



## Über dieses Buch

Dies ist ein digitales Exemplar eines Buches, das seit Generationen in den Regalen der Bibliotheken aufbewahrt wurde, bevor es von Google im Rahmen eines Projekts, mit dem die Bücher dieser Welt online verfügbar gemacht werden sollen, sorgfältig gescannt wurde.

Das Buch hat das Urheberrecht überdauert und kann nun öffentlich zugänglich gemacht werden. Ein öffentlich zugängliches Buch ist ein Buch, das niemals Urheberrechten unterlag oder bei dem die Schutzfrist des Urheberrechts abgelaufen ist. Ob ein Buch öffentlich zugänglich ist, kann von Land zu Land unterschiedlich sein. Öffentlich zugängliche Bücher sind unser Tor zur Vergangenheit und stellen ein geschichtliches, kulturelles und wissenschaftliches Vermögen dar, das häufig nur schwierig zu entdecken ist.

Gebrauchsspuren, Anmerkungen und andere Randbemerkungen, die im Originalband enthalten sind, finden sich auch in dieser Datei – eine Erinnerung an die lange Reise, die das Buch vom Verleger zu einer Bibliothek und weiter zu Ihnen hinter sich gebracht hat.

## Nutzungsrichtlinien

Google ist stolz, mit Bibliotheken in partnerschaftlicher Zusammenarbeit öffentlich zugängliches Material zu digitalisieren und einer breiten Masse zugänglich zu machen. Öffentlich zugängliche Bücher gehören der Öffentlichkeit, und wir sind nur ihre Hüter. Nichtsdestotrotz ist diese Arbeit kostspielig. Um diese Ressource weiterhin zur Verfügung stellen zu können, haben wir Schritte unternommen, um den Missbrauch durch kommerzielle Parteien zu verhindern. Dazu gehören technische Einschränkungen für automatisierte Abfragen.

Wir bitten Sie um Einhaltung folgender Richtlinien:

- + *Nutzung der Dateien zu nichtkommerziellen Zwecken* Wir haben Google Buchsuche für Endanwender konzipiert und möchten, dass Sie diese Dateien nur für persönliche, nichtkommerzielle Zwecke verwenden.
- + *Keine automatisierten Abfragen* Senden Sie keine automatisierten Abfragen irgendwelcher Art an das Google-System. Wenn Sie Recherchen über maschinelle Übersetzung, optische Zeichenerkennung oder andere Bereiche durchführen, in denen der Zugang zu Text in großen Mengen nützlich ist, wenden Sie sich bitte an uns. Wir fördern die Nutzung des öffentlich zugänglichen Materials für diese Zwecke und können Ihnen unter Umständen helfen.
- + *Beibehaltung von Google-Markenelementen* Das "Wasserzeichen" von Google, das Sie in jeder Datei finden, ist wichtig zur Information über dieses Projekt und hilft den Anwendern weiteres Material über Google Buchsuche zu finden. Bitte entfernen Sie das Wasserzeichen nicht.
- + *Bewegen Sie sich innerhalb der Legalität* Unabhängig von Ihrem Verwendungszweck müssen Sie sich Ihrer Verantwortung bewusst sein, sicherzustellen, dass Ihre Nutzung legal ist. Gehen Sie nicht davon aus, dass ein Buch, das nach unserem Dafürhalten für Nutzer in den USA öffentlich zugänglich ist, auch für Nutzer in anderen Ländern öffentlich zugänglich ist. Ob ein Buch noch dem Urheberrecht unterliegt, ist von Land zu Land verschieden. Wir können keine Beratung leisten, ob eine bestimmte Nutzung eines bestimmten Buches gesetzlich zulässig ist. Gehen Sie nicht davon aus, dass das Erscheinen eines Buchs in Google Buchsuche bedeutet, dass es in jeder Form und überall auf der Welt verwendet werden kann. Eine Urheberrechtsverletzung kann schwerwiegende Folgen haben.

## Über Google Buchsuche

Das Ziel von Google besteht darin, die weltweiten Informationen zu organisieren und allgemein nutzbar und zugänglich zu machen. Google Buchsuche hilft Lesern dabei, die Bücher dieser Welt zu entdecken, und unterstützt Autoren und Verleger dabei, neue Zielgruppen zu erreichen. Den gesamten Buchtext können Sie im Internet unter <http://books.google.com> durchsuchen.

---

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google™ books

<https://books.google.com>

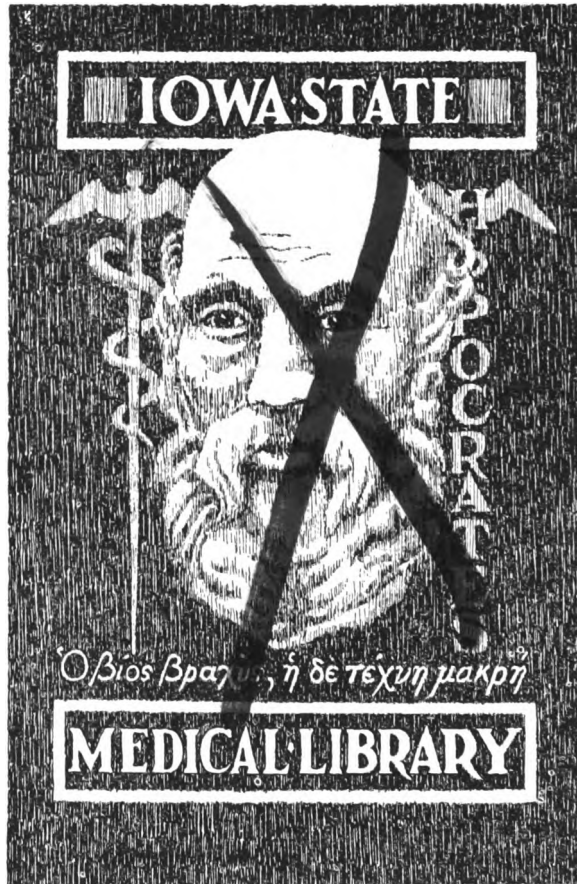






HEALTH SCIENCE

UNIVERSITY OF IOWA  
LIBRARIES



UNIVERSITY OF IOWA



3 1858 021 448 547

**DATE DUE**

MAY 27 1986 - 9:00 AM

DEMCO 38-297









# THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2

Telegrams: LANCET, RAND, LONDON.

Telephone: TEMPLE BAR 7228 and 7229.

No. XV. OF VOL. I., 1936.  
No. 5876. VOL. CXXX.

LONDON, SATURDAY, APRIL 11, 1936.

Pp. 112—Price 1s.  
Annual Subscription: 12s.  
Inland £2 2s. Abroad £2 10s.

## FIVE NEW BOOKS

### THE OPERATIONS OF SURGERY.

8th Edition. By R. P. ROWLANDS, M.S., F.R.C.S., and PHILIP TURNER, M.S., F.R.C.S. Vol. I. 435 Illustrations, 38 in Colour. 36s. Vol. II. (In Preparation.)

### MINOR SURGERY AND THE TREATMENT OF FRACTURES. 21st Edition. Revised by GWYNNE WILLIAMS, M.S., F.R.C.S. 284 Illustrations. 10s. 6d.

### MEDICAL ASPECTS OF CRIME

By W. NORWOOD EAST, M.D., F.R.C.P. 18 Illustrations. 18s.

### ELEMENTARY SURGICAL HANDICRAFT

By J. RENFREW WHITE, Ch.M., F.R.C.S. 243 Illustrations. 8s. 6d.

### PRACTICAL POINTS IN ANÆSTHESIA

By H. K. ASHWORTH, M.B., D.A. (R.C.P. & S.). 16 Illustrations. 7s. 6d.

J. & A. CHURCHILL LTD., 104 Gloucester-place, London W.1

## NOW AVAILABLE.

### PROGNOSIS.

VOLUME ONE.

Price 10s. 6d. net (postage 6d. extra).

Companion Volumes to the "Modern Technique in Treatment" and "Clinical Interpretation of Aids to Diagnosis" Series.

The first 66 articles of this series have been collected in book form. The Volume comprises 384 Demy Octavo pages, and is fully indexed under titles, authors, and broadly classified into groups to facilitate quick reference.

The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

### FRACTURES.

By MEURICE SINCLAIR, C.M.G., M.B., Ch.B. (EDIN.). With an Introduction by Sir ROBERT JONES, Bt., F.R.C.S. Pp. 550. 337 X ray photographs, photographs and diagrams. 24s. net.

Constable & Co. Ltd., London.

### BY LIEUT.-COL. ROBERT HENRY ELLIOT, M.D., B.S. Lond., F.R.C.S. Eng., I.M.S. retd.

A TREATISE ON GLAUCOMA.  
2nd Edition. Revised and Enlarged. 30s. net.

### TROPICAL OPHTHALMOLOGY.

With 7 Plates and 117 Illustrations. 31s. 6d. net.  
Spanish and French Editions, 1922. Full German Abstract.

THE CARE OF EYE CASES: 12s. 6d. net.

MANUAL FOR NURSES, PRACTITIONERS, AND STUDENTS.  
Chinese Edition. Oxford University Press.

THE INDIAN OPERATION OF COUCHING FOR CATARACT.  
7s. 6d. net. H. K. Lewis and Co. Ltd.

By H. CRIGHTON-MILLER, M.A., M.D., M.R.C.P.,  
Hon. Senior Physician, Inst. of Med. Psychology.

### INSOMNIA. An outline for the Practitioner.

Edward Arnold & Co., 41-43, Maddox-st., W.1. Price 10s. 6d.  
PSYCHO-ANALYSIS AND ITS DERIVATIVES.  
Thornton Butterworth, Ltd., 15, Bedford-st., W.C.2. Price 2s. 6d.

### IDEAL BIRTH.

HOW TO GET THE FINEST CHILDREN.

By TH. F. VAN DE VELDE, M.D.

(Author of "Ideal Marriage.")

Demy 8vo.

10s. 6d. net.

"This book is full of knowledge and wisdom and understanding. It is written by a gynecologist of experience. . . . He is writing for a public of fathers and mothers to be, nurses and midwives, doctors and the intelligent layman. . . . It cannot fail to impress itself upon many readers."—MEDICAL PRESS AND CIRCULAR.

Wm. Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

### DISEASES OF THE THYROID GLAND

WITH SPECIAL REFERENCE TO THYROTOXICOSIS.

By CECIL A. JOLL, M.S., B.Sc., F.R.C.S. (Eng.).

Crown 4to. Fully Illustrated. £3 3s. net.

Revista de Libros: "This book is the best clinical treatise which we possess to-day on the pathology of the thyroid. . . . The excellence of the text is greatly enhanced by the illustrations."

William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

NOW READY. 2nd Ed. in 1 Vol., 854 pp. 811 Illus.

### EMERGENCY SURGERY. 50s. net; postage 8d.

By HAMILTON BAILEY, F.R.C.S.

BRISTOL: JOHN WRIGHT & SONS LTD. LONDON: SIMPKIN.

With 80 Illustrations. Demy 8vo. 9s. net; postage 6d.

### INJURIES AND THEIR TREATMENT

By W. ELDON TUCKER, M.A., B.Ch., F.R.C.S., Surgeon at St. John's Hospital, Lewisham; Surgeon to the London Clinic for Injuries, &c.

With a Foreword by Sir HUMPHRY ROLLESTON.

"This is the book for which medical men, especially general practitioners, have long been waiting."—MED. PRESS AND CIRC.

London: H. K. Lewis & Co. Ltd., 136 Gower Street, W.C.1.

### MOTIVES AND MECHANISMS OF THE MIND

By E. GRAHAM HOWE, M.B., B.S.

Hon. Phys., Tavistock-square Clinic for Functional Nervous Disorders.

Pp. 230. Demy 8vo. 7s. 6d. net.

FIRST VOLUME OF THE POST-GRADUATE SERIES.

### THE CONDUCT OF MEDICAL PRACTICE

BY

THE EDITOR OF "THE LANCET"

AND EXPERT COLLABORATORS.

Price 10s. 6d. net. Postage 6d. extra.

"The book is certainly comprehensive, and indeed may be described as complete."—BRITISH MEDICAL JOURNAL.  
London: THE LANCET LTD., 7, Adam-street, Adelphi, W.C.2.

## JOHN BALE, SONS & DANIELSSON, LTD.

### THE TREATMENT OF VENEREAL DISEASE IN GENERAL PRACTICE.

By THOMAS ANWYL-DAVIES, M.D., B.S. (Lond.), M.R.C.P. (Lond.) Post free 7s. 9d.  
"The best book on the subject that I have ever encountered."—KENNETH WALKER, O.B.E., F.R.C.S., in "Health and Empire."

### THE CURE OF HÆMORRHOIDS AND VARICOSE VEINS.

A Practical Guide to Modern Methods of Injection and Bandaging. By STEWART MCAUSLAND, B.A. (Lond.), M.D., Ch.B. (Lis.), M.R.C.S. (Eng.), L.R.C.P. (Lond.). Second Ed. With Illus. Post free 4s. 4d.  
"This book is well written, there are some good illustrations, and the teaching is practical."—BRITISH MEDICAL JOURNAL.

### ARTIFICIAL CRANIAL DEFORMATION: A Contribution to the Study of Ethnic Mutilations.

By Dr. E. J. DINGWALL, 55 Full Page Plates. 90 Illus. 5 Maps. £3 10s. net. Post free £3 12s.  
"Dr. Dingwall has brought together in this well-illustrated volume the materials for the consideration of one of the strangest customs ever invented by man."—LANCET.

### OTOSCLEROSIS: With special reference to Ætiology and Treatment.

By MACLEOD YEARSLEY, F.R.C.S. Post free 8s. 6d.

"A readable and succinct review of the history of the recognition and investigation of its characteristics."—MEDICAL OFFICER.

### THIS PANEL BUSINESS.

By A. G. P. Post free 11s.  
"Involving the Future of the General Practitioner of Medicine."  
"The book is well worth study. In it is summed up the result of much all-round observation."—BRITISH MEDICAL JOURNAL.

### New Pocket Monographs Each post free 2s. 8d.

### THE MINOR MEDICINE OF GENERAL PRACTICE.

By L. V. SNOWMAN, M.A., M.B. (Camb.), M.R.C.P. (Lond.).  
"It would be almost impossible to recommend a more useful book."—CLINICAL EXCERPTS.

### AN EPITOME OF THE LABORATORY DIAGNOSIS AND TREATMENT OF TROPICAL DISEASES.

By HORACE M. SHELLY, F.R.F.P.S., M.R.C.S., L.R.C.P., D.T.M. & H. (Eng.).

83-91, GREAT TITCHFIELD ST., LONDON, W.1

# ESSOGEN AND ADVITA

(VITAMIN A) (VITAMINS A and D)

*produced from natural sources only*



ESSOGEN is a highly potent concentrate of Vitamin A, free from Vitamin D. The advantages in this respect will be readily appreciated, as Essogen may be employed over a wide range of conditions where it is desired to build up the resistance of the patient. Many diseases are definitely associated with low liver reserves of Vitamin A, and it is known that modern diets are commonly deficient in their Vitamin A content. One of the functions of Vitamin A is to correct a state of "passable" health and make it "buoyant." Xerophthalmia, Night Blindness and Coeliac Disease are attributed to a deficiency of Vitamin A.



ADVITA is an accurately balanced concentrate of Vitamins A and D, and is derived entirely from natural sources.

Advita is indicated in all conditions where the object is to ensure the efficient assimilation of calcium. It will be found particularly suitable for administration to nursing or expectant mothers as well as in the treatment of a number of children's ailments.

More than twenty years have been spent in extensive research on the fat-soluble Vitamins A and D at the Lever Biological Laboratories in Port Sunlight. With the vast resources at their disposal and the most advanced methods of assay, the Lever Biological Laboratories are in a unique position in this field, and Essogen and Advita may be accepted with confidence as biologically assayed products of guaranteed potency and rigid standardisation.

New and Improved Packs,  
 ESSOGEN and ADVITA, now available.  
 Bottles of 30 Capsules 2/6 per bottle  
 " 75 " 5/- "  
 " 500 " 31/6 "

*Clinical Samples and Literature on request*

AT  
**THE LEVER BIOLOGICAL LABORATORIES**  
**PORT SUNLIGHT, CHESHIRE**

**Sole Distributors: TRUFOOD LIMITED (Dept. 11)**  
**BEBINGTON, WIRRAL, CHESHIRE Telephone: Rockferry 500**

ENA 33-29-120

30789



# ADDRESSES AND ORIGINAL ARTICLES

## THE DIFFERENTIAL DIAGNOSIS OF DISEASES OF THE COLON

(DYSENTERY AND COLITIS) \*

BY PHILIP MANSON-BAHR, D.S.O., M.D. Camb.,  
F.R.C.P. Lond.

PHYSICIAN TO THE HOSPITAL FOR TROPICAL DISEASES,  
LONDON

(WITH COLOURED PLATE)

The subject of dysentery has extended enormously within recent years, and we at the present time possess a more comprehensive knowledge of the aetiology, diagnosis, and treatment of this condition than ever before.

The term "dysentery" itself denotes a symptom-complex; that is, the appearance in the stool, or in the form of an exudate derived from the bowel wall, of blood and mucus, either together or passed separately. It denotes therefore not one disease, but a whole congeries of conditions, fundamentally different from one another, to which this one sign is common.

The classification shown below is founded, as far as possible, upon an aetiological basis. It groups together all the different conditions, whether peculiar to the tropics or not, in which diarrhoea and dysenteriform symptoms are found. The list is a formidable one, but even now may not be complete.

### CLASSIFICATION OF THE DYSENTERIES AND ALLIED DISORDERS

#### THE DYSENTERIES

- |                         |                            |
|-------------------------|----------------------------|
| 1. Bacillary dysentery. | 3. Helminthic dysentery.   |
| 2. Protozoal dysentery. | (a) Bilharziasis.          |
| (a) Amebiasis.          | (b) Esophagostomiasis      |
| (b) Balantidiasis.      | and other worm infections. |

#### THE PSEUDODYSENTERIES

- |                          |                           |
|--------------------------|---------------------------|
| 1. Coccidiosis.          | 4. Malarial dysentery.    |
| 2. Giardiasis.           | 5. Leishmanial dysentery. |
| 3. Flagellate diarrhoea. |                           |

#### PATHOLOGICAL AFFECTIONS OF THE COLON RESEMBLING DYSENTERY

##### (a) Colitis Group

1. Mucous colitis and spastic colon.
2. Idiopathic ulcerative colitis.
3. Membranous colitis.
4. Colitis produced by foreign bodies.
5. Toxic colitis: (a) mercurial poisoning; (b) food poisoning (paratyphoid B); (c) uræmic colitis.

##### (b) MISCELLANEOUS GROUP

1. Tuberculosis of colon.
2. Syphilitic disease of the bowel.
3. Lymphogranuloma inguinale and rectal stricture.
4. Malignant disease and polyposis.
5. Diverticulitis.
6. Simple polypus.
7. Intussusception.
8. Internal hæmorrhoids.

The average person regards dysentery as being necessarily a somewhat disagreeable, or even dangerous, accompaniment of life in the tropics; but the genuine seeker after knowledge is bound to confess that the term "tropical" as applied to

dysentery is more convenient than real. Many of these diseases are found all over the world, and the conviction has gradually been forced upon us that their prevalence in the tropics is rather due to the lack of sanitary facilities than to any other dominating circumstance. In tropical lands, moreover, may be found many different forms of bowel diseases, and it is dangerous to presume that a patient from the tropics who is passing blood and mucus in the stools is necessarily suffering from one or other of the better known dysenteries, of which the aetiology is now well understood.

The diagnosis of dysentery, therefore, becomes a peculiarly definite clinical study, and it will be admitted that it is one of first-rate importance—mainly because the methods of treatment, as at present understood, differ so fundamentally that incalculable damage may be done by their inappropriate use.

### Bacillary Dysentery

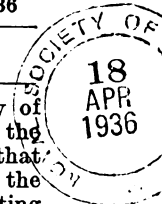
Bacillary dysentery is an acute epidemic disease whose ravages are nowadays mostly confined to tropical countries, where the insanitary conditions are the chief factors in its dissemination. To the student of tropical medicine it presents itself as a disease of major importance and as one of the chief causes of disability and invalidism in tropical countries. From the point of view of the settler or the government official with a growing family, a special danger lies in its liability to attack small children, and to produce in them a very serious and sometimes fatal illness. It must not be thought, however, that bacillary dysentery does not occur in more temperate climates; for cases are still met with which originate in schools and other institutions in this country. It is well known as a constant and inveterate disorder amongst patients in lunatic asylums and at least five epidemics have been recorded in Great Britain during the last 15 years.

From the point of view of the clinician, it is unfortunate that not one bacillus but several varieties of organism have been found to produce the symptom-complex of bacillary dysentery. There appears to be no special geographical distribution peculiar to the three chief forms of bacillus. The main factors which emerge are that it is comparatively easy to isolate the specific organism from the dysentery stool early in the course of the disease and when the specimen is tested within a short period of being passed by the patient. This time-factor becomes more and more important in a tropical climate, where all putrefactive processes are greatly accelerated.

Bacillary dysentery is an acute disease as a rule, but it has, as have all other acute infections, a most varied symptomatology; all grades are found, from an acute and rapidly fatal choleric form attack, to a comparatively mild and afebrile disease. In the differential diagnosis, with which this study is mostly concerned, it is important to note that its chief symptoms are due to toxic absorption of dysentery toxins from the large intestine. Bacillary dysentery, in popular language, is "lying-down" dysentery, and it is necessary to see it and to realise the pathological state of the mucous membrane of the large intestine before one can appreciate the finer points in differential diagnosis.

The dysentery bacilli attack the mucous membrane itself, which undergoes all changes from simple catarrh to complete coagulation necrosis, and this process extends throughout the whole 4½ ft. of the

\*The Lettsomian lectures for 1936 delivered before the Medical Society of London on Feb. 17th and 26th and March 2nd.  
5875



large intestine, and also, in the majority of cases, spreads upwards into the lower part of the small intestine as well; so it is obvious that there is a large vascular absorbing surface to be considered in estimating the damage to the human organism produced by this infection. All stages, from hyperæmia to complete destruction of the mucous membrane, can be studied in serial sections, and the natural process of cure entails the casting off, or exfoliation, of this dead and toxic membrane and a regeneration of the cells which have been destroyed in the process.

Shiga's bacillus is responsible for the most acute and the most readily fatal forms, and this was the bacillus that loomed large in the days of the Great War. Of Flexner's bacillus it is not so easy to speak as a single whole, mainly because the bacteriologists have succeeded in subdividing it into numerous varieties. Only recently it has been recognised that there are five serological groups, or races, of this organism, which have been labelled V, W, X, Y, and Z, and no longer need we worry our heads about this and that bacillus which has been christened after one bacteriologist or another.

The latest addition to the dysentery group which has received general recognition is Sonne's bacillus, and it is probable that many of the minor forms of acute dysentery and diarrhœa which are common amongst travellers on their first introduction to the glories of tropical life are due to an infection with this organism. Sonne differs from the true dysentery bacillus in its ability to produce acid out of lactose, and, moreover, in the human body it behaves very much like members of the food-poisoning group. For it may produce either symptoms of dysentery with blood and mucus in the stools, or, on the other hand, the symptoms of a generalised blood poisoning.

#### ISOLATION OF CAUSAL ORGANISM

The diagnosis of bacillary dysentery by the actual isolation of the organism from the faeces is a complex process, and for complete bacteriological accuracy a period of 5-7 days is necessary. In this lies the explanation why the diagnosis of bacillary dysentery is so seldom made, and it also explains to a great extent the discrepancies which one finds in studying the vital statistics of various countries where the two main forms of dysentery, the bacillary and amœbic, exist side by side.

If the whole of the mucous membrane is severely damaged the death of the patient is bound to ensue. In lesser degrees of infection the necrotic process has a patchy distribution, and only small areas of the bowel are involved. At autopsy the dysentery bacilli can be recovered from the inflamed mucous membrane in the early stages of the disease; but once necrosis has taken place, it is only possible to isolate them by scraping away the dead and putrefying mucous membrane and culturing the exudate which lies beneath.

There is a chronic form of bacillary dysentery (Fig. 1) also to be considered. In this form, which is very important from the point of view of differential diagnosis, the more acute dysenteric symptoms are not observed, and the main symptom-complex is one of chronic diarrhœa, accompanied by anæmia and grave emaciation. Here the underlying pathology consists in grave disturbance of the mucous membrane of the large intestine by sinuous ulceration with formation of submucosal sinuses and fistulæ. Sometimes also inclusion cysts are formed in the submucosa, and in their contents the dysentery bacillus finds a convenient and safe refuge.

In these chronic dysentery bowels the dysentery bacillus, far from vanishing from the mucous membrane in a few weeks, can persist for months or even years; and though it may be comparatively easy to isolate the organism post mortem, it is very difficult to obtain it by culture from the faeces during life. It is this fact that has led me to doubt the value of routine examination for dysentery organisms; simply because failure to obtain them from the stools does not indicate that they were not present at the same time in the ulcers of the bowel.

#### EXAMINATION OF STOOLS

A certain amount of assistance in diagnosis may be obtained from the macroscopic appearance of the stools, though this rough-and-ready method of diagnosis cannot supplant the finer methods of bacteriological examination. In the acute stage of bacillary dysentery the stools passed per rectum do not consist of faecal matter. There occurs a spastic contraction of the descending and sigmoid colon, which can be palpated through the abdominal wall by the examining hand, and there is actually a damming-back of the faecal contents; so what is passed per rectum is the inflammatory exudate, the casting off of the dead and defunct mucous membrane attacked by the dysentery bacilli. This exudate is passed out in an almost continuous stream, and it is safe to term it a "dysenteric exudate." Its evacuation is accompanied by pain and spasm, or tenesmus, and the very frequent passage of the stools leads to exhaustion.

The physical characters are best expressed by saying that the exudate consists of blood-stained mucus which is viscid and jelly-like; it may be compared to red currant jelly. The microscopical examination of this exudate has been termed cytodagnosis, and though it is at best only a rough guide it is valuable in times of stress and strain. In the bacillary dysentery exudate the predominant type of cell is the polymorphonuclear leucocyte, which constitutes something like 90 per cent. of the cells. Moreover, it has been pointed out that these cells have undergone toxic necrosis with large ring-shaped and easily visible nuclei. With these cells are found a variable number of large hyaline refractile elongated or oval cells, which are known as "macrophage cells." Very often they contain in their interior ingested red blood corpuscles, or even leucocytes, in various stages of disintegration (Fig. 2).

It is possible to demonstrate, in microscopic sections of the submucosa, that these cells are originally derived from the endothelium of the capillaries. They are obviously, then, endothelial macrophages which have undergone "hæmatophagy." These constitute about 4 per cent. of the cells found in the stools in the acute stage of bacillary dysentery, and their significance lies in the fact that they represent the reaction of the organism to an acute infection; and furthermore they are of crucial importance in differential diagnosis because the uninitiated in cytodagnosis are liable to mistake them for stages of the dysentery amœba, *Entamoeba histolytica*.

There has been a feeling throughout the years of war, and the critical years that have succeeded it, that many mistakes are being made in the differential diagnosis of the dysenteries, from the liability to mistake these body cells for the dysentery amœbæ, and many so-called "epidemics" of amœbic dysentery can be explained upon these simple grounds alone. It is not difficult to contemplate all the serious results that may accrue from a simple mis-

interpretation of this kind, which may lead to the continuous treatment and possible intoxication of the patient by emetine therapy.

In addition to these, other cells may be demonstrated, such as columnar epithelial cells, derived from the bowel surface and scattered red blood corpuscles. From continuous and daily microscopic observation of dysenteric stools I have been able to show that the cytological picture varies considerably from day to day, and that when the disease has lasted a week or more, the typical cell picture is entirely obscured.

The clearer out the cytological picture, the easier it is to isolate the dysentery bacillus on culture. Under the most ideal conditions, as in the field laboratories in which I worked during 1916-18, no difficulty was experienced in the isolation of one or other of the well-known species of the dysentery bacilli in the earlier stages of the disease; but the longer the disease has lasted, the more difficult this isolation becomes, and the more prevalent become the atypical or aberrant forms of dysentery-like organisms, such as Morgan's bacillus. This naturally has an important bearing upon the treatment of the patient; the sooner the disease is recognised, the sooner appropriate treatment is initiated, the more rapid is the recovery. A diagnosis of bacillary dysentery demands the institution of saline treatment, the injection of antidyenteric serum, usually intravenously, into those who are most seriously afflicted with the disease, and the adoption of suitable dietary.

#### AGGLUTINATION TESTS

There are other scientific methods of effecting a diagnosis in bacillary dysentery. There is, for instance, the serological agglutination test. Unfortunately, from the point of view of the practical physician, this test is not of great value, for in the most acute and fulminating forms of the disease, where rapid diagnosis is essential, it very often fails. This is especially true in the acute Shiga infections, in which the agglutinins to Shiga's bacillus do not appear in the serum until the patient is convalescent from the disease, when it is obviously too late to be of practical importance. The chief value of the agglutination test lies in the differentiation of the chronic stages of the disease from other

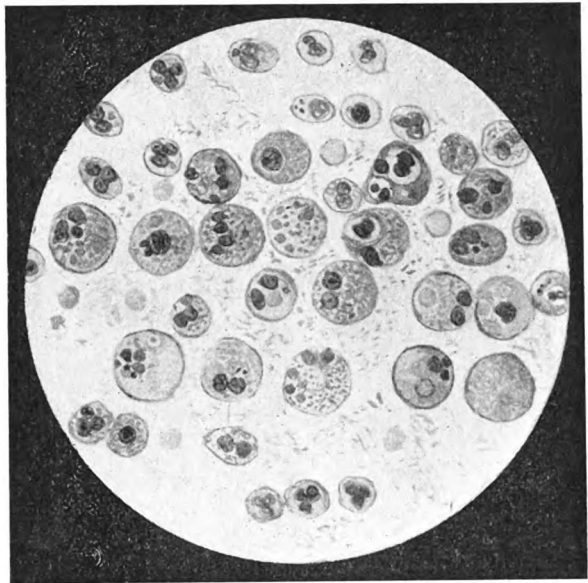


FIG. 2.—Bacillary dysentery (Flexner infection). Exudate with numerous macrophage cells. Stained with phosphotungstic haematoxylin to show their nuclear structure.

forms of colitis, and especially from the chronic "ulcerative" type.

The less acute clinical forms are usually due to Flexner's bacillus, and here the special difficulty arises in interpreting agglutination response to this bacillus. Apparently it is necessary to employ for the agglutination test a mixed emulsion of all five races of the organism, and very little importance should be attached to any result unless there is a titre of over 1 in 100.

#### SIGMOIDOSCOPY

Finally, there are the sigmoidoscopic appearances of the bowel. It is usually unnecessary, or even inadvisable, to employ sigmoidoscopy in the acute stages of bacillary dysentery; but where it has been performed, as by Biggam in Cairo, the appearances of the mucous membrane of the rectum tally very closely with those observed in pathological specimens (Fig. A on Plate).

Sigmoidoscopy is especially valuable in differentiating chronic bacillary dysentery from the chronic amebic disease; in fact, sometimes it is the only method by which a differential diagnosis can be brought about. In chronic bacillary dysentery the mucous membrane of the large intestine, ranging even to the lower rectum, is covered with patches of bleeding and easily vulnerable granulation tissue. To the practised eye, this scattered appearance is characteristic, though it is difficult, on appearances alone, to differentiate it from ulcerative colitis.

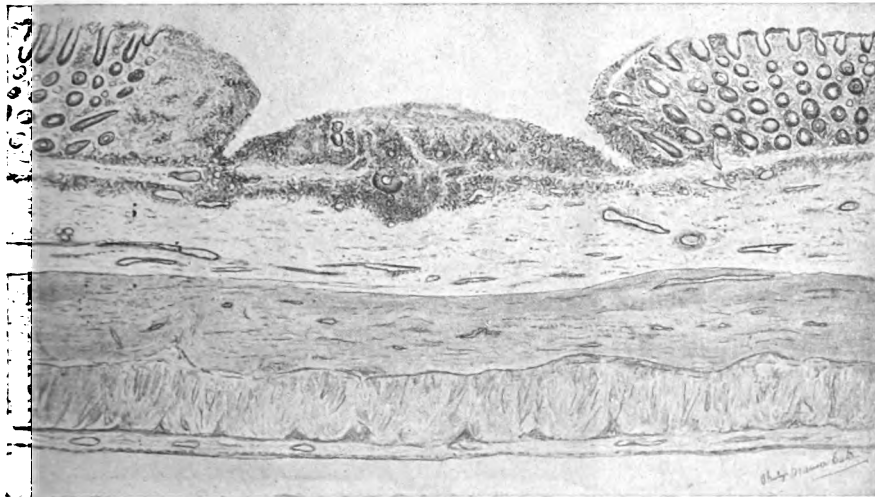


FIG. 1.—Bacillary dysentery. Shows the formation of a chronic bacillary ulcer affecting only the mucous membrane and not penetrating beneath the muscularis mucosae. (Flexner's infection.)

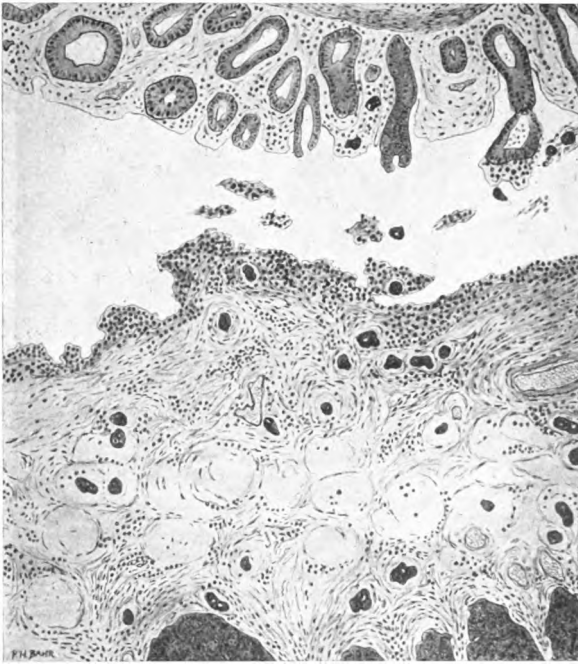


FIG. 3.—Amebic dysentery. Section through the base of an amebic ulcer in the large intestine, showing large numbers of tissue-invading forms of *Entamoeba histolytica* and the characteristic tissue changes in the submucosa. Note the healthy appearance of the adjacent mucous membrane.

The main point is that in bacillary dysentery there is some degree of stenosis of the bowel, accompanied by rigidity of the intestinal tube which renders the introduction of the sigmoidoscope somewhat difficult to the operator and painful to the patient (Fig. B on Plate).

This subject will be discussed further under the sigmoidoscopic diagnosis of amebic dysentery.

### Amœbiasis

Amœbic dysentery, or more correctly, primary intestinal amœbiasis, is due to the invasion of the large intestine by the *Entamoeba histolytica*. In order to understand the true natural history of this disease, it is essential to envisage the dysentery amœba as originally a parasite of the submucosa.

As Dobell has pointed out, it is not in the interests of the parasite to destroy its human host, but rather to live in a state of symbiosis, or more properly, to coexist on friendly terms. There is, therefore, a continuous struggle between the ravages of the parasite and the efforts of the tissues to repair the damage effected by the entamœba, and there is also an absence, more or less, of the toxic factor which plays such a considerable part in bacillary dysentery. As will be seen, the damage to the bowel is purely local and mechanical, and results only in the destruction of a very small portion of the absorbing surface of the large intestine.

Recent experiences have pointed to the fact that amœbic dysentery is a water-borne disease. The infection is transmitted from one human being to another by the cyst form of the organism. This cyst, which has a characteristic morphology, appears in the fœces of the patient, often in enormous numbers, during the chronic stage of the disease, when the stools are formed and are faecal in character. It is quite impossible to transmit the disease from one person to another by means of the active or

vegetative form of the amœba. This active form, which is familiar to all students of pathology, is found only in the fœces, more especially in the blood and mucus exudate, in the active or acute stage of the disease, when the patient is passing dysenteric fœces.

The cyst, on being ingested, passes undamaged through the gastric tract, and on reaching the alkaline constituents of the small intestine the cyst wall is digested and the young amœba emerges. The observations of many investigators have shown that the next stage of the invasion of the bowel consists in the penetration of the glands of Lieberkühn by young amœbæ, till the fundus of the glands is pierced and the submucosa itself is entered. The entry is effected by means of the mechanical movements of the amœbæ as well as by cytolytic ferments which they secrete.

A typical amœbic ulcer, as seen in pathological specimens, is formed as the result of the bursting towards the lumen of the bowel, of what is, in fact, an abscess of the submucosa. The resulting ulcer is what is known as a flask-shaped ulcer—that is, one with a narrow neck and a broad base (Fig. 3).

It is easy also to envisage other results which may accrue from the presence of such a submucosal lesion; for instance, the amœbæ may invade the submucosal blood-vessels, causing thrombosis and gaining entrance to the portal blood stream, and in this way the invasion of the liver by amœbæ, which is such a frequent complication of intestinal amœbiasis, may take place. Large blood-vessels too may be penetrated by an extension of the abscess, and this may lead to a fatal intestinal hæmorrhage. If, however, the extension of the abscess should be towards the peritoneum, then the perforation of the large bowel occurs with consequent fatal peritonitis.

From the brief consideration of these pathological details we can gather the probable course of events of an amœbic infection. It will be understood that the blood and mucus exudate containing the pathogenic amœbæ is squeezed out of the ulcers by the peristaltic action of the large intestine, and this in turn explains the chief characteristic of the amœbic

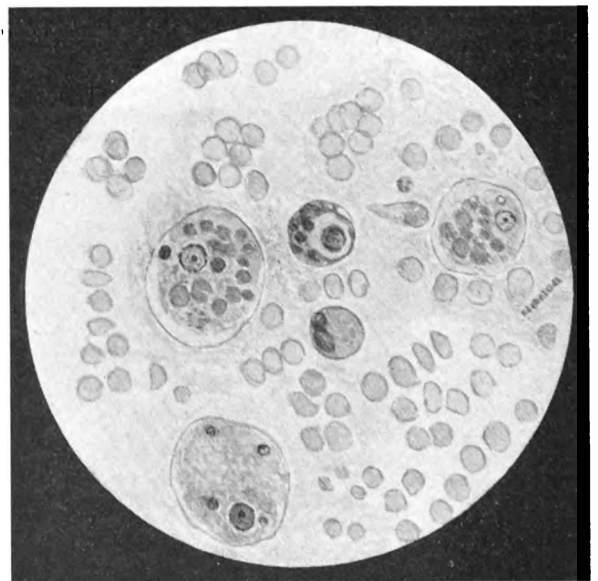


FIG. 4.—Amebic dysentery. Exudate of amebic dysentery showing trophozoites of *Entamoeba histolytica* containing ingested red blood corpuscles. (Stained with phosphotungstic hæmatoxylin.)

stool and assists in differentiating between it and the bacillary exudate.

The patient suffering from amœbic dysentery, however acute the clinical symptoms may appear, does not bear the stigmata of an intestinal toxæmia, mainly because the toxins are not produced by the parasite itself. The lesions of the bowel are a mechanical rupture of the mucosal surface, so that the greater part remains normal in appearance and function. The course of amœbic dysentery is, therefore, usually quite apyrexial; the stools are fewer in number and more fœcal in character than in the bacillary disease, and as a rule there is no pain or abdominal tenderness. Tenesmus is extremely rare. The fact is that amœbic dysentery is a chronic prolonged disease and may coexist with comparatively good health. I have investigated and treated cases which have been known to be infected with the dysentery amœba for 30 to 40 years.

#### THE STOOLS

The macroscopical characters of the amœbic stool correspond with what might be expected from a study of the pathology of the disease. They are generally loose and diarrhœic in character, large in amount, and usually very offensive, owing to the decomposing blood which they contain. The admixture of this dark tarry blood has led to their comparison to "anchovy sauce."

The microscopical appearances are also of value in differentiation. In contradistinction to bacillary dysentery, the polymorphonuclear cells are almost entirely absent, and wherever some intestinal debris is present, the cells have a ragged outline and are of a "mouse-eaten" appearance. The red blood corpuscles are massed together in clumps or rouleaux, and a large number of contaminating micro-organisms are visible.

Then there are Charcot-Leyden crystals. These are generally associated with active forms of *E. histolytica* and considerable diagnostic importance has been ascribed to their presence by various authorities, such as J. G. Thomson, A. Robertson, H. W. Acton, and others (Fig. 4). It is felt, however, that some protest should be made against the practice, which has become prevalent, of diagnosing amœbic dysentery upon the presence of these crystals alone. They are found in many other pathological conditions of the large intestine, and I have seen them in association with thrombosed piles, carcinoma of the rectum, ulcerative colitis, and coccidial infection of the large intestine. It is probably more correct to state that, if these crystals are present in the fœces in large numbers, a more prolonged search should be made for the dysentery amœba.

Finally, as regards the entamœba itself, it must be emphasised once more that in order to find these organisms in their active state in the fœces, the specimen must be examined microscopically within a short period of being passed, and furthermore, warming of the preparation encourages the amœboid movements and renders them more easily recognisable. Sometimes, even in a blood and mucus stool, a prolonged search is necessary in order to find amœbæ, and very often they occur in clumps or in congregated masses. Sometimes, even, cases are met with in which a search of the stools has failed to reveal amœbæ, but they have been obtained subsequently in large numbers in preparations made direct from the intestinal ulcers by a proctoscopic examination. From the consideration of these circumstances it is quite easy to understand that when specimens of

fœces are dispatched in containers to the laboratory by post, the correct diagnosis is often missed because the organisms are dead.

A further word of warning is necessary—namely, that when once the active *E. histolytica* is dead it disintegrates with great rapidity, and soon becomes entirely unrecognisable as such under the microscope.

In the chronic stage of the disease the difficulties of diagnosis are often considerable. Chronic amœbic



FIG. 5.—Balantidial dysentery. Section of the large bowel through an ulcer, showing the distribution of the balantidium in the submucosa.

dysentery parades itself under a great number of clinical forms, and may resemble almost any other form of chronic intestinal disease. One of the chief symptoms is diarrhœa alternating with constipation. It may, moreover, produce signs and symptoms of a chronic appendicitis or, on the other hand, it may provoke a train of events which more resemble those of diverticulitis than of any other recognisable intestinal condition.

Chronic amœbiasis is usually associated with some chronic enlargement of the liver and an earthy waxy appearance of the skin. Its absolute diagnosis rests upon the discovery of the characteristic cysts of *E. histolytica* in the fœces. These may be present in enormous numbers, or they may be extremely scanty. The recognition of these cysts with certainty can be attained only after considerable practical experience. They have to be differentiated from the somewhat similar cysts of other intestinal protozoa, which may be present in the stools, but the identification of a single cyst with certainty is as important as the recognition of many, for in this case "one swallow makes a summer."

There is another difficulty which is often encountered and which is not easy to explain, and that is the intermittent appearance of these cysts in the fœces. One day they may be extremely numerous, and on the next prolonged search may fail to reveal a single one.

#### DIRECT EXAMINATION OF THE BOWEL

In view of the difficulties related above, sigmoidoscopy is playing a very important rôle in the diagnosis of this condition (Figs. C, D, and E on Plate). In



the acute stage of the disease, the sigmoidoscopic appearances are quite characteristic and the amœbæ may be identified in preparations made through the sigmoidoscope from the lesions themselves. The main point that strikes the observer is the pale and somewhat anæmic appearance of the undamaged mucosa together with an extra-elasticity of the folds of the bowel itself. On the introduction of the instrument into the rectum this corrugated appearance of

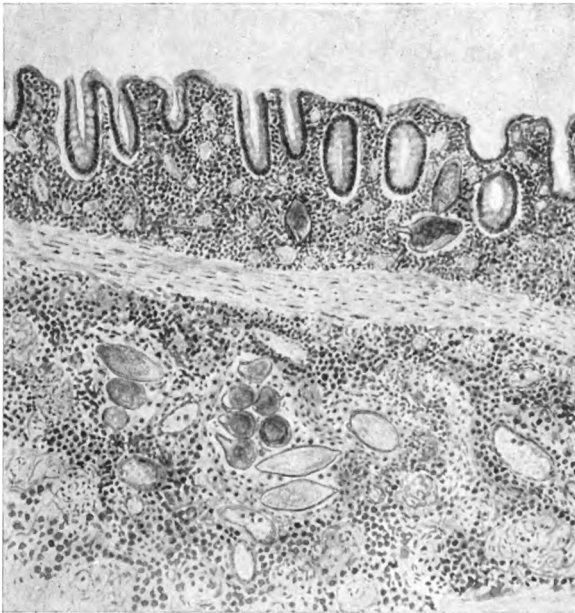


FIG. 6.—Bilharzial dysentery (Egyptian case). Showing eggs of *B. hematobium* and *B. mansoni* deposited in the submucosa and ulcerating their way through the mucosa into the lumen of the bowel.

the mucosa becomes instantly visible. The amœbic lesions are characteristic and consist of small punched-out ulcers surrounded by red areolæ or small yellow elevations which may be compared to the craters of microscopic volcanoes. There are generally interspersed between them numerous but small submucosal hæmorrhages. In the chronic stage the lesions are so minute that they can be discovered only by the use of a magnifying eye-piece. They are represented by small indentations or puckering of the mucosa, which represent the sites of healed or healing ulcerations. It is estimated that characteristic lesions are visible in the rectum and lower sigmoid in quite 75 per cent. of all amœbic cases. There remains, however, a residuum of 25 per cent. in which the lesions are situated higher in the bowel and beyond the reach of vision of the modern sigmoidoscope.

#### DIAGNOSTIC USE OF EMETINE

Before leaving the subject of amœbic dysentery it is necessary that some reference should be made to the therapeutic diagnosis of the disease. Unfortunately there always remains a small number of cases in which, although symptoms of diarrhœa and abdominal discomfort persist, yet no evidence of active amœbic infection can be verified. In these cases of doubt the experimental therapeutic injection of emetine is permissible. Should the more urgent symptoms clear up as the result of this course, then the practitioner has every right to regard the case as being one of amœbic infection. There are many grave objections to recommending this course as a

routine practice, but there are instances in which it must be resorted to.

#### Balantidiasis

Balantidiasis is a disease closely resembling amœbic dysentery in its course, but it is produced by the largest intestinal ciliate protozoan known, the *Balantidium coli*. This is a common parasite of the pig and of many monkeys, in all of which it may cause a fatal form of dysentery. Balantidial dysentery is such a rare disease in man that it is more of a medical curiosity than anything else. The human cases which have been recorded in the United States of America, Germany, Russia, and Italy have been in people who are closely associated with pigs, such as swineherds and pork butchers, and only occasionally have fatal infections been recorded. The pathology of the disease is very similar to that of amœbic dysentery, and in sections of the colon the balantidia can be demonstrated in large numbers in the submucosa and at the bases of the characteristic ulcers (Fig. 5). They are much larger and more conspicuous than are amœbæ in a similar situation. The diagnosis of balantidiasis is easily effected by the discovery of this large and conspicuous parasite in the fæces. Unfortunately the treatment of this infection has so far proved to be very unsatisfactory.

#### Bilharzial Dysentery

Apparently all three species of the bilharzia parasite which inhabit man are capable of giving rise to lesions in the large intestine, which take the form of ulcers or adenopapillomata, in which the characteristic eggs of the particular parasite can be found. The three species are *B. mansoni*, *B. hematobia*, and *B. japonica*. The eggs of these parasites are found in the fæces and each has distinctive character, so that it is unnecessary to particularise further (Fig. 6).

The bilharzia diseases have definite and well-defined geographical distribution. *B. mansoni*, which is the chief producer of dysenteric symptoms, ranges throughout almost the whole of Africa, and is occasionally found in the West Indies and South America. Therefore it is only in persons who emanate from areas where the disease is indigenous that the suspicion of this diagnosis can be entertained. In tropical practice, of course, this is an important matter. The diagnosis is made absolute by the discovery of the eggs of the parasite in the fæces. Often they can be found in the blood and mucus with which the faecal mass is covered, and, as a general rule, it is more advantageous to examine the outer layers of a formed motion rather than the centre portions. Rarely there is profuse diarrhœa with this infection, as in the other forms of dysentery. Some assistance is obtainable by a study of the cellular exudate in the fæces which usually contains a large number of eosinophil cells. Sometimes, especially in the case of *B. mansoni*, the characteristic eggs may be very scanty and difficult to demonstrate in the fæces, and in these, methods of concentration, such as that of Fülleborn, are employed.

The sigmoidoscopic examination is of great value and the pedunculated growths can be seen in the upper part of the rectum where they are quite characteristic. Portions of them may be removed by suitable forceps, crushed and placed under the microscope, in order to demonstrate the eggs. Sometimes in heavily infected persons, as in native Egyptians, the characteristic growths can be felt by digital examination of the rectum.

The earliest appearance of bilharzial dysentery in the bowel consists of small granulating areas

(Fig. F on Plate), and sometimes small elevated papules which more resemble tuberculosis, but these are usually seen in early European infections.

### Oesophagostomiasis

As a matter of academic interest it is necessary to mention the rare nematode, *Oesophagostomum apistomum*. This is the worm which inhabits the cæcum and colon of monkeys in Africa, the Philippines, Brazil, and China, and has been found in native prisoners in the gaols of Northern Nigeria. The female worms, which measure 2 to 3 cm. in length by 1 mm. in breadth, are found encysted beneath the mucous membrane of the large intestine and give rise to dysenteriform symptoms. The diagnosis is made by the discovery in the fæces of the eggs of the parasite. The eggs measure 60  $\mu$  in length by 40  $\mu$  in breadth, and closely resemble those of ancylostoma, except that the contained embryo is in an advanced stage of development.

(To be continued)

## MEDICAL PROBLEMS IN MINERAL METABOLISM\*

By R. A. McCANCE, M.D., Ph.D. Camb.,  
F.R.C.P. Lond.

ASSISTANT PHYSICIAN IN CHARGE OF BIOCHEMICAL RESEARCH,  
KING'S COLLEGE HOSPITAL, LONDON

### II.—SODIUM DEFICIENCIES IN CLINICAL MEDICINE (continued)

#### The Secretion of Urine

All the conditions now under discussion are liable to be accompanied by a rise in the blood-urea. O'Shaughnessy,<sup>241 242</sup> studying cholera in 1831-32, was, I think, the first to draw attention to this. Colin<sup>53</sup> noted it in 1868 in diabetic coma, so you see it is not a new discovery. It was not detected in intestinal obstruction till 1914,<sup>319</sup> but since that time it has frequently been observed clinically<sup>19 29 35 36 40 44 47 58 68 71 85 94 105 113 126 159 163 168 176 184 186 202 203 204 218 219 230 254 256 258 259 260 263 277 281 284 312 325</sup> and produced experimentally through dehydration or removal of the intestinal secretions.<sup>10 56 77 79 84 92 102 111 112 114 115 116 117 118 120 136 141 152 159 199 240 283 329 330 331 339</sup>

It is well recognised in Addison's disease.<sup>13 85 130 275 292 293 305 309 311 346</sup> It has been reported also by a number of clinical observers in an ill-defined but rather interesting group of cases, sometimes with signs of true nephritis, in which hypochloræmia, often of unproven origin, was a cardinal sign and the suggested cause of the high blood-urea.<sup>23 25 47 153 156 225 244 261 263 268 272 304</sup> It is possible that the high blood-ureas of uncompensated alkalosis<sup>18 237</sup> with hypochloræmia should be included here although there is no hyponatræmia. A considerable literature has grown up on the secretion of urine in diabetic coma which has been reviewed by McCance and Lawrence.<sup>188</sup> In this disease the blood-urea may be high when the patient comes under observation, or it may at this time be relatively normal and only begin to rise as insulin treatment proceeds. It may then go up in the course of 6 or 8 days to 250-300 mg. per 100 c.cm.

\* The Goulstonian lectures for 1936, delivered before the Royal College of Physicians of London on March 5th, 10th, and 12th. Lecture I. was published on March 21st; Part I of Lecture II. last week; and Lecture III. will appear in a forthcoming issue.

The post-mortem and other anatomical evidence gives no satisfactory explanation of why the blood-urea should rise in any of these diseases.<sup>44 58 176 188 199 216 223 225</sup> Morbid appearances have naturally been described,<sup>294</sup> but there is no unanimity about them and all are agreed that the kidneys are quite unlike those of chronic interstitial nephritis, sublimate poisoning, or any other condition in which a similar retention of urea may be encountered. Further, if the patient recovers from the intestinal obstruction or diabetic coma, renal sequelæ have never been recorded. One must therefore conclude that the abnormality is a temporary one of function only, and not a permanent one of structure. I wish now to discuss possible explanations of this rise of blood-urea which have been suggested from time to time. I say "suggested" purposely, for few of them have been tested experimentally. Let me begin by examining any other evidence we possess as to the function of the kidney in these conditions.

Our knowledge of the excretion of urinary constituents other than urea is unfortunately fragmentary and rather contradictory. Salt deficiency so upsets the water balance of the body that the excretion of water may become very abnormal. In both clinical<sup>208 274 275</sup> and experimental<sup>267 289 290</sup> Addison's disease, for example, the excretion of ingested water is very much delayed, but under the circumstances this is no real proof of renal deficiency. In chronic interstitial nephritis the kidney does not respond to ingested water with a diuresis, but here the kidney is partially destroyed and this is the primary cause of the abnormal water metabolism. For this reason I shall not include chronic interstitial nephritis in my discussion of the secretion of urine during salt deficiency. Apart from these two diseases, oliguria is the rule in clinical salt deficiency, but this is to be expected since clinically the causes of salt loss are also causes of water loss. Some authors have found that a rise in blood creatinine, or uric acid, accompanied the rise in the blood-urea,<sup>40 56 176 203 207 219 343</sup> and obviously if no urine is being passed this must occur. Others have found the reverse.<sup>113 115 338</sup> After diabetic coma the creatinine rises in the blood pari passu with the urea, but the excretion of ammonia remains normal.<sup>188</sup> The same is probably also true of the excretion of ammonia after severe diarrhoea<sup>218 282 286 287 315</sup> or loss of pancreatic juice.<sup>136</sup> Many have found intestinal obstruction to be accompanied by a subnormal excretion of phenol sulphone phthalein,<sup>71 113 109 223 263 281 319 345</sup> but others again have shown that the secretion of the dye may still be normal even when the blood-urea has been raised or when other signs of renal deficiency are present.<sup>259 290 319</sup> Louria's observation is of little value as saline had been given before the phenol sulphone phthalein. This dye, however, is a comparatively insensitive test for deficient function.<sup>76</sup> It is, moreover, probably excreted both by glomeruli and tubules,<sup>147 288</sup> so that it must be regarded as an unsatisfactory substance on which to base physiological argument. Schafer<sup>279</sup> has stated that in experimental Addison's disease the kidney does not lose its ability to concentrate nitrogenous substances in the urine. We may, therefore, conclude in general terms that signs of functional renal failure are common but that the excretion of urea, as judged by the height of the blood-urea, may appear to be defective while other functions of the kidney are still relatively normal.

Besides excreting nitrogen the normal kidney helps to regulate the pH of the plasma, and this is one of the functions which may undoubtedly fail in severe salt deficiency. Failure is most obvious

during a proved alkalosis when the urine may be found to be acid instead of alkaline.<sup>1 40 71 91 105 140 218 219 238 302</sup>

I wish now to discuss the reasons which have been suggested for these signs of renal failure.<sup>33 35 58 85 94 156 168</sup> Before I begin let me remind you that the volume of water excreted per day is probably controlled by humoral factors and by the pituitary gland. After mild loss of fluids by sweating, or after a reduced water intake, the volumes of urine may become very small indeed without any evidence of a reduction in the rate of glomerular filtration. Conversely the daily excretion of water may be normal or excessive when glomerular filtration and the power to excrete creatinine and urea is certainly reduced. The volume of the glomerular filtrates is always so *much* larger than the volume of urine that it is easy to see how this can be so. Extreme reduction of glomerular filtration must naturally reduce the volume of urine.

The first reason to be discussed is the fall of blood pressure. It is current knowledge that if the spinal cord is cut the secretion of urine stops because the blood pressure falls below the level at which glomerular filtration can take place. A fall of blood pressure is the rule in diabetic coma and Addison's disease,<sup>8 188 311</sup> and must reduce the glomerular pressure unless the efferent glomerular arterioles can maintain it.<sup>322 342</sup> I am satisfied that a fall in arterial blood pressure is not always the cause of the renal failure after diabetic coma,<sup>188</sup> and I do not think that a small fall should necessarily affect the volume of urine or the concentrating power of the tubules, provided the latter remain adequately nourished.<sup>321</sup>

Secondly, dehydration has often been invoked to explain the signs of renal failure.<sup>12 92 131 159 223 281 305 346</sup> This suggestion requires amplification in terms of what is known of renal physiology. The circulating blood,<sup>13 158</sup> which may be greatly reduced in volume, may only be able to fill a proportion of the normal number of capillaries in the body. If this applies to the renal circulation, the number of active glomeruli will be reduced, and hence the rate of glomerular filtration. The urine volumes will vary according to the cause of the anhydræmia. If this has been caused by severe water deprivation, the daily volumes of urine will be very small. These are the conditions met with after prolonged vomiting or excessive exposure to high external temperatures. If the anhydræmia has been caused by a loss of sodium salts, it may be accompanied by a normal fluid intake and by normal daily volumes of urine. This is the position in Addison's disease (see Lecture III.). The reduction in glomerular filtration, however, may be one of the factors which prevents the kidney developing its normal rate of diuresis after water ingestion. The excretion of solids should depend upon the rate of glomerular filtration rather than the urine volumes, although their excretion may not be quite so efficiently carried out when the volumes of urine are very small.<sup>78</sup>

Thirdly, a fall in plasma volume will cause a rise in the plasma proteins and hence in the colloidal osmotic pressure of the plasma. This will reduce the glomerular filtration unless the arterial blood pressure rises in compensation. We know that it does not. The efferent glomerular arterioles may of course constrict and so maintain glomerular pressure. Urine volumes should not be affected.

Fourthly, increased viscosity of the blood, which undoubtedly occurs<sup>13 119 128 145 196 211 269 270</sup> owing to the increased number of red cells per c.mm., may

decrease the circulation-rate and so reduce the efficiency of the kidney.

Fifthly, an uncompensated alkalosis, which often accompanies loss of the intestinal secretions, may in itself greatly diminish the capacity of the kidney to excrete urea and creatinine<sup>18 55 237</sup> (see Lecture III.). This probably means decreased glomerular filtration. If there is no sodium deficiency an uncompensated alkalosis results in polyuria in spite of the diminished glomerular filtration, but if there is a sodium deficiency the result is an oliguria (Lecture III.). The reason for this difference is not at present clear.

Sixthly, the kidney cells may be specifically injured by salt withdrawal so that the organ cannot function efficiently.<sup>33 85</sup> This suggestion is difficult to refute but requires experimental support to make it an attractive explanation. Other suggestions have been made<sup>42</sup> which I do not intend to discuss.

Lastly, there are factors affecting the secretion of urine which we all recognise although we cannot explain. I refer to the causes of those mysterious post-operative anurias, reflex anurias, and the anurias of acute nephritis, and so on.<sup>65 143</sup> Equally mysterious anurias are met with experimentally.<sup>3 5 6 61 63</sup> Some anurias—e.g., in acute nephritis—may be due to the tubules becoming so functionless that the whole of the fluid filtered off in the glomeruli is reabsorbed again, as it is in the peripheral lymph system.<sup>296</sup> We may have to relegate the anuria following diabetic coma to this unsatisfactory group.

These explanations account satisfactorily for the generalised fall in renal efficiency of which we have had evidence. The excretion of water demands special consideration, and it is important to distinguish a reduction in glomerular filtration from a reduction in total urinary volume. Patients may have rising blood-ureas and other signs of diminished glomerular filtration in the presence of a copious flow of urine.<sup>55 188 204 237</sup>

None of the reasons so far advanced explains why the excretion of *urea* should appear to be predominantly affected. One explanation for this is the excessive tissue breakdown. We have evidence from the nitrogen balances that this is going on, and many authors have had to postulate it to explain the rising blood-ureas which have been observed in spite of high rates of excretion.<sup>102 120 197 222 225 240 259 325 337</sup> It would obviously be possible in this way to get very high blood-ureas with perhaps no rise in blood creatinines and no change at all in phenol-sulphone-phthalein excretion. Urea-clearance tests would be invaluable under these circumstances and should always be done.

Blum considered that the rise in blood-urea was due to the "manque de sel."<sup>25 26 27</sup> The urea was reabsorbed to raise the subnormal osmotic pressure of the plasma. This you will remember is the normal state of affairs in the dogfish. The theory was evolved to explain the renal disorganisation following diabetic coma. It does not do so satisfactorily, for I have seen patients with reasonably high blood pressures filled with saline after coma till they were œdematous—and still no urine came. The theory does not explain the simultaneous retention of creatinine. Urea, moreover, even if reabsorbed, would not regulate the osmotic pressure of the plasma as originally conceived, for the substance permeates freely through all the tissues of the body. In the dogfish this was what was wanted because the osmotic pressure of the whole body was being raised relative to the liquid environment. In the mammal nothing can act as an efficient substitute for an extracellular electrolyte unless its distribution is limited to the



extracellular fluids. Glucose,<sup>339</sup> for example, or potassium chloride<sup>118</sup> would be quite useless. Nevertheless a consideration of the normal urea clearances and the glomerular filtration rates at high or low levels of water excretion suggests that some reabsorption of urea may always take place. Blum's theory then merely postulates the exaggeration of a normal process. Moreover, some of the experimental evidence is in keeping with reabsorption,<sup>21 80 81</sup> and until the results have been explained in some other way we cannot altogether dismiss reabsorption of urea as a cause of some of the high blood-ureas met with during salt deficiency. It is true that in acute water poisoning there may be no rise of blood-urea,<sup>297</sup> and considerable hypochloræmia and fall of serum osmotic pressure may occur in very young dogs without any rise of "Reststickstoff,"<sup>159 160</sup> but evidence based on the reactions of very young animals should be treated with caution. After all, new-born mice can survive an hour in pure nitrogen,<sup>154</sup> but no one would suggest that adult men could do the same.

### Medical Importance of Salt Deficiency

Minor degrees of deficiency must be quite common in the tropics,<sup>172 193 194</sup> and should be suspected if the urine does not contain normal amounts of chlorides. The danger of salt deficiency to miners, stokers, and others who have to work in very hot atmospheres is now unquestioned.<sup>78 229 314 340</sup> While no one would attribute the gravity of diabetic coma or intestinal obstruction to salt deficiency alone, it is certain that a loss of salt may be a very serious matter and may by itself have fatal consequences. The experimental work leaves no doubt of this. Rabbits can be killed in a few days by diuretin which produces a forced excretion of chlorides in the urine.<sup>21 109 110 222</sup> Removal of pancreatic,<sup>77 330</sup> gastric,<sup>102 136 329</sup> or intestinal juice,<sup>146</sup> without interrupting the continuity of the gut, is fatal, although it seems that animals suitably nourished can survive a loss of pancreatic juice for a considerable time.<sup>34</sup> Whatever the actual cause of death in intestinal obstruction, no one nowadays will dispute the gravity of the loss of the extracellular salts or the value of replacing them by giving saline. This is even more obvious in the acute gastro-enteritis of children. It is not quite right to attribute the bad effects only to the removal of sodium salts, for loss of gastro-intestinal secretions means loss of water as well. If water can be taken by mouth and absorbed, then a condition more akin to simple salt loss is obtained, but, in giving saline, water and salt are restored together and in most instances the beneficial effects are due to both.

Loss of salt is such an important feature of suprarenal removal or destruction that it may almost be said to constitute the disease. Clinically it is true that salt cannot yet be regarded as a complete cure, and some of the experimental findings—e.g., the interference with fat absorption—are perhaps difficult as yet to reconcile with a simple loss of sodium salts. Harrop et al.,<sup>128</sup> however, have been able to keep bilaterally suprarenalectomised dogs alive and in good condition for months with sodium chloride and bicarbonate alone. Signs of deficiency at once developed when this treatment was discontinued.

### Treatment

I have already touched upon this, and there is no need to emphasise facts which are already generally known. There are, however, one or two points which I should like to discuss. The first is the question of whether one should incorporate sodium bicarbonate or lactate in the solution of sodium

chloride to be administered. The question arises in diabetic coma and severe diarrhœa, which produce acidosis, and also in Addison's disease. In diabetic coma the acidosis is due to substances which the administration of insulin will remove. It seems unnecessary therefore to give bicarbonate with the saline, and the tendency nowadays in this country is, I think, not to do so. After severe diarrhœa without vomiting, some bicarbonate is probably beneficial, but in the acute gastro-enteritis of children acidosis or alkalosis may be present according to whether diarrhœa or vomiting has predominated. Unless the presence of acidosis has been correctly diagnosed, it is safer to give a simple saline solution, and this should always be used in cases of alkalosis. May I remind you that the most severe alkalosis may be accompanied by an acid urine. Never be misled by the reaction of the urine into giving such a patient bicarbonate or any other form of alkali.<sup>132</sup> It would probably be fatal. Hartmann and others<sup>133 134 137 212</sup> have advocated the substitution of Ringer solution for simple saline and the addition of sodium lactate in cases of acidosis. This salt is converted slowly to bicarbonate in the body,<sup>138 139</sup> and is claimed to be safer and more efficient than the latter for parenteral administration.

Harrop et al.<sup>128</sup> combined sodium lactate or bicarbonate with the sodium chloride, which they administered to their suprarenalectomised dogs, and considered that it was an important part of their successful treatment. It may have been, and if so it is possible that the combined salts would be much more efficacious clinically than sodium chloride alone. Systematic trial will no doubt settle the matter, and meantime I think the evidence is good enough to suggest that bicarbonate should be combined with the chloride.

The second detail of treatment which I wish to discuss is whether normal or hypertonic saline should be used. This obviously depends upon the circumstances, and Hartmann has actually described six different brands of salt solutions and the indications for their use.<sup>134</sup> I feel that this is making things unnecessarily complicated. If one can have a complete chemical examination made of the blood, one can prescribe almost exactly the salts and water required to restore normality, but few English physicians would consider it advisable to wait for such analyses before beginning treatment; nor do I think it necessary, but my experience of children is very limited. The safest solution to use is normal saline or Ringer's solution. Hypertonic saline should only be employed when it is specially indicated as in cholera and diabetic coma—and in the latter only in reasonable quantities.

### REFERENCES

190. McCance, R. A., and Watchorn, E.: *Brain*, 1932, *lv.*, 91.
191. Same authors: *Ibid.*, 1934, *lvii.*, 333.
192. McCarthy, J. F., Stepita, C. T., Johnston, M. B., and Killian, J. A.: *Jour. of Urol.*, 1928, *xix.*, 43.
193. McCord, C. P., and Ferenbauch, T. L.: *Milit. Surg.*, 1931, *lxix.*, 608.
194. McEwen, O. R.: *THE LANCET*, 1935, *i.*, 1015.
195. McGee, W. J.: *Interstate Med. Jour.*, 1906, *xiii.*, 279.
196. McIver, M. A., and Gamble, J. L.: *Jour. Amer. Med. Assoc.*, 1928, *xc.*, 1589.
197. MacKay, L. L., and MacKay, E. M.: *Amer. Jour. Physiol.*, 1924, *lxx.*, 394.
198. McQuarrie, I.: *Jour. of Pediat.*, 1933, *iii.*, 539.
199. McQuarrie, I., and Whipple, G. H.: *Jour. Exper. Med.*, 1919, *xxix.*, 397, 421.
200. McSwiney, B. A.: *Proc. Roy. Soc. Med.*, 1934, *xxvii.*, 839.
201. "": *THE LANCET*, 1934, *i.*, 641.
202. McVicar, C. S.: *Amer. Jour. Med. Sci.*, 1925, *clxix.*, 224.
203. McVicar, C. S., and Weir, J. F.: *Jour. Amer. Med. Assoc.*, 1929, *xcii.*, 887.
204. Mach, R. S.: *Rev. méd. de la Suisse. Rom.*, 1934, *liv.*, 829.
205. Magnus-Levy, A., and Siebert, W. W.: *Zeits. f. klin. Med.*, 1928, *cvii.*, 197.

206. Mainzer, F., and Joffe, A.: *Zeits. f. d. ges. exp. Med.*, 1928, lix, 492.
207. Major, R. H.: *Bull. Johns Hopkins Hosp.*, 1923, xxxiv, 104.
208. Marañon, G., and Collazo, J. A.: *Klin. Woch.*, 1935, xiv, 1107.
209. Marchionni, A., and Ottenstein, B.: *Ibid.*, 1931, x, 969.
210. Marine, D., and Baumann, E. J.: *Amer. Jour. Physiol.*, 1927, lxxxi, 86.
211. Marriott, W. M.: *Physiol. Rev.*, 1923, iii, 275.
212. " : *Southern Med. Jour.*, 1934, xxvii, 130.
213. Marriott, M., and Hartmann, A. F.: *Jour. Amer. Med. Assoc.*, 1928, xci, 1675.
214. Mellinshoff, K.: *Deut. med. Woch.*, 1934, lx, 1127.
215. Mellinshoff, K., and Heuschert, C. A.: *Klin. Woch.*, 1934, xiii, 1247.
216. Merritt, H. H., and Bauer, W.: *Jour. Biol. Chem.*, 1931, xc, 215, 233.
217. Meyer, L. F.: *Jahrb. f. Kinderheilk.*, 1907, n.s. lxxv, 585.
218. Meyer, P.: *Klin. Woch.*, 1931, x, 155.
219. " : *Ibid.*, 1932, xi, 1383.
220. Meyer-Bisch, R., and Bock, D.: *Zeits. f. d. ges. exp. Med.*, 1927, liv, 131, 145.
221. Meyer-Bisch, R., and Gunther, F.: *Biochem. Zeits.*, 1924, clii, 286.
222. Michelsen, J.: *Arch. f. exp. Path. u. Pharm.*, 1933, clxxxiii, 737, 746, 750.
223. Mitchell, A. G., and Jonas, L.: *Amer. Jour. Med. Sci.*, 1925, clxix, 236.
224. Mond, R., and Netter, H.: *Pflügers Arch. f. d. ges. Physiol.*, 1932, cexxxx, 42.
225. Morawitz, P., and Schloss, J.: *Klin. Woch.*, 1932, xi, 1628.
226. Morgulis, S., and Perley, A. M.: *Jour. Biol. Chem.*, 1930, lxxxviii, 169.
227. Mosher, H. H.: *Jour. Biol. Chem.*, 1933, xcix, 781.
228. Mosonyi, J., and Voith, L.: *Arch. f. exp. Path. u. Pharm.*, 1934-35, clxxxvii, 177.
229. Moss, K. N.: *Proc. Roy. Soc. B.*, 1923-24, xcv, 181.
230. Mozer, J. J., and Mach, R. S.: *Bull. et mém. Soc. méd. hôp. de Paris*, 1934, p. 443.
231. Muntwyler, E., Way, C. T., and Pomerene, E.: *Jour. Biol. Chem.*, 1931, xcii, 733.
232. Neale, A. V., and Esslemont, M. S.: *Arch. Dis. Childhood*, 1928, iiii, 243.
233. Neuhausen, B. S., and Pincus, J. B.: *Jour. Biol. Chem.*, 1923, lviii, 99.
234. Ni, T. G.: *Amer. Jour. Physiol.*, 1926, lxxviii, 158.
235. Nicholas, H. O.: *Jour. Biol. Chem.*, 1932, xcvi, 457.
236. Nicholson, H.: *Amer. Jour. Physiol.*, 1931-32, xcix, 570.
237. Oakley, W.: *THE LANCET*, 1935, ii, 187.
238. Odin, M.: *Svenska Läkaretidningen*, 1928, quoted verbatim by Brandberg, q.v.
239. Odin, M.: *Acta Med. Scand.*, 1928, lxi, 254.
240. Orr, T. G., and Haden, R. L.: *Jour. Amer. Med. Assoc.*, 1928, xcii, 1529.
241. O'Shaughnessy, W. B.: *Lond. Med. Gaz.*, 1831-32, ix, 486.
242. " : *Ibid.*, 1832, x, 20.
243. Palmer, W. W., and Henderson, L. J.: *Arch. Internal Med.*, 1915, xvi, 109.
244. Paraf, J., and Klotz, H. P.: *Bull. et mém. Soc. méd. hôp. de Paris*, 1933, p. 1398.
245. Parkins, W. M., Taylor, A. R., and Swingle, W. W.: *Amer. Jour. Physiol.*, 1935, cxli, 581.
246. du Pasquier, G.: *Rev. méd. de la Suisse Rom.*, 1927, xlvii, 789-798.
247. Pavanzo, I.: *Rass. Obst.*, 1931, xl, 23; from *Ber. u. d. ges. Gynäk.*, 1931, xx, 155.
248. Peters, J. P.: *Body Water*, London, 1935.
249. Peters, J. P., Bulger, H. A., Eisenman, A. J., and Leo, C.: *Jour. Clin. Invest.*, 1925-26, ii, 167.
250. Peters, J. P., Kydd, D. M., and Eisenman, A. J.: *Ibid.*, 1933, xii, 355.
251. Peters, J. P., Kydd, D. M., Eisenman, A. J., and Hald, P. M.: *Ibid.*, 1933, xii, 377.
252. Peters, J. P., and van Slyke, D. D.: *Quantitative Clinical Chemistry*, London, 1931, i, 755.
253. Same authors: *Ibid.*, p. 793 et seq.
254. Phelzot, G.: *Compt. rend. Soc. de biol.*, 1930, civ, 1310.
255. Pincus, J. B., and Kramer, B.: *Jour. Biol. Chem.*, 1923, lvii, 463.
256. Platou: *Norsk. Mag. f. Laegevid.*, quoted by Brandberg.
257. Poczka, N., and Steigerwald, F.: *Zeits. f. d. ges. exp. Med.*, 1935, xcvi, 20.
258. Porges, O.: *Klin. Woch.*, 1932, xi, 186.
259. Rabinowitch, I. M.: *Canad. Med. Assoc. Jour.*, 1921, n.s. xi, 163.
260. Rachmilewitz, M.: *THE LANCET*, 1934, i, 78.
261. Radot, P. V.: *Compt. rend. Soc. de biol.*, 1914, lxxvi, 760.
262. Ralli, E. P., and Waterhouse, A. M.: *Amer. Jour. Med. Sci.*, 1934, clxxxvii, 607.
263. Rathery, F., and Rudolf, M.: *Bull. et mém. Soc. méd. hôp. de Paris*, 1928, p. 1363.
264. Ravdin, I. S., Johnston, C. G., Riegel, C., and Wright, S. L.: *Amer. Jour. Physiol.*, 1932, c, 317.
265. Reed, C. I.: *Jour. Biol. Chem.*, 1928, lxxvii, 547.
266. Richon, L., Vigneul, M., and Girard, J.: *Compt. rend. Soc. de biol.*, 1929, c, 747.
267. Rigler, R.: *Klin. Woch.*, 1935, xiv, 227.
268. Robineau, M., and Levy, M.: *Presse méd.*, 1933, xlii, 1565.
269. Rogers, L.: *Philipp Jour. Sci. B. (Med.)*, 1909, iv, 99.
270. " : *Therap. Gaz.*, 1909, xxxiii. (xxv. of ser. 3), 761.
271. Rogoff, I. M., and Stewart, G. N.: *Amer. Jour. Physiol.*, 1926, lxxxix, 508.
272. Romalo, E., and Dumitresco: *Compt. rend. Soc. de biol.*, 1914, lxxvi, 676.
273. Rowntree, L. G.: *Physiol. Rev.*, 1922, ii, 116.
274. " : *Jour. Amer. Med. Assoc.*, 1925, lxxxiv, 327.
275. Rowntree, L. G., and Snell, A. M.: *A Clinical Study of Addison's Disease*, Mayo Clinic Monographs, Philadelphia, 1931.
276. Rubin, M. I., and Krick, E. T.: *Proc. Soc. Exp. Biol. Med.*, 1933-34, xxxi, 228.
277. Ryle, J. A.: *THE LANCET*, 1935, i, 198.
278. Savy, P., and Thiers, H.: *Compt. rend. Soc. de biol.*, 1928, xcix, 516.
279. Schäfer, W.: *Zeits. f. d. ges. exp. Med.*, 1933, xc, 552.
280. Schuff, E.: *Monats. f. Kinderheilk.*, 1919, xv, 593.
281. Schloss, O. M.: *Amer. Jour. Dis. Child.*, 1918, xv, 165.
282. Schloss, O. M., and Stetson, R. E.: *Ibid.*, 1917, xiii, 218.
283. Schnohr, E.: *Acta Chir. Scand.*, 1934, lxxxv, supp. 33.
284. Schwaab, A., and Walther, P.: *Presse méd.*, 1933, xli, 874.
285. Searle, O. M., and Michaels, J. J.: *Amer. Jour. Physiol.*, 1932, cxii, 455.
286. Sellards, A. W.: *Philipp Jour. Sci. B. (Med.)*, 1910, v, 363.
287. Sellards, A. W., and Shackle, A. O.: *Ibid.*, 1911, vi, 53.
288. Shannon, J. A.: *Amer. Jour. Physiol.*, 1935, cxliii, 602.
289. Silvette, H.: *Amer. Jour. Physiol.*, 1934, cxviii, 535.
290. Silvette, H., and Britton, S. W.: *Ibid.*, 1933, civ, 399.
291. Same authors: *Ibid.*, 1935, cxli, 305.
292. Simpson, S. L.: *Proc. Roy. Soc. Med.*, 1933-34, xxvii, 383.
293. " : *Quart. Jour. Med.*, 1932, xxv. (n.s. i.), 99.
294. Simpson, S. L., and Korenchevsky, V.: *Jour. Path. and Bact.*, 1935, xl, 483.
295. van Slyke, D. D., Linder, G. C., Hillier, A., Leiter, L., and McIntosh, J. F.: *Jour. Clin. Invest.*, 1925-26, ii, 255.
296. Smirk, F. H.: *Proc. Roy. Soc. Med.*, 1933-34, xxvii, 1485.
297. Smyth, F. S., Deamer, W. C., and Phatak, N. M.: *Jour. Clin. Invest.*, 1933, xii, 55.
298. Snell, A. M., and Greene, C. H.: *Amer. Jour. Physiol.*, 1930, xciii, 630.
299. Spiegler, A.: *Zeits. f. Biol.*, 1901, n.s. xxiii, 239.
300. Starry, Z., Kral, A., and Winternitz, R.: *Zeits. f. d. ges. exp. Med.*, 1929, lxxvi, 671.
301. Same authors: *Ibid.*, 1929, lxxviii, 441.
302. Steinitz, H.: *Zeits. f. klin. Med.*, 1928, cxvii, 560.
303. Stewart, D.: *Arch. Dis. Childhood*, 1928, iii, 96.
304. Straus, H.: *Klin. Woch.*, 1931, x, 2354.
305. Sullivan, R. C., McLean, A. B., and Zwerner, R. L.: *Amer. Jour. Dis. Child.*, 1932, cxliii, 1279.
306. Sunderman, F. W., Austin, J. H., and Williams, P.: *Jour. Clin. Invest.*, 1932, xi, 1261.
307. Sunderman, F. W., and Williams, E. S.: *Ibid.*, 1935, xiv, 245.
308. Swingle, W. W.: *Amer. Jour. Physiol.*, 1926-27, lxxix, 666.
309. " : *Ibid.*, 1928, lxxxvii, 450.
310. Swingle, W. W., Pfaffner, J. J., Vars, H. M., and Parkins, W. M.: *Ibid.*, 1934, cxviii, 159.
311. Same authors: *Ibid.*, 1934, cxviii, 428.
312. Tabanelli, M.: *Biochem. Ter. Sper.*, 1931, xviii, 448; from *Ber. ges. Physiol.*, 1932, lxxvi, 65.
313. Talbot, G. A., and Rosenberg, I.: *Amer. Jour. Physiol.*, 1928, lxxxiv, 520.
314. Talbot, J. H., and Michelsen, J.: *Jour. Clin. Invest.*, 1933, xii, 533.
315. v. Terray, P., Vas, B., and Gara, G.: *Berl. klin. Woch.*, 1893, xxx, 309.
316. Thompson, W. H., and McQuarrie, I.: *Proc. Soc. Exp. Biol. Med.*, 1934, xxxi, 907.
317. Thompson, W. O., Thompson, P. K., Silveus, E., and Dailey, M. E.: *Arch. Internal Med.*, 1929, xlv, 308.
318. de Thurzo, E., and Katzenelbogen, S.: *Arch. f. Neurol. u. Psychiat.*, 1935, xxxiii, 786.
319. Tileston, W., and Comfort, C. W.: *Arch. Internal Med.*, 1914, xiv, 620.
320. Urechia, C. I., Benetato, G., and Retezeanu: *Compt. rend. Soc. de biol.*, 1935, cxix, 439.
321. Verney, E. B.: *THE LANCET*, 1929, i, 539.
322. " : *Ibid.*, 1929, i, 645.
323. Verzar, F.: *Jour. Physiol.*, 1935, lxxxiv, 41 P.
324. Verzar, F., and Laszt, L.: *Biochem. Zeits.*, 1935, cclxxxviii, 396.
325. Vignes, H., and Levy, M.: *Arch. des mal. de l'app. digestif*, 1934, xxiv, 530.
326. Vogt, E.: *Arch. f. Gynäk.*, 1934, clviii, 61.
327. Walker, A. M.: *Jour. Biol. Chem.*, 1933, ci, 269.
328. Walker, A. M., and Relsinger, J. A.: *Ibid.*, 1933, ci, 223.
329. Walters, W., and Bollman, J. L.: *Arch. of Surg.*, 1926, xlii, 578.
330. Walters, W., Kilgore, A. M., and Bollman, J. L.: *Jour. Amer. Med. Assoc.*, 1926, lxxxvi, 186.
331. Wangensteen, O. H., and Chunn, S. S.: *Arch. of Surg.*, 1928, xvi, 1242.
332. Warner, E. C.: *THE LANCET*, 1930, i, 339.
333. Watchorn, E., and McCance, R. A.: *Biochem. Jour.*, 1932, xxvi, 54.
334. Same authors: *Ibid.*, 1933, xxvii, 1107.
335. " : *Ibid.*, 1935, xxix, 2291.
336. Whipple, G. H., and Cooke, J. V.: *Jour. Exper. Med.*, 1917, xxv, 461.
337. Whipple, G. H., Cooke, J. V., and Stearns, T.: *Ibid.*, 1917, xxv, 479.
338. Whipple, G. H., and van Slyke, D. D.: *Ibid.*, 1918, xxviii, 213.
339. White, J. C., and Bridge, E. M.: *Boston Med. and Surg. Jour.*, 1927, cxexvi, 893.
340. Whitehouse, A. G. R.: *Proc. Roy. Soc. B.*, 1935, cxvii, 139.
341. Winter, K. A.: *Klin. Woch.*, 1934, xii, 1454.
342. Wintou, F. R.: *Jour. of Physiol.*, 1931, lxxxiii, 151.
343. Wohl, M. G., and Brust, R. W.: *Jour. Lab. and Clin. Med.*, 1934-35, xx, 1170.
344. Yannet, H., Darrow, D. C., and Cary, M. K.: *Jour. Biol. Chem.*, 1935-36, cxli, 477.
345. Younkman, F. F.: *Amer. Jour. Physiol.*, 1928, lxxxvi, 471.
346. Zwerner, R., and Sullivan, R. C.: *Endocrin.*, 1934, xviii, 97.

## MANDELIC ACID AND AMMONIUM MANDELATE

### IN THE TREATMENT OF URINARY INFECTIONS

BY H. E. HOLLING, M.B., M.Sc. Sheff.,  
M.R.C.P. Lond.

MEDICAL CLINICAL ASSISTANT, ROYAL INFIRMARY,  
SHEFFIELD; AND

ROBERT PLATT, M.D. Sheff., F.R.C.P. Lond.  
PHYSICIAN TO THE ROYAL INFIRMARY

The episodes leading up to the treatment of urinary infections (pyelonephritis) with mandelic acid can be briefly summarised as follows.

In 1931 Helmholtz and Clark<sup>1</sup> introduced the ketogenic diet as a means of treating these conditions, the rationale being the observed fact that the urines of diabetic patients with ketosis and of epileptic patients undergoing ketogenic treatment were less subject to bacterial decomposition than those of other patients. The treatment was remarkably successful, and Fuller<sup>2</sup> in 1933 showed that its effect was due to the presence of  $\beta$ -hydroxybutyric acid in the urine. The difficult and unpalatable ketogenic diet could not be replaced by oral administration of  $\beta$ -hydroxybutyric acid, however, because that acid is completely oxidised in the body. Rosenheim<sup>3</sup> in 1935 found the necessary substitute in mandelic acid ( $C_6H_5.CHOH.CO_2H$ ) which is excreted unchanged in the urine and exerts a bacteriostatic effect if the urine is kept sufficiently acid. Clinical trial seemed to give promise of success, and this has since been confirmed by a series of 16 cases of urinary infection reported by Lyon and Dunlop,<sup>4</sup> in all but 3 of which the urine was rendered sterile. The present paper is a report on 29 cases.

#### METHOD OF TREATMENT

Of the 21 hospital cases treated, 13 were in-patients and the remainder out-patients. There were also 8 private patients, 3 of whom were in bed during the treatment.

Catheter specimens of urine were first examined to determine the nature of the infection, and pyelography (retrograde or intravenous) was performed where necessary, to exclude pyonephrosis, calculus, tuberculosis, &c.

The first few hospital patients were given mandelic acid, neutralised by sodium bicarbonate as described by Rosenheim. Later the sodium salt was prescribed as follows:—

Sodium mandelate.. ..	..	..	50 grains.
Syrup of orange .. ..	..	..	1 drachm.
Water to 1 ounce.			

In water four times daily.

This was preceded by:—

Ammonium chloride .. ..	..	..	30 grains.
Liquid extract of liquorice ..	..	..	15 minims.
Water to 1 ounce.			

Four times daily.

Fluid intake was restricted during treatment to two pints daily, unless thirst was complained of, when more fluid was allowed.

The acidity of the urine, which must attain a pH of 5.3 or less, was tested by the addition of five drops of methyl-red solution to 2 c.cm. of urine. This gives a bright pink colour if the urinary acidity is satisfactory, but an orange or yellow colour if it is too alkaline. The amount of ammonium chloride

administered was then increased or reduced accordingly. As a rule, a satisfactory acidity can be produced with about half the dose prescribed above. In private patients the ammonium chloride was given in 1.0 gramme capsules (4–8 daily).

Finally, 4 cases were treated by ammonium mandelate (see later).

Specimens of urine were examined at two-day intervals where possible. When the deposit (examined as a wet film) showed only a few leucocytes and no bacilli, cultures were again made from catheter specimens.

#### COMMENT

The results of treatment are set out in the accompanying Table, and it will be seen that in every uncomplicated case of acute or chronic pyelonephritis (abbreviated to "pyelitis") the urine was rendered sterile by mandelic acid treatment in from 2 to 21 days. The failures (5 out of 29) may be considered in further detail.

CASE 4, a man of 53, had prostatic calculi, though no enlargement of the prostate could be made out. He felt better when taking mandelic acid.

CASE 9 had tuberculosis of the kidney and bladder, with a secondary infection with bacillus coli. Mandelic acid and ammonium chloride made the symptoms worse and she only took the treatment intermittently.

CASE 11 was a woman very ill with pernicious anæmia, degeneration of the cord, uterine prolapse, and a severe urinary infection. She died during treatment, apparently from general weakness.

CASE 12 was a young woman who had had the right kidney removed three years previously for a growth (adenomyoma) involving the ureter. She had had a severe pyelonephritis of the other kidney ever since, which ketogenic diet failed to clear up. Early in 1935 an attempt was made to catheterise the left ureter but was unsuccessful owing to the very severe cystitis. Her condition in November, 1935, was so miserable with frequency and dysuria that although renal insufficiency was suspected it was thought that mandelic acid might be tried as a last resort. She refused to come into hospital or to have any further investigation before treatment. The ammonium chloride caused extremely severe dyspnoea which was no doubt due to acidosis. A satisfactory urinary acidity could not be produced; treatment was stopped after three days.

CASE 16 had *B. coli* septicæmia. Post-mortem examination showed pyonephrosis and perinephritic abscess.

It will thus be seen that with the exception of Case 4, and possibly Case 11, none of the failures were really suitable for mandelic acid treatment.

During treatment a few casts and a trace of albumin occasionally occur in the urine. The treatment is obviously unsuitable in the presence of renal insufficiency because badly damaged kidneys cannot excrete a sufficiently acid urine or a sufficient concentration of mandelic acid. Nevertheless the presence of nephritis in an earlier stage does not appear to be a contra-indication, as is shown by the two cases (Nos. 3 and 27) in which renal œdema was present. The superimposed urinary infection was cleared up in each without any apparent change in the course of the nephritis. In Case 1 (hypertension without renal insufficiency) the course of the disease also was unaffected, except favourably by the removal of the symptoms of urinary infection.

Of the other cases, Nos. 13 and 17 relapsed. The former was again successfully treated. Case 18 had previously had scarlatinal nephritis; intravenous pyelography showed slight stenosis of the right ureter and a ureteric catheter was therefore passed and kept in position for three days during mandelic acid treatment. Case 20 had had mandelic acid treatment at home once before and relapsed; she

## SUMMARY OF CASES

No.	Sex and age.	Organism.	Diagnosis.	Duration of infection.	Days till urine sterile.	Remarks.
1	F. 48	<i>B. coli.</i>	C. pyelitis.	2 years.	7 days.	Hypertension. Granular and hyaline casts.
2	F. 30	"	"	1½ "	6 "	Could not take ketogenic diet.
3	F. 26	"	Pyelitis and nephritis.	5 weeks.	10 "	Subacute nephritis not affected by mandelic acid.
4	M. 53	"	C. pyelitis.	1 year.	Not sterile.	? Prostatic calculi but no prostatic enlargement. Feels better on mandelic acid.
5	F. 49	"	"	?	3 weeks.	—
6	F. 34	"	"	2 years.	7 days.	—
7	M. 28	"	A. pyelitis.	—	14 "	Urine showed few hyaline and granular casts.
8	F. 5	"	C. pyelitis.	6 months.	4 "	Relapse after successful ketogenic diet.
9	F. 30	<i>B. coli</i> T.B.	T.B. kidney and bladder.	6 "	Not sterile.	No effect on secondary infection; refuses to take ammonium chloride.
10	M. 52	<i>B. coli.</i>	A. pyelitis.	4 days.	4 days.	—
11	F. 59	<i>B. coli</i> staph.	Pyelitis and cystitis.	6 weeks.	Not sterile.	Had subacute combined degeneration.
12	F. 30	<i>B. proteus.</i> <i>B. coli.</i>	C. pyelitis.	3 years.	"	Renal insufficiency.
13	F. 50	"	A. pyelitis.	1 month.	5 days.	Relapse and cure in 10 days.
14	F. 25	"	"	1 week.	10 "	—
15	F. 35	"	C. pyelitis.	Many years.	7 "	Mandelic acid made her sick and she refused it. Urine sterile but symptoms not improved.
16	M. 50	"	Pyonephrosis and perinephric abscess.	?	Not sterile.	Died of <i>B. coli</i> septicaemia.
17	M. 64	"	C. pyelitis.	3 months.	10 days.	Cure, later relapsed.
18	F. 14	"	"	1 year.	3 "	Kidney drained with catheter.
19	F. 45	"	A. pyelitis.	24 days.	2 "	—
20	F. 30	"	C. pyelitis.	9 months.	14 "	Previous attack cured in 14 days by mandelic acid.
21	F. 31	"	"	6 "	12 "	—
22	F. 21	"	"	5 weeks.	14 "	Followed pregnancy.
23	F. 27	"	Pyelitis of pregnancy.	3 "	21 "	—
24	F. 37	"	C. pyelitis.	10 "	14 "	—
25	F. 21	"	A. pyelitis.	4 "	10 "	—
*26	M. 66	"	C. pyelitis.	11 years.	5 "	—
*27	F. 6	"	Pyelitis and nephritis.	?	5 "	Acute nephritis, improved during treatment.
*28	F. 53	"	C. pyelitis.	Many years.	4 "	—
*29	F. 35	"	"	Few years.	7 "	Ammonium chloride and ammonium mandelate.

\* Treated with ammonium mandelate. C. = chronic; A. = acute.

had a history of having had "cystitis" at the age of 13 years. In Cases 7, 13, 19, 22, 23, and 25 a recent acute pyelonephritis had been controlled by alkaline treatment, but a heavy infection still remained. Cases 10 and 14 were treated with mandelic acid in the acute stage.

## AMMONIUM MANDELATE

The only disadvantage of mandelic acid treatment as so far practised is the necessity of giving two somewhat unpleasant medicaments, one followed closely by the other, four times in the day. The ammonium chloride is particularly nauseous to some patients and may actually cause vomiting, and even when it is given in capsule form there may be an unpleasant after-taste.

Mandelic acid has to be given as a salt because the acid itself is a gastric irritant. The ammonium chloride is given to acidify the urine so that a proportion of the mandelate administered is excreted as mandelic acid.

To obviate these disadvantages if possible, the British Drug Houses Ltd. have prepared the ammonium salt of mandelic acid, and we are indebted to them for placing stocks at our disposal for clinical trial. They state that ammonium mandelate, being

hygroscopic, cannot be supplied in tablet form and they have therefore made it up as an elixir, 1 oz. of which contains 34 grains of the salt, equivalent to 30 grains (2 grammes) of mandelic acid.

Salts such as ammonium chloride act as acids in the body owing to the ammonium radicle being converted into urea, and leaving the acid radicle to be excreted. Ammonium mandelate should be weaker in its action than ammonium chloride, but on the other hand the use of ammonium mandelate dispenses with the necessity of giving the sodium salt, and so saves the addition of an unnecessary alkali. Based on molecular weights, 3.0 grammes of sodium mandelate plus 1.0 gramme of ammonium chloride (approximately the usual doses) should be roughly equivalent to the effect of 3.0 g. of ammonium mandelate administered by itself.

It seems likely that, provided the urine can be sufficiently acidified by ammonium mandelate alone, the bacteriostatic effect of the mandelic acid radicle will be as good as when the sodium salt is used. We therefore tried the acidifying effect of the elixir of ammonium mandelate on ourselves (it is not particularly unpleasant to take) and found that doses of 34 grains of ammonium mandelate four times daily produced a satisfactory urinary acidity (pH 5.3)

within an hour or two, but this degree of acidity was not invariably maintained throughout the day. As we are both of about average weight (10 st. 2 lb. and 10 st. 9 lb.) we concluded that somewhat larger doses should generally be given for the treatment of patients.

Four patients were treated with ammonium mandelate, and in all four a sterile urine was effected in a week or less, though all had a chronic infection. Case 26, a man of 13 st., required doses of 51 grains four times daily (1½ oz. of the elixir). Case 27, a child of 6 (weight 3 st. 7 lb.) with acute nephritis as well as *B. coli* infection, was given 17 grains four times daily. Case 28 had 34-grain doses. In Case 29 the urine was alkaline to litmus before treatment, and 51-grain doses supplemented by 30 grains of ammonium chloride were necessary to produce a satisfactory acidity and cure the infection.

In the light of this short experience, together with what is already known of mandelic acid treatment, we feel justified in saying that ammonium mandelate, suitably prepared, is a convenient means of administering mandelic acid, and that in the majority of cases the use of ammonium chloride can thereby be obviated. The suitable dose of ammonium mandelate is probably the same as that of the sodium salt—namely, about 50 grains four times in the day, the equivalent of about 3 grammes of mandelic acid.

#### TREATMENT OF PYELONEPHRITIS IN GENERAL

The disease "pyelitis" affecting, as it does, the parenchyma of the kidney as well as the renal pelvis, ureter, and bladder, is better known as pyelonephritis. The term cystitis may be restricted to the occasional infection of the bladder only, by catheter or otherwise, before an ascending spread has taken place.

Acute pyelonephritis is often associated with high temperature, rigors, and general symptoms of which severe headache is one of the most frequent. For such severe cases, alkalis if given in sufficient doses are so efficient in bringing down the temperature and controlling the distressing symptoms that we have not used mandelic acid therapy, fearing to cause a temporary exacerbation of symptoms or to induce vomiting. It should be noted that it is often necessary to give as much as 30 grains of potassium citrate and 30 grains of sodium bicarbonate every two hours in order to produce the effect. We have recently seen two patients in whom the pyrexia remained *despite an alkaline urine*, until the dosage was pushed to this extent.

When the acute stage has been controlled, a few cases rapidly clear up spontaneously, especially in women after delivery. In many more, however, pus cells and bacilli remain in the urine, and a chronic pyelonephritis develops. Often there are acute exacerbations and for years the patient suffers from poor health and has intermittent attacks of frequency, dysuria, pyrexia, or urticaria. A few eventually develop renal failure.

As nearly all these chronic infections are now avoidable, we would like to stress the importance of not discharging any case of pyelonephritis, especially when acute, until it is known that the urine is sterile. If, after an acute attack has settled down, bacilli are still present, mandelic acid therapy should be employed at once, before waiting for chronic changes to develop.

For those who show a marked tendency to recurrence we are trying the effect of giving two consecutive days of mandelic acid treatment in each month. Between these brief courses, fluid intake should be

liberal, and both constipation and the over-use of aperients should be avoided as far as possible.

#### SUMMARY

Of 29 cases of urinary infection treated with mandelic acid 24 showed sterile urine within 2–21 days. Of the successful cases 2 had also a concurrent nephritis in an active stage, which was not adversely affected by the treatment. Of the 5 failures at least 3 were unsuitable cases in which cure was not to be anticipated.

Ammonium mandelate was found to be as effective as the sodium salt, and when it was used it was usually unnecessary to give the unpleasant ammonium chloride.

The proper use of these remedies will prevent chronic pyelonephritis.

#### REFERENCES

1. Helmholtz, H. F., and Clark, A. L.: Proc. Staff Meet. Mayo Clin., 1931, vi., 695 and 699.
2. Fuller, A. T.: THE LANCET, 1933, i., 855.
3. Rosenheim, M. L.: *Ibid.*, 1935, i., 1032.
4. Lyon, D. M., and Dunlop, D. M.: Brit. Med. Jour., 1935, ii., 1096.

## X RAY APPEARANCES OF THE LUNGS OF ELECTRIC ARC WELDERS

By A. T. DOIG, M.B. St. And., D.P.H.

MEDICAL SUPERINTENDENT, OAKWOOD HALL SANATORIUM, ROTHERHAM; AND

A. I. G. MCLAUGHLIN, M.B. Sydney,

M.R.C.P. Lond.

H.M. MEDICAL INSPECTOR OF FACTORIES, HOME OFFICE

(WITH ILLUSTRATIONS ON PLATE)

ATTENTION has been directed recently to the acute pulmonary conditions which may occur in welders as a result of their occupation. Adler-Herzmark<sup>1</sup> in 1929 described the illness and death of an electric arc welder from pulmonary oedema which he attributed to nitrous fumes. In 1934 Bridge<sup>2a</sup> recorded a number of cases of acute poisoning by nitrous fumes occurring in oxy-acetylene welders who were working in a confined space in a ship. Williman's recent case<sup>3</sup> of acute fatal pneumonia in an electric arc welder was that of a man who had been welding galvanised iron in a confined space; and Titus, Warren, and Drinker<sup>4</sup> have shown after a series of animal experiments that the pulmonary oedema associated with welding (not necessarily of galvanised metal) in confined spaces is caused by the gases (nitrogen peroxide and ozone) generated at the electric arc and not by the fine particles of iron oxide found in the fume. The symptoms associated with the welding of galvanised metal appear to be comparable with those of metal fume fever and were described by Bridge<sup>2b</sup> in 1921, by Koelsch in 1923,<sup>5</sup> and also by Drinker<sup>6</sup> and his co-workers in 1927. Similar symptoms in welders working on galvanised metal have been noted by Dickson<sup>7</sup> and by Anderson.<sup>8</sup> Metal fume fever is a transient malady and is characterised mainly by malaise, pyrexia, and shivering attacks.

Some of the occupational risks in welding—e.g., metal fume fever and poisoning by nitrous fumes—are common to both electric arc and oxy-acetylene welding, but each method has its proper risks. Wirtschaffter and Schwartz<sup>9</sup> state that the oxy-acetylene welder is exposed, under various working conditions, to poisoning by the products of incomplete combustion of the oxy-acetylene flame, especially

carbon monoxide and acetylene, and also by impurities in commercial acetylene. Westhofen,<sup>10</sup> who made a statistical study of the health of 146 electric arc welders, shows that a large number of them suffer from colds and inflammatory conditions of the upper respiratory tracts, a fact which he believes can be explained by the irritating properties of the metal fume and by the sudden changes of temperature to which welders are exposed.

Chronic pulmonary lesions directly associated with the occupation have not been recorded up to the present time as occurring in electric arc welders. This fact is not surprising because the process is a comparatively new one and it is only during the last ten years that it has been widely adopted. It may be noted also that covered electrodes have only been used for about ten years. We present in this paper the results of a clinical and radiological examination of the chests of 16 electric arc welders. They are apparently healthy men and are actively engaged at their occupation. Nearly all of them are young men who were apprenticed to electric welding at 14 years of age and who have worked at no other trade. The X ray films of 6 of them show a generalised fine mottling over both lung fields; the remaining films show less marked changes, but none could be considered to be a picture of a completely normal chest. The conditions which have to be considered in the differential diagnosis include miliary tuberculosis, asbestosis, silicosis, and other pulmonary conditions caused by dust or fumes. The X ray film in the first case, in view of the family history, was for some time thought to be an example of miliary tuberculosis. In the present early stage of the investigation we are not prepared to be dogmatic about the interpretation of the radiographic and clinical findings, especially because no opportunity for histological examination of the lungs has arisen. In this paper we merely wish to record the results of our examinations as far as they have gone and to discuss in a general way the possible factors in the aetiology.

#### THE FIRST TWO CASES

**CASE 1.**—Aged 44. This man was seen by one of us (A. T. D.) at the Rotherham Tuberculosis Dispensary on June 28th, 1933, because his sputum had been stained slightly with blood for a few days. He felt well except for slight debility which had followed an attack of influenza six months previously.

*Family History.*—His father and grandfather, both of whom had been tin miners in Cornwall, had died from silicosis.

*Occupational History.*—He left school at 14 years of age and for 1 year stoked boilers in a clay mine (above ground). For 18 years (until 1925) he worked as a blacksmith, but during this time he had done occasional electric welding jobs. He has been an electric arc welder for 11 years.

*X Ray and Other Examinations.*—On June 28th, 1933, an X ray film showed fine mottling\* evenly distributed over both lung fields. The sputum was examined on July 4th, 1935, for tubercle bacilli and for asbestos bodies, with negative results. The glass shield used by the man to protect his eyes during electric welding was examined on Sept. 29th, 1933, at the Government laboratory. The report stated that "the fume deposited on the glass consists essentially of magnetic iron oxide ( $Fe_3O_4$ ). Slight evidence of the presence of silica was obtained but this was probably derived from the glass slide, the surface of which was damaged by red-hot particles thrown off from the electrodes." Further X ray films were taken of his chest on Dec. 26th, 1933, and also on Sept. 3rd, 1934

\* We have used the word "nodule" as a convenient term to describe the individual shadows without reference to their size. "Stippling" is used to indicate the very fine "nodulation" seen in several cases, whereas "mottling" is used to describe a coarser type of "nodulation."

(Fig. I. on Plate). The appearances differed in no essential point from those of the original film. It was thought however that the punctate shadows seen in the later film were slightly larger, especially in the fifth right costal space close to the hilum.

The patient has not lost any time from work and when seen recently was found to be in fairly good health. Since 1933 he has been wearing a mask over his nose and mouth during actual work at electric welding. Physical examination revealed few abnormal signs with the exception that the breath sounds were harsh over the apices and bases of the lungs, and that a few post-tussic crepitations could be heard at both bases. The movement of the chest was equal on both sides but the degree of expansion was somewhat limited.

**CASE 2.**—Aged 35. This man was asked to attend for X ray examination because of the nature of his work. His occupational history shows that after leaving school he worked in an office for 6 years; for another 3 years he was engaged in a steel works as a cold steel roller, and for the 11 years he has been working continuously as an electric arc welder. For the last year he has been working as storekeeper because he thought the fume from welding was affecting his health. There is no family history of tuberculosis. He has a slight cough and occasional morning sputum, but otherwise is in good health. He was first radiographed in September, 1934, the film (Fig. II. on Plate) showing features similar to those of Case 1. The lung fields generally show a fine mottling, the individual shadows being irregular in size and having soft outlines. The mottling is distributed fairly uniformly, although the upper two-thirds of each lung field are rather more affected than the lower thirds. Both lungs are equally affected. A recent radiogram of the chest (Jan. 6th, 1936), taken a year after he had given up electric welding, shows that the mottling noted in the first film is still present but less marked. In some of the larger nodules a minute central core is visible. Clinical examination of the chest shows that the expansion is equal on both sides but is rather less than normal. The percussion note is not impaired, and the breath sounds are harsh with prolongation of expiration over both lower zones, especially in the mid-axillary lines. Post-tussic crepitations are heard at both bases. Examination of the sputum (March 12th, 1936) shows that it contains large numbers of macrophages or dust cells which are packed with fine granules of iron oxide. No asbestos bodies are seen.

On account of the findings in the first 2 cases, 14 more welders were asked to attend for examination. Brief notes of the history and of the results of the X ray examinations of the chest are given. In a few cases the results of clinical examination of the chest have been added.

#### FOUR "POSITIVE" CASES

Four showed X ray appearances comparable with those seen in the first 2 cases, and are therefore classed as *positive*.

**CASE 3.**—Aged 25. Electric arc welder for 9 years. No other occupation. No family history of tuberculosis. Has a slight cough with copious black sputum, especially after welding inside tanks. Movement diminished over the left upper part of the chest. No impairment of percussion note. Breath sounds harsh over left upper region and also at both bases posteriorly. Crepitations were heard at both bases in the axillary lines but more clearly on the left side. *Radiography* (Jan. 6th, 1936). Skeleton, heart, and diaphragm normal. Shadow of lung roots not enlarged. Prominent (? calcified) opacity in the upper pole of left root. Fine bronchial ramifications slightly accentuated generally. Fine stippling throughout both lung fields, the nodules being irregular in size and shape. The stippling is slightly more marked in the upper half of the right lung.

**CASE 4.**—Aged 23. Electric welder for 7 years. Health good and no family history of tuberculosis. Slight cough with morning sputum. *Radiography* (Jan. 8th, 1936). Skeleton, heart, and diaphragm normal. The shadow of the right hilum is definitely enlarged. The



bronchial markings are not increased. Over both lung fields there is generalised stippling. The nodules are irregular in size and shape and consist of single and aggregated units. Their outlines are soft but some of the larger ones have a hard central core.

CASE 5.—Aged 26. Electric arc welder for 9 years. Had an attack of acute bronchitis 5½ years ago, since when has had a persistent cough with black sputum. *Radiography* (Jan. 8th, 1936). Skeleton, heart, and diaphragm normal. Bronchial markings prominent. Right lung clear. Over the upper half of the left lung fine stippling is seen. Both hilar regions normal.

CASE 6.—Aged 28. Electric arc welder for 12 years. Health good. No symptoms apart from slight cough and sputum. Examination of the chest shows that the expansion is good and equal. Percussion note good. Breath sounds well transmitted with a slight prolongation of the respiratory murmur. No adventitious sounds. Heart sounds normal. *Radiography* (Jan. 15th, 1936). Skeleton, heart, and diaphragm normal. Right interlobar septum visible. Generalised fine stippling throughout both lung fields, the shadows being irregular in size and having soft margins.

### THREE "SUSPICIOUS" CASES

Three more cases showed X ray changes which were not so definite as those presented by the first 6 cases. We have classified them as *suspicious*.

CASE 7.—Aged 26. Electric arc welder for 9 years. No other occupation. No family history of tuberculosis. Has had a cough with morning sputum on and off for 10 years. The cough is worse after he has done a welding job in an enclosed space, and the sputum then becomes black. Finds that he gets very tired, especially on night shifts. *Radiography* (Jan. 6th, 1936). Skeleton, heart, and diaphragm normal. The bronchial shadows are accentuated generally in both lung fields. There is fine stippling distributed over the left upper zone, especially in the area immediately surrounding the upper pole of the left root.

CASE 8.—Aged 25. Electric arc welding for 11 years. No family history of tuberculosis. Has only a slight cough which is worse after working in an enclosed space, and brings up a certain amount of black sputum mainly in the mornings. Examination of the chest revealed no abnormal physical signs. *Radiography* (Jan. 6th, 1936). Skeleton and heart normal. Right dome of diaphragm slightly blurred. Slight enlargement of the hila, especially on the left side. There is only a slight increase in the bronchial trunk shadows, but the fine bronchial ramifications, especially in the mid-zones, present a honey-combed appearance. A few faint soft and fairly coarse nodules are present in both lung fields. These are mainly situated peripherally and give a coarse mottled effect. The mottling in this case is not nearly so well marked, nor the nodules so fine as in the definitely positive cases.

CASE 9.—Aged 22. Electric arc welder for 8 years. Health good, and only has a cough after doing welding inside a tank. *Radiography* (Jan. 8th, 1936). Skeleton, heart, and diaphragm normal. Bronchial shadowing is prominent in the right upper lobe, and some calcified nodules are present in the right hilum and upper perihilar area. Fine bronchial ramifications are increased generally, and both lung fields have a slightly stippled appearance, the nodules being poorly defined and well spaced. Actual nodulation is however present.

### "RADIOGRAPHICALLY NEGATIVE" CASES

The remaining 7 cases have been classified as negative from a radiological point of view. It will be seen however that a number of the films showed increased bronchial striation or fine honeycombing as opposed to definite mottling, and could not strictly be called normal X ray films of the chest.

CASE 10.—Aged 41. Oxy-acetylene welder for 3 years during his apprenticeship, and electric arc welder for 17 years. No family history of tuberculosis. Had a slight attack of influenza 2 years ago which kept him

away from work for a week. Has a slight cough with morning sputum. *Radiography* (July 13th, 1934). Heart rather bulbous and slightly enlarged to the right. The right dome of the diaphragm is elevated, and the right costophrenic angle obliterated. The shadow of the left hilum is enlarged. The bronchial trunks in both lungs are markedly accentuated. Close examination reveals a suggestion of fine stippling in the upper lung fields, but this feature is not definite.

CASE 11.—Aged 23. Electric arc welder for 9 years. Health good and no family history of tuberculosis. Has no symptoms. *Radiography* (Jan. 8th, 1936). Skeleton, heart, and diaphragm normal. Right interlobar septum very faintly seen. Fine bronchial ramifications show a slight honeycombing but no definite nodulation. An appearance of nodulation is present, especially in the third and fourth right intercostal spaces as a result of the crossings of the fine bronchial ramifications.

CASE 12.—Aged 25. Has been an electric arc welder for 10 years. He attended the dispensary because his wife was suffering from open pulmonary tuberculosis. Has no cough or sputum. *Radiography* (March 18th, 1935). Skeleton, heart (small), and diaphragm normal. Bronchial shadows not definitely increased in the lower zones. A slight degree of stippling is present in the second right intercostal space and also in the second and third left intercostal spaces.

CASE 13.—Aged 23. Electric arc welder for 8½ years. No other occupation. No family history of tuberculosis. Has no cough as a rule, but brings up black sputum after doing electric welding inside tanks or boilers. *Radiography* (Dec. 23rd, 1935). Skeleton, heart, and diaphragm normal. Bronchial markings generally intensified. No definite stippling present. In certain areas—e.g., the fifth right and fifth left intercostal spaces—the lung parenchyma shows a fine "honeycombing."

CASE 14.—Aged 31. Electric arc welder for 3½ years. Health good. No symptoms. No family history of pulmonary tuberculosis. Examination of the chest shows no abnormal signs. *Radiography* (Jan. 15th, 1936). Skeleton normal. Left auricular region of the heart shadow appears to be enlarged. Increased bronchial striation but no parenchymatous mottling.

CASE 15.—Aged 27. Electric arc welder for 11 years. Health good. Slight cough and sputum. Examination of the chest reveals no abnormal physical signs. *Radiography* (Jan. 15th, 1936). Skeleton, heart, and diaphragm normal. Slight increase of bronchial markings but no parenchymatous stippling.

CASE 16.—Aged 32. Electric arc welder for 9 years. Health good. Slight cough and sputum. Clinical examination showed no abnormal physical signs. *Radiography* (Jan. 15th, 1936). Skeleton, heart, and diaphragm normal. Definite increase of bronchial striation with very slight fine honeycombing but no definite stippling of the lung parenchyma.

### DISCUSSION

The diagnosis of the underlying pulmonary lesions which have given rise to these striking X ray changes is a matter which is both interesting, and in the absence of histological examination of the lung tissue, highly speculative. Little doubt exists, however, that the lung changes have been brought about in these men by the dust or fume which they have inhaled while working as welders. During welding operations dense white or greyish-white fume rises up continuously from the spot which is being welded. The welder is obliged to bend closely over his work because he holds in front of his face a coloured glass screen which protects his eyes from the strong light but impedes his vision. If no protective measures are adopted, the welder cannot fail to inhale large quantities of fume during the time he is actually working.

The electrodes or welding rods which contain a core of metal and an outer covering are consumed

gradually by the heat generated (about 1500° C.) during the welding operation. The metal in the core of the rod becomes molten and, assisted by the flux contained in the covering, spreads over the surface of the metal which is being welded. The fume is therefore made up of the volatilised constituents of the coverings of the rods together with fine particles of oxidised metal, usually in the form of iron oxides. In addition the fumes probably contain gases such as nitrogen peroxide and ozone which are formed by the action of an electric spark on the air. The composition of the coverings of the electrodes or welding rods becomes, in the circumstances, a matter of some importance. Many substances, all of which we do not propose to enumerate, are used. The basis of the majority of the coverings is sodium silicate which acts as a flux. Again, the coverings of a certain type of electrode contain asbestos. The rods are sometimes dipped in a mixture containing powdered asbestos and sodium silicate, or asbestos yarn is wound round the rod and fixed by sodium silicate. In some cases the asbestos completely covers the rods, and in others it is merely a cord which is wound spirally about the rod.

The composition of the fumes arising from electric welding electrodes has not yet been fully investigated. Mr. L. C. McNair, H.M. Engineering Inspector of Factories, has however had partial analysis made of the fumes evolved from an asbestos-covered electrode and some asbestos fibres were found. When the particulate matter of the fumes was collected in an Owen's dust-counter, it was seen that a large proportion consisted of iron oxide particles, with an occasional asbestos fibre.

The X ray appearances in the well-marked cases differ from the usual picture of asbestosis. In none of the positive cases and in only one of the suspicious cases was there any blurring of the diaphragmatic shadow, and in no case was the heart outline blurred. The line of the interlobar septum (a feature present in a number of films of cases of asbestosis) is seen in only one positive case. The opacities in the films are not accentuated at the bases of the lungs, but on the contrary the upper lung fields appear to be the earliest, and in established cases, most markedly affected. Before asbestosis can be eliminated from the differential diagnosis it must be remembered that the asbestos fibres are being subjected to intense heat and are not in the same physical state as the fibres which are inhaled by workers in an asbestos factory. It is possible that an atypical picture of asbestosis might be produced by the inhalation of altered asbestos. Merewether<sup>11</sup> says that—

"the radiographic appearances of the developed or advanced stages of asbestosis are distinctive, although they are not specific. While, as is the case with silicosis, certain radiographic appearances may be looked upon as typical of the disease, frequently modifications of and departure from the typical picture occur." †

The X ray appearances in our cases most closely resemble those of a fine silicosis, but the clinical features show two important differences. In the first place, the electric welders whom we examined are all in good health and are fit to work. The only symptoms observed were slight cough and morning expectoration, and in the first case a small hæmoptysis occurred. This man has not been away from work even for a day since he was first seen in June, 1933,

† We have submitted our films to Dr. Merewether and he is of the opinion that "while some of the films give a general impression of asbestosis, further examination reveals so many points of difference in detail from the currently accepted radiographic appearance of asbestosis, as to negative such a diagnosis."

## DESCRIPTIONS OF ILLUSTRATIONS ON COLOURED PLATE

DR. MANSON-BAHR

- A.—ACUTE BACILLARY DYSENTERY. Shiga's bacillus isolated. General œdema of mucosa, spasm, sub-mucous hæmorrhages. Early healing stage.
- B.—CHRONIC BACILLARY DYSENTERY. Flexner-Y infection. Agglutination test positive to Flexner 1:180. Great improvement on intestinal lavage.
- C.—AMÆBIC ULCERATION of lower rectum giving rise to symptoms suggestive of carcinoma.
- D.—AMÆBIC DYSENTERY. Chronic stage, showing "pitting" of mucous membrane.
- E.—ACUTE AMÆBIC DYSENTERY. Active ulceration of mucosa with blood and mucus exudate.
- F.—INTESTINAL BILHARZIASIS. Early stage. Patches of granulation tissue containing eggs of *Bilharzia mansoni*.
- G.—MUCOUS COLITIS. Showing the pale colour of the mucosa and the masses of adherent mucus.
- H.—ACUTE ULCERATIVE COLITIS. First stage. Usually called hæmorrhagic colitis.
- I.—ACUTE ULCERATIVE COLITIS. Showing plum-coloured, easily traumatised, mucosa in the second stage.
- J.—ACUTE ULCERATIVE COLITIS. Early stage, showing granular mucosa, with purulent exudate covering the surface. Note the lack of normal folding of the mucosa.
- K.—ULCERATIVE COLITIS. Superficial ulceration in the third, or ulcerative stage.
- L.—TUBERCULOUS ULCERATION OF RECTUM. Case in which tubercle bacilli were found in material obtained through the sigmoidoscope. The patient was suffering from chronic diarrhœa with blood and mucus in the stools.

and his health at the present time is good. None of the men suffers from dyspnoea. Secondly none of them has concomitant pulmonary tuberculosis.

Miliary tuberculosis can be ruled out of the differential diagnosis for clinical reasons, and to some extent on the radiological appearances. None of the cases shows the dyspnoea, cyanosis, and tachycardia of acute or subacute miliary tuberculosis. Chronic or healed miliary tuberculosis is rare and it is difficult to imagine that a condition of such rarity would be found in 6 out of one group of 16 men. In the X ray films of the welders' chests (see Plate) the fine opacities are irregular in size and shape, whereas in miliary tuberculosis of the lung the shadows are more uniform.

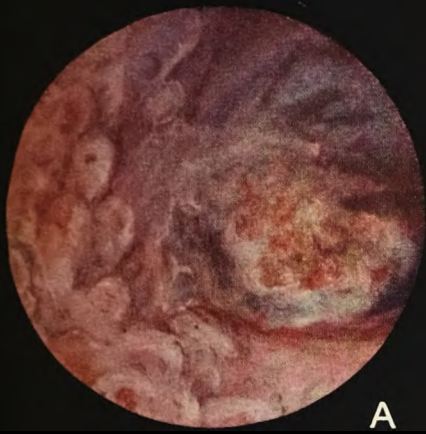
A further possible explanation of the X ray appearances in this series of cases is that the inhalation of small quantities of nitrous fumes together with the superadded effect of fine iron oxide dust might set up small areas of chronic inflammatory change, congestion, or fibrosis in the lungs. Again, the iron oxide particles might be opaque to the X rays and produce the picture without the associated presence of fibrosis and congestion.

### SUMMARY

1. The chests of 16 electric arc welders who have been engaged at the trade for periods varying from 6–16 years have been examined radiologically.
2. In 6 cases the X ray films showed fine nodulation over both lung fields; in 3 cases stippling was present over a more limited area; the remaining cases showed varying degrees of accentuation of the bronchial shadows, but no stippling. In no case was a completely normal radiogram obtained.
3. Clinical examination of the chests revealed few abnormal signs.
4. The alterations in the pulmonary or bronchial tissues underlying these X ray changes have been



DR. MANSON-BAHR : DISEASES OF THE COLON.



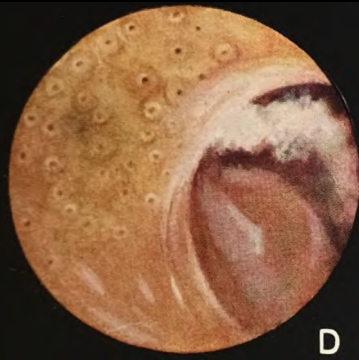
A



B



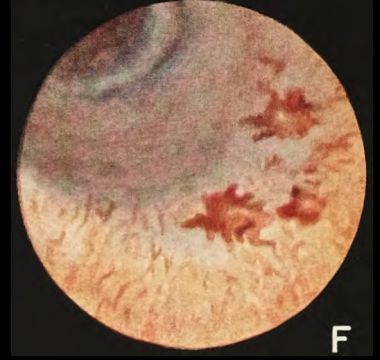
C



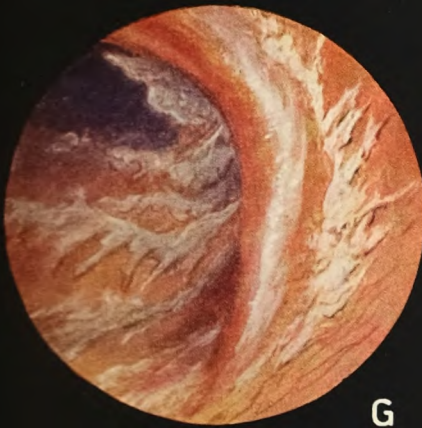
D



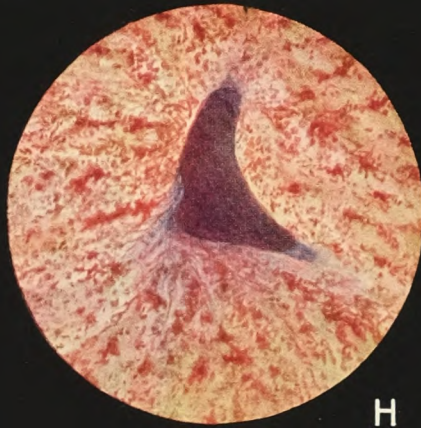
E



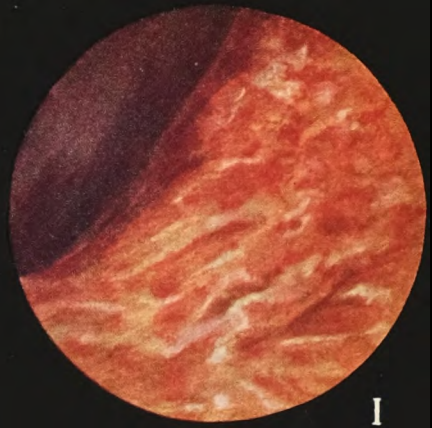
F



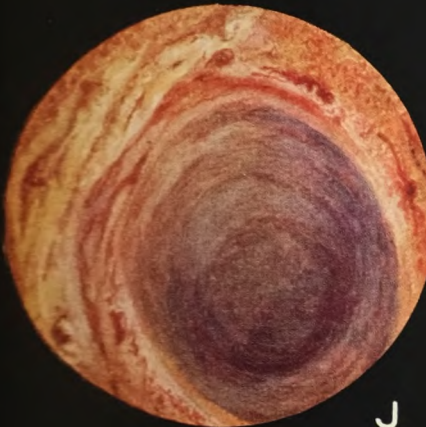
G



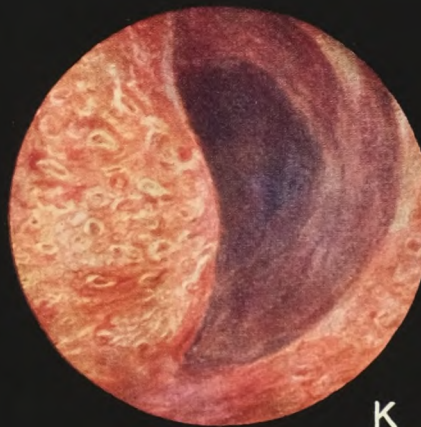
H



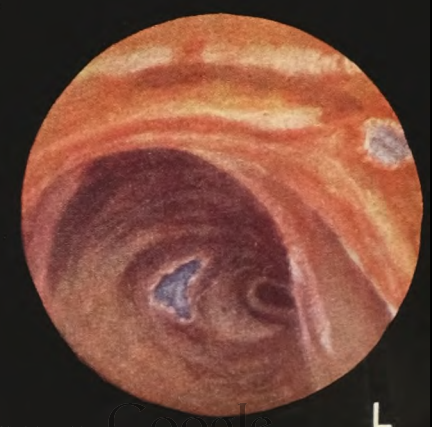
I



J



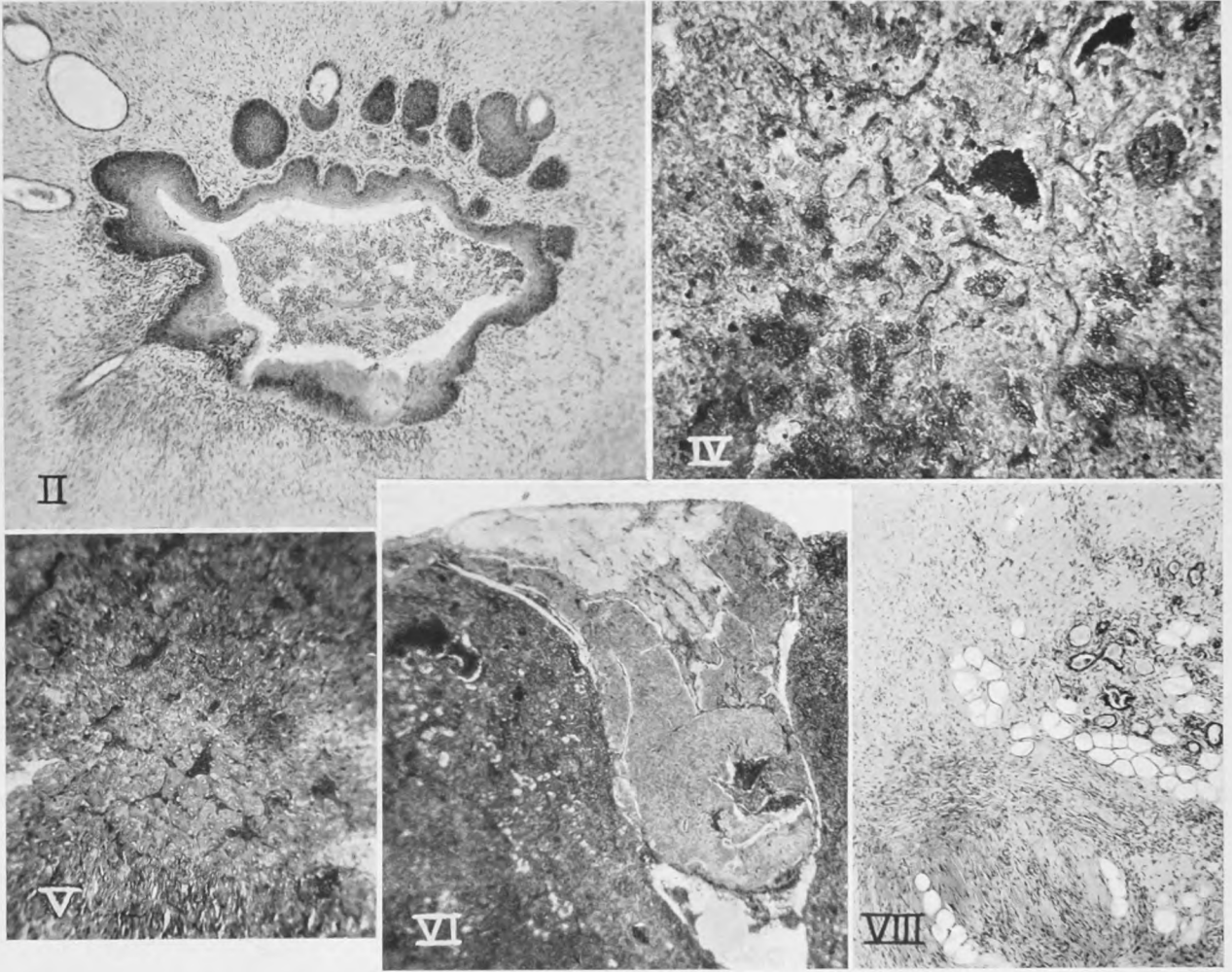
K



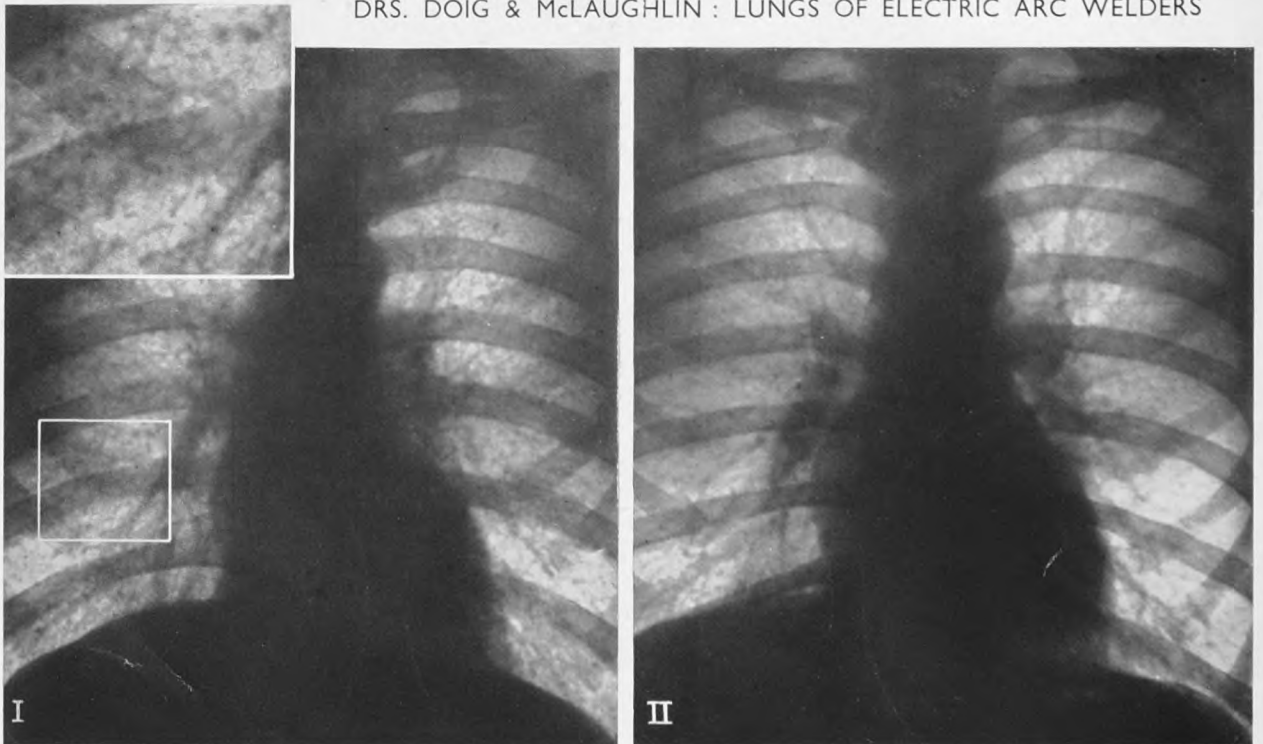
L



DR. McEUEEN, DR. SELYE AND PROF. COLLIP : EFFECTS OF ŒSTRIN ON RATS



DRS. DOIG & McLAUGHLIN : LUNGS OF ELECTRIC ARC WELDERS



**DESCRIPTIONS OF ILLUSTRATIONS ON PLATE**

DRS. DOIG AND MCLAUGHLIN

**FIG. I.**—Radiogram showing the fine mottling discovered in Case 1 (September, 1934). The portion outlined in white is reproduced (as an inset) on a larger scale.

**FIG. II.**—Radiogram from Case 2 (September, 1934).

DR. MCEUEN, DR. SELYE, AND PROF. COLLIP

**FIG. II.**—High magnification of endometrium showing metaplasia into cornified squamous epithelium. The islets of squamous epithelium in the submucosa are derived from deep prolongations of tubular endometrial glands. Note the marked fibrosis of the endometrium which simulates scar tissue.

**FIG. IV.**—Histological picture of a part of the tumour shown in Fig. III. Large cavernous sinuses surrounded by anterior lobe tissue.

**FIG. V.**—Small adenoma in the anterior lobe of an oestrin-treated rat; probably first stage of tumour formation. The cells in the area of the adenoma are much larger than those of the surrounding pituitary tissue.

**FIG. VI.**—Small adenoma of the intermediate lobe of the pituitary of an oestrin-treated rat. Note the irregular structure of the posterior lobe with light dots corresponding to vacuolised cells.

**FIG. VIII.**—Scirrhous fibro-adenoma of the mammary gland in an oestrin-treated rat.

set up by the inhalation of fume which arises during electric arc welding.

5. The probable composition of the fume has been discussed.

6. We wish to emphasise that these X ray appearances have been found in men who are apparently in good health.

7. Up to the present time we have come to no conclusion as to the exact diagnosis of the condition.

REFERENCES

1. Adler-Herzmark, J.: Zentrbl. f. Gewerbehyg., 1929, vi., 193.
2. Bridge, J. C.: (a) Ann. Rep. Chief Inspector of Factories, Home Office, 1934, p. 68; (b) Ann. Rep. Chief Inspector of Factories, 1921, p. 70.
3. Williman, F. L.: Jour. Indust. Hyg., 1935, xvii., 129.
4. Titus, A. C., Warren, H., and Drinker, P.: Ibid., 1935, xvii., 121.
5. Koelsch, F.: Ibid., 1923-24, v., 87.
6. Drinker, P., Thomson, R. M., and Finn, J. L.: Ibid., 1927, ix., 331.
7. Dickson, A.: Brit. Med. Jour., 1935, ii., 602.
8. Anderson, R.: Ibid., 1935, ii., 640.
9. Wirtschafter, Z. T., and Schwartz, E. D.: Jour. Indust. Hyg., 1936, xviii., 158.
10. Westhofen: Zeits. f. Medizinalbeamte, 1934, xvii., 85 (Abs. Jour. Indust. Hyg., 1935, xvii., 13).
11. Merewether, E. R. A.: Tubercle, 1933, xv., 78.

**SOME EFFECTS OF PROLONGED ADMINISTRATION OF OESTRIN IN RATS**

By C. S. MCEUEN, M.D.

RESEARCH ASSOCIATE IN BIOCHEMISTRY, MCGILL UNIVERSITY, MONTREAL

H. SELYE, M.D., Ph.D.

ASSISTANT PROFESSOR OF BIOCHEMISTRY IN THE UNIVERSITY; AND

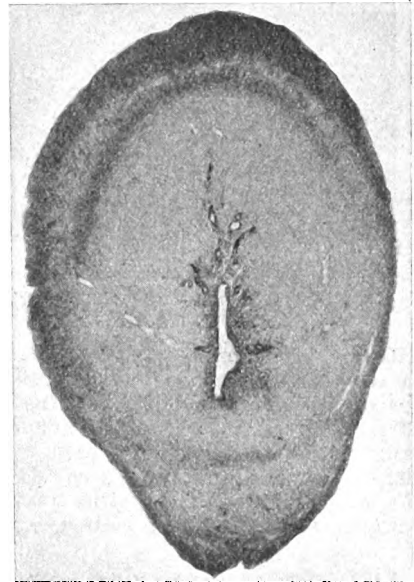
J. B. COLLIP, Ph.D., D.Sc., M.D., F.R.S.

PROFESSOR OF BIOCHEMISTRY

(WITH ILLUSTRATIONS ON PLATE)

THE discovery that the continued administration of oestrone, subcutaneously, led to squamous metaplasia of the uterine epithelium of castrate female rats<sup>1</sup> has been confirmed and extended by further experiments reported elsewhere<sup>2</sup> in which treatment was continued for periods up to 132 days. It

is the purpose of this communication to record the results of experiments of even longer duration. Cramer and Horning<sup>3</sup> have reported the appearance of hæmorrhagic chromophobe adenomata of the anterior pituitary in 3 male mice of a series of 12 receiving external applications of oestrone dissolved in chloroform for prolonged periods, up to 44 weeks; many of their animals showed cachexia, atrophy of the spleen and thymus, and degenerative changes in the adrenal cortex—effects which they ascribe in part to hypopituitarism. Simple enlargement of the pituitary was observed in 8 of their series of 12. It is known that the administration of large doses of oestrin to female rats may lead to hypertrophy of the anterior lobe within a few days,<sup>4</sup> and that this is accompanied by enlargement, probably secondary, of the adrenal cortex; but these changes were much less marked in males or in castrates.



**FIG. I.**—Transverse section across the uterus of oestrin-treated rat. Note the enormous development of fibrous tissue in the submucosa which leads to partial obliteration of the uterine cavity. The epithelium shows no metaplasia in this case.

Six castrate female rats, initially 3-4 months old, received daily subcutaneous injections of 30 γ of oestrone, dissolved in corn oil, for 331 days; vaginal oestrus was maintained, with very rare lapses, throughout this period. The animals were sacrificed after a further 30 days, during which all (save one) were either left untreated or were injected with solutions of crystalline progesterone (corpus luteum hormone), and in either case had returned more or less rapidly to an anoestrus state. The progesterone-treated animals did not differ materially from those in which all treatment had been discontinued.

At post-mortem examination the horns of the uteri were found to be nearly solid, pearly white, and hard; histological study revealed an extreme hypertrophic fibrosis, pushing the mucosa and muscular coats aside and enlarging the volume of the organ (Fig. I.). Squamous metaplasia of the epithelium was present in five cases (Fig. II. on Plate). These alterations in the uteri were also observed in biopsy specimens taken between the 300th and 330th day of treatment; occlusion of the cervix with secondary pyometrium was not encountered in this series.

The pituitaries were enlarged in all cases, and large cavernous adenomata of the anterior lobe were present in three; one showed a small adenoma of the intermediate lobe, and vacuolisation of the posterior lobe was noted several times. In one case

two adenomata were observed in the anterior lobe of the same rat (Fig. III., and Fig. IV. on Plate). All showed multiple mammary milk cysts (Fig. VII.);

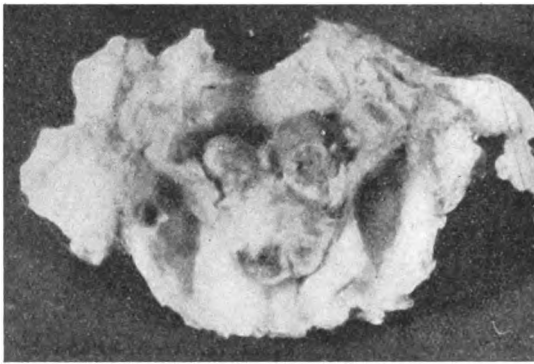


FIG. III.—Macroscopic picture of a large pituitary tumour in an oestrin-treated rat.

while other breast changes observed included an adenofibroma, whose scirrhus tissue invaded the spaces between the fibres of the pectoral muscle (Fig. VIII. on Plate). The adrenals were enlarged in five cases, and in one of these a cystic adenoma of the cortex was found on the left side (Fig. IX.); in the rat which received oestrin treatment up to the day when it was killed, however, cortical atrophy, hæmorrhages, and cysts were evident.

Five male rats, two of which were castrated during the experiment, received similar daily injections of oestrone for periods up to 344 days. As in a previous experiment,<sup>2</sup> the testes, penis, seminal vesicles, and prostate showed marked atrophy, but metaplasia and keratinisation were not observed. The pituitaries were enlarged in all cases, and in two (one normal,

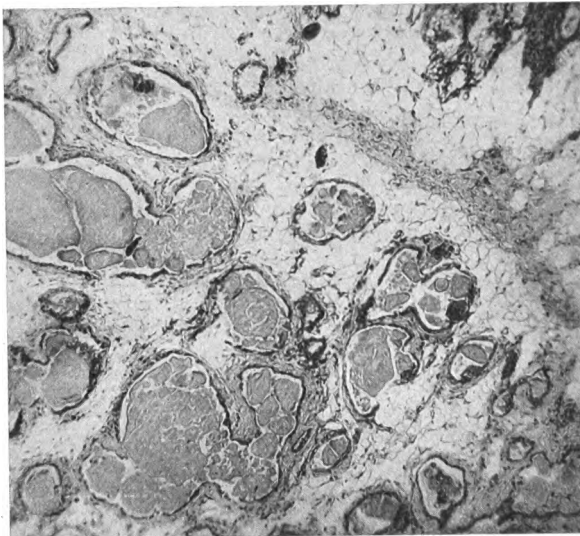


FIG. VII.—Milk cysts in the mammary gland of an oestrin-treated rat.

one castrate) cavernous adenomata were discovered in the anterior lobe.

The animals selected for these experiments were taken at random from stock cages containing 20-50 rats each, which in turn are filled haphazard from

the litter cages; the colony consists of some 6000 animals, and breeding is conducted without segregation of families; it is therefore improbable that all those which developed pituitary tumours, for instance, were of one litter or otherwise closely related. It is therefore unlikely that hereditary factors could have played an important part in producing the changes described. The incidence of

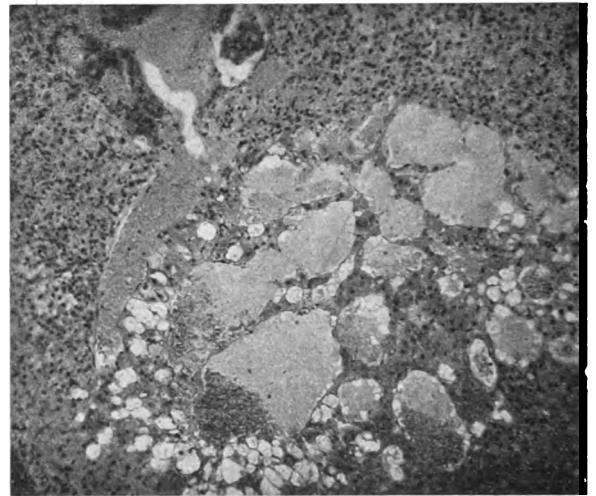


FIG. IX.—Cystic adenoma in the adrenal cortex of an oestrin-treated rat.

spontaneous tumours of any kind is very low in this colony.

This work was made possible by the generous support of Sir Charles Lindsay of Montreal. We are also indebted to Dr. A. Girard of Paris for supplying the oestrone; to Miss J. E. Williamson for technical assistance; and to Dr. J. S. L. Browne for preparing the progesterone.

#### REFERENCES

1. Selye, H., Thomson, D. L., and Collip, J. B.: *Nature*, 1933, cxxxv., 65.
2. McEuen, C. S.: *Amer. Jour. Cancer* (in press).
3. Cramer, W., and Horning, E. S.: *THE LANCET*, Feb. 1st, 1936, p. 247.
4. Selye, H., Collip, J. B., and Thomson, D. L.: *Proc. Soc. Exp. Biol. and Med.*, 1935, xxxii., 1377.

### TUMOUR OF THE PITUITARY INDUCED WITH FOLLICULAR HORMONE

BY Prof. BERNHARD ZONDEK

(From the Gynaecological and Obstetrical Department of the Rothschild-Hadassah Hospital, Jerusalem)

As I reported a short while ago in *THE LANCET*,<sup>1</sup> the function of the anterior pituitary gland may be inhibited by administering large doses of oestrin over a long period of time. Both the growth hormone of the anterior lobe and the gonadotropic hormones are put out of action by the follicular hormone, so that experimental animals (rats) show inhibition of growth and atrophy of the gonads. In this way dwarfed animals with atrophic genitals are produced. I intended to describe in later reports the effect on other endocrine glands and on the anterior lobe of the pituitary itself. Meanwhile an article by W. Cramer and E. S. Horning<sup>2</sup> appeared four weeks

after my paper. The authors investigated the carcinogenic effect of oestrin by painting the skin of mice twice weekly with a 0.01 per cent. oestrin solution ( $\alpha$ -folliculin) in chloroform. They studied the pituitary in twelve mice, which were treated over a prolonged period. Only one gland was normal to the naked eye; eight were macroscopically enlarged without an alteration in the general shape and without gross pathological lesions in the gland; and three were definite adenomatous tumours—nodular, round, deeply congested, and hæmorrhagic. In one case the tumour extended over the optic nerves and compressed them, producing degenerative changes; the authors described the tumour as a hæmorrhagic chromophobe adenoma of the anterior lobe. They believe that they have experimentally produced the syndrome of a disease known in man as Simmonds's disease (cachexia hypophysipriva).

## EFFECT OF OESTRIN ON THE PITUITARY

In the following I wish to report, as I mentioned in my last paper, my findings in the pituitary of animals whose growth was inhibited by the administration of follicular hormone.

TABLE I

Weight of the Pituitary and Body-weight in Male Rats

(a) CONTROL ANIMALS

Number.	Duration of expt. (weeks).	Medication.	Body-weight (g.).	Weight of pituitary (mg.).
R 319 ..	14	Olive oil.	104	7.0
R 251 ..	16		160	11.4
R 279 ..	17		125	8.2
R 281 ..	18		160	13.6
R 250 ..	19		160	8.4
Average ..	16.8	—	141.8	9.7

(b) EXPERIMENTAL ANIMALS

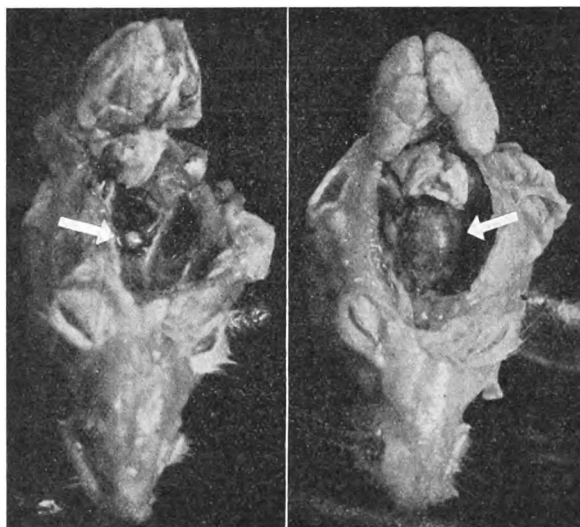
(c) Number. (d) Corresponding control animal.	Duration of expt. (weeks).	(e) Dose folliculin-menformon (M.U.) twice weekly. (f) Total dose.	Body-weight (g.).	Weight of pituitary (mg.).	Increase of weight (%).
(c) R 323 (d) R 319	14	(e) 5,000 (f) 140,000	70	9.0	23.6
(c) R 253 (d) R 251	16	(e) 10,000 (f) 320,000	100	43.1	273.9
(c) R 285 (d) R 279	17	(e) 10,000 (f) 340,000	95	16.1	96.3
(c) R 284 (d) R 281	18	(e) 5,000 (f) 180,000	100	20.6	51.4
(c) R 252 (d) R 250	19	(e) 5,000 (f) 180,000	95	41.6	395.2
Average	16.8	(f) 232,000	92	26.08	170.08

Whereas the gonads (ovaries and testes) of the animals undergo complete atrophy, the pituitary is enlarged. It is interesting to note, however, that an increase in the weight of the pituitary—i.e., of the anterior lobe—was not found in all animals. There is also a characteristic difference between the sexes. After prolonged treatment with follicular hormone,\* the pituitary of male rats shows enlargement in all cases, while the pituitaries of the females

are macroscopically unaltered. Table I. shows that while the weight of the pituitaries in male controls varies from 7.0 to 13.6 mg., with an average of 9.7 mg., those of male rats after folliculin treatment lasting from 14–19 weeks weigh from 9.0 to 41.6 mg., with an average of 26 mg. Comparing each animal with its individual control (Table I.) there was in every case an enlargement of the pituitary, the increase in its weight varying from 29 to 395 per cent. The body-weight therefore decreases by an average of about 30 per cent., the pituitary enlarges by an average of 170 per cent.

The results in female rats are quite different, though they also display stunting of the body growth. After treatment for 15 weeks—5000 M.U. (mouse units) of folliculin twice weekly—the body-weight of the treated animal is 33 per cent. less than that of the controls. However, there are no marked differences in the weight of the pituitary. The pituitaries of the controls weigh 10.9 mg. on an average, the pituitaries of the treated animals 12 mg. The period of treatment lasted in male and female animals 16 weeks on an average.

These experiments show that the functional inhibition of the anterior lobe of the pituitary—i.e., the production of stunted growth and atrophic genitals—appears equally in male and female animals, but that the reaction of the pituitary itself differs in the two sexes. The growth of the anterior lobe itself



Left: Brain of control rat (R 233), showing normal pituitary. Right: (R. 228). Tumour of the pituitary, after receiving 280,000 M.U. dimenformon.

cannot be held responsible for the defect in pituitary function because the growth hormone and the gonadotropic hormones are also diminished in females whose pituitaries are not enlarged. It is not the enlargement of the pituitary and the formation of a tumour which causes the syndrome of hypopituitarism—as is claimed by Cramer and Hörning—because, if it did, the hormone would not inhibit the function of the pituitary in female animals.

Why the male pituitary reacts by enlargement while the female pituitary does not do so cannot be explained. It may be mentioned that Collip<sup>3</sup> and Evans<sup>4</sup> were able to produce considerable enlargement of the anterior lobe of the pituitary in female animals, but not in males, by prolonged treatment

\* I am indebted to the Organon (Oss) for kindly supplying large amounts of Folliculin Menformon and Dimenformon.

respectively with prolan from pregnancy urine and with gonadotropic hormone from the blood of a pregnant mare. Here, too, the pituitaries of rats react differently, according to their sex, but in a reverse way from my experiments. Enlargement of the anterior lobe in the female is caused by giving gonadotropic hormone, whereas in the male animal it is the follicular hormone that produces enlargement.

#### EXPERIMENTAL PITUITARY TUMOUR IN A FEMALE RAT

Only in one experiment have I observed a considerable reaction of the anterior lobe of the pituitary in a female animal (R 228).

Treatment commenced at an age of four weeks and at a weight of 35 g. The rat was given 5000 M.U. twice weekly, 280,000 M.U. of folliculin in all. In the 28th

TABLE II

*The Action of Œstrin on the Pituitary in Female Rabbits*

No.	Dose of hormone (M.U.).	Duration of treatment (weeks).	Total dose (M.U.).	Weight of pituitary (mg.).
K 278	50,000 daily dimenformon.	3	1,100,000	17.6
K 269	50,000 twice weekly dimenformon.	8	800,000	10.8
K 233	15,000 twice weekly.	8	240,000	26.5
K 268	10,000 twice weekly.	12	240,000	24.0
K 266	12,500 twice weekly.	4	100,000	5.6
—	—	—	Average	16.92

week of treatment certain reactions pointing to cerebral disturbances were found in the animal. The rat turned and rolled only towards the right, ptosis of the right eye was present, the head was turned to the right, and the equilibrium of the animal was disturbed. It was therefore killed. On removal of the brain a very large tumour with a smooth surface was found in place of the pituitary (see Figure). It had a yellowish-green and in places dark red colour, and was the size and shape of a bean; the anterior and posterior lobe could not be identified as such. The optic nerves were invisible, being completely covered by the tumour, and the chiasma could only just be seen. The tumour weighed 250 mg., while the pituitary of the control animal was only 12 mg., an increase of over twenty times. On dissection the tumour was found to be very soft and crumbly; it was not possible to separate it completely from the nervi optici, because the tumour tissue had almost united with the nerves. I cannot yet make an exact statement regarding its histology, but I have sent it for examination to Prof. Erdheim of Vienna, who has an expert knowledge of the anatomy of the pituitary. I have myself examined a small piece of the tumour and I was impressed by multiple areas of hæmorrhage.

It is impossible to state why in this case the pituitary of a female animal reacted by forming a tumour, while the growth of female pituitaries generally remained uninfluenced by the oestrogenic hormones. The treatment however of the animal in which the tumour was found was continued ten weeks longer than in other female animals, and it is possible that the duration of the treatment is an essential factor.

#### REACTION OF THE PITUITARY IN RABBITS

After I had found that the pituitaries of rats vary in their reaction according to sex, I examined the reactions of other rodents to the application of

follicular hormone over a prolonged period. Immature female rabbits received 10,000–50,000 M.U. folliculin menformon or dimenformon, usually twice weekly.

Table II. shows an average weight for the pituitaries of the treated animals of 16.9 mg.; the same average weight was found in the control animals. After a longer treatment (12 weeks, K 268) the pituitary showed slight enlargement (24 mg.); pituitaries of similar weight, however, are also to be found occasionally in control animals. As we see, there is no marked influence on the size of the pituitary of the female rabbit after a prolonged treatment with follicular hormone. Whether or not this is also the case in the male animal is now being investigated.

#### SUMMARY

1. Administration of follicular hormone over a long period inhibits the anterior lobe of the pituitary so that the growth hormone and the gonadotropic hormone are not active. Dwarfed animals with hypoplastic genitals result.

2. The dysfunctioning pituitaries of such rats are enlarged and their weight may amount to four times the normal. This increase occurs in male rats only.

3. However, a very large tumour of the pituitary, produced in a female rat, was 20 times the normal size of the gland. This tumour produced signs of pressure on the brain and optic nerve.

4. The pituitaries of female rabbits do not enlarge after prolonged periods of folliculin administration. Whether or not this is the case in male animals is now being studied.

#### REFERENCES

- Zondek, B.: THE LANCET, Jan. 4th, 1936, p. 10.
- Cramer, W., and Horning, E. S.: *Ibid.*, Feb. 1st, 1936, p. 247.
- Collip, J. B., Selye, H., Thompson, D. L., and Williamson, J. E.: *Proc. Soc. Exp. Biol. and Med.*, 1933, xxx., 590; *Virchows Arch. f. path. Anat.*, 1933, xxiii., 290.
- Evans, H. M., Simpson, M. E., and Williams, M. M.: *Univ. California Publ. Anat.*, 1934, i., 161.

## Clinical and Laboratory Notes

### NINETEEN MONTHS' HUNGER-STRIKE

By H. BASIL ROSAIR, L.R.C.S. Irel., D.T.M.

MAJOR, I.M.D.; SUPERINTENDENT AND MEDICAL OFFICER, CENTRAL PRISON, BAREILLY, UNITED PROVINCES, INDIA

Convict Munshi Khan resorted to hunger-strike on May 18th, 1934. His weight was then approximately 130 lb.

Regular forcible feeding was begun on July 2nd, but before that date he had been forcibly fed on eight or ten occasions. On July 2nd his weight was 95 lb. and there were definite signs of weakness and exhaustion; from that time until Oct. 15th it ranged between 91 and 96 lb. By December it had dropped to 85—the lowest recorded during his nineteen months' hunger-strike. Between December, 1934, and January, 1936, his weight varied between 85 and 105 lb., the increase or decrease being mainly dependent on the quality and quantity of liquid food given.

Hunger pangs were confined to the first seven days of the fast. Nausea was an unpleasant symptom from time to time, but usually it was easy to check with a little bicarbonate of soda in barley water. The mind was always very active—if anything more alert than normal.

Forcible feeding through the nose by means of a soft rubber tube was the only form of feeding resorted to. I was fortunate in that the prisoner after the first ten days or so of forcible feeding offered little or no obstruc-



tion. The type of food material and the quantity used was varied as circumstances demanded—i.e., according to the man's condition. Frequently I reduced the routine feeds to one a day, and this would be allowed to go on for many days till the weight came down to about 90 lb. The nourishment given was selected from the following: milk, soup, raw eggs, mung dal, barley water, Glucose D-Roboleine, orange juice, cod-liver oil, and olive oil. Within six weeks of giving up his hunger-strike in January Munshi Khan had regained almost all his lost weight.

In feeding hunger-strikers it is important to avoid vitamin deficiency and to remember the value of fats and carbohydrates compared with proteins. Only carbohydrates and fats are stored as reserve fuel for use when food is insufficient or not available; proteins are utilised (mainly) for tissue repair, but muscle cells are not actually destroyed during starvation and fully recover when food is consumed.

With a well-nourished body, or when the correct type of food is used in forcible feeding, sufficient fat can always be provided for a prolonged fast. During my 15 years as medical officer of jails I have often had to order and conduct forcible feeding and I am convinced that there are no permanent ill-effects either upon mental activity or muscular strength. There are of course definite risks and danger when a prisoner refuses to be fed forcibly and offers obstruction with all the strength he can command; the possibility of exhaustion followed by collapse and even death must be borne in mind. Pneumonia owing to food entering the bronchial passage can ordinarily be prevented by not pouring any food into the funnel till the tube has passed well down.

So far as I am aware, no case of hunger-strike lasting as long as 19 months has previously been recorded.

### EXTRADURAL HÆMORRHAGE IN A CHILD OF 13 MONTHS

BY A. F. GOODE, M.B. Birm., F.R.C.S. Eng.

ASSISTANT IN THE SURGICAL UNIT, THE WELSH NATIONAL SCHOOL OF MEDICINE, ROYAL INFIRMARY, CARDIFF

I HAVE been able to find only one previous record<sup>1</sup> of middle meningeal hæmorrhage in a child so young as the case here described.

A girl, aged 13 months, was dropped from her father's arms, fell on her head from a height of about four feet, and at once commenced to scream, continuing to do so for about half an hour, after which she apparently went to sleep. However the mother noticed that the child did not close her eyes and thinking that she was having a fit, brought her to hospital. On admission to the Cardiff Royal Infirmary at 2 A.M. on June 21st, 1935, two hours after the accident, the child was unconscious, and soon after admission commenced to have attacks of twitching involving the left side of the face and the left arm, and later the left leg.

*Physical signs.*—When first seen by me at 5 A.M. the child was still unconscious with a right temporal hæmatoma and the left arm and leg showing flaccid paralysis. There was conjugate deviation of the eyes to the right, the pupils themselves being equal but small and reacting to light. The pulse-rate which had been 80 on admission was now 158. In view of the temporal hæmatoma and the twitching of the left side of the body followed by paralysis, a diagnosis of right middle meningeal hæmorrhage was made.

*Operation.*—Immediate operation was carried out under local anæsthesia. A temporal skin flap was turned down. Through a fissured fracture running across the squamous

temporal blood was oozing. A trephine hole was made in the skull about 1 in. above the zygoma, a considerable quantity of jelly-like clot removed and the meningeal vessels exposed. Bleeding was now profuse, from beneath the bone, and the trephine hole was enlarged upwards and it was found that both the middle meningeal artery and vein (anterior division) were torn. Both artery and vein were under-run with a catgut suture. It was necessary to tie both ends of the vessels to stop the bleeding. The wound was closed with a small drainage-tube.

The child recovered consciousness about four hours afterwards and had a very stormy convalescence for a few days, the temperature never falling below 102° F. and reaching 104° on several occasions. After the fifth day the temperature remained within normal limits. For three days there was a tendency for the eyes to deviate to the right. The left-sided paralysis steadily decreased but it was nearly three weeks before it had disappeared completely. When seen in January of this year the child was perfectly well.

The age and absence of concussion were misleading features in this child's history; but the fits and paralysis, together with the temporal hæmatoma, made the diagnosis more obvious. In fact extradural hæmorrhage, more often than not, appears to give atypical symptoms.

The necessity for tying both ends of the vessels in this case gives support to Wood Jones's theory of the origin of the bleeding, which he considers comes from the vein. Although consciousness was fairly rapidly regained, the paralysis persisted for a surprisingly long time after craniotomy and ligation of the vessels.

### PANTOCAIN L

#### A REPORT ON 160 CASES

BY AHMED ABDEL NABI, D.M. Cairo

CAPTAIN, EGYPTIAN ARMY; SURGEON, EGYPTIAN ARMY GENERAL HOSPITAL, CAIRO

FOR the last thirty years spinal anæsthesia has been used in Egypt on a very large scale. The drug mostly employed was Stovaine, on which the single-handed surgeon in the country relied for the greater part of his work on the abdomen and the lower extremities. Its use in hospitals has taken a big burden of anxiety and worry from the shoulders of the surgeon. The drawback of stovaine was the fall in the blood pressure, which often caused shock. Again, the rapid disappearance of the anæsthesia made it necessary to administer a general anæsthetic in the last stages of major operations.

Having given stovaine in 1500 cases during the last few years, and having gained much experience of its use, I sought some other drug that would not cause a big fall in the blood pressure. Pantocain L\* was chosen for trial, and I started my series of 160 cases in November, 1934. As usual when trying new drugs I was very careful and cautious in selecting my first few patients, but the results were so encouraging that I now believe that pantocain is the spinal anæsthetic that should be used everywhere.

Pantocain (*p*-butyl-aminobenzoyl-dimethyl-amino-ethanol hydrochloride) is a novocain derivative. It is a white crystalline odourless powder, which is readily soluble in water and normal saline. It is not affected by boiling and it keeps stable indefinitely. It is supplied in ampoules, each containing 3.75 c.cm. of an 0.8 per cent. solution of the drug (i.e., half a grain in each ampoule). The specific gravity of the

<sup>1</sup> Wakeley, C. P. G., and Lyle, T. K.: Problem of Extradural Hæmorrhage. A Report of 14 Cases. *Ann. of Surg.*, 1934, c., 39.

\* Made by Bayer Products Ltd.

solution is lower than that of the cerebro-spinal fluid, a fact which should be always borne in mind.

My series of cases consisted of 123 males and 37 females, ranging from between 15 and 55 years of age. The drug is contra-indicated in cases of arterio-sclerosis, severe sepsis, severe anæmia, old age, and nervous disorders.

#### TECHNIQUE

The instruments and drugs required are: (1) morphia (0.01-0.02 g.) and atropine (0.001 g.) ampoules; (2) pantocain L in ampoules (3.75 c.cm.); (3) Pantocain Racedrin\* (2 c.cm. containing grs. 2 of racedrin); (4) one 2 c.cm. record syringe; (5) one 10 c.cm. record syringe; and (6) a long thin-bored needle for the spinal puncture.

*Preparation of the patient.*—A mild aperient is given one day before the operation. *Strong purgation is not required.* An enema is usually administered in the early morning, but this could be omitted in weak patients. Twenty to thirty minutes before the operation an injection of morphia and atropine is given and the patient is kept in a quiet place.

*Position and doses.*—The specific gravity of the pantocain solution being lower than that of the cerebro-spinal fluid, the drug should on no account be administered while the patient is sitting up. He should always be lying on the side opposite to that on which the operation is to be performed, but if there is to be a double operation—for example, a double inguinal hernia—or if the incision is in the median line he lies on his left side. He must be put in the Trendelenburg position, the degree of tilting the table varying according to the site of the operation: the head should always be kept lower than the buttocks. Before injecting the pantocain, an average of 1.5 c.cm. of pantocain racedrin is injected along the proposed line of the lumbar puncture, to act as a local anæsthetic and to raise the blood pressure. If the blood pressure is high, only 0.5 c.cm. is to be injected.

The accompanying Table shows the dose and site of injection, and the inclination of the table, according to the operation:—

	Dose in c.cm.	Site of injection.	Speed of injection in secs. per c.cm.	Inclination.
Lower extremities ..	2	L. III.-IV.	5	10°
Perineum ..	1	L. IV.-V.	5	10°
Lower abdomen ..	2-2½	L. IV.-V.	4	5°
Middle abdomen (to umbilicus) ..	3	L. III.-IV.	4	5°
Upper abdomen ..	3½	L. II.-III.	3	5°

When the racedrin solution has been injected into the space chosen, the long narrow-bore needle is pushed into the spinal canal in the usual manner. The stillette is taken out and the 10 c.cm. syringe containing the pantocain solution is jointed to the needle, and an equal amount of cerebro-spinal fluid is drawn and the mixture is then slowly injected. The patient is now turned on his back and the table is tilted more (5-10 degrees) into the Trendelenburg position, according to the site of the operation.

*After-treatment.*—The foot of the bed is raised on blocks for a period of 8-12 hours. The patient may be given fluids very early after the operation.

#### EFFECTS

*Onset and duration of anæsthesia.*—Anæsthesia generally sets in after 1-2 mins., but in some cases the onset is delayed up to 8 mins. The duration of

anæsthesia is 2-4 hours and the patient is generally unable to move his lower limbs before 5-8 hours.

*The blood pressure.*—I am accustomed to record the pulse and blood pressure: (1) before morphia; (2) after morphia; (3) 10 and 20 minutes after pantocain injection; and (4) at end of operation. The blood pressure taken before the operation gave me an idea of the amount of racedrin to be injected. The normal blood pressure is better checked a day or two before the operation. Patients sometimes get very nervous immediately before; this causes a false reading to be recorded and, consequently, a wrong dose of racedrin to be given; both systolic and diastolic readings are affected in this way. One of the three patients in whom I noticed a fall in blood pressure was a little worried and complained of dragging pains in the abdomen. I gave 5 c.cm. of coramine intravenously and he again became cheerful and happy.

On the average there was a rise of 20 mm. in the systolic pressure, which appeared ten minutes after injection and lasted over half an hour; in only three cases did I notice a fall and it was slight. The pulse-rate was increased.

#### TWO ILLUSTRATIVE CASES

The following is a record of blood pressure given in two illustrative cases:—

CASE A.—Aged 26. Acute appendicitis.

CASE B.—Aged 40. Complete uterine prolapse and lacerated cervix.

—	Blood pressure mm. Hg.				Pulse-rate.	
	Systolic.		Diastolic.		A.	B.
	A.	B.	A.	B.		
Before morphia ..	115	135	70	86	100	72
After ,, ..	115	135	75	84	98	72
10 minutes after pantocain ..	140	155	90	100	110	78
20 minutes after pantocain ..	140	150	90	96	108	78
At end of operation	130	140	85	90	96	75
Racedrin, c.cm. ..	A. 1.5		B. 1.25			
Pantocain, c.cm.	3		1.5			
Space injected ..	Lumbar 3-4		Lumbar 4-5			

#### CONCLUSIONS

(1) The drug is safe and the anæsthetic effect lasts long. (2) Little or no headache follows its administration. (3) Retention of urine is rare (2 per cent.). (4) No cases of paralysis have been observed. (5) There is little or no fear of a fall in the blood pressure, as compared with other spinal anæsthetics.

I should like to offer my sincere thanks to Major FitzGerald Powell Bey, principal medical officer, Egyptian Army, and Major R. J. Rosie Bey, senior medical officer, Egyptian Army General Hospital, for their encouragement and for allowing me to use this drug in the Egyptian Army General Hospital.

BRISTOL CHILDREN'S HOSPITAL.—A new out-patient department, which will cost about £24,000, is urgently needed at this hospital. During the last four years the hospital has been rebuilt at a cost of £40,000, and a nurses' home erected. A great many children assist the institution, thirty-two schools contributing £25 a year each to support a cot.



## MEDICAL SOCIETIES

### MEDICO-LEGAL SOCIETY

AT a meeting of this society held at Manson House under the chairmanship of Sir WILLIAM WILLCOX on March 26th, an address was given by Dr. L. A. WEATHERLY on

#### Debatable Medico-Legal Episodes

in his long life of practice as a mental expert. It was in 1886, he said, that he became an alienist. His father was a country doctor with 13 children, eight of them boys, who owed their good education to the fact that their father had a wealthy resident patient, an eccentric man of genius, a schoolfellow of Thackeray and a friend of Gladstone. This was the background of his youth and in his student days at Bristol he spent his spare time at the county asylum, Fishponds, with George Thompson. In 1877 when he married, his wife consented to have a resident patient. He joined the Medico-Psychological Association and there got to know John Bucknill, Haek Tuke, George Savage, David Barr, Urquhart, Yellowlees, Clouston, Mercier, and—an association that meant more to him than any other—Henry Maudsley. In 1886 he bought a private mental hospital at Bath and a few years later was appointed deputy coroner for Somerset. The first inquest he held was on an imbecile child who had been hounded to death by drowning in the village pond. On arriving he found the jury had already viewed the body and were assembled in the inn around a table on which was a punch bowl and a pipe and tobacco was provided for each juror. He left the place a very unpopular man. At Bath he became friendly with the police surgeon, who was horrified at the number of boys sent to prison for trivial offences. Permission was obtained for Dr. Weatherly to see some of these juvenile offenders, and he liked to think he was instrumental in getting different treatment for many of them. In 1908 he was called to give evidence before the Royal Commission on the Weak-minded. He had a firm belief in the value of the coroner's court, and hoped its privileges would not be taken away.

His first important medico-legal case was a charge of murder heard at the Taunton Assizes in 1886 before Mr. Justice Field. Mr. Thomas Bucknill and Mr. Charles Matthews appeared for the defence. The accused was the son of a well-known medical officer of health. He was born at an asylum while his mother was suffering from the melancholic stage of manic-depressive insanity. Soon after birth he was seen to be abnormal; at school he developed epilepsy. His mother was keenly attached to him, but his two sisters shunned him, and after one of them had deprived him of something he was in the habit of having he became very angry; he was found walking in the streets of the town and his sisters when they passed him cut him dead. He felt he could brook their cruelty no longer, went home and wrote a letter containing these words:

"Dear father and mother, I leave everything that belongs to me to my dear mother. I have been treated so badly by my sister C—that I feel I must put an end to her life by shooting; and, knowing that I shall have to die for it, I shoot myself. Good bye to all; hoping you will have a happy time. Good bye, dear father and mother."

With that letter, and with a judge determined to interpret the McNaghten rule in its narrowest

sense, the poor alienists had a rough time. The judge would not allow Dr. Weatherly to give his opinion on the condition of the boy's mind, and witnesses were tied down to answering the question "Can you say that this boy did not know the difference between right and wrong in the face of that letter?" Dr. Needham, later superintendent of Barnwood House, had been subpoenaed to give rebutting evidence; he had to tell the prosecution that his evidence would be favourable to the defence and was not called. The verdict was "Guilty but insane," and the boy was sent to Broadmoor. Some years later he hanged himself at the prison. The alienist giving evidence on insanity was sometimes placed, Dr. Weatherly said, in a difficult position; he could not declare that he had microscopically examined the cells in the brain of the accused, and that certain cells believed to be concerned with intellect were seriously affected; nor could the will power or the emotions be weighed in a scale and assessed. Moreover, the affective portion of the mind was often responsible for a crime without the intellect acting at all. The judges who adhered to the McNaghten rule took no account of that affective region of the mind. His own belief was that grades of murder should be recognised.

Kleptomania, Dr. Weatherly contended, was a true disease of the mind. He had had to give evidence in many cases, and his experience told him that if the tendency was not dealt with early it would develop into systematic thieving on a larger scale. A case of this kind, tried by Mr. Justice Denman, was that of a post office employee in Bristol who had been taking to his lodging registered letters and other postal packages, also boxes of knuckle bones, and silks and satins. It was ascertained that he had been a butcher's boy, and had later been employed in a haberdasher's shop. Dr. Weatherly spent three hours in the witness-box and showed that the man had many of the stigmata of imbecility. The verdict was "Guilty but insane" and the patient was allowed to remain at Fishponds. Dr. Weatherly next dealt with sexual offences, commenting on the extraordinary position of the law which allowed magistrates to decide on some offences while others had to be sent to the assizes. He related the case of a public official charged with indecent exposure; the man's sexual life had completely altered after an operation for appendicitis. After six months under medical care he was able to go back to his family. Dr. Weatherly then referred to Section 49 of the Lunacy Act, relating a case in which the asylum superintendent and his staff refused to allow a patient to be visited or his papers to be inspected. The law, he submitted, required amendment; the matter was discussed by the Medico-Legal Society some years ago.

In conclusion, Dr. Weatherly said he had watched with great interest the growth of the Medico-Legal Society, but he thought its practical usefulness should be extended. For instance, Mr. Claud Mullins had made out a strong case for some alteration of the law in sexual offences. He wanted the society to set up a parliamentary bills committee.

Mr. Justice HUMPHREYS said he did not think there was any likelihood that coroners' courts would be abolished. Somebody must deal with the man found with a broken neck, who might have had it broken by somebody, or might have fallen out of a window, or might have committed suicide. A good

thing was done when Parliament decreed that as soon as a person was in custody for causing the death of somebody, the coroner's inquiry must cease. He had found coroners doing their very difficult work not only fairly but with great tact. He refused to be drawn into a discussion of the McNaghten rules; he was tired of them, and, he added, they were getting rather old.

Sir LAWRENCE BROCK (chairman of the Board of Control) said that Government departments were often blamed because legislation did not keep pace with the hopes of enthusiasts; people should remember that no Government could legislate far, if at all, in advance of public opinion. Hence the value of societies of this kind which could help to bring conflicting views to a focus and to educate public opinion. He hoped the desire for the humaner treatment of mental disorder which Dr. Weatherly had manifested in his long life would continue to animate the members of the society.

The CHAIRMAN, in thanking Dr. Weatherly for his address, said it was to him that the Medico-Legal Society owed its inception.

## ROYAL SOCIETY OF MEDICINE

### SECTION OF RADIOLOGY

At a meeting of this section held on March 20th the chair was taken by Dr. C. G. TEALL, the president, and Dr. E. W. TWINING opened a discussion on the value of

#### Radiology in Neuro-Surgery

The neurologist and neuro-surgeon, he said, had been fortunate at finding, just when they needed it, a development of radio-technique adequate for their purpose. The common intracranial tumours were gliomas (40-50 per cent.) angiomas, tuberculomas, meningiomas, pituitary tumours, acoustic neuromas, and cysts. Gliomas came low in the group producing direct radiological signs. There might be local bulging of the skull, a visible vessel over the tumour, or hydrocephalus. They sometimes calcified, showing a single dot, multiple dots, convoluted or radiating trabeculae, or a circular shadow. Meningiomas were not invasive but pushed the brain out of the way and often produced direct radiological signs. Some of the evidence was extremely difficult to assess. Calcification was rather uncommon in these tumours, and could not be distinguished from that associated with glioma. Pituitary tumours (20 per cent. of the total) appeared in the first half of life and the patient might go blind suddenly if the diagnosis were not made early. The sella was ballooned, often V-shaped; the anterior clinoids remained unaffected usually, but sometimes were tapered or pulled upwards. The condition had to be distinguished from the altered sella due to intracranial pressure. An arachnoid cyst might give signs indistinguishable from those of a pituitary tumour. Acoustic neuroma (9 per cent.) showed often an erosion or dilatation of the internal meatus, which was best demonstrated by Towne's method. Erosion of the petrous might be due to cholesteatoma resulting from middle-ear disease. Suprasellar tumours (5 per cent.) most often grew up from Rathke's pouch in young people who showed hypopituitarism and polyuria. X rays might show calcification but gross alteration of the sella was rare. Ventriculography was helpful in

the diagnosis of these tumours. Hydrocephalus yielded direct signs: rounded and thinned skull, widened sutures, and deepened digitate impressions in children, but often only sellar erosion in adults. Ventriculography was useful here also. The problem was to find where the block was. A head-tilting method would often fill the posterior part of the ventricular system; if the ventricle did not fill with this method there was nearly always a lesion. The infundibular recess seemed to press on the sella and cause osteoporosis of the bone, often quite flattening the pituitary. The third ventricle might be deformed by such lesions as suprasellar meningioma, optic nerve glioma, aneurysm of the anterior cerebral artery, pituitary tumours, craniopharyngeal cyst, and glioma of the optic chiasma. The use of Thorotrast had certain advantages in the radiology of cranial lesions.

#### THE MENINGIOMAS

Mr. HUGH CAIRNS said that meningiomas were for the most part benign and attached to the dura. They might be found in the vault or base. Typically they were composed of spindle cells with a tendency to whorl formation in which at times calcium—or even bone—was deposited. Sometimes they were part of a general neoplasia. Some of them gave no X ray signs. A few showed only signs of raised intracranial pressure, but more often bone formation or bone invasion was visible. The reaction to invasion was usually excessive deposition of bone, but might be excessive absorption. Meningiomas on the base of the skull produced such symptoms as proptosis. Areas of increased thickening might be seen without palpable lump. An important sign was a small endostosis on the inner surface, indenting the meningioma. These endostoses were not always associated with thickening of the bone; traction seemed to be one of the factors in their production. Some of them showed as areas of diminished density. Tangential views were essential if any area showed unusual vascularity, with vessels converging towards a point. The vascular changes in meningioma included increase in number and size; appearance of numerous fine channels, usually inside, sometimes in the substance and occasionally on the outer table; and increase in size and number of the diploic channels. Radiograms of abnormal vessels warned the surgeon when to anticipate excessive blood loss at operation. Some meningiomas obtained a lot of their blood-supply from the cerebral vessels and in this case the bone changes were much less intense. The olfactory groove tumours were the most difficult to diagnose; they showed a dark line along the groove, but this might appear in normal skulls and was not diagnostic unless the patient had also lost his sense of smell. Osteoma showed much sharper outlines than meningiomas. Leontiasis ossea gave rise to dense areas in the skull. Head injuries in childhood and syphilitic osteitis of the skull might show radiographic appearances resembling meningioma. Metastatic carcinoma could not be distinguished radiographically, and chronic alcoholic meningitis might closely resemble meningeal tumour. Positive radiological evidence had been available in 70 per cent. of his cases.

#### THE LATERAL VENTRICLES

Dr. M. H. JUPE said that calcified tumours within the lateral ventricle were uncommon. The more deeply the tumour lay the more difficult was both diagnosis and operation. Calcification was therefore an inadequate guide in any case. Ventriculography

gave the information required. Perforation of the septum lucidum might be revealed by "waviness" without bulging. Congenital absence of the septum was easily recognised. Tumour of the corpus callosum had to be distinguished from congenital absence; it did not show the convexity of the latter condition. If the foramen of Monro were blocked a single injection would not fill both ventricles; it was important to know on which side the bulk of the tumour lay. When the tumour arose more posteriorly the ventricles were more separated, and an antero-posterior view in a modified Towne position was useful. A large tumour at the base would deform the lateral ventricle. Failure to fill the descending horn pointed to temporal lobe involvement. Pure basal ganglia tumours and cysts of the third ventricle gave little indication of their origin, but could be distinguished from each other by air injection. As the former were treated by decompression and radiation and the latter could be removed, diagnosis was important. Sometimes stereoscopic views would reveal tumours not seen in direct views.

#### THE OPTIC CANALS

Mr. G. JEFFERSON pointed out that the examination of these canals had many applications and was quite simple. The cerebro-spinal fluid space was carried forward along the optic nerve and the prolongation might be dilated in hydrocephalus. An intrinsic tumour of the nerve itself produced the maximum disturbances. It was most important to examine the canals in cases of suspected chiasma tumour which might extend forwards into the nerve. To secure good views the head must be carefully positioned by a standardised technique. The normal canals attained a size of about 5 mm. at the age of 3 and thereafter did not alter. Erosions of the bony bridge between the optic canal and the sphenoidal fissure were caused by aneurysm and were visible on radiography. Meningioma from the anterior wing of the sphenoid caused disappearance of all the structures—and not the suppression of the bridge with a fairly normal optic canal. Meningiomata of the olfactory groove caused monocular blindness by pressure on the nerve and not by affecting the canal.

#### CEREBRAL BLOOD-VESSELS

Mr. D. W. NORTHFIELD said that visualisation of the vessels could give valuable information if they were properly filled and the normal patterns were known. The external carotid circulation was slower than the internal carotid and therefore the superficial vessels were not seen. According to the number of seconds of delay between the injection of thorotrast and the exposure, the arterial, sinus, or cortical venous systems were visualised. Abnormal collections of thorotrast indicated aneurysm or congestion. Vascular meningiomas showed typical smudge-like opacities. Vascular gliomas showed many large parallel vessels of all calibres. A tumour could be localised by displacement of vessels. Pituitary tumours might affect the carotid sinus, straightening out the carotid syphon curve. Tumours of the temporal lobe were often difficult to diagnose, but were shown clearly by displacement of the Sylvian vessels upwards.

#### TUBERCULOMATA

Dr. J. PURDON MARTIN showed slides illustrating tuberculomata shadows. In the acute stage they did not show on the film but later they calcified and then the patient often began to suffer from fits.

In one of the few cases that had been verified by operation the shadow was near the surface and lobulated. The outline was always irregular and sharply defined and the calcification dense. The aneurysm shadow was much more regular in outline.

The PRESIDENT said that, while much of the work was highly specialised, certain signs were clear for all who had eyes to see, and radiologists must learn to make early diagnosis if the full value of radiology in neuro-surgery was to be obtained.

### NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

To the account of a meeting of this society given in our last issue may be added the following note on

#### Repeated Ectopic Pregnancy

Dr. J. W. BRIDE, under the title of Recurring Ectopic Pregnancy, reported the case of a woman who had (1) a normal pregnancy by her first husband; (2) a left ectopic pregnancy by her second husband, 13 years later, which was treated by salpingo-öophorectomy; (3) a normal pregnancy 2½ years after the ectopic pregnancy; and (4) an ectopic pregnancy nine months after the second normal pregnancy. At the operation for the first ectopic pregnancy the right appendages were regarded as normal—a finding which seemed to be confirmed by the subsequent normal pregnancy. There was no disease of the appendix, no history suggestive of gonorrhœal infection and no sign of such infection at the second operation. The puerperia in each pregnancy had been uneventful.

Prof. MILES PHILLIPS thought it better to reserve the term "recurrent" or "recurring" for cases of tubal pregnancy in a tube which had been repaired at a previous operation after incision into its wall to remove a tubal mole. The term "repeated" was in general use for cases of pregnancy in the opposite tube after a previous operation (generally excision) for a tubal pregnancy. He referred to a case of recurrent tubal pregnancy in a conserved tube, after an interval of 16 months, which necessitated salpingectomy. He also recalled F. W. Ramsay's well-known case of successful uterine pregnancy after two operations for tubal pregnancy, in the first of which a tube had been removed and in the second conserved. On the other hand, Aleck Bourne had recorded fatal rupture of pregnancy in a conserved tube.

Mr. C. H. WALSH said he had records of 80 ectopic pregnancies, 43 of which were on the right side and 37 on the left. Half were tubal abortions and half tubal ruptures. Slightly over half were in multiparæ; slightly over half were presumed to be due to congenital defects of the tube, and slightly less than half to old infection. Of the 80, 5 were recurrent, 4 in the opposite tube, and 1 in the stump of a partial salpingectomy. There were no immediate deaths in the series, but 1 death three years later from intestinal obstruction.

Dr. BRIDE, in reply, agreed with Prof. Phillips about terminology. The second ectopic pregnancy had been treated conservatively by tubal resection, and he hoped that if the patient's wishes were fulfilled, and she became pregnant, the result would not be a cornual pregnancy.

## REVIEWS AND NOTICES OF BOOKS

**Insulin**

*Its Production, Purification, and Physiological Action.* By DOUGLAS W. HILL, B.Sc. Brist., Ph.D. Liverp., Lecturer in Chemistry, University College, Exeter; Special Lecturer in Organic Chemistry, University of Bristol; and FREDERICK O. HOWITT, M.Sc., Ph.D. Lond., F.I.C. With a foreword by Prof. E. C. DODDS. London: Hutchinson's Scientific and Technical Publications. 1936. Pp. 219. 12s. 6d.

THOUGH a large number of books have been written on insulin, few have been concerned with its more chemical aspects. These take up a large part, approximately one-half, of this monograph, which aims at giving a complete summary of the literature on insulin except that dealing with its clinical applications. Anyone who has attempted to keep abreast with this subject will be grateful to the authors for the most exhaustive presentation of the work done on its chemistry and preparation that has yet appeared. It is designed for specialised workers and therefore includes, at the end of each chapter, references to all the original sources made use of. The number of publications dealt with is exceptionally large for a book of this size; the name-index alone occupies some 24 columns. This constitutes such a valuable feature that it is perhaps ungrateful to suggest that the inclusion of a list not only of original communications to scientific journals, but of the more important reviews and monographs by established authorities would have been a useful addition.

After a brief introductory survey of diabetes mellitus the chemical and preparative section opens with a summary of the pioneer work on the isolation of the hormone, culminating in the discoveries of the Toronto workers in 1921 and the following years. The chapter on the methods of preparation employed by various workers and the yields of active principle obtained is excellent. The distribution of insulin in different tissues is also reviewed here. There follows a description of the methods used for purification of the crude material, and a valuable account of the chemical and physical properties is given. This includes a consideration of crystalline insulin and of the chemical nature of the highly purified substance. Considered in relation to this chemical work the final chapter on possible substitutes for insulin makes interesting reading, though it is clear that no satisfactory substitute for the natural hormone is available as yet. The substances hitherto discovered, whether synthetic or natural, throw little light on the pharmacological mechanism of insulin action, but in so far as they may in the future lead to the preparation of effective substitutes, the definition of their properties is timely.

Of the remainder of the book some 40 pages are devoted to the physiological properties of the hormone, including sections on hypoglycaemia, changes in composition of body fluids following insulin administration, and the relation of insulin to other internal secretions. The authors then review the mode of action of the pancreatic hormone and proceed to consider the regulation of insulin secretion, the physiological control of blood-sugar level, the relation between the internal and external secretions of the pancreas, and finally the present state of knowledge of the effects of insulin upon carbohydrate metabolism. The wide differences of opinion on this subject to

which conflicting experimental results have given rise, make it difficult to present a fair picture. On the whole this has been achieved, though occasionally it may seem that due weight is not given to certain important observations, probably from a desire to give space to all relevant ones. The concluding chapter on the biological assay of insulin preparations will be of practical value to those whose duty includes such determinations. The typography of the book is unusual in a scientific production and will not appeal to those who dislike prominent headlines. But there is something to be said for the view that highly technical matter is difficult to read and that help in differentiating the sections and sub-sections should not be despised.

**Surgical Diseases and Injuries of the Genito-urinary Organs**

Second edition. By Sir JOHN THOMSON-WALKER, M.B., C.M. Edin., F.R.C.S. Eng., Consulting Urologist and Emeritus Lecturer on Urology, King's College Hospital; Consulting Surgeon, St. Peter's Hospital. Edited by KENNETH WALKER, M.B., B.C. Camb., F.R.C.S. Eng., Lecturer on Venereal Disease, St. Bartholomew's Hospital; Surgeon with charge of Genito-urinary Department, Royal Northern Hospital. London: Cassell and Co., Ltd. 1936. Pp. 974. 32s. 6d.

THE first edition of this book appeared in 1914. It quickly established itself in this country as a standard work, and sold so widely abroad that soon the edition was exhausted and the book became unobtainable. Unfortunately the war and the obligations of his practice prevented the author from giving up the time necessary to bring out a second edition. During the last 20 years urology has advanced rapidly as a branch of surgery, and in order to bring the book up to date it has been necessary to rewrite most of it.

The new edition retains the original aim of reflecting current opinions of the day and at the same time bearing the impression of the experience and individual views of the author. In order to lighten the author's task Mr. Kenneth Walker has undertaken the work of editor, but Sir John Thomson-Walker has coöperated actively in the work of revision and has himself contributed many of the new chapters. The editor's main embarrassment must have been the wealth of new material at his disposal. Additional chapters on renal function tests, transurethral operations, obstruction at the bladder neck, impotence and sterility have been included. Amplifications elsewhere have been made necessary by the increasing importance of X rays in urology, not only in the realms of diagnosis but also of treatment. When the first edition was being prepared pyelography was in its infancy. It has since gained for itself a prominent position among aids to diagnosis, and training in interpretation of pyelograms has become an indispensable part of the urologist's equipment; plates illustrating the typical pyelographic appearance of different lesions of the kidney are interspersed throughout this book. All the plates (25 in colour and 33 in black and white) are of high quality, and nearly 300 illustrations are incorporated in the text. Most of the coloured plates are reproduced from paintings made by Mr. Thornton Shields in the operating theatre of appearances seen through the

cystoscope. They are sufficiently realistic to help those who are not expert cystoscopists to recognise the lesions portrayed.

The labour involved in bringing this work up to date has been well spent, and it will be welcomed at home and abroad as a sane presentation of current British teaching.

### Die Störungen des Lichtreflexes der Pupille

*bei denluetischen Erkrankungen des Zentralnervensystems. Beiträge zur Frühdiagnostik der Lues nervosa.* By Dr. OTTO LÖWENSTEIN, formerly Professor at the University of Bonn, at present at Nyon, Switzerland (Klinik la Métairie). Basle: Benno Schwabe and Co. 1935. Pp. 92. RM.4 (5 Swiss francs).

Dr. Otto Löwenstein has long made a special study of the reaction of the pupil to light, both in health and disease. For his purposes the ordinary clinical test is wholly inadequate and even the pupilloscopes devised by Hess and Sommer are insufficient. The first to use cinematography in this connexion was Weiler, but his method entirely fails to measure the consensual reaction of the unilluminated eye. By his improved method Löwenstein claims to have invented a kinemotographic apparatus by means of which all the phases of the direct reaction to light of the pupil and also of the consensual reaction can be studied. The initial difficulty of photographing a pupil in the phase of dilatation is got over by means of filtering the light through blue-violet reflectors, and the complete apparatus includes a device by which the various phases and their extent can be represented by a tracing on paper. A number of diagrams of curves so taken are reproduced and by means of them the following points are elucidated. There are four typical varieties of the normal pupillary reaction to light. After a short latent period which varies between 0.06 and 0.25 of a second there may be either (1) rapid contraction and rapid dilatation, (2) rapid contraction and slow dilatation, (3) slow contraction and rapid dilatation, or (4) slow contraction and slow dilatation. Fatigue caused by repetition of the flash occurs only after repeated flashes in the normal, but much sooner in a patient with disease of the central nervous system. In all normal cases the reaction of the right and left eyes is similar, and the phases of the consensual reaction follow very closely after the direct. The psychic dilatation of the pupil is, of course, very liable to complicate the reaction to light and hence the necessity of making the tests of the direct and consensual reactions simultaneous. Any considerable deviation from the normal points to an abnormal state of the central nervous system, and as by far the most frequent cause of this in cases in which the diagnosis is obscure is syphilis, these pupillary abnormalities may sometimes afford invaluable help. Dr. Löwenstein's study of these pupillary symptoms in relation to syphilis is based on an investigation of more than 100 cases during the last ten years. Many of them came under his notice at a period of the disease when the Wassermann reaction was negative and the diagnosis was doubtful. In others the clinical symptoms left no doubt; most were in an intermediate stage when syphilis was suspected but not proved. He concludes that the obscure pupillary symptoms, amounting to much less than anything capable of ordinary clinical demonstration, such as

the Argyll Robertson pupil, may if detected point to the diagnosis at a time early enough to give therapeutic measures an excellent chance.

Among the particular abnormalities that are discussed are: symptoms of fatigue occurring unduly early after repeated tests of the light reflex; definite differences between the response of the right and the left pupils to the light stimulus; marked differences between the direct and the consensual response; and differences in the latent period of the two pupils. Dr. Löwenstein has been able to study in cases of early tabes the stages of which the final one is the Argyll Robertson pupil, and also the curious phenomena which precede the so-called paradoxical pupil reaction.

Since there are so many varieties in the details of the pupillary reaction to light in normal individuals it is not claimed that these researches can ever provide an easy substitute for a complete clinical and pathological diagnosis of obscure cases either of early or latent syphilis, or of other diseases such as schizophrenia, but the method appears to afford an additional tool which is likely to be of increasing importance. Any neurologist who finds himself in Switzerland in the near future should take the opportunity of becoming acquainted with it.

### History of St. Thomas's Hospital

By F. G. PARSONS, D.Sc., F.R.C.S., F.S.A.  
Vol. III. London: Methuen and Co., Ltd. 1936.  
Pp. 274. 10s. 6d.

THIS volume sets out the story of St. Thomas's Hospital in the nineteenth century and is preceded by a brief review of the activities and personnel of the institution during the previous hundred years. A description of the hospital, given in the opening pages, enables one to see that the bond of union between St. Thomas's Hospital, the senior of the two institutions which until some 80 years ago stood facing each other in Southwark, and Guy's Hospital, its neighbour, was a loose one and attended with many circumstances which made the separation of their activities wise and probable. The chapter dealing with the last 25 years of the "United Hospitals," as they were then termed, makes very amusing reading and one can gather that Wakley, the founder of THE LANCET, who was a medical student at the joint schools, had a firm foundation for many statements which in the early days of THE LANCET compelled him to defend various libel actions. The next section of the book, taking the hospital up to 1845, deals with a period of distinct depression in the medical school. Students became fewer and though eminent men had places on the staff they do not seem to have discharged their duties with much altruism. In 1857 St. Thomas's Hospital moved from the Borough to take up a temporary home in the Surrey Gardens, until in 1863, after negotiation with the Metropolitan Board of Works, a site was acquired upon the new Albert Embankment. The years which intervened between the removal of the hospital from its old home and the acquisition of its new palace must have been very trying ones for the authorities. What seems to have been the central building was a large and abandoned music hall "capable of being divided into three floors in such a way as to hold two hundred beds, as well as an out-patient department and dispensary." Mr. Parsons's description continues: "Other buildings there were, ranging from mere dens and cages to

the stately giraffe house which was used as a cholera ward, but for all some use was found. A pavilion made a chemical laboratory, and I have heard Dr. Stone say that the elephant house became the dissecting room. The other departments of the medical school were housed in a large iron shed which was specially built for the purpose. There was, I am happy to say, no attempt to lodge the resident staff in cages and aviaries since houses in the neighbourhood were rented for them; not could a place where the governors might meet be found; and so, after the last court meeting in the old hall on July 16th, 1862, the governors met for nine years in the Terminus Hotel at London Bridge Station, an hotel which was built upon property belonging to the hospital." Now comes an extraordinary fact. The way in which the hospital was conducted in these circumstances must have been highly creditable to the much tried authorities, for at this time it was selected by Florence Nightingale as the site of her training school for nurses.

The remainder of the work dealing with the close of the nineteenth century is without the piquancy of the earlier story, for we are now in an environment to a great extent familiar to all who know what is implied by hospital life. It contains interesting and accurate notes on the personalities of the medical and administrative staffs during the later phases dealt with in the history, and the names recorded should make every student of St. Thomas's Hospital proud of his school.

### The Treatment of Asthma

By F. T. HARRINGTON, M.R.C.S., L.R.C.P.  
London: H. K. Lewis and Co., Ltd. 1936.  
Pp. 112. 6s.

THIS little book gives a full exposition of the general hygienic treatment of asthma. If the author had been content to stick to practical details and eschew theorising, it would have been admirable, for the advice is for the most part sound. As it is, there is much that will irritate the scientific mind. Asthma is attributed to toxæmia plus irritation, and the toxæmia is held to be the result of improper feeding. The nature of the toxin is not revealed, and it is hard to see what part food intoxication plays in hay-asthma or in occupational asthmas such as those of cotton operatives and similar workers. We know very little about the digestibility of foods, nor can we satisfactorily explain why attacks of asthma are induced by large meals and relieved by fasting. Empirically it has been found that certain food combinations are better tolerated by asthmatics than others. It is possible that these phenomena are due to mechanical or reflex disturbances comparable with the carotid sinus mechanism, and until we know more about their production it is unwise to dogmatise. When Dr. Harrington says, "It is of interest to note that when milk and meat are both included in the diet, histamine is produced and can be found in the sputum—histamine being a broncho-constrictor," he is hinting at a process which is almost inconceivable. In the practical part of the book the diet, the care of the digestive tract, the skin and the nose, appropriate clothing and exercise, are discussed in a sensible and helpful way. More space might have been devoted to the nervous factor and to asthma in childhood, and the brief mention of protein allergy, though calculated, is hardly wise.

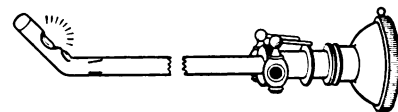
## NEW INVENTIONS

### A RETROGRADE CYSTOSCOPE

FOR some years I have felt the need of a cystoscope which would enable me to see the hypertrophied prostate, as it projects into the bladder, from more or less the same angle as in an open suprapubic prostatectomy. In the modern suprapubic operation the first step, once the bladder has been opened, is to insert retractors in order to inspect the neck of the bladder, when with good technique a clear view is obtained of the projecting middle or lateral lobes, or both. Existing retrograde instruments were found to be quite useless for this purpose. I have submitted three separate designs to Mr. Schranz, of the Genito-Urinary Co., during the course of two or three years. The first two he refused to manufacture as impracticable; the third he undertook to make, and it has proved very successful in giving the desired information. With this instrument and with some practice in its use, the projecting middle and lateral lobes are clearly seen, and with further experience the degree of projection is readily recognised. The view obtained, while not quite that seen at suprapubic prostatectomy, is sufficiently accurate for practical purposes.

I am indebted to Mr. Schranz for the following description of the instrument:—

The new irrigating retrograde cystoscope is 21 Charrière in size and of conventional length. It is fitted with a double reflecting prism and lens system, which deflects the main axis through approximately 135°, so that the shaft of the instrument comes into view at the lower edge of the field. The image is corrected in a vertical



plane, but inverted in the lateral plane. With the patient in the lithotomy position and the operator facing the perineum, the patient's left side is on the operator's right. It has been found that this is less confusing to the operator when he is using a retrograde cystoscope. A flushing channel with inlet and outlet cocks is provided, with two apertures at the distal end. One of these is immediately in front of the objective and is fitted with a baffle which sends the stream backwards towards the internal sphincter. The other aperture is situated at the heel of the instrument.

With this instrument one can obtain a true retrograde view of the prostate very similar to that seen at open prostatectomy. It is hoped that with its use we may be better able to select cases for suprapubic prostatectomy or for resection, and may be in a position to study more exactly the relationship between frequency and intravesical projection of one or more lobes. Apart from its use with the hypertrophied prostate, the cystoscope has proved exceedingly useful in locating papillomata at the neck of the bladder. Using the present optical system, I hope in the near future to develop an operating instrument for dealing with these notoriously difficult tumours. I also hope to improve the water channels of the present examining instrument and to lessen the sharpness of the angle at the heel. In actual practice, however, the instrument has been found quite easy to pass and the present water channels are quite adequate for the clean or reasonably clean case.

T. J. D. LANE, M.D. Dub.



# THE LANCET

LONDON: SATURDAY, APRIL 4, 1936

## UNSCRUPULOUS ADVERTISING

It is not only the so-called trade-union of doctors which will be disappointed that the House of Commons failed to give a second reading to the Medicines and Surgical Appliances (Advertisement) Bill. The measure was blessed with an unusual volume of approval; its scope was carefully limited and its concessions were already substantial. It would, with the goodwill of organised newspaper interests, have prohibited a cruel and delusive form of advertising—the offer of positive cures for cancer, diabetes, Bright's disease and other named ailments, or for conditions such as amenorrhœa, hernia, blindness, and structural or organic defect of the ear. It would have forbidden the dangerous advertisements which offer to promote the miscarriage of women. It would have stopped the publishing of invitations to diagnose or treat the specified diseases by correspondence. All reasonable safeguards for bona-fide practice and treatment were already embodied in the Bill; had any others been deemed desirable, they could have been added in the usual process of improving proposals by amendment. But the legislative machine requires a quorum. After two hours of discussion on Friday, March 27th, the second reading was lost by default. There are 615 members of the House of Commons, but fewer than forty were present at 1.16 P.M. when the House was counted out. Sir ARNOLD WILSON, who moved the rejection of the Bill, agreed that some control of the vast development of advertising in relation to remedies and treatments was essential, that enormous frauds were perpetrated on the public, and that the loathsome atmosphere of fear was being created by a thousand advertisements. He had no objection to legislation; indeed, he promised a respectful reception if the Ministry of Health would produce official proposals. But he denied himself the opportunity of helping, here and now, to fashion an effective remedy. The opponents of the Bill seemed satisfied that its proposals were simply another obscurantist device for persecuting the unregistered practitioner and the herbalist, and for strengthening what is oddly described as the monopoly of orthodox medicine. The names of Sir Herbert Baker, Dr. Axham, and Mr. Spahlinger fitted across the floor of the House. The wastage of life through the ravages of the named diseases was deplored, of course; but the fact that medical research has not yet found a remedy for a disease was apparently deemed a reason for allowing quacks to guarantee cures by advertisement and correspondence.

The inadequacy of our existing law was thoroughly exposed in the convincing report of the Select

Committee of the House of Commons on Patent Medicines, published in 1914 and reproduced as a special supplement to THE LANCET of Jan. 10th, 1925. The Venereal Disease Act of 1917, which deals within its own limited scope with the very scandal which we are discussing, was not yet passed when that report appeared. Otherwise the legal position to-day stands much as it stood in 1914. The Dangerous Drugs Acts and the Pharmacy and Poisons Act, operated by the Home Office, hardly touch the particular problem. The Food and Drugs Act makes it an offence to sell an article under a label which contains a false description, but it goes out of its way to create a special exemption for a proprietary or patent medicine. Section 88 of the Larceny Act makes it a crime to obtain money by false pretences with intent to defraud; but the Assistant Director of Public Prosecutions had to explain to the Select Committee that charges under Section 88 were mostly useless because first it was generally impossible to prove wilful misstatement against the retailer, secondly, the defendant would probably produce witnesses who said the advertised drug had been beneficial to them, and thirdly, in grave cases (e.g., where drugs are sold to procure abortion) the victims of the fraud were not likely to come forward willingly. British law cannot prevent anybody from procuring any drug or advertising any mixture, whether potent or therapeutically valueless, provided it is not a poison or a narcotic, or a remedy for venereal disease, advertising it as a cure for any ailment, recommending it by bogus testimonials and the signed praise of fictitious physicians, and selling it under any name for any sum which a gullible public will pay. He may have to pay a small stamp duty, but even the Government stamp has been used to persuade the purchaser that it represents some kind of guarantee. Other countries have laws which take better care of their citizens. When Lord ASTOR introduced his Proprietary Medicines Bill in the House of Lords in 1920, he quoted the instance of an American, said to have made £60,000 by a campaign of selling in England a vibratory cure for various ailments, who, for just the same procedure in France, was sentenced in Paris to three years' imprisonment and was fined £120.

To return to the House of Commons, it would be imprudent as well as useless to scold at members; we want them to make amends some day soon. The recent Bill was unlucky in setting to sea on a Friday. Well as the private members in charge pleaded for it, it remained a private member's Bill. Gilbert's sentry sang of our legislators voting just as their leaders tell them to. There were no directions from above last Friday afternoon; it was nobody's business to "Keep a House"; the whips which cracked most invitingly were the whips at Aintree. The publication of the Select Committee's report unfortunately clashed with the World War in August, 1914. Mr. DUCKWORTH's excellent Bill unfortunately clashed with the Grand National in March, 1936. Let us not despair. The history of Parliament suggests that all reforms, great or small, take time. Perhaps

the Minister of Health will take Sir ARNOLD WILSON'S hint and introduce an official Bill. Or perhaps some medical officer will persuade one of our great municipalities to attempt legislation in advance of the backward standard of the rest of the country. Or perhaps again, since progress by catastrophe is a national habit, some pitiful tragedy of suffering and disillusionment will stir public opinion to put an end to this sinister union of falsehood and profiteering.

### CESTRIN, TUMOURS, AND THE PITUITARY

WE are now provided with fresh evidence on two current and important problems—the connexion between tumour growth and hormones, and the action of oestrin on the pituitary. This evidence suggests that (1) the female sex hormone, (2) the central gland of the endocrine system, and (3) the phenomenon of tumour growth must be thought of as closely related. The description by Drs. CRAMER and HORNING of the experimental production of pituitary tumours by oestrin, published in our issue of Feb. 1st, is this week followed by two papers in which Prof. B. ZONDEK and Prof. COLLIP and his colleagues record similar observations, all made independently.

Much investigation and speculation have been called forth by the recognition that oestrin is chemically related, though not intimately, to the carcinogens, and by the belief that substances with intense activity in promoting growth in certain tissues must bear some relation to the factors governing the growth of tumours. Oestrin has been found to be carcinogenic only in a special sense.<sup>1</sup> Unlike carcinogenic tars, or the synthetic carcinogenic hydrocarbons, it does not induce tumours at the site of application on the skin; the tissue which reacts to persistent overdosage is a tissue which possesses a specific physiological sensitiveness; and there must probably be an accessory activating factor. In LACASSAGNE'S experiments, and their repetition by CRAMER and HORNING, a race of mice was used with a high incidence of spontaneous mammary tumours in the females. Prolonged treatment with oestrin induces mammary development in the male, followed by growth of tumours, but, paradoxically, inhibits tumour development in the female. CRAMER and HORNING consider that either the female organism is able to destroy the excess of oestrin, or the carcinomatous response of the mammary epithelium depends on an indirect and not on a direct interaction between oestrin and the cells. The possibility immediately suggests itself that an indirect action might take place through the anterior pituitary, which is already established as an intermediary in some of the extrasexual effects of high doses of oestrin.<sup>2</sup> The influence of the pituitary hormones on tumours has been the subject of work carried out in Germany and America<sup>3</sup> which has shown conclusively the importance of this effect, but has not yet reached

the stage at which all the factors involved can be clearly distinguished. A group of American workers<sup>4</sup> claim to have observed an effect in the reverse direction in mice with spontaneous mammary tumours. These are associated with loss of gonadotropic activity of the pituitary and consequent atrophy of the gonads. The investigation of the direct oestrin-pituitary interrelation has made a striking advance with the latest observations of the effect of long-administered, large amounts of oestrin on the pituitary itself, and its bearing on the problem of malignant growths must now be worked out. CRAMER and HORNING found in three mice out of twelve a condition of hæmorrhagic chromophobe adenoma of the anterior lobe of the pituitary, and believe that they have produced experimentally the syndrome of Simmonds's disease. In the majority of the other animals the glands were macroscopically enlarged. The papers we publish this week record comparable observations in rats, but there are certain inconsistencies in the results which remain to be cleared up. Prof. ZONDEK observed simple increase in size of the pituitary only in male rats, whilst his single example of a pituitary tumour occurred in a female. On the other hand, Prof. COLLIP and his colleagues found enlargement of the pituitary, with occasional cavernous adenomata of the pituitary, in both males and castrated females, and refer to observations not published in detail showing that female rats are more susceptible to pituitary hypertrophy. It is to be hoped that systematic work will clear up discrepancies due to different experimental conditions. There is no doubt that these investigations are of first importance, for they will surely lead on the one hand to a better understanding of the ætiology of tumours, and on the other to a clearer view of the therapeutic possibilities and limitations of oestrin.

Attention may be directed to one point. It is only after isolation and chemical characterisation of the oestrogens and carcinogens that rapid advance has been possible with their biological investigation. The experimental pathologist must now ask the chemist to take on the admittedly harder job of clearing up the chemistry of the pituitary hormones.

### CANCER OF THE STOMACH

DOES early diagnosis of gastric carcinoma hold out any good hope of cure? Is a really early diagnosis possible? To these two questions physicians and surgeons in New York attempt an answer in a symposium published in the February issue of the *American Journal of Surgery*. The main points made by the contributors are that radiological methods have rendered accurate diagnosis fairly certain; that we must be prepared to suspect the disease on the appearance of such equivocal symptoms as "gastric consciousness" and abnormal tiredness after an ordinary day's work; that there are now a limited number of surgeons capable of performing gastric resection with a reasonably good chance of the patient's

<sup>1</sup> See THE LANCET, Feb. 8th, 1936, p. 324.

<sup>2</sup> Ibid., Jan. 4th, 1936, p. 7.

<sup>3</sup> Cf. a brief summary by H. Druckrey in Naunyn-Schmiedeberg's Arch. f. exp. Path. u. Pharmak., 1936, clxxx., 367.

<sup>4</sup> Allen, E., Diddle, A. W., Strong, L. C., Burford, T. H., and Gardner, W. U.: Amer. Jour. Cancer, 1935, xxv., 291.

surviving the operation; and that a few of the cases in which the growth is fungating (not infiltrating) stand a chance of five-year or ten-year cure.

Dr. JAMES EWING reports that a patient with one of the earliest gastric growths he has ever seen died of general abdominal carcinomatosis within sixteen months of gastric resection. What then are we to consider an "early carcinoma"? Dr. SEALE HARRIS quotes an opinion of McCARTY's that "no cancer in any part of the body is early if larger than a half a centimetre in diameter." In a cavity so big as the stomach there seems a poor chance of such a lesion being recognised. All the typical symptoms of cancer of the stomach are referable to ulceration, infection of the growth, or infiltration, causing obstruction of the lumen; and all these complications occur late. The idea that radiology will give earlier and earlier information is over-optimistic; but on the positive side Dr. GREGORY COLE points out that ulcerating lesions seen on the greater curvature are almost certainly neoplasms, never simple ulcers. An infiltrating growth attacks first the muscularis mucosa, and the effect of this is to straighten out the rugæ of the mucosa. The absence of rugæ is definitely recognisable in the barium-meal radiogram, and, combined with a localised obstruction of peristalsis and a lack of pliability of the stomach wall, has justified a diagnosis of cancer in cases in which the growth has caused no conspicuous deformity or obstruction of the cavity of the stomach. HARRIS assesses the value of the available laboratory tests, but finds none of any real help in the diagnosis; and the conclusion of the matter lies in the remark that a patient with stomach symptoms should ask not for a bottle of medicine but for an X ray examination. Abdominal discomfort rather than pain is generally held typical of early carcinoma; but, contrary to certain teaching, HARRIS considers that

periodicity of symptoms is not against the diagnosis. The pain he describes as being unrelated to meals but exaggerated by eating; and as usually occurring at night.

Figures are presented showing the results of treatment in 718 cases of cancer of the stomach in one hospital, of which 430 had an operation of one kind or another, most often merely exploratory or palliative. In 98 cases (13·6 per cent.) resection was carried out, and of these there were 65 in which the patient survived the operation. Ten were living without sign of recurrence after periods ranging from eight to forty-eight months; 9 were living at the end of five years; and 7 at the end of ten. The possibilities of radiotherapy are limited, partly by the inaccessibility of the organ, and partly by the fact that many gastric tumours are only slightly radiosensitive. T. PACK and ISABEL M. SCHARNAGEL, who report on this method of treatment, are not in favour of using it either as a prelude to operation or as a prophylactic against recurrence after resection. Of 60 patients regarded as inoperable who were treated either with radium, X rays, or both, 4 did really well and 6 were relieved to the extent of being able to resume work and enjoy life. The tumours occurring in the proximal half of the stomach are, it is stated, those most likely to be radio-sensitive; but they are also the least accessible to implantation of radium. A discussion at the end of the symposium raises the question whether more harm is done to the general cause of cancer cure by attempting operation and irradiation in advanced cases than would be done by allowing the patients to go home to die. It is suggested that deaths in hospital lead to prejudice against the treatment, and are not understood as being inevitable at the stage when the patient reaches the surgeon. This means that an important lesson is not learnt, and that more hopeful cases are deterred from seeking a remedy.

## ANNOTATIONS

### NEW STATUTES FOR OLD

MANY of the complaints against the bureaucracy of Whitehall arise from the confused state of a mass of laws for the creation and administration of social services—laws which involve interference with older ideas of individualism and which, while demanding the careful attention of the average citizen, are made more puzzling by indiscriminate and frequent amendment. The remedy is a periodical spring-cleaning of the statute book, and in this respect the Ministry of Health is to be praised for its activity. Having rewritten the poor-law enactments in 1927 and 1930 and the series of Local Government Acts in 1933, the Ministry has now produced the draft of a new code of public health which, when the Bill becomes an Act, will at last replace the Public Health Act of 1875 and its subsequent amendments. Not resting content with this achievement, the Ministry has also recently produced a Bill to consolidate the law of national health insurance (previously consolidated in 1924), another Bill to consolidate the law of widows', orphans', and old age contributory pensions (as yet hardly eleven years old), and yet another for the law

of housing (rewritten as recently as 1925). To these may be added two others, with which the Ministry is less immediately concerned—a consolidating Public Health (London) Bill, which is longer even than the proposed Public Health Bill for England outside London, and a Bill to consolidate the law of non-contributory old age pensions. These six Bills, all likely to be passed before the summer holidays, will place upon the statute book nearly nine hundred pages of tidy legislation. This tidying process is not an occasion for altering the nature of the law; alteration means controversy; a consolidation Bill enjoys exceptional facilities in passing through Parliament upon the condition that the new statutes merely replace the old. To attempt to introduce substantial amendments is to run the risk of wrecking the Bill. When it is safely placed upon the statute book, the task of amendment will be so much the easier. The changes made by the Local Government Act of 1929 could hardly have been formulated if the Poor Law Acts had not first been rewritten in simple and orderly form. The efforts of the Ministry of Health deserve the reward of success; they should inspire other departments to a like persistence in making plain the riddles of the law.

### THE RISKS OF BREECH DELIVERY

DURING the years 1913 to 1934 inclusive 30,655 patients were delivered on the house service of the Boston Lying-in Hospital, Massachusetts, and of these 1219 were delivered, through the pelvis, of 1242 infants by the primary breech mechanism. Dr. Thomas R. Goethals<sup>1</sup> has used this extensive material for an inquiry into the risk to the infant in breech delivery, which, it will be observed, occurred in a fraction under 4 per cent. of all patients. Of the 1242 infants thus delivered 922, or 74.3 per cent., left the hospital alive, 13.1 per cent. were stillborn, and 12.6 per cent. died in the neonatal period. Comparable percentages for all deliveries over 1924-34 were 6.2 stillbirths and 2.2 neonatal deaths, and this shows the big increase in risk to which the infant is exposed by the circumstance of breech delivery. A part of this high mortality is due to the fact that in over a fifth of the breech deliveries either the pregnancy was pathological—with such complications as pre-eclamptic toxæmia, eclampsia, nephritis, syphilis, or diabetes—or labour was complicated by such conditions as placenta prævia, ablatio placenta, or prolapse of the cord. The total mortality (stillbirths plus neonatal deaths) was in these cases as high as 52 per cent. compared with 18.5 per cent. in the uncomplicated breech deliveries. It might be argued that the risk of breech delivery per se should be assessed only from cases in which labour is uncomplicated, but it should be borne in mind that this series shows the incidence of placenta prævia, ablatio placenta, and prolapse of the cord to be respectively three, five, and five times as frequently associated with breech presentation as with all types of delivery. When from the uncomplicated breech deliveries those cases are excluded which resulted in the birth of macerated and grossly malformed infants and the remainder are taken as a standard for uncomplicated breech delivery, the total mortality was 13.6 per cent., this figure being derived from a rate of 53.6 per cent. for the premature, 10 per cent. for the immature, and 6.9 per cent. for mature infants. This last figure of 6.9 per cent.—based upon 691 deliveries—Goethals takes to represent “the risk to the living, undeformed, full term infant *in utero* who is destined to be born by pelvic breech delivery in the absence of pathological pregnancy on the part of the mother, and of hæmorrhagia and other accidents of labor due to abnormalities of the placenta or of the umbilical cord.” Prematurity was relatively common and contributed considerably to the mortality. Goethals takes the birth weight to the best standard and classifies an infant weighing less than 5 pounds at birth as premature, one weighing between 5 and 6 pounds as immature, and one weighing over 6 pounds as mature. In this classification approximately 20 per cent. of the breech deliveries were of premature infants, a figure which is more than three times as high as the 6 per cent. incidence of prematurity in the hospital deliveries at large. In mortality the breech deliveries did not differ from the general series until a weight of about 3 pounds is reached, but above that weight the breech deliveries suffer a substantially higher death-rate. In the breech-delivered the mortality is lowest with infants of 7½–8 pounds birth weight, and rises steeply on either side to 100 per cent. for infants of under 2 pounds, and to 33 per cent. for those over 10 pounds, the mortality of the latter being frequently due to maceration, malformation,

or to intercurrent causes rather than to an increased risk from mechanical causes.

Dr. Goethals can take satisfaction in concluding his statistical survey from the fact that in this series the mortality-rate among mature infants born by breech delivery has declined very substantially over the years of his review. His figures are set out clearly and fully and should prove helpful both in themselves and as a standard for comparison.

### JHIN JHINIA

THE *Indian Medical Gazette* for February publishes a lively account of a new “disease” which appeared last Christmas in Calcutta. There was one constant symptom—namely, a tingling sensation in the sole of one or both feet, usually in the big toe. This symptom—*jhin-jhin* in Bengali means tingling—gave the disease its name. Other symptoms were a feeling of pressure in the head with or without headache and a violent trembling of the whole body. The appearance of trembling was often delayed till treatment had been administered. According to local tradition, the disease was caused by a perverse tendency of the blood to desert the extremities and to fly to the head. The object of treatment was to reverse this process. The patient, male, or more often female, was accordingly tied to a post to prevent her lying down, and cold water was then poured over the head. Pneumonia was an occasionally fatal complication of the illness or, possibly, a sequela of treatment. Other grave sequelæ were meningitis, apoplexy, and fractured skull. The disease spread rapidly and seemed usually to attack persons in crowded places. Though it was sometimes misdiagnosed as encephalitis, meningitis, or Landry's ascending paralysis, complete investigation of cases admitted to the large hospitals in Calcutta revealed no organic lesions. The condition is therefore almost certainly a neuromimesis probably the result of mass suggestion among an illiterate populace. Opportunist “healers” were not slow to exploit the possibilities of the situation, and quack remedies and prophylactics found a ready sale. Local practitioners and health authorities are blamed, perhaps unfairly, for taking too serious a view of the “epidemic” in its early stages and the scare-mongering press for adding fuel to the fire. One peaceable citizen of Calcutta was seized by four men who accused him of having *jhin-jhinia*, soused him under a tap and departed with his wallet containing a hundred rupees. It seems a heavy price to pay for advice unsought.

### FILARIAL MIGRATION IN THE MOSQUITO

AT a laboratory meeting of the Royal Society of Tropical Medicine and Hygiene held at the Royal Army Medical College, Millbank, on March 19th, there was set out a series of microscope slides and photomicrographs prepared by Prof. F. W. O'Connor and Mr. Harry Beatty in the laboratory of Dr. James Knott, chief medical officer in the Virgin Islands. They illustrated what is believed to be a new observation regarding the behaviour of the larvæ of *Wuchereria bancrofti* in the mosquito *Culex fatigans*. It has been held hitherto that these larvæ force their way through the wall of the posterior, or saccular, part of the mid-gut (usually called the stomach) which lies in the abdomen of the mosquito, and that from there they make their way forward to the thoracic muscles where they undergo that development which is necessary before they again become infective for man. In these new investigations this was the

<sup>1</sup> Surg., Gyn., and Obst., March, 1936, p. 525.

behaviour of the larvæ for the first ten hours after the infective blood feed. But at the end of that interval they began to collect at the anterior end of the stomach, and shortly afterwards they passed into the anterior cylindrical portion of the mid-gut. Their forward transport went on, partly at least as the result of reversed peristalsis, till they were first distributed over the whole of this cylinder, and later, by the end of sixteen hours after the infective feed, had collected together to form a writhing mass just behind the valve which stops progress into the fore-gut. In one of the slides which was set out could be seen the first of two larvæ which was surprised in the act of forcing a passage through the wall of this anterior portion of the mid-gut into the thorax.

In another series of experiments O'Connor had shut up fed mosquitoes in glass boxes built up of microscope slides held together with plasticine, one mosquito being put into each box. The boxes were afterwards dismantled and the collected droppings examined. They showed a few healthy and dead microfilariae and their sheaths. But if these larger objects can be passed by mosquitoes, there is little doubt that blood corpuscles and plasma are passed much more freely. Moreover it is the case with blood-suckers so different as fleas and hookworms that passage of blood elements begins while the feed is still going on, so that it is reasonable to suggest that it may be found to do so in these mosquitoes if they are allowed to go on feeding undisturbed. In such conditions the number of microfilariae which a mosquito will swallow and retain at one feed will be larger than the number of them contained in that quantity of blood which will fill its stomach once, and this quantity will not measure the degree of infection which the insect risks. O'Connor's investigations continue to shed needed light on filarial infection and to show that each fresh advance brings into view fresh problems calling for solution.

### HYSTEROSCOPY

THE technique and possibilities of hysteroscopy are described in an interesting paper<sup>1</sup> by Prof. Hamant and Dr. Durand. The first account of this procedure was given by Aubinais in 1864 and since that time various methods have been proposed though they have usually been received with little enthusiasm. Hamant recommends the use of the instrument designed by de Segond, which, in principle, is constructed like the urethroscope. Contra-indications to hysteroscopy are few and obvious; the operation should not be attempted when there is inflammation in the pelvis, pregnancy, or profuse uterine bleeding. It may be done under general or local anæsthesia, and with the patient in the lithotomy position a full aseptic technique is used. Sterile water is used to wash out the uterus and endoscopy is performed when the uterine cavity is distended by a pressure of about 650 mm. of water. The work of Schroeder has shown that water does not pass from the uterus to the Fallopian tubes at a pressure of 950 mm. of water, or 40-45 mm. of mercury. Hamant advises that the usual biopsy should always accompany hysteroscopy. That the method has considerable value as an aid to diagnosis is proved beyond dispute by his excellent illustrations. Whereas the curette is very useful as an aid to diagnosis, no one will deny that this instrument can fail upon occasion to

detect a small malignant ulcer, or to remove a small fragment of chorionic tissue or even a large endometrial polyp.

### PROBLEMS OF THE FAMILY

MUCH attention has been devoted to population problems in recent years. In a special memorandum (No. 40) published by the London and Cambridge Economic Service,<sup>1</sup> Dr. Enid Charles furnishes us with three estimates of the future size of our population depending upon three hypotheses: (1) that fertility- and mortality-rates from 1935 onwards will continue to be the same as they were in 1933, this being the most recent year for which the necessary data are available; (2) that the fall in fertility- and mortality-rates which has occurred in recent years will be continued into the future; and (3) that fertility-rates will rise to the level of 1931 (i.e., roughly 10 per cent. higher than in 1933), while mortality continues to fall. While it is unlikely that the actual movement of our population will coincide exactly with any of these three estimates, it is probable that the second will be most closely realised by future events. What then would be the effect upon our population if recent trends of birth- and death-rates were to be continued into the future? Briefly, the population will reach a maximum of about 41 million in the year 1940, after which it will begin to shrink. The decline will, at first, be slow. By the year 1950 the population would be but little smaller than it is to-day, but the age composition would be very different. There would be relatively more old people and fewer children. By the year 1965, a generation hence, the population would have fallen to 36 millions; by 1975 to 31 millions; and by the year 2000 to 17 millions. The decline would gain momentum each year, and a hundred years hence, in the year 2035, the population would have dwindled to about 4½ millions—a figure rather smaller than the present population of Greater London. In the last year the trends of previous years have been slightly reversed. The birth-rate has gone up by a fraction of a point in response, it is supposed, to an increased marriage-rate fostered by the recent improvement in economic conditions. What is the birth-rate going to do in the next few years? At its present level, it appears to have fallen to about 75 per cent. of replacement rate. Dr. Charles calculates that the net reproduction rate for 1933 is 0.734; if this rate continues below unity, we are confronted with an inevitable decline in the population. What are the prospects of its being raised?

The figures in Dr. Charles's numerous tables and the direction of the curves on her carefully prepared charts depend upon intimate events occurring within the family. A comprehensive and detailed study of these changes was published in 1934 by Prof. K. Folsom<sup>2</sup> in a book which, in his words, "attempts to weave cultural anthropology, individual psychology, social psychology, history, sociology, economics, and psychiatry into a unitary *science of the family*." In this ambitious scheme the family unit is examined from every standpoint and the conclusion is reached that its future evolution will be determined by two major groups of cultural changes. These are our mechanical inventions whose general social effect is increased machinery, urbanisation, and higher material

<sup>1</sup> Obtainable from the London School of Economics, Houghton-street, Aldwych, W.C.

<sup>2</sup> *The Family—its Sociology and Social Psychiatry*. By Joseph Kirk Folsom, Professor of Sociology, Vassar College. New York: John Wiley and Sons; London: Chapman and Hall. Pp. 604. 25s.

<sup>1</sup> Hamant, A., and Durand, E.: *Rev. franç. de gyn. et d'obst.*, January, 1936, p. 1.



standards of living, and our discoveries in biological and psychological sciences which, by displacing the theology of the Victorian era, have led to an unprecedented individuation of the personality. Folsom prophesies that, in the comparatively near future, reproduction will, in civilised countries, come to be completely and universally controlled. The solution of the other problems associated with the future of the family, however, will depend upon our cultural ideology, upon the possibility of international peace and of economic stability. Civilised countries may evolve in the direction of liberalism, which places its highest value upon the development of the individual personality; or it may take what he calls an anti-liberal direction as it has done in Japan and in those European countries which have adopted fascism. He is optimistic about the future of the family if liberalism finally prevails, as he hopes it will. Chapters follow on the cultural history and geography of the family, the effect on it of social change and family mass readjustments, and individual adjustments as they affect family problems. Perhaps the most interesting part of the book is the analysis of how the four essential problems relating to the control of reproduction, the economic foundation of the family, the mate-to-mate relationship, and the parent-to-child relationship are resolved in the cultural organisations of different races and countries.

#### PAIN IN PSYCHOPATHOLOGICAL CONDITIONS

PHYSICAL pain is like fear in that many of us have felt it only in its milder forms, and, if we are doctors, learn to contemplate it in others with a detachment that would be callous if it was not associated with confidence of our ability at least to relieve it by anodynes if not to cure it. We are apt, moreover, to think of physical pain as a relatively simple matter of sensations and nerve tracts which can be understood on physical lines. The psychogenic production of pain and the varying sensitivity to it in different individuals, or in different states of mind in the same individual, are among the many interesting aspects of the subject on which Dr. Macdonald Critchley touched in the twenty-fourth Long Fox memorial lecture.<sup>1</sup> It is evident from his exposition that the questions raised by pain are complex and bring up fundamental issues in psychopathology. As he points out, the disputes as to the "reality" of psychogenic pain are usually sterile exercises in casuistry, but the elucidation of the mechanism of such pain is none the less a necessary task. Dr. Critchley mentions a patient with causalgia, repeatedly and fruitlessly mutilated by the surgeons, even to chordotomy, who might well serve as an object lesson in the need for further study of the neurological and psychological basis of pain. It is curious that suicide is seldom resorted to as an escape from continual pain. Dr. Critchley remarks on a fact which is the converse of this—viz., that depressed people, in whom suicide is frequent, often show striking indifference to pain. It is, however, difficult to be sure whether this apparent indifference is not a stoicism that masks a perception as acute as that of more normally demonstrative people. There are many ways of reacting to pain, as J. D. Achelis<sup>2</sup> has pointed out. The depressive with his ideas of self-reproach may bear without complaint, may even welcome, bodily pains: many such patients say how gladly they would exchange their mental torment for some corporeal distress. Some of them

also have morbid proclivities, often masochistic in nature, which influence their conduct. The behaviour of depressive patients, especially when operations or painful dressings are necessary, does not bear out the view that their sensitivity to pain is lowered, even though the unpleasantness of the affect accompanying the pain is swallowed up in their larger misery. The interesting researches of H. Piéron<sup>3</sup> bear on this point. J. Schröder,<sup>4</sup> moreover, reported instances of manic-depressive psychoses in which pain played a large part. It is not necessary that pain should be consciously experienced whenever it is acutely felt. Thus in alcoholics, with deep clouding of consciousness, L. Bender and P. Schilder<sup>5</sup> have observed an increased sensitivity to pain, so that they conclude (paradoxically) that the somatic apparatus of consciousness has a protecting influence against pain: when consciousness is clouded and cortical activity greatly lessened, pain seems to sweep over the whole body instead of being localised. It would be an advance of great profit to psychiatry as well as to neurology if the nexus between cortex and sub-cortical centres, especially thalamus, could be further elucidated in its psychological implications, such as this problem of pain.

#### MORE TUMOURS OF THE ISLETS OF LANGERHANS

FIVE cases of severe spontaneous hypoglycaemia came under the care of the Neurological Institute in New York within 16 months, and in all of them tumours of the pancreatic islets were found and removed and the patients restored to health. The physicians concerned have reported them at length.<sup>6</sup> The clinical picture is distinctive and ought to be recognisable by a doctor of average experience who has read about it and not forgotten what he has read. The patients were adults, suffering for months or years from paroxysmal attacks of mental and physical disturbance lasting hours or even days. They sometimes became unconscious, often just confused, restless, irritable, or negativistic; they showed superfluous movements, tic-like, semi-purposeful, or bizarre; and objective neurological signs such as diplopia, nystagmus, and extensor plantar responses were sometimes noted. Profuse sweating characterised them all. Attacks often came on when the patient was fasting, and were alleviated by taking of food. Blood-sugar levels between 30 and 50 mg. per 100 c.cm. were usually found, and intravenous glucose gave temporary relief. While it seems clear that the symptoms are due to an excess of insulin activity, their mechanism is still obscure. The relation between blood-sugar level and cerebral disturbance is by no means constant, either from patient to patient, or from time to time in a given patient, and it is difficult to understand why the attacks should be paroxysmal with long intervals of comparative freedom.

The surgeons have also published their account of these cases,<sup>7</sup> prefaced by an admirably concise historical review. They find now 31 recorded examples of spontaneous hypoglycaemia with pancreatic tumours, nearly always adenomata and only rarely carcinomata of the islets. They also find 18 cases where an expected tumour was not found,

<sup>1</sup> Rev. gén. des sciences, 1923, xxxiv., 365.

<sup>2</sup> Zentralbl. f. Nervenhilf. u. Psych., 1907, xxx., 933.

<sup>3</sup> Arch. Neurol. and Psychiat., 1933, xxix., 990.

<sup>4</sup> Feinier, L., Soltz, S. E., and Hann, P.: Bull. Neurol. Inst. New York, 1935, iv., 310.

<sup>5</sup> Whipple, A. O., and Frantz, V. K.: Ann. of Surg., 1935, cl., 1299.

<sup>1</sup> Bristol Medico-Chir. Journal, 1935, lii., 191.

<sup>2</sup> Zeits. f. Psychol., 1924, lvi., 31.

and on the other hand 31 cases of such tumours found incidentally post mortem in the absence of suggestive symptoms. Some useful recommendations are made as to procedure in suspected cases. The diagnosis should be made in the first place from the history and the demonstration of hypoglycæmia; if it is supported by the occurrence of symptoms during 24 hours' starvation and their relief with intravenous glucose, then operation is advised. Spinal anæsthesia, a transverse incision, and complete exposure of the pancreas are recommended. The tumour is likely to be a purplish nodule half an inch or less in diameter, on the anterior or the posterior aspect of the pancreas, and there may be two of them. Body and tail are commoner sites than the head. Shelling out the tumour is usually easy, but if no tumour is found excision of two-thirds of the pancreas is to be undertaken, and that is naturally more difficult. Tying the splenic artery and removing the spleen as well may facilitate it. This large partial pancreatectomy has relieved symptoms in some recent cases, but even the most eager surgeon will still welcome the finding of one or two well-defined adenomata, and the almost certain prospect of cure that their removal will bring. It may be that these cases are commoner than we think; it rests with the general practitioner and the physician to recognise them and give them the chance to be treated.

#### DIAGNOSIS AND PROGNOSIS IN POLIOMYELITIS

RECENT outbreaks of poliomyelitis in Denmark have led to some interesting studies of this disease by the Danes, whose public health administration is singularly well fitted for the task. Dr. N. I. Nissen<sup>2</sup> gives an account of 132 cases of poliomyelitis treated in the Blegdam Fever Hospital of Copenhagen during 1934. During the latter half of that year no fewer than 316 patients were admitted to the hospital with the diagnosis or query of acute anterior poliomyelitis, but only in 113 of them could this diagnosis be maintained. It is obvious from these figures that it is very difficult to distinguish early poliomyelitis from the many other ailments which may simulate it. In as many as 56 of Nissen's cases the diagnosis was reduced to angina faucium, and this was the final diagnosis in another group of 66 patients, although there was a suspicion of spinal rigidity in the clinical picture. In 21 cases the diagnosis was reduced to that of acute gastro-enteritis, while 16 patients were found to be suffering from influenza with conspicuous catarrhal symptoms, and 10 from pneumonia. Various other diseases such as arthritis, tuberculous meningitis, and bronchitis masqueraded in the early stages as poliomyelitis. No wonder, therefore, that Nissen writes: "Often it has been very difficult, and sometimes altogether impossible, to make the differential diagnosis between mild and abortive cases of poliomyelitis and, in particular, the numerous mild cases of angina and fever that are admitted here to the Blegdam Hospital throughout the year." It has been found that in Denmark, as in several other countries, there has been a definite and regular upward shift in the age-distribution of the disease. No similar shift in the age-distribution of diphtheria, scarlatina, measles, and influenza has been observed during the past fifteen years, and Dr. Nissen is at a loss to account for it. With regard to the prognosis in cases in which paralyses have not yet occurred, he has sought by a statistical analysis to discover signs which would enable the clinician to forecast the subsequent course. Though

he can find no one sign or symptom of uniformly reliable prognostic value, he has come to the conclusion that paralyses are most probable when the illness is characterised early by drowsiness, restlessness, shivering, tremor, excessive sweating, and muscular tenderness. It is also of bad omen when the disease runs a diphasic course—i.e., one with a distinct primary febrile reaction followed by a symptom-free latent period which in its turn gives place to meningeal signs.

#### ADDENDUM TO THE B.P 1932

THE General Medical Council, on the recommendation of the British Pharmacopœia Commission, have arranged for the publication during the present year of an addendum to the British Pharmacopœia of 1932. General revision has led to several alterations in detail of description and method, and in addition the addendum will contain monographs on numerous new remedies introduced during the last four years. In order that the addendum may have the advantage of public criticism before it is officially adopted, the principal recommendations and emendations suggested by the various committees in charge of revision are now being circulated in pamphlet form. The clinical committee regrets that the law of patents has prevented the inclusion of certain drugs, and this no doubt explains the omission of such substances as the organic mercurial diuretics. Among the more important drugs recommended for description are liquor iodi aquosus ("Lugol's iodine"), oleum iodisatum, argentoproteinum, sodii thiosulphas, tryparsamidum, histaminæ phosphas acidus and ergometrina. Five new antitoxic sera are included—namely, gas gangrene (œdematiens), gas gangrene (vibrio septique), staphylococcal and pneumococcal (Types I. and II.). Calciferol (vitamin D) is to replace irradiated ergosterol, and ascorbic acid (vitamin C) is described. A standardised preparation of vitamin B<sub>1</sub> is to be included. The pamphlet merits careful perusal by all interested in pharmacology or therapeutics.

#### CONSTITUTION AND DISEASE

Two further studies on constitution in relation to disease have lately been published by Prof. Raymond Pearl and his colleagues working in the department of biology of the School of Hygiene and Public Health, Johns Hopkins University. The first comprises a statistical analysis by Antonio Ciocco of data concerning 126 white women with heart disease<sup>1</sup> and is a sequel to Pearl and Ciocco's analogous study on white men.<sup>2</sup> As a comparative group the author takes 37 female patients (a regrettably small number) who at the time of their examination gave no clinical evidence of cardiac disease. The general conclusion that can be drawn from his data is that as a group the women with heart disease are characterised by greater body-weight associated with greater chest and especially greater umbilicus girths. It will be recalled that the same feature was observed in the earlier study on men. In stature and correlated vertical dimensions the "cardiacs" and "non-cardiacs" show no material differences. A higher proportion of the cardiacs are classified as pyknics and a lower proportion as asthenics, but their superiority over the non-cardiacs in weight and correlated horizontal dimensions appears to be independent of somatic type, since in each group, pyknic, intermediate, and asthenic, the cardiacs have the higher average weight and chest girth. In their earlier study on males

<sup>1</sup> Acta med. Scand., 1936, vol. lxxxviii., Fasc. I.

<sup>2</sup> Human Biology, February, 1936, p. 38.  
<sup>3</sup> Ibid., 1934, vi., 650; see THE LANCET, 1935, i., 242.

Pearl and Ciocco suggested that the differences might be a consequence of relative over-eating and lack of physical exercise. Ciocco has tried to gain information on this point by questioning the women about appetite and regularity of bowel movement. The proportions of cardiac and non-cardiac patients who admit eating heartily, average, or sparingly do not differ, but a higher proportion of the cardiacs complain of irregular bowel movements or chronic constipation. These two facts taken in conjunction strengthen the hypothesis. Ciocco suggests, that the accumulation of fat in the cardiacs may be in part the effect of dietary habits not in keeping with their physical activity. Clearly there is no proof that this relative overweight is an aetiological factor in heart disease, but it is of some interest in view of the beneficial effect in some cases of restricted diet and consequent reduction of weight. In addition to the detailed statistical analysis of his two groups, Ciocco includes anthropometric measurements of women with various diseases taken from several published sources, which may prove useful to workers in this field.

The second study,<sup>3</sup> by Raymond Pearl, Marjorie Gooch, John R. Miner, and Walter Freeman, is a continuation of the author's earlier work on the relation of the endocrine organs to mental disease.<sup>4</sup> The object of the present analysis is to determine whether the endocrine organ weights individually, or the general endocrine system pattern, are differentiated quantitatively in the asthenic, intermediate, and pyknic body types, with a fourth group made up of individuals not falling precisely into these so-called "pure" types, labelled dysplastics, and of somewhat doubtful content. All measurements were, it will be remembered, taken at autopsy. As would be expected, there is a clear tendency for the average weight of the endocrine organs to increase as we pass from asthenics to intermediates and to pyknics. As the average body-weight increases from habitus group to group the average weight of all the endocrine organs tends also to increase. Does the latter increase when body-weight is taken into account, or put in other words, do the pyknics, on the average, carry a greater or smaller dosage of endocrine organ tissue than do the asthenics per kilogramme of total body-weight? The authors' answer to this question is quite definite. Uniformly in each of their groups (males, females, white, and negro) they find that the average quantitative dosage of endocrine organ tissue per kilogramme of body-weight is greatest in asthenics, less in intermediates, and least in pyknics so far as concerns adrenals, thyroid, parathyroids, hypophysis, epiphysis, and gonads, while in the relative dosage of thymus tissue the order is reversed, being least in asthenics, greater in intermediates, and greatest in pyknics. The differences between the two extreme types, asthenic and pyknic, are generally large in amount and thus reveal an interesting association between the quantitative endocrine system on the one hand and the bodily habitus types on the other.

### ILLICIT TRAFFIC IN NARCOTIC DRUGS

VALUABLE evidence of the extent of illicit manufacture and traffic in narcotic drugs is furnished by a report to the League of Nations by the Secretariat. The report summarises the amounts of the various drugs seized in each country during 1934 as well as details of seizures and the discovery of clandestine manufactories during the latter part of 1935. The

total seizures of raw opium in 1934 exceeded 34,170 kilogrammes, the largest amounts being in French Indo-China, Soviet Russia, and Burma; 8064 kg. of prepared opium were seized, more than half having been found in the Netherlands; 236 kg. of morphine were confiscated, Turkey, China, and Egypt yielding the chief contributions. Nearly 500 kg. of heroin were seized largely in Shanghai and Hong-Kong. Of cocaine some 117 kg. were seized, Burma and the International Settlements of China reporting the highest figures. It was in the last-named area in Shanghai that four clandestine factories were unearthed. The culprits, who were Chinese nationals, were prosecuted and fined or imprisoned, or both, the heaviest sentence being two years imprisonment and a fine of 300 Shanghai dollars. So far as information is furnished for the year 1935 it would appear that the amount of illicit traffic, as judged by seizures made, was less than was the case in 1934.

### A FINAL LECTURE

Mr. H. A. T. Fairbank, in giving his final lecture last week as senior orthopaedic surgeon to King's College Hospital, chose to speak impromptu on some general diseases of the skeleton. It was the kind of lecture that students do not often get; they are supposed by examiners to know about developmental errors many of which they do not get a chance of seeing. Mr. Fairbank circulated a list of over sixty such conditions, although he dealt in his address with only a few of the more common ones. The lecture was illustrated by lantern slides, and at its conclusion the lecturer was presented with a silver replica of the splint which bears his name. More than this, the theatre was decorated with streamers, and to reach it Mr. Fairbank was compelled to walk through a triumphal arch of human bones and splints.

THE King has consented to become patron of the Royal Medical Benevolent Fund.

THE second International Congress for the Protection of Infancy will be held in Rome in the early part of October, immediately following the sessions of the fourth International Paediatric Congress.

WITH the death of Sir JOSEPH PETAVAL at the age of 62 years we lose a physicist of singular practical acumen. Sometime professor of engineering in Manchester University and director of the Whitworth Laboratories, in 1919 he succeeded the late Sir Richard Glazebrook as director of the National Physical Laboratory at Teddington. His contribution to aeronautical research was outstanding. He was an original member of the National Radium Commission.

THE Medical Research Council have appointed Sir Patrick Laidlaw, F.R.C.P., F.R.S., to be deputy director of the National Institute for Medical Research, and head of the department of pathology and bacteriology there, in succession to the late Captain S. R. Douglas, F.R.S. Sir Patrick has been a member of the council's scientific staff at the National Institute since 1922. He has latterly been engaged chiefly in the investigation of diseases due to ultramicroscopic viruses. His success as leader of the team of workers who solved the problem of securing immunisation of dogs against distemper and subsequently discovered the virus of epidemic influenza will be fresh within the recollection of our readers.

<sup>3</sup> Human Biology, February, 1936, p. 92.

<sup>4</sup> *Ibid.*, 1935, vii., 350 and 355; THE LANCET, Feb. 1st, 1936, p. 271.

## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

XCV.

### PROGNOSIS OF ACUTE POISONING

IN Great Britain and the United States of America carbon monoxide outnumbers all the other poisons combined as a cause of fatal acute poisoning. The great relative frequency and gaseous nature of this poison entitle it to primary and separate consideration. The other common poisons causing dangerous poisoning in civil life are all liquids or solids.

#### Carbon Monoxide

Most fatal cases of carbon monoxide poisoning are suicidal, but this insidious gas claims many victims as the result of accidental inhalation. Its common sources are illuminating gas, exhaust gases from motors, and coal gas from stoves and fires. Carbon monoxide is poisonous because it combines with the hæmoglobin of the blood to the exclusion of oxygen. Otherwise it is physiologically inert. The gassed patient suffers simply from anoxæmia, and his state of oxygen-lack may be as severe as that of blue-black victims of obstructive asphyxia. The bright complexion of these patients is deceptive, being due to the red colour of carboxy-hæmoglobin.

There is no question as to the lethal quality of carbon monoxide and many men or women exposed to it are dead when discovered. On the other hand, many are only slightly or moderately poisoned and soon recover when removed from the contaminated atmosphere. Interest in regard to prognosis centres on the intermediate group of cases which are dangerously poisoned and whose lives hang in the balance. These are easily recognised because they are always unconscious or on the verge of coma—i.e., collapsed and stuporose. The inexperienced observer may be misled by their appearance which is by no means alarming. Not only is the colour good, but the breathing, owing to anoxic depression of the respiratory centre, is unobtrusive. The picture of a pink, quietly breathing, and apparently slumbering patient may well deceive the observer with tragic consequences. If a gassed patient cannot be roused his life is in jeopardy; without prompt treatment many such patients die.

The immediate prognosis in serious carbon monoxide poisoning has been radically changed since the introduction in 1922 by Henderson and Haggard of the carbon dioxide-oxygen method of treatment. It is now almost true to say that no case, however deeply gassed, discovered alive and efficiently treated will die. The treatment consists in the continuous administration, by means of a mask and bag, of a mixture of 7 per cent. of carbon dioxide and 93 per cent. oxygen. In patients whose breathing is greatly depressed the administration is started with artificial respiration by the Schäfer prone-pressure method. The powerful stimulus of the carbon dioxide to the respiratory centre soon causes a remarkable increase in breathing, and this combined with the inhalation of oxygen in place of air very greatly speeds up the displacement of carbon monoxide from the blood by oxygen.

Most patients recover consciousness within an hour under the carbon dioxide-oxygen treatment, but those who are very gravely ill may remain unconscious for days. Such prolonged unconsciousness is not due to poisoning, since little carbon monoxide remains in

the blood after an hour's hyperventilation with oxygen. The continuous coma is due to damage done to the nervous system by the profound anoxia before treatment was begun. Treatment must always be prolonged until normal breathing is not only established but sustained. Furthermore, all victims must be carefully watched for many hours after cessation of treatment as respiratory depression may return and the patient may relapse; in fact there may be recurrent relapses, any one of which may prove fatal if the patient is left unattended.

Very few patients after recovery of consciousness experience anything worse than a few days of malaise with headache, dizziness, and nausea. In an extremely small proportion the acute poisoning is followed immediately or in one to three weeks by mental or nervous sequelæ. The commonest mental sequela is a confusional psychosis; the commonest nervous sequela is a parkinsonian condition.

#### Swallowed Poisons

According to the annual statistical reviews of England and Wales by the Registrar-General deaths from swallowed poisons are due, in order of frequency, to the following agents: phenol and phenolic disinfectants; corrosive acids and alkalis; prussic acid and cyanides; oxalic acid and oxalates; various narcotic and analgesic drugs—opium derivatives, barbiturates, and aspirin; strychnine and nux vomica; arsenic; mercury salts; phosphorus; atropine and belladonna.

The prognosis in acute poisoning by any of these poisons must mainly depend upon the nature of the poison and the amount of it which has been ingested and retained. Academic discussion of the relative toxicities and lethal doses of these poisons is likely to be of little service to the practitioner confronted only very rarely with a case of poisoning. Such infrequently used data eludes the memory in an emergency. Moreover, such considerations neglect the fact that in practice one does not often know precisely what the patient has taken or how much of it. Patients who have taken sub-lethal doses will recover; the important practical point is whether or not a particular person who has *probably* swallowed a lethal dose of poison can or cannot be saved. His chances of survival depend upon the possibilities of: (a) removal or neutralisation of the poison; (b) counteraction of such effects of it as are immediately endangering life.

#### REMOVAL OR NEUTRALISATION OF THE POISON

The possibility of removal of the poison must be greatly influenced by the time which has elapsed before the case is seen. The hope for the patient varies inversely with the delay in beginning treatment. But even if many hours have elapsed eliminative treatment should not be neglected. Gastric lavage is the method of choice, except in the corrosive cases, and properly performed is most effective. If the patient is seen within an hour or two the thoroughness with which the stomach is washed out is the chief factor in the prognosis so far as treatment is concerned. Two gallons of water should be used, a pint at a time being run into the stomach. Such thoroughness is almost impossible unless the patient is placed in a proper position—i.e., with the mouth and pharynx on a lower level than the larynx and trachea—so that fluid regurgitated around the stomach-tube does

not enter the air-passages. This point, of paramount importance, does not appear to be mentioned in most text-books. Attempts to carry out a stomach wash-out with the patient in an unsuitable position (lying on the back or sitting up) lead in conscious cases to great distress and coughing and spluttering, while in comatose cases with absent cough reflexes immediate death from drowning or later death from broncho-pneumonia may result. Many an unconscious patient must have been killed in this way who might have survived had nothing at all been done to him. The most convenient suitable position of the patient for general use is lying *prone* upon a couch, bed, or table with the head, supported by an assistant, projecting over its end, the face directed and bent towards a bucket on the floor. The operator sits or kneels on the floor while passing the tube. Prolonged lavage with the patient in this position is an easy and safe procedure.

The only swallowed poisons for which gastric lavage is contra-indicated are the corrosive acids and alkalis (sulphuric, nitric, and hydrochloric acids, and caustic soda, caustic potash, and strong ammonia). The phenolic disinfectants and oxalic acid are corrosive, but not sufficiently so to preclude lavage. The corrosives should be neutralised by the administration of weak alkalis or acids. In my opinion the only condition in which neutralising antidotes are of much practical importance is when they are used against corrosives. With other swallowed poisons thorough mechanical removal by lavage is of much more value than is any attempt to render the poison inert.

#### COUNTERACTION OF IMMEDIATE DANGERS TO LIFE

There are only five common modes or mechanisms by which life is primarily endangered in acute poisoning: (1) asphyxia; (2) depression of the central nervous system—i.e., coma; (3) dehydration and de-

chloridation; (4) pain and shock; (5) excitation of the nervous system—i.e., violent delirium or convulsions.

The omission of circulatory failure from this list demands some explanation. Very few poisons seriously injure the circulatory system as a primary effect. Circulatory failure may be the almost invariable final mode of death, but it is secondary to one or more of the above-named effects.

From the point of view of prognosis it is fortunate that these five dangerous conditions are easy not only to diagnose but to treat. *Asphyxia* is effectively treated by clearing the patient's air-way, doing artificial respiration, and the giving of oxygen and/or carbon dioxide. *Toxic coma* is not quite so easily controlled, but luckily its seriousness is often largely due to coexistent asphyxia from respiratory obstruction or depression. The administration of strychnine and coramine in really large doses (i.e., strychnine grain  $\frac{1}{2}$  and coramine 5–15 c.cm.), repeated as often as once every hour, is very valuable in deep coma; so also is repeated lumbar puncture as advised by Willcox and Purves-Stewart. *Dehydration and dechloridation* from vomiting and diarrhoea is the lethal factor in cases of poisoning by the gastrointestinal irritants. Continuous intravenous drip saline therapy should completely abolish this cause of death. *Pain and shock* due to pain can be controlled by morphia. *Delirium and convulsions* are now controllable by the use of barbiturates such as pernocton.

The considerable efficacy of treatment, both in eliminating poison and counteracting lethal effects, in acute poisoning due to swallowed poisons justifies the statement that in most patients seen before they are actually moribund the chances of survival are very good.

H. L. MARRIOTT, M.D., M.R.C.P.,

Resident Medical Officer, the Middlesex Hospital, London; Assistant Physician, the Miller General Hospital, Greenwich.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. T. Gwynne-Jones and Surg. Lt. (D.) A. C. Horne lent to N.Z. Division for three years (*Achilles*, on recommg.).

Surg. Comdrs. W. A. Hopkins to *Excellent* and F. L. H. MacDowel to *Repulse*.

Surg. Lt.-Comdrs. R. G. Anthony, J. G. Holmes, and E. R. Sorley to rank of Surg. Comdr.; J. G. Currie to *Royal Sovereign*; and R. B. McVicker to *Tamar*.

Surg. Lt. W. Greaves to rank of Surg. Lt.-Comdr.

Surg. Lt.-Comdr. (D.) L. R. Armstrong to *Drake* for R.N.B.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. G. C. Martin to *Excellent*.

Proby. Surg. Lt. A. V. Griffiths to *Royal Sovereign*.

Surg. Sub-Lt. T. D. R. Aubrey promoted to Surg. Lt.

### ROYAL ARMY MEDICAL CORPS

Short Service Commissions: Lt. (on prob.) J. H. Caverhill is restd. to the estab.

### ROYAL AIR FORCE

Wing Comdr. T. J. Thomas to Headquarters, Fighting Area, Uxbridge, for duty as principal medical officer.

### INDIAN MEDICAL SERVICE

Col. I. M. Macrae, C.I.E., O.B.E., Ind. Med. Serv., V.H.S., is apptd. Hon. Physician to the King vice Maj.-Gen. T. G. F. Paterson, C.B., D.S.O., Ind. Med. Serv., ret.

Lt. (on prob.) C. W. A. Searle is restd. to the estab.

### DEATHS IN THE SERVICES

The death occurred at St. Briavels, Gloucestershire, on March 13th, of Surg. Capt. OCTAVIUS WILLIAM ANDREWS,

C.B.E., R.N. ret'd. Born in 1865, the son of Dr. H. C. Andrews, he was educated at Bishops Stortford, Durham University, and St. George's Hospital, London, and qualified M.B. Durh. in 1887. He entered the Navy in 1889, being surgeon of *Ringdove* from 1891 to 1894. In 1898 he was sent to the Pasteur Institute at Paris and was then appointed to *Tamar*, Receiving Ship at Hong-Kong. Later he was fleet surgeon of *Diana* when he made a "Report on the Island of Cyprus." In 1913 he retired with the rank of surg. capt. but was recalled and took part in the European War from 1914–19, being mentioned in dispatches and created C.B.E. (Mil.) in 1919 as well as an officer of the French Legion of Honour. In 1894 he wrote a "Report on Leprosy and Depopulation in the South Pacific Islands," and later "Seamarks and Landmarks." For his public health work he was awarded the Chadwick gold medal.

The death occurred on March 7th of Surg. Commander JULIAN LIONEL PRISTON, R.N. He was born at Gillingham, Kent, in January, 1892, son of Engineer Rear-Admiral R. B. Priston. He received his medical education at the London Hospital, qualified M.R.C.S. Eng. in 1914, and in April of that year entered the Navy as surg. lt., serving at the Naval Hospital, Plymouth. After the war he graduated M.B., B.S. Lond.; he took the D.P.H. in 1922, and became F.R.C.P. Lond. in 1926. In 1920 he became assistant pathologist at the R.N. College, Greenwich, where he worked on the germicidal efficiency of certain antivenereal prophylactics and the reaction of the blood in health and disease, being awarded the Gilbert Blane gold medal in 1923. Later he was transferred to the medical department of the Admiralty as assistant for hygiene duties to the director-general. Since 1933 he had served at the Royal Hospital, Chatham.



## SPECIAL ARTICLES

## IN HONOUR OF ALMROTH WRIGHT

ON Tuesday of last week a graceful tribute to the work of Sir Almroth Wright was paid when he was presented with a bust purchased with subscriptions from those who over many years have admired the untiring persistence and great results of his work. The presentation was made in the library of the medical school of St. Mary's Hospital before a large and representative gathering, and Sir HENRY DALE before unveiling the bronze, which is to stand in the inoculation department of the hospital, spoke in eloquent and intimate manner of the debt owed by the world to Wright.

## SIR HENRY DALE'S TRIBUTE

Sir Henry Dale said that he had an easy task before him, since all were present with the one object of expressing their admiration and affectionate regard for Sir Almroth Wright, now approaching the completion of his seventy-fifth year. They wished to tell him that they all realised what science and humanity had gained by his complete and tireless devotion, through so many years, to the increase of health-giving and life-saving knowledge, by work with his own skilful hands and his own ingenious mind. They wished to ask him to allow them to leave a permanent memorial of himself and his work in his own institute, so as to give some contact with his inspiring personality to those who would be working there long after all present had passed from the scene.

Some of those present could appreciate Almroth Wright's achievements chiefly from their practical results in the prevention and cure of disease and the relief of suffering. They would have in mind the comparison—who could miss it?—between the tragic toll taken of our armies in the South African War by the enteric fevers and the experience of the Great War, in which this one of the weapons in death's armoury had been effectively put out of action by the knowledge which Almroth Wright's researches had by then made ready for use. The great institute in which they were meeting was itself a monument of generous recognition of the great practical results for humanity, which had long been, were still being, and would continue to be obtained by the work in progress there into a far distant future.

There were others among those present who from a more intimate and expert knowledge could recognise not only the practical results, but the detailed interest and subtle beauty of the researches which had made these results possible. They knew their friend Sir Almroth Wright as a scientific philosopher, building and rebuilding, with brilliant ingenuity, the theories which gave order and coherence to the facts which he observed, and threatening to tax the resources of the Greek Lexicon for nomenclature to give precision to his ideas; but, though Wright was a philosopher with this scholarly instinct, it was never in the study or the library that they expected to find him. They knew by experience that, when they visited him in that institute, at any time of the day or even far into the night, they would find him bending over his laboratory bench, patiently at work with his own hands and eyes, and with the simplest of mechanical aids, putting ingenious questions to Nature, and loyally and humbly accept-

ing her answers. In that he resembled the other great scientific investigators throughout the ages. When he thought of their friend at his laboratory bench he was reminded of another great medical investigator—a friend of Sir Almroth Wright's—the late Paul Ehrlich. Ehrlich used to say that he could carry out all the experiments which he wished to make if he were provided with a supply of dyes and chemicals, a handful of test-tubes, a water-tap, and a sheaf of blotting-paper. It might be suggested that Almroth Wright would require for his beautiful researches little more than a supply of glass tubing, some rubber teats, a dab of plasticine, a gas burner, a microscope, and a tolerable incubator. With these he would need as material only some drops of blood, taken from himself, his colleagues, or his patients—for throughout his career, from his earliest researches to those which were still actively in progress, he had been consistently a man of blood. With these simple appliances and materials, his inspired imagination would devise experiments leading always to deeper knowledge of the nature of human blood, with its subtle mechanisms and delicate reactions to infection. He sometimes thought that they might regard Sir Almroth Wright as one of the born burglars of Nature's mysteries, fashioning his skeleton keys with his own ingenious fingers from the most homely materials, and using them with a touch of genius to force one after another of the intricate locks with which Nature seems to guard her secrets.

Seventy-five years was a long innings, and, in the case of Sir Almroth Wright, the score was 75 not out and well set. His long career included periods at Belfast, Dublin, Cambridge, Sydney, the Army Medical School at Netley, and, lastly, the Inoculation Department at St. Mary's Hospital, which he founded, and where they still found him working with a group of enthusiastic colleagues. In every place where he had been he had acquired devoted friends and admirers and enthusiastic disciples, and all were represented among the subscribers to the memorial, which they were going to ask him to accept, and many of them were represented in person in that gathering.

The portrait bust by Donald Gilbert, which was now unveiled, had the advantage over any painted portrait, that the subject could be seen from every aspect. It would preserve a memory of Sir Almroth Wright, which was the most familiar to those who visited him in his laboratory—namely, that of the back of a massive head and shoulders, bowed with patient diligence over his working bench. From the other aspect they would see no actual smile fixed in permanent bronze; but, he thought that they would agree, there was the hint and promise of the smile of friendly humour, which so characteristically lit up Sir Almroth Wright's features when he was talking to his friends. They all hoped that their friend would be willing to leave this portrait and memorial of himself in the niche on the landing of the institute, which the architect had, with proper foresight, provided for such a purpose.

He could not help introducing one note of sadness into a happy occasion. There was one man whom they were all sadly missing on that day—Almroth Wright's devoted friend and assistant, and his most intimate collaborator for many years, and, in more recent years, his own (Sir Henry Dale's) most loyal senior colleague and dearly loved friend, Stewart Ranken Douglas. All who knew Douglas, who died last

January, would know that he would have been among the most enthusiastic members of that gathering in honour of his great friend and teacher.

Sir Henry Dale then handed to Sir Almroth Wright an illuminated address, with the names of all the subscribers to the memorial bound in a small volume, asking him to receive this and the portrait bust as very sincere tokens of the admiration and affection in which he was held by all who had participated, and of their desire to keep the memorial of his personality and his influence alive among all who would follow him in his work.

#### SIR ALMROTH WRIGHT REPLIES

Sir Almroth Wright deplored that language provided only descriptive words for objects and events, and made no provision whatsoever for the more important business of expressing the emotions. Everybody was aware of that defect of language. The lover found it difficult to express his affection even to an ideally sympathetic audience of one. And everybody found it difficult to express in a convincing manner sympathy with the happiness or bereavement of others. And a man who had to express an internal commotion of gratitude experienced, as he did, the same sense of incompetence.

I would have you note that it is not impossible to express emotion through the channel of appropriate combinations of rhythmical words. It can be done provided only you are an orator and a poet. When however you are neither the one thing nor the other, then you have only the poor alternative—and I propose to avail myself of that now—of enumerating those to whom one feels one's special thanks are due.

I would, first in order, desire to express my gratitude to my friend Sir Henry Dale for having done me the honour of functioning as your spokesman and for having, in conveying this gift of yours to me, employed every sort of over-indulgent kindly expression. I would further express my gratitude to the sculptor—Mr. Donald Gilbert—for the skill and pains he has lavished upon this bust. I would express my thanks also to all those numerous friends whose names are written in this book as co-partners in this presentation. And I am specially grateful to the organising committee and their secretary, but I have from them the strictest orders that I must not even mention them by name. I would further thank all those who are assembled in this hall to-day for their courtesy in coming, some of them far away from London, to add distinction and grace to this ceremony. And lastly, I would thank those who would have desired to be here, but have been prevented by illness or absence abroad. And I have, among those absent for this latter reason, specially in mind Lord and Lady Iveagh. I would have you, when you presently make the round of the spacious quarters of this Institute of Research and Vaccine Therapy, bear in mind that this building owes its existence in large part to the munificence of Lord Iveagh.

I will now ask you to let me off saying anything more on the subject of my emotional reactions and my incompetence in giving voice to them. It will be more within my competence, and more congenial to the vocation of a scientist, for me to think out with you the philosophic basis of this ceremony in which Sir Henry Dale, and you, and I are playing our several parts. I would in particular very briefly discuss with you two questions: first, that of the association of the word pleasure with work in general and medical research work in particular; and,

secondly, the question of the rewards of work. The term "pleasure" is the most enigmatical in the English language. It embraces three kinds of "feelings" and "inward sensations" which are as far as far can be apart. First, pleasure includes what I am accustomed to call "voluptuary pleasures"—or, if you prefer the term, "pleasures of sense." All men, however much they may disagree in other points, are agreed that the pleasures of sense are genuine pleasures. There are pleasant sights and pleasant sounds and joys of taste and pleasures of smell—"fragrant the fertile earth," for example, "after soft showers." There is a *second* kind of internal sensations which count for a great deal in life, but to which the term "pleasure" is only doubtfully applicable. These are satisfactions of our sensory nerves—"satisfactions of our sensory requirements," we might call them. Sleep would be such a requirement. Life without sleep would be unendurable. And sleep has had from the poets its store of tenderest names. But even the poets would scruple to describe sleep as a pleasure. We may think further of the requirements of our nerves of temperature. We suffer from intense malaise when we are cold and chilly and we revive when we get comfortably warm. But relief from the malaise of chill is not what we have in view when we speak of pleasure. Precisely the same thing holds of freedom from hunger and thirst. There are many other somatic and psychological urges (biologists call these impulses *tropisms*) which are all of them reliefs from sensory discomforts, but would none of them properly be called pleasures. In particular, if I had time I might speak to you about our stereotyped cravings—our cravings for intimate contact with solid substances.

I come now to a *third* description of inward feelings which have been called pleasures. These are distinguished from the others by the fact that they come into consideration in connexion with work. And there are about these feelings all sorts of insulting misunderstandings abroad. I call it an insulting misunderstanding when a man who has never done a hard day's work in his life comes to one who has experience of the miseries of physical fatigue and tells him that it is perfectly plain that everyone who works works because he finds that work is a pleasure. Now no one who has ever done any strenuous physical or intellectual work ever thinks of work in that way. Hard work is always compelled work—there being of course two different sorts of compulsion. The one sort which we most frequently associate with the term is external compulsion. But there is also internal compulsion, this being an urge to get rid of the misery of wanting to do some particular thing (I call that misery "neuronic tension"), and to feel that the thing is done, or is at any rate so far as we are concerned done (I call that relief neuronic relief). And the proof that all hard work is done not for the sake of what is ordinarily called pleasure but from external or internal compulsion, is to be found in the fact that the "ordinary sensual man," who is untroubled by urges, absolutely refuses to undertake any of the serious forms of work. You cannot get him to dig the ground, or to learn languages, or to follow any handicraft or profession, and you may tell him as much as you please that there is pleasure in hard work, but he—for he is not a fool—knows perfectly well that there is in hard work always more pain than pleasure and more "neuronic tension" than "neuronic relief."

I have been talking with you, as you will have recognised, in quite general terms about the relation

between work and that spurious entity which is denoted by the term pleasure. But while most of you have been dwelling upon the instances of successful research work emphasised by Sir Henry Dale, all of us here who are engaged in *medical research* have had in mind the enormous disproportion of failure to success. And it is that which puts medical research in the same category of pleasure-giving occupations as, let us say, painfully attempting to climb Mount Everest, or passing a winter alone under the snow for the sake of making meteorological records.

I pass now to consider what are the external rewards of research work. For you will want to know whether the hard work of medical research can be made up to the worker by external rewards; and you will want to know something about the available rewards. I may remind you, to begin with, that Marcus Aurelius scoffs at the notion of rewards. "Does the eye," he says, "ask a reward for seeing, or do the legs ask a reward for walking?" And, you may rejoice, Does the brain ask a reward for thinking? That sort of high flown talk may seem foolishness, so I return to the discussion of rewards and of the appropriate sort of rewards for successful research.

I have it from the lips of a very famous research worker now dead that he who did important research work, such as he himself had done, should receive the emoluments of an archbishop and should be presented with a Rolls-Royce car and a salmon river. I have also heard from more than one research worker that those who are successful should be rewarded with titles of honour and public fame and decorations and fellowships of learned societies and gold medals and honorary degrees, and I can take heart of grace and say that to me these things may upon occasion have their value. For there is in my memory a speech made by a distinguished friend here present when returning thanks for a dinner given to him on his election into the Royal Society. He made this point, that every intellectual worker who is not incurably vain must in due season ask himself whether he is really the stout fellow that he imagines himself to be. And there followed then the point that a man who has been perturbed by such self-questionings is put into good heart again by his election into a learned society or the award of a medal, for these may be taken as sure indications that his work is really held in some esteem. I should like to put this to you; that the amount of pleasure that can be extracted from gratified intellectual vanity is—I venture to think—very strictly limited. And as for the ordinary flattering speech it is much better immediately forgotten. And there is with flattering speeches this special disadvantage—a man cannot with any decency go about retailing them to his friends. But I would make here one exception. There is a kind of flattering speech which is so tempered with reserves and criticism that it may quite profitably be remembered; and there is this good point about such a speech that it may without immodesty be repeated. Let me give you an example. A professor was seeking information as to the merits and demerits of your honourable servant now addressing you. "Oh!" replied Metchnikoff (and the professor reported this sally to me with pardonable pride), "Wright is a man who has very good original ideas; but he has also ideas which are only original."

I come now to the point as to what is the really gladdening reward of laborious research work. I find this reward not in the pleasures of sense which arrive in the course of our work. For these are few and rare. Nor do I find that reward in the neuronie relief which comes along with weariness at the end of a

long day's work, for the work of the day often turns out unprofitable. But I find that reward in the satisfaction of certain important psychological requirements. Just as a man requires sleep when he is tired, and food when he is hungry, and just as he longs for contact with the firm land and rest after a bad channel passage, so he requires, for the peace and satisfaction of his mind, some goodwill and affectionate esteem from those around him. Presentations, as I understand them, have something to do with this and this presentation which has been conveyed to me constitutes, I venture to believe, no exception to that rule. Finally, let me cite to you a passage that strikes the note upon which it will be good to end. It is—you will be surprised to hear—a criticism (I think a very penetrating criticism) of Shakespeare by Bernard Shaw. This is the passage:

"You suddenly see that Shakespeare, with all his flashes and divinations, never understood virtue and courage—never conceived how any man who was not a fool could, like Bunyan's hero, look back from the brink of the river of death over the strife and labor of his pilgrimage, and say, 'yet do I not repent me'; or, with the *panache* of a millionaire, bequeath 'my sword to him who shall succeed me in my pilgrimage, and my courage and skill to him that can get it.'"

## MEDICINE AND THE LAW

### Heart Disease as an Accident

*Reddish v. London, Midland and Scottish Railway*, decided at the Manchester county court last week, was one of those interesting cases where death from heart disease is found to be an accident within the Workmen's Compensation Act. An engine-driver collapsed and died on the express from Manchester to London. The court had to consider whether his employment had caused a strain which in turn had caused death. The widow contended that the heart attack was due to her husband's effort in helping to turn the turn-table at Manchester station before beginning the journey: it was aggravated, she said, by his action in closing the regulator of the engine when the train was running down from Haddon Tunnel to Rowsley. The judge went in person to the railway station, entered the cabin of an express engine, and tested for himself the requisite degree of exertion. He came to the conclusion that to pull the regulator over when the train was at rest meant no serious effort to an engine-driver in good health, but that, if the train was travelling down an incline with considerable oscillation, the effort would be a strain to a man in Reddish's state of health. The work contributed to, and materially accelerated, death; the employers were therefore liable to pay compensation.

The legal position has been well established since *Clover Clayton and Co. v. Hughes* in 1910, where the workman ruptured an aneurysm of the aorta while merely using a spanner to tighten a nut without any unusual effort. There was medical evidence that the aneurysm was so far advanced that death might have occurred during sleep. The employers contended that it was a case of disease and not of accident. "Accident," they argued, must be some sudden or unexpected occurrence of an untoward kind; the ordinary use of a spanner could not be an accident within the statute. The Lord Chancellor, however, laid down that the accident might be "something going wrong within the human frame, such as the straining of a muscle or the breaking of a blood-

vessel." It was sufficient that the "accident" was too great for the man undertaking the work, whatever the degree of exertion or the condition of health. It is unnecessary to prove sudden strain, but there must be evidence to connect the physical breakdown with the work. Thus in *McNamara v. Davis* (1933), where a lorry-driver was found dead beside his lorry and it appeared that he suffered from an aneurysm which had burst, the employers were held not liable in the absence of evidence that any accident had caused, or contributed to, his death. On the other hand, in two further cases decided in 1933 the employers had to pay. In *Partridge Jones and Paton v. James* the workman was a dipper in some iron-works; in *Falmouth Docks v. Treloar* he was a labourer unloading sacks of china clay. The arbitrator, said the court, must always consider whether, in substance and so far as he can judge, the accident comes from the disease alone (so that, whatever the man had been doing, the fatal result would probably have occurred all the same) or whether the employment contributed to it.

### Sardines Unfit for Human Food

A recent prosecution at the Mansion House disclosed some discreditable dealings in sardines unfit for human food. For some reason, which puzzled the presiding alderman, a consignment found unsatisfactory when examined at the London Docks last July was not condemned and destroyed forthwith at the time but was allowed to be sent back to the Portuguese packers. Some of the tins were found to be "blown" and to have been resoldered; the goods were far below the standard rightly required of food for human consumption in England. Last December this unwelcome consignment reappeared at the City and Continental Wharf, Upper Thames-street. Though it had been "reconditioned" and repacked in Portugal, it was none the more fit for human consumption. It was accordingly seized and condemned and the prosecution followed. The defendant, Edward Montague Fogden Humphrey, of Waverley Manor, Great North Way, Hendon, was summoned as the owner of the consignment. He pleaded "guilty." It was stated in extenuation that the goods were intended for re-export rather than for sale in England; there was indeed a half-suggestion that they were destined to be war stores for the Abyssinians. Evidence was given of a previous conviction for trafficking in dangerous drugs for which he was sentenced to six months' imprisonment in 1923. The alderman now imposed a sentence of three months in the second division. A representative of the *Consorcio Portugues de Conservas de Peixe* said that the president of that association had taken the trouble to come to London in case he could give the court any assistance. It was stated that the persons in Portugal instrumental in sending these sardines back to London after the first inquiry had been fined something like £1800 and forbidden to engage in the sardine trade for two years. It seems a pity that English law has no equivalent power of disqualifying a dealer who shows such indifference to proper standards of public health. Our rude forefathers might have put him in the stocks and fed him with his own unsavoury wares.

### Venereal Disease Act Infringement

The House of Commons lately showed no desire to prevent quacks from advertising their cures for cancer, epilepsy, and other afflictions. There is, however, one range of ailments for which Parliament has forbidden remedies to be prescribed or recom-

mended by anyone but a registered medical practitioner. The Venereal Disease Act of 1917 applies its prohibition even where the defendant has some genuine knowledge of pathology. On March 19th Ernest S. Lewis was fined £15, with £5 5s. costs, at Bow-street police-court, for having "announced" treatment for venereal disease in the pages of a book entitled "Every Man, Woman, and Child their Own Physician." The prosecution stated that it was probably true that Lewis had considerable knowledge of pathology. Lewis himself said that his book emphasised that the treatment which he advocated should be used in conjunction with medical supervision. He did not know he had committed any offence. The magistrate pointed out that the maximum punishment under the Act was two years' imprisonment; it was clear that the legislature intended serious notice to be taken of such offences.

## UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

### DAYTON DISPENSES WITH CLINICS

DAYTON, Ohio, is the headquarters of the National Cash Register and is a typical mid-western manufacturing city of 200,000 inhabitants. It is situated in Montgomery county. In March, 1934, the county medical society voted to close all out-patient clinics in the city. There had been some precedent for such action. The therapeutic clinics of the Los Angeles county health department had been abolished in the previous year. Youngstown, Ohio, had closed all clinics except those catering for patients with communicable disease. But Dayton is believed to be the first city to have made a complete sweep of all its clinics of whatever nature.

Organised medicine here is traditionally opposed to clinic practice and nourishes a belief that hospital and health department clinics habitually serve many patients who but for such service would consult and pay private practitioners. The advent of the depression lent fervour to this need as doctors saw many of their former paying patients added to the clinic rolls. From 1929 to 1933 the relief rolls of the city increased by 400 per cent. In the same period the attendance at public clinics increased by 160 per cent. Moreover when federal aid became available for the medical treatment of indigents, even the poorest became paying patients of a private physician when they did not elect to attend a clinic. Anyhow the clinics were closed. On Dec. 1st, 1935, federal aid for medical relief came to an end. The county relief funds also were depleted. On Dec. 2nd the Dayton health department reopened its venereal disease clinic staffed by two part-time salaried city physicians. The opening was approved by the clinic committee of the county medical society provided (1) there should be adequate investigation of the economic means of patients; (2) that the clinic be held on city owned property and that the doctors be adequately paid. The public relations committee is at present exploring the possibilities of opening other clinics to meet the present pressing need.

The debate as to the desirability of "socialised medicine" continues in American high schools, doctors in almost every community contributing to the negative. Common arguments against "socialised medicine" are that it destroys the physician-patient relationship, that it is unnecessary

since doctors already supply all needed medical care free of charge when the patient cannot pay, that it introduces politics into medicine with resulting political patronage and inefficiency. Exactly what constitutes "socialised medicine" it is not easy to say. Physicians are employed on a part-time basis in many communities to take care of the indigent sick, and this with the apparent consent if not approval of the local medical societies. The American Medical Association has for some years given publicity to an arrangement whereby several county medical societies in Iowa have contracted with the local government to supply medical service to indigents. Some of these Iowa contracts, but by no means all of them, guarantee choice of physician to the patient.

#### MAYHEM CHARGES IN CALIFORNIA

Two doctors in California have been indicted on charges of conspiracy to commit mayhem in connexion with the sterilisation of Ann Cooper Hewitt, only grandchild of the inventor of the quartz mercury vapour lamp. The California sterilisation law applies only to those legally committed to State institutions as insane or feeble-minded. Since no evidence was presented that Miss Hewitt had ever been so committed the judge ruled that the sterilisation law could not be invoked by the defence. Meanwhile the programme for eugenic sterilisation goes forward. The Human Betterment Foundation<sup>1</sup> reports that in the last year it has distributed more than 40,000 of its pamphlets in response to requests from 436 college instructors. Of these 431 are teaching in the United States and its territories and five abroad, in Canada, England, and Syria.

### VIENNA

(FROM OUR OWN CORRESPONDENT)

#### PSITTACOSIS IN CAGE-BIRDS

FIVE years ago, when there was an epidemic of psittacosis in Germany, quarantine was enforced upon all birds imported into Austria; the danger was then believed to be confined to parrakeets from South America. Occasional patients were suspected of having the disease, when they were known to have been in contact with parrakeets, but nothing could be proved and they all recovered. Prof. Eppinger, however, has recently had in his clinic a woman suffering from pneumonia of unusual type, the severity of which was out of all proportion to the mild symptoms. There was also a kind of "migration" of the pneumonic foci which aroused the professor's suspicions, as he had had the opportunity a few years before of observing 25 cases of psittacosis in the Rhineland. This patient had also kept two parrakeets. On the twelfth day specimens of blood and sputum sent to the Institute of Veterinary Infections were reported as giving positive reactions for psittacosis, and Prof. Gerlach, the director of the institute, succeeded for the first time in cultivating the virus from the blood and sputum. The patient had meanwhile recovered, though she was still in quarantine. The two birds had now died, but the authorities were able to exhume the bodies; both gave positive reactions for psittacosis. The shop was traced that had sold the parrakeets and orders were given for the destruction of its entire stock—176 birds in all, including 20 canaries, some forest

birds, and 2 birds of paradise—and for disinfection of the premises. The majority of these birds were found after thorough examination to be infected, and among them all the canaries.

This case was reported by Prof. Eppinger and Prof. Gerlach before the Gesellschaft der Aerzte in Vienna, and in the discussion it was pointed out that the bird-fancier's shop had been infected in spite of the quarantine restrictions. The only safe precaution was to keep birds that had been reared in the country and to avoid those that had been imported. The public should refrain from too intimate contact with any cage-birds and these should have a prompt examination at the first sign of illness. With these measures it should be easy to quell if not to prevent entirely an outbreak. All cage-birds seem liable to contract the disease; its onset is never spontaneous, for cross-infection can always be proved. Strict cleanliness is as important in these pets as in dogs and cats, to ensure their health and to prevent the spread of disease to their owners.

#### A MUSEUM OF ELECTROPATHOLOGY

In concentrating the medical institutes and laboratories within the buildings of the old General Hospital, two extensive wards of the former psychiatric departments have been converted into a museum for electropathology, where there is ample room for lectures and demonstrations. This collection of specimens, which owes its existence to the unceasing efforts of Prof. Stephen Jellinek, has hitherto been seriously handicapped by lack of space. The new institute contains a large amount of very interesting and instructive material on the physiology and pathology of the effects of electricity on living organisms. It is the only museum of its kind, and during its 35 years it has attracted a large number of visitors to Vienna, engineers as well as physicians. It contains many unique specimens, collected from all parts of the world, and the results of numerous scientific investigations which have been made in the institute—for example, methods for prevention of electrocution, the improvements in the safety of electric apparatus, the problem of markings after the discharge of a current. The museum will be concerned with the following subjects: the effects of lightning, protection against accidents, electricity in the army, in treatment, and in forensic medicine. Regular courses, chiefly for post-graduates, will be held in the museum by Prof. Jellinek.

### BUDAPEST

(FROM OUR OWN CORRESPONDENT)

#### THE LEX VENEREA

THE foundations of the Bill called the Lex Venerea have been laid during the past two years by a committee of the National Public Health Association under the presidency of Prof. Edward Neuber, ministerial commissioner for the prevention of venereal disease. Similar laws and their effects in other countries have been carefully studied and the Bill has been adapted from these to meet the special needs of Hungary. It makes treatment compulsory and provides for the discovery and treatment of all infected persons. The Minister of the Interior will be authorised to demand serological and other examinations, and the Bill contains an innovation, the "sanitary control," enforceable against women as well as men. Prostitution becomes illegal, brothels

<sup>1</sup> Suite 321, Pacific Southwest Building, Pasadena, California.



and similar institutions are to be abolished, and the police will be ordered to combat the activities of street-walkers. Anyone who exposes another to the risk of infection will be guilty of a misdemeanour and if infection takes place will be very severely punished. There are heavy penalties also for those who marry while still infected, and the law enforces a medical consultation—though not an examination—before every marriage. Physicians are obliged to give written as well as oral instructions to their patients and to report any who suspend or discontinue treatment. They must also notify any known source of infection. Advertisements and treatment through correspondence are forbidden. Steps are to be taken to instruct young people in the dangers of venereal diseases.

#### LONG LIFE

Nonagenarians have been called into consultation in an effort to discover the causes of longevity, and questionnaires have been sent by the Hungarian Statistical Bureau to all in the country over 90. These old people, of course, are the best authorities on the subject, and they have been asked to answer 63 questions about their heredity, environment, and mode of life. Some of these relate to the age, financial status, and health of their parents and grandparents, others to their own health, physique, diet, exercise, and sleep. The questions go into some detail about such subjects as the number of meals and whether these are meat or vegetarian; the partiality to tobacco or alcohol, and the nature and extent of indulgence; the length of sleep, time of rising, hours of work in the past and at present; and whether the surroundings are congenial. The part of the house in which the nonagenarians live is considered important, for four-fifths of the inhabitants of Budapest live in flats, most of which are five stories high. The conclusions of the Statistical Bureau will soon be published in the press for the benefit of the public.

After protracted negotiations and much expert advice the municipality here has made a contract with the Belgian firm Union Minière du Haut Katanga. Budapest will buy outright 1500 mg. of radium and hire 3242 mg. A cheaper offer had been made by an Austrian firm but it could only deliver the same amount in five monthly instalments and would not lend any; so its offer was declined.

The Budapest Health Resort Committee has received the grand prix given by the bureau of the World Exhibition held last summer in Brussels. It was awarded for the exhibit of modern bathing facilities and is much valued on account of the keen competition that there was from all parts of the world.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

#### THE IRISH HOSPITALS SWEEPSTAKES

THE draw for the seventeenth of the Irish Hospitals Sweepstakes was held at the Mansion House, Dublin, last week. The total receipts from the sale of tickets was over £1,400,000, of which the share to be handed to the National Hospital Trustees will be approximately £467,500. The sum is an increase on that which was received at the sweepstake on the Cambridgeshire last November, but less than that at the sweepstake on the Grand National a year ago. The total sum which has been collected for hospitals in

the seventeen sweepstakes since November, 1930, is approximately nine and a quarter million pounds. It was announced at the draw that the Minister for Local Government and Public Health had now given his approval to the scheme for the endowment of medical research put before him by a representative body of those interested in medical science, and that only certain legal formalities had to be gone through before the first grant would be available. It is understood that the council to control the scheme, must be given legal status as a registered association before moneys can be granted to it by the Minister. It is expected that, as soon as registration is effected, a grant of some £10,000 will be immediately available.

#### PROVISION FOR CARE OF SANE EPILEPTICS AND MENTAL DEFECTIVES

The Irish division of the Royal Medico-Psychological Association is trying to impress the Minister for Local Government and Public Health with the need for provision of care and treatment for mental defectives and sane epileptics. At present many of these unfortunate classes are either in mental hospitals or in district hospitals, in neither of which can they get curative treatment or educational care. The joint committee of Grangegorman Mental Hospital has recently passed and circulated a resolution in support of the activities of the Medico-Psychological Association, adding its opinion that "the establishment of suitable institutions or centres for the care and treatment of these afflicted classes would result in a saving to the community by reducing the number of admissions to mental hospitals and prisons, whose inmates are to some extent recruited from these sources." The committee further asks that the co-operation of medical officers of health and of school teachers should be sought in order to collect information as to the mentally defective children throughout the country who would be capable of education and improvement under persons specially qualified to deal with such cases.

#### DR. JOHN MILLS

The death of Dr. John Mills, resident medical superintendent of Ballinasloe Asylum, occurred in Dublin recently after a long illness. Dr. Mills graduated from Dublin University as M.B., B.Ch., B.A.O. R.U.I. in 1890. After a short period as house surgeon in the National Eye and Ear Infirmary, Dublin, he decided to practise in lunacy and went as clinical assistant to the Richmond Asylum in Dublin, and thereafter devoted himself to the care of the insane. Almost his whole professional life was spent in Ballinasloe, first as assistant medical officer, and for some fifteen years past as medical superintendent. Ballinasloe is in an out-of-the-way part of the country, and asylum practice is often detached from other branches of medical practice. But Mills became one of the best known, most trusted, and most loved members of the profession in Ireland. He was active in every matter of medico-political interest. He was for many years a member of council of the British Medical Association and a member of the Irish Medical Committee. When, about 1912, the interests of the medical profession appeared to be threatened by the National Health Insurance Act, it fell to Mills's lot to organise the profession of the province of Connaught, and despite the pressure of his official duties, he found time to visit almost every medical man in two counties. He was one of the most active members of the Irish branch of the Medico-Psychological

(Continued at foot of opposite page)

## CORRESPONDENCE

## TREATMENT BY PROLONGED NARCOSIS

To the Editor of THE LANCET

SIR,—I have read with great interest the leading article on treatment by prolonged narcosis in your issue of March 21st, which has done a great deal to clarify the position with regard to the dangers and efficacy of the treatment. There are one or two points of considerable importance that have not yet been sufficiently stressed. As your article suggests,

“there is no precaution, no routine procedure in their administration (i.e., that of malariotherapy and prolonged narcosis) which can take the place of special experience in their use, or good clinical judgment in selecting cases and supervising the course of the therapy.”

and I believe that much of the present confusion is due to neglect of these fundamental precautions. The method, which at its best is a difficult one, requires expert supervision and keen powers of observation for the detection of early danger signs if fatalities are to be avoided, and to be of therapeutic value and free from risks it should never be undertaken by the wholly inexperienced.

In this connexion it is interesting to note Oberholzer's criticism of Müller's comprehensive review. He observes that amongst the 17 authors whose work Müller summarised there was only one (Stuermann) who had at his disposal a material of more than 50 cases, the others having published results on work which frequently embraced fewer than 20 cases. These workers were for the most part inexperienced in the management of prolonged narcosis, and their results as one might expect, showed a proportionally larger number of catastrophes and failures. This unfortunate tendency on the part of over-zealous psychiatrists has no doubt to some extent contributed to bringing the method into disrepute.

If a plea should be necessary for a form of therapy that has proved of undoubted value in many forms of mental disorder it would be not only for caution in applying the method, but also for caution against hasty condemnation, based on results in such series of cases. On the other hand, as you point out, the treatment can be carried out in the vast majority of cases without a hitch, if the physician has thoroughly familiarised himself with the method beforehand, and has realised that no routine procedure or set rules, but only the condition of the patient during treatment, must be his guide. As regards dosage it is impossible to generalise; each case must be treated according to its own particular requirements. Although the “mitigated” form of narcosis, where not more than 4 c.cm. somnifaine is used per diem, may be successful in many cases, it will be found that larger quantities (up to 6 c.cm.)

(Continued from previous page)

Association. He was a very progressive alienist, and indefatigable in his attention to the welfare and comfort of the sufferers committed to his care. To them and to their relatives he was more than a doctor, he was a friend in whom they trusted. His death is a grave loss to the poor of the counties of Galway and Roscommon, as well as his colleagues in the profession the good repute of which he did much to enhance.

are often required for the treatment to be efficacious. In the 107 cases reported by Muriel McCowan and myself the average dose in 24 hours more often than not exceeded 4 c.cm. in 24 hours. The dosage, however, varied so much from one individual to another that it was found impossible to lay down any definite rule. Again, most workers who have given insulin a serious trial as a protective against the toxic risks speak favourably of its effect in this direction. Thus several Scandinavian workers (Östlind, Gjessing, and others) encountered fewer complications with the use of insulin than without, whereas glucose alone made but little difference.

Whatever theories of narcotic action may be held there can be no two views about the benefit obtained by combating rationally the state of severe ketosis which arises during the course of prolonged narcosis.

I am, Sir, yours faithfully,

ROLF STRÖM-OLSEN.

Runwell Hospital, Essex, March 25th.

## THE NUTRITION QUESTION

To the Editor of THE LANCET

SIR,—The thanks of your readers are due to Dr. Hutchison for provoking a discussion on this subject in your columns. Its importance is so great that a statement of certain facts may be permissible even if I repeat something of what I said at a recent meeting of the Royal Society of Medicine (see THE LANCET, Feb. 1st, p. 258). As Dr. Hutchison points out, one of the difficulties is the lack of definition of terms that are frequently employed.

1. It is certain that on the average children of the well-to-do are for their age taller and weigh more than those of the poorer classes; in fact, the grade in society is indicated by the amount of growth, as appears from Elderton's figures. Public school boys are taller for their age now than they were 50 years ago. The evidence is in favour of these differences being due to the presence or absence of growth factors in the food, though heredity also plays a part.

2. When the average height is compared with the average weight this relation, which we look upon as the best measure of “general nutrition,” is the same for all classes. This applies to public school boys now and 50 years ago (Roberts), to elementary and other school-children in this country observed by Greenwood, Fleming and Martin, Elderton, and to children in America observed by Baldwin and by Benedict and Talbot, in Germany by Camerer, in Denmark by Bierring, and in Sweden by Nylin.

These two facts are well known, but perhaps their combination has not been sufficiently emphasised. Riches tend to produce giants, poverty to produce pigmies; both giants and pigmies are on the average equally well formed. The height/weight relation is an excellent measure of under or over-nutrition (Dr. Hutchison's terms) of the *individual*; but cannot be used to distinguish the classes of society. The problem remains whether it is a disadvantage to be short. Dr. Hutchison suggests that it may not be and it was Prof. A. E. Boycott<sup>1</sup> who wrote in the Osler Memorial volume “on the importance of being rather small,” applying this to man as well as to other organisms. On the other hand, Sir John Orr<sup>2</sup> has defined as the standard of health “a state of well-

<sup>1</sup> Contributions to Medical and Biological Research, New York, 1919, i., 226.

<sup>2</sup> Food, Health, and Income, London, 1936.

being such that no improvement can be effected by a change in the diet." On this definition, which many would agree with, poor children are not perfect in health though this does not mean that they are "starving or even suffering from such a degree of ill-health as is recognised in the term disease."

Clearly additional criteria are desirable, such as are given by dynamometer, equilibration tests, and hæmoglobin determinations now being investigated by Dr. H. E. Magee<sup>3</sup> at the Ministry of Health. Then there is the incidence in children of those diseases where nutrition plays a part, as dealt with by Orr. If we view the evidence so far obtained, we must surely admit that the health of poor children could probably be improved by adding certain substances to their diet. This would not mean that the diet of adults should be increased, as in all classes of society they tend to eat too much already; hence the diabetic and cardiovascular diseases that Dr. Hutchison and all of us deplore.

I am, Sir, yours faithfully,

London, W., March 27th.

E. P. POULTON.

To the Editor of THE LANCET

SIR,—Dr. Neustatter's experience, as recorded in his letter in THE LANCET of March 21st, is probably unique. Much as one deplores the existence of poverty—and, personally, I should like to see the State provide every man, woman, and child in this country with food and other bare necessities of life—it is not a fact that poverty, per se (other than actual starvation, which fortunately need not exist at the present day), is a cause of malnutrition, as gauged by Dr. Neustatter's standard—viz., under-weight, under-height, pallor, poor posture, baggy eyes, poor muscular tone, and prematurely senile appearance. He finds 70 out of 240 boys examined by him in the poor districts of the East End of London to be of such poor physique. I doubt if anyone else has met with similar experience. I have examined many thousands of children in similar districts of London and have not found any considerable number having the standard of unsuitable physique given by Dr. Neustatter. On the other hand one not infrequently meets with such poor physique among the pampered children of the well-to-do. I have only very recently, in the course of a medical inspection of school-children in the East End, seen two children whose fathers were unemployed, but each of them looked a picture of health. They were above the average weight and height, had rosy cheeks, and were healthy in every respect.

I am, Sir, yours faithfully,

Harley-street, W., March 24th.

W. M. FELDMAN.

To the Editor of THE LANCET

SIR,—As a public health officer, whose work is mainly concerned with infants and children the vast majority of whom must be termed normal, I feel bound to express my indebtedness to Dr. Hutchison for pointing out that nutrition may be regarded as the public health "stunt" of the moment, and for emphasising the dangers of over-nutrition, to which some of us in the public health service may have unwittingly exposed those children brought for our advice.

If we have erred in this way, it must be due to the fact that we followed too literally the advice given us by the physiologists and specialist workers in nutritional fields, and emphasised year after year

in the annual reports of the chief medical officer of the Ministry of Health. We have been insistent to parents on the importance of an adequate supply of milk (say) not less than one pint per day—Sherman advocates two pints for optimum calcium intake—and of a regular supply of the so-called protective foods, including eggs, green vegetables, and fruits. We also knew that sugar protected against starvation, but had been warned of the dangers of a high carbohydrate diet. We had read of such experiments as Corry Mann's, where the addition of a regular daily milk ration in addition to a good basic diet—better in itself than many children get in the usual way—caused a more rapid growth and increase of physical well-being than in the control groups, and drew our conclusions accordingly. If we had advocated sugar as a protective food, certainly our advice would have been cheaper to carry out; the stumbling block in an enormous number of homes to an increased intake of milk, &c., proved to be the cost, and the Government, giving recent recognition to this fact, introduced the milk scheme for school-children, and therefore some millions are now being supplied with one-third of a pint extra per diem. If, on the same principle, a scheme for the cheap supply of the other protective foods were introduced so that their consumption were enormously increased, to what unknown dangers, brought on by this possible over-nutrition, does Dr. Hutchison suggest our children would be exposed?

If the dangers of over-nutrition in this connexion are rather vague, those of under-nutrition are certainly much clearer. Sir John Orr takes three characteristic signs of malnutrition in children to be rickets, bad teeth, and anaemia, all of which are widespread in the lower income groups, and all of which are directly affected by diet. "It is most interesting," he writes, "to note that these diseases and stunted growth are attributable to lack of those dietary factors—viz., first-class protein minerals and vitamins which are the constituents of the diets shown to be deficient in the lower groups." The common respiratory disorders, and those arising in connexion with whooping-cough and measles, are also of much more serious import in the lower income groups than in the higher groups.

With regard to the question of physique, Dr. Hutchison suggests that the "smaller and more wiry type fits in better with the conditions of urban life and a machine age." Presumably also it is this smaller and more wiry type which is rejected as physically unfit for the Army to the extent of between 50 and 70 per cent. If it is true, however, that this type may fit in better with our present state of civilisation, then we should rightly deplore the fact that reports of school medical officers from all over the country for many years past have shown a consistently slow but steady increase in the average weights and heights of school-children at all ages. It is true that public school boys are still bigger and heavier than elementary school boys at corresponding ages, but, on the other hand, the elementary school boy is now up to the standard of the secondary school boy of a generation ago. Does this mean that those fitted for the "urban life and a machine age" are likely to become fewer in number?

Dr. Hutchison summarises the purport of his paper as a protest against the pessimistic view that defective nutrition is prevalent in this country and the optimism which believes it possible to bring about a great improvement in the public health by an alteration in the national diet. Some of us may

<sup>3</sup> Proc. Roy. Soc. Med., 1935, xxviii., 713.

find it difficult to acquiesce in this attitude after reading two of the most recent summaries, Sir John Orr's "Food, Health, and Income" and Sir Robert McCarrison's Cantor lectures.

I am, Sir, yours faithfully,

V. FREEMAN,

Assistant Medical Officer of Health Heston  
Hounslow, March 25th. and Isleworth.

### FOOD PRODUCTION

To the Editor of THE LANCET

SIR,—It is suggested in your summary (March 21st, p. 681) of Sir John Orr's survey of nutrition that there are now "greatly increased powers of producing food." What, if anything, has happened in recent years to enable farmers to produce much more food per acre at little extra cost to themselves or the public—except, perhaps, in the case of poor grasslands? In 1922 a leading authority on the subject, the late Sir Henry Rew, said: "Within the past thirty years not only have many agricultural stations and colleges been established, but many millions of public and private money have been spent in promoting agricultural education and research. The result of this expenditure cannot be said to be very apparent in the statistical records of output."

I am, Sir, yours faithfully,

Manor-fields, Putney, S.W., March 21st. B. DUNLOP.

### SCURVY IN THE ADULT

To the Editor of THE LANCET

SIR,—In your last issue (p. 710) Dr. Archer and Dr. Graham have indeed made good use of the case of scurvy which came under their care. There is no doubt that scurvy is rare in the voluntary hospitals of this country. On the other hand, it is not quite so rare in the local authority hospitals which deal almost exclusively with the sick poor. During the last four years I have seen at least half a dozen typical cases of scurvy of varying degrees of severity. I have no doubt that my colleagues in municipal and poor-law hospitals have had similar experiences. I find that the patients are mostly elderly people living alone on a small pittance.

I am, Sir, yours faithfully,

W. A. RAMSAY,

Medical Superintendent, Crumpsall Hospital,  
Manchester.  
March 30th.

### OXYGEN ADMINISTRATION

To the Editor of THE LANCET

SIR,—In the annotation on oxygen tents on p. 730 of your last issue you point out that A. L. Barach recommends a flow of 6–8 litres of oxygen per minute with a tent that is not very airtight. Dr. Poulton uses 2–3 litres per minute and makes his tent more airtight. One of the main advantages of the tent is that it allows this great reduction of oxygen. If we are going to use 6–8 litres per minute a simple open box-shaped face mask is all that is required. With this we find it is possible to maintain an alveolar oxygen pressure of 60 per cent. with a flow of 6 litres per minute if a single catheter is placed 3 in. in the nasal cavity. If 8 litres per minute is used the catheter need not be within the nasal cavity but just outside.

This box mask may be made from thin cardboard; its length is 6½ in., breadth 4¾ in., and depth 2½ in. Its long axis lies in the long axis of the face and the eyes look over the top which is closed except for the entry of the catheter. On the back of the mask there is a triangular opening, lined with lint, into which

fit comfortably the nose and mouth. The bottom of the mask is freely open to the air at a space of 12 sq. in. (4¾ by 2½). The capacity of the mask is about 1000 c.cm. and the patient breathes the mixture of oxygen and air from this cavity. A flap at the lower end of the front side could be raised when food is taken.

The apparatus is simple to make, very light and comfortable in use, and it does not get overheated.

I am, Sir, yours faithfully,

London, N.W., March 28th. J. ARGYLL CAMPBELL.

### SOCIETIES CHARITABLE AND UNCHARITABLE

To the Editor of THE LANCET

SIR,—In writing to thank you for the valuable article in your issue of March 14th under this title, may I point out a remarkable legal anomaly. Christian Scientist parents are liable to prosecution and punishment for fatalities caused by their wilful neglect to supply their children with such a treatment as antidiphtheritic serum, for example, the great value of which, when given in time, has been very generally recognised by the medical profession for some forty years. The so-called antivivisectionists, to be logical, should be Christian Scientists or its equivalent; for they cannot make systematic use of modern medical treatment without availing themselves of knowledge obtained through physiological, therapeutic, and bacteriological experiments on animals.

Yet it appears to be legal for antivivisectionists, with no medical qualifications, to spend tens of thousands of pounds yearly in trying to persuade parents to withhold illegally such treatments from their helpless children; largely by means of propaganda including the aid of "harrowing descriptions and illustrations . . . in many cases calculated to deceive the public," to use the words of the 1912 final report of the last Royal Commission, in reference to shops, of which the then Home Secretary in reply to a question in the House of Commons was reported in the *Times* of June 11th, 1912, to have said: "I regret that I have no power to prevent such displays."

Would it not, therefore, be of importance to obtain the present Home Secretary's opinion on the advisability of ending this anomalous state of affairs, which has now reached a scale that it is a menace to public health?

I am, Sir, yours faithfully,

London, March 25th.

LEONARD ROGERS.

### EPILEPSY AND ALLERGY

To the Editor of THE LANCET

SIR,—It seems necessary to take a wider view than that taken by Dr. Oriel and Drs. Costello and Fox to explain the coincidence of epilepsy and asthma or migraine. The allergic side appears to be but a part of the whole mechanism which is a chain of emotional, neurological, chemical, and other factors. The psychological is just as important as the allergic factor in the problem. I should like to illustrate this by the case of a man whom I have had under my care.

This patient when a boy lost his mother and, since his father had to travel abroad on business, was sent to a boarding-school. The head master of this school was a sadist of the worst order and flogged the boy every day. Under this treatment the patient started to develop major epileptic fits—there does not appear to be any

doubts as to the genuineness of the epilepsy—and these became so marked that the father was informed and removed him to another school. At this new school the epilepsy disappeared but was replaced by migraine. He suffered from this until puberty when the migraine was replaced by attacks of depression which occurred in the spring (when his mother died) and elation which occurred in the autumn. These attacks gradually increased in severity until he was unable to work more than six months in the year. He came under my care about a year ago and was treated by psychotherapy. Last autumn was the first time for fifteen years that he did not have an attack of elation, and this spring he has, so far, failed to have his usual depression. His environment has been unchanged so that no factor other than the treatment can be found to have caused the disappearance of his symptoms.

I have recently seen a boy aged 14 years who complained of asthma, minor and major epilepsy, and headaches (which lacked the symptoms of typical migraine). The epileptic attacks started when he was aged 6 years and sent to England to school while his parents stayed abroad. He was under the care of a master who used to hit him a great deal, and was very unhappy. The asthma started when his parents visited him and he was not allowed to leave with them. It was controlled by allergic factors also. I had no opportunity to treat this boy.

It seems possible to explain the relation of emotion to epilepsy and migraine by postulating that emotion is a point of cortical excitation which is limited by inhibition. If the excitation overcomes the inhibition it can spread over the cortex either as a slow wave, which is migraine, or as a sudden wave, which is epilepsy. Whether asthma is due to this wave of excitation penetrating the hypothalamic regions it is difficult to know. In manic-depression the excitation (emotion) is not allowed to sweep over the cortex but is isolated. The allergic factors such as occur in asthma apparently stimulate one of the links of the chain between the highest cortical units and the bronchial musculature. It is only by postulating some such mechanism as this that one can explain the relief of symptoms by such diverse means as psychotherapy, drugs (such as Luminal), and desensitisation.

I am, Sir, yours faithfully,

CLIFFORD ALLEN.

Harley-street, W., March 30th.

### CARCINOMA OF THE CERVIX IN NULLIPAROUS WOMEN

To the Editor of THE LANCET

SIR,—In that useful little book the "Early Diagnosis of Malignant Disease," by Donaldson, Cade, Harmer, Ward, and Edwards, recently published, reference is made to the early diagnosis of carcinoma of the cervix and it is stated (p. 24) that "carcinoma of the cervix is found solely in patients who have had at least one child." At the Marie Curie Hospital 115 cases of carcinoma of the cervix occurring in women who have never been pregnant have been treated. In some of these, unfortunately, only temporary palliation was possible because the general practitioner, believing that carcinoma of the cervix never occurred in nulliparæ, had treated them for some months with douches, &c., before sending them to hospital.

I am, Sir, yours faithfully,

E. HURDON,

Director, Marie Curie Hospital.

Fitzjohn's-avenue, N.W., March 20th.

### A QUESTION OF PROFESSIONAL CONFIDENCE

To the Editor of THE LANCET

SIR.—Surely this is a very simple matter! Dr. A was quite right in conveying the information to his patient of her maid's complaint. Also, there is no reason why he should refrain from scrutinising the case sheet in the hospital. But if he took care to intimate to the mistress that a more tactful dismissal would be better, he would have saved a lot of trouble. The whole situation seems to have arisen, not through any breach of professional etiquette on either the doctor's or the hospital's part, but merely through a lack of a little of the tact and savoir-faire of which every general practitioner of repute is, or should be, possessed.

I am, Sir, yours faithfully,

March 30th.

M.R.C.S.

### FOTHERGILL TESTIMONIAL FUND

THE following is the fourth list of subscriptions to the testimonial to Dr. E. Rowland Fothergill received in response to the letter published in the *British Medical Journal* and *The Lancet* of Jan. 18th:—

Amount previously acknowledged, £967 8s. 6d.  
 Herefordshire Local Medical and Panel Committee, £15 15s.; Hull Local Medical and Panel Committee, £5 5s.; Sir John Atkins (London), £5; F. J. Gomez (South Petherton) and S. Hunt (Spondon, Derby), each £1 1s.; Dorset Local Medical and Panel Committee, £10 10s.; A. E. Hodder (Stafford), £2; Staffordshire Panel Committee, £20; C. Frier (Grantham), £2 2s.; Renfrewshire Panel Committee, £3 3s.; F. A. Roper (Exeter), £2 2s.; E. A. Gregg (London), £1 1s.; Burnley Panel Committee, £5 5s.; Lancashire and Cheshire Branch, B.M.A., £10 10s.; G. W. Beresford (Hove) and S. Fraser (Hove), each £1 1s.; Cleveland Division B.M.A., £5 5s.; Edinburgh Panel Committee, £2; Anonymous, 10s.; East Lothian Panel Committee, £2 2s.; Members and Staff of Brighton Insurance Committee, £5 5s.; Hastings Local Medical and Panel Committee, £21; A. E. Larking (Beckley), £1 1s.; Burnley Division B.M.A., £5 5s.; J. Livingstone (London (Hamilton)), £2 2s.; Manchester Local Medical and Panel Committee, £10 10s.; N. Kemp (York), £1 1s.; Blyth Division B.M.A., £3 3s.; E. D. Broster (Wirksworth), 10s. 6d.; Lanarkshire Panel Committee and Hertfordshire Local Medical and Panel Committee, each £10 10s.; J. M. Martin (Cheltenham), £1 1s.; L. A. Johnson (York), £1; Leeds Panel Committee, Nottingham Panel Committee, and Bournemouth Panel Committee, each £5 5s.; Barrow Panel Committee, £2 2s.; Cheshire Local Medical and Panel Committee, £50; Greenock Local Medical and Panel Committee, £5 5s.; Huddersfield Local Medical and Panel Committee, £2 2s.; North Riding of Yorkshire Panel Committee, £15; Morpeth Division B.M.A., £3 10s.; Surrey Local Medical and Panel Committee, £3 3s.; M. Du Bois Ferguson (York) and C. Charnock Smith (Hastings), each £1 1s.; Walsall Local Medical and Panel Committee, £3 3s.; Birmingham Panel Committee, £26 5s. Total, £1361 12s.

Cheques should be made payable to the Fothergill Testimonial Fund, and addressed to the Treasurer, Fothergill Testimonial Fund, British Medical Association, B.M.A. House, Tavistock-square, London, W.C. 1.

ROYAL NORTHERN HOSPITAL.—At the annual council of governors of the Royal Northern Group of Hospitals held on March 26th it was stated that the new section to St. David's wing had brought the bed complement of the Group up to 480, but unfortunately 43 of the beds were closed through lack of funds. The number of in-patients treated last year was 6295, and the out-patient attendances numbered 360,637. The casualty department, which is the Islington war memorial, received 18,956 patients, and the X ray department had 18,614 attendances, an increase of over 3000 on 1934. The expenditure amounted to £122,495, an increase of £6212, and the general debt of the hospital now stands at £139,460. An appeal for £350,000 will be launched next year, of which £138,000 will be devoted to maintenance and £212,000 towards buildings. The Zachary Merton trust has also offered £20,000 to provide a new section for early convalescent cases at Grovelands, Southgate.



## OBITUARY

**SIR ARCHIBALD EDWARD GARROD,  
K.C.M.G., M.D., F.R.S.**

CONSULTING PHYSICIAN, ST. BARTHOLOMEW'S HOSPITAL; LATE  
REGIUS PROFESSOR OF MEDICINE, UNIVERSITY OF OXFORD

THE death occurred at his house in Cambridge on March 28th of Sir Archibald Garrod, a leading figure for the last 40 years in scientific research and clinical medicine. We owe to Dr. Hugh Thursfield, his friend and colleague, the following sketch of his career and fine tribute to his great qualities.

Sir Archibald Garrod, the distinguished son of a distinguished father—Sir Alfred Garrod—has passed away in his eightieth year, and the medical profession has to mourn the loss of one who was not only a pioneer in a somewhat obscure field of research but was a source of inspiration and an example of accurate and clear-cut thought to many generations of medical students. He was born, so to speak, in the profession, and married into it, for his wife was the eldest daughter of Sir Thomas Smith, in his day the best-loved surgeon in London.

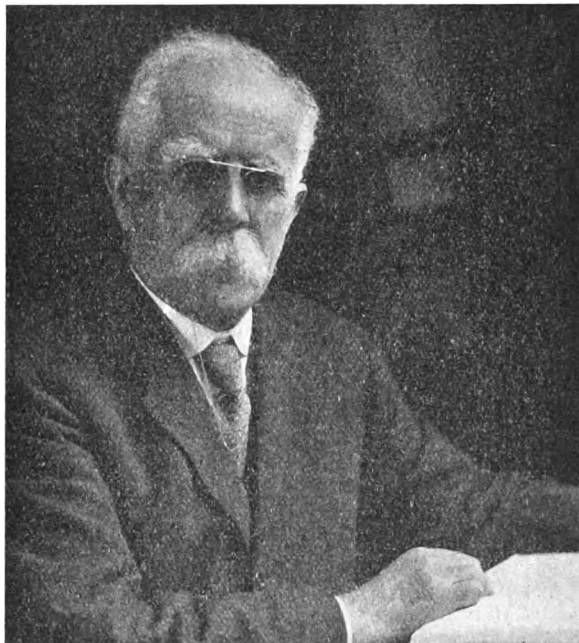
Marlborough and The House at Oxford preceded Garrod's entry to the medical school at St. Bartholomew's Hospital, where after holding the usual house appointments he became successively a teacher in the school, a tutor and registrar, and assistant physician on the staff. For this appointment, the immediate goal of his ambition, he had to wait more years than usually fall to the lot of the aspirant, for at that epoch St. Bartholomew's had a galaxy of medical talent, most of the members of which had reached the staff at an early age, and so blocked the path of Garrod and his contemporaries to promotion. It was therefore only after years of preparation that he attained his ambition. These years were busily employed in the day-to-day work of a medical school teacher, and in research work, which was mainly devoted to chemical investigations of the colouring matters, normal and abnormal, of the urine, a subject, which as he once said to the present writer, "lay on the very fringe of knowledge." His work in this field led to an appreciation of his merits, which at that time was probably higher on the continent, and especially in Germany, than at home, where outside St. Bartholomew's, and a small ring of scientific researchers, he was comparatively unknown.

It was during these years of waiting in connexion with St. Bartholomew's that he became attached to the staff of the Hospital for Sick Children, Great Ormond-street, in the work of which for the next twenty years he took the keenest pleasure. There

also came a period of waiting before he became a physician in charge of beds, but in later years he used to regret occasionally the loss of the opportunity of out-patient work, which with all its limitations and irritations, still offers an unequalled training to the clinician. Thus it happened that he was already past middle age before his reputation had spread beyond the walls of the two hospitals he served with so deep a loyalty and devotion. But he then began to enter upon a practice as a valued consultant, which though it never attained the extent of those of a good many of his contemporaries, yet made a demand on his time, owing to his cautious and deliberate accuracy. This involved to some degree the sacrifice of many of the researches he had planned. But though he

had thus to relinquish some of his personal activity in these directions, the spirit of research lived in him strongly, and in the years which were to come made him a source of inspiration to many of his younger colleagues and pupils.

The war found him with an established reputation and a grown-up family, only the youngest son being still at school. After serving the first part of the war in England he was appointed consulting physician to the Forces in Malta, where in busy work with a happy band of medical and surgical colleagues and helpers he spent the remaining years of the war. But the war brought him the greatest sorrow of his life. His second son was killed in action in the first year; his eldest



(Photograph by Lafayette)

SIR ARCHIBALD GARROD

son, who had become a doctor, was killed by a shell when working with an ambulance; and his youngest son who had survived a year or more of active service died in Cologne after the Armistice in the plague of influenzal pneumonia which in 1918 and 1919 attacked the Army. These repeated blows deprived him temporarily of energy and resolution, and it was a shadow of his former self which returned to St. Bartholomew's in 1919. However not long afterwards he was asked to take charge of the newly formed medical unit at that school, when he threw himself with reawakened zest and earnestness into work with the scope and aim of which he was thoroughly in sympathy. In the comparatively short time during which he remained director of the unit he was able to draw out the lines of an experiment which in the hands of himself and his successor, Prof. Fraser, has proved entirely successful.

From this post he accepted the succession to the professorship of medicine at Oxford, rendered vacant by the death of Osler. He did so with a characteristic modesty, declaring both in public and still more

emphatically in private that he could think of the names of several men better fitted than himself. At the same time he could feel that the work which he had been called to do in the unit at St. Bartholomew's was fairly started, and all his inclination was now to leave its development to younger men, and himself to embark on the "great adventure" of attempting to follow his admired and admiring friend, Osler. He could not, as he said, hope to emulate Osler's influence, and was wont, after he had been a short time at Oxford, to assert that in such a post every man must work on the lines which appeared to him to be most productive of good, and that no one should, or indeed could, pursue, in other than the broadest sense, the precise direction of his predecessor.

Others can appreciate the successes and the failures of his tenure of the professorship which he held till 1927, when on reaching 70 years of age he retired. He had in the meanwhile served both his own and all other English universities well on the Universities Commission.

In the meantime his only remaining child Miss Dorothy Garrod had maintained the family tradition of distinction, though in a new field, that of archaeological and anthropological research. Sir Archibald—he had been created K.C.M.G. in 1918—and Lady Garrod after leaving Oxford had retired to a house which they had long possessed in Suffolk, but not long afterwards they removed to Cambridge, where their daughter was now, in the intervals of her fruitful explorations in Gibraltar and the Near East, a director of studies at Newnham. Sir Archibald was received with open arms both by the University and Colleges of Cambridge; almost, he said, as if they had supposed him capable of changing Dryden's famous lines:

*Cambridge to him a dearer name shall be  
Than his own mother-university,  
Thebes did his green unknowing youth engage,  
He turns to Athens in his riper age.*

In this honoured retirement Garrod passed the remaining years of a life which in many respects was singularly happy, cheered by the warmth of his many friendships, clouded only lately by a steadily failing vision; retaining all his old interests, especially in medical and chemical research, and in his own chosen field still an acknowledged master.

Sir Archibald was, in the prime of life when I first knew him, of markedly handsome presence, with a finely shaped head and face, from which looked out dark eyes of an impressive brilliance, which at first sight seemed to promise quickness, vivacity, and perhaps irascibility. Yet with deeper knowledge it became clear that any such supposition was completely incorrect. Of irascibility there was never a trace; even by a momentary irritation he was but rarely overtaken, and never possessed but for a second or two; and quickness of wit, of which he had plenty, was always subdued to a somewhat slow and deliberate utterance, the outcome no doubt of his life-long habit of conscious self-criticism. This characteristic marked also all his teaching and writing, so that the bulk of his written work is comparatively small, but, especially in his volume on the "Inborn Errors of Metabolism," holding "great riches in a little room."

To all those who have enjoyed the privilege of working with Sir Archibald at any period of his active life, but most of all in what were perhaps his two happiest periods, before the war and when director of St. Bartholomew's unit, his death will come as a reminder of a time when his interest and

enthusiastic desire to help were a part of their own best and busiest days.

Prof. Francis Fraser writes: "The death of Garrod leaves a gap in the medical profession that cannot be filled. There was no one quite like him. An able, practical physician when the need arose, patients, as he said himself, did not really interest him, and the complex problem presented by an individual who is ill did not really appeal to him for solution. In a patient he saw one symptom only, one abnormality, and on this he would concentrate, thinking about it, reading about it, and experimenting with it, all else ignored. It is the mind of the true scientist and often one wondered, and he wondered also, how he had come to be a practising physician. He was almost an onlooker when he applied himself to the daily task of seeing patients and treating them. This daily task was something that had to be done, a price that had to be paid, for the privilege of contact with the numerous intriguing puzzles that he found and set himself to solve. Often he would spend all morning at a window in the ward testing a urine that presented an unusual colour or smell. The morning's round could be left to others. If he could not find the answer himself he would consult Dr. Hurtley in the chemistry department or seek help from his friends at Oxford or Cambridge.

"Each group of students was to him the raw material in which he hoped to find an individual who would be interested in the search for truth, who would be inspired to see a 'higher medicine' in the problems of the ward, who would perhaps be tempted to ignore the immediately practical and devote his life to 'things that matter.' He would look back on his career as a teacher of undergraduates and pick out those whom he thought he had influenced to think clearly and honestly, and with pride he would name those whose careers he had guided. With these ideals and with these objectives in his teaching, it is no wonder that he welcomed the opportunity of becoming director of the professorial unit at St. Bartholomew's Hospital at the close of the war. In the war he had lost his three sons, and it was with paternal devotion that he moulded the unit and with paternal ambition that he looked forward to the unit giving the stimulus and the opportunities for the advance of clinical science to the next generation of medical men. It was only after careful thought and some misgivings that he left St. Bartholomew's Hospital in 1920 to succeed Osler at Oxford, and it was partly the hope that there he could sow seed on soil uncontaminated by considerations of careers and of utility that persuaded him to leave the unit so soon after its inception.

"At Oxford he found the administration of the medical faculty gave him the opportunities for advancing his plans for 'better medicine,' and it was there that he worked at 'Inborn Errors of Metabolism' and 'The Inborn Factors of Disease.' These books epitomise his medical outlook. He saw that there are problems in medicine that are the field of the clinician and that only the clinician can solve, problems that do not interest the physiologist or the pathologist, but require for their solution the aid of the pathologist, the physiologist, and the chemist. He stoutly maintained that the clinician must have his own laboratories, for only he saw the problems and only he would worry at them and solve them. Garrod's researches were biological, though conceived at the bedside, and few physicians have had the power to eliminate the sociological and

environmental factors that obscure clinical medicine and see the clear biological problems beneath as he did. His critical faculties never sterilised his intellect, his honesty was constructive.

"Inclined to long silences, with bushy eyebrows and gentle voice, he had a personality that claimed attention. What he said was worth listening to and worth thinking about long afterwards, for what Garrod said and what he wrote was always carefully pondered and examined. He could be sarcastic but was never unkind, so when he censured strongly there was good reason for it. The deaths of his sons in the war were blows that affected greatly his private life, and no one can tell how they influenced his work, but he was a scholar in all he said and gentle in all he did, and those who had the privilege of knowing him, lived better and worked better because of him."

There should be added to these tributes certain details in Garrod's professional career. It is true that the bulk of his written work was not large but he had a great gift for summarising, in the form of public addresses, both the bearing of his own researches and the influence upon scientific progress derived from other predecessors and contemporaries. At the Royal College of Physicians of London he delivered the Bradshaw lectures in 1900, taking as his subject urinary pigments in their pathological aspects; he was Croonian lecturer of the College in 1908, his subject being the inborn errors of metabolism, a theme developed in his book with that title, and also in "Inborn Factors of Disease" published in 1931. Lastly, as Harveian orator at the College in 1924 he set out in an eloquent way the debt of science to medicine. All these addresses were published in full in THE LANCET at the time of their delivery, and those who consult them will derive from them both wisdom and pleasure. In 1912 he was Lettsomian lecturer at the Medical Society of London. Here in four lectures he told the story of glycosuria with a wealth of detail, chemical and clinical, while the carefully compiled bibliography displayed erudition and industry. In 1920 he delivered the Schorstein lecture at the London Hospital on the diagnosis of diseases of the pancreas, and in 1923 the Linacre lecture at Cambridge, when he modestly entitled his accomplished delivery as Glimpses of the Higher Medicine. In 1927 he delivered the Huxley lecture at Charing Cross Hospital, taking for his subject the broad theme of diathesis. These various addresses amount to a considerable literary performance and many would like to see them published as a volume. To the *Transactions* of the old Medical and Chirurgical Society, to the *Journal of Pathology*, and to the *Proceedings* of the Royal Society he was also a valuable contributor.

He was elected F.R.S. in 1910 for his work in connexion with errors of metabolism, urinary pigments, and alkaptonuria, and served on the council of the society during 1914-15. He was for some time a member of the Medical Research Council, was an honorary member of many English and foreign foundations, and a member of the advisory committee appointed in 1924 by the Home Secretary to report on the administration of the Cruelty to Animals Act. His services as an examiner in medicine were requisitioned by the Universities of Oxford, Cambridge, Glasgow, Manchester, and Liverpool, and by the English Conjoint Board. He was given an honorary doctorate degree of the Universities of Glasgow, Aberdeen, Malta, Dublin, and Padua, the last distinction giving him particular pleasure as emanating from Harvey's university.

Garrod's claim to admiration and respect is unchallengeable, and regret for his death will be widespread and real.

### SIR JAMES SMITH WHITAKER, M.R.C.S. Eng.

LATE SENIOR MEDICAL OFFICER, MINISTRY OF HEALTH

WE announced last week the death at Farncombe of Sir James Smith Whitaker, the medical politician to whose organising powers was due much of the shape which the medical side of the National Insurance Act assumed.

James Smith Whitaker was a Yorkshire man, born in 1866 the son of John Whitaker, of Hawes, and was educated at Manchester Grammar School and Owens College. He qualified as L.R.C.P. Lond., M.R.C.S. Eng. in

1891 and was for a time medical officer in Wye House Asylum, Buxton. He then went into practice in Great Yarmouth and during his ten years in the busy Norfolk town became deeply interested from personal experience in many sides of the general practitioner's life. At that time it had become evident to all who took interest in the practice of their profession that doctors, especially in provincial towns,

suffered seriously from the methods of medical clubs. Numerous societies having as their professed objects life assurance arrangements added to their projects medical aid as an inducement to the public to enter their fold. Many of these societies were at bottom nothing but attempts to secure for the public medical attendance at low rates. And where the management of the society remained entirely in lay hands the interests of both medical men and public suffered badly, competent practitioners saw their poorer, and by no means always their poorer patients taken from them and handed over to the ill-paid salaried servants of a society. In Great Yarmouth an active association of this kind was in existence and its operations led Smith Whitaker to consider whether the medical profession could not organise resistance to a movement which was becoming increasingly mischievous to medicine and public alike. He was a local official of the British Medical Association but found that body not to be inspired with what he considered the necessary zeal or the adequate machinery to deal with the scandal. He associated himself with others who held the same view or who for various reasons were disappointed in the policy of the Association, and he became their spokesman at a meeting held in Manchester in 1900. The meeting in Manchester had for its object to consider the need for reorganisation of the Association, especially on the medico-political side, and the reformers were able at an important conference to take such a strong line that the existing authorities of the Association found themselves in sight of a



[Photograph by Elliott & Fry

SIR JAMES WHITAKER

serious break away from their body. The result, however, proved entirely different. A committee, upon which Whitaker sat, was appointed to enter into negotiations with the council of the Association, with the result that not only was the medico-political side of the Association reconstructed, but what was in effect a completely new constitution was introduced, under which the affairs of the Association have since been administered. In the revolution Victor Horsley took the lead, but Whitaker gave effect, through his remarkable ability for draughtsmanship, both to Horsley's principles and his own views. Under reconstruction the Association became a representative body, and Whitaker, who was appointed medical secretary, proved a conspicuous success in the post. He was a tireless worker, a good public speaker, and while always logical in his expositions, combined persuasiveness with severity, and as a tactician he was remarkably subtle.

On the introduction of the first Insurance Bill all these qualities were of the first advantage to the Association and to the medical profession, and the value that they would have to the Government in the many difficulties obviously ahead was recognised by Mr. Lloyd George who made the dramatic move of securing Whitaker's services for the National Health Commission. As for sound reasons the medical profession had just cause to be critical of the details for working contract practice under the National Health Insurance Acts, the acceptance by Whitaker of the post of deputy chairman of the Insurance Commission came as a shock to many—it wore the appearance of a desertion. But Whitaker was a strong man. He knew perfectly well that he would be reproached for going over to the side against which he had been in action, but he knew intimately the evils to which the new legislation was designed to put an end. He knew also how sound were the grounds on which the medical profession resented the Bill in its original shape, and he apprehended with courage and shrewdness that, while obeying what he considered a public call, he could serve the interests of the profession best by directing official attention to the existent evils. It was on those grounds, and with the formal approval of the council of the British Medical Association, that he accepted Mr. Lloyd George's offer. The result was that the medical profession found inside the precincts of the Ministry of Health a well informed and valuable friend.

The war broke out shortly after Smith Whitaker's appointment as vice-chairman of the Insurance Commission and he played an important part in many of the activities set in motion. At the conclusion of hostilities he settled down to his official duties and was an assiduous public servant in a position which gave no appropriate openings for his talents. It seemed as though the recollection of past abuses, which he had been prominently keen in abating, remained always with him; he was a legalist and formalist, and a champion of the practitioner's rights, but he never showed a large conception of the needs of public health. But the good work that he did for medical practice will never be forgotten. He was knighted in 1931, shortly before his retirement from his official post.

#### THE LATE MR. A. R. TWEEDIE

Two of the late Mr. Tweedie's colleagues have sent addenda to the obituary notice which appeared last week. One colleague writes: "I was associated with Tweedie in various ways and at various times during the past 40 years. He was a man of outstand-

ing ability, among his chief characteristics being his unbounded and untiring energy; and his readiness at all times to assist whenever his advice and help might be sought. It is said that he never sat in an easy chair to read the newspaper or a novel; his time when he was not engaged in carrying out the multifarious duties of his practice being occupied in contributing to the literature of his specialty, in translating, or in reading current medical literature. His aid was never sought in vain; he would throw his whole interest and energy into the elucidation of a correct diagnosis, and this having been made, all his time and thought would be given to affording relief. He was an excellent surgeon, and to his work devoted a whole-hearted enthusiasm; any young men interested in aural surgery found in him a very real friend and helper. His favourite phrase, 'Anything I can do to help, you have only to command me,' conveys the character of the man. He was possessed of a very genial humour, and was an excellent story-teller, and played all his games with the energy that he put into his work."

Another colleague writes: "Tweedie possessed an abounding generosity. He was the most loyal of friends and colleagues. Since the war he kept in touch with all the members of his unit, ever ready to help anyone who was in trouble. A lover of nature; of hills and moors and wild places; of the spring notes of the curlew and the golden plover. His capacity for work was tremendous, but his modesty was such, that in all his labours for the Deaf and Dumb Institute he never let his name appear. A strong man; a robust personality; a good speaker with a ready wit. A man of intense sincerity with a fierce hatred of anything that savoured of selfishness or pretence."

#### INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 21ST, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2453; diphtheria, 1215; enteric fever, 24; pneumonia (primary or influenzal), 1232; puerperal fever, 44; puerperal pyrexia, 116; cerebrospinal fever, 27; acute poliomyelitis, 3; acute polio-encephalitis, 1; encephalitis lethargica, 8; dysentery, 49; ophthalmia neonatorum, 83. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 27th was 6493, which included:—Scarlet fever, 1031; diphtheria, 1111; measles, 2927; whooping-cough, 724; puerperal fever, 17 mothers (plus 12 babies); encephalitis lethargica, 283; poliomyelitis, 5. At St. Margaret's Hospital there were 19 babies (plus 11 mothers) with ophthalmia neonatorum.

*Deaths.*—In 121 great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 114 (38) from measles, 4 (1) from scarlet fever, 32 (6) from whooping-cough, 24 (3) from diphtheria, 61 (22) from diarrhoea and enteritis under two years and 86 (19) from influenza. The figures in parentheses are those for London itself.

The mortality from measles has again risen slightly, the figures for the last seven weeks (working backwards) being 114, 105, 84, 88, 78, 58, 34 for the country as a whole, and 62, 58, 47, 38, 18, 14, 13 for Greater London. Manchester reported 8 deaths, Liverpool 7, Salford 5, Leyton, Tottenham, and York each 4, Dagenham, Bradford, and Leeds each 3, no other great town more than 2. Deaths from influenza were scattered over 49 great towns, Liverpool reporting 4, Portsmouth, Birmingham, and Cambridge each 3. Birmingham reported 6 deaths from whooping-cough, Liverpool and Manchester each 3. Deaths from diphtheria were reported from 15 great towns, 3 from Wakefield, West Ham and Liverpool each reported a death from enteric fever.

The number of stillbirths notified during the week was 294 (corresponding to a rate of 43 per 1000 total births), including 49 in London.

## PARLIAMENTARY INTELLIGENCE

### NOTES ON CURRENT TOPICS

#### Advertisement of Medicines and Surgical Appliances

THE Medicines and Surgical Appliances (Advertisement) Bill was the outcome of the labours of a committee representative of the various interests connected with the trade in proprietary medicines. Their work had been directed towards removing some of the worse abuses in the advertising of proprietary medicines, surgical appliances, and curative treatment. The advertisements which the Bill was designed to control are those which are not only grossly misleading to the public but also tend to bring legitimate proprietary medicines into disrepute. All the principal interests concerned in the proprietary medicine trade had taken part in framing the draft—the manufacturers, the distributors, and the advertisers—and the position of the unqualified practitioners of medicine had received the fullest consideration. The deputation which presented the Bill to the Minister of Health in July, 1935, included representatives of the following organisations:

Advertising Association.	Parliamentary Medical Com- mittee.
Association of Municipal Cor- porations.	Pharmaceutical Society of Great Britain.
British Medical Association.	Periodical Trade Press and Weekly Newspaper Propri- etors Association, Ltd.
County Councils Association.	Proprietary Association of Great Britain.
Institute of Incorporated Practitioners in Advertising.	Surgical Instrument Manu- facturers Association.
National Association of Insur- ance Committees.	Wholesale Druggists Sundries and Proprietaries Associa- tion.
National Pharmaceutical Union.	Wholesale Drug Trade Asso- ciation.
Newspaper Society.	
Parliamentary Committee on Food and Health.	

The Bill was presented by Mr. A. Duckworth in the House of Commons on Feb. 7th and a summary of its provisions appeared in THE LANCET of Feb. 15th (p. 400).

#### MOTION FOR SECOND READING

In the House of Commons on March 27th Mr. DUCKWORTH moved the second reading of the Bill. The scope of the measure was, he said, extremely limited. Its provisions had received the support and approval of a large number of bodies, including the representatives of the proprietary medicines trade, the Advertising Association, the County Council's Association, the Pharmaceutical Society, and many other bodies. It was not promoted by any vested interest and it was not intended to discriminate in any way between the qualified and the unqualified practitioner, nor did they believe that it could possibly damage the interests of any religious body or association since such bodies were specifically excluded from the provisions of the Bill. The Bill sought to remove some of the worst abuses that existed in connexion with the advertisement and sale of patent medicines and secret remedies. It also struck at another method which was only, he thought, practised by the unscrupulous person, and that was the method of offering to diagnose and give treatment by correspondence. The existence of the abuses against which the Bill aimed was not, he thought, disputed, and he did not think that anyone would seek to justify those abuses. The Bill was designed solely to give the public some protection against the worst of the forms of exploitation that were practised by fraudulent and unscrupulous persons for their own profit; and even should this Bill become law it would still leave open an enormous field for the activities of the swindler and the cheap-jack. When they considered the state of the law in this country as compared with the protection in this respect given by the law of other countries, particularly in the British Dominions, it might be justly argued against the Bill that it erred on the side of moderation.

The extent and widespread nature of the abuses which were aimed at by this Bill were first made known to the public through the report of the Select Committee of the House of Commons which sat from 1912 to 1914 and reported in August of the latter year. That Committee in their report made some startling revelations as to the fraudulent claims put forward in advertising many well-known patent medicines on the market and as to the ingredients used in their composition. The report laid emphasis on the abuses and dangers to public health inherent in the advertising of claims to cure diabetes, cancer, consumption, and other diseases listed in Clause 1 of the present Bill. The report laid bare the fact that the traffic in that type of advertisement had grown to enormous proportions and produced evidence to show that agencies had been established where the unscrupulous for a sum of money could purchase thousands of names of persons suffering from these complaints. The Select Committee recommended that all advertisements in connexion with these diseases should be prohibited by law, and that was the intention of this Bill. The Select Committee's recommendations went much further than anything contemplated in the present measure. It was true that the report of 1914 was to some extent out of date and that the public had meanwhile received some additional measure of protection through the passing of the Dangerous Drugs Act and the Pharmacy Act. It was also true that reputable newspapers had now established a voluntary form of censorship which excluded the more unsatisfactory type of advertisement; but all newspapers did not come within the scope of that censorship. Examples of the type of advertisement which were still current and which no one could possibly defend were those which claimed to have cures for diabetes and tuberculosis, and which held out by implication the procuring of miscarriage by women. The last named was one of the most harmful and the most fraudulent, because he had been assured by medical opinion that there was no substance known that was in fact effective for this purpose, and if it was effective it could not be so without proving harmful to the health of women.

Efforts had been made in 1920 and in 1931 to deal with these abuses by legislation, but those efforts had proved abortive. The present Bill was of a much more modest character than its predecessors. It represented the greatest measure of agreement that had ever been attained on this problem, and he believed that it would afford the public the minimum amount of protection to which it was entitled. There was no intention, whatever, to discriminate between the unqualified and the qualified practitioner. The removal of the abuses to which he had drawn attention would be as much to the advantage of the unqualified practitioner as to the orthodox medical profession. Orthodox medicine had made enormous strides during the last 100 years, but he recognised the excellent work carried on outside the orthodox medical profession by osteopaths, herbalists, and others. There was no intention in the Bill of placing difficulties in the path of these people. If it could be clearly shown that the Bill did in any way threaten legitimate interests the promoters would be willing to accept amendments.

Captain ELLISTON, who seconded the motion, said the Bill was sorely needed and long overdue. In his experience he had never known any Bill to be so grossly misrepresented as this one. In this Bill the president of the Royal College of Physicians was placed on exactly the same footing as the most humble unqualified practitioner. In early days of the promotion of the Bill it was proposed to give exemption to qualified medical and surgical practitioners, but when they found that there was this feeling about what was called safeguarding the monopoly of the medical profession they said to the British



Medical Association, "Are you anxious for this protection?" and to his surprise the Association replied, "Not a bit." They said, "Place us on the same footing as unqualified practitioners; we ask for nothing more." That struck him as a very remarkable concession. The amendment to which Mr. Lansbury had lent his name said that the Bill "would unjustly penalise unregistered practitioners of various forms of genuine natural healing and would virtually prohibit the employment of many well-tried methods for preventing disease and correcting functional disorders"—in other words that the unqualified practitioner was better fitted to deal with certain conditions than a man who had been trained for the medical profession. The Privy Council through the General Medical Council had laid down what they considered to be the essential requirements of a medical education. When after a minimum period of five years students left medical schools to practise they left behind them chemists, biochemists, biologists, physiologists, bacteriologists, and pathologists carrying on ceaseless research to keep these men abreast of the latest progress in medicine and science. Any educated man knew that most diseases took many varying forms, and that each case demanded individual study and treatment. The patient who interpreted his own condition by the terms of an advertisement might often prevent the discovery of the real disease. It was a common trick of the quack to pick out certain perfectly normal physiological phenomena and to state in these advertisements that these were indications of incipient disease. They thus fraudulently traded on the fears of nervous people, and that was why so much importance was attached by the promoters of the Bill to personal consultation between practitioner and patients. There was not a hospital surgeon in this country but could testify to delayed inoperable cases in which the affected area had been treated with some secret remedy and in which life might have been prolonged or saved by early treatment.

Capt. Elliston said he felt bound to mention the whip that had been circulated to hon. Members to come to the House to-day to defend the pretensions of the gentleman who had offered to the public for many years past an infallible remedy for tuberculosis known as "Umckoloabo." He asked for no greater example of the class of cure which he hoped this Bill would regulate. The report of the Select Committee described him as "a well-known consumption curer who has been denounced in *Truth* for nearly ten years." When the first draft of this Bill appeared in the newspapers this gentleman wrote to all his cases and asked them to write to him (Capt. Elliston) appealing against this very outrageous Bill, which would rob them of their hopes of life. He (Capt. Elliston) received within a few days, less than 18 months ago, 1350 letters from strong supporters of this remedy. He was bound to say that he was considerably shaken, because they gave such assurances of salvation and rescue from death. Finally he put all these letters in a sack and sent them to Dr. Ernest Ward, the secretary of the Joint Tuberculosis Council, and asked for his answer to them. Dr. Ward had not yet been able to complete his investigation of the letters, but he had sent him an interim report. He had so far secured the investigation of 604 cases of which 31 could not be traced; 137 had never been notified as tuberculosis; 122 were in good condition, or fair condition and working; 115 were ill and not working; 62 were desperately ill, some at the point of death; 77 were dead. He had 30 or 40 typical letters written to him less than 15 months ago by unfortunate people who were "cured" and were now dead. The discoverer of this cure had said, "I do not say in my advertisement that consumption can be cured or that consumption is curable, or any such evasive remarks, but I say that I guarantee to cure you if you are consumptive, or to return your money." He did not know whether those 77 people got their

money back but if they did it must have been small consolation.

In conclusion Capt. Elliston remarked that if this Bill interfered with the liberty of any subject then all the public health legislation passed by that House came under the same description.

#### MOTION FOR REJECTION

Sir ARNOLD WILSON moved the rejection of the Bill. He and his friends did not feel that the orthodox medical profession had a monopoly of wisdom; the Bill would tend unduly to restrict the activities of the unorthodox practitioner. The House should pause before it acted on the assumption that most remedies and alleviations not approved by the orthodox medical profession were fraudulent, and that because remedies and treatment were advertised and sold for profit they were therefore deceptive. He agreed entirely that the problem presented by the vast development of advertising in relation to remedies and treatments should be dealt with and if the Minister of Health brought forward a Bill on the lines of that which was introduced last year the House of Commons would give it a patient and respectful examination. Enormous frauds were being perpetrated on the public, but they were not those dealt with by this Bill. Until men and women were able to take independent views and not be misled by propaganda Parliament must protect them as far as it could. But this Bill would do nothing to prevent the credulity of fools. Not one-quarter of 1 per cent. of the money spent on quack remedies in this country was dealt with by the Bill. This Bill did not touch the real problem. It did not touch the cures for asthma, bronchitis, influenza, the common cold, for too much flesh or too little flesh—a very common source of illness—for rheumatism and arthritis, for too little hair on men and too much on women—by no means safe remedies as they saw from scores of cases—for "that tired feeling" at night and in the mornings, shyness and stammering, pimples and skin diseases. He suspected that those who sought these remedies were not persons who had never gone to their local panel doctors, but persons who had not gained relief by orthodox treatment and turned in desperation to other remedies. What was the real remedy? He did not deny that there were evils, but the remedy was to deal with unorthodox practitioners on their own ground. The General Medical Council should accept for the first time in their history—it would be a great decision—the principle that they or the Medical Research Council should accept responsibility for broadcasting on public health at every opportunity without the grudging statement which every medical man who broadcasted at present received from the B.B.C. that he did so at his own risk. The G.M.C. were so frightened of advertisement that they had made it difficult for medical men to broadcast as they should. He would like to see the National Health Insurance Commissioners spend considerable sums of money on sending out leaflets inculcating positive good health instead of presiding over the permanent endowment of ill-health. The campaign for physical education would be useless unless it was accompanied by a campaign in favour of good positive habits of life. The G.M.C. should move with the times. Was the Medical Research Council making the best use of the money at its disposal? Let them have the antidote to quack remedies over the wireless. "Drugs alone will not cure you. You should go to your doctor early." Syphilis and gonorrhoea deserved far more serious attention than they got. It was a shameful fact that there had been no improvement in the death-rate in this respect for the last 10 years. Let the Minister tackle epilepsy seriously. The Eugenic Society stated that the proportion of mental deficiency in the United Kingdom was four times as great as over the northern parts of Europe. That should make us pause. The remedy was not this Bill, but a bold programme of remedial measures. If the Bill became law it would provoke fruitless,



barren, bitter, and purely negative controversy, and would tend further to exacerbate public opinion which was inclined to regard the medical profession with a suspicion which was unfair and unjust.

Mrs. TATE seconded the motion for rejection. She said the Bill would not do what it was designed to do because it was full of loopholes. How was it proposed to prevent the wireless broadcasting from a foreign station in English of advertisements of patent medicines? She deeply sympathised with the object of the provision in the Bill in regard to advertisements for procuring miscarriage of women. She knew how numerous those advertisements were and how serious the matter was. But even if the Bill did away with those advertisements altogether women would not be safer. If these drugs were taken away women would go in increasing numbers to the women who used some sort of instrument—an unsterilised knitting needle or something of that kind. If the Bill were passed there would also be a grave danger that some men whose work might be of immense value to the health of the nation would in future years be debarred from giving such help.

#### THE DEBATE ADJOURNED

Mr. J. G. KERR, speaking as a teacher of biology, said it was necessary to realise the immense amount of natural healing that goes on in the animal kingdom. Before he had had time to develop his argument attention was called to the fact that there were not 40 Members present.

The House was "counted out," the debate on the Bill being adjourned.

#### Public Health (London) Bill

On March 26th, in the House of Lords, Lord BALFOUR OF BURLEIGH moved the second reading of the Public Health (London) Bill. It was, he explained, a consolidation measure promoted by the London County Council after consultation with the Metropolitan Boroughs Standing Joint Committee, and also with the Ministry of Health. Public health legislation was regulated so far as London was concerned mainly by the Public Health (London) Act, 1891, and so far as the provinces were concerned by the Public Health Act of 1875. The law relating to Public Health in London had not been consolidated since the passage of the 1891 Act. Moreover, when that consolidation took place the laws relating to two very important parts of public health legislation—namely, sewerage and drainage and common lodging-houses—were not included in the consolidation. It had now been thought right to bring these within the scope of this Bill. They were at present governed, so far as sewerage and drainage were concerned, by the Metropolitan Management Acts of 1855 and 1862, and so far as common lodging-houses were concerned by the Acts of 1851 and 1853; and all these enactments were now brought within the scope of this consolidation. The public health legislation of London really could only be described at the moment as a jumble. It was in fact a maze, the route to the centre of which was beset with very grave difficulties, and this state of affairs had become an obstacle to good administration. This Bill included the whole of nineteen Acts so far as they applied to London, the whole of four other Acts, except so far as they related to the City of London, and parts of 57 other Acts. The consolidation of 80 Acts of Parliament into one would greatly simplify the administration of the public health legislation of London.

Viscount GAGE, on behalf of the Ministry of Health, stated that the Department regarded the Bill as a valuable clarification of the existing law. Naturally, it would have to be examined with great care by the Joint Committee on Consolidation Bills, but the Government welcomed it in principle.

The Bill was read a second time and referred to the Joint Committee.

#### National Pension Fund for Nurses

In the House of Lords on March 31st, the Royal National Pension Fund for Nurses Bill was read the third time and passed.

#### HOUSE OF COMMONS

WEDNESDAY, MARCH 25TH

#### Medical Examinations at Junior Training Centres

Mr. WILSON asked the Minister of Labour what steps were taken at the juvenile training centres to see that no physical deterioration was taking place; and whether at any period a medical examination took place.—Lieut.-Colonel MUIRHEAD replied: Under the existing scheme local education authorities have power to make their school medical service available to such juveniles attending junior instruction centres as are referred by the superintendent of the centre, and a considerable number of authorities have made such provision. I may add that it has been found in practice that the terms of the statutory scheme governing the provision of those medical services are too restrictive, and my right hon. friend hopes shortly to be able to announce to education authorities generally an amendment of the scheme to enable the school medical officer, if he finds it necessary to do so, to examine boys or girls other than those referred by the superintendent of the course.

THURSDAY, MARCH 26TH

#### Training Camps

Mr. ANDERSON asked the Minister of Labour what arrangements were made for the medical examination of men before being sent to training camps in view of the heavy work performed there; and how many men were rejected as unfit to enter these camps for the three months ended February, 1936.—Mr. ERNEST BROWN replied: Men are not admitted to instructional centres unless found on medical examination to be fit for admission. Men not fit for heavy work are passed for light work only. During the three months ended February, 1936, 940 men, or about 17 per cent., were rejected for training on medical grounds.

Miss WARD asked the Minister of Labour whether he was yet in a position to make a statement with regard to the providing of medical treatment for young men in accordance with the recommendations of the special commissioner.—Mr. ERNEST BROWN replied: I am proposing to set up a number of special local centres in the special areas of a non-residential character, in which men will receive preliminary training before entering either a Government training centre or an instructional centre. In any case where young men are in need of remedial treatment of a simple character, arrangements will be made for them to receive it in connexion with the centre. Pending the establishment of such centres, where it is necessary I shall hope to arrange as a temporary measure for the admission of such cases to one or two of the residential instructional centres where special arrangements for their treatment will be made.

FRIDAY, MARCH 27TH

#### Medicine Stamp Duty

Mr. HOLMES asked the Chancellor of the Exchequer the amounts received for medicine stamp duty in the years 1932-33, 1933-34, 1934-35, and the estimated amount to be received in the year 1935-36.—Mr. CHAMBERLAIN replied: The net receipts from the medicine stamp duty for the years 1932-33 to 1935-36 were as follows:—

1932-33	..	£882,006	1934-35	£709,046
1933-34	..	£777,131	1935-36	.. £730,000*

\* Estimated.

#### Playing Fields and Physical Training

Mr. JOEL asked the President of the Board of Education by what date the inquiry into the adequacy or otherwise of playing fields and physical training arrangements at elementary schools would be completed.—Mr. OLIVER STANLEY replied: In January last the Board issued a

circular on physical education, in which they expressed the hope that the authorities would survey the needs of their areas for playing fields and facilities for physical training and organised games. The authorities are showing great interest in the circular, but I think my hon. friend will agree with me that this matter is not one which can be dealt with by means of a survey, subject to a time limit.

#### Temporary and Voluntary Patients in Mental Hospitals

Mr. SORENSEN asked the Minister of Health how many temporary and voluntary patients received treatment in mental hospitals in 1935.—Sir KINGSLEY WOOD replied: According to the returns 1532 temporary patients and 9744 voluntary patients received treatment in mental hospitals in 1935. The latter figure is, however, subject to a small deduction to allow for persons who may have been admitted to treatment on more than one occasion during the year.

#### Antimony in Enamel Ware

Mr. BANFIELD asked the Minister of Health whether he proposed to introduce legislation to give effect to the recommendation contained in No. 73 of Reports on Public Health and Medical Subjects for the total prohibition of antimony in enamelled hollow-ware.—Sir KINGSLEY WOOD replied: I have under consideration the question of legislation on this subject, but I am not at present able to say when it will be possible to introduce a Bill.

#### Acetic Vinegar

Mr. DENVILLE asked the Minister of Health whether his attention had been drawn to the recent death of a farm labourer at Wainfleet as the result of drinking so-called concentrated vinegar concocted from acetic acid; and, in view of the fact that the sale of acetic acid as vinegar, whether diluted or undiluted, was prohibited by law in almost every country in the world, he would take steps to protect the public from the obvious risks of poisoning which they were running at the present time by prohibiting the sale of acetic vinegar.—Sir KINGSLEY WOOD replied: Yes, Sir. As my hon. friend may be aware, the case referred to has been the subject of a coroner's inquest. The question of the designation of acetic acid mixtures has been noted in connexion with the issues, at present under my consideration, which were raised in the report by the Departmental Committee on the Composition and Description of Food.

#### Public Health Acts Consolidation

Sir ROBERT TASKER asked the Minister of Health whether he contemplated introducing a Bill this session to consolidate the various Public Health Acts; and, if so, he would take the opportunity to make the necessary amendments consonant with technical progress.—Sir KINGSLEY WOOD replied: The Bill to which my hon. friend refers was introduced in another place in the early part of this week. Within the limits applicable to a Bill whose principal object is the consolidation of the existing law, I hope my hon. friend will find in the Bill an affirmative answer to the second part of his question.

#### Abortions and Maternal Mortality

Colonel SANDEMAN ALLEN asked the Minister of Health if the maternal mortality returns from his Ministry included those caused by abortions; and what percentage of those figures were due to illegal abortions.—Sir KINGSLEY WOOD replied: The published statistics of maternal mortality in England and Wales (deaths classified to pregnancy and childbearing) include deaths due to abortion or miscarriage with the exception of those classified to criminal abortion on a coroner's certificate, which are separately shown. Full analyses of all forms of maternal mortality and fatal abortion are annually included in the Text Volume of the Registrar-General's Statistical Review.

MONDAY, MARCH 30TH

#### Temporary Pensions for Neurasthenia and Shell-shock

Mr. ANDERSON asked the Minister of Pensions if he was aware of the ill-effects caused to ex-Service men suffering from neurasthenia or shell-shock by the non-

permanence of their pensions; and if he would arrange for all such pensions that had been given continuously for eight years or more to be made permanent.—Mr. R. S. HUDSON replied: Of the total number of pensions in issue for neurasthenia and shell-shock over 91 per cent. have been made permanent. To make awards permanent in cases where the prognosis is still uncertain would not be in the interests of pensioners, but awards for prolonged periods are given in all suitable cases.

#### Advertisements of Aids for Hearing

Mr. THORNE asked the Postmaster-General whether he was aware of the unfairness to the deaf arising from exaggerated advertising of aids for hearing; if he would decline to accept advertisements for insertion in books of stamps and other post office publications from dealers whose business practices were thus prejudicial to the interest of the deaf; and, before accepting advertisements of aids for the deaf, if he would communicate with the secretary of the National Institute for the Deaf.—Major TRYON replied: I am looking into the question raised by the hon. Member.

#### Anti-Gas Training

Sir GIFFORD FOX asked the Home Secretary (1) whether any local authorities in the London area were operating his anti-gas order and whether he could give the names of such authorities; and (2) if he would state the number of local authorities who had taken any action in the direction of providing gas-masks and providing anti-gas training.—Mr. G. LLOYD, Under-Secretary, Home Office, replied: A circular letter was sent to local authorities on Feb. 24th inviting them to submit the names of employees who should receive training as instructors in anti-gas measures at the civilian anti-gas school. As the circular letter suggested consultation among neighbouring local authorities, it is too early yet to make any statement about the general response to the circular, but I am quite satisfied with the progress that has been made so far. It is hoped by the end of this year that approximately 600 qualified instructors will have passed through the school. The Government has undertaken to provide respirators and protective clothing at the cost of the Exchequer to persons on air raid precautionary services.

#### Compensation for Occupational Diseases

Lieut.-Commander FLETCHER asked the Minister of Labour when it was proposed to ratify the international labour conventions on night work for women (revised), workmen's compensation for occupational diseases (revised), hours of work in the sheet-glass industry, and unemployment provision.—Lieut.-Colonel MUIRHEAD, Parliamentary Secretary to the Ministry of Labour, replied: A Bill to enable the draft conventions concerning the night work of women (revised) and hours of work in the sheet-glass industry to be ratified is now before the House. As regards the conventions concerning workmen's compensation for occupational diseases (revised) and unemployment provision, a Command paper announcing the intention of His Majesty's Government to ratify was presented last January, and the necessary Orders of the Privy Council are now being printed. Subject, in the case of the two former conventions, to the passing into law of the Bill referred to, I anticipate that it will be possible very shortly to notify the Secretary-General of the League of Nations of the ratification of all the four conventions.

TUESDAY, MARCH 31ST

#### Dust in Textile Card-rooms

Mr. RHYS DAVIES asked the Home Secretary whether he was aware that negotiations for the establishment of a voluntary fund to provide compensation for the victims of dust in textile card-rooms had proved abortive; and whether he would now take steps to achieve the object in view by some other means.—Mr. GEOFFREY LLOYD replied: Representations have been received on this matter from the Amalgamated Association of Card Blowing and Ring Room Operatives, who have asked for a deputation to be received. My right hon. friend has asked me to receive the deputation on his behalf, and I

(Continued at foot of opposite page)

## PANEL AND CONTRACT PRACTICE

### Secrecy of Medical Records

THE letter of *Iatros II.* on p. 742 of our last issue may give rise to misapprehension about the confidential nature of entries on medical records. In the case related a patient on the list of Dr. A. in the area of committee X. secured acceptance as a temporary resident by Dr. B. in the area of committee Y. It is stated that the clerk to the Y. insurance committee returned the record form on the ground that it contained insufficient professional details. Now the only details with which an insurance committee is normally concerned are (1) name and address of the insured person and (2) particulars of society or fund membership. Some committees now credit doctors for temporary residents only when a continuation card, showing that treatment has been given, has been submitted, and in such cases the clerk of the committee (or an officer specially deputed by him) would have to satisfy himself that the continuation card actually indicated that treatment had been given. But the clinical notes are no concern of the insurance committee or of its officers. When the present system of envelope medical records was initiated in 1921 the records had to be transmitted in a separate window envelope which allowed the staff of the committee to see the particulars which affected them and nothing else; this rather cumbersome arrangement was terminated in 1923, at the request of the Insurance Acts Committee, on the definite understanding that the records would be handled either by the clerk himself, or by an assistant specially deputed by him, who would be pledged to respect their confidential nature.

As regards the transmission of continuation cards for temporary residents from one doctor to another in sealed envelopes it is a fact that some committees make this arrangement but it applies only where credits are allowed whether treatment is given or not. In the case of other committees the fact of treatment being given on certain dates (a temporary resident is not temporary for more than three months from the date of arrival) must be made known to the committee in order that the treating doctor may be properly remunerated. Possibly Dr. B. could have overcome his difficulty by inserting the dates together with a reference to his having sent a report on diagnosis and treatment direct to Dr. A. Dr. A. could place the report inside the envelope record, as is the practice with hospital reports, reports of the R.M.O., and the like. It is not explained why Dr. B.'s trouble seems to be restricted to temporary residents; does he make entries of treatment of his permanent patients who suffer from ailments which they would prefer should not be divulged?

*(Continued from previous page)*

will arrange to do so at an early date. The position will be further considered in the light of the information furnished by the deputation.

### Milk Designations

Sir GIFFORD FOX asked the Minister of Health whether he had now reached any decision with regard to the suggested designations for milk; and whether in any case he proposed to postpone the coming into force of any order on the subject.—Mr. SHAKESPEARE replied: My right hon. friend regrets that he is not yet able to announce his decision on this subject. He is postponing the operation of the new order until June 1st.

After all the envelope records also have to pass through the insurance committee office if the patient happens to transfer. But since, as Dr. B. admits the medical service subcommittee have twice recommended deductions from his remuneration for delay in returning medical records, he gets over the difficulty by not returning the records.

### Surgery Visitation

A few weeks ago the London insurance committee had an experience (*THE LANCET*, March 7th, p. 574) which led it to ask the medical benefit subcommittee to consider what steps should be taken to satisfy themselves with the surgery accommodation to be provided by an insurance practitioner. The Insurance Acts Committee have had some qualms about this inquiry, and one of their members, pointing out that it was illegal for any surgery inspection to take place before a doctor had his name on the medical list, expressed the view that even if the inspection was voluntary it whittled away something of the right of every qualified practitioner to have his name on the list. The London representatives explained that the surgery accommodation was sometimes of a kind likely to bring the service into disrepute and friendly advice beforehand would prevent this. They may have had in mind the doctor whose consulting-room, in which he also lived, was approached by forty narrow winding stairs, and whose waiting-room was the landing. It was proposed that a medical man from the panel committee and the clerk of the insurance committee should together visit each new applicant and advise him if necessary.

In Edinburgh the practice is for the clerk of the insurance committee to notify the panel committee of doctors asking to be admitted to the medical list, and if there is reason to suppose from a knowledge of the neighbourhood or of the premises that the accommodation is likely to be unsatisfactory the applicant is visited by two members of the panel committee. Birmingham goes farther. In 1922 the insurance and panel committees there appointed a special joint subcommittee to consider questions relating to the efficiency of the insurance medical service, and under the direction of that subcommittee the doctors' waiting-rooms and surgeries were visited by non-medical members of the insurance committee. The local panel committee have agreed to the proposal that surgeries and waiting-rooms should be visited by non-medical members of the insurance committee, but they think that this should apply chiefly to doctors whose premises have not been previously visited, and that the insurance committee itself should decide when it is a question of revisitation. The panel committee have been asked to appoint four members to serve on a joint subcommittee to deal with the matter.

WESTMINSTER HOSPITAL.—The discovery is announced that an old banded iron strong-box in which the great seal of this hospital is kept is of Spanish workmanship of the sixteenth century, and is probably a relic of the Spanish Armada. There is a reference to the box in the minutes of the hospital for 1732-33, and it is thought to have been a gift from Mr. Henry Hoare, the banker, to the hospital on its foundation in 1719. A correspondent of the *Times*, however, believes "Armada chests" to be of late seventeenth or early eighteenth century German origin.

## MEDICAL NEWS

### University of London

Prof. A. K. Henry has been appointed to the university readership in surgery tenable at the British Postgraduate Medical School. Since 1925 he has been professor of clinical surgery in the medical school at Cairo and director of the surgical unit at Kasr-el-Aini Hospital.

Prof. Henry was born in 1886. He studied at Trinity College, Dublin, where he obtained a scholarship and gold medal in natural science in 1909 and graduated M.B. in 1911. In 1914 he came to London as house surgeon and medical registrar at the Cancer Hospital, and in 1915 went abroad to serve as a surgeon, first with the Serbian Relief Fund unit and later with the Royal Army Medical Corps and with the French Army. For his services he was decorated with the Order of St. Sava and made a chevalier of the Legion of Honour. In 1919 he returned to Dublin as assistant surgeon to the Royal Hospital and surgical specialist to the Ministry of Pensions; he also held the post of senior demonstrator in anatomy at the Royal College of Surgeons in Ireland. He took up his present appointment in 1925.

At recent examinations the following candidates were successful:—

D.M.R.

*Part I.*—S. B. Adams, F. R. Berridge, George Friedlaender, J. J. Magner, R. K. Modi, P. J. B. Murphy, H. E. Oford, Ihsan Qainaqchi, Atul Rakshit, B. G. Thompson, J. A. Vote, and A. J. O. Wigmore.

Among those who are to receive honorary degrees from the University in connexion with its centenary celebrations this year are Prof. Einstein, Sir William Bragg, P.R.S., Sir George Newman, Sir Joseph Larmor, F.R.S., Mr. H. G. Wells, Lord Snell, and Mr. S. A. Courtauld (chairman of council of the Middlesex Hospital medical school).

### University of Manchester

At recent examinations J. A. Hobson and Geoffrey Williamson were successful in the first part of the examination for the diploma of psychological medicine.

On May 20th the hon. degree of D.Sc. will be conferred on Dr. John Beresford Leathes, F.R.S., emeritus professor of physiology in the University of Sheffield.

### University of Dublin

At recent examinations at the School of Physic, Trinity College, the following candidates were successful:—

M.D.

Abraham Agranat, James Bell, W. A. Hopkins, and J. C. T. Sanctuary.

M.CH.

C. S. Wilson.

FINAL EXAMINATION FOR M.B., B.CH., B.A.O.

*Medicine.*—W. A. Gillespie, Max Levy, Neville Jackson, G. C. Retz, G. W. Patterson, W. D. Chesney, and John McQuillan.  
*Midwifery.*—\*E. W. L. Thompson, \*Isabelle M. V. Elliott, G. B. Jackson, D. T. Bardon, F. M. D. Byrn, S. E. M'Connell, M. R. W. Spack, J. M. Bryson, H. A. Daniels, H. W. W. Good, R. F. Cantan, J. H. A. Jewell, Francis Keane, J. G. Steinbock, Monty Toohey, B. P. P. Berney, Peter Delap, C. W. Greene, W. E. Connihan, G. L. Daly, Hyman Elliman, D. H. A. Irwin, E. T. McCartney, Margaret Perry, R. J. Sandys, T. S. Agnew, D. P. Beckett, Cecil Eppel, E. D. Mansell, P. J. Mulaney, B. G. Kearon, P. G. Patton, D. S. Toole, and J. G. Cunningham.  
*Surgery.*—\*W. A. Gillespie, D. J. Hayes, G. H. B. Roberts, Benjamin Rogol, J. C. Roux, G. S. Caithness, Bethel Lapedus, F. T. P. Bergin, J. J. Talbot, P. X. O'Dwyer, R. A. Bond, and R. L. Oakes.

D.P.H.

*Part I.*—\*W. C. B. Harrison, H. O. Mackey, P. B. Robinson, R. I. G. Reid, and H. R. Rogers.

\* Passed on high marks.

### British College of Obstetricians and Gynæcologists

The following have been awarded the diploma of the college after examination:—

A. M. F. Batty, Anthea A. Benham, J. A. Bentham, E. C. Bryant, H. F. P. Grafton, J. C. Gregory, Mahmoud Ismail, C. F. Krige, T. E. Lennon, E. W. Martindell, J. K. McCollum, William More, Dudley Racker, William Simpson, I. H. K. Stevens, and Anne E. Williams-James.

### Atmospheric Pollution

An educational exhibition illustrating smoke abatement and atmospheric pollution is to be opened by Sir Kingsley Wood, the Minister of Health, at the Science Museum, London, in October next. It is being designed to show the harmful effects of polluted atmosphere on health, buildings, vegetation, works of art, fabrics, and food, as well as the difficulty and danger caused to aviation. Further information may be had from the National Smoke Abatement Society, Salisbury-square House, Fleet-street, London, E.C.4.

### Hunterian Society

The 116th annual general meeting of this society will be held on Monday, April 6th, at Simpson's Restaurant, Cheapside, at 7.15 p.m. The business of the meeting will begin after dinner, at about 8.30 p.m., and will be followed by a short talk on mild radium therapy by Dr. Howard Humphris.

### London Jewish Hospital Medical Society

The annual oration of this society will be delivered at B.M.A. House, Tavistock-square, London, W.C., on Thursday, April 16th, at 4 p.m., by Dr. Robert Hutchison. He will speak on constitutional medicine.

### Congress of Sanatoria and Private Nursing Homes

The first International Congress of Sanatoria and Private Nursing Homes will be held in Budapest at the end of September. Further information may be had from the committee of the congress, Margitsziget Sanatorium, Budapest.

### Central Association for Mental Welfare

A course for persons engaged in the training of mental defectives in occupation centres or mental hospitals will be held in London from July 4th to 25th. Further information may be had from the secretary of the Central Association for Mental Welfare, 24, Buckingham Palace-road, London, S.W.1.

### British Red Cross Society

The King has become patron of this society, which has had the patronage of the reigning monarch since its foundation in 1870. Queen Mary is the president, the Duke of York chairman of council, and the Princess Royal commandant-in-chief of British Red Cross voluntary aid detachments.

### London County Council Hospitals

It is stated that the council have spent over £1,321,000 on the hospitals in their charge since they took them over from the old boards of guardians in 1930.

### Wingfield-Morris Orthopædic Hospital, Oxford

The Minister of Nepal in London has given £4000 to this hospital to provide a new ward for the treatment of infantile paralysis and £250 for a hard tennis court for the nurses.

### Post-graduate Courses in Tuberculosis

Under the auspices of the Joint Tuberculosis Council a post-graduate course on tuberculosis will be given by the medical and surgical staff of the Royal Chest Hospital, City-road, London, E.C., from May 4th to 9th. Short intensive post-graduate courses on modern methods of therapy in tuberculosis of the respiratory system with special reference to collapse therapy will also be given by Dr. Peter Edwards at the Cheshire Joint Sanatorium, near Market Drayton, Salop. The courses will be held from April 21st to 23rd, June 23rd to 25th, and Sept. 22nd to 24th. Inquiries about them should be addressed to the hon. secretary for the council's post-graduate courses, 8, Christ Church-place, Epsom, Surrey.

### Royal Sanitary Institute

A meeting of this institute will be held in the Guildhall, Swansea, on Friday, April 17th, at 2.30 p.m., in conjunction with the Welsh branch of the Society of Medical Officers of Health. Prof. R. M. F. Picken will open a discussion on the coördination of general hospital services and the provision of additional accommodation, and Mr. Walter Hunter on the coördination of housing, rehousing, and redevelopment under the housing acts with regional and town planning.

On Tuesday, April 21st, at the house of the institute (90, Buckingham Palace-road, London, S.W.), Dr. E. Kaye L Fleming, chairman of the physical education committee of the British Medical Association, will open a discussion on the problem of physical education in schools.

THE President of the French Republic has conferred upon Sir Henry Wellcome, LL.D., F.R.S., the Croix d'Officier de la Légion d'Honneur.

#### Food Production on the Continent

A party of British food chemists is to pay a visit to Holland in May. The tour, which is being arranged by the food group of the Society of Chemical Industry, follows on a similar visit paid last year to Paris and Brussels in which about 40 chemists took part.

#### Lincoln County Hospital

In connexion with the appeal for the extensions of this hospital, it is announced that £55,000 has been spent. The sum of £39,000 has already been received and a further £16,000 is needed at once.

#### Princess Alice Hospital, Eastbourne

Last year 1561 in-patients were treated in this hospital as against 1519 in 1934, but the report submitted at the annual meeting on March 20th showed a deficit on the year's working of £958, and an accumulated deficit of £7686. To meet this deficit the governors have reluctantly drawn upon the endowment fund and some legacy money. The hospital was fortunate last year in the amount it received in legacies, but subscriptions and donations fell by £932. The household box scheme however yielded £5866, which is £523 more than in 1934. The hospital has 116 beds, and the daily number of patients during the year was 108 to 110, but further extensions cannot be considered until the finances improve.

#### Medical Panel for Nurses' Examinations

In our advertisement columns will be found a notice that the General Nursing Council for England and Wales is now seeking the co-operation of doctors in the preliminary as well as the final State examination. Applications are invited (1) from "medical practitioners of good standing who have held a resident or other post on the staff of a hospital and who have experience in teaching" for examinerships in anatomy and physiology, and (2) from present or past members of the staff of hospitals recognised by the Council as complete training schools for nurses, for examinerships in medicine and in surgery. Examinations are held three times a year—in February, May, and October—and the names of examiners are entered on a panel from which those selected to serve are called up as required.

#### A Patients' Library for the Middlesex Hospital

The value of ample reading matter of all kinds to hospital patients was proved by the libraries for wounded soldiers initiated by Mrs. Gaskell during and after the late war, and there are now few hospitals, either voluntary or municipal, without a supply of books. A large modern library, fully equipped with bookcases and space for 10,000 books, has just been installed in the reconstructed Middlesex Hospital as a gift from the staffs of the *Times* and the *Times* Book Club. The presentation was made by Major Astor, M.P., on March 25th, in the presence of the governors, the medical staff, and voluntary workers at the hospital, and many others interested in the library movement. Prince Arthur of Connaught, in accepting the gift, spoke of the need for such a service for the patients and its help in a sound recovery; the gift came most happily and appropriately from the great national newspaper and its admirable book club. Mrs. Beddington, head librarian, traced the development of hospital libraries from sporadic beginnings to 1930 when organised libraries were generally started. Her voluntary staff rose from 8 last year to 18 this year, and in the 12 weeks from Jan. 1st to March 18th they had issued 4557 volumes, including books of all kinds and in many different languages. This library was one of the training schools for voluntary librarians in association with the Guild of Hospital Librarians recently formed for pooling and disseminating information about the formation and running of patients' libraries. On behalf of the donors Major Astor stated that the gift was the outcome of the realisation that the tedium of illness and convalescence can be relieved by the solace of books; they hoped the library would help the patients along the road to recovery and add something to the pleasant recollection they would carry away with them.

#### Royal Society of Medicine

The house and library of this society (1, Wimpole-street, London, W.) will be closed from Thursday, April 9th, to Tuesday, April 14th, both days inclusive.

#### Torbay Hospital

This hospital has only £330 with which to meet its debts of £5868. Subscriptions have again fallen, though a payment of £6555 was made by the contributory scheme.

#### Leeds General Infirmary

In the latest report of this hospital it is stated that in 1935 £4014 was spent on the in-patient treatment of accident cases of which only £2197 was recovered.

#### King's College Hospital

The Duke of York has issued an appeal on behalf of this hospital. To complete the buildings now in progress of erection, including the nurses' home, about £85,000 is needed, while alterations to the X ray department and new apparatus will cost £20,000, and the dental department and its equipment £8000. There is an outstanding debt of £57,000. As a beginning a sum of £79,000 has been collected.

#### Birmingham Hospital Centre

A sum of £770,000 towards the £1,250,000 which it is estimated the new centre will cost has been raised or promised. So far the appeal expenses have not amounted to 1 per cent. A general hospital of 500 beds with nurses' home and the medical school buildings will probably be finished by October, 1937.

#### Royal Free Hospital

The London (Royal Free Hospital) School of Medicine for Women has received an anonymous gift of £11,000 to endow the Free Woman's Lectureship in Clinical Medicine, and Dr. Una Ledingham, assistant physician to the hospital, has been appointed to the lectureship.—The Aldrich Blake travelling scholarship for 1936 has been awarded to Miss Geraldine Barry, assistant surgeon to the hospital.

#### Guest Hospital, Dudley

Workpeople's contributions here have reached a record sum of £8435, an increase of £771. The old buildings are decayed and no longer safe and £30,000 is to be spent in erecting a new administration block. At present there are 107 beds and a waiting-list of 284. The wards now being built will add 56 beds to the accommodation.

## Appointments

BOMFORD, R. R., B.M. Oxon., M.R.C.P. Lond., has been appointed Medical First Assistant and Registrar at the London Hospital.

BROWN, K. R., M.B. Glasg., F.R.C.S. Edin., Assistant Medical Officer of Health for Harrow.

CARTWRIGHT, F. E., M.R.C.S. Eng., D.A., Hon. Anaesthetist to the Ear, Nose, and Throat Department at St. John's Hospital, Lewisham.

HALL, A. S., M.B. Camb., M.R.C.P. Lond., Tuberculosis Medical Officer for Harrow.

HUGHES, D. O., M.B. Liverp., D.P.H., Assistant Medical Superintendent at High Carley Sanatorium, Preston.

MILLIGAN, P. J. W., B.M. Oxon., Resident Medical Officer at Royal Surrey County Hospital, Guildford.

PERRY, K. M. A., B.Chir. Camb., Medical First Assistant and Registrar at the London Hospital.

PHILLIPS, Prof. MILES H., M.D. Brist., F.R.C.S. Eng., F.C.O.G., Hon. Consulting Gynaecologist to the Rampton State Institution, Retford.

SIMPSON, Prof. GRAHAM S., F.R.C.S. Eng., L.D.S., Hon. Consulting Surgeon to the Rampton State Institution, Retford.

TIMMS, W. G., M.B. Liverp., Junior Assistant Medical Officer, Wroughton Hospital, Preston.

TOPHAM, E. J. E., M.B. Leeds, D.M.R.E., Junior Assistant Medical Officer in the Radiological Department of the Manchester Royal Infirmary.

WATSON, JEAN C., M.B. Belf., D.P.H., Assistant County Medical Officer of Health for Warwickshire.

*Middlesex Hospital.*—The following appointments are announced:

GRAY, C. H., M.B. Manch., F.R.C.S., Fracture and Orthopaedic Registrar;

JOHNSON, B. R. M., M.R.C.S. Eng., Anaesthetist; and

ROBERTS, F. W., M.B. Lond., Assistant Anaesthetist.

Certifying Surgeons under the Factory and Workshop Acts: Dr. D. F. SUTTIE (Auchtermuchty District, Fife); Frodingham District (Lincolnshire).

## Vacancies

For further information refer to the advertisement columns

**Ashton-under-Lyne District Infirmary.**—H.S. At rate of £150.

**Aylesbury, Royal Buckinghamshire Hospital.**—Second Res. M.O. At rate of £150.

**Beckenham, Bethlem Royal Hospital, Monks Orchard.**—Two Res. H.P.'s. Each at rate of £175.

**Birmingham, Canwell Hall Babies' Hospital.**—Res. M.O. At rate of £250.

**Birmingham City.**—Sen. Asst. M.O.H. £750.

**Birmingham City, P.H. Dept.**—Res. Asst. M.O. £400.

**Birmingham, Queen's Hospital.**—Bacteriologist and Clinical Pathologist. £600. Also Res. Surg. Reg. £125.

**Bolton Royal Infirmary.**—H.S. £125.

**Bradford Children's Hospital.**—H.P. £100.

**Brighton, Royal Sussex County Hospital and Hove General Hospital.**—Hon. Physiotherapist.

**Bristol Eye Hospital.**—Jun. Res. H.S. £100.

**Bristol Royal Infirmary.**—Hon. Asst. Surgeon. Also Hon. Clin. Asst.

**Burnley, Victoria Hospital.**—H.P. At rate of £150.

**Canterbury, Kent and Canterbury Hospital.**—H.S. £125.

**Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.**—Three Assts. to Out-patients.

**Chelmsford and Essex Hospital.**—H.P. and H.S. Each at rate of £150.

**City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.**—H.P. At rate of £100.

**Cumberland County Council.**—Asst. County M.O.H. and District M.O.H. £800.

**Evelina Hospital for Sick Children, Southwark, S.E.**—H.S. £120

**Exeter, Royal Devon and Exeter Hospital.**—H.S. to Ear, Nose, and Throat Dept. £150.

**General Nursing Council for England and Wales, 20, Portland-place, W.**—Examinerships.

**Glasgow, Stobhill Hospital.**—Res. Anaesthetist. £350.

**Golden-square Throat, Nose, and Ear Hospital, W.**—H.S. £100.

**Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W.**—Res. H.S. £150.

**Halifax and Royal Infirmary.**—Second and Third H.S.'s. £175 and £150 respectively.

**Hampstead Borough.**—Asst. M.O.H. and Clin. Tuber. O. £750.

**Hampstead General and N.W. London Hospital.**—Cas M.O. for Out-patient Dept. £100. Also H.S. £100.

**Hereford, Herefordshire General Hospital.**—Hon. Anaesthetist.

**Hull Royal Infirmary.**—First H.P. At rate of £175.

**Isleworth, West Middlesex County Hospital.**—Visiting Orthopaedic Surgeon. £3 3s. per session.

**Italian Hospital, Queen-square, W.C.**—Hon. Asst. Surgeon.

**Kent Education Committee.**—Half-time Asst. M.O. £350.

**King Edward Memorial Hospital, Ealing.**—Jun. Res. M.O. At rate of £150.

**Lancaster Royal Infirmary.**—Jun. H.S. £130.

**Leeds Public Dispensary and Hospital, North-street.**—Two H.P.'s. Also Cas. O. and H.S. At rate of £150.

**Leeds University.**—Chair of Anatomy. £1000.

**Leicester City, Education Committee.**—Asst. School M.O. £500.

**Liverpool Sanatorium, Delamere Forest, Frodsham.**—Second Asst. to Med. Supt. £200.

**London County Council.**—Asst. M.O.'s (Grade I.). Each £350. Two Asst. M.O.'s (Grade II.). Each £250. H.P.'s. Each £120. Clin. Asst. £150. Temp. Dist. M.O.'s. £165 and £142 10s. Also Locum Tenens Asst. M.O.'s. Each 6 gns. a week.

**London Homoeopathic Hospital, Great Ormond-street, W.C.**—Hon. Surgeon. Also Hon. Asst. Surgeon.

**London School of Hygiene and Tropical Medicine, Keppel-street, W.C.**—Asst. M.O. for Northern Rhodesia. £840.

**London University.**—University Chair of Anatomy at St. Bartholomew's Hospital Medical College. £1000.

**Macclesfield General Infirmary.**—Second H.S. At rate of £150.

**Maidstone, Kent County Ophthalmic and Aural Hospital.**—Ophth. H.S. £200.

**Manchester, Ancoats Hospital.**—Res. M.O. At rate of £150.

**Manchester, Christie Hospital and Holt Radium Institute.**—Asst. M.O. £400.

**Manchester Royal Children's Hospital, Pendlebury.**—Res. Surg. O. At rate of £125.

**Margate, Royal Sea-Bathing Hospital.**—Asst. Med. Supt. £500.

**Maudslayi Hospital, Denmark Hill, S.E.**—Part-time M.O. £300.

**Metropolitan Hospital, Kingsland-road, E.**—Sen. and Jun. H.P.'s and H.S.'s. Also Cas. O. and Res. Anaesthetist. Each £100.

**National Hospital for Diseases of the Heart, Westmoreland-street, W.**—Res. M.O. Also Out-patient M.O. At rate of £150 and £125 respectively.

**Newport, Mon. Royal Gwent Hospital.**—H.S. and Cas. O. Each at rate of £135.

**New Zealand, Queen Mary Hospital, Hamner Springs.**—M.O. £650.

**Oldham County Borough.**—M.O.H. £1200.

**Penarth, Glam. Llandough Hospital.**—Jun. Res. M.O. £100.

**Poplar Hospital for Accidents, East India Dock-road, E.**—Asst. Hon. Surgeon.

**Preston and County of Lancaster Royal Infirmary.**—Res. Surg. O. £300.

**Princess Beatrice Hospital, Earl's Court, S.W.**—Hon. Clin. Assts. Radium Institute, 16, Riding House-street, W.—H.S. At rate of £150.

**Richmond, Surrey Royal Hospital.**—Jun. H.S. At rate of £100.

**Rochdale County Borough.**—Sen. Asst. Res. M.O. &c. £500.

**Rochdale Infirmary and Dispensary.**—Second H.S. £150.

**Rochester, St. Bartholomew's Hospital.**—H.P. £175.

**Rotherham Hospital.**—H.P. Also Cas. H.S. £180 and £150 respectively.

**Royal College of Surgeons of England.**—Election of Professors and Lecturers.

**Royal Dental Hospital of London, 32, Leicester-square, W.C.**—Hon. Asst. Dental Surgeon.

**Royal National Orthopaedic Hospital, 234, Great Portland-street, W.**—H.S. At rate of £150.

**Royal Naval Medical Service.**—M.O.'s.

**St. Mary's Hospital for Women and Children, Plaistow, E.**—Res. H.S. and Res. H.P. £155 and £150 respectively.

**Salford City.**—Asst. M.O. for Venereal Diseases Treatment Centre. £500.

**Salisbury General Infirmary.**—H.S. At rate of £125.

**Sheffield Children's Hospital.**—H.S. At rate of £100.

**Sheffield University.**—Sorby Research Fellowship. £500.

**Sheffield, Winter-street Hospital.**—Asst. Tuber. O. £350.

**Shoreham-by-Sea, Southlands Hospital.**—Second Asst. Res. M.O. £300.

**Southern-on-Sea General Hospital.**—H.P. At rate of £100.

**Stamford, Rulland and General Infirmary, Stamford.**—H.S. £250.

**Surrey County Council.**—Ophth. Surgeon. £750.

**Swansea General and Eye Hospital.**—Cas. O. £150—£175.

**Taunton and Somerset Hospital.**—H.S. At rate of £100.

**University College Hospital, Gower-street, W.C.**—Hon. Clin. Asst. in X Ray Dept.

**Warwick, King Edward VII. Memorial Sanatorium, Hertford Hill.**—Jun. Asst. M.O. £250.

**Warwickshire and Coventry Mental Hospital, Hatton.**—Two Jun. Asst. M.O.'s. Each £350.

**West End Hospital for Nervous Diseases, Welbeck-street, W.**—Hon. Clin. Asst. to Psychiatric Out-patient Dept.

**West Suffolk County Council.**—Asst. County M.O.H. and Dist. M.O.H. £800.

**Wilkesden General Hospital, Harlesden-road, N.W.**—Hon. Anaesthetist.

**Wolverhampton Royal Hospital.**—H.S. At rate of £100.

**Worcester Royal Infirmary.**—Sen. H.S. £160.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Tutbury (Staffs), Middlewich (Cheshire), Southminster (Essex), and Ribchester (Lancs).

## Births, Marriages, and Deaths

### BIRTHS

**BAIN.**—On March 23rd, at Harrogate, the wife of Curtis Bain, D.M. Oxon., of a son.

**BELL.**—On March 24th, at Bentinck-street, the wife of Arthur C. Bell, F.R.C.S. Eng., of a daughter.

**DAVID.**—On March 24th to Dr. Olivia F. Digby-Smith, wife of T. N. T. David, Welling, Kent—a son.

**DAVIES.**—On March 24th, at Leicester, the wife of Dr. D. Justin Davies, of a daughter.

**EDWARDS.**—On March 24th, the wife of Dr. John A. Edwards, Colnbrook, Bucks, of a son.

**KAY.**—On March 28th, at Ipswich, the wife of R. S. Kay, M.B., Ch.B. Glasg., of a son.

**LUCAS.**—On March 24th, at Devonshire-place, W., the wife of Ernst Lucas, L.R.C.P. Edin., M.D. Munich, Hollycroft-avenue, N.W., of a daughter.

**MEADOWS.**—On March 24th, at Wilbraham-place, S.W., the wife of Swithin P. Meadows, M.D. Lond., M.R.C.P., of a son.

**SANDERSON.**—On March 26th, at Birmingham, the wife of Dr. A. W. Sanderson, of a son.

### MARRIAGES

**EMSLIE-ANDERSON.**—On March 27th, at King's College Chapel, Aberdeen, Harold L. Emslie, M.B., Ch.B., Edinburgh, to Elizabeth Grace, daughter of Dr. John A. Anderson, Aberdeen.

**GROVES-ST. JOHN.**—On March 28th, at St. Cross, Winchester, Dr. John Nixon Groves, to Myrtle St. John, niece of Sir Charles and Lady Close.

**HINDLE-BOYEN.**—On March 25th, in London, Edward Hindle, Rectus Professor of Zoology, Glasgow, to Mrs. Ellen M. Boyen, of Gloucester-gate, N.W.

**MILES-JAMESON.**—On Feb. 3rd, at Chungking, West China, Surg. Lt. Thomas Frank Miles, M.R.C.S. Eng., to Rosemary, younger daughter of the late Engineer Captain T. O. Jameson, R.N., and Mrs. Jameson, of Southsea.

### DEATHS

**ALSTON.**—On March 3rd, at Fish Hoek, South Africa, John Averell Alston, M.R.C.S. Eng., second son of the late Hugh Alston, of Canonbury, London, aged 65.

**CHRISTIE.**—On March 31st, at St. John's Wood, London, Joseph MacNaughtan Christie, C.B.E., M.D. Glasg., F.R.C.S. Edin., Colonel, N.Z. Medical Corps.

**EDER.**—On March 30th, after a short illness, at Brendon House, W.1, Montagu David Eder, B.Sc. Lond., M.R.C.S. Eng.

**ELAM.**—On March 26th, suddenly, George Elam, M.D. Durh., of Barry, Glam.

**GARROD.**—On March 28th, suddenly, at Cambridge, Archibald Edward Garrod, K.C.M.G., D.M. Oxon., F.R.S., formerly Regius Professor of Medicine in the University of Oxford, Consulting Physician to St. Bartholomew's Hospital, aged 78.

**HUME.**—On March 29th, at Brecon, Norman Hallburton Hume, M.B., B.S. Durh., Major, I.M.S., ret'd.

**O'DONNELL.**—On March 23rd, at Seamount Nursing Home, Galway, Dorothy O'Donnell, M.B., B.Ch., dearly beloved wife of Michael O'Donnell, M.D., M.R.C.P.I., Edanam Lodge, Sea-road, Galway.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.



NOTES, COMMENTS, AND ABSTRACTS

THE OVERCLOTHED BOY

By JOHN RIDDELL, M.D. Glasg., D.P.H.  
 ASSISTANT MEDICAL OFFICER OF HEALTH FOR THE  
 COUNTY OF STIRLING

"A CHILD should be clothed lightly, so that its activity is not hindered, but warmly enough so that its heat-productive power is not over-taxed." In these words Sir Leonard Hill<sup>1</sup> gives an objective excellent to strive for, but very difficult to reach. How many parents are governed by any such criteria in considering the clothing of their children? How many doctors even?

The probability is that the main factor influencing choice is "fashion." This almost entirely decides the types of garment to be worn. Individuality can only exist in minor differences in detail and in quantity, as expressed by the number of layers of clothing. Fortunately, since the beginning of the present century, fashion has tended to encourage approach towards the above standard. Perhaps it may sometimes have been made an excuse for an excessive zeal in discarding clothing, but on the whole much good has resulted. This is especially so in the case of girls. With boys, fashion has changed but little, and far too much clothing is still worn. An attempt should be made to remedy this.

To illustrate the changes which have taken place, and also those which still require to be effected, the following inquiry was undertaken among pupils attending schools in Stirling. The scholars come almost entirely from mining and working-class families. They were weighed with and without their indoor clothes (excluding shoes or boots) first at the end of August and again in the latter half of December. The average temperatures (Fahrenheit) over the periods of the examinations are given below—representative samples of summer and winter weather.

	Maximum.		Minimum.	
	Open.	Screen.	Open.	Screen.
August ..	72.5	61.1	49.0	48.8
December ..	44.5	37.4	29.0	29.6

With regard to the amount of clothing worn, very striking differences at once become apparent as shown in Table I.

TABLE I.—Weight of Clothing

Weight of clothing in lb.	Number of cases in—			
	GIRLS.		BOYS.	
	Summer.	Winter.	Summer.	Winter.
1-1	43	6	1	—
1-1½	104	29	15	—
1½-2	94	38	43	5
2-2½	50	77	85	18
2½-3	21	52	92	27
3-3½	12	43	105	47
3½-4	2	23	103	57
4-4½	—	16	68	69
4½-5	—	3	34	72
5-5½	—	2	28	71
5½-6	—	1	7	37
6-6½	—	1	4	32
6½-7	—	—	1	18
7-7½	—	—	—	10
7½+	—	—	—	11
Total ..	326	291	586	474

The differences between the sexes and in different seasons are noteworthy, but even with the same sex in the same season, individual variation is apparently very great. Universal factors which might affect this are age, height, and weight, the two latter being to a certain extent, of course, correlated with the former.

TABLE II.—Clothing at Various Ages

Age-group in years.	BOYS							
	Summer.				Winter.			
	Cases.	Average age.	Aver. wt. of clothing.	Per cent. gross wt.	Cases.	Average age.	Aver. wt. of clothing.	Per cent. gross wt.
XI. ..	40	11 8	3 2	4.2	17	11 8	4 1	5.2
XII. ..	195	12 6	2 14	4.0	142	12 7	4 5	5.3
XIII. ..	242	13 8	3 1	3.9	193	13 6	4 7	5.1
XIV. ..	76	14 4	3 13	3.7	84	14 4	4 13	4.8
XV. ..	20	15 5	4 7	3.8	25	15 3	6 8	4.9
XVI. ..	13	16 5	4 10	3.7	13	16 5	6 7	5.2
XI. to XVI.	586	—	—	3.9	474	—	—	5.1
GIRLS								
XII. ..	112	12 6	1 11	2.0	89	12 7	2 6	2.8
XIII. ..	166	13 6	1 10	1.7	136	13 6	2 13	2.5
XIV. ..	40	14 4	1 8	1.5	52	14 4	2 9	2.6
XV. ..	8	15 3	1 12	1.6	14	15 4	2 12	2.6
XII. to XV.	326	—	—	1.8	291	—	—	2.7

Y.=years. M.=months.

Table II. shows the effect of varying age and brings out the contrast between boys and girls. While the amount of clothing worn by girls changes very little with increasing age, that worn by boys increases markedly. In both cases, however, the weight of clothing expressed as a percentage of the clothed body-weight tends to decrease slightly with advancing age.

Table III. shows the relationship between height and weight of clothing, while Table IV. shows the relationship between the latter and clothed weight of the children. Again the amount of girls' clothing varies little, while that of boys increases, with both height and weight.

The present investigation shows, then, that girls between the ages of 12 and 15 years wear clothing amounting to about 1.8 per cent. of their weight in summer and 2.7 per cent. in winter, while the clothing of boys between the ages of 11 and 16 years amounts to about 3.9 per cent. of their weight in summer and 5.1 per cent. in winter or roughly twice that of the girls.

Comparing this with the results of previous inquiries is both interesting and illuminating. Quetelet<sup>2</sup> in Paris in 1835, presumably working in conditions comparable to our summer temperature, allowed 5.5 per cent. of the gross weight in the case of boys and 4.2 per cent. for girls. Bowditch,<sup>3</sup> of Boston, in 1875 found that the average amount to be allowed for clothing over the whole year was between 9.9 per cent. and 7.9 per cent. for boys and 5.8 per cent. and 7.3 per cent. for girls, depending on the age (similar to those in the present investigation), but he almost certainly included footwear as part of the clothing. Schmidt Mounard<sup>4</sup> in 1901 concluded that the weight of clothing in the case of boys from six to fourteen years of age was 7.75 per cent. of the gross

TABLE III.—WEIGHT OF CLOTHING IN RELATION TO HEIGHT OF CHILD

Height in inches	51-53		54-56		57-59		60-62		63-65		66-68	
	Cases.	Weight of clothing.	Cases.	Weight of clothing.	Cases.	Weight of clothing.	Cases.	Weight of clothing.	Cases.	Weight of clothing.	Cases.	Weight of clothing.
		lb. oz.		lb. oz.		lb. oz.		lb. oz.		lb. oz.		lb. oz.
<b>GIRLS.</b>												
Summer ..	18	1 9	82	1 10	100	1 9	96	1 10	22	2 0	4	1 7
Winter ..	9	2 1	70	2 6	103	2 9	82	2 10	23	2 8	3	2 15
<b>BOYS.</b>												
Summer ..	73	2 11	206	3 0	160	3 4	81	3 11	37	4 9	15	4 11
Winter ..	56	3 13	158	4 4	136	4 9	65	4 13	35	5 13	15	6 12

Several cases were omitted as they were outside the height limits.

TABLE IV.—WEIGHT OF CLOTHING IN RELATION TO WEIGHT OF CLOTHED CHILD

Gross weight in lbs. ...	56-69		70-83		84-97		98-111		112-125		126-139	
	Cases.	Weight of clothing.	Cases.	Weight of clothing.	Cases.	Weight of clothing.	Cases.	Weight of clothing.	Cases.	Weight of clothing.	Cases.	Weight of clothing.
		lb. oz.		lb. oz.		lb. oz.		lb. oz.		lb. oz.		lb. oz.
<b>GIRLS.</b>												
Summer ..	38	1 10	87	1 9	97	1 10	65	1 10	30	1 12	6	1 12
Winter ..	20	2 4	78	2 6	88	2 11	68	2 7	29	2 8	5	2 10
<b>BOYS.</b>												
Summer ..	75	2 9	240	3 0	150	3 7	57	3 10	34	4 6	18	4 14
Winter ..	49	3 12	176	4 3	135	4 9	55	4 15	32	5 10	18	6 7

Several cases were omitted as they were outside the weight limits.

weight and in the case of girls 8 per cent. In 1921 Baldwin<sup>5</sup> noted a change in conditions and stated: "It has been found that the weight of children's clothing worn at the present day is considerably less than the earlier estimates by other investigators. Also the range of variation in the clothing of different children and at different seasons is not so wide as has been supposed." In 1923, in conjunction with Wood,<sup>6</sup> he gave the weight of clothing as 4 per cent. of the nude weight in the case of boys and 2-2.5 per cent. in the case of girls.

The trend is therefore perfectly definite, but it has not been so marked in the case of boys as with girls. It is now commonly accepted that reduction of clothing, allowing more benefit to be derived from the sun and air, not only does no harm, but develops an increased immunity to those diseases commonly attributed to the influence of cold. On the other hand, it must only be put forward as part of the campaign for better health. To quote Leonard Hill<sup>7</sup> once more: "The scanty clothing of women should not result in overheated stuffy houses and hotels in which the air becomes polluted with dust and microbes which occasion respiratory disease. The clothing should be the lightest that can be borne without the wearer being pinched with cold or feeling the need of artificial heat when the weather is mild. It should not be so heavy as to reduce the heat production of the body to a lower level and interfere with the taking of vigorous exercise. . . . It is only the old, the underfed and feeble who require very warm clothing, those whose fire of life is weak and cannot be fanned up by vigorous exercise."

What lead is the medical profession giving to help the boys?

## REFERENCES

- Hill, Sir L.: Practitioner, 1930, cxxv., 112.
- Quetelet, A.: Sur l'homme et le développement de ses facultés, Paris, 1835.
- Bowditch, H. P.: The Growth of Children. 8th Annual Report, Massachusetts Board of Health, 1875, vol. viii., p. 273.
- Schmidt Mounard, K.: Über den Wert von Körpermassen zur Beurteilung des Körperstandes bei Kindern, Jahrb. f. Kinderh., 1901, liii., 50.
- Baldwin, B. T.: Physical Growth of Children, New York, 1921.
- Baldwin, B. T., and Wood, J. D.: Height-weight-age Tables for School-children, Mother and Child, 1923, vol. iv. (inset supplement).
- Hill, Sir L.: Practitioner, 1928, cxxi., 359.

## ESTIBIUS PSYCHALETHES

William Coward, who more than once found it convenient not to append his name to his works, but who originally employed the above curious pseudonym, is the subject of an essay in a recent issue of the Annals of Medical History.<sup>1</sup> His memory is worth rescuing because he was such a singular man. He was born at Winchester and in Dr. Burton Chance's essay he is credited with having been at Winchester College. He was at any rate a classical scholar, graduated in arts from Wadham College, Oxford, in 1677, and was shortly afterwards elected a fellow of Merton when he graduated in medicine. He seems to have practised in Northampton for a time and also in London, but no evidence as to his having obtained any regular position is forthcoming, though he was at one time "a candidate for qualification" at the Royal College of Physicians of London. His literary performances make curious reading. He started authorship by publishing a Latin version of Absalom and Achitophel which was not accepted by the University of Oxford for publication, but was

<sup>1</sup>Chance, B.: Annals of Medical History. New York: Paul B. Hoeber, 1935, vol. vii., p. 559.

afterwards published for him by a friend under the assumed name of Walter Curle. The effort brought him no great credit and he turned to medical literature, writing several books of a theologico-metaphysical sort, one of which, on volatile ferments, received the approval of the president and censors of the Royal College of Physicians of London. With one of his productions he obtained real publicity, and his Greek pseudonym suggests its purport in a vague manner. This was an essay on mortality entitled *Second Thoughts Concerning the Human Soul*, and its views aroused such serious controversy that Coward was called to the bar of the House of Commons to explain, and if necessary apologise for, his doctrines. He professed his readiness to the House of Commons to recant any views which might be considered irreligious or immoral, and it will be seen from the title-page that he would have much to explain to the orthodox thinker of the day. It runs thus:—

“SECOND THOUGHTS

Concerning

HUMAN SOUL,

Demonstrating the Notion of Human Soul,

As believ'd to be a SPIRITUAL IMMORTAL

SUBSTANCE, united to Human Body,

To be a Plain

HEATHENISH INVENTION,

And not Consonant to the Principles of

PHILOSOPHY, REASON, OR RELIGION;

But the Ground only of many

Absurd, and Superstitious Opinions,

Abominable to the Reformed Churches,

And Derogatory in General to

TRUE CHRISTIANITY”

The House considered that the book was offensive and ordered it and other of Coward's works to be burnt by the common hangman. As further editions of the incriminated works appeared it may be presumed that the tenets and theories were modified; certainly his zeal for authorship remained, and he returned to the composition of religious poems. Lastly, in his work on diseases of the eye, entitled *Ophthalmiatria*, he came into medical notice. This small book written in Latin appeared in 1706 and according to Dr. Chance the author must have been considerably indebted to others for his representation of the knowledge of his day, but his theological views probably made the text more unintelligible. Sir Hans Sloane undertook the supervision of the proofs and appears to have differed with the author on religious points. The alteration, as narrated by Dr. Chance, gives the honours to Coward who did not see his way to making certain modifications in order “to add something in commendation of the ‘tender consciences’ of physicians in point of religion.” Such modern ophthalmologists as have had the equipment and curiosity to peruse Coward's contribution to science have found nothing in his pages to show any original research or practical teaching. But it seems that from the bibliophile's point of view his books have the value of their rarity.

#### WILLESDEN WOMEN'S WELFARE CENTRE

WE have received the first report of this new centre which covers the period from June to December, 1935. It is a promising little document. Those behind the birth control clinic appealed at the start for £200, a sum which they felt would justify them in taking action. The immediate return amounted to only one-third of that sum, but none the less those responsible for the movement felt that the need for assistance in the district was such that a commencement ought to be made; already they are able to prove that valuable work is being done, and the Willesden borough council has come to their assistance by providing cheerful and hygienic premises. But the rent has only been paid in accordance with a special donation, and very little money is left. Any contribution, therefore, will be gratefully received by the honorary treasurer, Mrs. I. Bedford, Lake View, The Vale, Hampstead.

#### “MUSIC HATH CHARMS—”

THE Rev. S. C. TICKELL, writing from the vicarage, Latton with Eysey, calls attention to the influence of music in cases where the symptoms are dependent on mental strain and anxiety. No doubt he has had in mind that David's first appearance in biblical history is in the character of “a cunning player on the harp,” when it is recorded that he performed so well that Saul, who was troubled with an evil spirit from God, was refreshed and was well—at any rate for a period though his relapse was dramatic. Mr. Tickell will have on his side many churchgoers when he accuses the musical services of the church of being too dreary and didactic to minister to the diseased mind, and he suggests that this position could be remedied if organists had an opportunity for suitable improvisations which might attain the wider circulation of being broadcast. Mr. Tickell has a great advocate on his side when extolling music as mental refreshment, for Burton in the “*Anatomy of Melancholy*” devotes considerable space, and much of his quaint erudition, in enlarging on the theme. Burton's great work must rank high in that considerable list of classics which many quote, which more talk about, and which few read. An essay by Dr. J. L. Miller in the current issue of the *Annals of Medical History* should persuade readers to turn to Burton's deeply interesting and often highly amusing pages. Undoubtedly the book is made difficult reading by the prolific citation of the classics, and not those read as school books, but as a rule the passages are not difficult to follow taken with their English contexts. Burton was a learned priest, not a doctor, but it is always admitted that in his fantastic way he was a considerable psychologist. Dr. Miller has evidently read the “*Anatomy of Melancholy*” with gusto, as Sterne and Lamb, and possibly even Milton, have done before him. And those who are encouraged by his essay to follow suit will be rewarded.

#### FATHERS AND MATERNITY

FOR some years fathers' councils and committees have been springing up here and there in connexion with infant welfare centres and similar institutions. The Central Union of Fathers' Councils was formed to coördinate their activities, and it held its fifth annual conference in London on March 25th. Dr. G. F. Buchan, medical officer of health for Willesden, who presided, said that mothers should have at their disposal the best and most efficient service the community could provide. The maternity hospital should be in the charge of an obstetric specialist. He instanced the situation in Willesden, where in the municipal maternity hospital there were 64 beds, (comprising 9 antenatal, 4 isolation, 43 lying-in, and 8 labour beds). The maternal death-rate at the hospital during the last five years had been 1 per 1000, and in the last 2500 cases there had been no deaths at all.

Speaking on the psychological aspect of maternal welfare Dr. Grantly Dick Read stated his conviction that the rôle of the man was essentially that of the protector and provider, while the nature of woman was primarily dependent, a quality which became particularly apparent during pregnancy. The expectant mother relied on her husband not only for maintenance but also for a sympathetic understanding of her own state of mind. It was important for the husband to express pleasure and satisfaction at the prospect of a child. “The man who does not want his coming child may start a series of thoughts in his wife's mind which will make pregnancy a misery,” said Dr. Read. “Nothing is more likely to cause unsuccessful childbirth than unhappiness.” The father should assume the responsibility of ejecting relatives who told scare stories, and the expectant mother should not be allowed to hear talk of maternal mortality, for she was extremely suggestible.

## NEW PREPARATIONS

**NOVURIT SUPPOSITORIES.**—Novurit is an organic mercurial diuretic akin to Salyrgan, and containing 5 per cent. of theophylline. It is inactive when taken by mouth and has occasionally caused local pain when given in the usual way by intravenous or intramuscular injection. The manufacturers (Chinoin Chemical and Pharmaceutical Works, Hungary) have therefore devised suppositories containing 0.5 gramme of Novurit in cocoa-butter for use wherever injections of the drug are inadvisable or inconvenient. In our issue of Jan. 4th (p. 17) Dr. John Parkinson and Dr. W. A. R. Thomson reported a trial of this suppository in ten cases of congestive heart failure, from which they concluded that it is a safe and effective diuretic—"an addition of value in the treatment of dropsy." Given by rectum Novurit does not evoke quite so large a flow as when injected intravenously, but rectal administration is often more practicable, and no toxic or irritative action was observed in these ten cases. The manufacturers state that there are no side-effects and that the efficacy of the drug does not diminish on prolonged use; they recommend it for cardiac oedema, fluid in serous cavities, nephrosis, eclampsia, and other conditions—but not in cases with diarrhoea or acute or chronic glomerulonephritis. The suppositories are obtainable in this country from Messrs. W. Martindale, 50, Wigmore-street, London, W.

**NORMO-GASTRINE** is a preparation of aluminium silicate made up in tablets and intended for the treatment of excessive gastric acidity. The main advantage claimed is that it is not alkaline and does not operate against hydrochloric acid in the low percentages found in the normal stomach; nor does it affect the activity of pepsin. Its use is said to obviate the disadvantages associated with generation of carbon dioxide in the stomach or with imperfect digestion due to weakening of the gastric juices. The makers are Burgoyne, Burbidges and Co., Ltd., East Ham, E.6.

**LUTEOANTIN**, sold by Gedeon Richter (Great Britain) Ltd., 1, Hardwick-street, E.C.1, is a preparation of gonadotropic hormone obtained from the anterior pituitary, and its luteinising power is said to be several times as great as that of similar hormones extracted from pregnancy urine. In clinical practice it is meant to serve as substitute for the more expensive corpus luteum hormone (progestin), and it is held to be useful in various forms of excessive uterine hæmorrhage, and in dysmenorrhœa, hyperemesis, and habitual and threatened abortion. Luteoantin is issued in double ampoules, one of which contains the powdered hormone and the other a solvent. Each ampoule is stated to contain 50 mouse units.

**ANAHÆMIN B.D.H.**—Last year Dakin and West recorded a substantial advance towards isolation of the active principle which cures pernicious anæmia. They extracted from liver the light buff-coloured powder, soluble in water, which is now known as anahæmin, and in our issue of Feb. 15th Dr. Ungley and Profs. Davidson and Wayne were able to report excellent clinical results from the use of this concentrated extract as prepared in this country by the British Drug Houses Ltd. (London, N.1), who now market it under the name Anahæmin B.D.H. The substance is so potent that the manufacturers believe that a monthly injection of 200 mg. (or 2 c.cm. of the solution they supply in ampoules) will probably be sufficient to maintain a normal blood picture, and in view of this small dosage they claim that the use of anahæmin is not only convenient but also economical. The preliminary observations of Dr. Ungley and his colleagues suggested that the new preparation "may prove to be at least as potent as other liver extracts in the treatment of the neurological manifestations of pernicious anæmia," and it is hoped that it may be found to possess all the therapeutic properties of liver in this disease.

Messrs. Allen and Hanburys Ltd. announce that **EUCORTONE** (extract of suprarenal cortex) is now to be issued in a more concentrated form, having 2½ times the potency of the previous preparation and a correspondingly lower dosage. It will be supplied in ampoules of 10 c.cm. instead of 25 c.cm. and their price will be 30s. instead of 36s.

From their new premises at Greenford **GLAXO LABORATORIES LTD.** have issued a revised catalogue including particulars of their detoxicated vaccines, vitamin and antiviral preparations, pharmaceutical products, and foods. A price list gives the discount charges to the medical profession.

## Medical Diary

## SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**  
**MONDAY, April 6th.**  
*United Services.* 4.30 P.M. Annual general meeting. Surg. Commander M. B. Macleod: Vision in the Services with Special Attention to Colour Vision.
- TUESDAY.**  
*Orthopaedics.* 5.30 P.M. (Cases at 4.30 P.M.) Mr. Arthur Eyre-Brook: Results of Treatment in Perthes Disease. Dr. L. J. Rae: 1. Chondro-dystrophy with Multiple Chondromata. Mr. S. A. S. Malkin: 2. Fusion of Transverse Processes of the Fourth and Fifth Lumbar Vertebrae. 3. Osteochondritis of the Capitellum. Mr. C. Hope Carlton: 4-5. Central Dislocation of the Femur. 6. Lesion of the Vertebral Bodies for Diagnosis. Mr. B. H. Burns: 7. Tear of the Supraspinatus Tendon. Mr. Eric Lloyd: Director for the Smith-Petersen Nail in Neck of Femur Fractures.
- HUNTERIAN SOCIETY.**  
**MONDAY, April 6th.**—8.30 P.M. (Simpson's Restaurant, Cheapside). Annual general meeting. Dr. Howard Humphris: Mild Radium Therapy.
- SOUTH-WEST LONDON MEDICAL SOCIETY.**  
**WEDNESDAY, April 8th.**—9 P.M. (Holingbroke Hospital, Wandsworth Common, S.W.). Mr. Hamilton Bailey: Swellings in the Neck.
- MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.**  
**THURSDAY, April 9th.**—8.30 P.M. (11, Chandos-street, W.). Dr. Dennis Carroll: Some Problems in the Treatment of Delinquency.
- LECTURES, ADDRESSES, DEMONSTRATIONS, &c.**
- ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.**  
**TUESDAY, April 7th.**—5 P.M. Sir Robert Muir: Malignancy with Illustrations from the Pathology of the Mammal. (Lister Lecture.)
- UNIVERSITY OF BIRMINGHAM.**  
**TUESDAY, April 7th.**—3.30 P.M. (General Hospital). Mr. Percival Mills: The Treatment of Common Fractures.
- INSTITUTE OF HYGIENE, 28, Portland-place, W.**  
**WEDNESDAY, April 8th.**—3.30 P.M., Prof. James Young: Sociological Problems Affecting Women's Health.
- BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.**  
**MONDAY, April 6th.**—2.30 P.M., Dr. C. Kaufmann, Berlin: Clinical Uses of the Female Sex Hormones.  
**TUESDAY.**—2.30 P.M., Dr. Janet Vaughan: Supravital Technique in Hematology.  
**WEDNESDAY.**—Noon, Clinical and pathological conference (medical). 2.30 P.M., Clinical and pathological conference (surgical).  
**THURSDAY.**—2.15 P.M., Dr. Duncan White: Radiological demonstration. 2.30 P.M., Dr. W. S. C. Copeman: Arthritis. 3 P.M., Dr. Chassar Moir: Operative Obstetrics.  
 Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetric and gynecological clinics or operations.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.**  
**MONDAY, April 6th, and WEDNESDAY.**—8 P.M. (INFANTS HOSPITAL, Vincent-square, S.W.). Primary F.R.C.S. course in anatomy and physiology (open only to members).
- NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.**  
**TUESDAY, April 7th.**—5.30 P.M., Dr. John Parkinson: Palpitation.
- MANCHESTER ROYAL INFIRMARY.**  
**TUESDAY, April 7th.**—4.15 P.M., Mr. H. H. Rayner: The Trend of Surgery in the Post-war Period.
- LEEDS GENERAL INFIRMARY.**  
**TUESDAY, April 7th.**—3.30 P.M., Mr. Pyrah: 1. Demonstration of Some Surgical Cases. 2. Short Paper on Treatment of Some Minor Urological Disorders in General Practice.
- GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.**  
**WEDNESDAY, April 8th.**—4.15 P.M. (Lock Hospital, 41, Rottenrow), Dr. David Watson: Venereal Disease in Women.

## ADDRESSES AND ORIGINAL ARTICLES


**MEDICAL PROBLEMS IN MINERAL METABOLISM\***

R. A. McCANCE, M.D., Ph.D. Camb.,  
F.R.C.P. Lond.

ASSISTANT PHYSICIAN IN CHARGE OF BIOCHEMICAL RESEARCH,  
KING'S COLLEGE HOSPITAL, LONDON

### III.—EXPERIMENTAL HUMAN SALT DEFICIENCY

IN my second lecture I tried to give you an account of the importance of sodium chloride deficiencies in clinical medicine, and it must have been obvious to you how incomplete is our knowledge of the subject. It is perfectly true that a great deal has been written on the matter, but much of it will not bear scientific criticism. Almost all the salt deficiencies which have been produced experimentally have been accompanied by a forced loss of water, alkalosis, starvation, Addison's disease, or diabetes, and it is difficult to disentangle the effects. Patients with salt deficiencies are generally too ill to be studied experimentally, and there is generally the complication of some coincident disease. It occurred to me that if I could produce a simple sodium chloride deficiency in a normal animal or person, uncomplicated by forced dehydration, change of reaction, or any other concurrent morbid process I might be able to throw some light on the pathology of this group of diseases. A salt-free diet combined with sweating was the obvious method to try first. None of the ordinary laboratory animals are available for this sort of experiment since they do not sweat, but in any case man is the best experimental animal to use in this type of research, so I decided to employ him. Continuous loss of hypotonic sweat would of course lead to an over-concentration of the sodium salts in the body fluids, but my intention was to replace the water as it was lost by the simple process of giving more to drink, so that the net result would merely be a loss of sodium chloride and bicarbonate. I planned to follow the development of the deficiency by noting any symptoms or physical signs that might appear, and by studying the composition of the blood and the intake and output of mineral salts and nitrogen. As you can imagine, experiments of this sort are not very easy to carry out. I could not possibly have done them by myself and any success that I may have had has been the result of team-work. I have had a great deal of help from Miss E. M. Widdowson and my wife. I could never have managed the technical work but for the assistance of L. R. B. Shackleton, A. W. Haynes, and R. J. Millar, and I should like to take this opportunity of saying publicly how much I have appreciated all this coöperation.

#### Conduct of the Experiments

There have so far been four subjects. The first was one of the women medical students, P. M. Edwards, who very kindly volunteered to be the pioneer. We never succeeded in making her really salt-deficient.

After I had got the technique through its teething troubles I made myself sodium-deficient and I have since done it a second time. Between my two exploits

we have carried out experiments on two medical students from Oxford, R. B. Niven and D. Whitteridge, and I could not have wished for better or more willing helpers. There have therefore been five main experiments of which the first was a semi-quantitative trial, the second and third were fully quantitative balance experiments, and the fourth and fifth were carried out partly to confirm previous observations and partly to open up fresh ground.

We have found that it takes us about a week to make the subjects seriously deficient. We have generally maintained them in this condition for 3 or 4 days, so that the deprivation periods have all lasted about 11 days. The recovery periods have varied from 24 hours to 7 days according to the object of the particular experiment.

We have unfortunately no diet kitchen at King's College Hospital, so that it was impossible to have our special low salt diets prepared there, but my wife very kindly offered to do this for us, so I slept and ate at home and two of the other subjects have also stayed in my house during their experiments. We have lived mostly on salt-free "casein" bread, synthetic sodium chloride-free milk, salt-free butter, thrice boiled vegetables, jam, fruit, home-made salt-free shortbread and toffee. All the food was carefully weighed. The milk and bread were designed for these experiments<sup>20</sup> to enable a reasonably high protein intake to be combined with a salt-free diet, and both are quite palatable. I am very much indebted to Miss B. Swayne for making this bread for us. I experimented with rather more fancy dishes such as washed mince curried, but they were not a great success. During the recovery periods Niven and I ate regulated quantities of highly salted foods such as anchovies and bacon and also small weighed amounts of pure sodium chloride. We ate the bacon out of the frying pan to avoid losing any of its salt, and then, to make assurance doubly sure, we washed out the pan with a little hot water and drank the washings. All these salted foods and also all special foods such as the washed mince and vegetables were analysed. The composition of other foods was taken from our own food tables.<sup>10 12</sup>

We used a full length radiant heat bath as a sweating chamber. A mattress with two pillows at one end was placed on the floor and over all an 8 ft. strip of red rubber sheeting. The bath was placed on the sheeting. The open end of the bath, which was of the usual "tunnel" type, was closed by hanging a second piece of sheeting over it. The heat was always switched on half an hour before the subject got into the bath. Sweating under these conditions may be extraordinarily profuse. The subject usually spent two hours simmering inside with the heat on, followed by 10 minutes with the heat off, and during this time it was quite usual to lose 2 litres of water. Whitteridge once lost over 3 litres. 500-1000 c.cm. of sweat had generally been scooped off the sheeting before the subject came out. It is not very uncomfortable inside provided perspiration becomes profuse at a reasonably low body temperature: between 100° and 101° F. suited me very well. I sometimes got considerable abdominal discomfort towards the end. Whitteridge felt very sick once or twice after getting out, but Niven and Miss Edwards rather enjoyed the performance. The two hours and ten minutes in the bath passed quickly. There was really plenty to do, temperatures to take, notes to be made, measured amounts of water to be drunk, and so on. When

\* The Goulstonian lectures for 1936, delivered before the Royal College of Physicians of London on March 5th, 10th, and 12th. Lectures I. and II. appeared in previous issues.

time was up the subject crawled out and stood in an enamel tub while he was washed down from head to foot with a jet of warm distilled water. This was rather pleasant.

When the subject was out of the bath, washed down, dried, and dressed again, and all possible liquid sweat had been bailed off the sheetings, these, and the parts of the air bath touching them, were washed down with distilled water into the enamel tub. The contents were then evaporated down for analysis.

All urines and faeces were preserved for analysis, the latter in periods of several days at a time. To collect the insensible perspiration we wore special underclothes (day and night) which had previously been washed four or five times in distilled water. At the end of the deprivation period we took these off and washed them out in distilled water till the washings were again chloride-free. The washings were evaporated down and analysed. The underclothes were then dried, and we put them on again till the experiment was over, when they were again washed and the washings analysed. We shaved, but were very careful to get the lather off, and we used no soap anywhere else except for our hands, so that we did very little domestic washing of any kind.

### Symptoms and Signs \*

Salt deficiency produces an obvious change in the facies. The temporal hollows and the cheeks fall in, and the eyes seem tired and sunken. I think we all looked rather worn and ill towards the end of our experiments.

There is always a loss of weight, to which I shall refer again later. We have all noticed a peculiar sensation in the mouth, which is present all day long. This is not thirst, although Miss Edwards considered that it was so, and drank freely in her attempts to obtain relief. All food seems to be tasteless, even fruit, which contains no salt and is normally eaten without any. I found that cigarettes had lost all their flavour. At the same time an apple would never be mistaken for a pear. The characteristic flavours are there, but they are blunted. I am afraid we have not been able to make very much headway with the investigation of this symptom. At the close of my second experiment I tried the effect of washing out my mouth with salt and water and found it very refreshing, and thought my sense of flavour was thereby restored. We have examined the resting saliva on several occasions and have not been able to detect any important change in composition. I believe these observations are of clinical interest, for I think it is quite possible that the "thirst" so often complained of by patients with intestinal obstruction may really be this curious loss of taste brought about by salt deficiency. At all events Mr. J. B. Hunter has informed me that a patient's "thirst" is often relieved by hypertonic saline in amounts too small to relieve the general dehydration.

Anorexia and nausea are prominent symptoms. I was never hungry, and I think this is true of all the other victims, but Niven and I always managed to get through the prescribed rations for the day. Whitteridge was sick one evening after sweating. This nausea is not at all the same as "indigestion," from which none of us suffered. Indeed, the nausea is not noticeably related to food, and my feelings of sickness often passed off after I had managed to force a little food down my throat. The nausea and lack of appetite were not due to achlorhydria. The response to histamine, moreover,

when we were salt-deficient was almost exactly the same as it was when we were in normal health. None of us suffered from constipation.

We have all noticed that our water metabolism was not normal. After drinking a large amount of water no diuresis would develop at the expected time, but then, hours later—possibly during the night—the diuresis would begin. On one occasion, for example, Whitteridge wished to produce a diuresis for some kidney function tests to be carried out at midday. He began to drink at breakfast time, but the diuresis was quite moderate during the tests and fell off later. Between 10 P.M. that night and 8 A.M. next morning, however, he passed 1800 c.cm. of urine!

We have all suffered a good deal from cramps except Miss Edwards, who escaped, I think because her deficiency was relatively slight. These cramps are most characteristic. They are not the severe localised type described by Moss<sup>13</sup> and others<sup>2,19</sup> in miners and stokers. Our cramps were relatively mild and easily controllable, but any muscle suddenly brought into action was liable to spasm. Coughing produced cramps all round the chest; yawning, cramp in the floor of the mouth. I think the most characteristic were the cramps in the fingers that came on whenever one tried to use a pipette or a pair of forceps.

We have all suffered from excessive fatigue and a general sense of exhaustion. Towards the end Whitteridge felt wretched enough to go to bed as soon as the day's experiments were over, but I fancy I felt the physical strain more than the others. I noticed it particularly in going up the two flights of stairs to the laboratory, and the effort was accompanied by a sense of breathlessness and a most unpleasant feeling of constriction across my sternum, which compelled me to pause and rest several times on the way up. Once or twice I found my arm getting tired while I was shaving, and one day at breakfast I actually noticed my jaws getting tired eating toast! On the other hand, I think my mental faculties were more or less normal, whereas Whitteridge and Niven both got into an extraordinarily interesting state, in which they were content to sit and do nothing in a chair, sometimes for hours on end. They both commented on feeling "slow in the head." They reacted very slowly and apathetically to any suggestions, pleasant or unpleasant, made to them, and their whole mental processes appeared to be dulled. Whitteridge, for example, was quite unable to make any notes or even label his specimens. Roused up by someone and presented with a suitable vessel he would produce the specimen of urine demanded, set it on the bench and settle again in a comfortable chair without occupation of any kind. I am sure this mental state would repay investigation by those competent to do so.

We have not noticed any change in the resting pulse-rate, but the volume became small. All the subjects had normal blood pressures throughout, and we have failed to detect any fall in them, which I think is an important observation. We must conclude that even severe salt deficiency lasting for 6-8 days need not, and does not, alter a normal person's blood pressure.

The resemblance between some of the symptoms which I have been describing and those of Addison's disease are, I think, too striking to be a coincidence. I was not expecting anything of the sort when we began our experiments. Our own weakness, languor, nausea, and anorexia drew my attention to the possible resemblance because these are the text-



book symptoms of Addison's disease. My own breathlessness and cardiac distress and Whitteridge's and Niven's mental apathy seemed to me to be something fresh. I have since discovered Rowntree and Snell's descriptions of clinical Addison's disease based on 108 authentic cases seen at the Mayo Clinic. They say: "The disturbance is evidenced by . . . palpitation and dyspnoea, particularly on exertion. Heart consciousness and occasional precordial angina-like pains are precipitated by exercise." I felt just like this. They also describe mental symptoms of languor, patients "feel disinclined for physical or mental effort . . . they lose their ability to concentrate and drowse constantly." They might have been describing Whitteridge.

Further, our failure to produce a normal diuresis by drinking water recalls the fact that patients with Addison's disease suffer in exactly the same way.<sup>15</sup>

Pigmentation and a subnormal blood pressure, however,—two of the well-known signs of Addison's disease—were not observed in our experimental salt deficiency. I think it possible that both these signs may be due to the absence of the medullary rather than the cortical hormone. In any case pigmentation could hardly have been expected to develop in ten days. A very low blood pressure, moreover, is not invariable in Addison's disease<sup>15</sup> and there is always the possibility that a combination of several factors may be necessary to produce it.

Hypochlorhydria and achlorhydria are said to be common, although by no means invariable, in clinical and experimental Addison's disease.<sup>4 18</sup> We have not encountered this, nor was it to be expected, since it has been shown in normal persons and animals that hypochloræmia and anhydræmia caused by the removal of gastric juice itself do not produce achlorhydria.<sup>3 5 7</sup> Cramps are much less common in clinical Addison's disease than they were in these experiments, but I think that this may very well be due to the former's relatively chronic nature. Our cramps were mild compared with those of stokers, and I would correlate this with the fact that in our experiments the salt was removed comparatively slowly. With still slower desalting we might have missed the cramps altogether. I have often wondered if the well-known cramps of severe diabetes are really cramps of sodium deficiency, but I have no concrete evidence on this matter.

### Loss of Sodium and Chloride

The sodium and chloride lost could only be assessed by measuring carefully the intakes and outputs throughout the experiment. I attempted to do this on myself and Niven.<sup>9</sup> Niven's intake of sodium was of the order of 70 mg. per day. Mine was lower, only some 40 mg. per day. Niven lost 23,314 mg. of sodium, gross, of which nearly 18,000 was lost in the sweat, about 4000 in the urine, and the remainder in the faeces, insensible perspiration, and blood taken for analytical purposes. His net loss of sodium was 22,516 mg. His net loss of chlorides amounted to 27,028 mg. Now, in the first place, where did all this sodium and chloride come from? Some, of course, from the plasma, for, as I shall show you presently, there was a fall in serum sodium and chloride and also a fall in plasma volume; but the whole of Niven's plasma only contained some 8300 mg. of sodium and 9000 mg. of chloride—clearly not nearly enough to account for the loss. The red blood-cells contain chloride, but their loss of this ion was measured and found to amount only to a little over 1000 mg. Red blood-cells contain

very little sodium, and muscle-cells practically no sodium or chloride. The amount supplied by them may be neglected. To some extent the sodium and chloride lost may have come from the cells of glandular organs such as the kidney, or the brain, but the main source must have been the so-called extracellular fluids, lymph, intestinal secretions, interstitial fluids, and so on. These must have been very greatly reduced in volume. In the second place, what percentage of his total body sodium and chloride did Niven lose? This is difficult to answer because we have no accurate information as to the amount of sodium or chloride in an adult's body. I believe the best figure is obtained from a study of the amount of chloride in a number of the smaller animals of all ages, and the few analyses of fetuses and new-born infants which have been made.<sup>14 21 22</sup> Taking this evidence for what it is worth, Niven contains about 90,000 mg. of chloride. He lost 27,000 mg.—i.e., about 30 per cent. of his total chloride. His losses of sodium were undoubtedly of the same order, so that you see he was seriously depleted.

During the recovery period Niven regained almost exactly as much sodium as he had lost during the deprivation period, so that as regards sodium the *status quo* had practically been restored. By this time, however, he had more than made good his loss of chloride (Table I.) for his net gain had been nearly

TABLE I  
Chloride Balance. (Subject: R.B.N.)

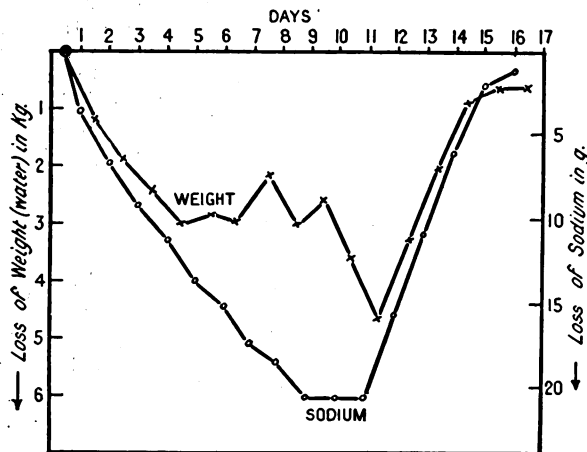
Total Intake (mg.)	Total output (mg.).				
	Urine.	Fæces.	Sweat.	Insensible perspiration.	Blood (tests, &c.)
4035	3770	738	25,490	655	410
	31,063				
Net loss = 27,028 mg.					
RECOVERY PERIOD (7 DAYS)					
57,033	20,970	330	—	875	120
	22,295				
Net gain = 34,738 mg.					

35,000 mg. against a loss of some 27,000 mg. Exactly the same phenomenon occurred in my experiment. It is due to the fact that sodium is the controlling ion, and during deprivation sodium lactate and bicarbonate were lost as well as sodium chloride. During recovery, sodium chloride *only* was returned and the body retained it. In course of time the extra chloride would no doubt have been excreted as the ammonium salt, and the sodium retained and recombined with bicarbonate to restore the original balance.

### The Water Balance

I have already alluded to the difficulty of producing a diuresis during salt deficiency. I now wish to discuss the relation between the loss of sodium and the water balance of the body. I must remind you once again that we all drank as much water as we wanted during these experiments, and our urine volumes were generally over 1500 c.cm. per day. We were therefore not dehydrated in the sense that we were ever deprived of water. Changes in the water balance were due to the loss of sodium, and to

this alone. The importance of securing such experimental conditions has not been generally appreciated, but Kerpel Fronius<sup>8</sup> has recently subjected rabbits to some interesting experiments which were designed to dissociate effects due primarily to loss of water from those due primarily to loss of salt. We did not attempt to measure the intake and output of water, but in these short-term experiments one can take the changes in body-weight as a rough measure of the variations in body water. The Figure shows Niven's loss of weight plotted against his loss of sodium. The two scales are so constructed that a



Subject R. B. N. Loss of weight and sodium.

loss of 1 kg. of body-weight is equal to a loss of 3400 mg. of sodium, which is approximately the amount of sodium in a litre of plasma or extracellular fluid. You will notice that at first each loss of sodium was followed by an almost equivalent loss of weight. During this time there can have been little change in the body's osmotic pressure, although there may have been (and probably was) some anhydræmia and hæmo-concentration. Suddenly the weight ceased to fall. The body had begun to sacrifice its osmotic pressure to maintain its plasma and extracellular fluid volumes. It had been forced into a compromise. It was during this period of compromise, when the osmotic pressure of the plasma was reduced, that we all noticed the abnormality of our water regulation. The fluctuations in Niven's weight are due to this, and one of the most interesting points is the large loss of weight that took place when he began taking salt.<sup>9</sup> I think the abnormal water metabolism of advanced Addison's disease, both clinical and experimental, is due to the loss of salt and the fall in the body's osmotic pressure which has inevitably ensued. In Kerpel Fronius's experiments a primary loss of salt produced changes comparable to those I have described. He also obtained the converse, for he found that a primary loss of water was not followed by an equivalent loss of salt, and that the sodium and the osmotic pressure of the plasma then rose.

### The Blood Changes of Salt Deficiency

We have all shown the same sort of blood changes, some of which are obvious to the naked eye. The venous blood, for instance, becomes sticky and viscous and flows slowly through a needle. The changes in Whitteridge's blood are shown in Table II. The rise in the cell counts, hæmoglobin, cell volumes, and plasma proteins all indicate anhydræmia. The plasma volume was undoubtedly reduced, and the

excretion of urea was certainly not normal. The colloidal osmotic pressure of the plasma was too high, owing to the rise in the plasma proteins, whereas the electrolytic osmotic pressure was too low, owing

TABLE II

Changes in the Blood during Salt Deficiency  
(Subject: D. W.)

	Normal.	Deficient.
Cell count (mil./c.mm.)	4.96	5.95
Hæmoglobin (per cent.)	101	126
Cell volume ( " " )	45.6	56.3
Serum proteins (g./100 c.cm.)	8.1	7.3
Urea (mg./100 c.cm.)	30	81
Chloride—		
Plasma (mg./100 c.cm.)	357	284
Corpuscles ( " " )	187	140
Alkali reserve (vols. per cent.)	61.4	63.3
Serum—		
Na (mg./100 c.cm.)	355	320
K ( " " )	16.2	16.5

to the fall in the serum sodium and chloride. The corpuscle chloride fell, but not the alkali reserve.

You will notice that these are the changes characteristic of experimental Addison's disease which I discussed in my second lecture. I have no doubt that the changes, which were taking place in the tissue cells, were also similar. In one respect only do the present findings differ from those of experimental Addison's disease. It is usual, although I believe not invariable,<sup>1</sup> to find the serum potassium raised in advanced suprarenal insufficiency. We have never observed this, and I feel satisfied that our experimental conditions do not bring about any gross changes in the serum potassium.

### The Nitrogen Balance During Salt Deficiency

I was anxious to make a study of the nitrogen balance because, as I outlined in my second lecture, the existing evidence was so unsatisfactory. The present experiments offered an excellent opportunity of doing so, because the subjects were able to eat ample food and protein to supply the normal needs of the body. Two nitrogen balances have been carried out, one on myself and one on Niven, and both have shown that salt deficiency led to a negative nitrogen balance. As is shown in Table III, my balance

TABLE III

Apparent Nitrogen Balance. From McCance.<sup>9</sup>  
(Subject: R. A. M.)

Deprivation period (days).	Daily intake (g.) (average).	Daily output (g.) (average). <sup>a</sup>	Balance.
1-3 inclusive ..	13.5	13.35	+0.15
4-6 " " ..	12.9	14.37	-1.47
7-9 " " ..	14.1	16.53	-2.43
10-11 " " † ..	13.2	16.52	-3.32
Recovery period.			
1-3 inclusive ..	18.5	22.4	-3.9
4-5 " " ..	17.9	16.3	+1.6

<sup>a</sup> The output includes all sources except blood taken for analytical purposes.

† The last day of the deprivation period was not a full 24 hours. For the construction of this table the actual output for 19 hours has been multiplied by 24/19. The intake for the missing meal has been assumed to be the same as the intake on the previous day.

became more negative as the deficiency grew worse, which suggests an intimate association. Actually the balance was worse than the figures in Table III. suggest, for during the deficiency my blood-urea rose from 30 to 70 mg. per 100 c.cm., and the apparent balance should be corrected for this retention of metabolic products. I have done this by making certain assumptions, and the results are given in

Table IV. I lost 33.6 g. of nitrogen during my deprivation period and 1.6 g. over the five days of my recovery period. The latter was due to the large loss on the first two days when I was still very deficient. If I had been able to carry my recovery

TABLE IV

"Corrected" Nitrogen Balance. (Subject: R. A. M.)

	Deprivation period (11 days).		Recovery period (5 days).
Total intake (N.g.)	146.3	Total intake (N.g.)	91.1
Observed output (N.g.)	172.4	Observed output (N.g.)	100.7
Metabolised but retained (N.g.)	7.5	Excreted but not metabolised (N.g.)	8.0
Metabolised + excreted (N.g.)	179.9	Excreted N. less non-metabolised N. (g.)	92.7
Balance (g.)	-33.6	Balance (g.)	-1.6

period on for a few days longer I would have shown a positive balance over the whole recovery period, as Niven did. Niven lost 45 g. of body nitrogen during his experiment, so that there can be no reasonable doubt that we were in negative nitrogen balance. Just why we were is not quite so clear. It may simply be the result of autolysis of the tissues due to their malnutrition following the reduction in the volume of the blood and interstitial fluids. I imagine that the increase in the viscosity of the blood may also interfere with the normal circulation, and so with the nourishment of the cells. These experimental results undoubtedly have a bearing on the wasting of Addison's disease, particularly the muscular wasting which would probably go on even if there were no digestive disturbances.

The Secretion of Urine

RESPONSE TO AN ALKALOSIS

I pointed out in my previous lecture that clinicians have observed that persistent vomiting may be accompanied by an acid urine. Since protracted vomiting causes an alkalosis, the urine should have been alkaline, and these observations suggest that one of the most characteristic functions of the kidney had failed. The explanations offered to account for this failure have not been altogether satisfactory, and so, since prolonged vomiting causes not only an alkalosis but usually a sodium deficiency as well, I decided to try to reproduce the clinical observations when we were salt-deficient and to study them. We required for this purpose an intense temporary alkalosis which would not interfere with the rest of the experiment. I considered the possibility of producing this by removing hydrochloric acid by a stomach-tube, but I decided that it would be easier and probably more pleasant to remove carbonic acid by overbreathing. The latter has the further advantage of producing a much more violent alkalosis. We have all overbreathed at least twice, once when in normal health and once when salt-deficient. I have done it seven times, and for 45 minutes on each occasion, but I let the others off with 30 minutes and I really think that this is long enough.

The urines secreted before, during, and after the periods of overbreathing were collected and analysed. One untoward incident occurred during these experiments. I foolishly forgot to breathe again voluntarily on one occasion after I had completed my 45 minutes overbreathing. I was so alkaline that I received no stimulus to breathe from my respiratory centre, and the resulting anoxæmia was so sudden and severe that I was unconscious for some minutes and very collapsed for several hours.<sup>8</sup> Miss Widdowson and I are publishing a full account of these overbreathing

experiments.<sup>11</sup> I have simplified and summarised the results in Table V.

You will notice in the first place that the normal response to overbreathing was a diuresis and an alkaline urine. The alkalinity was brought about by

TABLE V

Effect of Overbreathing on the Secretion of Urine

	Normal health. Breathing air.	Salt-deficient. Breathing air.	Salt-deficient. Breathing a CO <sub>2</sub> air mixture.
Reaction of the urine.	Becomes alkaline.	Does not change.	Does not change.
Minute volume	Increases considerably.	Decreases considerably.	"
Rate of excretion—			
of sodium ..	Increases.	Decreases, but traces only are present both before and during overbreathing.	No change.
of potassium	"	Slight decrease; normal amounts present.	"
of chloride ..	Increases slightly.	Decreases, but traces only present both before and during overbreathing.	"
of urea ..	No significant change.	Decreases considerably.	Very slight decrease.
of creatinine	No change.	" "	No change.
of sulphates	"	" "	"
of phosphates	"	" "	"

an increased excretion of sodium and potassium. There was sometimes a small increase in the rate of excretion of chloride as well, but this has no bearing on the present argument. Both sodium and potassium contributed to the increased excretion of base and it was this which brought about the change of reaction to the alkaline side. There was no constant change in the rate of excretion of the other urinary constituents mentioned in Table V.

Now observe what happened when the subjects were salt-deficient. To begin with there was no change of reaction, so you see we have been successful in reproducing the clinical observations. Next you will observe that there was no increased excretion of base. This explains why the urine did not become more alkaline. It is understandable that since the kidney is excreting practically no sodium during salt deficiency, it should not be able to excrete any when the plasma becomes alkaline. I may explain it by saying that the kidney prefers to regulate the osmotic pressure of the plasma rather than its pH, but it is at first most puzzling why the normal increase in the rate of excretion of potassium does not occur. I think the explanation comes from a consideration of the other urinary constituents. Observe firstly that the minute volume fell very greatly instead of rising, and that secondly there was a decrease in the rates of excretion of urea, creatinine, sulphates, and phosphates, whereas there had been no change under normal conditions. In other words, the normal excretory powers of the kidney were seriously curtailed. I think the excretion of potassium was involved in this general depression of functional activity, and hence the normal response was not observed. Now there are two possible explanations for this general depression of activity produced by overbreathing during salt deficiency. The mere muscular exertion of overbreathing might have caused the blood (already greatly reduced in volume) to be diverted from the kidney to the muscles.

On the other hand the depression of activity might have been due to the damaging effect of alkalosis, although why this should only be obvious during salt deficiency is not clear. We have decided between the alternatives by overbreathing during salt deficiency with air mixed with carbon dioxide. In this way we subjected ourselves to the muscular movements, but avoided any alkalosis. The results are given in Table V., and you will see that except for a very slight fall in the rate of excretion of urea there was no other change in the renal activity. We may conclude that the effects observed with air alone were due to the alkalosis.

The kidney therefore must be seriously hampered by an alkalosis combined with sodium deficiency. Now you will recollect that in pyloric obstruction and after persistent vomiting for other reasons, patients have both an alkalosis and a sodium chloride deficiency, and that their urines may be acid. The alkalosis, which should normally provoke the secretion of an alkaline urine, does not do so, because in the first place no sodium is available for excretion, and in the second, the activity of the kidney is so curtailed by the combination of alkalosis and salt deficiency that no extra potassium can be excreted. The high blood-ureas and other signs of renal failure are also due to this combination of salt deficiency and alkalosis. It is interesting in this connexion to recall that steady dosing with alkalis may produce high blood-ureas and signs of uræmia in susceptible persons (see Lecture II.). So far the syndrome has only been incompletely investigated, but I would point out that its resemblance to salt-deficient alkalosis may be purely superficial. Hypochloræmia is common to both, but there is no sodium deficiency when alkalis have been administered, and there are differences also in other respects.

#### GENERAL FUNCTIONAL ACTIVITY

I drew your attention in my previous lecture to the general association between sodium deficiencies and high blood-ureas. I was most anxious to see if the latter could be reproduced under our experimental conditions where there was no water deprivation, for I hoped that, once reproduced, we might be able to explain it. I now realise that a full explanation demands much more work than I have so far been able to do, and I must ask you to regard my results as preliminary rather than final.

Our first attempt to produce a high blood-urea was a failure. Miss Edwards's blood-urea remained quite normal throughout her experiment and so did her urea clearances. The reason I now think was because she ceased to lose more than 0.2 g. of sodium chloride in a 2-hours' sweat and so could not be made really salt-deficient. I next tried on myself. There is no doubt that I become salt-deficient rather easily. The day after my third sweat I found that the urea in my blood had gone up from my normal 30 to 53 mg. per 100 c.cm. On the next day—a Saturday—it had fallen to 46 mg. and I did my last overbreathing experiment in the afternoon. On Sunday morning I drove down alone to the hospital and climbed the stairs to the laboratory, feeling a little breathless and rather miserable. I sat down surrounded by the inevitable litter of food, bottled urines, and reagents lying about the benches. I had done my overbreathes, my blood-urea had gone up; should I stop? Was it in fact wise to go on? I could not make up my mind what to do. Ultimately I came to the conclusion that it would be cowardly to rest content with one blood-urea of 53 mg. per 100 c.cm., so when Miss Widdowson came in I rang up for

other help, and spent the whole of Sunday afternoon sweating. My blood-urea on Monday was 74 mg. per 100 c.cm. and I kept it there till the Wednesday while we completed our observations.

We are accustomed in this country to associate the high blood-ureas of nephritis with an inability to concentrate urea in the urine. I realised very quickly that there was not the usual association in my own case. I knew from preliminary tests and general experience that my kidney could concentrate urea up to a level of about 4 per cent. I continued to be able to do this even when my blood-urea was over 70 mg. per 100 c.cm., and on one occasion found 4.25 per cent. of urea in my urine when my blood-urea was 74 mg./100 c.cm. Subsequently we have found this to be characteristic of sodium deficiency. Niven on one occasion went on hour after hour turning out urine with more than 3 per cent. of urea in it when his blood-urea was 80 mg. per 100 c.cm.

At first therefore I was inclined to regard my high blood-urea as the result of my increased katabolism of body proteins. On the other hand my urea clearances were lower than they had been when the experiment began. I knew, too, from previous experiments with high and low protein diets how much urea I should have been excreting per day for any level of blood-urea up to 70 mg. per 100 c.cm. My actual daily excretions were falling very much short of this. Reconsideration of the matter showed me that my increased N katabolism (34 g. spread over 6-8 days) should not have raised my blood-urea to the height at which it stood when I was salt-deficient. My ability to excrete urea was evidently impaired. There were two reasons for this to be considered.

(1) The anhydræmia with its attendant complications had reduced my glomerular filtration rate. This would have raised the plasma concentrations of all substances excreted solely by the glomeruli. My urine volumes were normal, but I must emphasise once again that a large reduction in glomerular filtration is quite compatible with a normal volume of urine (see Lecture II.).

(2) Additional urea was being reabsorbed in the tubules to regulate the osmotic pressure of the plasma (see Lecture II.).

To decide between these two possibilities the first essential was to obtain a true measure of glomerular filtration rates. I considered the possibility of using glucose after complete phloridzinisation, but I decided it was unsuitable for the present purpose because phloridzin itself seems to affect the filtration,<sup>16</sup> and might have done so to a different extent during salt deficiency. According to Shannon and Smith<sup>17</sup> inulin satisfies all requirements, so I decided to use it. In trying to do so, however, I had a very unpleasant experience which I think I ought to mention. Having got a supply of the purest inulin I could obtain, Mr. E. G. Muir and I injected into a cat rather more than the required dose calculated on the basis of body-weight. The intravenous route was used and the animal seemed none the worse. I next decided to give 1/10th of the standard dose to the man who had volunteered to be made salt-deficient. I did so (intravenously) one day about 11.30 A.M., with no untoward results at the moment, but 10 minutes later the subject began to complain that his hands were cold, and when I looked at him I saw to my horror that they were blue. Five minutes later the man was cyanosed all over and suffering from an agonising headache. I took his blood pressure and found it had risen from his normal 115/75 to 168/110. Presently he began to have a rigor and was sick. His temperature rose in an hour to 103°F. and then over the next hour and a half to 105.2°.

His pulse-rate was 136-140 at this time. At 6.45 P.M. his face was tremendously flushed; his temperature was still 101° F., but he was much more comfortable and he was reading an evening paper. I felt that the worst was over, but during the night his temperature fell to 97° F. and his blood pressure to 65/50. He felt dreadfully ill and his pulse-rate fell to 90 at this time, but rose again next day to 120-130. It was several days before his blood pressure and pulse had returned to their normal levels. He never had any albuminuria, and fortunately he seems none the worse for this unpleasant experience.

After this I decided it would be wiser not to use inulin, so I chose cane sugar instead. It seems that some limited reabsorption of this substance does take place in the tubules, and that therefore glomerular filtration rates determined by cane sugar are too low. They do, however bear a constant relationship to the true rates so that the use of cane sugar is legitimate for comparative purposes. I also decided to determine the creatinine clearances simultaneously, but there were so many other things to do that we have only been able to carry through all these function tests on our last subject. On him we were able to determine the creatinine, cane sugar, and urea clearances when he was normal, and compare them with the same clearances when he was salt-deficient. For this purpose Whitteridge took 6 g. of creatinine by mouth to raise the plasma concentration, and about 30 minutes later we began to give him intravenously 200 c.cm. of a 25 per cent. solution of cane sugar in distilled water. The intravenous infusion occupied half an hour and, commencing about 30 minutes after it was finished, half-hourly collections of urine and blood were made for 2 to 2½ hours. Five experiments of this type were carried out so that in Whitteridge we have been able to determine the three clearances over 24 periods, 15 during normal health, and 9 during salt-deficiency. A summary of the results is given in Table VI.

TABLE VI  
Average Clearances. (Subject: D. W.)

	Creatinine	Sucrose.	Urea.	Urea sucrose.
Normal— Aver. of 15 periods	169 c.cm.	113 c.cm.	76 c.cm.	0.67
NaCl deficient— Aver. of 9 periods	126 ..	78 ..	46 ..	0.59
As percentage of normal .. ..	74	69	61	—

N.B.—The urine volumes were over 2 c.cm./min. in every period.

It will be seen that the normal clearances of cane sugar are lower than those of creatinine. There are two reasons for this. Firstly, the cane sugar clearances are a little lower than the true glomerular filtration rates because some cane sugar is reabsorbed from the tubules. Secondly, the creatinine clearances are a little higher than the true glomerular filtration rates because some creatinine is excreted by the tubules. We may conclude that the true glomerular filtration rate lies somewhere between the cane sugar and the creatinine clearances. The clearances of urea are lower than those of cane sugar and still lower therefore than the true glomerular filtration rates. Hence in all probability some urea is always being reabsorbed.

I take the fall in cane-sugar clearances during salt deficiency to indicate a fall in glomerular filtration rate. There was no change in arterial blood pressure,

and I have so far been unable to convince myself by the cyanide method of any change in circulation rate. I therefore attribute this fall mainly (a) to the decreased blood volume, which probably reduces the number of glomeruli in action; (b) to the increased colloidal osmotic pressure of the plasma brought about by the concentration of plasma proteins. The urea clearances fall rather more than the sugar clearances when the fall is expressed as a percentage of normal. If this difference is significant it means that there has been increased reabsorption of urea. I do not wish to draw any conclusions about this from the present experiments. There may or may not be additional reabsorption of urea. I have still many tests to make on other subjects, not only under the conditions heretofore employed—i.e., large volumes of urine—but also when the volumes of urine are normal or small.

My evidence at present is that the tubule cells are normal. Concentration of urea seems to be unimpaired, and also, so far as I have tested it out, the secretion of ammonia.

### Summary and Conclusion

This, then, is a résumé of our work on sodium chloride deficiency. It is particularly easy to be misled by symptoms, and I feel that I ought to be very much on my guard against drawing hasty conclusions from work of this kind. Nevertheless I feel justified in making one or two comments. In the first place the symptoms and signs of sodium deficiency are strongly suggestive of clinical Addison's disease. There are differences, but I think they can be explained. The low blood pressure, for example, and the pigmentation of Addison's disease may be due to lack of the medullary rather than the cortical hormone. The relative absence of cramps in the clinical disease may be due to its chronic nature, which allows time for the necessary adjustments to be made. In the second place the blood changes are almost identical with those of experimental suprarenalectomy, and when one considers Harrop's recent work, which strongly suggests that the main function of the cortical hormone is to regulate sodium metabolism, then the real significance of the present experiments becomes apparent. I regard them as the link between experimental suprarenalectomy and the clinical disease.

But really they are more. Intestinal obstruction, diarrhoea, and vomiting, and diabetic coma are all diseases in which salt deficiency is a prominent feature. I have great hopes that the present experiments will help us to unravel their respective pathologies, which up till now have appeared so obscure. I feel so hopeful because we have already been able to reproduce experimentally several aspects of these diseases, particularly aspects of renal pathology, and study them under controlled conditions.

I began these lectures by referring to a prophecy of William Prout made in this room over 100 years ago. That prophecy is not yet fulfilled, and can only be fulfilled by more research, but even Prout, visionary though he was, might be surprised if he could see how his subject has already influenced industry, agriculture, and medicine. He would have taken a delight in some of its recent applications to nutrition, bacteriology, embryology, and indeed to almost every field of medical science. A true prophet is seldom the idol of his contemporaries. Physicians of his day subjected Prout to the most scathing criticism for views which seem to us to have been inspired. If I express my confidence in the future

of biochemistry I hope that the physicians of to-day may take a more tolerant view. I feel that the influence of biochemistry on medicine is only in its infancy. I see for example no reason why certain problems of psychology and even of human behaviour should not be solved in the future by intelligent hormone therapy; or why neurology should not become just as biochemical a subject as nutrition. We owe much to surgery and radiology, more so perhaps at present than to biochemistry, but of the three the last is the most fundamental, and the future lies in its hands. Medicine already owes biochemistry a great debt. It will one day be incomparably greater.

The greater part of the original work embodied in these lectures has been financed by the Medical Research Council. I am very grateful to them for this assistance.

## REFERENCES

1. Baumann, E. J., and Kurland, S.: Jour. Biol. Chem., 1926-27, lxxi., 281.
2. Derrick, E. H.: Med. Jour. Australia, 1934, ii., 612.
3. Dragstedt, L. R., and Ellis, J. C.: Amer. Jour. Physiol., 1930, xciii., 407.
4. Greene, C. H., Rowntree, L. G., Swingle, W. W., and Pfaffner, J. J.: Amer. Jour. Med. Sci., 1932, clxxxiii., 1.
5. Katsch, G., and Mellinshoff, K.: Zeits. f. klin. Med., 1933, cxxiii., 390.
6. Kerpel-Fronius, E.: Zeits. f. Kinderheilk., 1935, lvii., 489.
7. Lim, R. K. S., and Ni, T. G.: Amer. Jour. Physiol., 1925-26, lxxv., 475.
8. McCance, R. A.: THE LANCET, 1935, ii., 370.
9. " : Proc. Roy. Soc. B., 1935-36, cxix., 245.
10. McCance, R. A., and Shipp, H. L.: Med. Research Council, Spec. Rep. Ser., 1933, clxxxvii.
11. McCance, R. A., and Widdowson, E. M.: Proc. Roy. Soc. B., 1936 (in press).
12. McCance, R. A., Widdowson, E. M., and Shackleton, L. R. B.: Med. Research Council, Spec. Rep. Ser. 1936 (in press).
13. Moss, N. K.: Proc. Roy. Soc. B., 1923-24, xcv., 181.
14. Rosemann, R.: Pflügers Arch., 1910, cxxxv., 177.
15. Rowntree, L. G., and Snell, A. M.: A Clinical Study of Addison's Disease, Mayo Clinic Monographs, 1931.
16. Shannon, J. A.: Jour. Clin. Invest., 1935, xiv., 403.
17. Shannon, J. A., and Smith, H. W.: Ibid., 1935, xiv., 393.
18. Simpson, S. L.: Proc. Roy. Soc. Med., 1933-34, xxvii., 383.
19. Talbot, J. H., and Michelsen, J.: Jour. Clin. Invest., 1933, xii., 533.
20. Widdowson, E. M., and McCance, R. A.: THE LANCET, 1935, i., 1437.
21. Winter, K. A.: Zeits. f. d. ges. exp. Med., 1934, xciv., 663.
22. " : Klin. Woch., 1934, xiii., 1454.

## THE DIFFERENTIAL DIAGNOSIS OF DISEASES OF THE COLON

(DYSENTERY AND COLITIS)\*

BY PHILIP MANSON-BAHR, D.S.O., M.D. Camb.,  
F.R.C.P. Lond.

PHYSICIAN TO THE HOSPITAL FOR TROPICAL DISEASES,  
LONDON

(Concluded from p. 765)

THERE are other protozoa which inhabit the intestine of man and may from time to time give rise to dysenteriform attacks.

### Coccidiosis

During the last twenty years various forms of coccidial cysts have been found in the faeces of man, but many of these have been ascertained, mainly by Thomson and Robertson, to be actually parasites of fish, especially of the herring and the sardine, and the cysts are merely passed unchanged through the human intestine when these fish are eaten.

There is, however, one, *Isospora hominis*, which appears to be the genuine inhabitant of the bowel, and more than 150 cases of this infection have been reported in man (Fig. 7). This is not a serious pathogenic entity, although it may produce diarrhoea

and distressing symptoms. The cysts of the parasite are easily discovered in the faeces, and their further development can be demonstrated by placing them for several days in an incubator. In those cases which I have personally observed, the faeces contained pus cells and Charcot-Leyden crystals. Most of the infections come from the Eastern Mediterranean, but cases from the West Indies have also been recorded. The infection does not seem to be very prolonged, and symptoms subside without any particular treatment.

### Giardiasis

A more complicated problem is presented when the bowel is infected with the protozoal flagellate, *Giardia (Lambia) intestinalis*. This parasite, which is provided with a sucking disc, attaches itself to the mucous membrane of the small intestine and apparently feeds upon the mucous surface without actually invading the bowel wall of man, although similar species are found in rats and mice, cats and dogs, in which definite intestinal lesions are observed. The parasite has a further historical interest in so far that it is the first protozoon ever seen by man, when it was discovered by Leeuwenhoek in 1681 with his primitive microscope. Interest has been aroused in recent years by the discovery of large numbers of these flagellates in the duodenal juice removed by means of a duodenal tube, and also in the bile obtained at operation. Encysted forms which may be confused with those of *Entamoeba histolytica* are commonly found in the stools of infected persons. This parasite is common and widely distributed in all parts of the tropics, but is also seen occasionally in children in this country.

A great diversity of opinion manifests itself at different times, and in different countries, towards the pathogenic rôle of this parasite. I am of the opinion that under certain conditions giardia is distinctly pathogenic, and that its numbers depend upon the diet of the individual infected. The mass infection of the small intestine appears to produce an irritative lienteric form of diarrhoea. The stools are pale, large, and contain undigested residue. The symptoms of giardiasis are somewhat indefinite, but consist of an explosive diarrhoea with flatulency and abdominal discomfort; sometimes a quantity of mucus is passed with the faeces.

The diagnosis is interesting in view of the need of its differentiation from sprue. The parasites are easily discovered in the faeces; in the acute stages the active flagellated parasite is found, and in the more chronic ones, the characteristic cysts. The main methods of treatment consist in altering the dietary of the patient and substituting a purely protein for a carbohydrate diet.

### Flagellate Diarrhoea

Various other forms of protozoal flagellates are found abundantly in diarrhoeic faeces of man, and it has been a matter of considerable perplexity to ascertain the part played by these minute organisms. The two main forms are known as trichomonas and chilomastix. The presence of these flagellates in the stools and in the intestine is certainly indicative of a contamination of the food taken in by the mouth, but it is thought by most people that their presence, often in enormous numbers in diarrhoeic faeces, is due to their capacity to multiply in such a suitable medium; they are, in fact, the outcome and not the cause of the diarrhoea.

They may be therefore a superadded infection on top of amoebic or bacillary dysentery. The matter is still unsettled.

\* The Lettsomian lectures for 1936 delivered before the Medical Society of London on Feb. 17th and 26th and March 2nd,



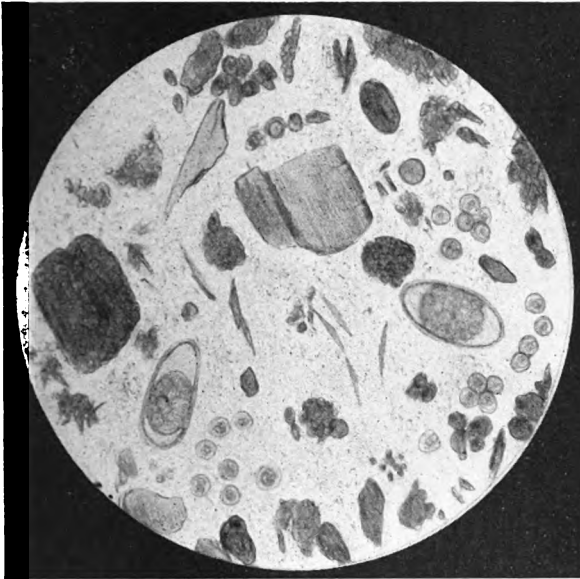


FIG. 7.—Intestinal coccidiosis. Case from the West Indies, showing appearance of feces under the microscope and cysts of *Isospora hominis* and also Charcot-Leyden crystals.

One cogent reason in the minds of those who maintain that these flagellates may be the cause of a peculiar diarrhoea is that, after appropriate treatment such as colonic lavage, the active forms disappear from the faeces and the active symptoms tend to subside.

#### Malarial Dysentery

Dysenteric symptoms are occasionally associated with protozoal blood disease. In the most severe forms of malarial infection produced by the subtertian malaria parasite (*Plasmodium falciparum*), dysenteric symptoms are occasionally observed. This is the so-called malarial dysentery of which I saw many examples during the Great War. Very often it is true the dysenteric syndrome is brought about by a superadded infection with the dysentery bacillus, or the dysentery amoeba, but there certainly exists a residuum of cases in which no active dysenteric agent can be discovered. The underlying pathology of this condition is due to the massive blocking of the smaller blood-vessels of the mucous membrane of the large intestine with sporulating subtertian parasites, after which actual hæmorrhages take place (Fig. 8).

The appearance of the stools therefore in these cases is not unlike that of hæmorrhagic colitis. Of course, the diagnosis is easily made by the discovery of the malarial parasite in the blood, and sometimes I have succeeded in demonstrating them in the red blood corpuscles which appear in the stool; all of which goes to show how very numerous these parasites must be.

#### Leishmanial Dysentery

Leishmanial dysentery is found in visceral leishmaniasis or kala-azar. In the terminal stages of this infection a massive invasion of the villi of the small intestine, and of the crypts of Lieberkühn of the large intestine with the Leishman-Donovan bodies occurs, leading to the actual ulceration of the bowel (Fig. 9). This in turn leads to the passage of blood and mucus in the stools in which the Leishman-Donovan bodies have in fact been demon-

strated. Naturally these cases are very rare and are only encountered in Assam, the endemic centre of the disease. In these cases other signs and symptoms of kala-azar are sufficiently obvious.

### The Colitis Group

#### MUCOUS COLITIS

It is necessary to state that I disagree with those who deny the separate existence of a pathological condition of the colon which produces the sequence of symptoms usually known as "mucous colitis." The aetiology of this condition has been the subject of much debate; but it is agreed by those who investigate their cases thoroughly that mucous colitis is a definite entity.

Perhaps it is best to look upon it as an allergic condition of the mucous membrane of the bowel which is associated with a distinct neurological element. It is a matter of observation that these patients are of a distinctive introspective type, and their interest in living is mainly centred in their digestive tract. In tropical practice the symptoms of mucous colitis are a common sequel to one or other of the classical forms of dysentery, and it is very often difficult to ascertain where the symptoms of dysentery end and those of mucous colitis begin.

Associated with the discharge of large quantities of mucus and undigested food remains from the bowel there is a spastic condition of the colon which can be demonstrated by a barium enema. I consider that the stools of mucous colitis are quite distinctive and the condition can be diagnosed by microscopical examination.

The nuclei of the mucous cells as seen in the stool resemble those of the goblet or mucus-secreting cells of the large intestine, and can be easily recognised (Fig. 10). A search for distinctive micro-organisms in the stools of these cases usually leads to a false clue. Naturally all kinds of micro-organisms, and

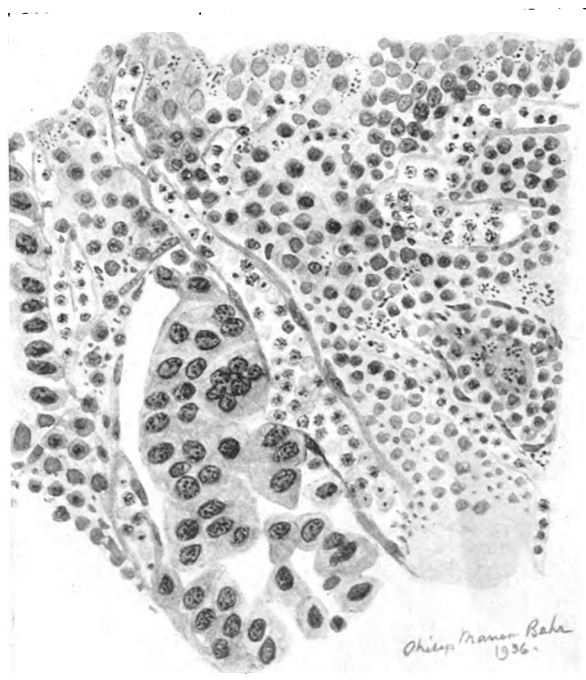


FIG. 8.—Malarial "dysentery." Section showing sporulating forms of the subtertian parasite (*P. falciparum*) blocking the capillary vessels.

especially streptococci, may be isolated; but there is no proof that they are the actual cause of this condition. The sigmoidoscope is of considerable value in making a positive diagnosis. The mucous membrane is of a pale, rather yellow appearance, and is coated with ropes of viscid mucus. The surface of the mucous membrane itself is dry and unhealthy (Fig. G on Plate published last week).

Everybody knows that these cases are very difficult to treat successfully. The main principle appears to be to put the bowel at rest as much as possible by the injection of bland substances, such as olive oil, and at the same time allay the nervous apprehensions of the patient.

#### ULCERATIVE COLITIS

There are very many great difficulties in discussing this difficult subject, as our premises do not rest upon definitely formed grounds. In fact the term "ulcerative" is not strictly correct in describing this condition. From the observations that have been made in a series of cases in the Hospital for Tropical Diseases, the initial lesions in the mucous membrane of the bowel seem to be a large number of small hæmorrhages, and this stage is followed (as observed by sigmoidoscopy) by a peculiar plush-like congestion of the mucosa. Next a layer of granulation tissue forms on the mucous surface which is extremely friable and is easily traumatised by the discharge over it of faecal matter. Actual ulceration of the mucosa is a late phenomenon and is only found in the terminal stages of the disease when secondary infection has taken place (Figs. H, I, J, K on Plate).

The whole natural history of this disease marks it out definitely as a specific infection, but it is certain that the true ætiological factor remains to be discovered. So far a search for the true cause in the flora of the intestinal tract has proved to be a wild-goose chase. The association of pyrexia, of toxæmia, of arthritis, as well as all other metastatic phenomena, accompanied by grave anæmia and definite blood changes, seems to indicate that in ulcerative colitis we are dealing with a systemic blood dyscrasia in which the toxic elements are being excreted via the



FIG. 10.—Mucous colitis. Fæces preparation of mucous colitis case showing the type of mucus-secreting cell in the stools.

mucous membrane of the large intestine, and so are producing the train of symptoms just described.

There is no certain way of diagnosing ulcerative colitis, save by the general clinical picture, backed by sigmoidoscopic examination. The stools themselves resemble closely those of the chronic stage of bacillary dysentery, and it cannot be said that on microscopical examination they present any distinctive features. The predominating cell is the polymorphonuclear leucocyte, while Charcot-Leyden crystals are common and large phagocytic macrophage cells are seen (Fig. 11).

#### MEMBRANOUS COLITIS

Membranous colitis resembles the former condition very closely, except that from time to time casts—which may be almost complete—of the mucous membrane of the large intestine appear in the stools. There appears to be no essential difference in the exudate from that of the ulcerative form, save that from time to time portions of mucous membrane with the characteristic columnar epithelium can be recognised.

I regard the ætiology of this condition as being in the main similar to that of the ulcerative form.

It cannot be said that there are any characteristic appearances of the mucous membrane as seen through the sigmoidoscope, at least in those cases I have investigated. Usually the area of the exfoliating membrane is in the upper part of the large intestine, far removed from the field of vision of the sigmoidoscope.

Unfortunately in this form of colitis, as indeed in the other varieties already considered,

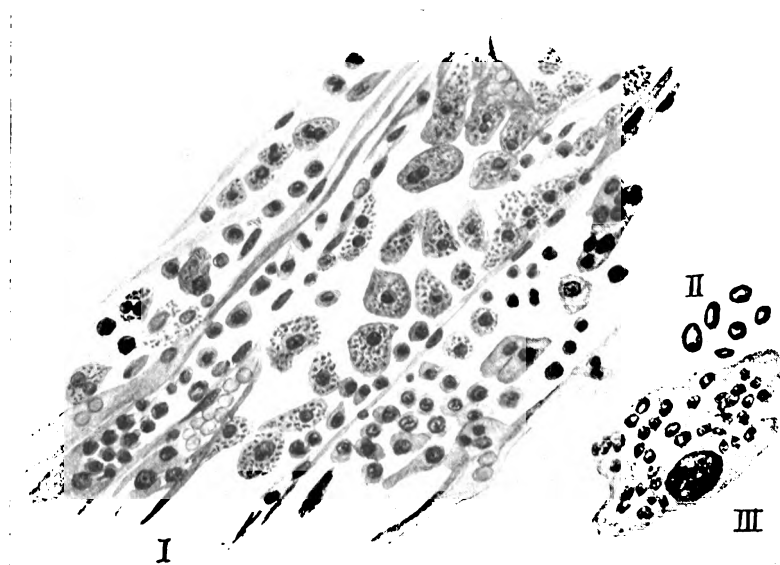


FIG. 9.—Kala-azar "dysentery." I. Section of Lieberkühn's follicle showing infection of columnar cells with leishmania. II. Leishmania bodies as they appear in smear preparations. III. Leishmania bodies enclosed in endothelial cells.

there is a distinct neuropathic factor. Membranous colitis usually supervenes in a peculiar type of introspective hyperneurotic persons, usually of the female sex.

#### COLITIS PRODUCED BY FOREIGN BODIES

An irritative form of colitis may be brought about by the impaction of any foreign body in the rectum. Thus such a foreign body may consist of pig's bristles, fish-bones, or even (as in one case in my experience) portions of a glass tumbler inserted into the rectum. There is usually little difficulty in making a diagnosis in this condition.

#### TOXIC COLITIS

*Mercurial poisoning.*—Toxic colitis, resembling in its clinical aspects a severe ulcerative colitis, has been described in chronic mercurial poisoning in industrial workers, and is always associated with chronic nephritis. It is usually fatal. I have been unable to find any more information on this subject than can be gleaned from books on pharmacology.

*Food-poisoning.*—In certain cases of infection by paratyphoid B, and other members of the salmonella group, ulceration of the large intestine may occur, giving rise to the appearance of blood and mucus in the stools, from which the specific bacillus can be isolated. These cases are admittedly rare, and I have not seen any instances of this nature since the epidemic of paratyphoid fever in Gallipoli in 1915.

*Uræmic colitis.*—Acute inflammation of the mucous membrane of the large intestine with blood and mucus in the stools is not infrequently seen in the terminal stages of uræmic poisoning. The colitis is undoubtedly caused by the excretion of toxic substances through the bowel wall.

#### Miscellaneous Group

##### TUBERCULOUS INFECTION OF THE COLON

It is commonly stated in text-books on medicine that tubercle of the large bowel in adults is of great rarity, but in my experience tuberculous lesions of the bowel wall itself, or ulceration of the mucous membrane, are not uncommon in residents in the tropics. The tuberculous infiltration of the large intestine may be confined to the cæcum, as in a well-known hypertrophic form, or may affect other portions of the large intestine.

Tuberculous ulceration can be recognised during sigmoidoscopy, and the tubercle bacilli can be demonstrated in material taken from the ulcers through the sigmoidoscope (Fig. L on Plate). It is always advisable to search for these acid-fast organisms in cases of chronic diarrhoea which cannot be diagnosed by other means. As the result of considerable experience on this subject, I hold that it is not possible to exclude tuberculosis of the bowel on a single examination of the stool. The bacilli appear in the fæces in showers and can be demonstrated very often after washing out the bowel with saline enemata.

Possibly the comparative frequency of this infection in tropical residents may be due to the lowering of the resistance of the mucous membrane by previous dysenteric infection. At any rate the cases that I have diagnosed occurred in dysenteric subjects. The stools may contain blood and mucus from time to time and on microscopic examination may consist of pus and other inflammatory cells.

##### SYPHILITIC DISEASES OF THE BOWEL

Syphilitic stricture of the rectum associated with the ulceration of the mucous surface is one of the rarities of medicine, and I am convinced that many

of the so-called syphilitic lesions of the large intestine can be more satisfactorily explained on other grounds. I have seen only one case which was diagnosed by sigmoidoscopy, and in which the Wassermann reaction was positive. The condition eventually responded to specific treatment. Blood and mucus may be passed also.

#### LYMPHOGRANULOMA INGUINALE

Lymphogranuloma inguinale is a condition which parades itself under a variety of names and was formally known as climatic bubo. Quite recently Stannus has drawn attention to the fact that the *genito-*

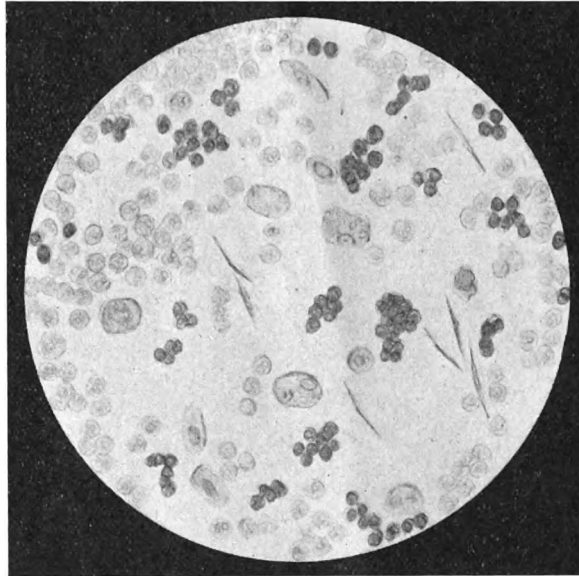


FIG. 11.—Acute ulcerative colitis. Cellular exudate showing clumps of red cells, macrophage cells, and Charcot-Leyden crystals.

*ano-rectal syndrome*, which is so frequently seen in native women especially in China, may be explained on the climatic bubo basis. The virus of this disease is ultramicroscopic and affects the lymphatic glands; travelling via the lymph-flow it may reach the rectum and cause chronic inflammation and stricture. The proof that such a stricture is due to this infection can be ascertained by the intradermal test; for instance, in 1932 Frei reported that 80 per cent. of these cases gave a positive intradermal test. Rectal stricture may lead to ulceration, and in 1934 I had a case of this kind under my care of 17 years' duration, in which the patient was passing blood and mucus stools resembling those of dysentery.

#### MALIGNANT DISEASES AND POLYPOSIS

These two conditions are grouped together because of the similarity of their symptoms, and of their very serious and usually fatal character. Malignant ulceration of the bowel must always be borne in mind, especially in elderly people of either sex. The discharge of blood and mucus from the rectum may be the first and possibly the only sign of a malignant growth situated somewhere in the large intestine. As a rule, the more profuse the dysenteric symptoms the higher in the bowel is the growth situated.

Malignant changes not infrequently take place, as Willmore has shown, at the base of chronic amoebic ulcers. The practitioner in the tropics therefore should not content himself with merely inspecting

the stools of every dysenteric-like case, but should perform a rectal or sigmoidoscopic examination in every instance where a true dysenteric infection cannot be ascertained. The stools contain pus cells, epithelial cells, and often Charcot-Leyden crystals (Fig. 12).

As regards *polyposis*, there is no doubt that this is a hereditary affection of the colon. The symptoms may be those of a dysentery, but usually there is a profuse hæmorrhage together with blood and mucus. I have encountered three instances of this disease which could be diagnosed easily by sigmoidoscopic examination. Death always occurs through the

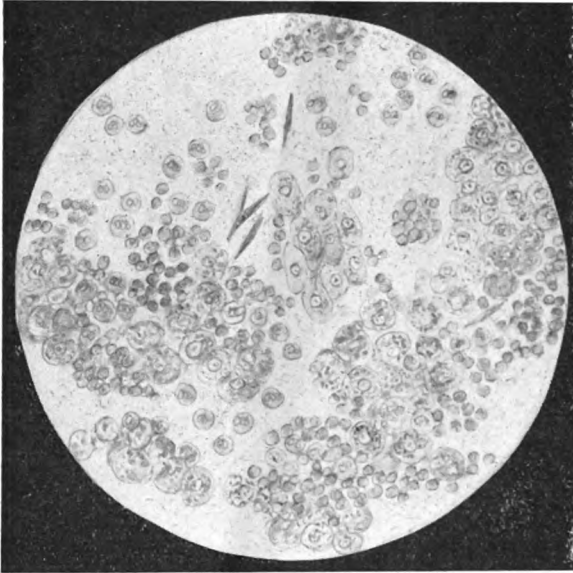


FIG. 12.—Carcinoma of rectum. Cellular exudate of case of rectal carcinoma with intestinal epithelium and Charcot-Leyden crystals, from a case which had been treated as amœbic dysentery for 1½ years.

supervention of malignant changes. (A pseudo-polypoid condition can be a sequel to chronic ulcerative colitis and to chronic bacillary dysentery. Lockhart-Mummery recognises an adenomatous form.)

#### DIVERTICULITIS

It is a matter of considerable surprise to find that blood and mucus may be passed in cases of diverticulitis, and this is probably due to the ulceration of the mucous membrane which may accompany advanced stages of this disease. I have seen several instances of patients who have been sent from the tropics labelled "incurable amœbic dysentery."

Of course these cases can be easily diagnosed by means of a barium enema, but I have not had much success in gaining further information from the sigmoidoscopic examination. It cannot be said that there is anything distinctive about the stools, which may closely resemble those of amœbic dysentery.

#### POLYPUS : INTUSSUSCEPTION : HÆMORRHOIDS

*Simple polyposis*.—Simple polyposis of the rectum or of the large intestine may give rise to dysenteric symptoms. From time to time people have been referred to me from the tropics, perhaps children who have been thought to be intractable cases of dysentery, and in one instance a man of 64 years of age. But the suspicion regarding the possibility of this diagnosis should be engendered if the general condition of the

patient is good, and there is no loss of weight. As a rule there is a considerable amount of pain on discharge of the stools associated with polypus, and from time to time a not inconsiderable hæmorrhage. The stools usually contain glairy masses of mucus tinged with blood resembling sputum and passed apart from the fæces themselves. Naturally the diagnosis can be clinched by sigmoidoscopy, and occasionally by means of a barium enema; but this is usually not quite so easy.

*Intussusception*.—Intussusception is associated with the discharge of bright red blood and mucus in the stools. This may be an accident supervening upon bacillary dysentery or may arise from other causes. It is usually found in infants and small children, and the other appearances are quite characteristic. It is mentioned here for the sake of completeness.

*Internal hæmorrhoids*.—Internal piles, especially when they are thrombosed or have become infected, may give rise to the passage of blood-stained mucus. The diagnosis is easily made by the employment of the proctoscope. Sometimes, too, a small degree of ulceration may actually be present.

## NEURITIS IN PREGNANCY SUCCESSFULLY TREATED WITH VITAMIN B<sub>1</sub>

By G. W. THEOBALD, M.D. Camb., M.R.C.P. Lond.,  
F.R.C.S. Edin., F.C.O.G.

FIRST ASSISTANT TO THE DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY, THE BRITISH POSTGRADUATE MEDICAL SCHOOL, HAMMERSMITH; CONSULTING GYNÆCOLOGIST TO THE NORTH KENSINGTON WOMEN'S WELFARE CENTRE; LATE ASSISTANT MASTER, THE ROTUNDA HOSPITAL, DUBLIN

(From the Hammersmith Hospital and St. Mary Abbots Hospital)

It has long been recognised that neuritis may be associated with pregnancy, and although it has been suggested that the pregnancy may lower the resistance of the body to some toxin—e.g., from a septic tooth—which causes the neuritis, the view generally held is that the condition is a manifestation of a pregnancy toxæmia, the result of a toxin peculiar to pregnancy. The fact that the polyneuritis of pregnancy in its severer form is usually associated with hyperemesis gravidarum has been considered to lend support to the latter assumption.

The symptomatology of the condition is well known; it may progress until Korsakoff's syndrome is manifested. Many of these patients die and at autopsy not only changes in the peripheral nerves but also degenerative changes in the anterior horn cells and petechial hæmorrhages in the brain and spinal cord have been described (Berkwitz and Lufkin, 1932; Luikart, 1933; Ford, 1935). It is thus evident that patients dying from beri-beri, scurvy, and the polyneuritis of pregnancy may show similar histological changes in the tissues of the nervous system.

In 1930 I suggested that the cases of pregnancy neuritis seen in this country might be a form of beri-beri, and for three reasons: (1) the incidence of the neuritic form of beri-beri in Bangkok was much higher in pregnant than in non-pregnant women, indicating that an increased intake of vitamin B was necessary during pregnancy; (2) the neuritic

symptoms of beri-beri were indistinguishable from those of the polyneuritis of pregnancy; and (3) I was of the opinion that all the toxæmias of pregnancy were interrelated and due to dietetic deficiencies and considered that the increased incidence of beri-beri during pregnancy supported that hypothesis. Curiously enough in the same year and the same month Wechsler, from the neurologist's viewpoint, drew attention to the probable occurrence of deficiency polyneuritis in hitherto unsuspected cases, including those associated with pregnancy. Three years later Strauss and McDonald reported the results of the dietetic treatment of three cases in which pregnancy polyneuritis was associated with anæmia and hyperemesis gravidarum. Two of the patients were delivered before the treatment was commenced, but in the third a very marked improvement occurred and the patient was delivered at term by Cæsarean section. In addition to a high protein diet the patients were given considerable amounts of vitamins A, B<sub>1</sub>, B<sub>2</sub>, and D, and of iron. In the same year (1933) I reported, in a general paper on the toxæmias of pregnancy, a case of pregnancy polyneuritis cured by dietetic measures. This patient early in pregnancy suffered from a polyneuritis affecting all four limbs. Both knee-jerks were absent. There was wasting of the thenar and hypothenar eminences and general tenderness on deep muscle pressure. The hand grip was very weak on the right side. In addition the patient evinced choreiform movements of her limbs and head. She was put on an adequate diet rich in vitamins A, B, C, and D and was indistinguishable from a normal person when she came to be confined. Fouts, Gustafson, and Zervas (1934) and others have reported further cases of pregnancy polyneuritis successfully treated by diet.

Apart from these cases, which are uncommon, every obstetrician of experience has treated patients complaining of tingling and numbness particularly affecting the fingers and usually associated with a gnawing pain which runs up the arm, particularly at night. This pain, which disturbs sleep, usually demands the exhibition of hypnotic drugs and the condition rarely, if ever, clears up before delivery. I have seen a number of such cases, particularly in Leeds, and have recently been told by post-graduates from South Africa, Australia, and India, that they have observed the condition not infrequently, that they have never seen it clear up before delivery, and that the pain invariably demanded the administration of some drug.

The purpose of this paper is to report the successful treatment of 5 such cases by dietetic measures, in 4 of them solely by the administration of vitamin-B<sub>1</sub> concentrate. All the patients complained of numbness, tingling, pins-and-needles, and, with the exception of Case 5, of pain which was worse by night. The arms and hands were affected in all the cases, and one side more than the other.

#### THE FIVE CASES

CASE 1.—A primigravida, aged 26, first complained at the antenatal clinic of tingling of the fingers on Sept. 5th 1935, and was given calcium and Advita\* capsules (four daily) to take home with her. A week later the symptoms were worse and she was admitted to St. Mary Abbots Hospital on Sept. 15th. She complained of pins-and-needles and numbness in the fingers of both hands and pain shooting up the arms, particularly affecting the left side. The pain was severe and wakened her

up several times in the night, but did not disturb her much by day, although the numbness and pins-and-needles persisted. She was put on the full antenatal diet already described (Theobald, 1935) and was given in addition to vitamins A, B, and D, daily intravenous injections of 10 c.cm. of a 10 per cent. solution of calcium gluconate. Her condition improved so rapidly that she was discharged on Sept. 21st, complaining merely of tingling and numbness in her fingers. She was given calcium tablets and advita capsules to take out with her and came up three times in the week for intravenous calcium injections. Her condition rapidly disimproved and the pain recurred waking her up frequently, and making sleep impossible after 5 A.M. She was then given Bemax† in addition to other substances to take home with her and a few days later her symptoms improved and she slept better. She was again admitted to hospital on Dec. 6th by which time the right hand was normal. The fingers showed normal sensation to heat, cold, pinpricks, and cotton-wool. The tendon-jerks were more difficult to elicit on the left than on the right side, the biceps-jerk not being obtained. Her symptoms rapidly cleared up on the full diet and it is unfortunate that she was not seen by a neurologist until all her symptoms had disappeared. On Nov. 15th Dr. D. H. Brinton reported that there was no evidence of any organic nervous disease except for inequality of biceps-jerks. He thought, however, that the history of paresthesia was very suggestive of an early peripheral neuritis. Except for slight tingling which occurred on three subsequent occasions, one being the day after delivery, the patient had no further symptoms during her stay in hospital.

Two days after she left hospital, however, pain, numbness, and tingling recurred in her left arm, the right remaining normal. At her visit to the postnatal clinic a month later she reported that the condition in her left arm had been getting progressively worse so that it was then as bad as it had ever been. Tingling in the fingers occurred at intervals during the day, but at night the old pain shot up her arm leaving it numb and powerless, so that she could not hold the suckling baby with it. She was given vitamin B<sub>1</sub>‡ tablets in dosage of 2250 units daily. Within three days the pain and numbness ceased to affect her arm, and at the end of the week she complained merely of occasional tingling in the fingers of the left hand. After a further fortnight on this dosage of vitamin B<sub>1</sub> her symptoms entirely disappeared.

In this case the successful treatment before delivery showed the symptoms to be due to dietetic deficiency, while that subsequent to her confinement proved them to be due to a deficiency of vitamin B<sub>1</sub> in her diet.

CASE 2.—The patient, a 2-gravida aged 33, complained on Nov. 5th, 1935, of pain in her right arm and leg which had troubled her for about three weeks. It did not bother her by day, but at night the pain was so severe that she walked round the room "the whole night." She said she had not had a decent night's rest for the last three weeks. The pain ran up the arm and down the right side to the leg and was associated with marked numbness and tingling of the toes and fingers. The tingling (pins-and-needles) occurred by day. Sensation was unimpaired, the tendon-jerks were normal, and the knee-jerks brisk. There was tenderness on deep muscle palpation and slight pressure along the nerve trunks of the right arm and leg elicited pins-and-needles in the fingers and toes. Similar pressure applied to the left limbs had no effect.

She was sent home and given B<sub>1</sub> tablets (10 = 1500 units) daily; no further change of any kind was made in her dietary. On Nov. 12th she reported that she had three fairly good nights during the previous week; she thought her condition was improving. On the 19th she was "much better." The right leg was normal, and she had had one day with no tingling or numbness in her right hand. On the 26th she stated that she had had no

† One ounce (or 4 heaped tablespoonfuls) of Bemax contains 400 units of vitamin B<sub>1</sub>.

‡ Each of these tablets prepared by Messrs. Vitamins Ltd. weighs 0.75 g. and contains 150 units of vitamin B<sub>1</sub> and no other active substance.

\* Each capsule contains 111 of concentrated whale oil, in 1.0 gramme of which there are 25,000 units of vitamin A and 1000 units of vitamin D.



abnormal sensations in either of the affected limbs for some days.

There was no recurrence of symptoms either before or after delivery.

CASE 3.—On Sept. 16th, 1935, the patient, a 5-gravida aged 39, complained of severe cramps in her calves, insomnia, and tingling (pins-and-needles) in the fingers of the left hand. She was given an intravenous injection of 10 c.cm. of calcium gluconate and calcium and advita capsules to take home with her. (Calcium grs. 20; vitamin A 10,000 units, vitamin D 400 units, daily.) On Oct. 15th she reported that the cramps had ceased and the insomnia was better, but she was awakened several times in the night by gnawing pains down the arms to the hands, accompanied by numbness and tingling in the fingers. The left hand was much worse than the right. The circulation of the left arm was cut off for five minutes by means of an armlet. The fingers did not flex and she was able to maintain them fully extended without much discomfort.

On Oct. 22nd she said that for the last 14 days the condition of the left hand had been getting worse, so that she could no longer dress her children. In the morning the fingers were partly flexed and she was unable to extend them. They "cramp up" and are "dead." She complained of numbness, tingling, and loss of power in the left hand, the tingling and numbness persisting throughout the day. There was hypersensitivity along the course of the ulnar nerve. She had been seen on the previous day (Oct. 21st) by Dr. J. Purdon Martin who reported as follows: "Tendon-jerks all very brisk. Marked bilateral finger flexion. No sensory disturbance. Right plantar response flexor; left indefinite. In view of the increased tendon-jerks, spinal cause for the pains is suggested."

The calcium and vitamin capsules were discontinued and she was given vitamin B<sub>1</sub> tablets to take home with her and told to take ten daily. By Oct. 25th the condition had definitely improved, and she could dress her baby. On the 29th she said that she had the tingling sensation and numbness in her fingers only in the morning. On Nov. 12th the hand was quite normal and she had done a good day's washing on the previous day.

The vitamin B<sub>1</sub> tablets were discontinued, and the symptoms did not recur either before or after delivery. It will be observed that this patient also suffered from a deficiency of vitamin D in her diet.

CASE 4.—A primigravida, aged 23, 38 weeks pregnant, complained of tingling and numbness in both hands, but particularly the right hand, of a week's duration. The "pins-and-needles" ran all the way up the arm and once she had what she described as an "electric shock" at the tips of her fingers. The pain wakened her up three or four times in the night. She was given vitamin B<sub>1</sub> tablets, 2250 units daily, and the symptoms cleared up completely within ten days; neither did they recur after delivery.

CASE 5.—On Oct. 23rd, 1935, a primigravida, aged 25, complained of cramps in legs and hands, insomnia, and tingling and numbness of both middle fingers by night and by day. It had become very unpleasant for her to touch wool or silk with these fingers. On the 26th she was admitted to the antenatal ward and given the routine diet, but no bemax. Five days later there was no improvement in the fingers, and she was put on 15 vitamin B<sub>1</sub> tablets daily, all other substances additional to the basal diet being discontinued. On Nov. 9th no significant improvement was apparent. Both index-fingers were now slightly affected. The full routine diet was therefore commenced, the bemax being increased to 3iss. daily and advita capsules from 4 to 20 daily. On the 16th the condition was improving, but pins-and-needles developed in both arms on the 21st and persisted for five days. By Dec. 4th sensation in the affected fingers had been normal, except on deep pressure, for three or four days.

The symptoms did not recur. After the first two nights in hospital she slept well, had no cramps, and the oedema, except for the degree which was present apart from pregnancy, disappeared.

This patient was seen by Dr. Macdonald Critchley, who diagnosed the condition as gestational neuritis. Her neuritic symptoms were the least conspicuous of any of the five patients, and yet it took over six weeks to effect a cure. Apart from the rich diet she received vitamin A 50,000 units, vitamin D 2000 units, and vitamin B<sub>1</sub> 2850 units daily. It can be asserted that the condition responded to dietetic treatment, but it is not possible to say whether it was due merely to vitamin-B<sub>1</sub> deficiency in the diet. It must be presumed that the few fibres involved had suffered degenerative changes necessitating time for repair after the deficiency in the diet had been made good. It will be noted that this patient also suffered from the effects of a deficiency of vitamin D in her dietary.

#### DISCUSSION

It is immaterial whether the well-recognised syndrome exhibited by these patients is to be attributed to a peripheral neuritis, as is commonly taught, or to lesions in the spinal cord. It is, however, important to distinguish between the tingling sensations due to nervous lesions and those believed to be occasioned by circulatory disturbances. In the latter cases the pins-and-needles occur symmetrically in both hands, as frequently by day as by night and disappear when the fingers are rubbed together or the hands allowed to hang down for a few minutes. In between the attacks the fingers feel quite normal. If the circulation be cut off by an armlet applied to the arm the fingers tingle immediately and after a lapse of about three minutes they become partially flexed, the patient being unable to maintain them in the extended position. In those cases where the symptom first appears towards the end of pregnancy the condition can usually be cured within a few days by calcium therapy.

It must remain an open question as to whether the cases I have reported represent an early stage of the severer form of pregnancy polyneuritis for which Berkwitz and Lufkin have suggested the term "toxic neuronitis." It is interesting on the one hand to note that Strauss and McDonald and others have caused much improvement in such cases by dietetic measures, and on the other to recognise that the symptoms of Cases 2 and 3 might be considered to have been due to lesions in the spinal cord.

Reference has already been made to the statements of Berkwitz and Lufkin and of Luikart that the histological changes in the nervous system are similar in beri-beri, pellagra, scurvy, and the polyneuritis of pregnancy, or in other words presumably, that severe deficiency of either vitamins B<sub>1</sub>, B<sub>2</sub>, or C in the diet may lead to degenerative changes in the anterior horn cells.

The position is still further complicated by the fact that lesions both in the spinal cord and in the peripheral nerves may occur in animals fed on a diet rich in the vitamin-B complex and that these lesions may be prevented by the addition of vitamin A to the diet (Hart, Miller, and McCollum, 1916; Hughes, Lionhardt, and Abel, 1929; Mellanby, 1929). Beri-beri is usually attributed to a deficiency of vitamin B<sub>1</sub> in the dietary, but Mellanby (1934) suggests that the nerve lesions associated with this disease as well as those occurring in pellagra and lathyrism are due to vitamin-A deficiency. He asserts that he is unaware of any evidence which proves that neuritis involving demyelination of nerve-fibres can be produced in animals by diets deficient only in the antineuritic vitamin B and doubts whether the condition once produced can



be cured by the exhibition of this vitamin alone. The apparently conflicting laboratory results appear to be due to two main facts: (1) in order to produce lesions in animals it is often necessary to feed them with diets to which they are not accustomed and which may be deficient in other substances, organic and inorganic, as well as the vitamin concerned; (2) once nerve lesions have been produced a long period of time may be necessary for their recovery even when the diet is adequate, and it is difficult, if not impossible, to be sure of early lesions in animals.

The main reason why this question has been discussed in some detail is to draw attention to the remarkable opportunities afforded by pregnancy to study with the precision of laboratory experiments the early stages of vitamin deficiencies as they occur in man. Thus insomnia, headache, muscular cramps, vomiting, skin rashes, and circulatory disturbances including dizziness and tingling of the fingers may undoubtedly be caused by disturbance of the calcium metabolism. The gingivitis of pregnancy is probably due to vitamin-C deficiency in the diet, and offers the opportunity of investigating the possibility of masked vitamin-C deficiency occurring during pregnancy apart from the scurvy symptom-complex. It is indeed probable that the uncomplicated effects of any vitamin deficiency in the diet can only be observed in the early stages of its operation. Gross deficiency of any vitamin in the dietary may result in lesions not merely due to deficiency of that vitamin but to a resultant disturbance of the metabolism, the factors concerned being as yet imponderable. The interrelation between and the interactivity of the vitamins are little understood, but the harmonious interdependence of the hormones may provide an analogy.

It has been reported that symptoms due to nervous lesions and occurring towards the end of pregnancy were cured, usually within three weeks, merely by the addition of from 1500 to 2250 units of vitamin B<sub>1</sub> to the daily diet, without otherwise altering it or changing the environment of the patient. In two of these patients the symptoms progressed in spite of the daily addition of vitamin A (10,000 units) and D (400 units) and calcium lactate, grs. 30, to their basal diets. It is, moreover, of interest to note that at least two of these patients suffered from a deficiency of vitamin D in their dietaries.

Inasmuch as it was postulated that the neuritis as well as all the "toxæmias of pregnancy" were due to deficiencies in the diet and inasmuch as the neuritis of pregnancy has been attributed to the toxin of pregnancy—to that extent the results now reported may be held to support the dietetic-deficiency hypothesis of the toxæmias of pregnancy. The form of neuritis described is, I consider, best termed "atelo-sitetic neuritis of pregnancy"—a term derived from the Greek *ἀτελής* (imperfect) and *στροφή* (nutrition).

#### SUMMARY

1. Five patients, in the later weeks of pregnancy, suffering from a symptom-complex due to nervous lesions and usually described as gestational neuritis were cured by dietetic treatment.

2. In four of these patients the symptoms were completely relieved merely by the addition of vitamin B<sub>1</sub> to their dietaries. It may therefore be assumed that the symptoms resulted from a deficiency of that substance in the diets.

3. Two of these patients suffered in addition from deficiency of vitamin D in their diets.

4. It is at present impossible to say whether these symptoms represent an early stage of the "toxic neuronitis" of pregnancy.

5. Pregnancy offers opportunities for studying the effects of vitamin and other deficiencies in the diet with the precision of a laboratory experiment.

6. The results reported may be held to support the dietetic-deficiency hypothesis of the toxæmias of pregnancy.

I wish, in conclusion, to thank Prof. James Young for allowing me to undertake the treatment of these patients who were admitted either to the Hammersmith Hospital or to St. Mary Abbots Hospital, and Mr. J. Carver, medical superintendent of the latter hospital, for his unfailing coöperation. I have pleasure, moreover, in expressing my indebtedness to Sir Frederick Menzies, medical officer of health for the county of London, for permission to publish data concerning patients admitted to St. Mary Abbots Hospital.

#### REFERENCES

- Berkwitz, N. J., and Luffkin, N. H.: *Surg., Gyn., and Obst.*, 1932, *liv.*, 743.  
 Ford, R. K.: *Jour. Obst. and Gyn.*, 1935, *xliii.*, 641.  
 Fouts, J. P., Gustafson, G. W., and Zerfas, L. G.: *Amer. Jour. Obst.*, 1934, *xxviii.*, 902.  
 Hart, E. B., Miller, W. S., and McCollum, E. V.: *Jour. Biol. Chem.*, 1916, *xxv.*, 239.  
 Hughes, J. S., Lienhardt, H. F., and Anbel, C. E.: *Jour. of Nutrition*, 1929, *ii.*, 183.  
 Luikart, R.: *Amer. Jour. of Obst.*, 1933, *xxv.*, 810.  
 Mellanby, E.: *Jour. of Physiol.*, 1926, *xxiv.*, 61 P; *Brit. Med. Jour.*, 1926, *i.*, 677; *Nutrition and Disease*, London, 1934.  
 Strauss, M. B., and McDonald, W. J.: *Jour. Amer. Med. Assoc.*, 1933, *c.*, 1320.  
 Theobald, G. W.: *THE LANCET*, 1930, *i.*, 1115; *Brit. Med. Jour.*, 1933, *ii.*, 376; *Proc. Roy. Soc. Med.*, 1935, *xxviii.*, 88.  
 Wechsler, I. S.: *Med. Jour. and Rec.*, 1930, *cxviii.*, 441.  
 Zimmermann, H. N.: *Jour. Exp. Med.*, 1933, *lvii.*, 215.

#### NOTE ON

### MALE HORMONES AND THE QUESTION OF ACCESSORY SUBSTANCES

BY R. DEANESLY, D.Sc.

AND

A. S. PARKES, Sc.D., F.R.S.

(From the National Institute for Medical Research, London)

IN making the original announcement of the isolation of testosterone from the testis, Laqueur and his collaborators<sup>1</sup> reported that its male hormone activity was greatly increased by the addition of an  $\alpha$ -substance, itself inert, obtainable from testis. These authors found further that androstanediol could be similarly activated,<sup>2</sup> and that the  $\alpha$ -substance was probably of the nature of a fatty acid and occurred in various tissues and body fluids.<sup>3</sup>

These results have been confirmed and extended by workers in Basle (see Ruzicka, Wettstein, and Kägi<sup>4</sup> and Miescher, Wettstein, and Tschopp<sup>5</sup>), who find that the "synergistic" effect may be obtained with a large variety of pure fatty acids, as well as with Prof. Laqueur's and other extracts. These authors also showed that the activity of testosterone varies according to the kind of oil in which it is dissolved. In paraffin oil, for example, it is inactive.

The work described below was begun as a study of variable factors in the assay of male hormones on the accessory reproductive glands (prostate and seminal vesicles) of castrated rats, but subsequently became relevant to the problem of "activation" of male hormones.

#### TECHNIQUE

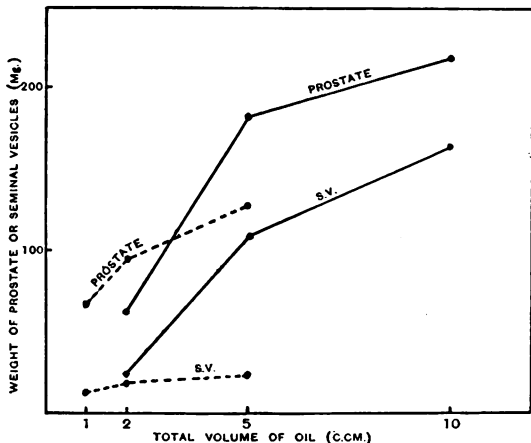
The methods used were those described by Deanesly and Parkes.<sup>6</sup> Rats were castrated at 40–60 g. body-weight and used not less than one month later. Within these limits the results, though individually

variable, were found to be independent of the exact age, size, and time after castration of the rats. As a precaution, however, all sets of comparisons except one were carried out on batches of 20-30 rats castrated, and later injected, at the same times.

The hormone was administered subcutaneously in ten equal daily injections to groups of 5 or 10 similar rats which were killed one day after the last injection. For comparison of the effectiveness of various methods of administration the standard total dose per rat was 10 mg. androsterone or 2 mg. testosterone.

AMOUNT AND NATURE OF OIL

As already mentioned <sup>6</sup> (and see also <sup>7</sup>) we have obtained striking results by varying the amount of oil in which the hormone is administered. Three



Effect of volume of arachis oil solution on the response of the prostate and seminal vesicles to 10 mg. androsterone and 2 mg. testosterone. --- = Androsterone. — = Testosterone.

groups of 5 rats each were given the standard 10 mg. of androsterone in a total of 1, 2, and 5 c.c.m. arachis oil respectively per animal. The experiment was subsequently repeated on a different batch of rats, with corresponding effects. The combined results, given in Table I. and the Figure, indicate that

TABLE I

Effectiveness of 10 mg. androsterone in different amounts of arachis oil

Total amount of oil (c.c.m.).	Average weight of—	
	Prostate (mg.).	Seminal vesicles (mg.).
1.0 ..	66	11
2.0 ..	95	17
5.0 ..	123	22

10 rats in each group.

TABLE II

Effectiveness of 2 mg. testosterone in different amounts of arachis oil

Total amount of oil (c.c.m.).	Average weight of—	
	Prostate (mg.).	Seminal vesicles (mg.).
2.0 ..	61	27
5.0 ..	183	118
10.0 ..	219	163

10 rats in second group, 5 in others.

increasing the volume of oil by five times more than doubles the effectiveness of 10 mg. of androsterone.

A similar experiment with 2 mg. testosterone (in which, however, the groups of rats were not of the same batch) gave a similar result (Table II.).

Our first inclination was to ascribe this effect to alteration of the conditions of absorption, possibly to spreading the absorption more evenly over the interval between injections, but in view of the results

with x-substance, the increased response might have been due to the presence in the arachis oil of free fatty acid or some other accessory substance. Various experiments were therefore carried out to throw light on this problem :—

(a) The standard dose of androsterone was administered in a total of 5 c.c.m. arachis oil, but each daily dose was given as five separate injections of 0.1 c.c.m. in different parts of the body.

(b) The standard dose of androsterone was administered in a total of 1 c.c.m. arachis oil, the daily injections all being on the left side of the rat, while 4 c.c.m. of blank arachis oil was given over the same period on the other side.

The first of these experiments gave a result similar to that obtained by the administration of the standard dose in a total of 1 c.c.m. oil. The second gave only a slightly higher result which, allowing for the partial mixing which may have taken place under the skin, points to the same conclusion—i.e., that the increased efficiency of the larger volumes of oil solution is not due to the presence of accessory substances in the oil, but is due to some local action at the site of absorption. This conclusion was supported by an experiment in which we used a pure solvent, 1:2 propylene glycol, which is miscible with both oil and water. The standard amount of androsterone given in a total of 2 c.c.m. of this medium produced the highest response to that dose so far obtained, the results with an increased volume of the same solvent being rather lower. Whatever the explanation of the high efficiency of this solvent may be, it is clear that the conditions of absorption from it are very different from the conditions of absorption from oil, and that it does not contain accessory substances. Tests on the use of various oils as solvents showed that castor oil was about as effective as arachis oil, but that olive oil was much less so (Table III.). It

TABLE III

Effectiveness of 10 mg. androsterone in 2 c.c.m. of various media

Medium.	Average weight of—	
	Prostate (mg.).	Seminal vesicles (mg.).
Olive oil .. .. .	78	18
Arachis oil .. .. .	133	21
Castor oil .. .. .	149	19
Propylene glycol .. .. .	199	37

5 rats in each group.

is clear from these experiments that in comparative work with male hormone compounds the technique must be carefully standardised; the above experiments may well explain some of the discrepancies in the results of different workers.

ADDITION OF PALMITIC ACID

At this stage we were fortunate in being able to discuss our findings both with Dr. Miescher and Dr. Freud. The former kindly gave us early information of the results he and his collaborators had obtained with various fatty acids.

The experiments shown in Table IV.\* were then undertaken and the following conclusions reached.

\* We understand that both Dr. Freud and Dr. Tschopp have performed somewhat similar experiments, but we have not heard actual details. (Added April 6th): Dr. Tschopp's experiments (Miescher, Wettstein, and Tschopp: Schweiz. med. Woch., 1936, lxi., 310) have apparently given similar results.

(a) The addition of palmitic acid to the oil solution of testosterone causes a great increase in response, much above that obtained by increasing the total volume of oil to 10 c.cm. (Table II.).

(b) The administration of palmitic acid in separate injections on the side of the animal opposite to that receiving the testosterone causes no significant increase in response.

(c) The definite increase brought about by the palmitic acid cannot apparently be attributed to synergism at the site of action of the hormone.

TABLE IV

Effectiveness of 2 mg. testosterone with 0.5 g. palmitic acid

Method of administering testosterone.	Average weight of—	
	Prostate (mg.).	Seminal vesicles (mg.).
In total of 5 c.cm. arachis oil solution	183	118
In total of 5 c.cm. arachis oil solution containing 0.5 g. palmitic acid ..	252	210
In total of 5 c.cm. arachis oil given on left side of the rat with 0.5 g. palmitic acid in 5 c.cm. oil given on right side .. .. .	171	135

10 rats in each group.

It may be added that experiments show that the increase in the effectiveness of testosterone caused by the addition of  $\alpha$ -substance or fatty acid is not obtained in capon tests,<sup>1</sup> and the addition of the substances therefore greatly increases the activity of testosterone on rats per capon unit. As we have already pointed out,<sup>6</sup> some such alteration of the ratio is necessary for testosterone to have the typical biological activity of testis extracts.

## DISCUSSION

The immediate problem is (a) whether the mode of action of fatty acids given in conjunction with testosterone is similar to that of the  $\alpha$ -substance described by the Amsterdam workers; (b) whether the fact that increased activity is produced by increasing the volume of oil has any bearing on the subject; and finally (c) whether there is any conclusive evidence of real synergism between the "accessory substances" and the hormone, at the site of action of the latter.

Freud<sup>8</sup> states that the purest preparations of  $\alpha$ -substance are very much more active than the fatty acids tested by Miescher, but this does not necessarily indicate any qualitative distinction. According to Freud, Dingemans, and Polak,<sup>3</sup>  $\alpha$ -substance activates androstanediol and testosterone, but not androsterone. The positive results with androsterone recorded in Table I. are thus presumably of a different kind from those obtained with  $\alpha$ -substance. Miescher and his co-workers have not apparently tested the fatty acids in conjunction with other male hormones than testosterone, but a single experiment in this laboratory suggests that the effect of 10 mg. androsterone in 5 c.cm. arachis oil (Table I.) is increased by the addition of 500 mg. palmitic acid.

The crux of the problem seems to be whether or not the "activating" effect is obtained by separate injection of the  $\alpha$ -substance, of the fatty acid, or of excess oil. For the last two, our evidence strongly suggests that the activating effect is only obtained when they are injected in intimate mixture with the hormone. It is therefore most difficult to see how the "activation" can be due to synergism at the site of action, and by contrast local effects at the site of injection are implied. A comparison may be made

with the increased efficiency of oestrone obtained by esterification or by subdividing the total dose into a series of frequent injections. The present results may similarly be due to slowing the rate of absorption and thus levelling the supply of active substance available to the animal, with a consequent decrease of wastage by excretion. Actually, in our experience, considerable heating is required to dissolve the palmitic acid and hormone in a suitable quantity of oil, and under such conditions the possibility of esterification of the hormone cannot be entirely excluded.

This doubt concerning the mechanism of the process, however, in no way alters the fact that, owing to the researches of Freud and of Miescher and of their co-workers, a method has been found of very greatly increasing the effectiveness of some at least of the extremely expensive male hormone compounds. A wide field of work has also been opened up in the possible application of this technique to other hormones.

## SUMMARY

An increase in the amount of oil solution, or the addition of palmitic acid to it, greatly increases the effectiveness of androsterone or testosterone. The effect is not obtained if the excess oil or the fatty acid is given by separate injections in another part of the animal.

We are greatly indebted to Prof. L. Ruzicka and Messrs. Ciba Ltd. for the supplies of androsterone and testosterone, while we wish to thank Dr. K. Miescher, Dr. J. Freud, and Dr. R. K. Callow for valuable information and discussion.

## REFERENCES

1. David, K., Dingemans, E., Freud, J., and Laqueur, E.: *Zeits. f. physiol. Chemie.*, 1935, *ccxxxiii.*, 281.
2. Freud, J.: *Acta brev. Neerl.*, 1935, *v.*, 97.
3. Freud, J., Dingemans, E., and Polak, J.: *Ibid.*, 1935, *v.*, 179; Laqueur, E., David, K., Dingemans, E., and Freud, J.: *Ibid.*, 1935, *v.*, 84.
4. Ruzicka, L., Wettstein, A., and Kägi, H.: *Helv. chim. Acta.*, 1935, *xviii.*, 1487.
5. Miescher, K., Wettstein, A., and Tschopp, E.: *Chem. and Ind.*, 1936, *iv.*, 238.
6. Deanesly, R., and Parkes, A. S.: *Biochem. Jour.*, 1936, *xxx.*, 291.
7. Ruzicka, L., and Rosenberg, H. R.: *Helv. chim. Acta.*, 1936, *xix.*, 361.
8. Freud, J.: *Statement at Meeting of the Biochemical Society*, London, March 13th, 1936.

## Clinical and Laboratory Notes

## XANTHOMATOSIS OF THE SPLEEN

BY W. G. BARNARD, M.R.C.P. Lond.

CONSULTING HISTOLOGIST TO THE LONDON COUNTY COUNCIL; AND

G. E. BREEN, M.D. N.U.I., D.O.M.S.

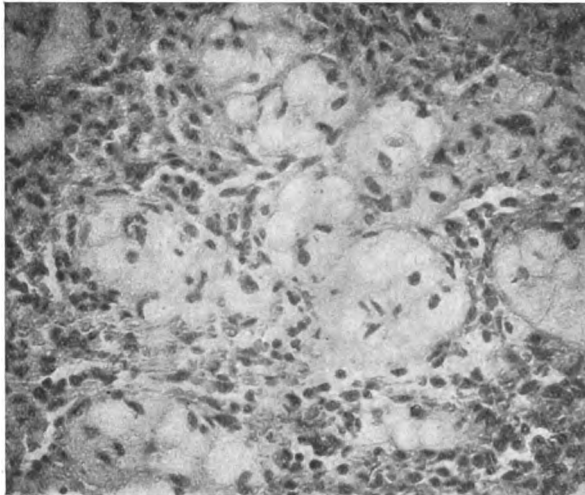
SENIOR ASSISTANT MEDICAL OFFICER OF THE SOUTH EASTERN HOSPITAL

IN addition to the well-defined general xanthomatoses of Gaucher's and Niemann-Pick's disease and the more localised Hard-Schuller-Christian's disease, there are cases which do not belong to either of these groups. That described here is one in which the sole organ affected was the spleen, which was only moderately enlarged. The macroscopic appearance of its cut surface gave no indication of the widespread change in its pulp, which was almost entirely occupied by large cells closely resembling those found in Gaucher's disease, except that in the periphery of the cells were closely packed granules, stained by Sudan III. and osmic acid.

A breast-fed infant, aged 4 months, was admitted to the Brook Hospital on July 25th, 1934, certified as diphtheria, a routine swab having proved positive. She

was a small but well-nourished and well-proportioned baby. On examination, apart from a few dry râles over both lungs, she appeared to be normal. It is especially to be noted that there was no demonstrable enlargement of the spleen, liver, or superficial lymph nodes.

On the evening of the day of admission she was found to have a temperature of 103° F. A re-examination revealed nothing more than the mild bronchitis already referred to, which could hardly be regarded as an adequate cause of the pyrexia. The following day a mild gastro-enteritis



Section of spleen. ( $\times 360$ .)

set in, probably as the result of the change from breast to artificial feeding. This cleared up in a few days but the fever continued. Attention was therefore focused on discovery of a possible cause, but all investigations proved negative, including a Widal test and cultures from the blood and urine. Finally dentition, then in progress, was blamed, since the child but for the temperature could have been passed as normal. She took all feeds readily, gained a little weight, was lively and contented, and well above the average intelligence for her age. A close inquiry into the family history, with special reference to tuberculosis, was also without result. One fact, disregarded at the time, becomes interesting in retrospect: the father and one brother suffered from diabetes insipidus. Otherwise the family health was excellent.

The child was said to be continually "restless," especially at night. This became worse and culminated on August 19th in a convulsion. Two more convulsions occurred on the following day. As they were very brief it was not possible to reach the ward in time to see one, but from the descriptions supplied a diagnosis of tetany was hazarded, although there were no cardinal signs of this condition. Massive doses of a calcium-vitamin-D preparation—were therefore injected, and as the fits promptly ceased it was felt that the diagnosis had been correct and less potent tablets of the same preparation were subsequently included in the feeds.

For a week no further convulsions occurred. The fever persisted with morning remissions, but the baby appeared so well that the mother pressed to be allowed to take her home. On August 27th however another fit occurred, and another on the following day. The injections were again resorted to, but this time without result, and fits recurred at intervals of from 12 to 48 hours. Despite this the general condition remained remarkably good, and there was one week of apyrexia, but this did not have any influence on the number or severity of the attacks. Further investigations were made. Lumbar puncture yielded a normal cerebro-spinal fluid, and the Wassermann reaction was negative both in the fluid and in the blood. The urine remained clear. The fundi were normal, as were the superficial and deep reflexes. The feeds were suspected and altered; fat was withheld for a week and the sugar content was varied. All changes were equally well tolerated, all the feeds being taken

and the stools were normal, but the weight gradually went down. No medication seemed to influence the frequency or severity of the fits or to diminish the restlessness. This, which seemed at first no more than a mild athetosis, became more and more violent, so that the description "continuous convulsion" could much more accurately be applied to it. The child lay on her back thrashing with the arms and legs, the eyelids blinking, and the facial muscles twitching continuously. At intervals of about half an hour the limbs would flex slowly and deliberately, the lids retract and the pupils dilate, and the colour change to an extreme pallor. It seemed that death must ensue immediately, but in a minute or less the colour would revive and the movements recommence. In these seizures there was no incontinence, the heart action was unchanged, the pupils would still react to light, and the reflexes were normal. As it was imperative that some rest be procured at any cost the more powerful hypnotics were given. These did something to diminish the violence of the movements but nothing to alter the frequency. On Sept. 8th stupor supervened and death occurred the same day.

*Post-mortem report.*—A moderately well-nourished, well-developed, pallid female infant; slight jaundice of conjunctivæ. Heart normal; foramen ovale patent but valvular; remainder of fetal circulation closed. Lungs oedematous; slight purulent bronchitis and small patches of broncho-pneumonia. Liver: slight fatty degeneration.

The spleen (7 by 3 by 1 cm.) was enlarged and purple, having a smooth red to reddish-grey cut surface with distinct Malpighian bodies (0.1 cm. diam.). Kidneys: cloudy swelling. Adrenals: pale yellow cortex and grey medulla. Brain: vessels congested, particularly in the basal ganglia; thrombosis of right choroid plexus; middle ears clean. Ribs: normal line of provisional calcification at costochondral junction.

*Histology.*—Tissues examined were the spleen, liver, lung, kidney, pancreas, thyroid, pituitary, basal ganglia of brain, mid-brain, cerebellum, medulla, and choroid plexus. These were all stained with hæmatoxylin and eosin and with Weigert's iron hæmatoxylin and van Gieson's stain; in addition frozen sections were made of the spleen and liver and examined unstained, after heating, and stained with Sudan III. There was fatty change in the liver, oedema, and broncho-pneumonia of the lung, cloudy swelling of the kidney, and thrombosis of the choroid plexus. Apart from these and the changes in the spleen, the remaining organs were normal.

In the spleen the Malpighian bodies, trabeculæ, and blood-vessels were normal. The remainder of the spleen was largely composed of trabeculæ and small clusters of large cells having a vacuolated foamy protoplasm. The outline of each group of cells was distinct but the individual cell outlines were occasionally lost. The nuclei varied from round and oval to narrow crescent-shaped nuclei forming part of the border of a "blown out" cell. A delicate chromatin net and a small nucleolus could be made out in those which were least squashed. In frozen sections granules, staining a golden brown colour with Sudan III. and black with osmic acid, were present in the periphery of all the foam cells, but they did not fill the whole space and with a polarising microscope doubly refractive bodies were also present.

#### DISCUSSION

The cells in the spleen were similar in size and arrangement to those found in Gaucher's disease, and they also contained a substance which would not stain with the ordinary fat stains. In addition, however, they contained, particularly in the periphery of the cells, granules which stained readily, and also granules which were doubly refractive with polarised light. The limitation of the change to the spleen and the presence of these stainable "fats" appeared to rule out the possibility of this being genuine Gaucher's disease. The localisation of the abnormal fat-containing cells to the spleen, and their size, make it impossible to label the case one of Niemann-Pick's disease, for the characteristic of

that disease is the widespread distribution of the foam cells, which infiltrate the entire splenic pulp, diffusely infiltrate the lymphatic glands of the cœliac and hepatic groups, infiltrate the bone-marrow, intestinal mucosa, lung, and perivascular tissues of the brain. The cells stain irregularly with the usual fat stains and contain doubly refractile bodies.

Whether the family history of diabetes insipidus could in any way be associated with the condition it is now impossible to say. There were no histological abnormalities either in the pituitary or in the pancreas.

We are indebted to Dr. J. V. Armstrong of the Brook Hospital for permission to publish details of this case.

## HENOCH'S PURPURA CAUSING ACUTE OBSTRUCTION TWICE IN EIGHT DAYS

By TINA GRAY, M.B. Glasg.

DISPENSARY SURGEON TO THE GLASGOW ROYAL INFIRMARY

THE following case seems rare enough to warrant publication. I have not been able to find a similar one recorded in the literature.

The patient, a miner aged 21, was admitted to the medical side of the Glasgow Royal Infirmary on Jan. 12th, 1936, with Henoch's purpura. Eighteen months previously he had developed joint pains with purpuric spots. Attacks had recurred every two or three weeks till the beginning of 1936, when there was a much more severe attack and acute pain was felt in both ankles and the joints were swollen; two days later the left knee was similarly affected. These joint pains were accompanied by pain in the right hypochondrium, with nausea and vomiting; the vomitus was black, and the pain lasted for three days. On Jan. 11th the left wrist and both elbows became swollen and painful, the abdominal pain and vomiting returned, and he was admitted to the infirmary.

On admission there was a rash, papular and bright red on the extensor surfaces of the forearm, hand, and leg, especially round each elbow. The tip of the spleen was palpable. The patient appeared drowsy and exhausted.

The investigations were as follows:—

Blood examination: Red cells, 3,700,000; white cells, 5200; hæmoglobin, 88 per cent.; colour-index, 1.0. Bleeding-time diminished (2 min.); coagulation-time slightly increased (5½ min.); film showed well-stained red cells of uniform size and shape; leucocytes normal; numerous platelets were seen. Wassermann reaction negative. Ophthalmic examination: no abnormality. Vomitus, Jan. 12th–26th, negative for blood; fæces, Jan. 20th–26th, positive; urine, Jan. 14th–26th, positive.

The following treatment was given: Hæmoplastin 6 c.cm., once after admission; autohæmotherapy 10 c.cm. 5 times; sod. salicyl. and sod. bicar. grs. 15 t.i.d.

On Jan. 26th he developed very severe colicky abdominal pain and vomiting. A tender mass was palpated in the abdomen and he was transferred to the surgical side. The patient looked very ill, was restless, and in great pain; obstructive vomiting was present and he was passing blood and mucus per rectum. He was taken into theatre immediately. Mr. G. T. Mowat opened the abdomen with a paramedian incision. An intussusception caused by hæmorrhage into the wall of the gut was found reaching to the middle of the transverse colon, commencing at the iliocecal valve. This was reduced and the appendix, which was very congested, was removed. Much fluid was present in the pelvis and a stab puncture was made to allow for suprapubic drainage.

The patient made satisfactory progress till a week later, Feb. 1st, when he again complained of severe colicky abdominal pain similar to that before his operation. He looked desperately ill and blanched. The abdomen was rigid and very tender in the cœcal region, and obstructive vomiting recommenced. He had the temperature of collapse and a pulse-rate of 108. I reopened the old wound. Quantities of blood welled up and bubbles of gas, then distended fluid-filled small intestine escaped.

Beyond the cœcum the large bowel was collapsed. There was a gangrenous patch about the size of a crown piece on the cœcum at the site of the previous intussusception. At a distance of 8 in. and 12 in. from the cœcum the ileum was firmly fixed down and kinked by organised blood clot; at these places the peritoneal coat and the mesentery were split and the walls of the bowel thickened and purple with the extravasated blood, these conditions forming a complete obstruction. His condition made resection out of the question, and as the bowel, though blocked, was possibly viable a lateral anastomosis between the ileum and the transverse colon seemed the only thing to do to tide him over the crisis. This I did and invaginated and overstitched the gangrenous patch on the cœcum. The clots were cleared from the mesentery and the peritoneum stitched. Hot saline solution was introduced and the wound resutured. A drainage-tube was replaced in the pelvis through the old stab puncture.

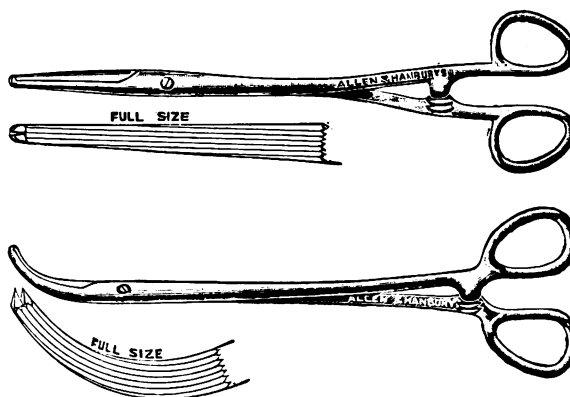
The sickness stopped after the operation and the bowels moved naturally a day or two later. He was put on daily doses of Calcium Sandoz 5 c.cm., and Campolon 2 c.cm. intramuscularly. On Feb. 4th and again on the 20th 700 c.cm. of citrated blood was transfused. Even after the first transfusion the patient's condition improved tremendously. His appetite improved, there was no melæna, and the hæmaturia ceased. He looked and felt well. The red cell count was now 5,390,000 per c.mm.; there were no abnormal cells in the film and numerous blood-platelets were present. The superficial layers of the wound broke down and required resuture, but this did not delay his convalescence unduly. He was up on March 9th and went home on the 13th.

I am indebted to Mr. G. C. Swanson, in whose wards the patient was treated, for permission to publish this case.

## NEW INVENTIONS

### HYSTERECTOMY FORCEPS

THESE forceps are made both straight and curved. They are 8½ in. long and have longitudinal grooves instead of transverse serrations, distinctive shaped bows, and Kocher tooth at tip. The grooves add greatly to the ease of panhysterectomy operations, vaginal or abdominal, in that the slipping of tissues



out of the forceps whilst tying ligatures is obviated. Panhysterectomy is the hysterectomy of election owing to the danger of cancer of, and chronic discharge from, the cervical stump. In no operation is annoying hæmorrhage after a slipped ligature so common or so difficult to recontrol, especially in large stout women. The instruments are not too long, and the Kocher tooth holds up the tissues as they bunch together along the grooves as the ligature tightens and the forceps opens. They are manufactured by Messrs. Allen and Hanburys Ltd., Wigmore-street, W.

W. McK. H. McCULLAGH, F.R.C.S. Eng.

## MEDICAL SOCIETIES

OPHTHALMOLOGICAL SOCIETY OF  
THE UNITED KINGDOM

Mr. R. FOSTER MOORE presided at the annual congress of this society held from April 2nd to 4th at the house of the Royal Society of Medicine. A large number of individual papers were read and discussed. At the opening session a discussion on

**Ophthalmia Neonatorum**

was opened by Mr. J. D. MAGOR CARDELL, hon. secretary of the society. As early as 1545, he said, the English edition of the "Rosengarten" stipulated that after the child was born, the cord cut, and the baby swaddled, the eyes should be carefully and frequently washed out with warm water. This advice was elaborated and repeated by various other writers, and since 1879 advance had been made by the education of doctors, midwives, and mothers, by compulsory notification, and the provision of antenatal clinics and institutional treatment.

The commonest of several sources of infection was the discharge from the maternal passages and adnexa, evidence of which could be found on the infant's face and especially on the eyelashes. The child could infect itself by unwashed hands which had not been secured to its body. If the mother had vulvitis, infection could be carried by her fingers to the child's eyes. In the examination the non-infected eye should receive first attention; when an eye-dropper was used the drop should not be "touched off" on the lid. Some of the modes of infection were only likely in poor surroundings, but they accounted for a certain number of infected eyes. The character of the discharge varied greatly. Cases were frequent in which for a time there was nothing but a stickiness of the lids, and—without possibility of further infection—the typical purulent discharge followed after an interval. The discharge might be thick, watery, or sanious. Mild infection might be either gonococcal or non-gonococcal; if gonococcal the discharge lasted (on the average) nine days longer. In marasmic, premature, or sickly children discharge might be slight or almost absent; in many cases its amount could be reduced without much influence on the ultimate course of the disease. Discharge imprisoned behind swollen lids had an adverse effect on the cornea, which might also suffer from excessive force in opening the lids or the unskilled use of silver nitrate. Œdema of the corneal epithelium produced a haze which cleared up rapidly; if marked and localised it carried a risk of ulceration. Deeper keratitis was more likely to be followed by ulcer. In all these conditions the utmost delicacy of handling was essential.

Early and efficient treatment could in most cases prevent ulceration, provided the child was not syphilitic. There were three types of ulcer. First the puncture or pin-hole ulcer, which might perforate in 48 hours. Frequently this was gonococcal, and little scarring resulted. A slight trauma was often the cause. The second kind was the large ulcer with a good deal of surrounding keratitis, and this mostly perforated. The third was a sloughing of the cornea, occurring in premature and weakly babies. In the presence of severe dacryocystitis the eye condition became more chronic, but the lacrimal gland itself was rarely involved. Rhinitis in slight degree was not uncommon. Gonococcal arthritis was fairly common in the mother but rare in the infant. The duration depended on the intensity

of the infection, the child's resistance, and the efficiency of treatment. Prognosis was better if institutional treatment could be obtained, and if the child was breast-fed. In premature infants home treatment frequently ended in disaster. In 73 per cent. of the cases he had seen the discharge ceased in both eyes on the same day, independently of the difference in the amount of discharge. At St. Margaret's Hospital the patient was sent home after all discharge had ceased and at least seven days had elapsed without a recurrence. There were only 3 per cent. of return cases, and even this rate was higher than it would be but for the over-anxiety of doctors and mothers in the presence of slight stickiness of the lids. Corneal involvement was easily missed unless examination was made under good conditions. The presence of a corneal ulcer was always a grave menace to vision; the end-result depended on its site and type and on the treatment. Sloughing of the cornea was often followed by extrusion of the lens, panophthalmitis, glaucoma, and loss of sight. Diagnosis was simplified in the multipara by a history of previous babies with ophthalmia. The ordinary ophthalmia must be differentiated from that caused by silver nitrate; here the microscope was useful.

Methods of treatment were very numerous, and to judge by the reports, said Mr. Cardell, all were equally successful. There was, he thought, a tendency to overtreat. He stressed the value of fresh air in assisting a cure. Irrigation was necessary, but with the minimum of force, and the stream should be directed from the inner to the outer canthus, so as to avoid carrying pus from one eye to its fellow. Irrigation was best carried out by two nurses: one to apply the treatment and manipulate the upper lid, the other to steady the child's body and head and take charge of the lower lid. A gentle drawing of the lids apart at the same time massaged the cornea and coaxed pus out of the fornices. At St. Margaret's, eusol one in ten had been successfully used for many years. In the initial stages silver salts rapidly killed the bacteria in the most superficial parts of the conjunctiva, but after they had penetrated well below the surface they were protected. Ice and cold lotions should not be persisted in if the lid swelling did not subside in a few hours. He had found no success from vaccine therapy. Atropine, preferably dissolved in castor oil, was the accepted treatment of keratitis and corneal ulcers. Treatment of corneal nebulae was important but sometimes neglected.

For a preventable disease the incidence was not falling at the rate it was reasonable to expect. In the period 1927-29 it fell only from 8.66 per 1000 births to 8.11 from 1930-32. Primarily, said Mr. Cardell, education was at fault. Of the cases admitted to St. Margaret's 60 per cent. had corneal involvement, 6 per cent. corneal abrasions or ulcers. A factor in the reduction of incidence might be its inclusion in the medical curriculum; but on the whole, midwives received more practical instruction about ophthalmia than did the medical man to whom cases were reported. Every case of ophthalmia neonatorum in practice should be regarded as an emergency.

## STANDPOINT OF PREVENTIVE MEDICINE

Dr. H. P. NEWSHOLME, medical officer of health for Birmingham, said the public health officer is dealing with gonococcal ophthalmia diluted by other, usually less grave, kinds of ophthalmia. He



learns of cases of ophthalmia mainly from two sources, the medical practitioner and the midwife. The practitioner is required to notify "purulent discharge from the eyes of an infant commencing within twenty-one days from the date of its birth." The midwife must report any "inflammation of, or discharge from, the eyes, however slight." In both cases the issue is the practical one of drawing attention to any potential danger; neither doctor nor midwife is asked to select the gonorrhœal cases for report. The number of notifications vary enormously from area to area. High figures may connote heavy incidence or an energetic health service. The prophylactic rinsing fluid, especially the stronger solution of silver nitrate, may itself be the cause of a catarrhal ophthalmia of chemical origin. The incidence will appear higher in areas where cases of ophthalmia are brought readily to an eye hospital. Birmingham had almost the highest rate in the country, with a definite increase during recent years, but impaired vision or blindness had diminished. Starting from May, 1911, when ophthalmia became compulsorily notifiable, and taking 5-year periods up to and including 1935, the number of cases of partial or complete impairment of vision from this cause in infants was in successive 5-year periods 37, 47, 21, 35, and 8, the numbers for the last five years separately being 3, 4, 1, 0, and 0. Pressure had been put on practitioners and midwives to send all cases to the Birmingham and Midland Eye Hospital, which was subsidised by the local authority. The routine use by the midwives of one per cent. silver nitrate led to a considerable proportion of the cases attending the hospital on account of irritant and not infective ophthalmias. Formerly half per cent. solution was in use; this was increased to one per cent. in a largely successful attempt to reduce the number of damaged eyes, but with a concomitant rise in total notifications. The substitution of acriflavine for silver nitrate was now to be tried. But the increase in notifications in Birmingham masked an improvement quite as significant as that indicated by the dwindling prevalence of blindness. From 1928 each case of purulent ophthalmia attending the hospital had been examined (film and culture) by Dr. E. W. Assinder with the following results:

Year.	Cases.	Gonococcal and percentage.	P.G.T.
1928 ..	481	29 (6.0)	6.0
1929 ..	478	19 (3.9)	3.9
1930 ..	571	20 (3.5)	4.1
1931 ..	622	14 (2.2)	2.9
1932 ..	624	12 (1.9)	2.5
1933 ..	537	9 (1.7)	1.9
1934 ..	554	10 (1.8)	2.1
1935 ..	644	5 (0.8)	1.0

P.G.T. = Percentage gonococcal assuming the annual total of cases to have been identical with that for 1928 (481) in each subsequent year.

The falling gonococcal infection rate was far from being accounted for by mere dilution with non-gonorrhœal cases. This decrease might conceivably be the result of three factors: (1) decrease in female gonorrhœa, (2) more effective treatment, and (3) improved midwifery service. From an analysis of data drawn from the Birmingham venereal diseases clinics he did not feel justified in drawing any conclusion as to a change in prevalence of gonorrhœa; at any rate the number of attendances of infected women for specific treatment had increased greatly. Better care before, during, and after labour was undoubtedly a dominant factor in the reduction of gonorrhœal ophthalmia. In Birmingham 10.5 per

cent. of the total persons certified under the Blind Persons Act were blind through ophthalmia neonatorum; but since certification under the Act began at the age of 16 years, it did not reflect the improvement of recent years.

Dr. Newsholme then reviewed the measures taken in Birmingham for the prevention of ophthalmia neonatorum, including the 40 weekly municipal antenatal clinics at which 50-60 per cent. of all women delivered during the year attended on an average 3 to 4 times, the provision of three maternity beds in the venereal diseases clinic, the routine use by midwives of silver nitrate drops, and the facilities provided at the eye hospital. Notification was all-important, and omission or delay to notify had been the main factor in the few recent cases of blindness. The specialist service arranged by the eye hospital, in conjunction with the health committee of the city council, provided (1) out-patient examination and treatment at any hour of day or night, (2) beds to which the more acute cases could at once be admitted at public charge, and (3) provision of two extern nurses to visit the homes between the hospital attendances.

Granted the provision of facilities on these lines, said Dr. Newsholme, it appeared to him an act of almost criminal folly for a general practitioner to retain a case of even moderately acute ophthalmia under his own care, unless he had unusual experience in their treatment and exceptional nursing service available.

#### BACTERIOLOGY

Dr. S. H. BROWNING said he doubted whether bacteriological cleanliness was a practical proposition. The treatment of ophthalmia depended to some extent on the particular organisms found in the discharge, as also must the prognosis. The most skilled must often have difficulty in distinguishing clinically ordinary gonococcal from pneumococcal and staphylococcal infections of the eye. Treatment by vaccines and serums had not been successful. He agreed that many cases of ophthalmia neonatorum were overtreated. Some cases showed the presence of several virile bacteria. He had not found the complement-fixation test of any great value in gonorrhœa. Syphilitic babies with ophthalmia neonatorum almost always did badly. Of a number of infants infected with syphilis, only 48 per cent. recovered without loss of sight, whereas of non-syphilitic cases 81 per cent. recovered without loss. Recently the pneumococcus had been found more frequently than formerly in all eye diseases. When several organisms were present it was often found that the mother had been wiping away the baby's eye discharge with an apron she was wearing and which did duty for a variety of purposes.

#### DISCUSSION

Prof. M. MARQUEZ (in a paper read in his absence) said that the basic treatment should be silver nitrate. In many cases excessive treatment brought about greater evils than those it was sought to cure. He strongly condemned the use of the silver-nitrate stick; a solution would bring about the best results without danger. Care must be taken that chemical irritation did not enhance the inflammation due to the bacteria. The wonderful defensive power possessed by the tears and the eyes generally must always be remembered in treatment. Potassium permanganate 1 in 4000 thrice daily was valuable. He was not convinced of the value of protargol. He did not find protein therapy necessary.

Sir JOHN PARSONS suggested caution in the interpretation of statistics about ophthalmia; some returns recently submitted to Prof. Major Greenwood had been found to be unsound. Credé's method was used in some public health departments; he thought it should be employed more generally.

Dr. A. J. BALLANTYNE said that in Glasgow there was no diminution in the number of cases of the disease reported over some years, but he did not doubt that the severity was much less than 20 years ago. Some of the cases he saw were due to silver nitrate irritation. In recent years he had seen little corneal involvement.

Dr. SPENCE MEIGHAN emphasised the need for repeated bacteriological examination in suspicious cases when gonococci were not at first found.

Mr. F. JULER commented on the fact that in ordinary hospital work in London the incidence of ophthalmia neonatorum was very low. When he was a student cases were always to be seen; now it was difficult to find one to show to students. There seemed a tendency now to use silver nitrate of less strength than formerly. In one large maternity hospital, among 44,357 live babies delivered, 180 (or 0.4 per cent.) had ophthalmia, while among 44,717 cases on the district it was 0.157 per cent., and this despite the fact that the institution was largely resorted to by the poor, and there were many unmarried mothers.

Mr. RANSOM PICKARD (Exeter) said that in Exeter and neighbourhood there had been a decided decrease in ophthalmia, but he saw a fair amount of chemical irritation of the eye following treatment. In no case however could he attribute a serious effect to the use of a chemical agent.

Mr. CHARLES GOULDEN ascribed the low incidence-rate in London hospitals generally to the work at St. Margaret's Hospital. Cases due to streptococci, he said, were the most shocking; the cornea seemed just to fade away. If the streptococcal form was at all frequent it would be some excuse for a low recovery-rate, as it seemed to defy all treatment. Ordinarily he trusted silver nitrate; all excess however should be neutralised, as the baby had no tears. In the adult ophthalmia should be treated without the cornea being touched with silver solution.

Mr. SOMERVILLE LARGE said that at the Rotunda Hospital, Dublin, 1 per cent. silver nitrate was the routine application, and if there was a second discharge a further drop was used an hour later. The number of chemical inflammations was small.

#### A Talking Book for the Blind

One evening session was chiefly taken up with a demonstration on a talking book for the blind. Sir ARNOLD LAWSON, who disclaimed any part in its production, said the idea which had been simmering in the minds of those who had the welfare of the blind at heart had come to fruition through the constructive ability of Sir Ian Fraser. For a large proportion of blind people Braille was a failure, only a limited number attained sufficient proficiency to be able to read by its means, and few of those over 40 had not had their touch coarsened by manual labour. This apparatus not only dispensed with Braille, but made the blind man independent of reading aloud by a friend. The difficulty to be solved had been the number of records needed on the basis of the ordinary 12 in. record working at 78 revolutions per minute, and playing four minutes—added to the need for frequent changing of records and the heavy postage. The new record revolved at 24 per

minute; its grooves were spaced at 200 instead of the usual 100 to the inch; it would last 25 minutes for each side, or nearly an hour per record. People with good broadcasting voices gave their services gratuitously, and some 30 books had now been put into circulation. Any blind person could join the library without charge; each volume was sent post-free, the receiver paying the return postage. Already 300 blind people were using the library.

Sir IAN FRASER remarked that the blind world was a small one, and until a device came into common use it was sure to be expensive to produce. That was the reason for working on the gramophone record, which was practically universal.

#### LIVERPOOL MEDICAL INSTITUTION

At a meeting of this institution on March 19th, with Mr. G. C. E. SIMPSON, the president, in the chair, a paper on

##### Gas-air Analgesia

was read by Dr. R. J. MINNITT. Since February, 1934, he said, when he read his first paper on the subject, many thousands of patients had the benefit of gas-air analgesia, and nearly 400 apparatuses were employed in various parts of the world. In analysing 1025 cases in which it was used in childbirth in the Liverpool hospitals during 1933-35, he compared the findings with those of the British College of Obstetricians and Gynaecologists, and found but little difference. Criticisms in the College's report, regarding the weight and bulk of the apparatus, were answered with a description of a midwives' model in attaché case, weighing 15 lb. without cylinder. The cost of the nitrous oxide used was not high if leakages were prevented, and in cases conducted by himself the amount of gas used was about 25 gallons per hour. As labour was accelerated by the use of gas and air, an obstetric cause should be sought in cases where it appeared to be retarded. Dr. Minnitt said that the apparatus had been used with great success in the wards of the David Lewis Northern Hospital, Liverpool, for the purposes of analgesia for painful dressings, and suggested that it should be provided in the out-patient department of every hospital. It had also been adapted for use in the preparation of painful dental cavities.

Miss RUTH NICHOLSON pointed out that in the recent investigation, by the British College of Obstetricians and Gynaecologists, of the various methods of inducing analgesia, Dr. Minnitt's was the only one found to be safe and efficient for the use of midwives.

Dr. JOHN GRAHAM said that he had used a Minnitt gas-and-air apparatus for about a year. Most patients were enthusiastic, pain was greatly relieved, and noise was very much less, relations consequently being much less troublesome. The machine was quite easily portable, supplies of gas were easily obtained, and the speaker's average cost was about 6s. per case, using about 15-25 gallons of gas per hour. A midwife with no previous experience had used the machine satisfactorily on several occasions after a few minutes' explanation. Dr. Graham thought that the cost would be very greatly increased by leakages of gas, but this was obviated by judicious use of the spanner provided. He hoped that the day might never come when he would have to conduct midwifery cases without gas-and-air analgesia.

Dr. A. WINFIELD said that, having used Dr. Minnitt's apparatus on some 50 or so cases, and

having found it efficient for producing analgesia in a good proportion, he always carried it. Low forceps delivery of multiparæ had been performed without pain, and primiparæ had been delivered without operative interference with great diminution, if not always absence, of pain. This had been effected by blocking some of the air inlets to increase the concentration of nitrous oxide during the last few pains,

but Dr. Winfield felt that, in his attempt to make an apparatus safe for use by people of no experience in the administration of anæsthetics, Dr. Minnitt had sacrificed a good deal of flexibility. An attempt to use the apparatus for small repairs of the perineum had not met with much success.

Mr. J. T. MORRISON read a paper on chronic empyema.

## REVIEWS AND NOTICES OF BOOKS

### Industrial Medicine

By W. IRVING CLARK, A.B., M.D., Assistant Professor of the Practice of Industrial Medicine, Harvard School of Public Health, Boston; and PHILIP DRINKER, S.B., Ch.E., Associated Professor of Industrial Hygiene at the School. New York: National Medical Book Company, Inc.; London: H. K. Lewis and Co., Ltd. 1935. Pp. 262. 13s. 6d.

INDUSTRIAL medicine is defined as "the practice of medical supervision, preventive medicine, and public health within the confines of an industry" in this book, which aims at assisting the United States doctor to understand the conditions under which his patients work, and at informing him of "standard practice in the industrial medical field." The problems confronting such a doctor may be divided into two groups: maintenance of the health of workers, and diagnosis and treatment of minor sickness and of injury. The authors point out that prevention of industrial disease is largely an engineering problem, its basis being the separation of the toxic or irritating substance from contact with the worker. In no other field of medicine is there such a close relation to the engineering profession, and where there has not been close coöperation between physician and engineer the main problem stated above has remained unsolved.

The first three chapters are devoted to the organisation of departments in industrial medicine and surgery, together with the general scope of industrial medical service and the keeping of sickness records. Four chapters are devoted to pneumoconiosis, much more attention being paid to particle size than to descriptions of the working conditions which constitute the hazards. This is in accord with the modern conception of the causation of the disease by the very fine particles, whereas many of the preventive measures formerly relied on are now known to affect only the larger particles. The discussion on the effects of dust challenges the evidence, now generally accepted as conclusive, that the solubility of quartz in the biochemical sense is the basis of the specific cellular necrosis which it causes. Experimental evidence as to the relative harmlessness of artificial abrasives such as silicon carbide and aluminium oxide is detailed.

In the chapter on lead poisoning insufficient emphasis is placed on the nature of the conditions which give rise to the disease. It cannot too often be brought home to the students of this subject that breaking a white lead stack containing 150 tons of white lead must be more harmful than handling lead cable or metallic lead, or even the repeated use of the plumber's blowpipe for wiping joints. The section on metal fume fever is an excellent summary of the work on this subject by one of the authors. The section on asphyxia and artificial respiration gives in detail the use of oxygen-carbon dioxide, and describes how teams of men are trained to apply the Schäfer method of artificial respiration. The last chapter deals with the prevention of industrial

disease, and gives in detail the means of protection against the effects of accidents. There are many illustrations, most of them of theoretical rather than practical interest. Amongst the striking points illustrated is a curve showing the beneficial effects of oxygen-carbon dioxide on patients seriously gassed with carbon monoxide. The book is well printed and the bibliography covers 20 pages. The precise style of writing is marred only in one place—namely, where directions are given for cutting two pieces of material the one the size of a dime and the other the size of a fifty cent piece. It is time that authors writing on scientific subjects should give such measurements in centimetres.

Readers will find in this book much precise information, especially on scientific investigations into industrial problems.

### Early Diagnosis of Malignant Disease

By MALCOLM DONALDSON, F.R.C.S., M.B., B.Ch., F.C.O.G., Physician Accoucheur and Director of Cancer Department, St. Bartholomew's Hospital, and Gynæcological Surgeon, Mount Vernon Hospital; STANFORD CADE, F.R.C.S., Surgeon to Out-patients, Westminster Hospital, and Surgeon, Mount Vernon Hospital; WILLIAM DOUGLAS HARMER, M.C., F.R.C.S., Consulting Surgeon, Throat Department, St. Bartholomew's Hospital, and Hon. Surgeon, Mount Vernon Hospital; R. OGIER WARD, M.Ch., F.R.C.S., Assistant Surgeon, St. Peter's Hospital, and Genito-urinary Surgeon, Mount Vernon Hospital; and ARTHUR TUDOR EDWARDS, M.D., M.Chir. Camb., F.R.C.S. Eng., Surgeon, Westminster Hospital, Brompton Hospital for Diseases of the Chest, Queen Mary's Hospital, Roehampton, and Mount Vernon Hospital. London: Humphrey Milford, Oxford University Press. 1936. Pp. 168. 8s. 6d.

If there is a phenomenon in the life-history of cancer as striking as its relentless course it is the clinical silence of its initiation. It might even be said with some truth that the early diagnosis of malignant disease does not exist except as an accidental occurrence. In the majority of cases even external cancers, cancers of the breast, for example, pass unnoticed by patients until they are well established. It follows that as a rule the general practitioner is given little opportunity for early diagnosis. It would seem then, if their title is taken literally, that the authors of this book have set themselves an impossible task; but it does not follow that their book will not be useful. The reader will find in it an account, a very good account, of the clinical features of what may, in this enlightened age, be called established cancer of the breast, the female genital organs, the mouth, the larynx, the thorax, the abdomen, the urinary organs, the skin, and the bones. The teaching is that which is now orthodox in the best medical schools. It is good to have the facts collected in a small volume, convenient for reference by the

practitioner who may have graduated long ago or may not have devoted sufficient attention to this most important branch of his education. It is a salutary reminder to him to keep on the alert; and since it is compiled by members of the staff of a hospital now entirely devoted to cancer, it evidently provides teaching which they have reason to think is not generally followed by those who have had the care of their patients previous to admission. Much as we may regret it, it is still apparently necessary to reiterate the essential points in the diagnosis of cancer, and no one could do so with more authority than the staff of the Mount Vernon Hospital.

### A Textbook of Midwifery

Eighth edition. By R. W. JOHNSTONE, C.B.E., M.D., F.R.C.S.E., M.R.C.P.E., F.C.O.G., F.R.S.E., Professor of Midwifery and Diseases of Women, University of Edinburgh; Physician, Royal Maternity Hospital; Gynaecologist, Royal Infirmary, Edinburgh. London: A. and C. Black Ltd. 1936. Pp. 471. 18s.

THE arrangement of the subject matter in this useful and popular book is successful in focusing the student's attention on broad principles before he is encouraged to master the details of obstetric practice. The physiology of pregnancy, labour, and the puerperium is described in the opening chapters, and the modern view of the nature and control of menstruation is also prominent. The pages—still too few—allocated to antenatal care and hygiene have been revised and slightly increased in number. Prof. Johnstone's teaching is so practical that the further extension of this aspect of the subject would be welcome. The chapters on the management of occipito-posterior positions and on the treatment of placenta prævia have been expanded. The many methods of dealing with a case of placenta prævia are described, and are critically compared in relation to their value, dangers, and difficulties. The excellent illustrations appear to be unchanged.

### Traité d'urologie

Third edition. By GEORGES MARION, Professeur de Clinique Urologique à la Faculté de Médecine de Paris; chirurgien de L'Hôpital Necker. Paris: Masson et Cie. 1935. Vols. I. and II. Pp. 1232. Fr.220.

SINCE 1928, when the second edition of this book was published, considerable advances have been made in urology. Not only have pathological conditions about which little was known been more fully investigated, but new methods of examination have been perfected. As an example of the former may be cited the work done on diseases of the bladder neck that formed one of the subjects at the International Congress of Urology held in London in 1933, and of the latter, the introduction of intravenous pyelography. Certain chapters dealing with these subjects are duly included in Dr. Marion's new edition. Another important change is found in that part of the work that deals with urethroscopy and cystoscopy. Instead of describing the appearances of the bladder and urethra under the various diseases that may affect these structures, they have been brought together in special chapters devoted to cystoscopy and urethroscopy. Another innovation is the inclusion of an entire chapter dealing with the technique of operations on the male genital organs. Whilst these are the main differences between the second and third editions, innumerable minor changes

will be found; a notable one is that the description of Marion's well-known operation on the female urethra for the treatment of such conditions as incontinence has been partially rewritten and is now so well illustrated that the reader is in a position to carry it out without any risk of departing from the exact technique recommended by the author.

It is perhaps a little disappointing that Dr. Marion has not dealt more fully with endoscopic resection of the prostate, a method of treatment which in selected cases has given excellent results. Most urologists would agree that the McCarthy operation and Harris's technique of prostatectomy with closure of the bladder are the two most important advances in prostatic surgery that the last ten years have witnessed. It is of course well known that in the treatment not only of minor forms of prostatic enlargement but also of sclerosis of the bladder neck, Marion favours an open operation rather than an endoscopic resection, and that a technique for resection of the neck by the suprapubic route has been described by him. Perurethral methods have, however, advanced so rapidly during the last few years that they now constitute an important method of treatment. It is only natural that in a work based on the experience of one man rather than on urological literature in general small space should be devoted to techniques which he does not himself favour, but it would have been wise to provide bibliographies at the end of each chapter containing references to alternative methods.

These new volumes are worthy of an author who must be regarded as among the most eminent and most experienced of European urologists.

### His Patients Died

By CLAUDE LILLINGSTON. Edinburgh and London: William Blackwood and Sons, Ltd. 1936. Pp. 317. 7s. 6d.

THIS novel, written by a doctor, is a tract upon euthanasia. The arguments are introduced in the form of cases so that the right of the medical profession to put a term in hopeless cases to an existence of perpetual and irremediable suffering may be estimated. The author is not a direct advocate of the practice; but his hero, who is not only an advocate but an actual performer, is drawn as a highly sympathetic character, and in this way the attitude that may in suitable cases be adopted is indirectly brought to the reader's attention.

Dr. Lillingston is happy in his hero when analysing the humane man's impulses; he is less happy in his descriptions of the environment or in the collection of material. Dr. Skooner's professional career is exciting, and the difficulties he meets with and the contacts he makes are certainly unusual. The method adopted by Samuel Warren—not by the way a doctor—of an imaginary case-book allowed the author to set down a string of terrible episodes where the want of relation between them actually added to their probability; Dr. Lillingston's endeavour to make a novel out of Dr. Skooner's experiences brings out the unlikelihood that any one man could have passed through such trials. Dr. Skooner is also endowed with a power of character reading for which it might be difficult to find scientific support, and scepticism as to his personality necessarily lends an air of unreality to his actions.

The book may be read and enjoyed as a thriller; but it is also an attempt to set out the contradictory aspects of a difficult question, and it deserves respectful attention for this reason.

# THE LANCET

LONDON: SATURDAY, APRIL 11, 1936

## ASHES AND WATER

THE clerk who, a century or so ago, gave up his job at the Patent Office because he felt there was nothing left to be invented, may or may not have been legendary, but his spiritual descendants are many and lack of imagination does not deter them from competing for the mantle of the prophet. It has been fashionable in the last year or two to aver that the days of mineral chemistry in medicine are numbered. No doubt the mere metals seem poor mutes in comparison with the infinitely versatile quartet carbon, hydrogen, oxygen, and nitrogen. But if man dances to the tune of a band of assorted sterols conducted by a dictatorial pituitary, he is none the less largely a matter of ashes and water.

Dr. McCANCE's Goulstonian lectures, which are concluded in this issue, show that apart from a few well-explored shafts, the army of research workers in the mineral field have done little more than scratch the surface. Although there is no reference to water in the title, it is natural that his observations concern water as much as mineral metabolism. The two are inseparable in biology, and there will be no end to problems involving them, as long as life itself eludes definition. Dr. McCANCE has broached so many interesting questions that there would be little point in attempting to sum up his lectures. It will be enough to comment on two points. In the first place his survey of the subject from the viewpoint of evolution is refreshing. Knowledge is accumulating so quickly at present that a research worker can be, and too often is, fully engaged in unearthing facts, without ever attempting to understand their significance. But "Why?" is more important than "What?" and if he is to avoid premature burial under a heap of sterile facts, he must pause from time to time and look where his burrowings are leading him. The need for frequent stocktaking has never been more imperative in the interests, not only of the research worker himself, but also of the general reader and the student. Tell a student that his kidneys concentrate urea something like a hundredfold during excretion, and he will accept the statement as one more relentless fact to be retained until he has passed his examiners and thereafter to be forgotten as soon as may be. Lead him up to the same fact with a picture of man's ancestors forsaking an environment of infinite wetness for a dry land in which water is a precious commodity, and he will have something to remember without effort and later, perhaps, to apply.

The second subject which invites particular comment is Dr. McCANCE's own work on experi-

mental salt-deficiency in man. Dehydration is encountered in many different clinical states, of which loss of intestinal contents by diarrhoea and vomiting and diabetic coma are familiar examples. However it is brought about, dehydration must be looked on as loss of body fluid as distinct from body water, for in order to survive the body cells require an environment not merely of fluid, but a fluid with a particular electrolyte pattern and an osmotic pressure somewhere near that of normal saline. As dehydration advances the body is accordingly forced to face an unpleasant dilemma—namely, the choice between desiccation and a radical change in osmotic pressure. Although the course of events in a particular case is determined by the nature of the loss, it may be said that as a general rule the body can safely yield a considerable fraction of its fluid reserves, and that alterations in electrolyte content appear only when the dehydration has attained serious proportions. When this stage is reached considerable care is necessary in restoring the lost fluid, and it is now generally recognised that to a very dehydrated person plain water may be extremely poisonous. In recent years, however, an important exception to this generalisation has been discovered in Addison's disease, in which lack of the cortical hormone leads to serious loss of sodium from the body, without proportionate loss of water, the salt content of the extracellular fluids becoming in consequence considerably diminished. The striking effect of salt solutions in relieving the symptoms of this disease suggest that sodium deficiency is largely responsible for these symptoms; but is this the whole story? Dr. McCANCE has attempted to answer this question by observing the effects of sodium depletion in the healthy human subject. Simple restriction of salt intake is not enough to cause significant loss of body sodium, for the kidneys respond by diminished excretion. The sweat glands, on the other hand, are less closely guarded, and Dr. McCANCE has been able, by combining a low salt intake with perspiration in a radiant heat bath, to reduce the salt reserves of the body by something like 30 per cent. Even so the rule mentioned above has held good, and a heroic amount of sweating has been necessary to get ahead of mere dehydration. However, the labour has not been in vain, and the symptoms and humoral changes observed by Dr. McCANCE and his volunteers are of much interest. The chief symptoms which they noticed were anorexia, nausea, lassitude, and muscular cramps. Their blood showed a deficit of sodium and chlorine, an excess of urea, and evidence of concentration in the shape of high values for protein, hæmoglobin, and cell volume. Apart from the cramps, which are reminiscent of the water intoxication which affects miners who drink too much water after sweating profusely, all these changes are characteristic of Addison's disease, and the parallel supports the belief that salt deficiency looms largely in the pathogenesis of that disorder. Two conspicuous features of Addison's disease are certainly missing—namely, pigmentation and low blood pressure—but perhaps

these are due to lack of the medullary hormone, adrenaline. The rise in blood-urea is especially interesting, for it occurs in many other forms of clinical salt deficiency, notably intestinal obstruction and diabetic coma; and, since nitrogen retention is linked up in the clinician's mind with renal damage, it has often led to serious errors in diagnosis. It is therefore important to know that simple sodium deficiency will increase the blood-urea in a subject with healthy kidneys. If Addison's disease is mercifully rare, intestinal obstruction and diabetic coma are common enough, and Dr. McCANCE'S lectures should stimulate others to pay more attention to fluid metabolism in everyday illnesses.

### AIR-CONDITIONING

HAVING conquered the air as a medium for locomotion, man has more recently turned his ingenuity towards the preparation of artificial atmospheres. The therapeutic properties of changes of air have been recognised since the dawn of medicine but until recent times such changes implied movement from one place to another. Air-conditioning now makes it possible for various types of climate to be provided successively in the same room, the only effort needed being that required for regulating the machine whose function it is to alter the temperature and humidity of the atmosphere. Up to the present the industrial uses of air-conditioning seem to have outdistanced the medicinal; the "Refrigerating Data Book," published by the American Society of Refrigerating Engineers, supplies information about the best atmospheres for carrying on a number of trades which include such diverse products as hygroscopic colloids, chewing gum, macaroni, mushrooms, and cigars. Among buildings with special requirements are mentioned picture theatres, churches, hotels in hot climates, and laundries. The needs of operating theatres, baby incubators, pneumonia and bronchitis inclosures have also been studied. A complete air-conditioning plant consists of (1) heat regulating mechanism (radiators and refrigerators), (2) humidity regulating mechanism (air washers, sprays, silica gel, calcium chloride, &c.), (3) cleaning mechanism (filters and dust collectors), (4) distributing system (fans, ventilators, &c.), (5) regulating system (thermostats, hygrometers, &c.).

In private dwellings heat regulation is a fairly simple matter, whatever the source of heat employed, and it is with humidity that the serious problems of air-conditioning are concerned. Americans are uncomfortable if the room temperature falls below 70° F. In the Eastern States the outside air in winter is frequently many degrees below zero and is consequently incapable of holding more than a very small amount of water vapour; if such air is heated to room temperature its relative humidity will be far too low for comfort and dryness of the throat will soon be experienced. It seems pretty certain in fact, as MOYER and FITZ have pointed out,<sup>1</sup> that were the humidity

increased a room temperature of 68° or less would be tolerated and found more healthy by those who now require 70°. The trade in antiques bears testimony to the high temperature and excessive dryness of American houses, in which the veneer of old furniture, which had remained in place for centuries in the cooler damper air of English houses, soon begins to peel off. The bowl of water on the radiator or in front of the gas fire is a rough-and-ready method of dealing with insufficient humidity. At the other end of the scale, probably the most unhealthy atmospheric conditions are those experienced in hot thundery weather when high temperature is combined with high humidity. With an outdoor temperature of 90°-100° F. it is not advisable to reduce the indoor temperature more than 15°-20° by means of refrigeration, but a more comfortable atmosphere can be provided by drying the indoor air—dehumidification, as American engineers call it—when heat loss is facilitated by evaporation. The filtration of air through viscous or dry cellular filters has the advantage of removing the antigens of asthma and hay-fever and of greatly reducing the number of micro-organisms it contains. One problem however awaits solution. Although electric fans are used to distribute conditioned air no one has yet succeeded in giving that freshness to indoor air that open windows provide. There is a sensation of staleness as though the air has been bottled and relief is experienced on emerging into the open air. Some engineers therefore recommend a combination of conditioning with direct window ventilation. When untreated air is admitted in this way a rough estimate of its volume, temperature, and humidity must be made and allowed for in calculating the composition of the conditioned air to be mixed with it.

Some further data are available. ELLSWORTH HUNTINGTON, in his book "Civilization and Climate,"<sup>2</sup> states that the room temperature conducive to the best mental activity is about 63° F., with the humidity held as high as possible. But unless double windows are put in to prevent condensation of moisture, it would be impossible in Dr. HUNTINGTON'S opinion to raise the humidity in the living-rooms of an ordinary house sufficiently to make so low a temperature tolerable. Writing of air-conditioning in the treatment of pulmonary tuberculosis, Prof. J. A. MYERS, of Minnesota, remarks<sup>3</sup> that it is no longer necessary to construct sleeping porches, erect tents on lawns, or to have the head protruding from the window during the sleeping hours. The air of the patient's room is conditioned at 68°-70° F. during the day and at 55°-60° for sleeping hours with a relative humidity of 40-50 per cent. These are indications of the direction air-conditioning is taking in America. The next few years will no doubt see a great extension of the principle in this country. If properly used it should be a factor in improving the public health, as the provision of pure air in adequate quantities and at the right temperature and humidity has obvious merit in heat waves,

<sup>1</sup> Air Conditioning. New York and London. 1933.

<sup>2</sup> Oxford University Press. 1924.

<sup>3</sup> Diseases of the Chest. New York. 1935.



foggy weather, and whenever large numbers of human beings congregate in a small space. At the same time a lead is required from the medical profession to determine what are the best atmospheric conditions for health. That free access of outdoor air, low temperature and low relative humidity, by raising the general health, help the consumptive patient to fight his disease can hardly be in dispute, and convincing clinical evidence will be required before the American standard of an indoor temperature of 70° F. with a humidity of 50 per cent. can be accepted as the optimum.

### SPIROCHÆTAL JAUNDICE IN ENGLAND

It is a striking fact that for twelve years after 1922—when C. M. WENYON and H. C. BROWN isolated the organism for the first time in this country from the case described by MANSON-BARR—only two papers were published relating to spirochætal jaundice in England. The first was an account of 4 cases in Norfolk by BURTON-FANNING and CLEVELAND in 1926; the second was LAWRENCE and OKELL's record of a case in which the patient was thought to be infected through post-mortem examination of dogs (1929). The year 1934, when HAMILTON FAIRLEY drew attention to the prevalence of spirochætal infection in London sewer-workers, was a turning-point in the history of the disease in this country. A paper by BROWN (1935) on its serological diagnosis led to his receiving specimens of sera from all over England, and we understand that in the past seven months no less than 37 of these have proved positive. These do not include the 3 cases in sewer-workers noted by ALSTON in 1935, nor the 9 sewer-men showing agglutinins in the blood described by ALSTON and BROWN (1935); but they do include the 12 cases of Weil's disease among coal-miners in Northumberland and Durham reported in our columns last September by SWAN and McKEON. Taking these figures as a whole we see that although only 5 cases were reported between 1922 and 1934, more than 40 have been brought to light in the last seven months. It is noteworthy that in all of them jaundice was a prominent sign. We have no data in this country from which we can compute the proportion of jaundiced to the total number of cases of Weil's disease, but if we consider the fact that in an epidemic in Holland SCHÜFFNER found that some 60 per cent. of all cases showed no jaundice, it becomes evident that the prevalence of the disease in England is probably much greater than has been supposed. This is supported by the fact that ALSTON and BROWN (1935) were able to demonstrate agglutinins in the blood of 9 out of 45 London sewer-workers who said they had never had jaundice.

There is no longer any question that Weil's disease ranks among the occupational diseases, but it is only in the last year that compensation has been officially recognised. In May, 1935, Judge DUMAS at the Westminster county court awarded £600 compensation to the widow and three children of a sewer-worker who had died

from infection contracted during the course of his employment, and last month Judge THESIGER at Newcastle county court awarded compensation to a miner who, among many others, contracted it from working in a rat-infected mine. The occupational incidence is of great assistance in the diagnosis; when a sewer-worker or miner complains of influenza-like symptoms associated with intense muscular pains Weil's disease should be suspected, and with the help of a well-equipped laboratory there is every chance of an early diagnosis which will allow of serum therapy being employed without delay. There is still some confusion, however, in the minds of many medical men regarding Weil's disease on the one hand and infectious jaundice on the other. Although infectious jaundice does occur in apparently sporadic cases, it generally takes the form of a more or less widespread epidemic chiefly affecting children. All degrees of severity are encountered, and in severe cases abdominal pain, hæmaturia, prostration, and ocular congestion associated with intense jaundice, make the condition hard to distinguish from Weil's disease, though it seldom produces the same intense muscular pain. It is here especially that the laboratory can be of value, for in the absence of any condition such as tonsillitis or any septic focus which confuses the blood picture, a differential count in spirochætal jaundice will show an excess of polymorphonuclear cells, whereas in infectious jaundice there will be an increase of mononuclears. The two diseases are wholly distinct in origin; the causal organism of infectious jaundice has not been discovered, but it is certainly not the *Leptospira icterohaemorrhagica*.

### THE BELFAST CONGRESS

THE congress of obstetrics and gynaecology held in Belfast last week was clearly an outstanding success. The first day's proceedings are summarised on another page and some account of the rest will be given next week. At the close of the meeting Mr. Eardley Holland voiced the general impression that the contributions were not only of unusual interest but were exceptionally well presented. Even the most serious deliberations seem to have been lightened by an element of mirth proper to a congress held on Irish soil. The members were delighted, for example, by the vein of irony with which Dr. Heyman thanked his "collaborators" for their assistance in allocating a series of 20 specimen cases of cervical carcinoma to their appropriate groups and referred to the considerable variation in the classifications recorded on the voting sheets. Where the opinion of experts is so divided it is not remarkable that statistics from different clinics on the results of treating cancer of the cervix at various stages are diverse, and this was the weakness that Dr. Heyman successfully exposed. On the social side the hospitality shown to members was almost overwhelming and few could take advantage of more than a selection of the entertainments offered if their attendance at the scientific sections was to be more than perfunctory. The congress will long be remembered with gratification by all those who attended it and especially by those coming from what was described as "the adjacent island of Great Britain."

## ANNOTATIONS

## INCREASING THE EFFECTIVENESS OF SEX HORMONES

THE discovery of David, Dingemans, Freud, and Laqueur, working in Amsterdam, that the action of testosterone can be increased by the simultaneous administration of an  $\alpha$ -substance, itself inactive, has led to some curious results. The Amsterdam investigators showed that the activating substance was of the nature of a fatty acid, and that androstenediol as well as testosterone could be "activated" by it. Subsequently Miescher, Wettstein, and Tschopp, in Basle, confirmed these results and then showed that the same effect could be produced by a wide range of fatty acids. These workers found testosterone in paraffin oil to be almost inactive, and it might be argued that co-substances, present in the oils commonly used as media for injection, are essential for the activity of the hormone. A paper we publish to-day throws further light on this problem. Dr. Deanesly and Dr. Parkes find that an increase in the effectiveness of androsterone and testosterone is obtained by increasing the volume of oil in which a given dose of the hormone is dissolved, and they also confirm the results of Miescher, Wettstein, and Tschopp with palmitic acid. They have failed, however, to find the increased effectiveness when the palmitic acid or the excess oil is given as a separate injection in a different part of the animal, and they incline to the belief that the effect depends on a more even absorption from the subcutaneous tissue, rather than on synergism between the hormone and the accessory substance at the site of action of the former. One has only to recall the great increase in effectiveness of androsterone when given as benzoate,<sup>1</sup> and the inefficiency of single injections of aqueous solutions of œstrone,<sup>2</sup> to realise the great differences caused in the degree of response by the manner in which a given dose becomes available to the animal.

The possibility of greatly increasing the effectiveness of comparatively scarce and expensive hormones is of general interest and the question arises whether the effect will be shown for the other known activities of the male hormones. It seems certain that  $\alpha$ -substance or fatty acid does not increase the activity of testosterone on the comb of the capon, but in the case of the œstrogenic<sup>3</sup> and progesterone-like<sup>4</sup> activities of certain male hormones an interesting field of experiment is opened up. At the present time œstrone and œstradiol are comparatively abundant substances in relation to their effective doses: hence, rendering more effective the œstrogenic action of male hormones is only of academic interest. Progesterone, on the other hand, is still very scarce, and comparatively large quantities are required to produce biological results. Until very recently the capacity to cause progestational proliferation has been supposed to be restricted to a particular diketone, progesterone; but the report by Klein and Parkes<sup>4</sup> disposes of this presumed specificity and makes it conceivable that more easily obtainable substitutes may be found and that the action of these might be intensified by methods similar to those discussed on p. 837.

<sup>1</sup> Callow, R. K.: *Jour. of Physiol.*, 1936, lxxxvi., 49 P.

<sup>2</sup> Marrison, G. F., and Parkes, A. S.: *Ibid.*, 1929, lxxvii., 389.

<sup>3</sup> Deanesly, R., and Parkes, A. S.: *Brit. Med. Jour.*, Feb. 8th, 1936, p. 257.

<sup>4</sup> Klein, M., and Parkes, A. S.: *Chem. and Ind.*, 1936, lv., 236.

## THE SURGICAL CONSCIENCE

CONSCIENCE has been defined, not without cynicism, as "the fear of being found out." A less ignoble, if slightly priggish, alternative might be "the fear of finding oneself out." Using the word in some such sense, Dr. Robert B. Greenough<sup>1</sup> emphasises the importance of a keen conscience to the surgeon in a world full of gullible persons obliged to entrust him with their lives and welfare. "Physicians and surgeons," says Dr. Greenough, "are not born supermen, they merely have to become so," and it is during the time of studentship that the surgical conscience is developed well or ill according to the ethical standards of the teaching staff. Once qualified the young surgeon is legally entitled to perform any operation of which he considers himself capable. His conscience is his only guide as to what he should or should not attempt. An ill-trained conscience may make him too bold or not bold enough. The apprentice system of surgical education, ideal where teacher and pupil loyally cooperate, may be ruined by the jealousy of the one or the arrogance of the other. In dealing with cases referred to him by the physician for operation, the surgeon's conscience must again be exercised. He is not to regard himself as the mere craftsman of the physician, but must take full responsibility for the patient and satisfy himself in every case that operation is warranted. Readers of *Punch* may remember the dialogue between a general practitioner and a surgeon. "What did you operate on old Jones for?" asks the general practitioner. "A hundred pounds," says the surgeon. "Yes, I know," says the general practitioner, "but what had he got?" "A hundred pounds" is the reply. There can be little, if any, truth in the gibe. Nevertheless some surgeons are casual in the matter of fees, being, no doubt, unduly generous in many cases and unduly exacting in a few. As Dr. Greenough wisely says, a good surgical conscience demands that the question of fees be frankly discussed beforehand if subsequent "unpleasantness" is to be avoided. In the surgeon's relations with professional colleagues, even in these days of keen competition, the "Golden Rule" is still an adequate guide to conduct.

## THE SIGNIFICANCE OF PSYCHOSIN

THE cerebroside, first described as constituents of fresh brain tissue, and subsequently found in the spleen and the kidney, yield on mild hydrolysis substances of great interest, and possibly of importance in the function of the brain. Derivatives from the brain have, for example, been shown to fix tetanus toxin; and this ready fixation obviously has an important bearing on the genesis and treatment of the disease. It is clearly important that our knowledge of these substances should be extended, and the substance psychosin, which is an amino-alcohol united to a sugar, has been, along with some other cerebroside derivatives, the subject of a detailed investigation by Drury and his co-workers.<sup>2</sup> It proves to be water-soluble and markedly surface-active; it is bactericidal in low concentrations, and capable of fixing bacterial toxins, agglutinating bacteria, precipitating normal serum, and hemolysing red cell suspensions. The bactericidal power is

<sup>1</sup> *Surg., Gyn., and Obst.*, Feb. 15th, 1936, p. 390.

<sup>2</sup> Drury, A. N., Miles, J. A. R., Platt, A. E., Plaut, G., Weil, H., and Hughes, A. R.: *Jour. Path. and Bact.*, 1936, xlii., 363.

dependent in part on the presence of the amino group, and is of the same order as that possessed by other surface-active substances like saponin. Two to four milligrammes of psychosin will fix 1000 minimal lethal doses (mouse) of tetanus toxin and about 50 minimal lethal doses (guinea-pig) of diphtheria toxin; the sugar and the amino groups appear essential for this action, and the toxins of Shiga's bacillus and *Olostridium welchii* are unaffected. The serum precipitation occurs at definite concentrations which fall within certain constant limits for the normal sera of different species. The phenomenon is not comparable with the straightforward precipitation by compounds such as ammonium chloride, but takes place in high serum dilutions and apparently depends on the change in charge of the serum particles as a result of absorption of the psychosin to the serum proteins. In rabbits this optimum concentration changes slightly after bleeding and considerably after poisoning with uranium nitrate or diphtheria toxin (these phenomena may have some relation to the changes in quantity and dispersion of the serum proteins that have been recently described in abnormal sera tested by specific serological precipitation and the ultra-centrifuge techniques). Psychosin readily lyses the red cells of many species of animals, including those of the human being. The hæmolysis is inhibited by the addition of serum.

These properties are probably dependent on the high degree of surface activity of the substance, which results in its ready absorption to a wide variety of other substances. Unfortunately this very activity prevents its detection as such in fresh tissue, since no agent which will disassociate it from its absorption compounds has yet been found. Pending that discovery, this work forms a very satisfactory groundwork for the biological study of the cerebroside derivatives.

#### PRE-OPERATIVE MEDITATION

NEATLY parodying the phrase "pre-operative medication" to which we have grown accustomed during the past decade, Dr. S. Kleinberg<sup>1</sup> pleads for more pre-operative meditation. Thirty years' experience of joint surgery has convinced him that joint tissues are no less resistant to infection than other tissues. Joint surgery, to be successful, requires merely "proper pre-operative cleansing of the patient's skin, the practice of aseptic methods, careful atraumatic expeditious technique, and, in addition, adequate pre-operative meditation." Planning ahead is essential. "The time to think," says Dr. Kleinberg, "is before and not during an operation." Especially is this desirable, and possible, in orthopædic surgery which is mostly elective and seldom of an emergency nature. When properly planned beforehand "an operation takes on the qualities of a musical symphony in which every element is a necessary part of the composition." One of the dangers of modern surgery is that the time spent in pre-operative meditation may be shortened whereas the time spent in operating may be lengthened. Dr. Kleinberg quotes the case of a surgeon who spent three hours fixing a fractured hip. During the operation a score of X ray photographs were taken. "During the whole of the procedure the patient was under a general anaesthetic and the wound was kept open. The risk of infection in such an instance is manifest." Dr. Kleinberg's phrase might be used in a much wider sense than merely that of planning the stages of an operation. It might with advantage

be borne in mind whenever any operative procedure is contemplated. General practitioners are familiar with the far-reaching and sometimes disastrous psychological effects of even successful operations. Pre-operative meditation should be cultivated by those who recommend operations as well as those who perform them.

#### MUMPS ORCHITIS

ALTHOUGH the orchitis of mumps, described by Hippocrates, is recognised as a serious complication that may result in sterility and possibly impotence, there is great diversity of opinion about its pathogenesis, incidence, prognosis, and treatment. Stengel,<sup>1</sup> in an elaborate study containing 120 references, accepts mumps as a virus disease, the portal of entry being "probably" the upper respiratory tract. He accepts, too, Trousseau's view that the orchitis is a metastasis, and that it proves a sympathy between the parotid gland and the genital organs. Trauma, chill, and exposure are not important factors, although they play, perhaps, contributory parts. An analysis of representative statistics shows that the average incidence of orchitis in those series comprising 1000 or more cases of mumps is 18.2 per cent. Stengel finds, however, that only 5 cases have been reported in boys under 12; it is commonest at puberty and during early manhood. It usually follows parotitis, but occasionally it seems to have been the first manifestation and "spontaneous" orchitis without parotitis has been recorded. (It may be suggested that, if the virus was the cause of the orchitis at all, missed solitary submaxillary or sublingual mumps may have been responsible.) Usually only one testis is involved; bilateral orchitis is much less common. Stengel considers that the temperature is the best guide to diagnosis and course. The parotid swelling and pyrexia having subsided, the temperature again rises and the patient experiences malaise and anxiety; there is local tenderness and swelling and, occasionally, fluctuation of one or other testis. Tenderness progresses to real pain, and by the third or fourth day of the orchitis the organ may be "enormously large" and the pain so intense that "large doses of morphine may not relieve it." The temperature may reach 105° F. with a parallel increase in the pulse-rate and, possibly, the respiratory rate. The testis becomes very hard and tense and continues thus for about six days, the whole attack lasting for ten days. Thereafter, swelling subsides and the temperature falls, usually by lysis, although true crisis is recorded. During the height of pyrexia, delirium, stupor, and even mania have been noted. Stengel says that there may often be meningitis and encephalomyelitis (of the aseptic type). The lesion is probably a parenchymatous sclerosis. As to whether the epididymis is first and always involved, or implicated later, or escapes entirely, there are divergent views. Subjectively, failure to recover completely from orchitis is indicated by diminished sexual power; objectively, by "atrophy"—a term very loosely employed. "Atrophy" may be relative or temporary, the organ regaining its normal size; it is estimated to occur in 40-60 per cent. of cases of mumps orchitis and is the result of pressure necrosis. Although only two cases of biologically proved sterility are on record, Stengel believes that there have been many others; femininity is stated to have followed double orchitis. The treatment of the condition is purely symptomatic; rest in bed with

<sup>1</sup>Med. Rec., Feb. 19th, 1936, p. 144.

<sup>1</sup>Stengel, A., Jr.: Amer. Jour. Med. Sci., March, 1936, p. 340.

elevation and suspension of the testis together with soothing local applications are among the most important measures. Injection of convalescent serum is recommended by some, incision for the relief of tension by others. Prophylaxis consists in measures to prevent the dissemination of mumps by contact spread, quarantine for 21 days being maintained; some regulations require isolation in separate cubicles. Convalescent mumps serum in the protection of contacts has met with "very fair success."

#### INTRASPINAL ALCOHOL FOR THE RELIEF OF PAIN IN MALIGNANT DISEASE

THE severe pain sometimes caused by malignant disease in its later stages cannot always be adequately relieved with opiates. Operations such as chordotomy and pelvic sympathectomy remove it in some cases, but these are major operations which throw a great strain on a patient who is often already exhausted by disease. It is good to learn therefore that a method of treatment has been devised which involves little strain and is often effective. It was Dogliotti who, in 1931, reported that pain could be relieved by the intraspinal (subarachnoid) injection of a small quantity (0.2 to 0.8 c.cm.) of absolute alcohol. He aimed at damaging the nerve-roots which, in the case under consideration, were conducting the painful impulses. The alcohol was therefore injected into the cerebro-spinal fluid with the patient lying in such a position that the nerve-roots to be dealt with lay at the uppermost part of the spinal canal. With the patient in this position the injected alcohol, because of its low specific gravity, rises to surround the nerve-roots concerned. Sensation may be slightly dulled, but weakness of the muscles seldom results, since the motor roots are more resistant to the effects of alcohol than are the posterior roots. Dogliotti's good results have been confirmed by several workers in America, and one of the most recent papers<sup>1</sup> on the subject comes from the Peter Bent Brigham Hospital, Boston. Good results have also been reported recently in our own columns.<sup>2</sup> In many of the reported cases severe pain has been abolished for several months by a single injection. A curious feature of some of them is that the pain is not relieved immediately, but continues unabated for two or three days before diminishing. All the authors emphasise the importance of giving a small injection (about 0.4 c.cm.) in the first place, because individual susceptibility to the alcohol injection varies greatly. The injection may be repeated in ten days' time if the first fails to give relief. Retention of urine is a serious complication which may follow the injection if too much alcohol is introduced.

While the intraspinal injection of alcohol requires no special skill, several details in technique are important. Hence it should not be attempted without study of the published records of those who have tried it.

#### VITAMINS AND IMMUNITY

A BATTLE over the anti-infective action of the vitamins is waged to and fro; but it is a pity there should be any battle. Prof. Rominger,<sup>3</sup> of Kiel University, sums up the situation in the following words: "Die Rolle, die Vitamine bei der Infektabwehr spielen, ist noch keineswegs klar erkannt und wird vielfach überschätzt"; which is in fact a

not unjust verdict. A specific action of the vitamins against infection has been sought and not found, except in the case of vitamin A. In rats deficiency of this vitamin leads to damage to epithelial tissues which is indisputably favourable to the penetration of infective organisms. In man it is seldom pushed to an extreme and opportunities for critical observation on any considerable series of cases have been few; but in Bloch's famous series of infant cases, in which the deprivation was severe, the disposition to broncho-pneumonia was conspicuous.

Unfortunately this question of the relation of vitamins to immunity is used in the political argument for and against prophylaxis against widespread malnutrition. It seems to us certain that malnutrition in any form, whether qualitative or quantitative, must aggravate the detrimental effects of infection, and whether it does so in a specific sense or otherwise is of less importance.

#### LOCALISATION OF SOUND

It seems unlikely that differences of apparent loudness between the response at the two ears have much to do with the accurate localisation of sounds under ordinary conditions of listening. This is at all events the considered opinion of Prof. F. C. Bartlett, F.R.S., in his introduction to the third report of a committee of the Medical Research Council.<sup>1</sup> People move their heads to help them to tell the direction of a sound, but because of the limited sensitivity of their binaural sense the ears are used only to provide the initial cues and then the listener peers about until he can see the object from which the noise is coming. If it is a familiar noise in a familiar place the localisation is more accurate, but sounds of very high or very low pitch are rarely located correctly, and a continuous sound is more difficult to place than one which is intermittent. As, moreover, our ears are normally used in the same horizontal plane, we possess a binaural sense of direction in bearing only, none in elevation. There are, it may be seen, two occasions of intense practical importance for exact localisation of sound when sight is not available: how can a listener locate the source of the sound emitted by a submarine when it is travelling under water; how can he tell the position and direction of flight of an aeroplane at night time? Science has come to his aid with a simple mechanical contrivance by which two enclosed airpaths lead one to the right and one to the left ear of the listener. Stethoscope tubes are connected to separate sound collectors, say five feet apart, which are so mounted as to be capable of being swung in any desired direction. The listener adjusts the whole apparatus so that he keeps the sound mid-way in his head. Provided the tubes are of equal length, the two sound collectors will now be in phase with respect to the waves coming from the source of sound. The human ears are capable of detecting a phase difference of half an inch in a sound wave (about 12 ft.). As they are about 6 in. apart it is not possible for them, unaided, to locate sound accurately to less than 5° in bearing. With the sound collectors 5 ft. apart the same phase difference will still be perceptible and the margin of error will have been reduced from 5° to 0.5°. For the detection of aircraft, four sound collectors are used, with one listener directing the apparatus in bearing and one in elevation. This mechanism would be of wider application were it not for the production of

<sup>1</sup> Dunphy, J. E., and Alt, R. E.: *New Eng. Jour. Med.*, March 5th, 1936, p. 472.

<sup>2</sup> Russell, W. R.: *THE LANCET*, March 14th, 1936, p. 595.

<sup>3</sup> Rominger, E.: *Forschungen und Fortschritte*, 1936, xii., 122.

<sup>1</sup> *The Localisation of Sound*. By H. E. O. James, M.Sc. Special Report Series No. 207. Pp. 38. 9d.

auditory fatigue, better called experimental deafness, which almost certainly occurs in the central nervous system and not in the ear itself. If, for instance, one ear of a listener is submitted to intense stimulation for a short period the acuteness of hearing not only of that ear but also of the opposite ear is reduced for the time being. It is curious that this depression of hearing can be almost immediately dispelled if any sudden and unexpected stimulus of a different quality, such as a flash of light, is brought in. The phenomenon seems not to be one of fatigue in any exact sense but rather of the nature of a central inhibition. Both for theory and for practice the study of this attunement effect is of importance, and Mr. James's report contains the investigation and comparison of monaural and binaural attunement in which the share of central and peripheral factors is carefully worked out.

#### MENTAL DISTURBANCES ASSOCIATED WITH HYPERTENSION

THE mental states that accompany arterial hypertension have not been systematically studied. cursory reference to them, where arterio-sclerotic or uræmic phenomena are the main topic, is all that is to be found in text-books or monographs. This gap has been filled by Dr. Eduard Krapf of Buenos Aires.<sup>1</sup> The material of the psychiatric clinics of Munich and Cologne afforded him an opportunity, prior to the revolution in Germany, of making a large collection of cases which he had intended using for a descriptive study on Kraepelinian lines. The attempt to delimit a clinical group and incidentally narrow somewhat the problem of the involuntional psychoses led him, however, to the study of pathological bodily functions, and to a review of the whole question of constitutional and extrinsic causes, with hypertension as a paradigm. In the course of this further inquiry Dr. Krapf found himself departing from the strict Kraepelinian approach and coming nearer to the views which Kleist has urged with such force. This change of outlook did not materially alter his careful use of the data for, from either angle, the necessity for minute psychiatric as well as physical examination and description was obvious. Dr. Krapf has in fact compiled a clear and detailed picture of the range of mental symptoms accompanying hypertension. He describes four main forms: absences, twilight states, mood disorders, and change of personality. These varieties are not independent of each other, though they show differences in their mode of onset and their course. Many cases now loosely attributed to arterio-sclerosis or myocardial disease seem to belong properly to this group; and the discovery and separation of cases with hypertension from the ill-defined pre-senile psychoses would, it appears from this work, be clinically and pathologically profitable. Dr. Krapf thinks that general measures of diet and hygiene, the use of sedative drugs, and psychotherapy may do much in the way of prophylaxis, and that, when the condition is well established, measures for diminishing intracranial tension should be employed: it is to swelling of the brain that he attributes the confusional state that may develop in patients with "essential" hypertension. A general predisposition to high blood pressure and a more localised cerebral predisposition seemed, in Dr. Krapf's clinical material, to be potent factors in the causation. The significance of the findings in this

study, when applied to psychiatry generally, is considerable, as may be seen in Dr. Krapf's final review of the relation of the syndrome to other morbid types of reaction.

#### EPILEPSY AND CORTICAL RHYTHM

A NEW and promising line of attack upon the problem of epilepsy is described by Dr. William G. Lennox in a paper entitled the Physiological Pathogenesis of Epilepsy,<sup>1</sup> which he read before the International Neurological Congress in London last year. Dr. Lennox has been engaged for many years in investigating epilepsy by physiological and biochemical methods. In this paper, the twentieth of a series on epilepsy, he first describes some observations which negative once-popular theories of the mode of production of epileptic attacks. He brings forward evidence that an attack is not preceded by a diminution in the volume of the cerebral blood flow nor of the oxygen tension of the blood going to or coming from the brain. Complete unconsciousness caused by syncope artificially induced was rarely effective in precipitating an attack in epileptic patients.

During recent years a method of recording electrical changes in the cerebral cortex has been devised, and it is already clear that we may expect this new technique to throw as much light upon disturbances of cortical function as electrocardiography has done upon abnormalities of the heart-rate and rhythm. Dr. Lennox and his collaborators, Dr. Frederic Gibbs and Dr. Hallowell Davis, have obtained records of the electrical potentials from the brains of 21 patients during hundreds of seizures. They have found that an attack of petit mal is invariably accompanied by a burst of action potentials much larger and less frequent than those normally found in the patient. Such patients, however, even when they are free from any objective or subjective evidence of a seizure, may show similar small alterations in potential which are regarded as subthreshold seizures. The nature of these abnormal electrical discharges occurring in the brain must, at present, be a matter of speculation. Lennox suggests that in normal activity there are many clusters of neuronal cells discharging, not in unison, but in harmony. The usual Berger rhythm of 10 to 20 discharges a second is explained as a mosaic of the activity of many centres. In an attack of petit mal many waves become one. The large wave represents a synchronisation of various discharging cell clusters. In Lennox's graphic words, "the harmony of the symphony orchestra has become a single note. The representative constitutional government has become a totalitarian state." The cause of this pathological unanimity has yet to be found, but it is already clear that the search for it will lead to one of the most fundamental of neurological problems, the rôle of time in neural function.

At a meeting of the Royal College of Physicians of London last Monday Lord Dawson of Penn was re-elected president.

On April 1st the Lord Mayor of London presided at the Mansion House over the first meeting of the general committee formed in connexion with the proposed memorial to King George. A "philanthropic scheme" committee was elected, whose 26 members included Lord Dawson, Lord Horder, Lord Moynihan, the lord provosts of Edinburgh and Glasgow, and the lord mayors of Liverpool, Cardiff, York, and Newcastle.

<sup>1</sup> Die Seelenstörungen der Bluthdruckkranken. By Dr. E. Krapf. Leipzig and Vienna: Franz Deuticke. 1936. Pp. 120. M.6.

## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### **XCVI.—PROGNOSIS IN CEREBRAL CONCUSSION AND CONTUSION**

THE common effects of head injury fall naturally into two groups. The outstanding feature of the first group is immediate interruption of consciousness. This may range in degree from a state of automatism to one of stupor, and in duration from minutes to days. It leaves behind it a gap in the memory by which the duration of unconsciousness is conveniently measured. This phase (which in its shorter forms is usually called concussion) presents a great variety of symptoms—positive as well as negative—which deserve closer study than they have received, especially in relation to the occurrence of sequelæ.

The second group includes symptoms such as headache, giddiness, mental change, and insomnia. These may appear after consciousness has been regained, or they may occur without any initial disturbance of consciousness; they may follow the injury at once, or after a latent interval of hours or days. Though they show constantly a tendency to improvement and eventual recovery, sometimes and in some degree symptoms of this kind may persist indefinitely. Their character implies the persistence of some morbid state, which is commonly assumed to represent an unresolved cerebral contusion.

These two groups of symptoms together represent the common sequelæ of head injury, and run their course independently of such complicating features as fracture of the skull, epidural, subdural, or sub-arachnoid hæmorrhage. They offer a field still rich in opportunity for detailed observation and correlation of early symptoms with end-results.

#### **Immediate Prognosis**

##### IN SEVERE INJURIES

*Prognosis as to Life.*—In the majority of fatal cases death occurs within the first twenty-four hours. During the succeeding twenty-four hours the risk is still considerable. Post-mortem examination reveals extensive contusion and laceration of the brain. These patients when first seen are, as a rule, comatose. They do not respond by movement or grimace to painful stimulation. The pupils are dilated and often unresponsive to light, and the corneal reflex may be absent. The limbs are flaccid and motionless, and the breathing stertorous. The plantar responses are usually extensor. The pulse-rate is variable. A rapid, feeble pulse persisting is of bad import, but a normal rate may be found in cases which are rapidly fatal. The temperature in the first instance is subnormal—in the region of 96°. Subsequently it is apt, either to remain at the subnormal level, or to rise rapidly to 104°, 105°, or even higher.

In this group of the most severely injured the patient who is going to recover will, as a rule, show a definite improvement within the first twenty-four hours. Response to painful stimulation returns, spontaneous movements of the limbs appear, the pupils become smaller and react to light, the pulse becomes fuller, and the temperature, rising to a moderate height (101° to 103°), remains about this level. In the phase of recovery a slow pulse-rate (56 to 60) is often observed and may persist for several

days. After the first forty-eight hours death from cerebral contusion is uncommon, and the small mortality-rate which persists is mainly due to such complications as pneumonia and meningitis, the latter resulting from a fracture of the base running into the middle ear or one of the nasal sinuses. Some patients, however, do succumb without any cause other than cerebral contusion after remaining in a state of coma or stupor for a week or more. As a rule in such cases the temperature shows a climbing trend.

*Traumatic Stupor and Delirium.*—The patient who survives frequently passes through a phase of stupor and delirium lasting several days before he becomes mentally clear. Apart from an extensor plantar response on one or both sides, he usually presents no abnormal physical signs. What will be the outcome of this phase? We can at least affirm that the state of confusion will pass. It rarely exceeds three weeks in duration, but I have notes of three cases in which a state of severe traumatic delirium persisted for three, seven, and nine months respectively with eventual recovery. While it persists the confusion itself conceals effects of the injury which may be of a more lasting and, therefore, of a more serious nature. Sometimes the presence of hemiparetic signs, or the detection of dysphasia, during this stage may make it clear that a coarse lesion of the brain is present. As a rule prognosis as to the next stage must wait until the patient is clear. On the whole, the longer the duration of traumatic stupor the greater is the likelihood of troublesome after-symptoms, but there are exceptions to this rule. Young persons, especially, may return to full consciousness at the end even of two or three weeks, and neither show nor admit any further symptoms.

*The Aftermath.*—With the return of consciousness the patient may exhibit changes in disposition or defective memory, of which he himself is unaware, or of which he may complain. Impairment of the intellectual functions is, on the whole, commoner and more persistent in patients past middle age. Children, on the other hand, are more likely to exhibit striking changes in character and disposition. Such mental traces of organic damage are slow to improve, but usually end in recovery. Most of the symptoms in this stage, however, are subjective, and it is, therefore, the complaints of the patient which afford the main facts available for prognosis. Of what degree of mental and physical activity is he capable without symptoms, such as headache, giddiness, excessive fatigue, or insomnia? This question can only be answered by separate experiment in each case. If under conditions of absolute rest such symptoms are present, convalescence must be slow and the disability will be of long duration. Even if at first there is freedom from symptoms, it is not safe to predict an uneventful recovery until the patient has progressed symptom-free through graduated stages to his normal level of mental and physical activity. If in the course of this experimental progress symptoms develop, the stage of activity at which they occur will provide an indication of the prognosis. The answer, then, in this phase to such questions as: "Has there been lasting damage to the brain?" and "How long will it be before he gets well?" must often be given in such terms as: "We cannot tell until we have seen



how much the brain will stand without complaint." We may safely add that complete recovery is the rule even though the symptoms at first may be severe and improvement slow. If evidence of a coarse lesion is present from the first, such as hemiparesis or dysphasia, the prognosis is naturally uncertain, but the majority of patients who survive with such symptoms make a satisfactory recovery. Dysphasia is the more serious symptom.

"Neurasthenic" symptoms—*anxiety, depression, preoccupation with self, increased liability to mental and bodily fatigue, and head discomforts of the functional type*—constitute an important part of the aftermath of head injuries, both severe and mild, but are more likely to occur after the former. They are often precipitated or aggravated by anxiety over compensation. Symptoms of this kind are not likely to be observed in tough-minded persons. Their frequency is proportionate to that of similar illness in the family, and personal, history of the patient. Knowledge of his constitution in these terms may sometimes explain why it is that one individual may suffer much more than another after injuries of comparable severity.

#### MILD INJURIES

A man suffers a blow on the head at football, continues with the game in a state of traumatic automatism, and is later shown to have a half-hour gap in his memory. Such is a typical mild head injury. In nine cases out of ten there are probably no after-symptoms more serious than a headache which is gone next day. In the tenth a persistent and even disabling liability to headache may supervene, perhaps associated with giddiness, insomnia, and fatigue. The more severe and prolonged the disturbance of consciousness, the more likely on the whole are sequelæ, but effects of this kind may follow a head injury without any disturbance of consciousness. In either case these effects may directly follow the injury, or may appear after an interval, sometimes amounting to several days. Once such symptoms have appeared, their prognosis (which depends a good deal upon early recognition and proper treatment) must be gauged by the methods already described in connexion with the aftermath of severe injuries.

#### MENINGEAL HÆMORRHAGE

Meningeal hæmorrhage, whether epidural or subdural, is more likely to occur (and much more difficult to detect) in the severe injuries than in the mild. A chronic subdural hæmatoma may develop after the mildest injury, especially in aged persons. In such cases there may be an interval of weeks during which recovery may appear complete. The condition is an extremely rare one, but the complete prognosis after any head injury, especially in old people, would include a note of this possibility.

### Ultimate Prognosis

#### DURATION OF SYMPTOMS

Symptoms of the kind already referred to under the aftermath of severe injuries may, as we have seen, be absent even after prolonged traumatic stupor; they may occur without disturbance of consciousness. As a rule, however, their severity and duration are directly related to the duration of unconsciousness. Of the common symptoms giddiness is usually the earliest to disappear; defective memory and changes in disposition are slow to improve, as also are symptoms of the neurasthenic group. Of all symptoms the liability to traumatic headache—intermittent, localised, and often severe—

is the most persistent, and is more likely than the others to be permanent. The duration of all these symptoms depends a good deal upon the efficacy of treatment in the earlier stages. Recovery is quicker among those whose means enable them to obtain a quiet and smoothly graduated convalescence.

The age of the patient also is an important factor. Over the age of 45 the process of recovery is slower. W. Ritchie Russell's paper on this subject (*Edin. Med. Jour.*, 1934, xli., 129) is an important source of information. Taking a series of 200 patients admitted to hospital with loss of consciousness—a group therefore from which a great many of the milder cases of head injury are excluded—he found 40 per cent. free from symptoms at the end of two months. The percentage of those recovered in each age-group showed little variation, except that of the patients over forty, only 23 per cent. were recovered at this time, and of those over fifty none.

Of the 120 patients whose symptoms persisted longer than two months 66 per cent. still had symptoms at the end of eighteen months. Many of the symptoms, however, were slight and did not interfere appreciably even with heavy manual labour.

#### DURATION OF DISABILITY

The main factors which influence prognosis in this respect are, in order of importance, the severity of the injury as measured by the duration of unconsciousness, the age of the patient, the question of compensation, and the nature of his occupation. These may conveniently be considered in the reverse order.

*Nature of Occupation.*—Headache is the most persistent of the common symptoms and, being aggravated by physical effort, is likely to remain a source of disability to the manual worker after other symptoms have disappeared.

*Compensation.*—Anxiety over unsettled compensation, or a sense of injustice after settlement, are important causes of prolonged disability. The latter may result in some degree of permanent invalidism. Of Russell's 200 patients, 139 were working men or women. Among these 30 per cent. of the compensation cases reported unfit for full work eighteen months after the accident, whereas the figure for the non-compensation cases was only 9 per cent. In the non-compensation group 83 per cent. of the patients had returned to full work within six months of the accident.

*Age.*—After middle age risk of permanent incapacity in some degree is considerable, especially in the case of manual workers. In the group of non-compensation cases just mentioned, of the patients who were over fifty years of age, 45 per cent. remained unfit for full work at the end of eighteen months. The prognosis in the case of sedentary workers is certainly better than these figures would suggest.

*Duration of Unconsciousness.*—There is a direct relationship between this and the duration of disability, which is best seen when the factors of age and compensation are excluded. The following estimates are based mainly upon Russell's figures. In persons under the age of forty, if no compensation question is present, when the injury is one which does not involve more than a few minutes loss of consciousness, disability lasting more than a few days is uncommon. After a period of unconsciousness up to one hour, nineteen persons out of twenty will be back at full work within two months. If stupor persists longer than 24 hours the chances are against the patient being fit for work within two months, but eight out of ten patients will be able to return to full work within six months of the injury.

Such are the considerations which afford a guide to the *likely* duration of disability. Actually in the individual case the question can only be settled by trial and observation. In non-compensation cases if a manual labourer has not returned to full work at the end of six months it is on the whole unlikely that he will ever do so.

#### TRAUMATIC EPILEPSY

As a late complication of closed injuries epilepsy is uncommon but important. Its rate of incidence is

difficult to compute, but the risk appears to be greatest in cases which show in the early stages signs of focal injury, prolonged traumatic stupor, or fracture of the vault; and in the later stages, persistent headache and mental changes of the organic type. The interval between the injury and the first attack is commonly about a year, but may be much longer.

C. P. SYMONDS, D.M., F.R.C.P.,  
Physician for Nervous Diseases, Guy's Hospital  
Physician to Out-patients, National  
Hospital, Queen-square.

## SPECIAL ARTICLES

### TUBERCULOSIS ASSOCIATION

THE provincial meeting of this association was held in Cambridge from April 2nd to 4th. The subject for discussion at the first session was

#### Dispensary Organisation

The opening paper was read by Dr. R. H. HAZEMANN (médecin inspecteur, préfecture de la Seine), who gave a critical review of the dispensary organisation in France, with special reference to his own administrative county. The organisation of the anti-tuberculosis campaign was practically autonomous, and was based on the *Dispensaire d'hygiène sociale et de préservation antituberculeuse*, to which was added a scheme of appropriate institutions for the sick, for those infected, and for healthy contacts, the main effort being directed to the welfare of children. The treatment of sick patients was restricted to private medical practitioners and to institutions. In France the dispensary doctors never visited patients at home, and the only treatment practised at the dispensary was pneumothorax refills. No treatment by ultra-violet light or tuberculin, and no dental or orthopaedic treatment was carried out. The dispensary, except as regarded treatment, was open to all, irrespective of income, with the full consent of the medical syndicates; and all its benefits were obtained free of cost. Of the 60 dispensaries in the Seine, which included Paris with its 2,891,000 inhabitants, 51 belonged to the public health office, 2 to the assistance publique (an official organisation controlling almost all the hospital beds in the Seine), and the remainder to private bodies. Each dispensary dealt with a particular district in which it was legally bound: (a) to detect and diagnose cases of tuberculosis; (b) to detect and deal with contacts; (c) to facilitate institutional treatment of patients; (d) to carry out home prophylaxis, particularly with regard to children. Contacts underwent the same investigation as other patients—physical, X ray, and sputum examinations, and a tuberculin test in children. Child contacts remained registered indefinitely after the death of the patient; adults were discharged after a year's observation if free from disease. Attendance at the dispensaries for examination was encouraged by such "means of persuasion" as education, and the distribution of meat and milk coupons.

Dr. M. R. HEYNSIUS VAN DEN BERG (director, tuberculosis service, Amsterdam), said that the anti-tuberculosis campaign in Holland was carried out by voluntary organisations subsidised by the State, province, or municipality, their activities being under the supervision of the Government inspector of health. The national association undertook general propaganda, the training of visiting

nurses, tuberculosis research, &c. The 11 provincial societies in the country ran the dispensaries in each province. The task of the local societies, of which there were between 800 and 900, was to carry out the prophylactic and social measures prescribed by the tuberculosis officer, while they were also in charge of the expenses for institutional treatment. In the larger cities, indeed, the local societies were specifically tuberculosis institutions with specially trained tuberculosis nurses. There was in Holland no compulsory notification, and at the dispensaries no treatment whatever was given. Refills for artificial pneumothorax must be given at the nearest hospital. In Amsterdam the work was strictly centralised, so that everything the patient needed could be obtained only through the dispensary. Admission to hospitals and sanatoria was, in Amsterdam, arranged by the dispensary, and after discharge the patients were supervised from there. Whenever possible, an infectious patient was hospitalised, which could be done in 80 per cent. of the newly registered open cases. Removal of the children from their homes, as in the *Œuvre Grancher*, was hardly ever resorted to. Infants in contact with open cases were vaccinated with BCG. The death-rate from pulmonary tuberculosis in Amsterdam was 3.4 per 10,000, and from all forms of tuberculosis, 4.34.

Dr. N. TATTERSALL (Leeds) pointed out that dispensary organisation could not be discussed as a separate entity; it was only one part of the complete tuberculosis scheme, and apart from its indispensable complement—institution beds—would be but a feeble weapon. Further, the problem to be tackled varied widely according to the area served. The speaker went on to sketch the organisation of the Leeds dispensary, as being fairly typical of the first group. There was one large central dispensary, fully equipped for diagnostic work and special treatment with X ray, artificial sunlight, orthopaedic and dental facilities; the main city sanatorium was only some three miles away and large general hospitals close at hand. The whole scheme was thus compact and made coöperation easy between dispensary and institutions. All attendances except those of new patients were made by appointment. One day was largely reserved for contact examinations, and two afternoon sessions were devoted to A.P. refills. Two evening sessions weekly were devoted to workers, and Saturday mornings devoted to school-children. Close coöperation with many agencies was an essential part of dispensary work. The home rather than the patient was the unit on which they concentrated, and continuous close touch was maintained with the homes of all patients. The most important of the many "lines of communication" was with the general practitioners, and coöperation with school medical officers was also valuable. Although the mortality statistics were encouraging

and even flattering, the real test of antituberculosis organisation would be the establishment of morbidity statistics.

At the next session Dr. RUSSELL J. REYNOLDS, after describing his cineradiographic apparatus for recording the functioning of active organs, showed two films, the first reel dealing with general thoracic work—chiefly cardiac conditions—and the second with the movements of the lungs and diaphragm in various stages of pulmonary disease and under different conditions, such as collapse, after phrenicectomy, with pleural effusion, after lipiodol injections, &c. The films were followed with the greatest interest, the value of this method of permanent record being fully appreciated.

On April 3rd the meetings were held jointly with the International After-Care Committee of the *Union internationale contre la tuberculose*. At the first session a paper by Sir PENDRILL VARLIER-JONES (Papworth) was read, in his absence through indisposition, in which he reiterated his belief that treatment and after-care must be regarded as one and indivisible. He deprecated the deep-seated idea that while clinical treatment was important and worthy of State support, after-care was an unimportant frill which might with propriety be left to private or public charity. If this viewpoint were changed, local authorities and other public bodies would be as willing to contribute towards the permanent settlement of their cases as they were to provide for their treatment. We might then get some idea of the real potentialities of village settlements which at present could only be estimated. So long as after-care remained the Cinderella of the tuberculosis schemes of the nations, just so long would there be a tuberculosis problem.

#### Capacity for Work in Pulmonary Tuberculosis

Dr. MAURICE DAVIDSON (London), opening a discussion, reminded his audience that the word "work" applied to all forms of expenditure of energy, and he went on to stress the importance of various forms of mental and emotional energy in relation to pulmonary tuberculosis. In estimating the capacity for work of a tuberculous person he thought that too little emphasis was laid on the significance of purely nervous katabolic energy, apart from that of physical exertion. In regard to the incidence of active disease of the "young adult" type in females, the factor of psychological energy, which played no small part in the life of young women to-day, was one which ought to be taken very much into account, as all experienced tuberculosis officers would agree. Their conception of the meaning of work in this connexion was often too one-sided, and these broader principles should underlie their advice to patients in regard to a choice of future occupations. Dr Davidson laid great emphasis on the importance of frequent radiological examinations as a guide to the behaviour of tuberculous lesions in the lung, pointing out the value of this (sometimes the only) evidence of the extension of disease.

Dr. L. B. STOTT (Papworth) said that tuberculosis could be an acute disease, and, like any other acute general infection, have a pneumonic stage in which the patient would obviously be incapacitated. On the other hand, the patient with a healed primary focus in the lung was of undisturbed working capacity; though during the establishment of the focus he might have been completely incapacitated or working in spite of toxæmia. In the life history of every case

of tuberculosis there were doubtless periods during focal reactions when the capacity for work stood at nil; and in any estimation of how far a tuberculous patient was limited in output during the intervals between exacerbations, the decision as to capacity for work must be made in complete ignorance of the future. The physical signs held a significance as to present capacity alone. Estimations of the capacity had to be made (a) on anatomical indications, including location and extent of the tuberculous lesion; and (b) on physiological capacity, or response to effort. For practical purposes, the examination of the urine—especially ratio of free acid to combined acid—was one of the most useful physiological guides. Another important point was the effect of tuberculosis upon the physiological efficiency of the ductless glands. Perhaps, however, the most important factor in the assessment of the capacity for work was a consideration of the psychological state. The object of all treatment was to restore the working capacity, and there could be no doubt that purposeful routine had its reaction on every organ.

#### After-care

Prof. Dr. VON WEIZSÆCKER (Heidelberg) said that the after-care movement seemed to him to be the result of a conception of medicine which affected not only the tuberculosis question, but the whole field of therapy; it appeared to be the outcome of a system of social medicine and the recognition of the social diseases. The inquiry was now not only: "What does the patient need?" but "How does the patient live?" They wanted to know not only which remedies would relieve his symptoms, but also how society should behave towards the sick man. Social therapy ordained not only that the sick man or ex-patient should live, but that he should live as an ordinary human being. In many cases there was a gap between hospital and employment which neither practitioner nor dispensary physician could fill. An example of this was in a case of concussion. Returning home after discharge from hospital the patient would be still unable to make a complete recovery, because he was still unfit for normal employment. He would almost inevitably drift into a state of worry and boredom, and his health would deteriorate rapidly. This they called in Germany the "secondary disease." It used to be treated in a neurological clinic as a neurosis, but although the predisposing factor was psychological, psychotherapy was not the most suitable treatment, since the patients in most cases were not constitutional psychopaths or neurotics, their secondary symptoms having developed under a sense of insecurity and futility, coupled with fatigue of the will-power. This factor of interruption of the placid stream of social existence was now recognised as the origin of the secondary symptoms. It could largely be obviated by gradually giving the stimulus of work at a much earlier point—e.g., in the case of concussion, before the patient had left the hospital. In regard to social insurance as a means of obviating this so-called secondary disease, Dr. Weizsæcker made three suggestions: (1) The system of special insurance rates for special injuries, and especially for accidents, had great disadvantages from the medical point of view. National health would benefit by a comprehensive scheme of insurance; (2) it was also a disadvantage when a system of insurance was based upon the quantitative assessment of injury. Benefits should rather be assessed according to financial needs, or, better still, by the provision of suitable

employment rather than purely financial assistance; (3) the legal administration of insurance was not as good as the practical organisation of after-care, national health, and supply of work. The ideal was re-education and re-adaptation to work.

Dr. E. BACHMANN, Secretary, International After-Care Committee, said that it was essential that when treatment, training, and colonisation were carried out in different localities and under different organisation, the whole should operate as a single unit under medical control. They must not forget that they were dealing with tuberculous patients in whom at any time reactivation and relapse might occur. For this reason experiments in after-care were to be deprecated which were independent of sanatoria, antituberculosis organisations, and dispensaries. It must always be borne in mind that the essential element of the whole structure was the sanatorium or similar institution, with which the other departments were indissolubly united. Sanatorium training centre and settlement might together form a single unit, or they might be situated in different areas, each under its own medical superintendent, but in every case close coöperation was indispensable. A training centre independent of a sanatorium must perforce provide its own clinical and therapeutic wards for the treatment of patients who prove unfit for work. In many places this coöperation was absent, although it was the basic principle of the successful solution of the whole problem. Dr. Bachmann then went on to describe in detail the scheme which had been adopted by the Anti-Tuberculosis League in Switzerland for the Canton of Zurich. This experiment differed from that of the principal Dutch institutions, in that the training was separate and under a different board of control from that of the sanatorium. In spite of this division, close contact between the two had to be maintained in view of the constant necessary interchange of patients fit for training and those who, owing to relapse or unsuitability, must return to the sanatorium. Although this coöperation was continually being increased, the training centre had found it desirable to establish a small therapeutic unit for those inmates who could presumably begin to work fairly soon, and for those in whom the arrest of disease had been temporarily interrupted by employment. In any case, when sanatorium and training centre were not in the same area, instruction regarding the aim and object of training should be given at the sanatorium; otherwise the patient would immediately get the idea that he might just as well go home and seek employment under more or less sheltered conditions.

This paper was followed by a long discussion. Dr. N. BARDSWELL commented on the difficulty of deciding whether or when a patient would be fit for work. He found himself instinctively depending on first impressions. One might be occasionally misguided by the appearance of a patient straight from a sanatorium who might look better than he was; but he had learnt to discount this. He judged also largely by the character of the primary lesions, and by the response the patient had made to treatment. He attached also great importance to negative sputum reports over a period of six months. The question of A.P. complicated the issue, by disguising the condition; but any patient whose disease was arrested, whether by rest or by mechanical means, should in his opinion be allowed to return to work. The factor of age was of importance, also that of the nature of the work.

In the afternoon excursions were arranged to Papworth and to the Strangways Research Laboratory at Cherry Hinton. At Papworth other papers on schemes for after-care were read by Dr. BRONKHORST (Holland) and Dr. PATTISON (Potts Memorial Hospital, New York).

### Chronic Miliary Tuberculosis

On April 4th Prof. L. SAYÉ (Barcelona), reading a paper on this subject, said that the clinical study of this condition led to the following classification: (1) chronic miliary tuberculosis of primary infection; and (2) chronic miliary tuberculosis of reinfection—(a) chronic generalised tuberculosis, (b) chronic *granulie*, (c) localised forms of hæmatogenous origin, and (d) non-apparent forms. In (1) the clinical onset was usually unrecognised or insidious, or associated with the symptoms of primary infection, showing high pyrexia and signs of broncho-pneumonia. In the generalised form death usually took place from meningitis. The recent work on primary infection, which had shown the frequency with which this syndrome is found in adolescents and young adults, had extended the clinical scope of the primary infection type of chronic miliary tuberculosis. Further clinical study was needed to define its limits and characteristics at these age limits. With regard to (2) the speaker examining radiologically 1176 students at Barcelona University had discovered in them all four varieties. The second variety, showing disseminated discrete nodules, were found in 5.6 per cent., and they were being followed up in order to ascertain whether these lesions played a pathogenic rôle in the development of phthisis, or whether they should be considered merely as relatively recent remains of primary infection. Of the students with unsuspected lesions or with lesions associated with very slight symptoms, more than one-third showed lesions of the hæmatogenous type. In the first type, chronic generalised tuberculosis, the pulmonary involvement which the morbid anatomists nearly always found in the patients, did not give rise to clinical signs until in the advanced stage. In other cases extrapulmonary and pulmonary symptoms appeared at the same time, but the latter remained most obvious in most of the patients. Radiography of the lungs showed a chronic miliary picture. Further work might lead to the recognition of a hæmatogenous basis in certain unilateral lesions, and the systematic examination of the lungs in cases of chronic generalised tuberculosis should assist in their study.

The remainder of the session was taken up by the presentation of cases for diagnosis by Drs. S. VERE PEARSON and G. T. HEBERT and Mr. H. P. NELSON.

### X RAY DEVELOPMENT ON THE CONTINENT

IN the course of an address to the medical section at British Industries House Mr. C. Morgan Davies, of the engineering department of King's College Hospital, gave some account of radiological development in northern Europe, based on a recent visit to 20 hospitals and clinics in Belgium, Germany, and Holland, and some factories specialising in hospital X ray apparatus. Dr. Graham Hodgson presided. Mr. Davies was impressed, he said, by the rapid developments in electro-technics in hospital work. Short-wave generators for electrical treatment, high-

frequency spark cutters for operative purposes, numerous diagnostic aids, the X ray kymograph, cine-radiography, the tomograph, and many other devices are in some cases in regular use. The German hospitals also employ a larger number of radiographers and other medical auxiliaries than we do in this country and train them for a longer period.

The tendency, noticeable in this country, to separate X ray diagnosis and therapy appears to be absent in Germany and Holland, where the services are under one director. In the newer hospitals it is customary to provide greater privacy for the patient by the installation of one or, at most, two pieces of apparatus in a room or cubicle. One important difference between British and continental diagnostic lay-out is in the machine control. On the continent the switch-table controlling the generator is always a fixture, being installed in a control cabin with observation windows of lead glass and dark blinds, so that the operator may observe in three separate rooms, of which one may be in darkness for screening. Continental workers express surprise at our less scrupulous precautions to guard against stray radiation. In hospitals the generators themselves are housed in separate rooms, it may be on the level of the operating rooms, above or below them, controlled by switchgear housed in the cabins. The all-metal cabinet, a standard production of the factories, is however used in private installations and the smaller clinics. The examination rooms contain nothing other than the diagnostic apparatus, the tubes, and shock-proof cables. All installations visited were completely shock-proof; bare high-tension systems are rarely seen. The first shock-proof cable, installed at Heidelberg in 1928, is still in use and giving no trouble. There are several methods of connecting the transforming units to the X ray tubes; some of these indicate the confidence placed by the makers in their cables. In one installation in Hamburg the transformers are connected to junction boxes by means of paper-insulated lead-covered cables buried in the plaster of the walls; some of these cables carry 200 kilovolts. In another installation in Berlin the transformers are in the basement, the high-tension distribution gear in a loft above the operating rooms, the connexions being made by lead-covered conductors which run in cavities in the walls. Metal-covered wall ducts are common and the cable runs may be very long, sometimes 20 metres or more per pole. The three-phase unit is not found inferior to the single-phase in the production of contrasting radiograms. The rotating anode tube is firmly established; there are at least 700 installed in Germany. In the diagnostic installations there are refinements for chest and stomach work. All the controls for screening, radiography, diaphragms, different coloured room lights, &c., are grouped to the left of the screen, handy for the operator. Foot switches are rarely seen. This equipment, observed through periods of intensive activity, appeared to meet every requirement with a minimum of trouble or effort. It combines minimum weight with great strength. Apparatus known as the tomograph and the introscope, for producing pictures of sections or layers of the human body, are in routine use at Berlin, Bonn, Heidelberg, and Rohrbach.

Activity in X ray therapy is apparent everywhere. Here again the tendency is to limit the number of treatment couches to one per room. At the Louvain hospital the installation consists of eight tubes, four working at 200 kv. and four at 400 kv., the latter energised from cascade condenser units with gas-filled valves. Although these tubes are not shock-

proof as generally understood, it is impossible for a patient to come into contact with high-tension conductors while undergoing treatment. One room housing two tubes has been designed for an ultimate tension of a million volts, with 5 cm. of lead incorporated in the walls. The "cannons" installed some years ago in the Holfelder clinic at Frankfurt are all in daily use and giving satisfaction. It is well known that Germany has comparatively small supplies of radium, which probably accounts for the development of short-distance X ray therapy equipment seen in many hospitals and developed by Prof. Chaoul of Berlin. This therapy, which has much in common with radium treatment, consists of the application of a high dose carefully localised. The radiation is generated in a special tube having one electrode earthed, the anode in the case of the Chaoul tube, the cathode in the case of the tube used by Van der Plaats at Eindhoven. The apparatus is simple and comparatively inexpensive; it will permit, it is stated, of a far greater number of treatments than is possible with radium, having regard to the quantities available and the ease of application.

In thanking Mr. Davies for his lecture, which was followed by an interesting discussion, Dr. Graham Hodgson endorsed his plea for closer collaboration between the radiologist, the physicist, and the engineer, and he observed that the allocation of diagnostic and therapy work to two members of the staff in voluntary hospitals was probably due to the fact that one man is unable to give voluntarily the time necessary for the two departments.

## MEDICINE AND THE LAW

### Irish Free State Law against Contraceptives

THE sale of contraceptives, or the advertisement or importation of them for sale, became a statutory offence in the Irish Free State last year. What seems to have been the first prosecution under the new law is reported from Waterford. A firm of pharmaceutical chemists was summoned for having imported, or attempted to import, a quantity of quinine pessaries. An official of the Free State customs, during the usual examination of imported goods, found these commodities and communicated by telephone with the defendant firm to whom they were consigned. According to the prosecution, a representative of the firm admitted that the goods were contraceptives and, when warned that they were liable to confiscation, answered that the customs authorities could keep them. The goods were then sent to Dublin to be destroyed. The definition of contraceptives in the Free State statute is "any appliance, instrument, drug, preparation or thing designed, prepared or intended to prevent pregnancy resulting from sexual intercourse between human beings." A customs official seems to have been asked whether the telephone conversation did not include a statement that the commodities could have been used for dogs or cattle. A medical witness who described the nature and properties of quinine is reported to have said that, in the course of his experience and training, he had never heard of quinine pessaries being advocated or suggested for use in any obstetrical or gynaecological condition. A managing director of the defendants, producing the firm's ledgers, read therefrom four instances in which medical officers had prescribed these pessaries; he contended that the prescriptions did not contemplate

their use as contraceptives. The prosecution conceded that the firm was well managed and of high repute. The district justice, observing that it was a difficult section of the Act, dismissed the summons under the Probation of Offenders Act.

The Irish Free State Act of last year under which this prosecution was launched contains, apart from Section 17, several fresh provisions against immorality. There are sections for the suppression of brothels and of prostitution, and there are various amendments of the Criminal Law Amendment Act, 1885, which is still the basis of the law of offences against women and girls in the Free State.

### Murder Conviction Quashed on Fresh Medical Evidence

Last week in *R. v. Harding* the Court of Criminal Appeal did two unusual things; it allowed an appeal against a conviction for murder and it permitted fresh evidence to be called on appeal. Mrs. Harding, aged 31, was the mother of four children; the youngest was a baby six months old. The case for the Crown at the trial was that she deliberately threw her child into the canal. Her own story was that she had been sitting on a seat, nursing her baby, when she felt faint and giddy; that she rose and walked a little way and fainted on the bank; and that, when she came to, she saw the baby in the water. No one else was present who could say what happened. There was some other evidence which told against Mrs. Harding—for instance, her subsequent conduct after she knew the child was in the water; but the main point in the case was the rapidity and the degree of the immersion. A medical witness, called for the prosecution, described the results of the post-mortem examination of the child. No medical witness was called by the defence. On appeal, Mrs. Harding's counsel obtained leave to call another medical witness. This was Dr. J. C. M. Matheson, medical officer and governor of Holloway Prison. He had been present in his official capacity during the trial. He now told the court that the post-mortem condition described was compatible with death from shock due to water suddenly entering the baby's nostrils. He considered that such a shock might have resulted if the baby fell from its mother's arms and rolled down the bank into the water. Counsel submitted that, if this evidence had been tendered at the trial, it might well have inspired the jury with a reasonable doubt of Mrs. Harding's guilt. The Court of Criminal Appeal accepted this contention. The judges could not say that, if this evidence had been tendered at the trial, the summing-up might not have been different and the jury might not have come to a different conclusion. The conviction was therefore quashed.

Two points may be worth a final word. First, the Lord Chief Justice, in delivering the judgment of the appellate court, was careful to observe that the circumstances were quite exceptional and unprecedented and were never likely to be repeated. In other words, the Court of Criminal Appeal is guarding itself against the risk of being asked to reopen every case on appeal by the tendering of fresh evidence. The proceedings on appeal are not a rehearing. The appellate tribunal has been conspicuously reluctant to hear fresh witnesses—particularly perhaps medical witnesses where the defence is insanity. Secondly, it seems strange that the evidence offered on behalf of Mrs. Harding on appeal was not offered at the original trial. The explanation is that she was defended under the Poor Prisoners' Defence

Act. She had therefore, apparently, inadequate facilities for obtaining the help of medical evidence to rebut the medical evidence adduced by the Crown. There have, however, surely been cases where the accused, having been granted legal aid at the public expense, has had the advantage of being able to call expert witnesses in support of the defence. It would shock the public conscience if it were true that the defence of poor persons is not properly equipped.

### Claim for Damages for Food Poisoning

In *Mence v. Thierry* a visitor unsuccessfully sued a hotel for damages for alleged negligence and breach of warranty in respect of food served at luncheon. He said he stayed at the hotel on a golfing holiday last September and was given a croquet of salmon and turbot served in a scallop shell with cheese sauce; he complained that it was unfit for human consumption and that he suffered from gastro-enteritis as a result of eating it. He said he was violently sick in the afternoon and two days later, being still ill, he returned home on medical advice; he had been unable to attend regularly to his business till January. Doctors called by the plaintiff could give the court no other explanation of his illness except the eating of the fish. On the other hand, it was contended that the browning of the sauce at grilling heat would kill any germs. There was also evidence that 85 portions of this dish were served and that the plaintiff made the only complaint. Mr. Justice Porter said he accepted the fact that the plaintiff expressed dissatisfaction with the taste of the fish at the time, but it was not established that the eating of the fish caused the illness. The poison was toxic and not bacterial; though the salmon and turbot were mixed and served to a number of people, nobody else was affected; the course of the plaintiff's illness did not seem to be such as would be attributable to toxic poisoning. It would, said the judge, be too speculative to find in favour of the plaintiff; the case had not been made out, and there must be judgment with costs for the defendant hotel.

## AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

### INTRAVENOUS OLIVE OIL EMULSION THERAPY

CONSIDERABLE interest has been taken recently in Australia in the claims made for the intravenous injection of olive oil in the treatment of septicæmia, pneumonia, and certain toxic conditions. A report has appeared<sup>1</sup> of a case diagnosed as septicæmia, the infection following removal of tonsils and adenoids. The only treatment given was a three-hourly intravenous injection of olive oil, followed by a daily maintenance dose. Within seven hours there was a remarkable improvement in the temperature, which dropped 4° F. and returned to normal next day, after which recovery was rapid and uneventful. Good results are reported in other cases. This method of treatment has resulted from the work of V. G. Walsh and A. C. Fraser.<sup>2</sup> The experimental basis is that when lethal doses of various toxins are mixed with olive oil and injected into animals, death does not take place, and that similar absorption of the toxin takes place when the

<sup>1</sup> Med. Jour. Australia, 1935, I., 661.

<sup>2</sup> Jour. of Physiol., 1933, lxxviii., 467; and Brit. Med. Jour., 1934, I., 424.



olive oil is introduced into the blood of patients with toxin circulating in their blood. Walsh invented an ingenious machine for emulsifying the oil so that the droplets should be sufficiently small to pass the capillaries without fear of embolism.

In criticisms of the method it has been objected that the experiment on which it is based is unsound, and that the recoveries claimed for the oil are capable of other explanations and may be due, for example, to the crisis in pneumonia, the bursting of abscesses internally, or to therapeutic measures such as curettage employed at the same time as the injections. Cerebral embolism, hæmaturia, and death are said to have occasionally followed the introduction of oil and the analogy of another oil—sodium morrhuate—as an occasional cause of embolism has been quoted. It is known that solutions of various chemical substances in olive oil—e.g., local anæsthetics—are absorbed extremely slowly when injected into the subcutaneous tissues of the body, and this is the basis of the use of A.B.A. and similar solutions. We know little, if anything, of the absorption of oily solutions introduced intravenously, and the hypothesis that the oil introduced into the blood stream will attract and absorb circulating toxin is entirely unsupported by any evidence. It has even been suggested that any therapeutic effects of olive oil might be just as well expected if it were given by mouth instead of intravenously. Further, the claim that it is of value in pneumonia and septicæmia must surely imply that its action is not only one of absorption of toxin but also directly bactericidal. Many who have seen the oil used therapeutically are far from convinced. It is thought that sufficient patients have been treated for a proper record of a consecutive series to have been published instead of reports of occasional and seemingly miraculous cases. The crucial experiment on which the treatment should rest is surely the giving of a lethal dose of toxin, followed by an intravenous injection of the emulsion. It is more or less generally felt that the method should be much further investigated experimentally before being used therapeutically in man.

#### MOTOR ACCIDENTS

The problem of the prevention of motor accidents is disturbing the Governments of both New South Wales and Victoria. In the former, figures for January and February, 1936, show an increase of 43.9 and 51.9 per cent. on the corresponding months of last year and 1934 respectively, allowance having been made for the number of cars. Taxi-cabs have been involved in more accidents than their numbers warrant. As in England, there is some difference of opinion about the responsibility of high speeds for accidents and there is considerable opposition to the introduction of low speed limits. The latest investigations have been directed to the responsibility of new cars for accidents. The percentage figures of these were 15.4 of the total registrations and were involved in 21.9 of the accidents during last December and January; new lorries and vans (19.0) were concerned in 29.2 and new motor-cycles (9.4) in 22.6. Many suggestions are being made for drastic amendment of the present traffic laws, including provision for compulsory third-party insurance.

#### MATERNAL AND INFANT WELFARE

Dr. R. Marshall Allan, professor of obstetrics in the University of Melbourne, in the course of the

annual Ann Mackenzie oration, criticised the Federal Government's decisions for the expenditure of money subscribed for infant and maternal welfare. It was more a spectacular gesture, he said, than one likely to lead to any permanent improvement. The public has been confused by statements concerning the maternal mortality-rate in different countries and he thought that inaccurate comparisons of Australia with other countries are being made, which tend to make the public believe that Australia is much worse off than is the case. The present system of compiling statistics in different countries affords an opportunity to the propagandist to alarm the public. Much good has come from antenatal clinics, which should be placed under medical supervision, and baby health centres are of considerable value.

## PARIS

(FROM OUR OWN CORRESPONDENT)

#### PRECAUTIONS AGAINST INFECTION AT AUTOPSIES

A SERIES of post-mortem room infections has led Dr. L. Mourier, administrative head of the Assistance Publique in Paris, to issue a rather strongly worded circular to the directors of the public hospitals here. He pointed out that some laxity has crept into the conduct of post-mortem examinations, which according to the regulations should be strictly supervised by the heads of hospital services. It seems that hospital externs have of late been in the habit of conducting them not always under the eyes of their teachers. This practice has its *raison d'être*; what is more simple and convenient for a busy hospital physician or surgeon than to let externs carry out by themselves the more or less mechanical preliminary stages of a necropsy, and only when all the organs have been isolated to visit the post-mortem room and inspect them with his interns and others? Dr. Mourier's injunction to the heads of hospital services to spend more of their valuable time in the supervision of autopsies has not been taken in good part, and it has even been suggested that his circular was inspired by a craving to play to the gallery occupied by representatives of ratepayers disinclined to pay for the cost of accidents. It is certainly true that in his circular Dr. Mourier washed his hands of all pecuniary responsibility for such infections, insisting that the infected extern or his hospital chief must in person pay the piper. The storm of protest against the circular has successfully blown it back into Dr. Mourier's office where it has been interred. Another edict, drafted in a more chastened spirit, has now replaced the first. Henceforth post-mortem examinations are still to be conducted by externs and interns, but there is to be a certain tightening up of the formalities in the hope that carelessness conducive to post-mortem room infections will be checked.

#### EXPLOITATION OF THE PUBLIC HOSPITALS BY THE RICH

With every increase in the comfort provided by the French public hospitals there is a corresponding increase in the number of well-to-do patients anxious to enjoy it. This may seem natural enough to the public in general and particularly to those patients who, like your John Gilpin, have a frugal mind; but it sticks in the gullets of the private practitioners who

lose these patients and of the hospital doctors who inherit them and have to treat them for nothing. An echo of these sentiments is to be found in an appeal issued by Dr. Georges Audain to all whom it may concern to add to the dossier he is building up about well-to-do patients who have crept into beds needed by the poor. This appeal is addressed not only to general practitioners and hospital doctors, but also to hospital interns and externs. Indeed, it is for these prospective doctors that Dr. Audain's activities should, in his opinion, prove most beneficial, for they may well find on starting medical practice in a few years' time that this tendency has grown into a habit so widespread that they may find no private patients awaiting them. Specially selected for the black list are the well-to-do provincials who come to Paris to fill the one-bed wards of the general hospitals. It seems a pity that anyone and everyone should be roped in to spy on the proceedings, however nefarious, of supposedly well-to-do patients enjoying the hospitality of beds in public hospitals. Wealth and poverty are such relative conceptions that a callow medical student can hardly be expected to pose as a judge and denunciator in so delicate a matter; and it is to be hoped that the hospital authorities themselves will deal with it and not leave it to any budding Sherlock Holmes.

#### BACK TO THE LARGE-WARD HOSPITAL

Dr. Raphaël Massart, who is on the editorial staff of *Concours Médical*, has contributed an essay to that journal on the virtues of the large 30-bed ward and the vices of the hospital partitioned off into a lot of small wards. He admits that the evolution from the large to the small ward has for some time been a tendency common to hospital architects as a class. In the provinces as well as in Paris the large wards are falling into disrepute to the disadvantage, according to Dr. Massart, of all concerned, the patient included. In the modern small-ward hospital, doctors, nurses, and medical students play a continuous game of hide-and-seek. All cannot be in the same small ward together, and there is an incessant scuttle from one ward to another, with opening and shutting of doors, shouting, and other evidence of distraction. How can thoracentesis or lumbar puncture be demonstrated to a class when all concerned are packed like herrings in a barrel? In the small ward, supervision of the patient is hampered and he is tempted to indulge in forbidden conspiracies with those who visit him. Left to himself, he becomes bored and does not enjoy those minor services which patients in a large ward render each other with more promptness and camaraderie than overworked nurses. It is so much easier to ask your convalescent neighbour in the bed next you to pass you the urinal than to lie helpless and fuming in a single-bed ward ringing and waiting and waiting and waiting. Yet another fault inherent in the one-bed ward is the temptation it offers to the well-to-do patient who does not deserve it. What has hitherto kept him out of the public hospitals has been his dread of the many-bed ward—whose attractions seem somehow or other to have escaped his notice.

**GRANTS TO LEEDS HOSPITALS.**—Grants totalling £57,660 have been made to Leeds hospitals by the Leeds and district workpeople's hospital fund. The grants include an award of £40,000 to the General Infirmary. The income of the fund increased last year by over £8000, owing to an increase in the workshops of the city.

## BRITISH CONGRESS OF OBSTETRICS AND GYNÆCOLOGY

THE tenth meeting of this congress held at Belfast on April 1st to 3rd, Prof. R. J. JOHNSTONE presiding, was mainly devoted to discussions on the

### RESULTS OF CONSERVATIVE TREATMENT in its various aspects. At the first morning session Prof. JAMES HENDRY spoke on Conservative Treatment of The Ovaries

He said that ovariectomy was the pioneer abdominal operation, representing the triumph of surgical technique over physiological principles. The practice of ovariectomy depended on an ill-founded belief in the ovary as the cause of pelvic pain; whereas conservative treatment was based on the recognition of the ovary as an endocrine gland with many functions: fertility, menstruation, and balanced endocrine function, the loss of which constituted the pathological menopause. Experimental work on ovarian grafts had demonstrated the superiority of ovaries in situ over all grafts, which were liable to degenerative changes and in any case functioned only for a limited period. All who had used grafts agreed that a graft cannot compare with a normal ovary. Conservation of fertility required an intact uterus and persisting ovulation, with access to the uterine cavity, but a relatively small amount of ovarian tissue was necessary. Prof. Hendry referred to the case in which Sir Halliday Croom had removed both ovaries and implanted an ovary from another woman; four years later the patient had a normal confinement. Conservation of menstruation required a menstruating surface and an adequate amount of ovarian tissue. Menstruation could be re-established by ovarian grafting. The duration of efficiency of ovarian grafts was from two to three years. Conservation of endocrine balance was difficult to assess; "flushings" were the most reliable sign. The disturbance caused by the spontaneous menopause varied in different individuals. In the absence of the uterus an ovarian transplant had no value and in the conservation of endocrine balance only a limited value. The subjective symptoms of continued ovarian function were too uncertain to be of much value; the three important physical signs were (1) high glycogen content in vaginal mucous membrane, (2) homogeneous grade A flora in vagina, and (3) continued acidity of vaginal secretion (pH 4.0 to 4.6). The dangers of conservative treatment of the ovaries were: degenerative changes in retained ovarian tissue, malignant changes, and changes in ovarian grafts. Prof. Hendry suggested as possible conclusions: (1) Ovarian tissue should be saved in situ wherever possible. In one of his cases a large ovarian dermoid was removed on one side and a smaller dermoid resected on the other, leaving a little ovarian tissue; pregnancy followed five months later. (2) Conservative treatment of pelvic inflammatory lesions was advantageous; late operation, if it became necessary, allowed better scope for preserving ovarian tissue in its natural relationships. (3) Where a functional part of the uterus was saved and healthy ovarian tissue could not be retained in its natural relationships, ovarian grafts might be used to conserve either fertility or menstrual function. (4) In the absence of a uterus the conservation of ovarian tissue was not essential; in these cases the administration of standardised ovarian hormones was

of more permanent use than retained or grafted ovarian tissue.

### The Fallopian Tubes

Dr. BETHEL SOLOMONS said that for acute salpingitis palliative treatment was the method of choice. The arguments had been effectively discussed at a previous congress, and therefore need not be further considered. In the investigation of chronic salpingitis it must be remembered that lipiodol was not altogether safe. Five deaths and 13 infections had been reported in 2000 cases, and the danger was increased if the injection was followed by immediate operation. The inflation test might give a false impression of blockage, if fibroids and retroversion were present, unless an X ray examination was made. Operative treatment designed to produce fertility yielded success only in 10 per cent. of cases and this should be explained to the patient and to her husband, who should, moreover, be tested for fertility before the wife is treated surgically. From the answers to the questionnaire sent out it had emerged that Dr. Rubin operates more and more on *all* parts of tubes with good results. Operation was much more likely to result in patency than in pregnancy; but pregnancies had followed all types of operation, including the resection of the uterine end and implantation.

### The Uterus

Prof. A. LEYLAND ROBINSON described the functions of the uterus under the headings (1) reproductive, (2) menstrual, (3) sexual, (4) metabolic, (5) mechanical, (6) sociological, and discussed the principles underlying the application of conservative measures. Among the simple expectant methods of conserving the pregnant and the non-pregnant uterus, the practice of antenatal work, he said, took pride of place. Antenatal period began during the *intra-uterine* life of the individual. Unfortunately the success of this antenatal work had given rise to a new type of obstetrician who emphasised the necessity for the practice of conservative methods during pregnancy, but regarded labour more as a surgical procedure than a natural process, and Cæsarean section as the only means of dealing with any complication arising during the act of birth. The increasing popularity of the lower segment technique had, however, set up a current in favour of conservatism by demonstrating that it was safe and indeed advantageous to give the natural powers fair trial before resorting to surgical methods of delivery. Postnatal care was still far behind antenatal work; the development of many morbid conditions and much dysfunction could be avoided by the application of the appropriate method at the proper time. In gynæcology expectant methods were employed with fair success for acute uterine infection, but their application to subacute and chronic conditions was much less satisfactory. In severe cases of inflammatory disease the best results could still only be obtained by the employment of radical methods. In the treatment of certain types of innocent uterine tumours, expectant methods might be employed with safety and success, but in malignant neoplasms conservative treatment had but a small part to play. Perhaps the practice of better postnatal care, such as the careful immediate repair of cervical injuries inflicted during labour, would reduce the present incidence of carcinoma of the cervix. Those clinics where all torn cervixes were repaired reported a lower incidence of carcinoma.

Conservatism in surgery had been encouraged by the success of simple surgical measures for innocent

tumours, for example, myomectomy for fibroids. The most recent figures, published by Fahndrich, suggested that the risk entailed by the conservation of the cervix in subtotal hysterectomy for malignant disease of the body of the uterus had been exaggerated. The additional immediate risk of a total hysterectomy over a subtotal one must be taken into consideration when the decision between the two operations was taken. The conservation of uterine function had been encouraged still further by the modern conception of the significance of uterine displacements. It was now realised that active interference was rarely required for simple types of backward displacement. Surgical methods had also been displaced by the introduction of other forms of treatment such as radium, X rays, and hormone therapy; since irradiation was not entirely a conservative method of treatment it was to be hoped that in the future hormone therapy might replace X rays and render surgery obsolete. Much of our best treatment was still necessarily empirical. Dr. Robinson then indicated briefly the problems awaiting solution in connexion with the four topics chosen for special investigation which were to be the subject of communications by other members of the congress: myomectomy, radium for intra-uterine bleeding, the treatment of endocervicitis, and the scope of hormone therapy for functional hæmorrhage.

Mr. A. A. GEMMELL gave a report on

### Myomectomy

based on a study of the literature, the replies to a questionnaire sent all over the world, and the case records of a group of Liverpool gynæcologists. Abdominal myomectomy only was considered, as vaginal myomectomy so often meant nothing more than the removal of a fibroid polyp. The advantages were that the operation involved no physiological changes, but this was no compensation if it entailed greater risks than did hysterectomy. The decision between the operations could not be taken until the abdomen was opened. The contra-indications were malignant change or degeneration; Victor Bonney and Leith Murray held that red degeneration and hyaline change were not contra-indications. The incidence of sarcoma occurring in a fibroid varied in different reports from 0.24 to 2.3 per cent. The lowest percentage given was 0.09. The main principles to be observed in carrying out the operation were asepsis, hæmostasis, peritonisation, and the closure of cavities. Mr. Gemmell himself did not practise lipiodol radiology. The mortality of myomectomy was about 2 per cent., the chief cause of death being sepsis. Normal menstruation continued in over 80 per cent. of the cases. Bright Banister had reported six myomectomies for sterility followed by pregnancy.

The objections which had been brought up against the operation were (1) an alleged high morbidity, not supported by the literature; (2) the danger of rupture of scar in subsequent pregnancies—no such accident had occurred in the Liverpool series though 11 cases were recorded in the literature; and (3) the possibility of recurrence. The average recurrence rate was about 4 per cent., and it must be remembered that fibroids might recur in a cervical stump. In making the decision the age of the patient must be considered, and also the thoroughness with which seedlings would be removed. Most cases recurred within five years or not at all. Of operations undertaken during pregnancy 81 per cent. were followed by living children. The danger of abortion was least in operations done at about the fifth month. During labour the mortality of the operation was

15.4 per cent., so that it was safer at this period to do hysterectomy.

### Discussion

Dr. GEORGE GRAY WARD (New York) said he was in accord with what previous speakers had said except for slight differences in detail. Conservation of ovarian tissue was now his rule. He agreed that the life of grafts was limited, but thought it worth while to insert them even if their activity lasted only a few years. He described a case in which he had removed two ovarian cysts the size of grape-fruits in a young recently married woman; he had shelled out the cysts and made two tiny rudimentary ovaries. The patient subsequently bore a healthy child. As to the Fallopian tubes, Frank Simpson, of Pittsburgh, produced an epoch-making contribution to gynæcology when in 1909 he advocated delayed operation in acute tubal inflammation. The operative mortality in acute stages was 20 per cent., and in the delayed operation only 1 per cent. An operation delayed until symptoms had completely subsided and temperature had been normal for three weeks was the accepted practice in America to-day. General surgeons still tended to say: "Hot appendix, hot tube; out it comes." Dr. Gray Ward described a case operated on for sterility and adhesions four years after an acute salpingitis, a hydrosalpinx being removed on one side and salpingostomy being performed on the other. Pregnancy followed five months later. He also described and showed illustrations of an operation for temporary sterilisation, and reported a case of pregnancy following a second operation to reopen tubes.

Dr. O'DONEL BROWNE (Dublin) said that the results of his operations for restoring the patency of the Fallopian tubes had hitherto been disappointing, and that patients should be warned not to expect too much. He described a case where he had done an end-to-end anastomosis of one tube and found the condition of the other hopeless. The patient subsequently became pregnant and was delivered by Cæsarean section, when it was seen that the anastomosis had failed and the "hopeless" tube had recovered. He described some interesting operations on rabbits' tubes, of which the results were not yet ready for publication.

Mr. EARDLEY HOLLAND, speaking on the conservation of ovarian tissue, said that nearly everyone was careless of the need to leave some ovarian tissue behind. Dermoids and epöphoric cysts should always be shelled out, and this was worth while even if only a few ovarian follicles were left. Mr. Holland had operated on two patients with bilateral dermoids, both of whom had since had children. In bilateral endometrial cysts it was always possible to leave a little ovarian tissue, and in four such cases the women had since had children. He had never succeeded in leaving ovarian tissue in pseudo-mucinous cysts, and doubted whether it would be right to try. Otherwise it was worth while running the risk of a further operation. Speaking of tubal conservation, he said that the fimbriated end was not necessary for the occurrence of pregnancy; if, therefore, the middle of the tube was stenosed, it was only necessary to excise this portion or simply to snip it apart. Anastomosis was unnecessary.

Prof. E. FARQUHAR MURRAY, speaking on the conservative treatment of ovaries, reminded the congress that even in very young women ovarian cysts might prove to be malignant. As to tubes he recommended the injection of lipiodol before operating on a tubo-ovarian mass, otherwise it might be impossible to

estimate the degree of patency. The lipiodol might also prove to be curative. He thought that the high mortality of myomectomy combined with Cæsarean section was accounted for by the fact that many of the cases for which these procedures were performed together were cases of obstructed labour.

Prof. J. YOUNG doubted whether it was often possible to be conservative in cases of endometrioma. He thought the risk of panhysterectomy was so much greater than that of subtotal hysterectomy that the former procedure should not be advocated in a teaching school. He agreed that cervical infections were among the commonest gynæcological conditions and applauded Dr. Herd's reference to the cervix as the "pelvic tonsil." Faulty drainage made cervical lesions very unlikely to heal spontaneously, and one of the most essential points in their treatment was full dilatation of the cervix. He agreed with Dr. Gray Ward that cauterisation should be superficial and not deep, and said that it was important to puncture all follicles in addition. Many cervical lesions caused referred pain in the iliac fossa. This could be stirred up by touching the cervix and often disappeared when the cervical tension was relieved. Other reflex symptoms might be bladder irritation and pain in the renal area due to irritation of the pelvic sympathetic fibres.

Prof. D. DOUGAL said that he was brought up in a radical atmosphere where if the uterus was removed, the ovaries were removed too. He had since become a left wing or centre conservative, and did not even agree that the ovaries should be removed at the menopause, for this made subsequent adjustment more difficult. He agreed with Dr. Young that in endometrioma there was only occasionally scope for conservative measures, and thought it possible that retained ovarian influence might keep the growth active. With regard to myomectomy, he thought it was no satisfaction to a patient to have an operation and not be cured of her symptoms. He did not consider panhysterectomy more dangerous than subtotal, and the former had the advantage of an opening into the vagina for drainage.

Prof. MILES PHILLIPS said he was an ardent supporter of panhysterectomy but did the subtotal operation in selected cases. He stressed the value of an historical survey as a means of preventing dangerous swings of the pendulum. He had no experience of ovarian grafting, but had had very good results from leaving scraps of ovary in situ. He had regretted having left it in cases of true endometrioma. He believed that if the uterus had to be removed, the patient was better without the ovaries and quoted his case of a girl of 18 where the uterus and ovaries were removed for sarcoma botryoides; ten years later the patient was living happily married with no sign of lack of ovarian function. The worst cases of lacerated cervix were best treated by the Sturmdorff amputation, which did not lead to delay in labour. Carcinoma of cervix was the only type of carcinoma which was on the decrease, and this was due to more frequent amputations.

Prof. R. M. WINDEYER (Sydney) said he was interested to hear that red degeneration of fibroids was rare in England. It was very rare also in his experience. He was glad that the meeting favoured conservation. He had removed a fibroid from the lower part of the uterus in a patient five months' pregnant, and though the membranes were practically exposed he had oversewn the area, and the patient subsequently had a normal delivery.

At the first afternoon session, Prof. FLETCHER SHAW presiding, Dr. S. B. HERD read a communication on the

### Conservative Treatment of Endocervicitis

He said that for the purpose of this paper endocervicitis had been taken to include all pathological conditions of the cervix, with the exception of acute gonorrhoeal, tuberculous, and syphilitic infections, and all neoplastic conditions. Conservative treatment could be defined as the employment of those measures likely to produce best results with the least possible interference with the normal genital functions. Dr. Herd then discussed the advantages and disadvantages of conservative measures, taking cognisance of the following factors: relief of symptoms, effect on possible pregnancy, prevention of malignancy, and subsequent development of stenosis.

The analysis of successful therapeutic measures was difficult because the condition was often complicated by something else—for example, prolapse. Of the various methods of treatment antiseptics (mercurochrome douches, and so forth) had their place. The results of curetting the cervix were unsatisfactory. Ultra-violet light was useful if combined with diathermy. Caustics might do good, but might lead to stenosis. Thermo- or electro-cauterisation with preliminary dilatation of the cervix to ensure good drainage was favoured by some. Diathermy coagulation in the opinion of many authorities had replaced almost all other methods unless the lacerations were very deep. Trachelorrhaphy was best done soon after parturition. The questionnaire issued on the subject had given rise to very varied replies. For deep lacerations most of those who answered preferred amputation, usually Sturmdorff's. In Liverpool the majority of cases of torn infected cervix were treated by Sturmdorff's amputation. Coagulation diathermy, cauterisation, and Sturmdorff's operation all increased fertility. There was slightly more danger of abortion after amputation, also of delays in the first stage of labour. In a series of 7000 cases of amputation of cervix no cancer had developed. Hæmorrhage and infection were more likely to follow deep cauterisation than any

other treatment. In Dr. Herd's view it was necessary to use different methods for different cases.

Dr. GRAY WARD agreed on the importance of varying the type of treatment to suit the case, and laid stress on the difference between cauterisation, which was a burn, and might be followed by stenosis and electrocoagulation which caused no tissue charring. In his postnatal clinic 50 per cent. of cases were found to have cervical erosions. If lacerations and erosions were still present after eight weeks they were treated by diathermy as ambulatory cases. There were only two failures in 120 cases and no stenosis followed.

In the absence of Dr. DE SA through illness, his communication on Conservative Therapeutics in Gynæcology was not delivered, and instead Dr. JAMES HEYMAN (Stockholm) discussed a subject not on the official programmes, namely

### Grouping of Cases of Cancer of Cervix

He said that uniformity in estimating results was only possible if these were based on an absolute as opposed to a relative cure rate, but that many clinics could not state their absolute cure rate because they dealt only with selected cases. The relative cure rate was much less accurate, but when it was employed, similar groups of cases should be compared. He reminded the members of the now classical definitions of the four stages of carcinoma of cervix, but deplored the fact that different clinicians were not agreed on the stage to which a given case should be assigned, particularly as between stages 2 and 3. He then showed about 20 beautifully prepared schematic drawings of cases in all four stages and invited the members of the congress to indicate on sheets of paper prepared for the purpose the stages to which they would assign the different cases. He felt it necessary to add that no prize would be awarded for the best achievement. Later, when Dr. Heyman thanked his "collaborators" for their assistance in relegating the cases to their appropriate groups, it became clear that he had by no means overstated difference of opinion that might well vitiate statistics. (To be continued)

## PANEL AND CONTRACT PRACTICE

### Sickness and Unemployment Benefits

THE *National Insurance Gazette* is concerned over the different levels of benefit for the same trouble. The *Gazette* points out that when recommending the reduction of unemployment insurance contributions by 1d. per week for each party the Statutory Committee indicated that social insurance should be looked at as a whole. This recalls the position which existed in 1911 when unemployment insurance constituted Part II. of the first National Insurance Act. The provision for unemployment is already on a higher scale than that for sickness; in many cases it approaches the level of wages and may even surpass wages. There are dangers in having the benefit rates for unemployment and for sickness at widely differing levels, as there are also dangers in making the compensation for loss of wages in any particular case equal to, or greater than, wages. In the committee's opinion any increase of unemployment benefit rates in general should now be made only after full consideration by Parliament, as an act of deliberate social policy, and not simply because a decline in unemployment has produced a surplus in the Unemployment Fund. In a pamphlet entitled

"Merseyside; the Relief of the Poor" Prof. Caradog Jones suggests that the lower rate of benefit paid to the sick man, as compared with the unemployed man, results in the unemployed man when sick being transferred from the unemployment insurance fund to the rates—the sick man calls on public assistance to make up his sickness or disablement benefit to something comparable with unemployment benefit.

The sick man needs no less money than when he is well; his recovery is assisted by adequate nourishment, and the knowledge that his dependants are not suffering. Whether the money from insurance funds should be supplemented by the ratepayer or by the State is not for us to decide, but the wide divergence in the benefit rates for unemployment and for sickness is illogical. Admittedly there is a closer hold, through the employment exchanges, on the recipient of unemployment benefit than on his ailing brother, in the mind of whose insurance doctor there may be conflict whether or not to certify him as incapable of work. When work is plentiful there is little incentive for the insured person to prolong his disability, particularly if sickness pay falls far short of what can be earned at work, but there is also the danger of a premature return. The *Gazette*

would like a Royal Commission to consider the whole question and make recommendations for coördination, possibly also with a view to laying down a minimum weekly sum for workmen's compensation benefit. There are tiresome anomalies—for instance the black-coated worker often has his sickness benefit made up to his normal salary, at any rate for a time, by his employer, but the artisan is seldom so lucky; increase in the statutory rate of sickness benefit would benefit the employers in the first class but not in the second. Our system of social insurance has grown up piecemeal and there are many who think that such an examination of it is overdue.

#### Notification of Tuberculosis in London

In the county of London for the four years 1931 to 1934 some 12 per cent. of pulmonary and 40 per cent. of non-pulmonary cases of tuberculosis were not notified before death. Many others were only notified at a very late stage of the disease or even when death was impending. In view of the fact that all forms of tuberculosis were made compulsorily notifiable as long ago as 1912, it is rather disturbing to find that so many cases still evade the supervision of the local public health department. The London

medical benefit subcommittee has been considering how an earlier notification of cases might be secured. The omission may in part be explained by the fact that under Article 5 of the Public Health (Tuberculosis) Regulations, 1930, a medical practitioner is not required to notify a case if he has reasonable grounds for believing that the case has in fact already been notified in the district. The doctor may be wilfully misled by the patient who does not wish to be visited and advised from the dispensary. Tuberculous patients may fear to be told they are suffering from the disease and refrain on this account from placing themselves under the care of a doctor until the disease is far advanced. The committee felt helpless to persuade patients to apply earlier to their doctors. But as the outcome of its inquiry it has issued a letter to each doctor on the list containing a reminder that under Clause 9 (13) of the terms of service an insurance practitioner is required to prepare and send (on Form G.P. 17) to the tuberculosis officer a report on each patient whom he finds to be suffering from tuberculosis as soon as he makes the discovery. Medical officers of health of London boroughs are being informed of the action taken by the committee in the hope that non-insurance practitioners may be led to coöperate.

## PUBLIC HEALTH

### The New Clean Milk Policy

THE new designations for milk in commerce did not come into force on the first of this month as expected. The operation of the new order has been postponed until June 1st and the Minister of Health has not yet announced his decision about the designations themselves. It seems clear that sufficient time has not elapsed for those concerned to appreciate all the points made by Prof. G. S. Wilson and his colleagues in a critical study of the bacteriological grading of milk which appeared in January and was then summarised in our columns (Jan. 25th, p. 217). The new grades of milk, as set out in the draft order, are to be graded partly on the number of bacteria they contain—a maximum of 30,000 and 100,000 per c.cm. for the two grades of pasteurised milk; 200,000 for the two grades of fresh milk. But after the end of the present year the bacteriological test for fresh milk will be replaced by the methylene-blue reduction test, and about the working of this test there has evidently been some misconception. Prof. Wilson's committee found the methylene-blue test fulfilled most of the requirements demanded of a test for the routine grading of raw milk, but they expressed doubt whether the test was suitable for the examination of freshly pasteurised milk. Mrs. Foot, a "Certified" milk producer of Berkhamsted, added a teaspoonful of cow manure to some one-pint samples of her high-grade milk, sent the mixture to a bacteriologist, and was assured by him that the milk easily passed the standard laid down for the new tuberculin-tested grade. She was, it seems, unaware that in the new order the Minister has definitely lowered the standard of cleanliness. There is no longer any grade of milk corresponding to the present top grade known as Certified which is what Mrs. Foot herself produces; but apart from this the experiment itself was not very wisely conceived. Although manure contains a fairly large number of organisms, many of them are dead and it is well known that gross particulate matter can be added to milk without greatly affecting the plate count. The addition of manure to Certified milk produces only a small absolute increase in the

plate count and generally lowers the reduction time by about one hour—the reduction time still being longer than that laid down for the new tuberculin-tested grade. This is abusing the test because it does not condemn a milk of a higher standard of cleanliness than the one for which the test was proposed. If the Ministry had wished to retain the present Certified standard and had laid down a reduction time of (say) 7½ and 8½ hours, in summer and winter respectively, then Mrs. Foot's manure-contaminated milk would have been condemned. It seems worth while to make it clear that Mrs. Foot's experiment was not designed to prove what it was intended to prove. The methylene-blue reduction test, like many other tests in applied chemistry, is only valid within certain limits within which it is intended to be used, and the standards laid down refer only to milk that has been kept at atmospheric temperature for the prescribed time. Crude extraneous matter can be detected much more easily by simple sediment tests than by any bacterial test, and the bacterial tests that are in use are not designed to detect matter of this type. Even the coliform test is not of any real value for the purpose; though it is true that the addition of manure to milk will probably be reflected in the occurrence of coliform bacilli, the reverse does not hold true. Should such bacilli be found in milk it is not justifiable to conclude that the milk is contaminated with excremental material. There are many other sources of coliform bacilli on a farm. Moreover it is quite possible for manure-contaminated milk to pass both the plate-count and the coliform tests at present laid down for Certified milk.

The real conclusion is that the methylene-blue reduction test seems satisfactory for grading milk on a basis of bacterial cleanliness, provided the reduction time is adjusted to the particular grade of milk which the test is designed to control. The plate-count and the methylene-blue tests give closely related results, and there seems no reason to doubt that the grading of milk will be any less satisfactory when performed by the reduction test than when performed by the plate count. There are indeed several grounds for believing the contrary.



## CORRESPONDENCE

VITAMIN B<sub>1</sub> BY INJECTION IN THE  
TREATMENT OF NERVOUS DISEASES

To the Editor of THE LANCET

SIR,—A propos of your annotation on Dr. Ritchie Russell's work on the parenteral administration of vitamin B<sub>1</sub> (March 28th, p. 727) brief details of a case of polyneuritis which I have recently been treating with a similar preparation may be of interest. In this case the product used was prepared by Glaxo Laboratories over two years ago and contains 100 international units of vitamin B<sub>1</sub> per 5 c.cm.

The patient, a woman of 24, developed a rapidly spreading polyneuritis of unknown origin, with widespread sensory loss and weakness especially of the left arm and leg. On March 13th last she could not lift her left arm or leg off the bed nor turn herself over; even to raise her head was an effort and there was marked wasting of some of the arm muscles, particularly the intrinsic muscles of the hand. Injections were given on March 13th, 19th, 23rd, and 27th. On March 15th—i.e., two days after the first injection—she could keep her hand raised above her head, on March 19th she turned herself over in bed, and on March 25th she stood up out of bed (without permission). She can now walk tolerably well, has full, though weak, movements of her hands, and the wasting of the muscles is already much less. The sensory loss has been much slower in returning, though the last four days have shown considerable improvement. The wasting of the muscles seems to show definitely that this is not a case of neurosis, as one might otherwise suspect.

For the past five years I have been using a solution of vitamins A and D for parenteral administration, also made by Glaxo Laboratories, and have written a paper on the highly interesting results which will, I hope, shortly be published. It is however worth recording that when summarising my preliminary results in my M.D. thesis three years ago I made the same observation which Dr. Russell has made in connexion with vitamin B<sub>1</sub>—namely, that the parenteral injection seems to give a quick response apart from any demonstrable vitamin deficiency. But while he suggests that this might be used to diagnose vitamin deficiency I suggested that it might be used to investigate the action of vitamins by studying the effects of a rapidly induced excess rather than a slowly induced deficiency. Both suggestions are, I believe, of value.

As not long ago I wrote a letter in the *British Medical Journal* championing the cause of the foreign chemical firms, I hope I may here say, without offence or chauvinism, that when our own firms are able and willing, even anxious, to provide these experimental products, it seems a pity that Dr. Russell should have gone to a continental firm for his supplies, even though it be to one of the supreme excellence of Hoffmann-La Roche. Compliance with British ethical standards and government regulations puts a heavy handicap on our pharmaceutical manufacturers which is not always realised, and if they lack deliberate support from pioneers in treatment they are more heavily handicapped still.

I am, Sir, yours faithfully,

Winsford, Cheshire, April 3rd.

W. N. LEAK.

## SARDINES UNFIT FOR HUMAN FOOD

To the Editor of THE LANCET

SIR,—Under the above heading, on p. 800 of your last issue, you say "A recent prosecution at the Mansion House disclosed some discreditable dealings in sardines unfit for human food. For some reason, which puzzled the presiding alderman, a consignment found unsatisfactory when examined at the London Docks last July was not condemned and destroyed forthwith at the time but was allowed to be sent back to the Portuguese packers." These words might be taken to suggest that the officers of the Port of London Sanitary Authority were at least a party to the "discreditable dealings." Officials of the public services are not expected to defend themselves in the press, and I have therefore allowed the observations of the magistrate as reported in the *Times* of March 27th to pass without comment, but I feel that I am justified in taking exception to your report of the case.

For some time past the Port of London Sanitary Authority has, quietly and without appeal to a magistrate's court, been dealing with the problem of the contamination of sardines with lead and great improvement has been effected. It was neither necessary nor desirable to ruin the sardine industry and the English importers by suddenly insisting on a change in old-established methods of preparation and packing. The object was simply to reduce to a minimum the amount of lead unwittingly ingested by the inhabitants of this country. Consignments found on chemical analysis to contain more than a few parts per million of lead have been stopped in the port and, for the reasons stated, have been returned to the packer on receipt of a guarantee that they would not be returned to any port in this country.

The consignment in question was, on its arrival in the Port of London in July, observed to contain a number of tins which had been blown and resoldered. Samples on analysis were found to contain 36 parts of lead per million. It was therefore obvious that no part of the consignment could be passed for human consumption in this country and the question arose whether it was reasonable to put the importer to the expense of sorting it, seeing that even any tins which appeared sound on external examination would not be allowed to be sold in this country because of the lead content. Out of consideration for the importer, whose honesty there was then no known reason to doubt, it was decided to permit him to return the whole of the consignment to the packer on receipt of a guarantee from the packer that the goods would not be returned to any port in the United Kingdom. This guarantee was in due course received from Lisbon through the importer and in early September the goods were checked outward from this port.

It is easy to be wise after the event, but at the time there was no reason to suspect that the course pursued was other than efficient so far as the protection of the public health of this country is concerned and fair and just to the English importer. I was present in the court at the time of the prosecution but was given no opportunity to tender any explanation of the line of action which puzzled the magistrate.

I am, Sir, yours faithfully,

CHAS. F. WHITE,

April 3rd.

Medical Officer of Health, Port of London.

## MICTURITION AND THE PROSTATE

To the Editor of THE LANCET

SIR,—Recent articles in your columns by Dr. Paul Niehans and others regarding the treatment of the enlarged prostate remind us of a leading article in THE LANCET of 1930, ii., 805, on Lord Moynihan's Toronto address. In discussing this address you suggested that "the difficulty in making progress (in natural knowledge) lies not in finding answers to questions but in framing the questions." It seems to us that the time has come to ask "How much and in exactly what manner does the enlarged prostate interfere with micturition?" If the work of Niehans and others is accepted it becomes obvious that current theories of the physiology of micturition in general and of the pathological physiology of the prostate in particular are inadequate. It is, we think, generally admitted by physiologists that there are lacunæ in our knowledge of the physiology of micturition, but it is our impression that surgeons have been too complacently satisfied as to the manner in which "prostatism" interferes with micturition.

Our results in a small series of cases fully bear out Dr. Niehans's claims. Our earlier technique was less simple than that of the Steinach II. ligature and we have abandoned it in favour of Niehans's simpler method. But it is a humiliating and mortifying fact that we were encouraged to try the method because we had examined post-operatively patients operated upon by a surgeon in this country whose methods of attracting patients to himself are not those sanctioned by the profession. We are not acquainted with the surgeon referred to but we understand that since 1917 he has performed his operation over 8000 times and it is common knowledge that he is operating upon an average of ten patients per day at the present time. Here, if you please, is a mass experiment!

We were at a complete loss for even a partial scientific explanation of the good results prior to the publication of Niehans's article in your columns. The results seemed to be too uniformly successful to be explained upon the basis of the well-known remissions and exacerbations of "prostatism." Further, in none of our cases has the prostate appeared to decrease in size though micturition is free and the residual urine diminished or even abolished. In your annotation (Feb. 22nd, p. 439) you comment on Dr. W. E. Lower's results as follows: "Unfortunately the improvement was almost entirely symptomatic, for the size of the prostate . . . had as a rule not altered." The reply to this comment is the question: "What kills the patient: simple enlargement of the prostate or lack of complete urinary excretion?" Results now being reported indicate the possibility of the two being divorced.

We are, Sir, yours faithfully,

FRANK RIGGALL,

Prairie Grove, Arkansas, March 25th. CECIL RIGGALL.

## GLUCOSE-SALINE IN TOXIC DIPHTHERIA

To the Editor of THE LANCET

SIR,—I have been so impressed by the success of glucose-saline administration in a case of almost hopeless diphtheria that I would like to hear of its trial in our larger fever hospitals. A child of 6 was admitted to my care from a home where two children had already died after a few hours' illness. Although a large dose of diphtheria antitoxin separated the membrane within 36 hours, serious symptoms

rapidly developed. Vomiting persisted to such an extent that the child's systolic pressure fell to 80, and in spite of rectal glucose-saline she became so dehydrated as to appear moribund. At this stage an intravenous saline with 2 per cent. glucose was tried with success which led to complete recovery.

If I had to deal with many such cases I would institute continuous intravenous drip as a routine, giving 2 per cent. glucose-saline by the apparatus suggested by Farquharson, and using the internal saphenous vein near the ankle so as to control the apparatus at the foot of the bed. The piercing of the rubber tubing by the serum needle would provide ready access for antitoxin in whatever dose or doses it is thought desirable. Atropine, strychnine, adrenaline, or other drugs could be readily administered by the nurse through the same channel; and the continuous drip of 20 to 30 drops of the solution per minute could be continued until all danger of toxæmia had passed.

I am, Sir, yours faithfully,

GILBERT BURNET,

Medical Superintendent, Isolation Hospital,  
Hemel Hempstead.

April 4th.

\* \* \* The value of glucose in toxic diphtheria is recognised by two at least of the medical superintendents of London fever hospitals. Last year in our own columns Dr. N. D. Begg wrote (1935, i., 484): "Antitoxin intravenously and intramuscularly, and dextrose intravenously and by mouth, are accepted as the basis of treatment in diphtheria"; and Dr. E. H. R. Harries wrote (1935, i., 1341): "In the toxic case prognosis, immediate and remote, is definitely improved by the exhibition, in addition to antitoxin, of glucose at first intravenously, and then, for the next ten days at least by mouth."—Ed. L.

## INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 28TH, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2260; diphtheria, 1171; enteric fever, 13; pneumonia (primary or influenzal), 1286; puerperal fever, 46; puerperal pyrexia, 115; cerebrospinal fever, 35; acute poliomyelitis, 5; acute polio-encephalitis, 1; encephalitis lethargica, 7; dysentery, 41; ophthalmia neonatorum, 90. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 3rd was 6843, which included: Scarlet fever, 984; diphtheria, 1070; measles, 3302; whooping-cough, 693; puerperal fever, 16 mothers (plus 10 babies); encephalitis lethargica, 282; poliomyelitis, 5. At St. Margaret's Hospital there were 25 babies (plus 10 mothers) with ophthalmia neonatorum.

*Deaths.*—In 121 great towns, including London, there was no death from small-pox, 1 (1) from enteric fever, 104 (38) from measles, 7 (1) from scarlet fever, 32 (7) from whooping-cough, 35 (6) from diphtheria, 57 (17) from diarrhoea and enteritis under two years, and 79 (12) from influenza. The figures in parentheses are those for London itself.

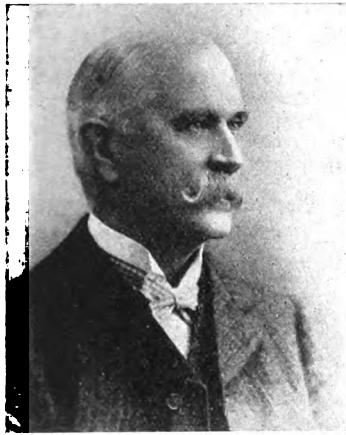
The mortality from measles is now falling, the figures for the last eight weeks (working backwards) being 104, 114, 105, 84, 88, 78, 58, 34 for the country as a whole, and 38, 62, 58, 47, 38, 18, 14, 13 for Greater London. Liverpool reported 9 deaths, Leeds 6, Acton, Croydon, Dagenham, Gateshead, Manchester, York, and Birmingham each 3; no other great town more than 2. Liverpool and Birmingham each reported 4 deaths from whooping-cough, no other great town more than 2. Deaths from diphtheria were reported from 22 great towns, 3 each from Luton and Birmingham.

The number of stillbirths notified during the week was 288 (corresponding to a rate of 45 per 1000 total births), including 43 in London.

## OBITUARY

**DAVID MACKAY CASSIDY, M.D., D.Sc.,  
F.R.C.P. Edin.**

Dr. David Cassidy, who died at Salisbury on April 3rd in his ninetieth year, was son of Lieut.-Col. T. Cassidy of the Army Pay Department, and the eldest of three brothers, all of whom entered the medical profession. During his boyhood his father was stationed in Canada, and David began his medical studies at McGill College, Montreal, of which university he was at the time of his death the oldest



[Photograph by Wynspear Herbert

DR. CASSIDY

graduate. It was a great disappointment to him that ill-health prevented him from travelling to Montreal in 1925 in order to accept the honorary degree of LL.D. which the University of McGill then offered to confer upon him. After graduating in Canada he went to Edinburgh University, where he obtained the degrees of M.D., D.Sc. (Public Health), and the F.R.C.P. From the outset of his career he was interested in psychiatry, and soon after leaving Edinburgh he became assistant medical officer at the Inverness county asylum. He was regarded as a young man of exceptional brilliance, as will be manifest from the fact that at the early age of 25 he was appointed deputy medical superintendent under Dr. Wm. Orange at Broadmoor. Five years later, in 1876, he became medical superintendent to the county asylum at Lancaster, one of the largest institutions of its kind in the Kingdom. This important post he held with distinction for a period of no less than 50 years, for, at the earnest request of his committee, he did not retire until the year 1926, at the age of 79. He was a progressive administrator, for he was a pioneer in the introduction of female nurses for male mental cases, and Lancaster was one of the first mental hospitals to be equipped with a pathological laboratory and an X ray installation. In recognition of his work at Lancaster he was created C.B.E. in 1925.

Dr. Cassidy married Miss Helen Angus, who predeceased him. He leaves three daughters and two sons, both of whom are members of the medical profession.

**NORMAN HALIBURTON HUME, M.B. Durh.**

Dr. Norman Hume, who died at Brecon on March 29th, had a distinguished career in the Indian Medical Service before settling in Wales 15 years ago. Born in Newcastle-upon-Tyne, he was educated at the preparatory school there and at Uppingham, returning to Newcastle for his medical course which he completed at the London Hospital, graduating M.B. Durh. in 1904, the same year as his brother (Prof. W. E. Hume) graduated at Cambridge. He joined the I.M.S. two years later, was at first medical

officer of the 2nd Rajput Light Infantry at Secunderabad, and later superintendent of jails. He was employed during the war on the Afghan frontier, being invalided with pneumonia and empyema. Later he was administrator and surgeon at the General Hospital, Calcutta, where he gained much surgical experience. On retiring with the rank of captain in 1921 he joined the late Dr. T. P. Thomas in practice at Brecon, and on his death in 1930 remained in partnership with Dr. D. L. Lees and Dr. David Kyle. His surgical record gained him the appointment of surgeon to the county hospital, where his operation list was frequently comparable to that at any general hospital. His surgical opinion was widely sought in the neighbourhood; he was surgeon to the King Edward VII. Memorial Sanatorium at Pontywal, and recently medical officer to Christ College, Brecon. Dr. Hume was a keen sportsman, using his scanty leisure mostly in fishing.

**MONTAGU DAVID EDER, B.Sc. Lond.,  
M.R.C.S. Eng.**

Dr. Eder, who died in London on March 30th, was a leading figure in the Zionist movement and well known for his researches into analytical therapy. Born in London in 1868, the son of David W. Eder, he was educated in Brussels, took the London B.Sc. in 1891, and then entered St. Bartholomew's Hospital as a medical student, qualifying with the conjoint diploma in 1895. He held for a time appointments in educational and sanitary services, became an active member of the Fabian Society, and being able to travel extensively used his opportunities to make close study of methods of psycho-analysis in use in many foreign centres, pursuing lines of investigation that might lead to the better territorial and political establishment of the Jewish race. For a time he lived in Palmira, Colombia, and was later appointed surgeon to the Bolivian Government. Returning to England he took up analytical therapy as a specialty and was the first secretary of the British Psycho-analytical Society. Becoming physician to the London Clinic for Psycho-analysis, his kindly disposition and outstanding desire to help his patients found full expression in his psychological work. He wrote much in scientific journals, and made useful communications to international congresses of medicine. For a time he was joint editor of *School Hygiene*. He translated Freud on Dreams and Jung on Studies in Word Association.

Dr. FRANK ERNEST GUNTER, who died on April 2nd at Rochester, was born in 1869, educated at Edinburgh University and the Middlesex Hospital, and qualified in 1891, becoming M.D. Edin. in 1923. He joined the R.A.M.C. in 1895, became major in 1907, and was temp. col. while A.D.M.S. of a division in 1916. He became a specialist operating surgeon and in 1917 he was awarded the D.S.O. After his retirement from the Army in 1918 he joined the staff of the Margaret-street Hospital, and became specially interested in the use of tuberculin both in phthisis and in asthma. For some time past he had been chief medical referee to the Sun Life Assurance Company of Canada.

Dr. WILLIAM TURNER, M.V.O., who died in an Edinburgh nursing-home, was for more than 30 years surgeon to the Colonial Hospital at Gibraltar. Born at Keith, Banffshire, in 1856, the son of Dr. Robert Turner,

he graduated M.A. at Aberdeen before studying medicine at Edinburgh, where he took his M.B., C.M. in 1879 and M.D. two years later. After holding resident hospital posts he was for some time assistant in general practice until his appointment at Gibraltar in 1882. There he was also medical officer to the asylum and prison, and chief medical adviser to the Colonial Government. He had also an extensive general and consulting practice in Algeciras. He took the L.M.S. Madrid in 1913. From 1914-19 he was principal medical officer at Milton Hill war hospital, Berks. Dr. Turner was a fellow of the Royal Geographical Society and the author of various articles on conditions at Gibraltar. After his retirement he travelled round the world.

Colonel JOSEPH MACNAUGHTAN CHRISTIE, who died in London on March 31st, had practised for many years at Wanganui, New Zealand. Born in 1871, son of John Christie of Glasgow, he qualified M.B. Glasg. in 1893, M.D. four years later, and F.R.C.S. Edin. in 1898. After serving as surgeon to the Anchor Line he settled in New Zealand, becoming surgeon to the New Plymouth and Wanganui hospitals. On the outbreak of war in 1914 he joined the N.Z. Medical Corps, served in the Hospital Ship *Maheno*, and was appointed consulting surgeon to the Forces. In 1919 he was created C.B.E. (Mil.) and returned to New Zealand as president of the medical appeal board. When all the troops had been repatriated Dr. Christie settled in London, where he maintained his interest in New Zealand affairs. He married Miss V. A. M. Bayley, of New Plymouth, Taranaki, N.Z.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. (reted.) F. G. H. R. Black to rank of Surg. Capt. (reted.).

Surg. Comdrs. R. K. Shaw to *Drake* for R.N.B., and A. L. McDonnell to *Drake* for Devonport Dockyard.

Surg. Lt.-Comdr. (D.) D. Barker and Surg. Lt. F. W. A. Fosbery to *Pembroke* for R.N.B.

Surg. Lt. (D.) A. McD. Watson to *Woolwich*.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. C. C. Ungley and Surg. Lt. H. A. Lockhart transferred from List 2 to List 1 of the Tyne Division.

Surg. Sub-Lts. T. D. R. Aubrey and P. M. Inman promoted to Surg. Lts.

### ROYAL ARMY MEDICAL CORPS

Maj. C. A. Hutchinson retires on ret. pay.

Capt. R. A. M. Humphrey retires receiving a gratuity.

Short Service Commissions: Lt. I. U. Young to be Capt.

### REGULAR ARMY RESERVE OF OFFICERS

Maj. L. C. Hayes ceases to belong to the Res. of Off. on account of ill-health.

### TERRITORIAL ARMY

Capt. Graeme Gibson Talbot (New Zealand Med. Corps) and Lt. D. R. Hood to be Capts.

R. J. Kellar (late Offr. Cadet, Edinburgh Univ. Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Lt.

Capt. A. Pain to be Maj.

W. G. Love (late Offr. Cadet, Edinburgh Univ. Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Lt.

### TERRITORIAL ARMY RESERVE OF OFFICERS

Capt. R. P. Anderson, M.C., relinquishes his commn. and retains his rank.

### ROYAL AIR FORCE

Flight Lt. W. Hall is transferred to the Reserve, Class D.

Flying Offr. C. F. R. Briggs to No. 1 School of Technical Training (Apprentices), Halton.

### INDIAN MEDICAL SERVICE

The promotion to rank of Maj. of the undermentioned officers is confirmed: S. P. Joshi and J. L. Donnelly.

Lt. (on prob.) J. F. A. Forster to be Capt. (on prob.).

Capt. R. L. Raymond is confirmed in his appointment.

Maj. A. L. Robb, Medical Officer at Army H.Q., reverts to the home establishment and vacates his appointment after three months' summer leave.

Indian Medical Department: Lt. (Sen. Asst. Surg.) S. D. Rieley retires.

The notification in the *Gazette* of May 10th, 1935, regarding the appointment of Lts. Harbans L. Khosla, Nisar Mohammad Durrani, Suraj Prakash Wanchoo, Sharad Chandra Misra, and Shri Rameshwar is cancelled (*vide* THE LANCET, May 18th, 1935, p. 1184).

### COLONIAL MEDICAL SERVICE

The following appointments have been made:— Medical Officers: Dr. W. S. Davidson, West Africa; Dr. K. J. Gilchrist, Gibraltar; and Dr. J. O. Poynton, Malaya; Dr. W. R. Logan, Assistant Medical Superintendent, Mental Hospital, Singapore. Dr. W. E. Glover becomes Deputy-Director of Medical Services, Nigeria, and Miss M. Gosden Pathologist, Medical Department, Trinidad.

### DEATHS IN THE SERVICES

Major-General JAMES BARNETT WILSON, who died on April 1st at Broughshane, co. Antrim, was born in 1862, and educated at Queen's College, Belfast, and Edinburgh University, qualifying M.D. in 1883. Entering the R.A.M.C. in 1886 he became colonel in 1915, major-general in 1918, and retired in 1921. He served on the North-West Frontier of India 1897-8 (medal with clasp), in South Africa, 1901-2 (Queen's medal with five clasps), and in the war 1914-18 as asst. director of medical services. He was mentioned in despatches and was created C.M.G. in 1916 and C.B. (Mil.) in 1918. From 1904-1909 he occupied posts in Egypt and from 1912-14 was senior medical officer in Jamaica. He married in 1895 Kathleen Dorothea, daughter of Captain David Aird, R.N., and had two sons, of whom the younger is Capt. D. A. O. Wilson, R.A.M.C.

### BRITISH POSTGRADUATE MEDICAL SCHOOL

An intensive course, intended primarily for practitioners, will be held at this school from May 4th to 16th (10.30 to 4.30 daily). Among those giving lectures and demonstrations will be Prof. F. R. Fraser, Mr. St. J. D. Buxton, Sir Maurice Cassidy, Mr. Zachary Cope, Dr. F. G. Chandler, Sir Thomas Dunhill, Mr. Bright Banister, Dr. E. Mapother, Mr. J. P. Hosford, Prof. Leonard Findlay, Mr. A. J. Watson, Mr. Charles Donald, Dr. R. T. Brain, Dr. Janet Vaughan, Dr. E. H. R. Harries, Prof. James Young, and Dr. D. T. Davies. Sessions will also be held at the Royal London Ophthalmic Hospital, the National Hospital, Queen-square, the Central London Throat, Nose, and Ear Hospital, and the Hospital for Sick Children, Great Ormond-street. Early application for membership of this course is recommended, and further information may be had from the dean of the school, Ducane-road, London, W.12. Similar courses will also be held from June 8th to 20th, July 6th to 18th, Sept. 21st to Oct. 3rd, and Oct. 26th to Nov. 7th.

On Mondays from April 20th to July 6th at 3.30 p.m. lectures on recent advances in gynaecology will be given by the following: Dr. J. M. Robson (female sex endocrinology), Mr. Frank Cook (dysmenorrhœa), Prof. R. W. Johnstone (hormone therapy in gynaecology), Mr. Wilfred Shaw (irregular uterine hæmorrhage), Mr. V. B. Green-Armytage (sterility), Prof. W. Fletcher Shaw (genital prolapse), Mr. Bright Banister (fibromyoma of uterus), Mr. Victor Bonney (carcinoma of uterus), Miss Louisa Martindale (radiation therapy in gynaecology), Prof. Miles Phillips (neoplasms of the ovary), and Mr. L. Carnac Rivett (inflammatory diseases of tubes and ovaries). Applications for this course should reach the dean by April 14th.

On Thursdays from May 7th to June 11th at 2.30 p.m. Sir Henry Gauvain will give six lectures on surgical tuberculosis, and from May 21st to June 25th at 3 p.m. Dr. R. A. Young will lecture on non-tuberculous pulmonary diseases.

## PARLIAMENTARY INTELLIGENCE

### NOTES ON CURRENT TOPICS

#### Public Health Bill

IN the House of Lords on Thursday, April 2nd, Viscount GAGE moved the second reading of the Public Health Bill. He said that it represented a further stage in the task of consolidating and bringing up to date the Statutes for whose administration the Ministry of Health were responsible. The Bill was based on the work of a Departmental Committee appointed in 1929 under the chairmanship of the late Lord Chelmsford. The first result of the labours of that committee was the Local Government Bill passed in 1933. After the death of Lord Chelmsford the committee continued its work under the chairmanship of Lord Addington and proceeded to consider the second part of its task—namely, the law of public health. The possibility of producing a single Bill dealing with the whole of the law on this subject was considered by the committee, but they came to the conclusion that such a Bill would run to the quite unmanageable length of about 1000 clauses and that the balance of advantage lay in the preparation of a series of Bills not exceeding 350 clauses each.

The present Bill represented the first of the series and dealt with provisions of a strictly public health character, relating principally to sanitary matters and to the prevention and treatment of disease. Other and later Bills would deal with such topics as streets, open spaces, markets, and food. In the main the clauses of the Bill were a re-enactment of the great Public Health Act of 1875 and of amending Acts passed in 1878, 1885, 1890, 1907, 1921, and 1925; but in addition a number of Acts such as the Notification of Births Acts of 1907 and 1915, and the Maternity and Child Welfare Act, 1918, which dealt with public health matters but did not technically form part of the public health code, had been re-enacted. The Bill did not deal with London, whose public health administration was founded on separate Statutes, except as regarded a few matters in which the London County Council had asked for the Bill to be applied to their area. The fact that the Bill repealed in whole or in part some 30 to 40 Acts of Parliament and substituted 334 clauses for something like 600 sections on the existing legislation was a measure of the simplification which it achieved.

The Bill, like the Local Government Bill of 1933, combined consolidation with a limited amount of amendment. The opportunity had been taken to clear up a number of points on which the law had been notoriously obscure and unsatisfactory, the chief of these being perhaps the question of the vesting of sewers and the relation between sewers and combined drains. Another important clarification which the Bill sought to effect related to the right of appeal against orders, requirements, and other decisions of local authorities. It was plainly necessary that a Bill of this size and importance should be subjected to a close scrutiny by Parliament and the Government therefore proposed to adopt the course taken with the Local Government Bill of 1933 and to invite the two Houses of Parliament to appoint a Joint Select Committee to undertake a detailed examination of the Clauses. It was hoped that the committee might begin its work shortly after the Easter recess and that it might thus be possible for the Bill to reach the Statute Book in the present session. It was not the aim of the Bill to lay down a perfect public health code, but rather to gather together for the first time in orderly and intelligible shape the whole of the law relating to the matters with which it dealt, and thereby to provide a firm foundation and starting point for any necessary future legislation.

After further debate, the Bill was read a second

time. Viscount GAGE then moved that it be referred to a Joint Committee of both Houses of Parliament, and the motion was agreed to.

#### HOUSE OF COMMONS

WEDNESDAY, APRIL 1ST

#### Use of Margarine in Royal Air Force

Mr. LEACH asked the Under-Secretary of State for Air if he was aware that at least 14 county councils and 24 large municipalities had lately abandoned margarine for butter in their homes, hospitals, and public assistance institutions; that many of them already noted an improvement in the health and happiness of the inmates since tinned milk and margarine were given up; that the dietary practices of the defence forces' authorities were now falling seriously behind those of the local authorities; and if he, in the interests of the Air Force would make this reform in diet.—Sir P. SASSOON replied: The present arrangements in regard to the supply of margarine are under review. No decision has yet been reached.

#### Medical and Psychological Treatment of Offenders

Mr. TURTON asked the Home Secretary whether, with a view to making appropriate provision for the accommodation of such cases, he would issue a circular to magistrates asking them to give an estimate of the number of cases each year that came before them where medical or psychological treatment, as recommended by the departmental committee on persistent offenders, would in their opinion be of value.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: I am afraid it would not be practicable to obtain in the manner suggested estimates which would be of value. The question whether a particular offender is suitable for treatment of the kind indicated is often one of difficulty and may require skilled investigation over a considerable period. It would be impossible to obtain from each of the 1000 courts of summary jurisdiction estimates framed on a common basis or forming a reliable guide to the probable number of offenders for whom some form of medical or psychological treatment would be appropriate.

Mr. TURTON: As it is now nearly four years since the committee reported and made this recommendation, will my hon. friend take into account that fact and the grave dissatisfaction which exists at the delay in carrying it out?

Mr. LLOYD: The Home Secretary has sent a circular to the courts. It may have arrived at different times, but there is no reason to suppose that the courts are not acting on it.

THURSDAY, APRIL 2ND

#### Aliens and Medical Practice in Britain

Mr. CHARLES TAYLOR asked the Home Secretary whether he was aware that certain alien refugees who were permitted to reside in this country for the purpose of obtaining British medical qualifications were taking up appointments in this country; and what steps he proposed to take to stop this practice, in view of the undertakings given by the Home Office.—Mr. G. LLOYD, Under-Secretary, Home Office, replied: Since March of last year refugees who have applied for permission to reside in this country for the purpose of medical study have been informed that permission can only be granted on the clear understanding that after qualifying they will not be allowed to establish themselves in medical practice in the United Kingdom, but will be expected to leave the country; but amongst the refugee doctors who came here before that date there is a limited number to whom it has been thought right on various special grounds to grant permission to practice in this country after they have obtained a British medical qualification and been admitted to the British Medical Register. The number of cases in which such permission has been granted is 148.

Mr. TAYLOR: Could the hon. gentleman say what are these special cases?

Mr. LLOYD: In some cases of eminent medical men having special attainments their colleagues in this country have asked for them to be allowed to practise here.

Mr. WATKINS: Does that reply mean that those who are not regarded as special cases are by the action of the Government forced to go back to Germany and suffer the persecution that is involved?

Mr. LLOYD: No, Sir, not necessarily, but the hon. Member will appreciate the Government have to consider first of all the interests of British subjects.

Mr. DALTON: Would it not be possible to send some of these people to Palestine where their services are badly needed?

Mr. LLOYD: My information is that there is already a surplus of doctors in Palestine.

#### Bristol Prisoner's Defiance of Medical Officer

Mr. BEVAN asked the Home Secretary if he was aware that George Berry, serving a sentence of three years at Horfield prison, Bristol, after being in the punishment cell on bread and water for several days, refused to go out for exercise on the ground that he felt too weak, and that on his refusal two officers assaulted and beat him; whether the complaints made by the prisoner were recorded in the appropriate books on his appeals to the visiting magistrate, the doctor, and inspector or commissioner of prisons; and whether he would make a full inquiry into the case.—Mr. GEOFFREY LLOYD replied: I presume that the hon. Member is referring to an incident which occurred on Jan. 18th when the prisoner in question refused to go to outdoor exercise though the medical officer recommended that he should do so. It is quite untrue that two officers assaulted and beat him. When they ordered him to put his shoes on and to go to exercise he declined to do so, and on their attempting to put on his shoes he at first resisted violently, but eventually desisted and went to exercise at which he was quiet and well behaved. My right hon. friend had before him at the time reports on the matter, and is satisfied that all complaints made by this prisoner have been properly investigated and recorded. A prisoner has the right not only to petition the Secretary of State, but to make representations to the visiting committee which is an independent body of local justices; and this prisoner was interviewed at the time by one of the visiting justices.

#### Radium Supplies

Mr. ROSTRON DUCKWORTH asked the Minister of Health whether his attention had been called to the statement by the Radium Commission that the present condition of radium supplies in the country presented a serious problem; and whether any steps could be taken to increase the supply of this commodity for the benefit of the hospitals.—Sir KINGSLEY WOOD replied: My hon. friend refers, I assume, to the sixth annual report laid before the National Radium Trust by the Radium Commission. I am informed that the Trust have the report now under consideration, but that they are not yet in a position to make a statement as to their proposals.

#### Cost of Patients at Pension Hospitals

Mr. MAXTON asked the Minister of Pensions the cost per head of maintaining patients at the hospitals of the Ministry at Cosham, Hants, and Erskine House, Renfrewshire, respectively; and what were the proportions of that cost due to administrative charges, medical attention, and to food.—Mr. R. S. HUDSON replied: The cost at the Ministry Hospital at Cosham is 8s. per patient per day, but precise analysis of the expenditure cannot be prepared on the lines desired. The Princess Louise Scottish Hospital for Maimed and Limbless Sailors and Soldiers at Erskine House is not maintained by the Ministry and no information is therefore available as to the analysis of cost. The cost to the Ministry of its own patients in this hospital is about 7s. 8d. per head per day.

MONDAY, APRIL 6TH

#### Panel Practitioners and Clerical Assistance

Commander OLIVER LOCKER-LAMPSON asked the Minister of Health if he was aware that doctors with large panel practices were overburdened with the clerical work involved in registering their patients and filling forms, &c.; and whether, as this non-medical work

adversely affected the capacity of doctors to cure, as well as injuring their health, he would take steps to make a small grant to doctors with large panel practices in order to enable them to afford clerical assistance.—Mr. SHAKE-SPEARE replied: My right hon. friend is not aware that insurance doctors are overburdened with the clerical work to which my hon. friend refers. Account was taken of this necessary part of their work when their capitation fee was fixed.

#### Ex-Service Men and Eye Affections

Mr. GROVES asked the Minister of Pensions the number of Service men who were blinded in, or as a consequence of, the Great War.—Mr. R. S. HUDSON replied: The total number of cases of eye affection due to war service which have at any time been pensioned at 100 per cent. is approximately 2500.

## Medical Diary

### SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.  
FRIDAY, April 17th.  
*Clinical.* 5.30 P.M. (Cases at 4.30 P.M.) Cases, already shown, whose subsequent history is instructive.  
*Radiology.* 8.15 P.M. Dr. Peter Kerley: Emphysema. Dr. Maurice Davidson, Dr. J. V. Sparks, and Dr. H. V. Morlock will also speak.
- NORTH-WEST LONDON MEDICAL SOCIETY.  
TUESDAY, April 14th.—8.30 P.M. (Royal Veterinary College and Veterinary Research Laboratories, Great College-street, N.W.). Address by Sir Frederick Hobday.
- LONDON JEWISH HOSPITAL MEDICAL SOCIETY.  
THURSDAY, April 16th.—4 P.M. (B.M.A. House, Tavistock-square, W.C.), Dr. Robert Hutchison: Constitutional Medicine.
- NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.  
WEDNESDAY, April 15th.—9 P.M. (Royal Northern Hospital, Holloway-road, N.), Clinical Meeting.
- LECTURES, ADDRESSES, DEMONSTRATIONS, &c.
- UNIVERSITY OF BIRMINGHAM.  
FRIDAY, April 17th.—3.30 P.M. (Queen's Hospital), Mr. Douglas Marsh: Demonstration of Ear, Throat, and Nose Cases.
- UNIVERSITY OF GLASGOW.  
WEDNESDAY, April 15th.—5 P.M. (Tennent Memorial Building, Church-street), Prof. Brückner: Physiological Optics and their Relation to Clinical Ophthalmology, and Special Clinical Ophthalmological Problems.
- BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.  
WEDNESDAY, April 15th.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).  
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 2.30 P.M., Dr. W. S. C. Copeman: Arthritis. 3 P.M., Dr. Chassar Moir: Operative Obstetrics.  
FRIDAY, 2.15 P.M., Dr. A. A. Davis: gynaecological pathology. 3.30 P.M., Dr. Alan Moncrief: Hygiene of the New-born Child 5 P.M., Sir James Walton: The Surgical Aspects of Dyspepsia.  
Daily, 10 A.M., to 4 P.M., medical clinics, surgical clinics, or operations, obstetric and gynaecological clinics or operations.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.  
SATURDAY, April 18th, and SUNDAY.—All-day course at the City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E. (Open only to members of the Fellowship.)
- GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.  
WEDNESDAY, April 15th.—4.15 P.M. (Western Infirmary), Dr. J. G. Macgregor-Robertson: Venereal Disease in Men.

JOURNÉES MÉDICALES DE PARIS.—The third of the congresses known as Journées Médicales de Paris will be held next year from June 26th to 30th at the time of the International Exhibition under the presidency of Prof. A. Carnot. The object of these meetings is to bring together doctors in civil and military practice, pharmacists, veterinary surgeons, biologists, physicists, and chemists, both French and foreign. The general subject of discussion will be Hormones and Endocrine Therapeutics, and particulars may be obtained from the Service des Journées Médicales, *Revue Médicale Française*, 18 rue de Verneuil, Paris, VII.



## MEDICAL NEWS

**University of Glasgow**

On Mondays, Wednesdays, and Fridays from April 15th to 27th Prof. Brückner, of Basle, will deliver six lectures in the ophthalmic department of the university on physiological optics and their relation to clinical ophthalmology and on special clinical ophthalmological problems. The lectures will begin at 5 P.M.

**University of Aberdeen**

On April 1st the following degrees and diplomas were conferred:—

*M.D.*—\*John Findlay and \*M. McI. Milne.

\*With commendation.

*M.B., Ch.B.*—A. A. N. Bain, L. G. Boyd, J. G. Byth, J. S. Cruickshank, Louis Findlay, Margaret A. Hay, and William Wilson.

*D.P.H.*—Hugh Morrison and M. J. Schultze.

**British College of Obstetricians and Gynaecologists**

A meeting of the council of the College was held in Belfast on April 1st, with Sir Ewen Maclean, the president, in the chair. Mr. Eardley Holland was appointed to represent the College on the committee of the Eugenics Society which is considering population problems, and Dr. Douglas Miller (Edinburgh) was appointed representative at the forthcoming French Congress of Gynaecology.

S. L. Navaratnum and G. A. W. Wicknamasuriya were elected members of the College.

At a special meeting of the council held on April 2nd the following were formally admitted to the fellowship:

Alexander Ernest Chisholm (Dundee), John Francis Cunningham (Dublin), Margaret Fairlie (Dundee), and John Gardner and Robert Aim Lennie (Glasgow).

The following were admitted to the membership:

A. J. S. L. Boyd, R. B. Charlton, Mildred I. Ealing, Stanley Henderson, C. R. MacDonald, J. S. MacVine, T. N. MacGregor, S. D. Meares, Elizabeth M. Moore, T. R. Plunkett (in absentia), A. W. Purdie, Edward Solomons, and W. R. Winterton.

At the annual general meeting which followed Mr. Bright Banister, Prof. Daniel Dougal, Dr. Theodore Haultain, and Mr. Henry Greer were elected to the council as representatives of the fellows, and Mr. G. F. Gibberd and Dr. Douglas Miller as representatives of the members. Sir Ewen Maclean was elected a trustee in place of the late Prof. W. Blair-Bell.

**International Congress of Orthopaedic Surgery**

The third congress of the International Society of Orthopaedic Surgery will be held at Bologna from Sept. 21st to 24th, and in Rome on Sept. 25th, under the presidency of Prof. Putti (Italy). There will be discussions on internal derangements of the knee and on arthrosis in the sequels of infantile paralysis. Mr. H. A. T. Fairbank is vice-president of the congress, and the speakers in the first discussion will include Mr. Harry Platt. The secretary-general is Dr. Delchef of Brussels.

**Fellowship of Medicine and Post-Graduate Medical Association**

The following courses will be given during this month: proctology at St. Mark's Hospital (all day, April 20th to 25th); ophthalmology at the Royal Eye Hospital (afternoons, April 20th to May 1st); medicine, surgery, and gynaecology at the Royal Waterloo Hospital (all day, April 27th to May 9th); psychological medicine at the Maudsley Hospital (afternoons, April 27th to May 30th). In May courses will include: dermatology at St. John's Hospital (afternoons, May 1st to 29th); thoracic surgery at the Brompton Hospital (all day, May 11th to 16th); urology at St. Peter's Hospital (all day, May 18th to 30th); proctology at the Gordon Hospital (all day, May 25th to 30th); venereal diseases at the London Lock Hospital (afternoons, May 25th to June 20th). Week-end courses will be held during April and May as follows: heart and lung diseases at the Victoria Park Hospital (April 18th and 19th); infants' diseases at the Infants Hospital (May 2nd and 3rd); chest diseases at the Brompton Hospital (May 9th and 10th); surgery at the Cancer Hospital (May 16th and 17th). Courses arranged by the fellowship are open only to members and further information may be had from the secretary of the fellowship, 1, Wimpole-street, London, W.

**Central Midwives Board**

Sir Comyns Berkeley, F.R.C.P., has been elected chairman of the Central Midwives Board in succession to Dr. J. S. Fairbairn, who has retired from the Board.

**Medical Research Council**

Mr. Richard K. Law, M.P., has been appointed a member of the Medical Research Council, in the vacancy caused by the retirement of Mr. W. S. Morrison, M.P., on becoming Financial Secretary to the Treasury.

**Army Dental Corps**

The annual dinner of the officers of the Army Dental Corps will be held on Friday, July 24th, at the Connaught Rooms, W.C.2.

**Society for the Study of Inebriety**

The spring meeting of this society has been deferred till Tuesday, April 21st, when it will be held at 11, Chandos-street, London, W., at 4 P.M. After the business meeting Dr. J. D. Rolleston will read a paper on snuff-taking.

**German Radiological Congress**

The twenty-seventh congress of the Deutsche Röntgen-Gesellschaft, which was postponed because of the German elections, will now be held at Wiesbaden from April 23rd to 25th. Further information may be had from Prof. Dr. Frik, Brückenallee 22, Berlin, N.W. 87.

**Course on Chemical Warfare**

Seven lectures and a practical demonstration on air-raid precautions for members of the medical profession and trained nurses have been arranged by the British Red Cross Society. They are to be given on Fridays at 5 P.M. at 9, Chesham-street, Belgrave-square, London, S.W., and the first will be on May 1st. The lecturer is Major H. N. Stafford, R.A.M.C., and further information may be had from the county secretary of the society, 9, Chesham-street, London, S.W.1.

**Pathological Research in Relation to Medicine**

Our advertisement columns contain particulars of a course of lectures on this subject to be given in the institute of pathology and research at St. Mary's Hospital, London, at 5 P.M. on Tuesdays from April 21st to June 9th. The first is by Sir Almoth Wright, F.R.S., principal of the institute, and the other speakers will be Sir Joseph Barcroft, F.R.S., Mr. F. L. Pyman, F.R.S., Dr. J. E. McCartney, Prof. L. J. Witts, Prof. E. N. Andrade, F.R.S., Prof. Grey Turner, and Prof. S. P. Bedson, F.R.S.

**London School of Hygiene and Tropical Medicine**

The annual malaria control course for laymen will be held at this school (Keppel-street, W.C.) from June 22nd to 26th under the direction of Sir Malcolm Watson. On Thursday, July 16th, it is proposed to hold at the school the annual conference for medical officers in industry overseas, the object being that officers on leave from the tropics may be able to meet their colleagues and discuss their problems. The main subject for discussion will be the prevention of disease. Further information about the course and the congress may be had from the organising secretary of the Ross Institute of Tropical Hygiene at the school.

**Association for Moral and Social Hygiene**

Dame Rachel Crowdy, R.R.C., will preside at a public luncheon to be held at the Criterion Restaurant, London, W., on April 23rd to celebrate the fiftieth anniversary of the repeal of the Contagious Disease Acts. The speakers will include Lady Astor, M.P., Mr. R. A. Butler, M.P., and Prof. Gilbert Murray. At 6 P.M. on the same day a service of thanksgiving is to be held at St. Martin-in-the-Fields, when the Bishop of Liverpool will be the preacher, and on April 24th, at 5.30 P.M., Madame Pesson-Debret will address a meeting at the Livingstone Hall (opposite St. James's Park station) on the Fight against Regulation in France. Further particulars may be had from the Association at Livingstone House, Broadway, S.W.1.

a similar swelling, but not so large. The right-sided aneurysm was successfully excised, with complete relief of the pain, but the left, which was causing no symptoms, was left alone.

Bilaterally symmetrical aneurysm has previously been described, and is ascribed to atheromatous changes in the vessels, possibly combined with nervous disturbances. Krull considers that these factors applied in the case he describes.

### THE SERIOUSNESS OF TUBERCULOUS SUPERINFECTIONS

WHEN clinically demonstrable tuberculosis develops in someone who, a few years earlier, had been found to be Pirquet-positive, is his disease a sequel to his primary infection or to a recent superinfection? Many, if not most, of the papers in which an attempt is made to answer this question provide evidence which is so inconclusive that it is a pleasure to discover such weighty arguments as those provided by Dr. J. Heimbeck in a lecture recently given before the Medical Society of Oslo (Nord. med. tidskr., Feb. 15th, 1936, p. 241). It may be said at once that he makes out a plausible case for superinfections as the cause of a goodly proportion of cases of active tuberculosis in persons between the ages of 12 and 38.

The material consisted of 2425 persons with a total observation period of 9903 years. These persons were classed in five groups. Group A consisted of persons of both sexes between the ages of 12 and 19, some living in tuberculous and others in healthy surroundings. Group B included persons between the ages of 20 and 38 unexposed to tuberculosis. Group C included persons of the same age as in group B, but living in tuberculous surroundings. Group D included the nurses of the Ullevaal Hospital in which they were exposed to intensive infection with tuberculosis. Group E included the Ullevaal nurses who became Pirquet-positive as a result of B C G inoculation. The 2425 persons in these five groups were kept under observation with reference to their development of tuberculosis during the 9903 years under review. The tuberculosis they developed was classified in two categories according as it was characteristic of primary tuberculosis (pleurisy or erythema nodosum) or appeared in some other form (pulmonary tuberculosis or pulmonary infiltration) commonly regarded as usually being a comparatively late manifestation of a tuberculous infection. Such a distinction was, of course, rather arbitrary, and Dr. Heimbeck is careful to note that the tuberculous manifestations in his second category may in some cases have been the prompt sequel to a primary infection.

In his first three groups, in which there were 1608 persons kept under observation for a total of 6431 years, there were only 2 cases of tuberculosis in the first category, and 21 in the second. But in group D, represented by 588 nurses, the incidence of tuberculosis was much higher—13 cases in the first category and 14 in the second. In group E (229 nurses) there were 7 cases in the first category, but only 1 in the second. Commenting on these findings, Dr. Heimbeck emphasises the fact that in his first three groups all but two of the cases of tuberculosis belonged to his second category (comparatively late manifestations of tuberculosis). But in group D—originally healthy nurses—there were as many as 13 cases of tuberculosis in his first category and 14 in his second. After considering various possible sources of error in his calculations, he comes to the conclusion that the frequency with which the nurses in group D developed manifestations of tuberculosis indicative of a recent infection must be taken as the measure of the importance of superinfections. As for the nurses in group E—persons inoculated with B C G because a negative Pirquet test had indicated the absence hitherto of a primary infection—it was significant that all but one of the 8 nurses subsequently developing tuberculosis suffered from it in the form of pleurisy or erythema nodosum. Evidently

the benign infection with B C G had in these cases failed wholly to counteract the massive infections to which the nurses had been exposed.

### STATISTICAL POINTERS TO PRACTICE

DURING the past twenty years manufacturers have more and more adopted quantitative methods of measuring their markets and a book<sup>1</sup> lately issued to help them in their task provides valuable information by bringing together from scattered official and unofficial sources statistics of population, of families, of density, of the incidence of social grades, of local prosperity, and so on. The tables are often illustrated by the type of pictorial diagram which leads to the digestion of statistics without much dyspepsia, and the clear presentation of the material, and references to its places of origin, may well lead to the book having a wider circulation than is the authors' immediate aim. For instance, the young medical graduate in two minds as to where to practise might well find hints in its tabulations. The southward trend of population is shown by the fact that between 1921 and 1934 there was an increase of 1½ millions in London and the south-east—an increase equal to the populations of Manchester and Liverpool combined—while Scotland, Northumberland, and Durham had virtually no increase, and Wales actually diminished in population. Parallel with these changes there has been a tendency for the populations of metropolitan centres to move outwards. He who is interested in midwifery or the diseases of childhood will find high birth-rates and a high proportion of children in South Wales, Northumberland, and Durham, and in Scotland. For the same number of patients it appears that the practitioner of to-day—and still more of to-morrow—must have a larger number of families on his visiting list than his predecessor. For in 1921 there were 4·17 persons per family, and by 1934 this had fallen to 3·68. As is well known, the age composition of the population is changing; the number of children is diminishing while the number of adults is still increasing, and every increase in the latter means an increase in small families. By 1941 families of 1-3 persons will, it is estimated, have risen by nearly a million, while those of 6 or more will have fallen by 300,000. Estimates of the numbers of families in different income groups show that the lowest grade, whose chief income-earner receives less than about £4 per week, are proportionately most frequent in Lancashire, Warwickshire, Nottinghamshire, Durham, Derbyshire, and Staffordshire, and least frequent in Sussex, London, Cornwall Middlesex, Surrey, and Devon. We may note in passing an estimate that the total sales of newspapers in Great Britain per 100 families is equivalent to 95 morning, 57 evening, and 130 Sunday papers.

OXYGEN ADMINISTRATION.—We have received a letter from Dr. Argyll Campbell saying that the box mask for administration of oxygen to which he referred in a letter in THE LANCET last week may be obtained in aluminium from Messrs. Siebe Gorman & Co., Ltd., 187, Westminster Bridge-road, London.

TUBERCULOSIS IN MOSCOW: CORRIGENDUM.—In our issue of March 21st (p. 699) we credited Mr. Le Gros Clark with a statement that the Moscow death-rate from tuberculosis has been reduced from 40 per 1000 during the civil wars to less than 12 per 1000 to-day. These rates are (as may be supposed) ten times too high. The figures given by Mr. Clark were 400 and 120 per 100,000—i.e., 4 and 1·2 per 1000.

<sup>1</sup> Home Market, a Handbook of Statistics. By Major G. Harrison and F. C. Mitchell, and the statistical staff of the London Press Exchange, Ltd. London: George Allen and Unwin Ltd. 1936. Pp. 149. 10s. 6d.

NOTTINGHAM HOSPITAL SATURDAY FUND.—This fund for the past year amounted to £28,174, the highest figure reached since its inauguration.

## ADDRESSES AND ORIGINAL ARTICLES

## MALIGNANCY

WITH ILLUSTRATIONS FROM THE  
PATHOLOGY OF THE MAMMA\*

By Sir ROBERT MUIR, M.D. Edin.,

F.R.C.P. Lond. &amp; Edin., LL.D., F.R.S.

PROFESSOR OF PATHOLOGY IN THE UNIVERSITY OF GLASGOW

MAY I ask your indulgence if at the outset of my address I refer to a matter which has doubtless presented itself to the minds of you all—the break with precedent which has admitted to the high honour of the Lister award one who is not himself a surgeon? I come before you as in some sort a layman, with a layman's disabilities, but I am fully conscious that in your catholicity of outlook your desire has been to stress the fact that pathology and bacteriology were the base and the essential condition of Lister's work in surgery. I appreciate to the full the signal distinction which has been conferred upon me.

On the occasion of the 109th anniversary of Lord Lister's birth, we are met to do honour once more to his memory. In fulfilling my obligation to give a lecture I should have liked to make the subject Lister's scientific work, but a short time ago I gave an address on this subject to the Canadian Medical Association, and I felt that it would not be justifiable to offer on the present occasion what would necessarily be a repetition in great part of what I had already said. I have had perforce to choose another subject. Before speaking on it I should like to offer a few remarks of a general kind.

Than the life work of Joseph Lister there is in the history of our profession no better example of the truth that advance in practice can come only from increase of knowledge, hardly won by continuous and painstaking investigation. The scientific achievements of the earlier part of Lister's life are naturally overshadowed by his epoch-making contributions to surgery in the latter part, but no one can appreciate how his immortal benefaction to mankind was bestowed without following the steps in his scientific progress. And it is to his earlier years that we must look for a just estimate of his gifts as an investigator. "Science for its own sake" might be said to have been his motto at first, but this was modified as practical requirements arose.

By the time he had gone to Glasgow at the age of 33 he had published more than a dozen papers on subjects histological, physiological, and pathological, several being historical landmarks. In them is apparent that combination of detailed observation and breadth of outlook which marks the master mind. While occupied with minutiae he was ever seeing afar and thinking broadly. He lived both in valleys and on the heights. And if we bear in mind the simplicity of the apparatus at his disposal and also the fact that his investigations were made in the spare time of a busy life, we cannot but marvel at his recorded achievements. Is there anything more pleasing or instructive in the history of research than the picture presented in his biography by Sir Rickman Godlee—the picture of Lister after a day's work was over carrying on his experiments till the early morning hours, spending what he called "a glorious night" in the study of the phenomena of inflammation?

The year 1865 was the turning-point in Lister's life for he then saw the bearing of Pasteur's researches; the fundamental facts regarding fermentation and putrefaction thereafter occupied his thoughts. A principle was grasped by him for the first time and his task then became an endless series of experimental trials, yet a sure evolution towards its successful application. In this his powers and methods to which I have referred are again clearly in evidence. The tale has often been told and is known to you all. In his opening lecture when he went to the chair of clinical surgery in Edinburgh in 1869 he was able to use these words, with confidence yet with modesty, "The germ theory is the pole-star which will guide you safely through what would be otherwise a navigation of hopeless difficulty." It is to me a pleasing thought that after having practically completed his work on antiseptics and having bestowed on mankind the greatest gift it has received, he should have been able once more to follow his bent and devote himself with unabating zeal to more purely scientific problems. His classical paper "On the lactic acid fermentation and its bearings on pathology" is a remarkable example of the outcome. Lister indeed possessed the essential qualities of the ideal investigator.

I close with the words which ended my previous address.

"In Lister's own time there were those who followed him along his way with understanding, expectancy and generous pride. There were those too who knew no more than to accord him a grudging kind of honourable mention when they ought to have sat at his feet. In these our own days, there can be but one attitude, that of veneration, and our veneration goes forth with a personal intensity to the man whose encompassing kindness made all humanity his concern. In him rare gifts and rare goodness met and greeted each other, made a pact of mercy and kept it. In commemorating once more the consecrated work of Joseph Lister we salute the memory of a man great in intellect and in soul, great in aim and achievement, great and humble in triumph."

\* \* \*

In speaking on malignancy I shall keep to very general terms. It would be impossible to discuss the various views with regard to the nature and origin of malignant tumours, and it is not my object to do so. I shall rather state as simply as I can how the subject presents itself to me after a relatively long life as a pathologist. What I have to say falls mainly into three parts. In the first place, I shall speak of our present knowledge of the characters and aetiology of malignancy, as the result of observation and experiment; in the second place, I shall illustrate some of the chief points by my own observations on malignant disease of the mamma; and lastly, I shall briefly consider the essential nature of malignancy.

## Some Features of Malignancy

I have used the term "malignancy" in my title rather than "neoplasia" since it may be taken to indicate the latter in its extreme deviation from normal growth. This entails the disadvantage that simple tumours and the graduated series of growths which may originate from one tissue are not considered, but I do not think the discussion will be seriously affected thereby.

It is unnecessary here to detail the nature of malignancy. In a general way malignancy may be regarded as an abnormal behaviour of cells, consisting

\* The Lister memorial lecture for 1936, delivered before the Royal College of Surgeons of England on April 7th.

essentially in uncontrolled growth. It is evidenced by deviations in cell structure, dedifferentiation or anaplasia and sometimes extreme aberration in type, and it is often characterised by metabolic changes, especially in respiratory functions. But these and other properties are merely indications of changes in the biology of the cells, and do not in any way explain these changes; in other words, they are evidences of altered behaviour. It has been pointed out by others that normal cells will proliferate indefinitely if the conditions are favourable; this is seen in tissue cultures where the cells are free from adjacent tissues. Such cells, however, on being reintroduced into the body are once more restrained by the tissue tension which they encounter. Malignant proliferation, on the other hand, overcomes the controlling influence of the surrounding tissues and continues indefinitely in spite of it; this is most satisfactorily studied in the case of carcinoma. The term "autonomous" is eminently suitable as it implies that the malignant cells are a law to themselves. They invade and destroy the tissues while the latter exert their powers of restraint and are sometimes successful. But the proliferation must not be regarded as all-powerful. Experimental work on transplantation of tumours shows that the margin between growth and non-growth is comparatively narrow, and observation on malignant disease in the human subject supplies numerous examples of malignant cells being overcome and disappearing locally. The actual malignancy is in fact the surplus malignancy against tissue resistance.

While malignant cells are frequently overcome locally by stroma reaction, there is, however, no satisfactory evidence that weakened resistance of connective tissue will in itself lead to malignancy in the related epithelium; although *diminished tissue tension* has been put forward as a factor by various writers. As I have said, we are dealing with a biological change in the cells which is not brought about in this way. Furthermore, the malignant character once acquired seems to be a permanent property of the cells; they may be destroyed or die out, but they do not, so far as we know, regain a normal behaviour. Thus tumours have been transplanted in mice over many years without loss of malignancy. Likewise, tumour cells after having been grown in cultures separate from the other tissues for a time manifest their properties again on introduction into a living animal. I wish to emphasise here that the biological properties of the cells appear to have undergone an essential alteration which is apparently transmitted to their descendants.

With regard to *congenital abnormalities* in relation to malignancy I cannot speak in detail. These are not infrequently the bases of malignant growth—without the abnormality the tumour would not have arisen. Undoubtedly, too, the liability to malignancy varies in different examples of such abnormalities; compare, for example, the high incidence of malignancy in teratoma testis with that in pigmented naevi. Not many naevi originate a malignant melanoma. The incidence of malignancy must be investigated in the case of each abnormality. It is possible that abrogation of function arising from displacement of cells brings with it an increased tendency to malignant proliferation but, as I have said elsewhere, embryonic cells, though energetic in proliferation, are just as much under the laws of controlled growth as those of the adult tissues. And we have clear evidence that in the origin of malignancy in congenital abnormalities irritants and cell stimuli play a part just as in the case of normal tissues.

Undoubtedly the most striking examples of malignant growth in relation to embryonic proliferation are the tumours which arise at the earliest period of life, such as nephroblastoma and sympathicoblastoma. With the exception of the fact that they occur at a period of very active normal proliferation, we know nothing as to their origin.

Some other points may be referred to in this preliminary review; one of these is the *distribution of malignancy* in the human body. Recent investigation has not only revealed more and more the wonderful variations in the structures of tumours but also the multiplicity of cells from which they may arise. One is justified in saying that malignancy may appear in any cell of the body, with one proviso, however, that the cell has the power of normal proliferation. Tumours malignant, as well as simple, arise not only from the tissues most active in repair but also, though less frequently, from the specialised cells—e.g., those of the liver, adrenals, and endocrine glands. An adult nerve-cell, on the contrary, has lost the property of proliferation and no tumour arises from it; but a growth may originate in its progenitor, the neuroblast, and often possesses highly malignant properties. The terms "carcinoma" and "sarcoma" are thus a poor reflection of the varieties of tumours. The origin of malignant neoplasms from highly specialised cells is an important section of the general subject, but so far it has been scarcely touched by experimental methods.

Another matter in relation to the general question is *age-incidence*. Malignancy becomes more frequent as age increases owing to the higher incidence of carcinomata associated chiefly with increasing opportunity for damage, irritation, and other disturbances of the tissues. But malignant growths are met with in the early years of infancy, and there is clear evidence that they may originate during intra-uterine life. Interesting facts with regard to this subject have been gathered in recent papers by Blacklock (1934). Sarcomata of bone too are markedly related to the growth period. The outstanding fact, however, is that from whatever cells, in whatever way, and at whatever age malignant tumours arise, they are essentially similar in their general behaviour and in their conditions of growth. One naturally holds as a working hypothesis that there must be some ultimate disturbance of cell life underlying all the different conditions.

#### Ætiological Factors

When we consider the cause of malignancy, it must be recognised that the subject is of great complexity. In the first place there are the particular circumstances in time which give rise to malignancy—the primary or initial causes. There are also additional circumstances such as the susceptibility of the tissues, especially that which is hereditary; these are equally essential to the occurrence of malignancy. And finally there is the factor of the vital behaviour of the cells, whether this is a continued reaction to some agency or results from some obscure form of nuclear damage. The last question concerns the real nature of malignant proliferation. The matter may be put in the following way. Various irritant and abnormal conditions give rise to malignancy; there are numerous primary causes. But what is the causation of the malignant proliferation, say in a secondary growth, when the cells are beyond the influence of the agency which originally led to its development? Neoplastic proliferation corresponds up to a point with reactive proliferation but it seems to possess in addition a feature all its own.

Looking back on the results of research during recent times, say the last 25 years, one cannot but be impressed by the advance in knowledge of the different ways in which tumours may be initiated. Chronic irritation was the first factor to be recognised, and the cumulative evidence of numberless clinical observations became practically conclusive as to its importance. Then followed the recognition, still from the clinical side, that a number of so-called irritants, strikingly different in their nature, were specially liable to cause the malignant change. The matter was then clinched by experimental work which started with the researches by Fibiger on gongylonema cancer and those of Yamagiwa and Iohikawa on the production of epithelial new growths by tar. Since that time the number of carcinogenic agents has been steadily added to and now they are many in number and variety. I should like to say here that the contributions of workers in this country have been of a distinguished order. Real progress was made when Kennaway (1925, 1930) first established the relation of chemical structure to the carcinogenic property and showed how slight variations in the molecule might be attended by absence or presence of the property. Kennaway's observations and those of Cook and his co-workers (1932) brought out clearly that there is no relationship between irritating effect in the ordinary sense and the faculty to lead to malignancy, and hence raised the possibility of there being some common feature in chemical structure on which the carcinogenic property depends. From these and other observations it would appear, however, that the carcinogenic agents have a special property of stimulating growth or cellular proliferation, whilst other closely allied chemical substances have not this property. "Growth stimulants" rather than "irritants" would appear thus to be the preferable term. The next advance was made by Cook and Dodds (1933) who showed that dibenzanthracene, one of the most active carcinogenic agents, had an oestrogenic effect on mice like that of oestrone or folliculin. In this way a link was made as regards biological effect between a carcinogenic substance and a female sex hormone. Another step of great importance was the demonstration by Lacassagne (1932) that the injection of oestrone is effective in producing adenocarcinoma in the mammae of male mice. These observations will be further referred to.

If I were to attempt to give a summary of the results which have been reached I might put it as follows: (1) By both experimental and observational methods it is shown that malignant growths may be produced by the prolonged action of irritants and cell stimulants. Such growths chiefly affect tissues active in repair. (2) There are malignant growths of the more specialised epithelial tissues and of some connective tissues which have not yet been produced experimentally, but pathological observations in the human subject indicate that they may arise on the same principles. (3) There are malignant growths which can be placed in neither of these two classes. We know nothing as to the conditions incidental to their occurrence and can hardly even speculate as to their causation. Such are the malignant growths arising from embryonic cells, sometimes multipotent; those of the leucocyte-forming tissue; also a great variety of tumours in connexion with the central nervous system, endocrine glands, &c. The methods of experimental embryology may throw light on some of these. The origin of malignancy in relation to normal proliferative processes, however, is a subject on which one can say nothing definite. For

example, while the age-incidence of bone sarcoma indicates its relation to processes of normal growth, it is an instructive fact that bone sarcoma may also arise at a later period of life in relation to abnormal proliferative processes—e.g., those in connexion with generalised osteitis and Paget's disease of bone.

In view of the large number and great variety of chemical and physical agencies which have been shown by clinical and experimental methods to lead to malignancy, one is caused to inquire whether there is any one general principle concerned in the initiation of malignant growth. The nearest approach to a general statement which I think can be made is that the acquisition of malignancy is related to *previous non-neoplastic proliferation*. Sometimes the proliferation may not be continuous, and it is known that malignancy may appear after a person has been removed for some time from the carcinogenic influence; but the fact that the time intervening between its start and the onset of malignancy is comparatively long as a rule cannot be without significance. The occurrence of a long latent or silent period between the initial stimulus and the malignant growth is the rule. But there are exceptions; noteworthy examples are the malignant growths appearing shortly after birth, also chorion-epithelioma at a later period of life. It is interesting, however, that such tumours are related to growth of a very active kind.

I shall not discuss here proliferation following a single trauma in relation to the origin of malignant growths; it is a wide and controversial subject and has recently been treated comprehensively by Ewing (1935), with whom I agree in all essential particulars. On considering the conditions which lead to repeated or continuous cellular proliferation in pathological states we see that they are chiefly of three kinds: (a) chronic irritation, (b) compensatory hyperplasia, and (c) the action of hormones. Something may now be said in exemplification of malignancy occurring in these three conditions.

(a) The term "chronic irritation" must be used in the widest sense. There are cases of carcinoma following long-continued reactive proliferation where nothing is known of the nature of the irritant. Carcinoma of the cervix uteri may be mentioned in illustration. An interesting example of a malignant growth produced by a definite *chemical substance* is that recently discovered by my colleague, Prof. Browning, and his co-workers (1936). The substance in question is a water-soluble styryl compound, chemically unrelated to the carcinogenic substances of Kennaway and others, and an interesting point is that sarcoma has followed a single injection in a large proportion of cases. When injected subcutaneously the dye becomes precipitated in the tissue fluid and minute coloured particles are formed but there is almost no immediate irritant effect. Some months later a perceptible induration is present at the site, and this is due to tissue formation constituted mainly by large masses of phagocytes containing the coloured particles. Later still, rapid growth occurs owing to development of sarcoma which is of the spindle-cell or pleomorphic type. The growth has been transplanted to other mice, in one case ten successful passages have been made. The special features here are the relative lack of initial irritant effect and the very slow growth of the reacting cells up till the time of the appearance of malignancy.

(b) In the second place, reference will be made to malignancy as a sequel to *compensatory hyperplasia*. The importance of this is that *specialised* cells proliferate. There are fewer definite examples of this

but a noteworthy one is met with in the liver. Probably no other organ responds so readily to loss of its substance by compensatory growth; the loss of a third or even half of its bulk experimentally produced, is soon followed by restoration practically to the original weight. The same compensatory process occurs when there is destruction of the liver cells by disease, as in cirrhosis, and then not rarely the compensatory process passes into malignant neoplasia. I studied this and was able to follow the stages (1908). The cells in a hypertrophic focus on acquiring malignancy show alterations both in cytoplasm and nuclear structure. A liver trabecula, which may be regarded as a tubular gland with a bile capillary as its lumen, becomes changed into an elongated mass of cells without lumen, while the cells become altered in appearance. A break through then occurs and a liver-cell carcinoma results. This may happen in multiple foci. To what extent a similar process may occur in growths from other specialised cells is uncertain, but the same principle may hold in the case of endocrine glands. In the thyroid, for example, carcinoma is definitely related to goitre, and this in turn depends upon a succession of processes of hyperplasia and involution.

(c) I shall now say something with regard to malignancy as a sequel to proliferation produced by hormones. A new field of inquiry has been opened up by the work recently done on this subject. The malignant growths thus produced have been in the mamma and, as the results enable us to interpret the changes found in human disease, I shall first describe my observations bearing on the general question.

#### Malignancy in the Mamma

The subject may be arranged under three headings: (a) the development of malignancy in the mamma; (b) the struggle between malignant cells and the normal tissues; (c) the parasite-like behaviour of the cancer cells.

#### DEVELOPMENT

The development of malignancy has been studied in breasts the seat of manifest cystic disease, in those with various conditions of local hyperplasia and fibrosis with little or no cyst formation, and also in those in which actual carcinoma is present. In the last mentioned the non-malignant changes are of special importance in relation to the development of carcinoma. As a result of such study one becomes convinced that there are a whole series of structural changes presenting infinite variety as regards detail, which affect the mammary epithelium and lead up to malignancy. To speak in the most general terms, these are (1) increased and altered secretion accompanied by changes in type of the epithelium, and by desquamation of cells, and (2) hyperplastic proliferation of the epithelium. These are, of course, associated with fibrosis in varying degree. Whilst disordered secretion, leading to distension of ducts and acini, appears often to be the initial change, the degree in which either of the two kinds of epithelial changes predominates varies in different cases. Sometimes cyst formation is the outstanding feature, resulting in the so-called cystic degeneration or Schimmelbusch's disease. More frequently hyperplastic changes predominate and these are of special importance in relation to malignancy. Cheatle (1926, 1931) has already given a full account of the changes and I agree with him on all essential points.

The hyperplasia of epithelium is attended for a long time by a coördinated increase of connective tissue—a condition still removed from malignancy.

Thus there arise papillomatous growths in the ducts and these are often present at an early stage in association with cystic dilatation. The papillomata may be small and numerous or they may reach a considerable size. The well-known duct papilloma, for example, may be associated with relatively large papillomata in the substance of the breast. The next stage is a relative overgrowth of epithelium in comparison with stroma; epithelial outgrowths are now produced which contain only a small amount of connective tissue. This condition passes on gradually to a stage where there is proliferation of epithelium alone and large cellular masses without any stroma are found within the ducts. For a time the epithelial cells, though enlarged, show little alteration in their characters and mitoses are few. Further, the cells retain their polarity to a certain extent; some are columnar and form rings or pseudo-acini in the cell masses (Fig. 1). Occasionally the hyperplasia affects only one side of a duct (Fig. 2). Finally the anaplasia becomes distinct; the cells and their nuclei vary in size, the latter becoming of the vesicular type with distinct nucleoli. The amount and arrangement of chromatin vary and ultimately one finds within the ducts cellular masses which have all the characters of an encephaloid carcinoma (Fig. 3). The term *intraduct carcinoma* may be then applied as we are justified in regarding the cells as malignant although they have not yet passed into the tissue spaces. Such changes may be met with at different stages in the same case and may be accompanied or not by carcinoma.

The statement is not infrequent that intraduct carcinoma is rare. Its occurrence as a widespread condition, giving rise to the so-called comedo masses within the ducts, is relatively uncommon. But local intraduct carcinoma is in my experience quite common, being found in many cases of carcinoma of the breast as well as in cases free from carcinoma. In association with the changes in the ducts a few acini are commonly affected similarly but occasionally there is a growth of malignant cells within the acini over a considerable area. The epithelium of the acini may be entirely replaced by cells of malignant type whilst the structural outlines of the acini are completely retained, a condition of intra-acinous carcinoma. Such a condition may be extensive, whilst alongside there are lobules of normal appearance (Fig. 4). I believe that intraduct carcinoma with or without intra-acinous carcinoma represents a condition where the cells have acquired the characters of malignancy yet are still within normal bounds—a sort of pure culture of malignant cells but still within test-tubes, as one might say. It is usually a process of very slow development; it is often relatively static and may exist for years. Ultimately the natural consequence is the break through the normal confines with an ordinary infiltrating carcinoma as the result. This probably happens more frequently from the ducts as they are so much oftener affected. On the other hand, when acini are affected break through will take place more readily owing to the slighter resistance afforded by their walls.

One may ask—why do the cells not break through at once? Reactive changes in the walls of the ducts play a part, but sometimes they are absent; and the basement membrane of an acinus would appear to be but a slight barrier. The supply of nourishment will also be concerned and it is evident that the malignant cells will be in a much more favourable condition in this respect when once they are in the tissue spaces. It is, however, clear that there may be a balance between tissue restraint and malignancy



ILLUSTRATING CHANGES IN THE MAMMA BEFORE OCCURRENCE OF CANCEROUS INFILTRATION OF THE TISSUES



FIG. 1.—Duct showing marked hyperplasia of epithelium without stroma; cells still show polarity and tendency to form circles. ( $\times 100$ .)

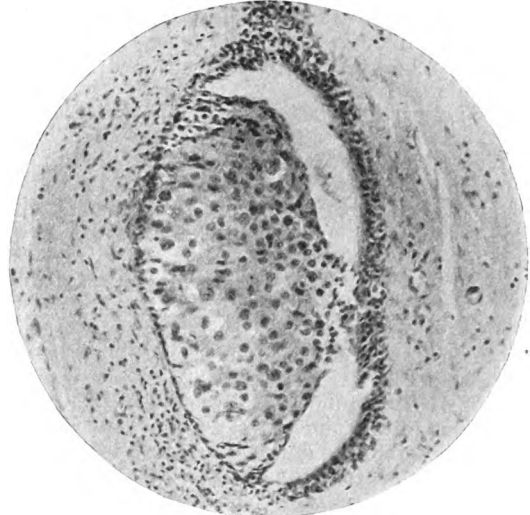


FIG. 2.—Localised precancerous epithelial hyperplasia in small duct; several similar foci were present. ( $\times 150$ .)

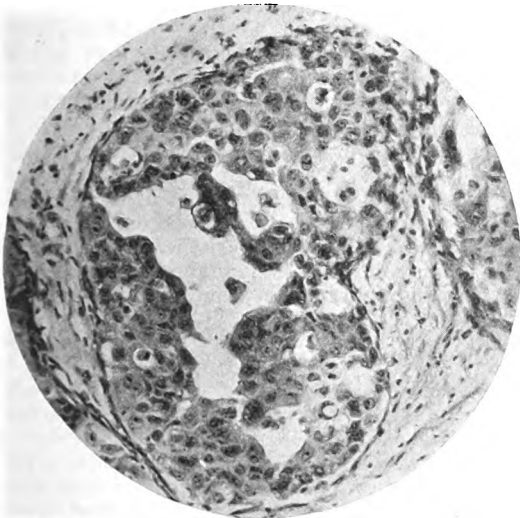


FIG. 3.—Fully developed intraduct carcinoma. ( $\times 150$ .)

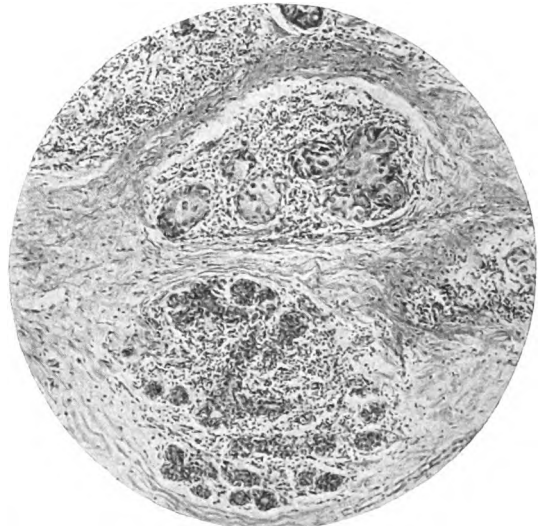


FIG. 4.—Above, group of acini showing intra-acinous carcinoma; below, unaffected acini. ( $\times 75$ .)

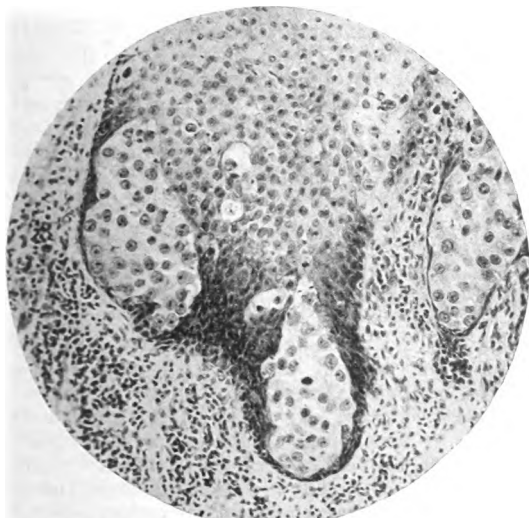


FIG. 5.—Masses of cancer cells within interpapillary processes of epidermis of nipple—"Paget" lesion; also separate cancer cells. Secondary to intraduct carcinoma. ( $\times 150$ .)

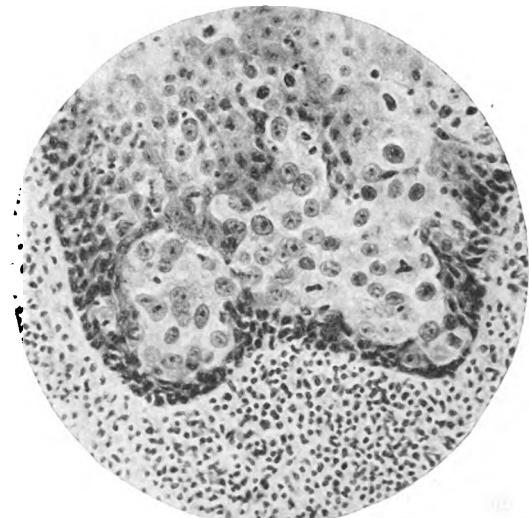


FIG. 6.—Mass of cancer cells in deep part of epidermis, showing several mitoses (from same case as Fig. 5) ( $\times 200$ .)

for a long period. The same holds when the malignant cells reach the epidermis and produce Paget's disease.

It may seem strange, almost incredible, that intraduct carcinoma may exist for some years before infiltration occurs, but it is not so strange if one bears in mind how many years may elapse before there is recurrence after operation, that is, before cells actually infiltrating have been again able to produce a manifest growth. I shall add only one other point. From a picture of malignant cells within the mammary ducts one can readily understand how trauma may set up actual invasion.

#### STRUGGLE BETWEEN MALIGNANT CELLS AND NORMAL TISSUES

This struggle has often been observed and is of two main types. In the first place, the presence of malignant cells within ducts may give rise to reaction of the connective tissue inside the elastica. This tissue often undergoes a laminated thickening leading to diminution of the lumen, and as it progresses the cancer cells are gradually strangulated, as it were, and ultimately disappear. The condition corresponds with a chronic endarteritis proceeding to complete obliteration. This process has been described and figured also by Cappell (1931). In the second place, there may occur a marked cellular reaction around the affected ducts and also around affected acini, the cells being chiefly plasma cells and lymphocytes. At places these may penetrate the walls of the ducts and as this occurs the elastic tissue disappears. The contained cancer cells are then invaded and again they may undergo atrophy and disappear; fibrosis of the newly formed connective tissue follows. The result of either process is that obliterated ducts come to be represented by a relatively acellular core of hyaline tissue surrounded by markedly hyperplastic elastic tissue. Ducts in this condition are of common occurrence both when intraduct carcinoma alone is present and also when infiltrating carcinoma has supervened. I cannot say that ducts in this state are always the result of effete intraduct carcinoma but there is no doubt that this is often the mode of development. The same sort of cellular infiltration as that described is seen also round intra-acinous carcinoma, and it would almost appear as if the cells in the malignant state had a chemotactic influence on the lymphocytes and plasma cells. Malignant acini may be invaded by them and all stages up to complete disappearance of malignant cells may be followed. Such processes of healing are of course effective only here and there and the disease as a whole is progressive. Nevertheless they illustrate well "the conflict between malignant cells and the normal tissues."

#### THE CANCER CELL AS "PARASITE"

The parasite-like behaviour of the cancer cell is only a descriptive term without reference to the ultimate nature of malignancy. A striking example is the growth of cancer cells within non-neoplastic epithelium which is found in those rare cases where the cells of an underlying carcinoma invade the epidermis and then spread within the latter just like parasites, occurring in clumps and also as isolated cells. I show you coloured photomicrographs † from the case published by Shaw Dunn (1930). The tumour is a mucoid (colloid) carcinoma and has been stained by mucicarmine. You will see at a glance the cancer cells stained red within the epidermis, especially in the deeper layers; a great many cells are quite

isolated. Such a mode of spread is, however, commonest in connexion with intraduct carcinoma, and in my opinion it is the basis of Paget's disease of the nipple.

The distribution of the malignant change within the ducts depends in part on multiplicity of foci and partly on the manner of spread, and the latter includes the intra-epithelial route. To put the matter briefly, once the cells have assumed malignant properties they may infiltrate the lining epithelium and grow within it. The malignant cells again behave like parasites and the epithelium plays a passive rôle. The epithelial cells invaded are in fact compressed by the malignant cells though they may be recognisable for some time by their flattened and atrophied nuclei. One may see large oval malignant cells with characteristic nuclei growing in an isolated manner here and there, or they may form a continuous sheet of cells covered by a persisting layer of the original epithelium. I have traced this mode of intra-epithelial growth at all stages and in all parts of the mammary tissue. I have seen it within acini, in the small and large ducts, in the ampullæ and large ducts of the nipple. It is more frequent in the last-mentioned situation, possibly because the epithelium there has a purely lining function to the pathways and presents more resistance to the spread. I have seen isolated malignant cells confined to the epithelium at the orifices of the ducts where the cells first arrive at the epidermis. Spread then occurs in the latter, producing the Paget lesion, and the peculiar appearances of the invading cells are simply due to their growing in a comparatively resistant epithelium. Sometimes, however, the growth is of an active type (Figs. 5 and 6). I need not go further into details as I have described them elsewhere (1927, 1935); the point that I wish to emphasise is that the parasite-like behaviour of the malignant cell is brought out in a striking manner in these conditions and situations.

#### PRECANCEROUS CHANGES AND THE ENDOCRINE FACTOR

A considerable diversity of opinion still prevails as to the relation between cystic disease and carcinoma. One can approach the question from two points of view. From the clinical side one can follow up cases of cystic disease and find the incidence of carcinoma in these. The results obtained by this method are somewhat conflicting. On the other hand, one can study histologically breasts in which carcinoma has already developed and search for evidence of precancerous changes. My experience is that with the latter procedure it is the rule to find epithelial hyperplasia on the basis of which malignancy has developed. The epithelial growth is often associated with cysts but these may be of microscopic character and more frequently still would not be recognisable as such during life. Malignancy may develop in connexion with large cysts, but epithelial hyperplasia is the all-important factor, and although the two types of lesion, cysts and hyperplasia, may coexist sometimes in striking fashion, I think that they are often in inverse proportion to one another.

To interpret the above changes as the usual precursor of malignancy agrees with what we know regarding malignant disease elsewhere and especially with the results of experimental work on carcinogenesis. In the complete absence of evidence that the changes are of inflammatory nature produced by some outside agency, it was natural to regard them as in some way the result of endocrine disturbance, though it seemed more difficult to apply this

† The lecture was illustrated by lantern demonstration of photomicrographs in colour.

explanation to the numerous examples of localised hyperplastic change. Such a view is in agreement with what had been demonstrated with regard to endometrial abnormalities. I shall refer briefly to what has been established.

The effect of folliculin or œstrone on the resting mamma was first, I believe, described by Goormaghtigh and Amerlinck (1930), who demonstrated the important effect of the hormone in producing growth. Lacassagne (1932) was, however, the first to show that carcinoma may be produced by repeated administration; this has been confirmed by Burrows (1935), Bonser (1936), and Cramer and Horning (1936) in this country. Lacassagne showed that in the case of male mice of a susceptible strain the incidence of carcinoma was very high, but malignancy developed also in a proportion, though much smaller, of unselected mice. Briefly one may say that œstrone causes in the male mouse a growth of the relatively atrophic epithelium of the ducts of the mamma, this growth being often attended by dilatation and accumulation of a colloid-like secretion. The epithelium also may show hyperplastic changes and occasionally there may be a growth of small intraduct papillomata. There may be accompanying growth of acini from the extremities of the ducts and a considerable portion of glandular tissue may thus develop, this resembling what occurs in the female mamma at the time of full sexual development. These are the essential changes, and from an examination of sections kindly lent me by Dr. Lacassagne and Mr. Burrows I consider that they belong to the same category as those in the human disease. Accordingly, the male breast is in a sense changed into a female breast, and thereafter the tendency to development of carcinoma makes itself evident. Inherited susceptibility plays a very important part but the carcinogenic action is manifest, though to a less degree, in animals of ordinary strains. Here we have an example of the remarkable effect of a hormone affecting a tissue specifically related to its action. The proliferative changes followed by malignancy in a sense correspond with those produced in other tissues by carcinogenic agents, but in the present case it is to be noted that the agent is not applied directly to the tissue in question but is carried to it by the blood stream. There is thus, as I have said, a specific relationship between the œstrone or other compound and the mammary tissue.

One must however be cautious in interpreting the significance of these results. The two important points are that proliferation brought about by a growth-producing stimulus goes on to malignancy and also that the action of the agent is of a peculiarly selective kind. It does not follow from such experiments that the changes in the human breast are the result of œstrone in excess. It is known, for example, that lutein also is concerned in the mammary changes in connexion with menstruation and pregnancy, and our knowledge is at too early a stage to allow any opinion as regards the mode of production of hyperplastic cystic disease. Nevertheless the facts give strong support to the view that cystic hyperplasia is the result of disordered endocrine balance. Advancing knowledge goes to show that this balance is of a very delicate kind. It is interesting to note that Cramer and Horning have found that the repeated administration of œstrone may produce an adenomatous condition of the pituitary—another example of the interdependence of the endocrine system.

It is thus seen that malignancy may arise in different ways—it has in a sense many different initial causes—and that previous reactive or non-neoplastic

proliferation is a common and important factor. An analogy is sometimes drawn between the inflammatory process and the cancerous or malignant process. Each undoubtedly results from many diverse causes and each is incapable of ultimate explanation. But in inflammation there is a combination of cell proliferation, tissue formation, phagocytosis, &c.; the changes are directed towards the defence or repair of the tissues and are representatives of processes normally in operation. Inflammation, in fact, may be regarded in chief part as evolved for the benefit of the organism, and though, like malignancy, it often cannot be controlled, it is regulated by the presence of the irritants or micro-organisms, and on their removal or destruction it comes to an end. In malignancy, although there may be no phenomenon new in kind, the intensity and autonomous character of the proliferation, resulting usually in the death of the organism, is in certain respects a unique phenomenon. Why is the growth not controlled by the normal agencies? I shall now discuss this question.

### Essential Nature of Malignancy

With regard to the essential nature or cause of malignancy there have been many theories. Any theory must of course be applicable to all the known facts and must also stand every experimental test. With advance in knowledge views formerly held have had to be put aside and there are now two main theories. The one is that malignancy is the result of a change in the mechanism of the cell; the other is that it is produced by the presence of a virus. The first of these has been held by many, and within recent years has been brought into prominence by Boveri (1933), who described the change as a definite "abnormal chromosome-complex," or as Murray puts it, "an invisible, partial damage to individual chromosomes." It has been modified by Lockhart-Mummery (1934) in the form of gene mutation of somatic cells. I would prefer, however, to avoid the use of terms which may have a connotation not strictly applicable to malignant growths. The essence of all such theories is that the cell mechanism has undergone a change, evidently in the nucleus, which is apparently permanent and transmitted to the cell descendants. In this form the theory is little more than a summary of the facts already discussed. The change in the cells, which be it noted is in at least most instances produced by environmental conditions, appears to be twofold. In the first place there is the escape from the normal growth-controlling agencies of the body. In the second place there are the altered characters of the cells which give the tumour its special structural characters. Both of these alterations are transmitted in series and the first is manifestly of a very fundamental kind.

The parasitic theory has passed through many phases. The coming of bacteriology and the establishment of the relationship of bacteria and other micro-organisms to granulomata naturally suggested that malignant tumours were brought about in a similar way; and the idea of an extraneous agent as the cause was to many more satisfying than the hypothesis of altered cellular mechanism. Various organisms have been put forward—protozoa, bacteria, yeast, &c.—but it is now generally recognised that if a parasite is concerned it can only be an invisible micro-organism such as a virus. No definite pronouncement can be made on the subject but some established facts with regard to the virus theory may be considered.

## THE VIRUS THEORY

The discovery of Peyton Rous in 1911 that in fowls a sarcoma can be transferred by a cell-free filtrate is a fundamental one in biology and starts a new era in connexion with neoplasia. It was thus shown that malignancy can be transferred apart from the medium of living cells, the latter method having been up till that time the only one by which it could be effected. As is well known to you, the sarcoma occurred naturally in a fowl, and since that time a considerable number of filterable tumours in birds have been discovered—sarcoma, osteo-sarcoma, endothelioma, &c. Nothing is known as to the origin or initial causation of the natural growths and there is no evidence that they are passed from bird to bird like an infection; they occur sporadically. They have all the characters of malignant neoplasms, and the only peculiar feature is that they can be transferred by the agency mentioned. The filtrates of such growths are specific in the sense that they are active only in birds of the same species or in closely allied species; in this respect there is a correspondence with what obtains in the case of transplantation by living cells. The filterable agent has another characteristic feature—namely, that it reproduces in specific form in the new growth the characters of the original growth.

It is important to realise that the filterable agents in these tumours cannot be placed in the same class as the carcinogenic agents. The former produce malignant proliferation almost at once and, what is of greater significance, they are reproduced or increased in amount as the tumour grows. Carcinogenic agents have done their work when they have started malignancy; they are not present, for example, in the secondary growths. The filterable agents, on the other hand, both start and maintain the malignant proliferation and are present in the tumour tissue wherever it is. Two questions thus arise: first, what is the nature of the filterable agent, and second, to what extent can the results established with regard to these growths be applied to malignant tumours in general?

Gye (1925), from his observations, put forward the view that the filterable agent is of dual nature. There is a specific factor formed by the tumour cells—specific for the type of growth and produced in them as malignancy develops. There is also a virus which is common to malignant neoplasia in general but which for its action requires the co-operation of the specific factor. This view theoretically is in accordance with the facts stated above, but all attempts to prove definitely the dual nature of the filterable agent have so far been unsuccessful. If this is to be the ultimate result, is it possible to explain the facts on the assumption that there is a single agent? Whether is the virus or the specific factor to be retained? According to Gye's theory the specific factor produces the structural characters of the growth, but it has a further effect—it induces the cell to produce more of itself. In other words, there is an increase of the specific factor as the tumour grows, thus there is a resemblance to multiplication. There remains to be considered only the effect supposed to be due to the virus—viz., the cell proliferation induced. In view of what is known with regard to hormones and other substances, may not the specific factor, seeing that it is reproduced, be the cause also of the uncontrolled growth?

If the filterable agent is a virus the question arises—is there one or are there many? On the supposition that there is a single virus one great difficulty presents itself owing to the fact that it produces in the new tumour the features of the tumour from which it

comes. That a virus should be modified by the tissue in which it has gained a footing and grown is in accordance with what we know, but that it should, as it were, carry with it the characters of its environment in the original growth to a normal tissue is a phenomenon to which so far as I know there is no parallel. If, on the other hand, there is a multiplicity of viruses or a virus for each tumour, we are left with insuperable theoretical difficulties, which were met by Gye's view as to the dual nature. The filterable agent corresponds in many of its properties with a virus or living organism, and the majority of workers on the subject accept the virus theory. Others, however, consider that its virus nature has not been established. Murphy (1926), for example, believes that it is a cell product which he considers a transmissible mutagen; this is at least a descriptive name for Gye's specific factor. These seem to me the essential facts bearing on the subject, but I may refer to one or two other points.

What is required in this field of inquiry is some method of definitely recognising a virus. Suggestive experiments have recently been published by Ledingham and Gye (1935) with regard to this. In the case of the Rous sarcoma they have centrifuged at high speed the infective fluid and have demonstrated in the sediment elementary bodies similar to those found in vaccinia and other virus diseases. Moreover the infectivity of any portion of the fluid is in proportion to the number of such bodies. These results at once raise the question whether such bodies can be seen in other kinds of malignant growths and especially those which are produced experimentally by carcinogenic agents. Time alone will supply the answer but the result, whatever it may be, has an important bearing on the problem as to whether the fowl tumours occurring naturally and those produced artificially are alike in this respect. It may be noted too as another point of interest that intranuclear inclusion bodies resembling those seen in certain virus infections have been observed in some tumours by Dorothy Russell (1932) and others.

An all-important question is whether there is a filterable agent in an artificially produced fowl tumour, as contrasted with a naturally occurring tumour such as the Rous sarcoma. As an example, dibenzanthracene in lard or some other vehicle is injected into the breast muscle of a fowl; in a short time the dibenzanthracene is no longer demonstrable at the site (Chalmers, 1934); some months later a sarcoma develops—a remarkable series of events. Can a tumour be set up in a fresh fowl by injection of a filtrate of an emulsion of the tumour thus produced? Peacock (1935) has carried out a large number of experiments on this subject with great care and persistence, and the results have been uniformly negative; he has been able to find no evidence of a filterable agent. McIntosh (1933), on the other hand, has obtained three positive results. This is another problem to which a definite answer cannot be given; we must await further evidence. If it is found possible to transmit such artificially produced tumours by the method mentioned, this might be due again to a product of the malignant cells or to a virus secondarily invading the proliferating cells and rendering them malignant. In the latter case the question arises as to the origin of the virus and the method by which it has reached the site of inoculation, and this will be referred to below.

## VIRUSES AND MAMMALIAN TUMOURS

The general facts with regard to tumours produced by a cell-free filtrate correspond in a striking way

with those observed when transplantation of living cells is the agency. The filterable agent has been found only in some connective tissue and endothelial tumours of birds; in other instances such growths have not been filterable. So far as I know, there have been no undoubted examples of transference of a mammalian tumour by this method. This restriction in occurrence does not weigh greatly with me; it does not imply that the filterable tumours are in nature different from other growths. It is well known that a filterable tumour may lose its filterability and again regain it. The negative results in the case of epithelial growths too are not surprising since, owing to the difficulty of bringing the neoplastic agency sufficiently long in contact with the homologous epithelium, the test is an exacting one.

The domain of viruses as pathogenic agents is gradually being extended by investigation, and some definite tumours have been shown to be caused by them. A recent example is the work by Peyton Rous and Beard (1934) on Shope's infective papilloma of the cotton-tail rabbit in America. This growth is undoubtedly caused by a virus; under natural conditions it spreads as an epidemic and the lesion can be artificially propagated by scarification. Now if a portion of such a papilloma is transferred into the internal tissues or organs of rabbits, the appearance of an infiltrating epithelioma is produced. More recently they have shown that papillomas induced in domestic rabbits by the virus progress to malignancy in a considerable proportion of cases. These are interesting results; how are they to be interpreted? It can be demonstrated that the virus is present in the epithelioma since a papilloma results when the skin of a normal rabbit is inoculated from such an epithelioma. The problem here comes to be quite a definite one—does the malignancy of the epithelioma, that is the uncontrolled proliferation of its cells, depend upon the presence of the virus or has the virus produced malignancy as other carcinogenic agencies may do, the virus then merely persisting in the malignant growth? In other words, if the virus could in some way be removed from the epithelioma, would malignancy persist or would it come to an end? Till this is answered it is not possible to assess the general bearing of the observations.

I have given briefly the chief facts relating to the subject and it is not possible to give definite answers to the question put above with regard to the nature of the filterable agents in fowl tumours and their relation to other growths. Certain fundamental facts have been established and one would like to be able to bring them into harmony with our knowledge of malignant tumours in general and give a comprehensive view, even if it were merely theoretical. At present this does not seem possible. But if we consider as a whole the results with regard to carcinogenesis and the filterable growths, there is no valid evidence that malignancy in general is produced by a virus or viruses entering the body *from outside*. The experimental facts appear to exclude this possibility. This is a matter of great practical as well as theoretical importance. Malignant growths can be set up by carcinogenic agents so regularly, not only when they are applied externally but when they are introduced into the tissues, that the access of a virus from without on each occasion seems impossible. The high percentage of growths produced in cancer-susceptible strains of mice by means of cetrone is a specially significant fact in this connexion. Even if it were supposed that a virus were a practically ubiquitous commensal on the skin and mucous surfaces, this would not explain the regularity with

which growths may be produced in the deeper tissues. It may be that some human malignant tumours are due to viruses entering the body from outside, but this does not affect the general question.

The matter has been investigated too from the experimental side. Rous and Botsford (1932) reared mice from birth in a sheltered condition—that is, they were protected against the entrance of any infective agent from without, though the growth of commensal bacteria such as coliform organisms or cocci was not prevented. It was found that in such mice repeated applications of tar led to the development of epithelioma just as readily as in normal mice. We thus seem to be driven to the conclusion that if a virus is necessary for malignancy it must be present within the normal tissues in the interior of the body and act only when proliferation has been previously set up by carcinogenic agents or in some other way. Various supporters of the virus theory have been forced to this view; it has recently been expounded by Andrewes (1934) and the facts bearing on it have been marshalled by him. It is a hypothesis on which nothing definite can be said. No one can prove or disprove the presence of a virus in normal tissues ready to produce malignancy when occasion offers. It must be noted however, as has been already mentioned, that in addition to uncontrolled proliferation there are alterations in the characters of cells which are transmitted to their descendants. The experimental work on cancer in the mouse shows clearly that the cells of a malignant growth breed true both as regards their characters and rate of growth. As Murray (1933) puts it, the growths show "a continuous graduated series in those arising from any one tissue both in histological structure and in rate and habit of growth. In spite of this great range any one variety is relatively permanent." Can this impress resulting in special features be made by a single virus? No one doubts that such an agent as cetrone of itself produces the hyperplastic changes in the mamma, varying greatly in different cases, and a virus, if one there be, can come into play and produce uncontrolled proliferation only when these essential changes have occurred. It seems to me that transmission of permanently altered cell characters must also be a necessary factor. The same applies to growths in the human subject. The numerous and practically endless variety of histological types must be due to forms of proliferation and hyperplasia brought about by the various agencies referred to, aided of course by congenital abnormalities and inherited susceptibility.

#### IGNORANCE AND KNOWLEDGE

Each of the two theories has its strong supporters but a decision is not to be arrived at by the votes even of so-called authorities. On either view there seems to be a failure on the part of nature. In the one case normal proliferative processes evolved for defence and repair—one may say, "for the good of the organism"—pass into malignancy. In the other case the animal body has somehow come to harbour a virus or viruses which, given certain opportunities, lead to its destruction. It may seem that for practical purposes it is immaterial which of these two hypotheses is correct; nevertheless, the demand for intellectual satisfaction is and always will be insistent. The problem seems to be in a realm which we have not yet the means of entering, and some think it is incapable of solution. But no one conversant with the advances in recent times can doubt that at least fresh light will be thrown on the subject.

In what I have said a sharp distinction has been



made between the conditions which induce malignancy and the real nature of malignancy or, as one may say, the essential cause of the uncontrolled proliferation. If we are held up for the present by our ignorance of the latter the advances in our knowledge of the former have brought results which have an important practical bearing. I remember some thirty years ago hearing an authority on tumour growths discuss the question whether neoplasia could arise in tissues previously normal. We have now moved far from such a standpoint. The advances in knowledge during that period have been numerous and substantial and in the main due to the experimental method. There have been three main phases of experimental investigation—first, the transference of naturally occurring malignant growths by transplantation of their cells into normal animals, and the conditions and limitations of such transference; second, the methods of starting malignancy *de novo*; and third, the transference of tumours by means of a filterable agent. In all three departments much has been accomplished.

The fact that the problem as to the essential nature of malignancy has not been solved has unjustifiably obscured what has actually been achieved. That malignancy may supervene on cellular proliferation brought about in various ways, by irritants, cell stimuli and hormones, and as a result of compensatory hyperplasia; that in most cases a long period elapses between the onset of proliferation and malignancy; that in the case of chemical substances the tendency to institute malignancy is in certain instances related to molecular structure; that inherited susceptibility plays an important part especially in certain organs; that the development of malignancy depends in some cases upon congenital abnormalities, and that these factors may be combined in different ways—these are facts which have been completely established.

Knowledge of causes brings with it the possible means of prevention and has already been effective. Recognition of the necessity for an intimate study of growths, simple and malignant, in every organ and region of the body is clearly shown by the publications of the present time. And in investigating what I may call the natural history of neoplasia close coöperation between clinical observers and pathologists is essential for the attainment of the best results.

I see much that is hopeful. In the various departments of inquiry to which I have made reference fresh stimulus has been supplied by recent advances. It is natural, in fact it is right, that workers in any one field should push the implication of their results to the full, but all results must be coördinated and tested in relation to the fundamental questions. The picture I have endeavoured to present has come chiefly from researches in the last twenty-five years. I have little doubt that in another similar period it will be greatly changed and that what I have brought before you in this address will be only a record of what has been.

## REFERENCES

- Andrewes, C. H.: THE LANCET, 1934, ii., 63, 117.  
 Blacklock, J. W. S.: Trans. Med.-Chir. Soc. Glasg., 1934, xxviii., 127, in Glasg. Med. Jour., 1934; Jour. Path. and Bact., 1934, xxxix., 27.  
 Bonser, G. M.: Jour. Path. and Bact., 1936, xlii., 169.  
 Boveri, T.: The Origin of Malignant Tumours, Baltimore, 1933.  
 Browning, C. H., Gulbransen, R., and Niven, J. S. F.: Jour. Path. and Bact., 1936, xlii., 155.  
 Burrows, H.: Brit. Jour. Surg., 1935, xxiii., 191.  
 Cappell, D. F.: Jour. Med. Jour., 1931, cxv., 181.  
 Chalmers, J. G.: Biochem. Jour., 1934, xxviii., 1214.

(Continued at foot of next column)

## VITAMINS IN HUMAN NUTRITION THE EXCRETION OF VITAMIN B<sub>1</sub> IN HUMAN URINE AND ITS DEPENDENCE ON THE DIETARY INTAKE

By LESLIE J. HARRIS, Sc.D., D.Sc.

MEMBER OF THE SCIENTIFIC STAFF, MEDICAL RESEARCH COUNCIL; AND

P. C. LEONG

TRAVELLING STUDENT, RAFFLES COLLEGE, SINGAPORE

(From the Nutritional Laboratory, Medical Research Council and University of Cambridge)

IN the past the assessment of malnutrition, or of "suboptimum-nutrition," has been based largely on measurements of physique; various alternative formulae have been proposed by which numerical expression may be given to the weight-height or weight-age relationships. The clinical appearance, and to a less extent the physical performance,<sup>1</sup> are two other criteria most commonly used. To-day, however, the realisation is growing that more specific tests should be available to establish the presence of any given type of dietary deficiency. Not only is it important when a child is undernourished to know which specific dietary errors are responsible, but—more important—it has to be realised that partial deprivation of an essential factor may not lead to any obvious symptoms of ill-health at all for some considerable time to come. In the latter case then a specific test for a given vitamin or other nutritive element may give the first evidence that nutrition is in fact suboptimal.

For vitamin C it has already been shown that the amount excreted in the urine<sup>2,3</sup> may serve as the basis for a test. Subjects suffering from avitaminosis C cease to excrete vitamin C in their urine and in contrast with normal subjects fail to give a urinary peak of response after the administration of a suitable test dose. Quantitative data for the excretion and response to test doses have now been determined for subjects given the reputed "minimal" or "optimal" doses of vitamin C.<sup>3</sup> With the object of

(References continued from previous column)

- Cheatle, G. Lenthal: Brit. Jour. Surg., 1926, xiii., 509.  
 Cheatle, G. Lenthal, and Cutler, Max: Tumours of the Breast, London, 1931.  
 Cook, J. W., et al.: Proc. Roy. Soc. B., 1932, cxi., 455; 1934, cxlii., 273.  
 Cook, J. W., and Dodds, E. C.: Nature, 1933, cxxxii., 205.  
 Cramer, W., and Horning, E. S.: THE LANCET, 1936, i., 247.  
 Dunn, J. Shaw: Jour. Path. and Bact., 1930, xxxiii., 1297.  
 Ewing, J.: Arch. of Path., 1935, xix., 690.  
 Goormaghtigh, N., and Amerlinck, A.: Bull. du Cancer, 1930, xix., 527.  
 Gye, W. E., and Barnard, J. E.: THE LANCET, 1925, ii., 109.  
 Gye, W. E., and Purdy, W. J.: The Cause of Cancer, London, 1931.  
 Kennaway, E. L.: Brit. Med. Jour., 1925, ii., 1; Biochem. Jour., 1930, xxiv., 497, 504.  
 Lacassagne, A.: Compt. rend. Acad. de Sci., 1932, cxcv., 630; Compt. rend. Soc. de biol., 1934, cxv., 469, 579.  
 Lacassagne, A., and Nyka, W.: Compt. rend. Soc. de biol., 1934, cxvi., 844.  
 Ledingham, J. C. G., and Gye, W. E.: THE LANCET, 1935, i., 376.  
 Lockhart-Mummery, J. P.: The Origin of Cancer, London, 1934.  
 McIntosh, J.: Brit. Jour. Exp. Path., 1933, xiv., 422.  
 Muir, R.: Jour. Path. and Bact., 1908, xii., 287; 1927, xxx., 451; Brit. Jour. Surg., 1935, xxii., 728.  
 Murphy, J. B.: Jour. Amer. Med. Assoc., 1926, lxxxvi., 1270 (see also Claude, A., and Murphy, J. B.: Physiol. Rev., 1933, xiii., 246).  
 Murray, J. A.: Proc. Roy. Soc. B., 1933, cxliii., 268.  
 Peacock, P. R.: Amer. Jour. Cancer, 1935, xxv., 51.  
 Rous, Peyton, and Board, J. W.: Jour. Exp. Med., 1934, lx., 701, 723, 741; 1935, lxii., 523.  
 Rous, Peyton, and Botsford, E.: Ibid., 1932, lv., 247.  
 Russell, D. S.: Jour. Path. and Bact., 1932, xxxv., 625.



elaborating similar methods for vitamin B<sub>1</sub> the experiments to be recorded below were undertaken.\*

*Past work.*—Very little information of a quantitative nature is available in the past literature as to the amount of vitamin B<sub>1</sub> in urine. Muckenfuss<sup>4</sup> in 1918 concluded from feeding tests on pigeons that "the antineuritic vitamin . . . is present in fresh filtered human urine in traces apparently." Although similar experimental results were obtained by Gaglio<sup>5</sup> in 1919, he, on the other hand, supposed that this action upon the pigeons was due to some non-specific substances and not the vitamin itself. In view of this uncertainty van der Walle<sup>6</sup> reinvestigated the question in 1922 and concluded from pigeon feeding tests that "a small quantity of antineuritic vitamin is present in the [human] urine." When he fed a dog on a vitamin-free diet the urine lost its curative power. More recently, a preliminary note by Helmer<sup>7</sup> states that the presence of vitamin B<sub>1</sub> in human urine can be detected by a growth-test on rats; he fed the evaporated equivalent of one twenty-fifth part of the total daily output of urine and an appreciable growth response was seen.

**Technique**

It early became apparent that some method of concentrating the vitamin B<sub>1</sub> from the urine was necessary before it could be tested satisfactorily on the experimental animal. After a trial of various alternatives, we found that the following very easy procedure sufficed—namely, to shake the urine with "acid clay" in order to adsorb the vitamin, and then feed the activated solid direct.

TABLE I  
*Quantitative Control of Method. Adsorption of Added Vitamin B<sub>1</sub> from Urine*

Amount of crystalline vitamin B <sub>1</sub> HCl added, in γ, to 100 c.cm. of vitamin B <sub>1</sub> -free urine.	Amount found adsorbed, γ.	Percentage recovery.
2 .. ..	1.9	95
5 .. ..	3.7	74
5 .. ..	3.7	74
5 .. ..	5	100
10 .. ..	7.5	75
10 .. ..	9.3	93

Control tests (Table I.) show that with this method under suitable conditions the great bulk of the vitamin B<sub>1</sub> is removed by two such successive adsorptions. Specimens of 100 c.cm. of urine were first autoclaved at pH 10 for 4 hours under 2 atmospheres pressure, in order to destroy the vitamin B<sub>1</sub>. To the autoclaved urine various known amounts of crystalline vitamin B<sub>1</sub> hydrochloride were then added. The reaction was adjusted to pH 5, and two successive adsorptions carried out by the addition of two lots of 1 g. of acid clay. The two specimens of activated clay were then combined and fed to rats in the manner described below.

Other adsorbents were tested under similar conditions (pH 5, 20° C.) as possible substitutes for "acid clay," but were found less effective (Table II.). Further control tests showed that the adsorption was best carried out in the region of pH 5 (Table III.).

*Details of technique.*—The full 24 hours' specimen of urine should be collected, preferably under a few cubic centimetres of toluene added as preservative. The total day's volume is noted, and the reaction is adjusted to about pH 5 (brom-cresol-green may be used as indicator) by the addition of a few drops of HCl as necessary. An aliquot part of the urine is taken for estimation (normally 100 to 200 c.cm.,

\* The methods available for other nutritional factors will be discussed in a separate note (Harris) to be published shortly in THE LANCET.

depending whether the total daily volume is low or high; or 50 c.cm. if the diet is rich in vitamin B<sub>1</sub>, as after a test dose). One gramme of Clarit acid clay (obtained through the kindness of Messrs. Lever

TABLE II  
*Comparison of Various Adsorbents*

	Amount of vitamin B <sub>1</sub> found adsorbed (in international units) from 100 c.cm. of urine.	
	Urine specimen 1.	Urine specimen 2.
Acid clay .. ..	2.4	3.3
Fuller's earth (E. Merck) ..	0.7	1.4
"Norite," charcoal ..	—	2.4
Vegetable charcoal ("medical") .. ..	0.9	—

TABLE III  
*Influence of pH on Adsorption of Vitamin B<sub>1</sub> from Urine*

pH.	Amount of vitamin B <sub>1</sub> found adsorbed in I.U. (1 g. acid clay added to 100 c.cm. of urine).		
2	1.0,	1.4,	1.4
5	1.4,	1.4,	1.9
7	1.4		
9	0.5		

Brothers Ltd., Port Sunlight) is added. The mixture is shaken on an automatic shaker for 15 minutes and filtered. The filtrate is treated with a further 1 gramme as before, shaken and filtered again. The two specimens of activated clay are combined and tested direct on the rat, mixed in with a small fraction of his basal diet.

TABLE IV  
*Effect of Storage on Vitamin B<sub>1</sub> in Urine*

	Amount of vitamin B <sub>1</sub> found, I.U. per 100 c.cm.		
	Sample—		
	1	2	3
Fresh urine .. ..	0.5	2.4	1.9
After 48 hours' standing—			
No preservative .. ..	—	1.9	1.4
With chloroform .. ..	0.5	2.6	—
With toluene .. ..	0.5	2.4	—

As will be seen from Table IV. the presence of toluene is sufficient to preserve the vitamin from destruction, for several days at least. Further, the activated acid clay if dried retains its full activity even after 3 months' storage in a refrigerator (Table V.). This finding is of interest as it suggests the possibility of having assays on the patient's urine carried out at a distance whenever there are no local facilities for the animal test—e.g., in the East where beriberi is prevalent. Such work is at present in progress (see below).

*Animal test.*—Because of its rapidity, convenience, and accuracy the "bradycardia" method (Harris)<sup>8-10</sup> seems most suitable. The irregularities and "scatter" inherent in the pigeon method are obviated, and in contrast with the rat-growth method only a single dose of supplement has to be administered, and results can be obtained in the course of a few days instead of several weeks (i.e., the rats being available, ready prepared at the time of the test). Another

advantage is that the same rat can be used repeatedly for separate tests. The error of the method is no more than about 15-20 per cent., which compares very favourably with most biological methods.

TABLE V  
Stability to Storage of Vitamin B<sub>1</sub> Adsorbed on Acid Clay

—	Amount of vitamin B <sub>1</sub> found, I.U.		
	Specimen—		
	1	2	3
Initial value, freshly adsorbed ..	1.0	1.4	2.4
After standing—			
2 days .. .. .	1.0	—	—
3 ,, .. .. .	—	1.4	2.4
12 ,, .. .. .	—	1.4	—
18 ,, .. .. .	—	1.4	—
71 ,, .. .. .	1.0	—	2.4
82 ,, .. .. .	1.0	—	—

Young rats weighing about 50-60 grammes at time of test are used, having been placed on the standard vitamin-B<sub>1</sub> free diet when about 45-50 g. As soon as their heart-rate, as measured in the electro-cardiograph (Clifton Instruments Ltd., Clifton, Bristol),† has fallen from the initial value of about 500 to about 370-390 they are ready for test. Single-graded doses of "unknown" are administered to groups of such rats (for greatest accuracy, 4 or 5 animals should be included per group) and the heart-rate is measured about twice daily. The time which elapses before the heart has fallen back to the original value at the beginning of the test is noted. Simultaneously graded doses of the international standard are administered to a comparable group of rats and measurements taken in the same manner. (For the sake of accurate standardisation, similar tests have also been made with specimens of pure crystalline vitamin-B<sub>1</sub> hydrochloride obtained from Messrs. Merck; the relation found was—

$$10\gamma \text{ vitamin-B}_1 \text{ HCl} = 38 \text{ mg. of international standard} \\ (= 3.8 \text{ I.U.})$$

Average, or better median, values for each group are then calculated (see Table VI.). A dose-response

TABLE VI  
Animal Responses with Crystalline Vitamin B<sub>1</sub> and International Standard

Material.	Dose fed.	Days cured.	
		Individual values.	Average or median.
Vitamin B <sub>1</sub> hydrochloride.	2.5 γ	2, 2, 2, 3	2.2
	5.0 γ	{ (a) 3, 4, 4, 4, 4, 4, 5, 5, } { (b) 4, 4, 4, 5 }	4.0
	7.5 γ	5, 5, 7, 7	6.0
	10.0 γ	7, 8, 8, 9, 9	8.0
International standard.	10 mg.	2, 2, 2.5, 3, 3	2.5
	20 ,,	3.5, 4.5, 4.5, 5, 5.5	4.6
	30 ,,	4.5, 5.5, 6, 6, 8	6.0
	40 ,,	6, 7, 7.5, 9, 10	7.9

(a) = administered orally. (b) = injected subcutaneously.

curve may thus be drawn (Fig. 1), and the dose of the unknown equal in its effect to a given number of units of international standard is thus determined—or the equivalent in terms of so many γ of pure vitamin-B<sub>1</sub> hydrochloride may be given. In approximate routine determinations such lavish use of

animals is not called for; 2 or 3 tests per specimen suffices. For fuller details of technique the paper by Birch and Harris<sup>9</sup> may be consulted.

Results

EXCRETION OF VITAMIN B<sub>1</sub> BY NORMAL ADULTS

Typical results for the day-to-day excretion of vitamin B<sub>1</sub> in the urine are shown in Fig. 2 and the averages are summarised in Tables VII. and VIII.

TABLE VII  
Daily Excretion of Vitamin B<sub>1</sub> in Urine by Normal Adults

No.	Initials.	Weight in kg.	Age.	Group.	Vitamin B <sub>1</sub> in urine.	
					Conc., I.U. per 100 c.cm. (av.).	I.U. per day (av.).
1	A. W. D.	53	22	1 (M.R.)	0.7	12
2	S. I.	72	25		1.1	13
3	T. W. B.	58	29		1.6	14
4	S. A. C.	67	20	2 (N.R.)	1.2	18
5	L. J. H.	72	37		1.7	21
6	P. C. L.	56	25		1.6	21
7	G. G. G.	71	20		4.2	22
8	V. L.	73	22		3.2	27
9	B. M.	63	17	3.1	35	

M.R., N.R., G.R. = moderate, normal, and good reserves.

TABLE VIII  
Effect of Single Test Dose Administered to Adults with Varying "Resting Levels"

Group designation.	Initials.	Special features of diet.	"Resting level" before test dose.	Amount of vitamin B <sub>1</sub> excreted, I.U., in one day.	
				340 I.U.	950 I.U.
1. Poor or moderate reserves.	{ P. C. L.(1) P. C. L.(2) T. W. B. S. I. L. J. H.(1) S. A. C.(1) V. L.	B <sub>1</sub> -free diet for 3 days. Usual diet.	10	11	—
			11	31*	—
			14	26	44
			14	—	—
			15	—	57
2. Normal reserves.	{ L. J. H.(2) P. C. L.(3) G. G. G.(1) P. C. L.(4) S. A. C.(2)	Good diet.	21	68	—
			21	76	—
			22	47	59
			23	67	—
			25	—	61
3. Good reserves.	{ B. M. S. A. C.(3) G. G. G.(2) S. A. C.(4)	Diet supp. with 16 g. Bemax daily for 6-12 months. Diet supp. with B <sub>1</sub> concentrate for several days.	35, 41	—	66
			37	—	68
			51	—	199
			82	—	142

\* Previous test doses had been given shortly before.

It will be seen that the subjects have been arranged in three groups roughly classified as "moderate," "normal," and "good." Nos. 1, 2, 3, and 4 (Group 1, Table VII.) are the "moderate" (or poor) group. Their dietary histories indicate a somewhat low intake of vitamin B<sub>1</sub> (the chief source being generally one egg daily and a small amount of milk), and their urinary output is likewise a little below the "normal" (average = 14 international units daily). Subjects Nos. 5, 6, and 7 (Group 2) may be classed as "average" or "normal." Their dietaries include more liberal amounts of milk, brown bread, eggs, &c.; and their average excretion is appreciably higher, about 21 I.U. daily. Two other subjects who had received a diet unusually rich in vitamin B<sub>1</sub> (Nos. 8

† The use of a simpler oscillograph may furnish a less expensive alternative.

and 9, Group 3)—namely, a special daily supplement of 16 g. of Bemax for one year past, plus a good mixed diet, including porridge, bacon, eggs, milk—may be classed as “good”; their average daily excretion was significantly higher again (31 I.U. per day).

It may be concluded, therefore, that an average normal value for the excretion of vitamin B<sub>1</sub> by adult subjects on normal diets in this country is of the order of 20 I.U. per day. The preliminary indications that the output varies according to the dietary intake is confirmed below in a series of carefully controlled observations. We may suppose that the daily excretion varies with the body’s “reserves” of the vitamin which in turn depend on the amount provided in the food. Animal tests bear this out. The amount of vitamin B<sub>1</sub> which can be held in store in the body is, however, less important than, for example, in the case of vitamin A, immense reserves of which may be accumulated in the liver.

EFFECT OF TEST DOSE

Following the technique described for the determination of vitamin-C subnutrition, we have investigated the effect of the administration of a single large test dose of vitamin B<sub>1</sub>. As with vitamin C, we have found that with vitamin B<sub>1</sub> also the effect of the test dose is related to the past dietary history,

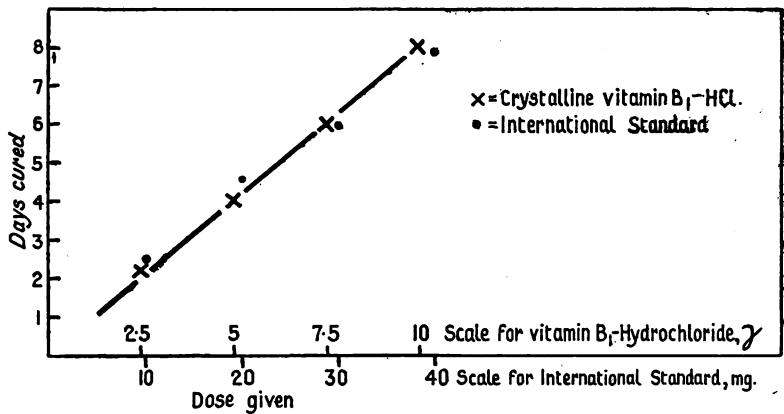


FIG. 1.—Dose-effect curve, for pure crystalline vitamin B<sub>1</sub>-hydrochloride and for international standard preparation.

and hence to the “resting level” of excretion. That is to say, subjects having larger “reserves” of the vitamin and excreting more of it in their day-to-day “resting level” show a somewhat larger immediate response to a given test dose than do those whose past diet has been poorer in the vitamin. Typical values are given in Table VIII.

Reference to Table VIII. suggests that for the diagnosis of the more moderate degrees of vitamin-B<sub>1</sub> subnutrition a suitable level for the test dose is probably about 900γ of vitamin B<sub>1</sub> HCl (=340 I.U.). Such a dose gives a good response with “normal” subjects, and little response from subjects with somewhat subnormal past intakes of the vitamin. On the other hand, the test for subjects with unusually high values for their resting level was

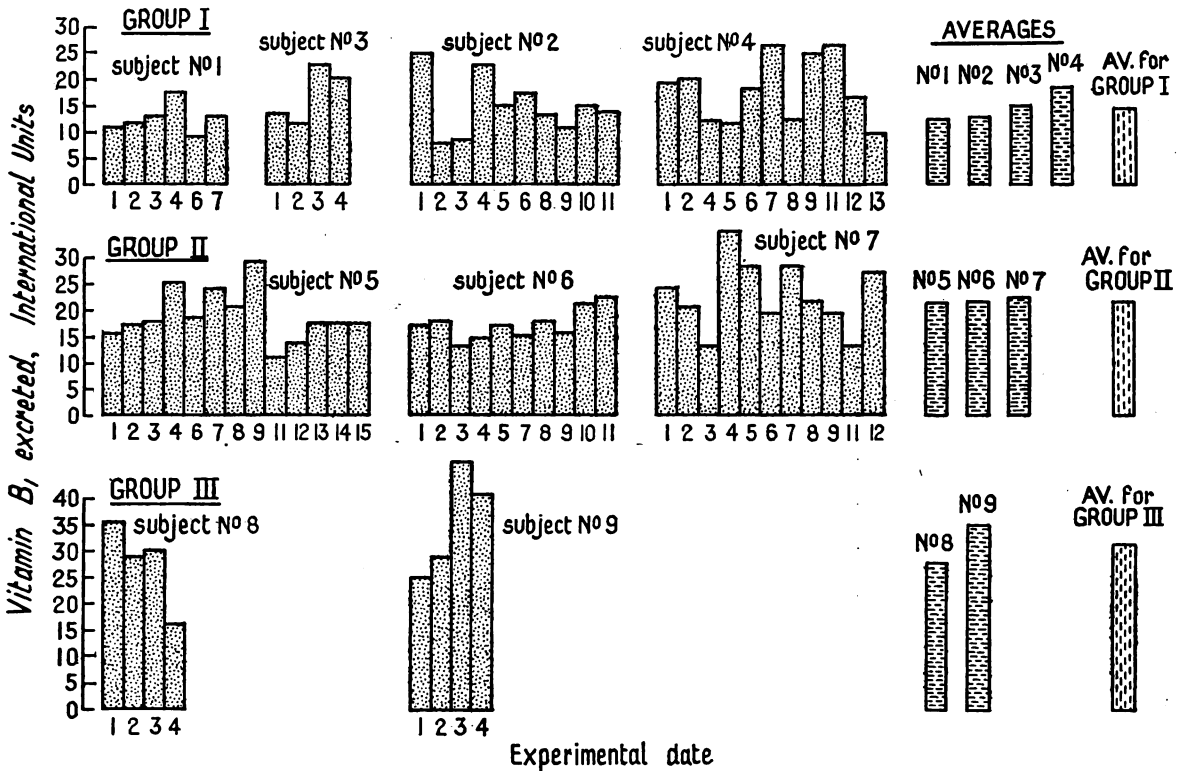


FIG. 2.—Day-to-day excretion of vitamin B<sub>1</sub> by nine adults.

Group I. (Nos. 1-4).—Average resting level = 14 I.U. daily, “moderate reserves.”  
 “ II. (Nos. 5-7).— “ “ “ “ = 21 “ “ “ “ “normal reserves.”  
 “ III. (Nos. 8-9).— “ “ “ “ = 31 “ “ “ “ “good reserves.”

made more dramatically evident when a still larger test dose was tried. For example, subjects who had had a diet unusually rich in vitamin B<sub>1</sub> and were excreting it at the high rate of 51-82 I.U. per day, gave a response of no less than 140-200 I.U. after a test dose of 950 I.U.

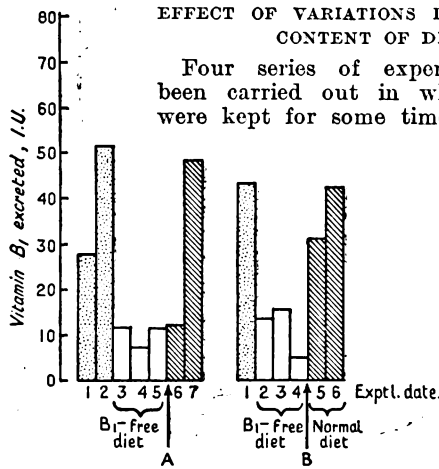


FIG. 3.—Effect of diet free from vitamin B<sub>1</sub> on a subject with good reserves. At A a diet containing about 490 I.U. daily was given. At B a test dose of vitamin B<sub>1</sub> (342 I.U.) was given, followed by normal diet.

(Fig. 3) illustrates [the rapid depletion of reserves which occurs when a diet is taken containing no vitamin B<sub>1</sub>.

A normal subject with a good dietary history was placed for 3 days on a B<sub>1</sub>-free diet, consisting mainly of polished rice, cream crackers, egg-white, and butter. His excretion of vitamin B<sub>1</sub> quickly fell from an initial value of 51 I.U. per day to the subnormal value of 10 I.U. On the fourth day foodstuffs rich in vitamin B<sub>1</sub> were restored to his dietary (eggs, milk, pork, bacon, green vegetables; calculated to contain a total of about 490 I.U. of vitamin B<sub>1</sub>), yet his output remained for a time subnormal. This clearly indicated that a considerable depletion of the vitamin-B<sub>1</sub> reserves had occurred and that the vitamin B<sub>1</sub> consumed on the fourth day was utilised in "saturating" the tissues once again to their previous level. On the following day the excretion had returned to the original normal value. A few days later the experiment was repeated and a similar result obtained. After three days on the B<sub>1</sub>-deficient diet the test dose of 342 I.U. gave only about one half of the response obtained with a normal subject.

(2) Expt. II. (Fig. 4) illustrates results obtained with a subject having an initial low "resting level," his previous

dietary history indicating a less than average intake of vitamin B<sub>1</sub>. As the amount of vitamin B<sub>1</sub> administered daily was increased from time to time there was a corresponding slow increase in the output. Perhaps the most interesting feature of the results however was that there was some lag in the increased urinary output following upon the increased intake. This would indicate that when the vitamin-B<sub>1</sub> reserves are originally low some of the extra vitamin B<sub>1</sub> administered is first absorbed to "saturate" the tissues up to the new level.

(3) Experiments with a normal subject having a higher initial "resting level" are shown in Fig. 5. The results indicate that with a normal adult having good vitamin-B<sub>1</sub> reserves, the tissues become more rapidly "saturated" after a test dose and a more prompt response is seen in the urinary rise.

(4) A further experiment giving quantitative data for the excretion of vitamin B<sub>1</sub> by a normal subject given in turn various levels of vitamin-B<sub>1</sub> intake are recorded in Fig. 6.

QUANTITATIVE RELATION BETWEEN DIETARY INTAKE AND URINARY OUTPUT ("RESTING LEVEL")

Our results indicate that under normal circumstances only a relatively small amount of the vitamin B<sub>1</sub> taken in the food is excreted in the urine. The proportion excreted is notably less than that for vitamin C, under comparable conditions.<sup>2 3</sup>

An attempt to show quantitatively the relation between the vitamin intake and the output is made in Table IX. For this purpose we have made an allowance of 250 I.U. per day to represent the amount of vitamin B<sub>1</sub> found in the ordinary middle-class dietary. This figure was arrived at from calculations based on the vitamin-B<sub>1</sub> values of foodstuffs as determined by the "bradycardia" method and recently published by Baker and Wright.<sup>10</sup> According to our calculations (cf. below, Table XII.) the vitamin-

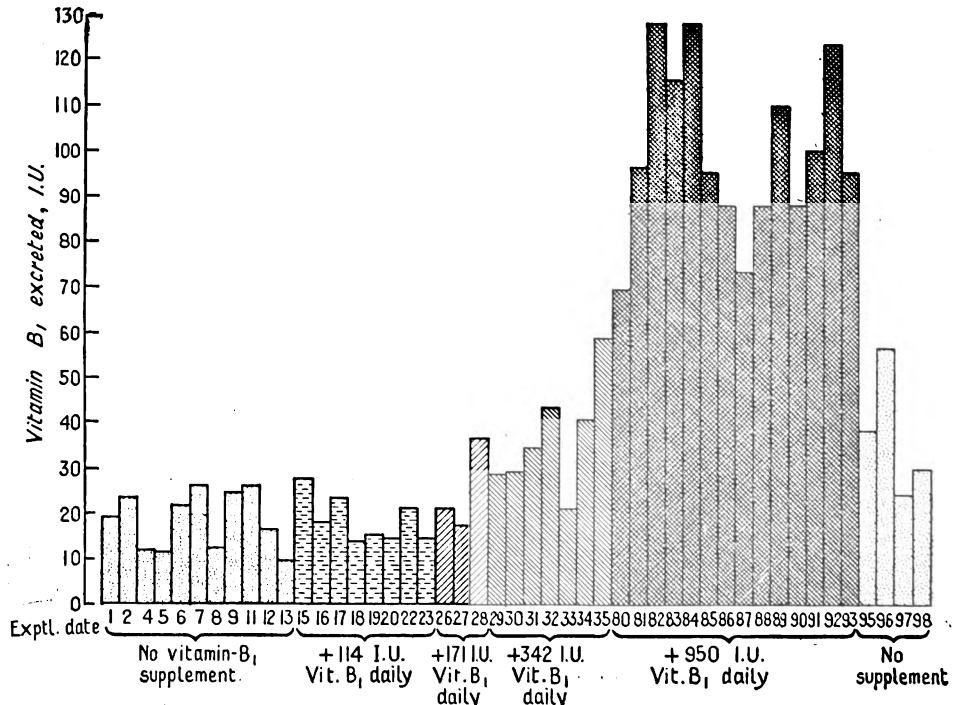


FIG. 4.—Effect of increase in intake of vitamin B<sub>1</sub> in subject with initially rather low reserves.

TABLE IX  
Relation between Dietary Intake and Urinary Excretion of Vitamin B<sub>1</sub>

Daily dose of vitamin B <sub>1</sub> , I.U.	Approx. vitamin B <sub>1</sub> content of diet, I.U.	Total daily intake, I.U.	Average daily output of vitamin, I.U.*	Output expressed as percentage of intake.
<b>As Bemax—</b>				
110 .. ..	250	360	19 (6)	5
170 .. ..	250	420	24 (3)	6
170 .. ..	250	420	27 (4)	6
170 .. ..	250	420	35 (4)	8
340 .. ..	250	590	30 (8)	5
<b>As B<sub>1</sub>-concentrate—</b>				
500 .. ..	250	750	34 (2)	5
500 .. ..	250	750	50 (3)	7
500 .. ..	250	750	40 (3)	5
1000 .. ..	250	1250	44 (3)	4
1000 .. ..	250	1250	100 (10)	8
1000 .. ..	250	1250	68 (6)	5

\* Based on observations for number of days shown in parentheses.

B<sub>1</sub> values of normal dietaries vary from a value of about 200 I.U. for a better working-class regimen (in which the day's food contains moderate allowances of meat, egg, potatoes, and vegetables plus half a pint of milk) to a value of about 400 to 500 I.U. for a richer menu (containing larger allowances of eggs, bacon, potatoes, vegetables, plus one pint of milk). Such an allowance (250 I.U. per day) is clearly no more than a first approximation only, but it serves our present purpose sufficiently well.

Our results are plotted in Fig. 7 and it will be seen that there is a well-defined proportionality between the daily intake and the output of vitamin B<sub>1</sub>.

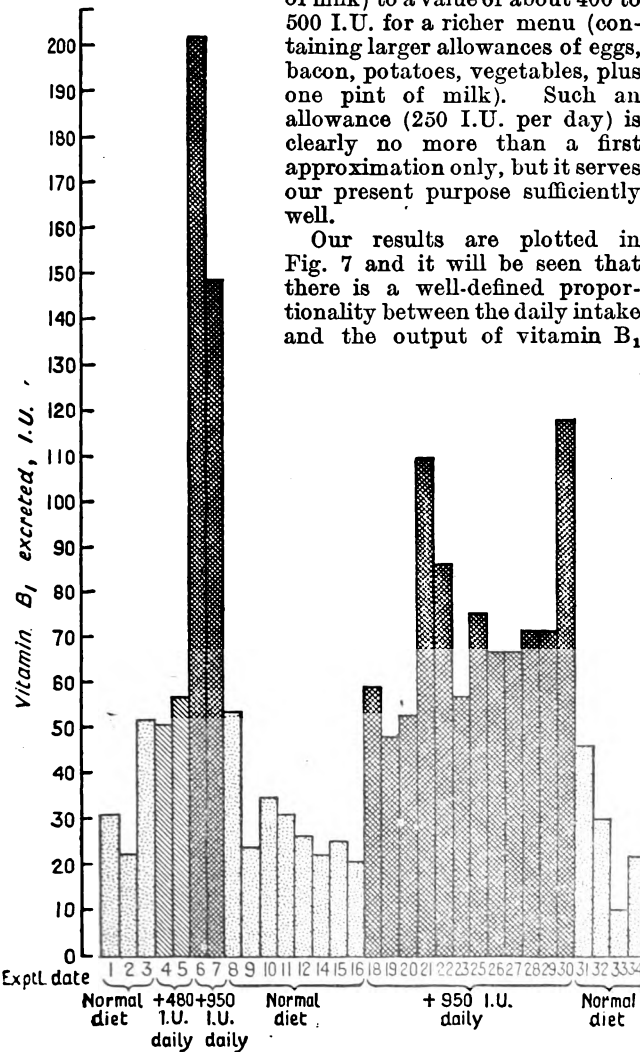


FIG. 5.—Effect of variations in vitamin-B<sub>1</sub> intake. Normal subject.

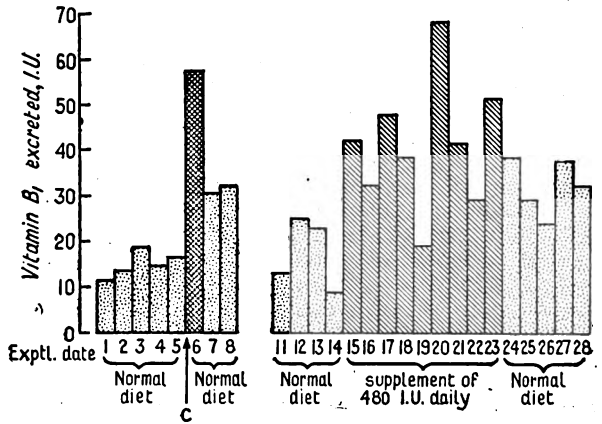


FIG. 6.—Variations in vitamin-B<sub>1</sub> excretion with intake. At C a test dose of 950 I.U. was given.

when a steady state has been reached.† The amount of vitamin B<sub>1</sub> excreted remains fairly constant at around 5 to 8 per cent. of the intake, notwithstanding the wide variations of the latter. As already hinted, this behaviour is rather in contrast with that noted for vitamin C. With vitamin C any very large increase in the intake causes a rapid

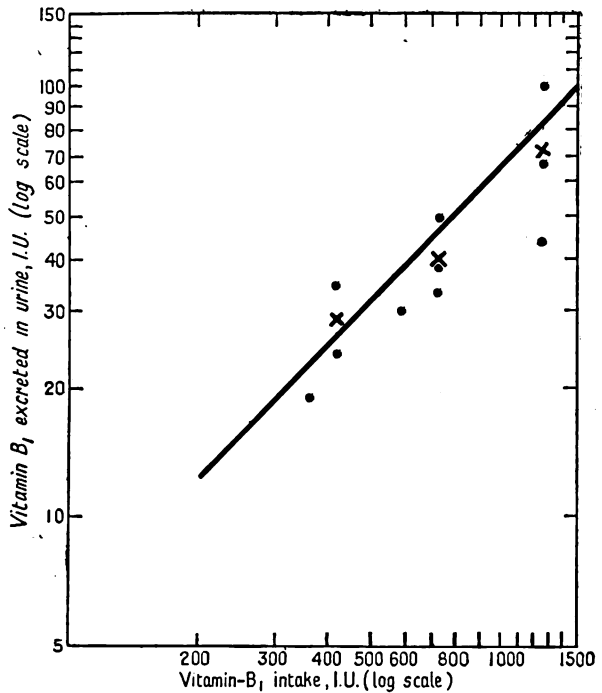


FIG. 7.—Excretion of vitamin B<sub>1</sub> with varying intakes. (Crosses represent averages of groups.)

rise in the output; the tissues quickly become "saturated"; and before long the greater part of the extra vitamin ingested will be excreted—instead of generally only about 5 to 8 per cent. of it as with vitamin B<sub>1</sub>.

† It is important to realise that in this section we are referring to the steady state of excretion after equilibrium has been attained on a given fixed daily dose of the vitamin continued for some time—i.e., when "saturation" has been reached for the given level of intake. Obviously the more immediate response seen just after a change has been brought about in the vitamin intake—as when a test dose is given—depends on the past vitamin history, that is, on the state of the body's reserves.

It is reasonable to assume that vitamin B<sub>1</sub>, being water-soluble, is readily absorbed and distributed by the blood stream, and it appears to be quickly eliminated by the kidneys. Thus we found in one experiment that the administration to a normal subject of a test dose of 950 I.U. led to the excretion of about 90 I.U. after 2 hours—that is, about 9 per cent. of the dose given.

We may therefore conclude that in the metabolism of vitamin B<sub>1</sub> by the normal human body, about 5 to 8 per cent. of the vitamin is quickly eliminated unchanged by the kidneys, and that (apart from any lost in the faeces) a greater part of the remainder is presumably destroyed by metabolic changes in the tissues, the exact mechanism of the latter being still obscure.†

TABLE X

Excretion of Vitamin B<sub>1</sub> in Urine by Infants and Children

Initials (and sex).	Age years.	Diagnosis.	Exptl. date.	Vol. of urine c.cm.	Vitamin B <sub>1</sub> in urine.	
					Daily total, I.U.	Conc., I.U. per 100 c.cm.
D. O. (m.)	1	..	1	260	4.9	1.9
*J. H. (m.)	3	Convalescence after pertussis.	1	350	4.7	1.3
	2		500	11.8	2.4	
	3		500	4.7	0.9	
	4		350	9.5	2.7	
			av.	..	7.7	1.8
S. N. (f.)	3	Inguinal hernia.	1	335	5.3	1.6
	2		250	4.9	1.9	
	3		370	3.8	1.0	
			av.	..	4.7	1.5
E. R. (f.)	4	Otitis media.	1	290	5.7	2.0
	2		380	3.8	1.0	
	3		440	6.5	1.5	
			av.	..	5.3	1.5
G. W. (f.)	5	Broncho-pneumonia.	1	450	4.2	0.9
	2		340	4.9	1.4	
	3		510	7.2	1.4	
			av.	..	5.4	1.2
*M. B. H. (m.)	6	Convalescence after pertussis.	1	1500	17.2	1.2
	2		800	15.2	1.9	
	3		550	5.2	1.0	
	4		700	13.3	1.9	
			av.	..	12.8	1.5
E. D. (m.)	7	Fractured femur.	1	230	5.3	2.3
	2		385	1.9	0.5	
	3		275	5.3	1.9	
			av.	..	4.7	1.6
L. H. (m.)	8	Hæmophilia.	1	305	6.8	2.2
	2		830	8.0	1.0	
	3		710	6.8	1.0	
			av.	..	7.2	1.4
B. C. (f.)	8	Mastoiditis.	1	590	5.7	1.0
	2		275	6.8	2.5	
	3		335	7.6	2.3	
			av.	..	6.7	1.9

\* All subjects except these two were working-class children. The higher daily totals shown by these two compared with other children of the same age is probably significant; they are the children of a nutritional research-worker and had received a diet containing more than the usual working-class allowance of vitamin B<sub>1</sub>—including brown bread, Marmite, and ample milk.

LOW VITAMIN-B<sub>1</sub> RESERVES IN DISEASE OR ON SPECIAL DIETS

As a result of a survey of hospital patients which has been begun, a number of cases of low vitamin-B<sub>1</sub>

† Apparently little of the vitamin B<sub>1</sub> of the food is lost in the faeces. The antineuritic potency of the latter is due to the presence of micro-organisms and bears little or no direct relation to the amount of vitamin B<sub>1</sub> in the diet (unpublished data).

excretion has come to our notice. Three examples may be cited here.

CASE 1.—Aged 72, suffering from carcinoma of the œsophagus, could eat little solid food, and at the time of examination had been on a "light hospital diet" for three days containing little vitamin B<sub>1</sub>. His daily excretion of vitamin B<sub>1</sub> was only 4 I.U. per day.

CASE 2.—Aged 41, suffering from general malnutrition, had a daily output of only 2 I.U. He was examined four and five days after admission during which time he had been on "normal hospital diet."

CASE 3.—Aged 60, suffering from bronchiectasis, and on a "normal hospital diet" for four days excreted only 7 I.U. daily (av.).

It is possible that in certain diseased conditions the absorption of vitamin B<sub>1</sub> from the food is interfered with. Further experiments are also in progress to determine how far lower reserves of vitamin B<sub>1</sub> are common in old age.

DATA FOR CHILDREN

Analyses for vitamin B<sub>1</sub> have been carried out on the urine from a number of infants and children. The results so far obtained indicate that the average values for the concentration of the vitamin in the urine is similar to that for adults—viz., about 1 to 2 I.U. per 100 c.cm. The average total daily outputs, calculated on the basis of kilogramme body-weight, is also of the same order as for adults or perhaps rather higher for the better nourished children. (See Table X.)

EXPERIMENTS WITH LABORATORY ANIMALS

As the more extreme degrees of vitamin-B<sub>1</sub> deprivation can rarely be seen in this country, and such deficiency as does exist is probably nothing more than a moderate degree of hypovitaminosis (see below), we thought it would be instructive to determine the effects upon rats not only of partial deficiencies but also of a more established condition of avitaminosis.

Our tests have led to the important finding that in vitamin-B<sub>1</sub> deficiency in the rat the amount of vitamin B<sub>1</sub> excreted in the urine becomes negligibly

TABLE XI

Urinary Excretion of Vitamin B<sub>1</sub> with Varied Allowances of the Vitamin added to Diets of Rats Suffering from hypovitaminosis B<sub>1</sub>.

Rat No.	Dose of vitamin B <sub>1</sub> added per day to diet of depleted rat, I.U.	Period during which the vitamin B <sub>1</sub> supplement was administered (days).	Period elapsing after discontinuation of vitamin supplement.	Amount of vitamin B <sub>1</sub> found in the rat's urine, I.U. per day.
1	120	11	1 2 3 4 5	10 12  0.7 (a) 0.3 (a)
2	76	1	7	2
3	19	1	1 2 3 4 5	1.4    0.1 (b) <0.1 (b) <0.1 (b)
4	0.6 0.2 0.2	1 1 1	1-5 1-5 1-5	0.1 (b) <0.1 (b) <0.1 (b)
5	0.15	1	1-5	<0.1 (b)
6	0.2	1	1-5	<0.1 (b)

(a), (b) Urine was collected for 2 or 5 successive days respectively, and pooled in order to obtain enough for an estimation of the vitamin-B<sub>1</sub> content.

Note.—Rats 5 and 6 were suffering from a more advanced state of deficiency, and rat 4 from a gradually increasing degree of hypovitaminosis.



small and indeed is scarcely possible of detection (Table XI., rats 4-6).

Furthermore, the experiments on rats confirm the two principal conclusions reached in the tests on human beings: (1) The vitamin-B<sub>1</sub> output varies according to the amount given in the diet (Table XI., rats 1-4). (2) The amount excreted is a small fraction only of that ingested—namely, about 8 per cent., when the steady state has been reached (that is the same fraction as for human beings). (Rat 1, Table XI.)

**Discussion**

Having shown that the subject's dietary history determines his excretion of vitamin B<sub>1</sub>, as also his response to a test dose, the next thing to consider is how these results may be turned to use in relation to problems of human dietetics, as for the determination of the prevalence of undernutrition and for the establishment of vitamin-B<sub>1</sub> standards. Surveys are at present in progress in which our object is to determine average values for excretion in different sections of the community, and to correlate these with the consumption of diets believed to contain either adequate or inadequate amounts of vitamin B<sub>1</sub>. A considerable amount of large-scale experimental work, carried out mainly in America,<sup>11</sup> goes to suggest that a suboptimal intake of vitamin B<sub>1</sub> is not uncommon, especially in bottle-fed babies, for when extra sources of the vitamin (generally of cereal origin) were added to the diet the growth-rates and weight curves went far ahead of those of the control groups. An immediate need therefore is

state of advanced deficiency of the vitamin (i.e., in beri-beri) vitamin B<sub>1</sub> will cease to be excreted in any significant amount. Indeed, preliminary observations (made possible by the kind help of Prof. J. L. Rose-dale) showed that in 7 cases of beri-beri no appreciable amount of vitamin B<sub>1</sub> was being excreted in the urine (viz., < 2.5 I.U. per day), although the patients had

TABLE XIII  
*Calculation of Vitamin-B<sub>1</sub> Needs of Human Beings\**

No.	Description of diet.	Calculated vitamin B <sub>1</sub> content of diet, I.U. per day.	
		Against beri-beri—	
		Diet not protective.	Diet protective.
1	Fletcher, 1905.	152	286
2	Frazer and Stanton, 1907.	130	382
3	Megan and Bhattacharjee, 1924.	200, 206	256, 282
4	"Average" (? liberal) American diet, Sherman, 1924.	..	342
5	Average North China diet, Adolph, 1925.	..	264
6	Institutional diet for school-children (containing 1 pint of milk daily), Corry Mann, 1926.	..	374
7	Average for Cambridge Laboratory assistants (present work; see Table XII.).	..	220-290 (av. 250)

\* Nos. 1 to 5 are quoted from Cowgill's "The Vitamin B Requirement of Man,"<sup>11</sup> the data being re-calculated on the basis that 1 "mg. equivalent" = 0.05 I.U. No. 6 is from Medical Research Council, Special Report Series No. 105, 1926.

TABLE XII

*Calculated Vitamin-B<sub>1</sub> Content of Representative Normal Diets, Cambridge, 1936*

Subject.	Description.	Day.	Amount of vitamin B <sub>1</sub> I.U. per day.
G. G. G.	Laboratory assistant.	1	167
		2	142
		3	361
		4	221
S. A. C.	"	1	410
		2	256
		3	234
		4	234
		5	291
		av. 285	
P. C. L.	Research worker.	1	410
		2	498
		3	508
L. J. H.	"	1	290
		2	360
		3	330
		4	510

already been placed for treatment on B<sub>1</sub>-rich diets. The urine test therefore promises to be of diagnostic use in this connexion, and we hope to publish further data on this aspect of the problem in a later communication. As a simple alternative to the test-dose technique, measurements may be made of the amount of vitamin B<sub>1</sub> excreted during a period of 24 hours while the subject is temporarily restricted to an experimental diet containing no vitamin B<sub>1</sub>. Well-nourished controls are found to carry sufficient "reserves" of the vitamin to be able to continued to excrete significant amounts of it in their urine under these circumstances (see Fig. 3).

*Nutritional standards for vitamin B<sub>1</sub>.*—It is perhaps not premature to essay a few preliminary calculations in the endeavour to determine the probable minimum (or optimum) needs for vitamin B<sub>1</sub>, and the corresponding values for the urinary response. We have estimated the vitamin-B<sub>1</sub> content of a series of characteristic normal diets, and find that an average middle-class (or a better working-class) diet at Cambridge may be expected to contain about 250 to 500 I.U. per day (see Table XII.). A consideration of past clinical records suggests that diets containing less than about 150 to 200 I.U. per day may be inadequate to cure or prevent beri-beri (Table XIII.). Hence a daily intake of 200 I.U. (for a man of 10 st.) may be fixed provisionally as the minimal standard allowance; and reference to the previous tables given in this paper entitles one to reach the conclusion that if a subject excretes less than about 12 I.U. per day (per 10 st. body-weight—the urine having an average concentration of less than about 1 I.U. per 100 c.cm.) a strong presumption must be raised that his diet contained less than a normal allowance of vitamin B<sub>1</sub>.

that such observations be correlated with the corresponding values for urinary excretion of vitamin B<sub>1</sub> on the different diets. It may be added that as far as adults are concerned there is also reason to suppose that large numbers of unemployed and poorer-paid workers, subsisting on diets consisting largely of white bread, margarine, jam, tea, sugar, condensed milk, potatoes, &c.,<sup>12</sup> are likely to be below the optimum in their intake of vitamin B<sub>1</sub>.

Judging from our own short-time experiments on B<sub>1</sub>-free diets, as well as from the experiments on avitaminous rats, there seems little doubt that in a

§ To avoid undue complication, we may ignore the consideration that more precisely the vitamin-B<sub>1</sub> requirements somewhat increase with an enlarged caloric intake or extra carbohydrate.

### Summary

In the search to find a simple method of estimating the state of vitamin-B<sub>1</sub> nutrition of human subjects, quantitative studies have been carried out of the day-to-day excretion of vitamin B<sub>1</sub> in the urine. This can be measured simply and rapidly by means of the "bradycardia" method (Harris). It is shown that the output varies with the dietary intake. In a group of 9 healthy adults (aged 17 to 37) on "normal" diets the amount excreted (November to February) was of the order of 12-35 I.U. (= 30-90  $\gamma$  of vitamin B<sub>1</sub> hydrochloride) with an average of 20 I.U. per day. This represents only a very small proportion (about 5-8 per cent.) of the daily intake of the vitamin (cf. vitamin C). The consumption of a diet containing comparatively small amounts of vitamin B<sub>1</sub> led to a proportional reduction in the daily output of the vitamin, while a diet containing large amounts produced a corresponding increase. The immediate response in excretion after a large test dose of the vitamin was also appreciable graded, according to the past dietary history. Similar results were obtained with experimental animals (rats): in hypovitaminosis-B<sub>1</sub> the amount excreted became negligibly small. Reference is made to preliminary surveys which are in progress to measure the state of vitamin-B<sub>1</sub> nutrition in groups of healthy and diseased children and adults. A daily excretion of less than 12 I.U. (corresponding with an average concentration of 1 I.U. per 100 c.cm.) raises the presumption that the diet contains less than a normal allowance of vitamin B<sub>1</sub>. Preliminary observations confirm the expectation that in actually developed avitaminosis (beri-beri) in man vitamin B<sub>1</sub> may cease to be excreted in the urine in appreciable amounts (< 2.5 I.U. daily).

Our thanks are due to Dr. A. Z. Baker, of Vitamins Ltd., for supplying concentrated preparations of vitamin B<sub>1</sub> and specimens from two human subjects on special diets. Estimations on several pathological subjects were made possible through the valued collaboration of Dr. Leslie Cole and Dr. John Yudkin at Addenbrooke's Hospital, Cambridge.

### REFERENCES

1. Magee, H. E.: Proc. Roy. Soc. Med., 1935, xxviii., 713.
2. See, inter alia: Harris, Ray, and Ward: Biochem. Jour., 1933, xxvii., 2011; Johnson, S. W., and Zilva, S. S.: Biochem. Jour., 1934, xxviii., 1393; Harris, L. J., and Ray, S. N.: THE LANCET, 1935, i., 71.
3. Abbasy, Harris, Ray, and Marrack: Ibid., 1935, ii., 1399.
4. Muckenfuss, A. M.: Jour. Amer. Chem. Soc., 1913, xl., 1606.
5. Gaglio: Policlinico (sez. prat.), 1919, xxvi., 1381.
6. van der Walle, N.: Biochem. Jour., 1922, xvi., 713.
7. Helmer, O. M.: Proc. Soc. Exp. Biol. Med., 1935, xxxii., 1187.
8. Drury, A. N., and Harris: Chem. Ind., 1930, xlix., 581; Drury, Harris, and Maudsley: Biochem. Jour., 1930, xxiv., 1632; Harris: Jour. Agric. Sci., 1934, xxiv., 410.
9. Birch, T. W., and Harris: Biochem. Jour., 1934, xxviii., 602.
10. Baker, A. Z., and Wright, M. D.: Ibid., 1935, xxix., 1803.
11. Bloxson, A. P.: Amer. Jour. Dis. Child., 1929, xxxvii., 1161; Dennett, R. H.: Jour. Amer. Med. Assoc., 1929, xcii., 769; Morgan, A. F., and Barry, M. M.: Amer. Jour. Dis. Child., 1930, xxxix., 935; Hoobler, B. R.: Jour. Amer. Med. Assoc., 1931, xcvi., 675; Summerfeldt, P.: Amer. Jour. Dis. Child., 1932, xliii., 284.
12. Lowry, Sir A., and Pearce, J.: Ministry of Health, Report on Investigations in the Coalfields of South Wales and Monmouth, Cmd. 3272, 1929.
13. Cowgill, G. R.: The Vitamin-B Requirement of Man, Yale University Press, 1934.

DEACONESS HOSPITAL, EDINBURGH.—At the annual general meeting of the Church of Scotland Deaconess Hospital reference was made to the extension and reconstruction of the hospital which is now being carried out. The total alterations involve an expenditure of £40,000, of which £28,000 has already been subscribed. The hospital has been closed since August, 1935, but the district maternity work has been continued. It is hoped that the reconstructed hospital will be reopened in October.

## GLYCOSURIA AND ACETONURIA IN SUBARACHNOID HÆMORRHAGE

A REPORT OF FOUR CASES

By E. J. S. WOOLLEY, M.B., M.R.C.P. Lond.

LATE MEDICAL REGISTRAR, ST. GEORGE'S HOSPITAL, LONDON

THE occurrence of hyperglycæmia and glycosuria following cerebral injury has been recognised since Claude Bernard described his experiments of fourth-ventricle puncture in the middle of the last century. As one of the findings in the examination of the urine of patients suffering from hæmorrhage into the subarachnoid space glycosuria is by no means uncommon. When this glycosuria is associated with acetonuria in a comatose patient, it may lead to errors of diagnosis. This possibility has been pointed out by Hinds Howell,<sup>1</sup> but apart from his observation it seems that the condition has attracted little attention in this country. In 1929 Römcke and Ustvedt<sup>2</sup> described 27 cases of subarachnoid hæmorrhage: in one of these glycosuria and acetonuria were found. In the following year 2 more cases were described, 1 by Bix<sup>3</sup> in Vienna and 1 by Vitkova and Vitek<sup>4</sup> in Paris. Römcke and Skouge<sup>5</sup> have since described 14 cases of cerebral hæmorrhage and 1 of epilepsy in which acetonuria was demonstrated. More recently 2 further cases have been recorded by Jamieson and Scott<sup>6</sup> in Canada, and 1 by Rathery, Hesse, and Roy<sup>7</sup> in France.

In each of the 4 cases of hæmorrhage into the subarachnoid space described below, acetone and sugar were found in the urine, and 1 presented a clinical picture which resembled in some respects that of hyperglycæmic coma. An examination of the records of St. George's Hospital has revealed 1 other case of proved subarachnoid hæmorrhage in which it is recorded that "a minute trace of acetone" was found in the urine. Since the nature of the test used and the extent of the minute trace of acetone demonstrated are not disclosed, the case is not included in this series. It is of interest, however, to note that this patient was given insulin before the true diagnosis was revealed by lumbar puncture.

### CASE RECORDS

CASE 1.—A woman, aged 59, was admitted to St. George's Hospital Dec. 24th, 1933. It was stated that she had suffered from "blood pressure" for some months, but the exact nature of her symptoms was never satisfactorily ascertained. No story could be obtained from relatives in any way suggestive of the symptoms of diabetes mellitus. It was subsequently learnt that her systolic blood pressure had recently been in the neighbourhood of 240 and that the urine was sugar-free a few weeks before admission. On the evening before admission she took a short walk, and on her return sat down in a chair to rest. Here she was discovered by her relatives, who found that they were unable to rouse her. She remained unconscious throughout the night, vomiting from time to time. At 11.30 on the following morning she was admitted to hospital.

On examination she was profoundly unconscious; the temperature was 99.4° F.; pulse-rate 130, regular and of good volume; respiration-rate, 36; blood pressure was 130/80. The breath was excessively foul but free from any odour of acetone; the intra-ocular tension was not abnormal; the tongue was dry and coated, and crusts hung from the lips. The heart was slightly enlarged, the apex-beat being in the fifth space 4 inches from the mid-line; the sounds were weak and there were no murmurs. Apart from moist râles at both bases the chest was normal. The pupils were slightly dilated and failed to react to light; there was no corneal reflex; the fundal vessels showed some arterio-sclerotic change and the discs were

normal. All tendon reflexes were extremely sluggish and the abdominal and plantar reflexes were not obtained. The urine contained red cells, albumin, sugar by Fehling's and Benedict's tests, and acetone by Rothera's nitroprusside test; the last-named test was strongly positive, but Gerhardt's ferric chloride test was negative. The cerebro-spinal fluid was under a pressure of 230 mm. of fluid and two specimens which were withdrawn consecutively were intimately and equally mixed with blood.

*Course.*—The patient failed to regain consciousness and died of pulmonary œdema 48 hours after admission. Permission to make a post-mortem examination was refused.

**CASE 2.**—A woman, aged 29, a domestic servant, was admitted to the hospital Sept. 29th, 1935. For about two years she had suffered from headaches which had become gradually more severe during the last few months; otherwise she had enjoyed good health. There was no history of polyuria, polydipsia, or loss of weight. At 11 o'clock on the night of her admission, while visiting her mother, it is stated that she complained of pain in the back of the neck and said that she felt unwell. She returned to her place of employment and retired to bed. At midnight she rang her bell and was found in a dazed condition from which she rapidly passed to deep coma. There was no history of her having vomited.

*On examination* at 2.30 A.M. she was found to be deeply unconscious, cold, and clammy. The temperature was 96° F.; the pulse-rate 88, regular, and of good volume; and the respiration-rate 14. The blood pressure was 135/90. There was no odour of acetone in the breath, which had a heavy stale smell. No abnormal physical signs were detected in the heart; there were a few scattered râles on both sides of the chest, but it was otherwise normal. The pupils were small, equal in size, and reacted to light; the optic discs were slightly blurred at the edges; there were no fundal hæmorrhages. The tendon reflexes were present and equal on both sides; there was a bilateral extensor plantar response. The urine was found to contain sugar by Benedict's test, and Rothera's test for acetone was strongly positive; but the ferric chloride test was negative; no other abnormal constituents were found. The cerebro-spinal fluid was under increased pressure which was not measured, and was intimately mixed with fresh blood; two specimens were taken and were found to be of the same degree of coloration.

*Course.*—The pulse-rate and the temperature rose steadily and the respiration-rate fell to 12. The patient died seven hours after admission without regaining consciousness.

*Post mortem* the right cerebellar fossa contained about 2 oz. of blood. The upper part of the right lobe of the cerebellum was markedly macerated; the fourth ventricle, the aqueduct of Sylvius, and the lateral ventricles contained blood. Both the aqueduct and the ventricles were somewhat dilated. Stained sections of the cerebellum examined microscopically showed no evidence of tumour or cyst in which the hæmorrhage might have originated. It is probable that the hæmorrhage occurred from the right posterior superior cerebellar artery. No aneurysm, however, was found. The lungs were congested, but otherwise normal. The aorta showed early atheromatous changes. The spleen and kidneys were congested. No abnormality was detected in the other organs.

**CASE 3.**—A man, aged 43, a car salesman, was admitted to the hospital on Oct. 1st, 1935. His general health had been poor for two years during which time he had suffered from lassitude and fits of depression. Three weeks before admission he had had an attack of numbness in the left arm which had passed off after a few hours. For five days he had complained of headache which had become progressively worse. There had been no history of an abnormality of thirst, appetite, or micturition. On the evening of his admission to hospital he had consumed a large meal. While resting after this meal he suddenly collapsed and, after remaining inert for a few moments, became extremely violent and noisy. He did not vomit.

*On examination* he was found to be quite irrational. During the course of the clinical examination morphine hydrochloride gr.  $\frac{1}{4}$  was given, and before it had been completed he had passed into coma. He vomited once during the examination. The temperature was 95° F., the pulse-rate 80, and the respiration-rate 24; blood

pressure was 110/65. There was no odour of acetone in the breath; the tongue was clean. The apex-beat was in the fifth space  $3\frac{1}{2}$  inches from the midline, the sounds were distant, and there were frequent extrasystoles. No abnormality was found in the lungs. The pupils were somewhat dilated and reacted to light; the right fundus only was clearly seen and appeared normal. The tendon-jerks in both arms were very much increased, but were equal on the two sides. The knee- and ankle-jerks on the left were distinctly brisker than those on the right. The plantar response on the left was extensor, that on the right could not be elicited. The abdominal reflexes were present. The urine was found to contain sugar in considerable quantity by both Fehling's and Benedict's tests; Rothera's test for acetone was strongly positive, but the ferric chloride test was negative. The cerebro-spinal fluid had the appearance of pure blood and was under such pressure that a reading could not be obtained with the ordinary manometer measuring up to 300 mm.

*Course.*—Coma continued to deepen, respiration became more stertorous, and the rate fell to 12 per minute. The pulse-rate remained steady and became regular, but the volume became gradually less. The abdominal reflexes disappeared and an extensor plantar response was elicited on the right side before death occurred  $6\frac{1}{2}$  hours after admission and  $7\frac{1}{2}$  hours after the attack.

*Post mortem* the surface of the cerebral hemispheres was covered by fresh blood which filled the cranial fossæ and had penetrated to the cerebral ventricles. The hæmorrhage had originated from the left middle cerebral artery in the fissure of Sylvius, where there was considerable destruction of brain tissue. Sections of the cerebral cortex in the immediate neighbourhood of the hæmorrhage showed a marked excess of polymorphonuclear leucocytes in some of the vessels. No aneurysm was found on the middle cerebral artery itself, examination of which was difficult because its remains were embedded in clot to which they were adherent. There were a few petechial hæmorrhages into the duodenal mucous membrane. The lungs, spleen, and kidneys were congested. The heart and other organs were normal.

**CASE 4.**—A man, aged 59, a silver cleaner, was admitted to hospital on Nov. 15th, 1935. Nothing is known of his past medical history for he lived in lodgings and was without friends. It is probable that he suffered from headaches, since his urine was found to contain salicylates. On the day of admission he was found by his landlady lying in bed in a comatose condition from which she was unable to rouse him. There was no evidence of his having vomited.

*On examination* the patient was deeply unconscious; he appeared well nourished. The temperature was 97.8° F.; the pulse-rate 56, regular and of fair volume; respiration was stertorous, the rate 40. Blood pressure was 160/80. The area of cardiac dullness was normal and the heart sounds so distant as to be practically inaudible. Moist râles were heard all over the chest, which was otherwise normal. The pupils were fixed and unequal, the left being dilated and the right constricted. The fundus of the left eye only was seen; papilloedema was present, but there were no hæmorrhages. The tendon-jerks in the arms and legs were present, equal on the two sides and not exaggerated. The abdominal reflexes were absent; a bilateral extensor plantar response was obtained. The urine contained much albumin; Benedict's test for sugar was strongly positive and an immediate strongly positive reaction was obtained with Rothera's test, but the result of the ferric chloride test was obscured by the presence of salicylates. The cerebro-spinal fluid was under increased pressure, which was not measured, and was deeply and uniformly stained with fresh blood.

*Course.*—The patient died without regaining consciousness three hours after admission, and four hours after he had been found to be in coma.

*Post mortem* the seat of the hæmorrhage was found to be in the anterior part of the right parietal lobe. Here there was a cavity containing macerated brain substance and blood clot, which had ruptured into the lateral ventricle. Both lateral ventricles, the third and the fourth ventricles, contained blood. From the fourth ventricle sufficient blood had leaked to produce large collections at the base of the brain and beneath the arachnoid on the surface of

the cerebral hemispheres. There was early atheroma of the aorta, the heart was somewhat fatty, the kidneys and spleen were congested, the lungs œdematous, and the liver fatty.

#### DISCUSSION

Apart from the fact that sugar and acetone were demonstrated in the urine, and that all four illnesses were fatal, these cases have little in common. In the three in which a post-mortem examination was made the only common findings were extensive destruction of brain substance and the presence of blood or deeply blood-stained fluid in the cerebral ventricles; the site of the hæmorrhage was different in each case. It is interesting to note that the findings in Case 3 were almost identical with those described by Jamieson and Scott<sup>6</sup> in their second case. Case 1 was sent to hospital with the diagnosis of diabetic coma, having been seen by her own doctor; the true nature of the condition was revealed by lumbar puncture which was performed chiefly in view of the absence of acetone in the breath and the negative Gerhardt's test. The presence of a strongly positive Rothera's test was, at the time, thought to be due to the patient having taken no food for some 18 hours and during that time she had vomited frequently. In Cases 2, 3, and 4, however, there was no emesis before admission, and in two of them the urine was examined within three hours of the ictus. In Case 3 the patient had recently taken a large meal. It seems, therefore, that the ketonuria is not the result of starvation.

The possibility that these patients were the subjects of undiagnosed diabetes mellitus cannot be excluded. There is no evidence in support of such a conjecture, except for the history of lassitude in Case 3. It is known that the urine of Case 1 had been sugar-free a few weeks before her final illness. In the case described by Bix<sup>3</sup> and three of those recorded by Rømcke and Skouge<sup>5</sup> the patients were known to be non-diabetics.

The urine in each was obtained by catheterisation. The lubricant and the disinfectants used have been shown to contain no acetone either as part of their composition or as an impurity. The tests were Rothera's nitroprusside test and Gerhardt's ferric chloride test. In each specimen the former was strongly positive; a deep purple coloration developed almost immediately and rendered the solution opaque within the space of a few minutes. The ferric chloride test was negative in three cases and indefinite in one. It therefore seems probable that ketone bodies occurred in the urine in small quantities only; acetone alone may have been present, but that is extremely improbable.

The mechanism whereby ketonuria is produced in these cases is obscure. It seems that the hyperglycæmia following either piqûre or pathological cerebral injury is the result of sympathetic stimulation. According to Macleod<sup>8</sup> and others, glycogen is liberated from the liver as the result of stimuli reaching that organ through the hepatic nerves, reinforced by the action of adrenaline, increased secretion of which occurs following stimulation of the suprarenals through the splanchnic nerves. Hubbard and Wright<sup>9</sup> have shown that the injection of adrenaline in healthy individuals produces a definite rise in the quantity of ketone bodies in the blood. It is possible therefore that the ketonuria is the result of a massive increase in the secretion of adrenaline. An alternative theory involves the assumption that there is pancreatic dysfunction as the result of deranged nervous control. It has been shown by Clark<sup>10</sup> that the islets of Langerhans normally

receive inhibitory stimuli through the vagi. If the centres of origin of such stimuli were themselves stimulated as the result of hæmorrhage a true diabetes might result.

Bix<sup>3</sup> objects to theories suggesting central causation of ketonuria on the grounds that it has not been produced by piqûre. The stimulus acting upon a cerebral centre following an intracranial vascular catastrophe is associated with sustained increased pressure, and is of a very different order from the temporary stimulus of experimental piqûre. It is difficult therefore to uphold his argument.

One of the cases recorded by Rømcke and Skouge<sup>5</sup> showed a positive test for acetone while the tests for sugar were negative. This would seem to oppose both the theories outlined above, although as these authors point out, in a patient with small glycogen reserves the hyperglycæmia would be of mild degree and short duration. Both theories involve the acceptance of views and experimental work concerning which there is some dispute.

Be the explanation of the ketonuria what it may, it is in the difficulty of diagnosis to which it may give rise that the real interest lies. The coma following intracranial hæmorrhage may, in the absence of signs directing the attention to the central nervous system, simulate the coma of hyperglycæmia so closely that differentiation of the two conditions may be extremely difficult. It is unusual for the odour of acetone to appear in the breath following subarachnoid hæmorrhage, but its presence has been described.<sup>4</sup> In none of the cases recorded has altered intra-ocular tension been found. A negative ferric chloride test is common in these cases and, since it must be extremely rare in hyperglycæmic coma, it is valuable in differentiating the two conditions. The test was, however, found to be positive in four of the cases described by Rømcke and Skouge.<sup>5</sup>

#### SUMMARY

Four cases of hæmorrhage into the subarachnoid space are reported associated with glycosuria. In all of these ketone bodies were present in the urine in small but definite amounts, as evidenced by a strongly positive Rothera's test. The differential diagnosis from diabetic coma can be made in the absence of neurological signs by the ferric chloride reaction, which is usually negative in subarachnoid hæmorrhage; in diabetes it is almost always positive. In each patient there was extensive destruction of brain substance and the ventricles were filled with blood. It was not possible to determine whether the ketonuria was due to sympathetic stimulation, causing an excessive secretion of adrenaline, or to pancreatic dysfunction due to central irritation.

I am indebted to Dr. Anthony Feiling and Dr. Hugh Gainsborough, under whose care these patients were admitted, for permission to publish the cases, to Dr. John Taylor and Mr. Garthowen Williams for the pathological reports, and to Dr. Winterstein-Gillespie for his assistance in translating the German references.

#### REFERENCES

1. Hinds Howell, C. M.: *Brit. Med. Jour.*, 1931, ii., 209.
2. Rømcke, O., and Ustvedt, H. J.: *Norsk. mag. f. lægevidensk.*, 1929, xc., 441-464.
3. Bix, H.: *Wien. klin. Woch.*, 1930, xliii., 1373.
4. Vitkova, L., and Vittek, J.: *Rev. neurop.*, 1930, ii., 424.
5. Rømcke, O., and Skouge, E.: *Acta med. Scand.*, 1931, lxxvii., 210.
6. Jamieson, H. O., and Scott, J. W.: *Canad. Med. Assoc. Jour.*, 1935, xxxii., 540.
7. RATHERY, F., HESSE, J., and ROY, L.: *Bull. et mém. Soc. méd. hôp. de Paris*, 1935, li., 441.
8. Macleod, J. R. R.: *THE LANCET*, 1932 i., 1079.
9. Hubbard, R. S., and Wright, F. R.: *Jour. of Biol. Chem.*, 1921, xlix., 385.
10. Clark, G. A.: *Jour. of Physiol.*, 1931, lxxiii., 297.

## CLINICAL AND LABORATORY NOTES

A CLAMP FOR STRETCHING  
CONGENITAL CLUB-FEET

By M. FORRESTER-BROWN, M.S., M.D. Lond.

SENIOR SURGEON TO THE BATH AND WESSEX ORTHOPÆDIC HOSPITAL; CONSULTING ORTHOPÆDIC SURGEON TO THE DORSET AND SOMERSET ADULT TUBERCULOSIS HOSPITALS AND TO THE WILTS COUNTY COUNCIL

ONE of the difficulties in correcting the equinus deformity of a congenital club-foot is that, at the age when treatment is most advisable—i.e., in early infancy—the bones are very small and relatively soft in comparison with the dense shortened ligaments. It is therefore essential to localise very accurately the correcting force. In order to get a true dorsiflexion of the ankle, and not merely a pseudo-correction by lifting up the front of the foot at the mid-tarsal region, one must push up the front of the os calcis at the same time that one brings down its posterior end with the insertion of the tendo Achillis, thus restoring the normal tilt to its axis, which in club-foot is horizontal instead of upwards and forwards.

Some surgeons have stated that this manoeuvre can only be accomplished by pulling downward with a pin passed deep to the tendo Achillis. I have found, however, that the clamp here illustrated is equally effective. It leaves the surgeon's hands free to control the lateral movements of the foot, so that after dorsiflexion in inversion, which is relatively easy, the foot can be stretched into valgus; for, unlike the contractures of the tendo Achillis in other conditions, that in club-foot is tightest in the everted position, owing to a lateral displacement of the tendon.

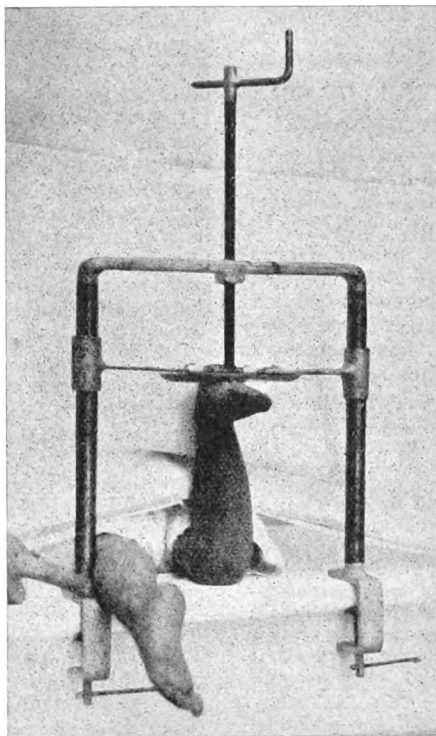
In an infant whose club-foot is not yielding to regular manual stretching followed by fixation with adhesive strapping (to include the flexed knee), it is best to anaesthetise the child deeply. He is placed prone, in which position the knee is best kept free from lateral strain, and the lower leg lies vertically with the sole upward in the clamp; this is made on the same principle as those used by book-binders. A small cushion should be placed under the knee to protect the patella from bruising and the foot should be steadied so that the cross-bar of the clamp, which is convex downward, fits into the hollow just in front of the os calcis (mid-tarsal joint). While the surgeon steadies the foot, an assistant tightens the screw slowly, gradually forcing the front of the os calcis toward the table, the bone acting as a lever to bring the insertion of the tendo Achillis further from the calf. It is the slow and even stretching afforded by the clamp that is so valuable, as the surgeon's thumb is apt to tire and act unevenly

when used for a similar purpose. When used slowly, there is no bruising by the clamp nor tearing of the muscle. If it is found that there is no appreciable stretching of the tendon, as happens in the worst cases, it is desirable to tenotomise the posterior ligaments of the ankle deep to the tendo Achillis; often the external and occasionally, also, the internal lateral ligament should be divided at the same time, though, contrary to what one might expect with a varus deformity, it is the posterior fasciculus of the external ligament, rather than the internal, that obstructs dorsiflexion. The foot should be removed from the clamp for the tenotomy and then replaced, while the surgeon keeps pressure on a dressing over the tenotomy opening. This bleeds briskly for a short time, but if the tenotome has been kept close to the bone the vessels that it divides do not jeopardise the

circulation to the foot. After the ligaments are cut, the tendon is fairly easy to stretch, as one's force affects the elastic fleshy belly, which previously had been splinted by the ligaments. The advantage of not tenotomising the tendon itself is that it is always poorly developed in the worst cases of club-foot, the very ones which require manipulation under an anæsthetic, so that there is serious risk of weakening it by immediate correction after division, or by too early stretching of the scar, and it must be remembered that a calcaneus is a more disabling deformity than an equinus. If time is allowed for the divided tendon to reunite the ligaments are also reuniting. Accordingly, I have found this method of dividing ligaments and simultaneously merely stretching the muscles a very valuable one. I have never failed to get full correction of all the elements of the club-foot deformity. This is not the same thing as saying that relapse may not occur later. As I have pointed out in a recent investigation of a large number of late results,<sup>1</sup>

the bad club-foot represents not a fixed deformity like that after a badly set fracture but an impetus to faulty development, to resist which will tax all the surgeon's patience and ingenuity during the whole period of the child's growth.

As soon as the foot falls limply into the corrected position it is removed from the clamp and enclosed in plaster with the knee at right angles and the child still prone. Stockingette is applied and three pads only are inserted under it—i.e., one on the dorsum of the foot, one over the tendo Achillis, and one over the patella. Heussner's glue is then poured over the heel to prevent the ill-developed heel slipping upward and plaster is applied directly over the stockingette, very smoothly without any dragging. It is essential to mould closely, as these feet slip very



The clamp in use.

<sup>1</sup> Jour. Bone and Joint Surg., 1935, xvii., 661.

easily and then get sore; as an index of this it is useful to mark with an indelible pencil the line of the toes when the plaster is finished, when any slipping upward is noticeable at once. If the patient is going into the country, one may split the plaster up the dorsum so that it could be easily removed if serious disturbance of the circulation occurred. The bad cases have shortening of the vessels and nerves behind the ankle, as well as of the other tissues, and poor circulation is the rule. Nevertheless, with the technique described and fixation of the knee in flexion, which relaxes the popliteal vessels, no serious trouble has been encountered. In the worst cases, in which open operation has been necessary in older children, it has been noted that when the obstructions to dorsiflexion have been dealt with and the foot brought to a right angle with the leg, not only is the astragalus incongruous to the tibia, but the circulation in the foot ceased until the angle was altered to about 100°, at which point blood again flowed into the stretched posterior tibial artery. It is not clear why the relaxed anterior tibial vessels do not suffice.

### SUPPURATING DERMOID CYST OF THE GASTROHEPATIC OMENTUM

By E. N. MacDERMOTT, M.D. Dub., F.R.C.S. Irel.

JUNIOR SURGEON TO THE CENTRAL HOSPITAL, GALWAY  
PROFESSOR OF THERAPY, PHARMACOLOGY, AND MATERIA  
MEDICA, UNIVERSITY COLLEGE, GALWAY

OMENTAL dermoids are amongst the rarest of intraperitoneal lesions. Shapiro and Meyer<sup>1</sup> were able to find records of 33 cases, other than their own. I have been able to collect five further references.<sup>2-6</sup> Although dermoids and teratomata are ubiquitous in distribution, the cases of Shapiro and Meyer, and of Kowalczyk were the first such growths of the lesser omentum to be recorded.

A boy, aged 7 years, was admitted to the Galway Central Hospital with a history of abdominal pain and vomiting of two weeks' duration; the pain had increased in intensity until admission. He had a temperature of 103° F. (axillary), a pulse-rate of 138, and respiration-rate of 44. The abdomen was distended, rigid, and tender; the tenderness and rigidity were most marked on the right side, the maximum point of tenderness being about 2 in. above McBurney's point, and they were enough to prevent a satisfactory examination.

With a diagnosis of "acute abdomen," the abdomen was opened under ether anaesthesia by a right paramedian incision through the rectus, centred on the umbilicus. There was a little serous fluid in the peritoneal cavity. The caecum and appendix were normal. A firm oedematous tumour was felt in the right hypochondrium. A few recent adhesions between the anterior abdominal wall and the tumour were divided, and a tense, spherical mass about the size of a cricket ball was delivered through the wound. This was dissected free from the transverse colon, gastrohepatic omentum, and anterior surface of the pylorus, to which it was attached; it seemed to have originated in the lesser omentum above the pylorus. The peritoneum over the tumour and the adjacent structures all showed much inflammatory thickening. During removal the cyst was perforated and material flowed out exactly resembling in appearance and smell the mixture of pus and sebum found in the common suppurating sebaceous cysts; this was mopped up and the abdomen closed without drainage.

Convalescence was prolonged by an abscess of the abdominal wall, but was otherwise satisfactory, the patient leaving hospital on the 31st day in excellent general condition. He has since been readmitted with occasional vomiting and a severe secondary anaemia, which required

a blood transfusion. Six months after operation he is said to be in good health.

On section the cyst wall was found to consist of an outer layer of dense inflamed connective tissue with an inner lining of granulation tissue, the original lining having apparently been destroyed by the inflammation. Other parts of the mass consisted of inflamed connective tissue of texture varying from myxomatous to fibrous.

The great *rarity* of such cysts is emphasised by Judd.<sup>7</sup> Preoperative diagnosis must of necessity be exceptional; in point of fact the majority of intraperitoneal dermoids have been discovered during the course of laparotomy for some other concurrent or apparent lesion. In some few cases the diagnosis of mesenteric cyst had been considered preoperatively.

The *symptoms* are those of pressure on the stomach, intestine, or biliary tract, or perhaps, in the case of a retroperitoneal dermoid, of pressure on the kidney or ureter, or great vessels—when the condition might simulate an aortic aneurysm. The *signs* will be a tumour, in uncomplicated cases painless, usually smooth, sometimes fluctuant, and of varying though generally considerable mobility. Among the possible *complications*: are (1) inflammation of the cyst; (2) torsion of the omentum, described by Aviles<sup>8</sup>; and (3) acute intestinal obstruction, described by Foucault. Inflammation of such a cyst has seemingly not hitherto been described, though it is a frequent complication of the commoner ovarian dermoids; it was mentioned as a possibility by Meyer and Shapiro. The *treatment* of these tumours is of course excision, when practicable, and, if this is not possible, marsupialisation as performed by Meyer and Shapiro.

#### REFERENCES

1. Meyer, K., and Shapiro, P.: Amer. Jour. Surg., 1935, xxvii., 551.
2. d'Abreu, A. L.: Brit. Jour. Surg., 1934, xxii., 390.
3. Montgomery, J. G., and Morest, F. S.: Jour. Missouri Med. Assoc., 1934, xxxi., 456.
4. Foucault: Rev. méd. du centre-ouest, 1934, vi., 205.
5. Treutinger, J.: Arch. f. Gynäk., 1934, clv., 595.
6. Kowalczyk: Polski. przegl. chir., 1934, xiii., 424 (Abstr. in Zentralbl. f. Chir., 1935, lxi., 2352).
7. Judd, E. S., and Fulcher, O. H.: Surg. Clin. North America, 1933, xiii., 835.
8. Aviles, M.: Bol. Soc. de cir. de Chile, 1932, x., 157 (quoted by Meyer and Shapiro, Ref. 1).

### CONGENITAL ABSENCE OF AN UPPER AND LOWER LIMB

By A. H. BIZARRO, F.R.C.S. Eng.

SURGEON TO SAN FRANCISCO HOSPITAL, OPORTO, PORTUGAL

A FEMALE child, aged 4, was brought to me a few months ago. I found that she had total absence of the right upper and lower limbs and of the left fibula and fifth toe. Free, wrinkled skin covered the right shoulder-joint. At the right hip a small pedunculated knob, like an olive, was to be found in the acetabular area; it looked like a toe and was the sole representative of the components of the right lower limb. There was a severe valgus deformity of the left foot and full, passive extension of the left knee was impossible from disuse, and was limited by about 40°.

A skiagram of the right shoulder showed a normal clavicle, a rather overdeveloped acromion, and complete absence of the glenoid. In the right hip the acetabular zone was without any triradiate formation. It is interesting to note the absence of both glenoid and acetabulum. There was a



small bone, exactly like a toe phalanx, in the skin covering the hip. The left fibula was absent, as well as the fifth toe and its metatarsal. The child uses her left upper limb in a normal fashion. There was nothing relevant in the family history.

I suggested an orthopædic boot to correct the valgus and the use of a crutch to enable her to learn to stand up and gain balance. Possibly, later she may be able to walk about, when the knee and valgus deformities have been treated.

## MEDICAL SOCIETIES

### WEST KENT MEDICO-CHIRURGICAL SOCIETY

A MEETING of this society held on April 3rd, with Dr. J. R. WYLIE, the president, in the chair, was devoted to a debate on the motion that the

#### Neurotic Patient Should be Treated by His Own Family Doctor

Dr. F. HUDSON EVANS, in proposing, said that most practitioners have several neurotic patients and although it may be said that doctors live partly by them, certainly these patients live entirely on the doctor. In treating them the doctor should remember that there is usually a reason and foundation for their state and the first necessity was a complete physical overhaul; doubtful points should be referred to specialists; and any related defect should first be treated. A disadvantage, however, of specialist treatment for these cases was the hospital attendance and the inevitable contact there with abnormal and sick people. The neurotic patient required to be surrounded by normal people, to have plenty of work and play, and little time to think about himself. An anxiety neurosis could often be dispelled by the buoyant attitude of the doctor; many people had reason to be anxious—perhaps about their business, their domestic affairs, or their legal position—and confided to their doctor troubles which they would not tell to their parson. The doctor should talk their troubles over with them and assist them as far as possible to accept what could not be altered in their position. After an accident the neurotic patient was slow to recover and then often required alternative—carrot and pitchfork—forms of treatment.

The speaker considered that the manic-depressive tended to become worse in mental hospitals but would ultimately get better if adequately treated at home. The general practitioner should remember that patients with anxiety neuroses do not commit suicide, but that it was dangerous to treat a psychosis as a neurosis. His experience of psycho-analysis was only of one case which had ultimately come to a successful issue, but he felt that the time involved and the danger of rousing sleeping dogs were serious drawbacks to this therapy. The family doctor should treat the neurotic patient as one man to another, and although he should make every effort to secure the relatives as allies he should leave them outside when interviewing the patient. He should find out about the patient's way of living and whether he read medical books and health chats; he should reassure the patient throughout his examination and summarise the findings at the end of the interview. In hysteria the symptoms might be produced and cured by suggestion, but the symptoms were the patient's means of escape from a situation; the patient did not thank the doctor for curing him of his symptoms and so returning him to the original situation.

Dr. Evans had found that the most potent remedy for the neurotic patient was severe depletion of the

pocket. It made other treatment more effective and inculcated the desire to get well. The doctor's duty was also to reassure these patients and to try to make their lives happier. He felt that such treatment should be undertaken by the family doctor.

Dr. EDWARD GLOVER said that, while formally opposing the motion, he wished to discuss the means of obtaining really competent treatment of the patient rather than the question of who should undertake it. He himself was neither in favour nor against the motion. In favour of it must be said that not only were there cases which should be treated by the family doctor, but, as Dr. Evans had said, neurotic patients always insisted on treating themselves by going to the family doctor. At the other extreme there were cases of pure neurosis the treatment of which demanded specialised training, and it was positively wrong for the family doctor to attempt it. He likened this position to an emergency of major surgery, where, except, say, on a desert island, a doctor would not undertake the treatment unless he had the skilled training and constant practice of the surgeon. Between these extremes there were two intermediate classes where the family doctor might undertake treatment. There were certain forms of special treatment, such as suggestion, hypnosis, and sidetracking, for which there was no recognised training. If the family doctor had a flair for such methods and combined them with common sense and a friendly attitude he should use his skill; but he must also have a good sense of diagnosis or he might relieve a phobia to precipitate an underlying mania.

Then there were minor types of neurotic maladjustment which the doctor might treat if he knew a few rules and they were not hard to acquire. The speaker said that in cases of classical hysteria, obsessions, and compulsions, and some sexual difficulties the usual basis of the neurosis was some violent disturbance of the instincts—not necessarily in their immediate satisfaction, but disturbances which may have lasted from infancy and childhood. When a doctor, faced with a neurotic patient, tried to enter into a patient's difficulties, to agree with his view of himself, and to give him the bottle of medicine asked for, the rapport might be good and the treatment successful. This corresponded to the carrot mentioned by Dr. Evans. In this unwitting treatment it was often best if the doctor knew little of psychotherapeutic methods. But if the doctor disagreed with the patient, even though he did not say so and used various devices to hide the disagreement, the rapport often failed and the patient was likely to become worse. It was therefore important for the doctor to know his capacity in this direction. This second type presumably corresponded to Dr. Evans's pitchfork. There were, however, some passive non-resistant cases which liked to be bullied out of their condition; but such formed only a small proportion of all cases.

Dr. Glover considered that the family doctor might help the patient in some neurotic crises where there was some obvious emotional precipitating factor. For instance, if after the death of a father the son developed a guilt neurosis reproducing the father's

illness, the case might clear up with a simple explanation; but if such cases failed to respond specialist treatment was imperative. The doctor's equipment for such cases included common sense and a big personal factor. Advice and admonishment might occasionally be used, but lying, apart from deliberate suggestion, was inexcusable. Politeness was also required, and, as these patients often received little of it, was often very effective. And the doctor had to have a fairly broad understanding of the patient's general make-up.

The speaker then mentioned the family doctor's part in the prevention of neurosis. It was now known that the foundation of neurosis lay in childhood, but unfortunately few doctors had the understanding of a child's mind, possessed by an ordinary ignorant mother of good feeling. For the doctor who had there was enormous scope in assisting children with their fears and repressions. He thought that most family doctors instead of laying down the law to mothers might well have lessons from, say, four or five sensible mothers on neurosis in childhood.

In conclusion Dr. Glover said that although the family doctor could do much for the simple case requiring kindness and sympathy, expert and highly trained assistance was absolutely essential for cases of pure neurosis. This could not be given by the general practitioner, even if he had the requisite training—partly because he had not sufficient time (the speaker often took two hours over the first interview with his patients) and partly because it was impossible to carry out psychotherapy efficiently for a few hours only of a busy day.

Dr. F. A. BEATTIE seconded the motion; he said that even Dr. Glover had allowed that three-quarters of the neurotic patients should be treated by the family doctor. There was a trend in medicine to-day for the specialist to take over more and more from the general practitioner's province and insistence on specialist treatment for neurotic cases would take half his practice from him. Sir Humphry Rolleston's oration to the society, entitled the Dumping Ground of Neurasthenia, had encouraged him in the treatment he had been carrying out—more especially of the manic-depressive. He considered that patient treatment on the part of the family doctor helped such people through their phases of depression, but it was important to explain the condition to the relatives. He thought that the greater number of neurotic cases, since they were of minor degree, should be treated by their family doctor; only the more severely affected should be passed on to the specialist.

Dr. S. S. LINDSAY defined a neurotic patient as a man who was not well adjusted to his surroundings; when one considered his surroundings one felt that the relatives and friends who pestered and exhorted him also needed treatment, and that he were better treated away from home. Before treatment such patients needed a thorough clinical overhaul, and Dr. Lindsay felt that the general practitioner had neither the time nor the equipment to assure himself that there was nothing organically wrong. Dr. Beattie had asked what would become of the general practitioner if he lost his neurotic patients; he himself would be greatly relieved.

Prof. J. WOLFSCHON (Canford University, San Francisco) considered the treatment of the neurotic patient from the doctor's and the patient's point of view. The doctor used to be poorly equipped for psychotherapy, although he used it unconsciously

on every patient he saw. Nowadays students were given instruction in the prevention of neurosis. The neurotic patient was trying to escape from life not because a particular problem had risen up to attack him but because he was born with a latent instability of his nervous system. When relieved of his neurotic symptoms he still retained his own type of being. Neurotic patients liked to talk, but the busy general practitioner usually cut them short, and so lost their rapport. This impatience in listening was driving patients to the quacks and producing in the United States various cults such as osteopathy and Christian Science. He thought that the neurotic patient was seldom frank with his family doctor for fear of information reaching his parents and relatives. The tendency of the age was to too great specialisation.

Dr. HAROLD PRITCHARD said that the general practitioner's great difficulty in dealing with these cases lay in the diagnosis. He felt that if the practitioner had been specially trained he should treat some of his neurotic patients and that it was impossible to do justice to such cases in a general hospital. Once a patient was labelled neurotic the student was liable to overlook him, but as one grew older such details became more interesting. He thought that true neuroses should receive specialist treatment.

Dr. JANET GRAY cited an example of a nurse suffering from a nervous breakdown who rapidly improved on being given more suitable work.

Dr. E. P. CAREY suggested that there should be institutions and a system of after-care, resembling those for the tuberculous patient, for the neurotic.—Dr. W. E. HALLINAN thought that if there were such sanatoria everybody would crowd into them.

Dr. C. E. BOWEN WILLIAMS mentioned that a sensible mother could do much to prevent neurosis by bringing her children up not to expect too much of life. She thought that it was the craving for affection which drove many neurotic patients to their family doctor for understanding and attention.

Dr. H. V. MORLOCK held that as a neurotic patient was not adapted to his surroundings he should not be treated in them.

Dr. C. J. B. BUCHAN said that in his search for a cure outside himself the neurotic patient was liable to leave his doctor. He knew of one woman who had in the same district changed to nine different doctors since the war.

As mention had been made of the unpleasant homes of neurotic patients, Dr. EVANS pointed out that nevertheless the patients were fond of them and were generally happiest there. He felt that these patients required especially to be away from contact with abnormal people. He was distressed to think what a colony of neurotic patients might be like.

Dr. GLOVER agreed that a family doctor had many advantages in treating neurotic patients, but he considered that a true neurosis required the greater skill of the specialist.

The motion was carried by 11 votes to 9.

---

TRAINING FOR WORK OVERSEA.—A course for the training of women for citizenship oversea will be formally opened by Sir Archibald Weigall at 4 P.M. on May 1st at 17, Carlton House-terrace, London, S.W.1. Particulars may be had from the secretary, Training of Women for Citizenship Oversea, at that address.

## REVIEWS AND NOTICES OF BOOKS

**Textbook of Gynæcology**

By WILFRED SHAW, M.D. Camb., F.R.C.S. Eng., F.C.O.G., Assistant Physician Accoucheur, St. Bartholomew's Hospital. London: J. and A. Churchill Ltd. 1936. Pp. 588. 18s.

IN recent years Dr. Wilfred Shaw has made important contributions to the pathology of certain gynæcological conditions, notably ovarian tumours and the physiology and pathology of menstruation. There is evidence here not only of careful and critical research, both pathological and clinical, but of an extensive knowledge of the literature of the subject.

In its general arrangement the book follows orthodox lines. More stress has been placed upon anatomy and physiology than has been customary in recent text-books of gynæcology, because Dr. Shaw believes that future advances are most likely to come from this direction. The histology and pathology of the ovary and endometrium are fully and clearly described, and as lucid an account as our present limited knowledge allows is given of the part played by the various internal secretions in the control of the ovarian and menstrual cycles. The assessment of the importance of uterine displacements in the production of symptoms is admirable, and will provide additional support to teachers who are constantly finding reason to emphasise the harm which may be done, and in the past was often done, by too energetic treatment of what may be a symptomless abnormality. In his discussion of the operation of hysterectomy, Dr. Shaw finds illogical the argument that total hysterectomy should be performed merely because the cervix, if it is conserved, may subsequently become carcinomatous in about 1 in 150 cases. There are certain formidable arguments on the other side.

If any criticism of this work is called for it is that Dr. Shaw has somewhat neglected the psychological aspect of gynæcology. Here more than in any branch of surgery, the mental outlook of the patient and the possible effect thereon of operative or other intervention are of extreme importance. The illustrations merit special notice. There are four plates in colour and nearly 250 figures in the text. Dr. Shaw has gone far afield for his material; he has picked the best he could find at home and abroad and has added original diagrams and microphotographs where required.

This excellent book, which is comprehensive in scope and yet not too bulky for the needs of the medical student, should achieve and hold a recognised position as a text-book.

**Treatment of Diabetes Mellitus**

Fifth edition. By ELLIOTT P. JOSLIN, M.D. Harvard, Clinical Professor of Medicine, Harvard Medical School. London: Henry Kimpton. 1935. Pp. 620. 28s.

IN the fifth edition of his well-known book Prof. Joslin has secured the coöperation of Dr. Root, Dr. White, and Dr. Marble, who have written certain sections. In the discussion on the pathology of diabetes Prof. Houssay's work receives close attention. He has shown that the pituitary gland secretes a hormone which raises the blood-sugar and counters the action of insulin. When the pituitary gland is removed from a dog, and at a later date the whole of the pancreas, the animal does not develop diabetes;

but hyperglycæmia and glycosuria can always be produced in these dogs by the injection of a pituitary extract. The exact bearing of this interesting observation on the pathology of diabetes is not yet clear. A noteworthy account of the influence of heredity is given by Priscilla White and R. Pincus. They have studied 2817 siblings and show that the inheritance of diabetes is a recessive character. Even then, at the time the figures were examined, marriage between two diabetics, between a diabetic and a diabetic carrier, and between two diabetic carriers, had led to a smaller percentage of diabetic children than would have been anticipated. Since, however, diabetes is a disease which commonly develops after the age of 40 it is possible that in investigations to be made 30 years hence the figures for the same families will more nearly approach those expected under Mendelian laws of heredity. It is suggested here that the development of diabetes depends primarily upon the transmission of a single recessive gene, but also on the operation of one or more of these secondary factors—obesity, the increased consumption of sugar all over the world, and the reduction in muscular activity associated, among other causes, with the efficiency of machinery. The dietetic requirements of healthy persons are fully discussed, and also the changes which are necessary after the development of diabetes. Prof. Joslin, in his teaching, occupies an intermediate position between the advocates of high and low content of the diet; he favours between 100 g. and 200 g. per day for a patient weighing 144 lb., the average figure of choice being 140–150 g. with protein about 70 g. and fat 50 g. to 100 g. The course and treatment of coma are discussed very fully, and special sections are devoted to gangrene, tuberculosis, and cancer. The food tables are elaborate and would be even more valuable if compiled on the basis of the different amounts of food which contain 5 g. of carbohydrate.

**1. I Knew 3000 Lunatics**

By VICTOR R. SMALL, M.D. London: Rich and Cowan Ltd. 1935. Pp. 273. 7s. 6d.

**2. Asylum**

By WILLIAM SEABROOK. London: George G. Harrop and Co., Ltd. 1935. Pp. 266. 8s. 6d.

1. THE number of writers who describe their mental illnesses grows apace. A few of these works are by practised writers who have been patients or by people with a gift for narrative: their accounts are interesting, even when they manifestly distort the occurrences which provide the main attraction of the book for many readers. Other ex-patients, accurate in their recollection and not influenced by residual features of their psychosis, are misled into fine writing, and thus manage to give an unjustified impression of falsehood. That few combine literary skill with a true picture of their own behaviour or of the life in the mental hospital is not astonishing when we remember that a distorted outlook and a faulty adaptation were the reason for their segregation. It is thus with satisfaction that we note that Dr. Small's book is not by a patient but by a psychiatrist. His description of a provincial mental hospital in the United States may be taken as accurate, though his style may not please. He regards the

mental hospital in which he worked for six years as a place in which he was "privileged by fate and fortune to view from many angles the enactment of a complex drama of romance and crime, pathos and dark tragedy," and it is in this strain that he gives a rather pinchbeck account of an experience that was doubtless genuine enough but is hardly made to seem so to the reader.

2. Mr. Seabrook writes plainly and tellingly, and provides here what is probably the best description available of what goes on in a modern mental hospital. The alcoholism for which the author sought treatment did not impair his ability to see what was happening around him and afterwards to report it accurately: he has no paranoid or crusading axe to grind, his attitude is fair, even to the doctor whom he disliked, and his descriptive powers would surely be the envy of the psychiatrists who had to record his condition. The great hospital near New York in which he spent seven months is among the best of its kind in the world. Those who have read only trivial, denunciatory, or psychologising books about the conditions of treatment of the mentally ill can see here what is actually done, its efficacy, and the impression it may make on the patients themselves.

### A Textbook of Surgical Pathology

Second edition. By C. F. W. ILLINGWORTH, M.D., F.R.C.S. Edin., and B. M. DICK, M.B., F.R.C.S. Edin., Lecturers in Clinical Surgery, University of Edinburgh. London: J. and A. Churchill Ltd. 1935. Pp. 719. 36s.

THE authors have been at pains to bring this text-book up to date. Among the sections altered in this edition are those on calcium metabolism and its relation to bone disease, the prenatal muscular dystrophies, intracranial suppuration, chronic mastitis, and endocrine disease. The lists of references at the end of each chapter have also been amended; these deserve praise for the judgment used in the selection only of key articles for insertion. It is perhaps unfair to criticise the book for omitting certain elementary sections. The authors specifically state that the text-book is intended for graduates and senior students with a certain knowledge of pathology; but even so the omission of discussions of general pathological principles, such as inflammation, leaves the vast store of information provided a little out of focus. The text is clearly written and easy to follow. The section on senile gangrene is misleading where it suggests that medical calcification, not atheroma, causes narrowing of the lumen in peripheral arteries. The illustrations are numerous and with two exceptions (Figs. 101 and 136) they are good. On the whole the book fulfils its purpose well and should prove of continued value to surgeons and advanced students of pathology.

### Sanitary Inspector's Handbook

Second edition. By HENRY H. CLAY, F.R.San.I., F.I.S.E., Lecturer in Sanitary Engineering, London School of Hygiene and Tropical Medicine. With an introduction by Prof. W. W. JAMESON. London: H. K. Lewis and Co., Ltd. 1936. Pp. 432. 15s.

THE duties of a sanitary inspector are now so varied that any text-book attempting to cover them would be so long that its intention to instruct might be defeated. Mr. Clay's first problem must thus have

been one of selection, and he has been successful in giving a well-balanced presentation of essentials. An obvious criticism is that urban conditions are given pride of place. For example, in the chapter on housing law and house inspection much space is devoted to overcrowding, which is the least important matter from a sanitary inspector's point of view, and little space to unfit and defective houses and the legal questions which may be involved in dealing with them. The structures of cowsheds and their inspection get small attention and the question of land treatment of sewage, a very practical one in rural areas, does not seem to be mentioned. It is not made clear that the methods described under house disinfection are applicable to tuberculosis, and the information in the section on graded milk requires revision. These points are noted and might well receive the attention of the author in a future edition. They do not detract from the practical value of the book, for we have here a clear and fairly put account of the various legal powers under which the sanitary inspector has to act, with practical hints how his duties should be performed. The work is clearly that of an able teacher and the book can be recommended not only to the student but to the experienced sanitary inspector.

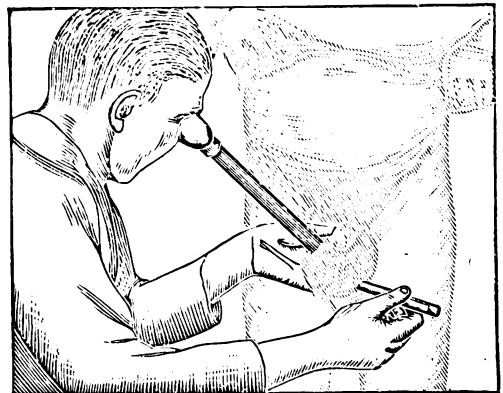
## NEW INVENTIONS

### A POCKET TRANSILLUMINOSCOPE

ANYONE who is in close touch with clinical surgery will have seen scores of cases where the diagnosis has been vitiated, occasionally with disastrous



results, by not carrying out the test for translucency, or by carrying it out inefficiently. In the absence of a dark room a wooden stethoscope or a cardboard carton are helpful, but the former's calibre is too



small to make it reliable. The transilluminoscope here illustrated can be obtained from the Genito-Urinary Manufacturing Company at a very small cost. The rubber end-piece fits the eye accurately, and it renders eliciting the test for translucency a pleasure instead of a nuisance.

HAMILTON BAILEY, F.R.C.S. Eng.

# THE LANCET

LONDON: SATURDAY, APRIL 18, 1936

## TREATMENT WITH ACETYLCHOLINE AND ITS DERIVATIVES

THE work of DALE and his collaborators has made it clear that a large number of physiological actions are brought about by the liberation of acetylcholine, or some similar substance, at nerve-endings. This view has already shed light on such clinical problems as the action of Prostigmin in myasthenia gravis.<sup>1</sup> It is natural that interest should also have been aroused in the therapeutic possibilities of such a simple and powerful substance and in the last decade a large number of papers have been published claiming success from acetylcholine administration, mainly in vascular and gastro-intestinal conditions. So much information about pharmacological actions of acetylcholine is now available that a reassessment of its value in clinical medicine may be attempted. It is not a hormone in the sense that adrenaline is a hormone; it is not manufactured in a ductless gland nor carried in the blood stream to distant tissues, but is liberated at nerve-endings when the appropriate nerve is stimulated, after which it is rapidly destroyed by an esterase universally distributed throughout the blood and tissues. The labile nature of the compound would seem to render it at the same time an ideal chemical transmitter for physiological purposes and a substance with doubtful therapeutic applications. Carefully controlled studies on human subjects have, in fact, thrown doubt on its activity as usually administered. ELLIS and WEISS,<sup>2</sup> who studied the effects of continuous intravenous infusion, found that doses of 90 to 140 mg. a minute gave flushing of the skin, sweating, palpitation, salivation, nausea, and vomiting. The minimal effective rate of injection was found to be from 20 to 60 mg. a minute—which gives a rough measure of the rate of destruction of acetylcholine by the tissues—and the conclusion reached was that it is not a suitable therapeutic agent in diseases of the arterial system. CARMICHAEL and FRASER<sup>3</sup> have also examined the effect of intravenous doses of acetylcholine and report that single doses of 10 to 30 mg. gave the above-described subjective symptoms, slowed the heart for a few seconds, and lowered blood pressure. The effects passed off completely in less than a minute; they were abolished by atropine and accentuated if eserine had been previously given. CARMICHAEL and FRASER emphasise the great variability in the response of different individuals. Doses up to 500 mg. given subcutaneously or

intramuscularly produced no subjective sensations and had no effect on pulse-rate or blood pressure even after eserine had been administered. Presumably therefore such results as have been obtained when acetylcholine has been injected therapeutically into subcutaneous tissues or muscle must be attributed to the small and variable amounts leaking into the blood stream from the very large doses injected. The greater part is probably inactivated at the site of injection.

The defects of acetylcholine as a remedial drug have stimulated the search for substances which would produce similar but more prolonged effects. Two of these have been fully investigated—namely, acetyl- $\beta$ -methyl choline (Mecholyl) and carbaminoylcholine (Doryl). The former has an action like that of acetylcholine, but is less rapidly destroyed; it is more effective after subcutaneous injection and is active when given orally. In normal human beings it is about ten times as powerful as acetylcholine when given subcutaneously and much more constant in its action. The effects last for at least twenty minutes. ABBOTT<sup>4</sup> has shown that when given by mouth in doses of 300 mg. it relieves abdominal distension by causing contraction of the gut and increases the secretion of hydrochloric acid in achlorhydria. Of greater interest are the results obtained in cases of cardiovascular disease<sup>5</sup>; when given intramuscularly to patients with hypertension it produces a profound fall in blood pressure and may in some cases relieve headache, and in Raynaud's disease the symptoms may be relieved by its regular administration. In the treatment of paroxysmal tachycardia acetyl- $\beta$ -methyl choline appears to be of great promise. Even allowing for the notorious difficulty in assessing the value of a remedy in this disorder the results recently reported by STARR<sup>6</sup> are striking; for on 66 of the 75 occasions on which it was given the paroxysms were promptly terminated—though in some of the cases it was necessary to press on the carotid sinus while the drug was acting. The dose required was less in young than in old patients, but a dose of 10 mg. seems to be safe in any patient over 20 years of age. The second derivative, carbaminoylcholine, was fully investigated pharmacologically in 1932 by H. KREITMAIR and by H. NÖLL, but seems to have attracted less attention from clinicians. Its actions are identical with those of acetylcholine but it is heat-stable, can be absorbed from the alimentary canal, and is less readily destroyed by the tissues. DAUTREBANDE and MARECHAL<sup>7</sup> have shown that doses of only 0.2 to 0.3 mg. intramuscularly give a definite fall of blood pressure which lasts for about half an hour, and this preparation appears preferable to acetyl- $\beta$ -methyl choline where it is desired to give a drug of this type by mouth. Good results have been reported from the treatment of ozæna with a 0.05 per cent. aqueous solution of carbaminoylcholine for local application.

<sup>1</sup> Abbott, W. O.: Amer. Jour. Med. Sci., 1933, clxxxvi., 323.

<sup>2</sup> Starr, I., Jr.: Ibid., 1933, clxxxvi., 330.

<sup>3</sup> Starr: Ibid., February, 1936, p. 210.

<sup>4</sup> Dautrebande, L., and Maréchal, R.: Compt. rend. Soc. de biol., 1933, cxiii., 79.

<sup>1</sup> THE LANCET, Feb. 29th, 1936, p. 491.

<sup>2</sup> Ellis, L. P., and Weiss, S.: Jour. of Pharmacol., 1932, xlii., 235.

<sup>3</sup> Carmichael, E. A., and Fraser, F. R.: Heart, 1933, xvi., 263

A word of warning is necessary about the toxic effects which may arise during treatment with these drugs. The desired effects on the heart or vessels can rarely be brought about without some undesirable side-effects such as sweating, salivation, or (more rarely) nausea, and it is advisable to prepare the patient for such symptoms. The drugs should always be given with the patient lying down to avoid syncopal attacks, which may be brought about by the fall in blood pressure. It is wise to avoid giving them in cases of angina pectoris, since substernal pain has occurred after their use, and PAGE<sup>8</sup> has shown that acetyl- $\beta$ -methyl choline may temporarily invert the T wave in all leads of the human electrocardiogram. Their employment is also contra-indicated in patients with gastric hyperacidity. The really dangerous effects may occur in two ways. A dose of acetylcholine or its derivatives intended for subcutaneous use may be given by mistake intravenously; in this way 30 mg. of acetyl- $\beta$ -methyl choline has caused cardiac asystole for seventy seconds. Equally serious is the risk that one of the highly active derivatives of acetylcholine may be given subcutaneously in doses which would be reasonable for the unstable parent substance.<sup>9</sup> It is advised therefore that a syringe containing a full dose of atropine be kept at hand ready for intravenous administration whenever one of this series of drugs is being injected.

It seems that these derivatives of acetylcholine have a definite but restricted place in therapeutics; and it might be advantageous if they came to replace acetylcholine itself, which is always inconstant in its effects and often entirely inactive.

### CONTINUOUS VENTRICULAR DRAINAGE IN CEREBRO-SPINAL FEVER

Dr. HAMPSON points out<sup>10</sup> that, of all forms of meningitis in infants, that caused by the meningococcus offers the best chance for effective treatment—provided it can be recognised in good time. In milder cases especially, the early appearances may be deceptive, the condition being diagnosed, without lumbar puncture, as meningism. Diagnostic puncture, with removal of 1.0 c.cm. of fluid for examination, is quite harmless, and in HAMPSON'S opinion its more frequent performance would avert many tragedies. It is in the less serious cases which have been missed, and those in which treatment has been only partly effective, that the late sequel of posterior basic meningitis (recognised by G. F. STILL in 1898 as a meningococcal infection) is to be apprehended. The clinical picture, which appears to be associated with thick purulent exudate at the base of the brain, is graphically described by HAMPSON but may here be summarised in the term *opisthotonos*. Partial occlusion of the foramen of Majendie, and excessive production of cerebro-spinal fluid, lead at length to a condition of internal hydrocephalus which if unrelieved results in death, or, at best, mental defect.

If meningitis is recognised very early, intravenous injection of antimeningococcal serum may bring about rapid improvement, and HAMPSON advises the use of a mixture of the available commercial sera without waiting for laboratory findings. Because of the risk of adhesions from an "aseptic meningitis" he hesitates to employ the intrathecal route before the organism has been typed and a serum provided which agglutinates it; but the intramuscular route is unobjectionable. In the series recorded in his paper an autogenous vaccine, the initial dose of which, for fear of troublesome reactions, was not allowed to exceed half a million organisms, gave promising results in two or three cases. Daily lumbar puncture, supplemented by cisternal puncture if the lumbar tap is dry, and the introduction through the needle of a suitable serum, should be maintained until cultures of the fluid, which should be almost clear, are constantly negative; thereafter the intervals of treatment should be lengthened. Sometimes, possibly owing to the provision of complement, a single blood transfusion is dramatically successful. When complete block had occurred and all methods of withdrawal of fluid had failed, continuous ventricular drainage proved successful in 24 out of 25 cases in overcoming the block and re-establishing normal flow. Many of the children so treated were moribund; even so, 6 recovered and HAMPSON believes that earlier resort to ventricular drainage would have saved more lives. The avoidance of daily puncture, which the child comes to dread, and the relief from an irksome posture and from vomiting, make the procedure well worth while even in the apparently hopeless case.

A small opening is made in the skull over the posterior horn of the lateral ventricle; to effect this in older children a burr is required, but in infants a trocar suffices. The cannula to be inserted is mounted on a hollow trocar through which runs a hollow guide and through this again a blunt-pointed stilette, its lower end grooved and its upper end cone-shaped. The cone permits and controls the escape of fluid. The guide is pushed into the ventricle; the depth of insertion is noted and cautiously increased until the medial wall of the ventricle is touched. The depth is again noted and the guide withdrawn to the mid-point of the two readings; a sufficient depth of insertion is important. Trocar and cannula are then pushed along the guide to the same depth, usually about 3.5 cm. Slight withdrawal of the stilette permits of a slow escape of fluid and obviates a sudden fall in ventricular pressure when the trocar guide and stilette are next withdrawn and replaced by a two-way inner cannula provided with a small lateral tube for irrigation. The larger tube of the inner cannula is connected to a collecting-bottle the height of which can be adjusted to control the pressure in the ventricle. The outer cannula is kept in position by a clamp fitted with a ball-and-socket joint and a webbing strap. For the first 24 hours the joint is unclamped; contraction of the ventricle, resulting in the tube being carried forward, might injure the brain. Unless the pus is very thick, artificial irrigation is not

<sup>8</sup> Page, I. H.: Amer. Jour. Med. Sci., 1935, clxxxix., 155.

<sup>9</sup> THE LANCET, Feb. 15th, 1936, p. 391.

<sup>10</sup> Hampson, A. C.: Guy's Hosp. Rep., 1935, lxxv., 431.



called for; the cerebro-spinal fluid itself irrigates sufficiently. Serum may be introduced through the apparatus. Usually after two or three days fluid can be withdrawn by cisternal puncture, and thereafter saline and serum can be run through from ventricle to cistern. Ultimately, when the character of the fluid is satisfactory, the cannula is gradually and cautiously withdrawn, and finally the wound is closed with a collodion dressing. Dr. HAMPSON emphasises the paramount importance of expert nursing in securing changes of posture, cleanliness, and nutrition. Most of the breast-fed babies were kept on the breast—a tribute, he adds, to the nursing staff and, not least, to the mother.

### THE ADELPHI

THE demolition of the central block of the Adelphi buildings, which has for its front the famous terrace overlooking the Thames, is due to start at any moment, and the circumstances which have led up to the widely criticised action illustrate in a striking way situations that must become increasingly frequent in large cities. The claims of the old for preservation, made strong by history or sentiment, must yield to the claims of the new which arise out of the needs of developing society. That in a general way will be accepted, but acquiescence does not imply any universal endorsement of the value or virtue of the building developments now going on in the older districts of the metropolis; and the questions that are arising in London with growing frequency confront all who dwell in old and important urban communities. Two things, it would seem, should be made clear in connexion with these operations of destruction and substitution—first, that the old buildings have outgrown utility, and, secondly, that the structures which rise in their place meet real needs and have not as their justification only the making of money, whether on behalf of rating authorities or of personal speculators. The great justification of rebuilding schemes is that they promote health in the widest sense, not only by modern sanitation and amenities, but also by providing facilities for the discharge of necessary work. If these two things can be proved history and sentiment must be ignored, however regretfully. Regarded in this way no valid arguments can be advanced against the demolition of the Adelphi. The charming structures have outlived their practical utility, and in face of this fact the plea for the preservation of the picturesque cannot prevail.

The cultured and leisured sections of the population, for whom ROBERT ADAM and his brothers designed the Adelphi quarter, have left it long ago; their followers, men of literary and artistic proclivities, who gave the Adelphi throughout the nineteenth century its fascinating and slightly humorous distinction, have gradually ceased to occupy the lovely rooms, one well-known social club remaining till the end as the sole representative of this aspect. The slow desertion of the Adelphi by artists, in words or materials, by critics

and journalists and their friends and imitators, proves that the buildings no longer conform sufficiently to modern standards of life, and those who once competed for the semi-cloistered shelter afforded in an elegant example of town-planning have found in other places their more convenient if less happily situated abodes. There is therefore no widespread grievance following on dispossession, such as must be grievously felt in many quarters of London to-day, where small houses, charming in character, standing in their own greenery, and conforming entirely to the needs of their tenants, are being torn down to make place for masses of flats, generally described as offering luxury while constituting a curious commentary on what luxury means.

No medical conveniences or facilities happen to be lost by the disappearance of the Adelphi central quadrangle, and the present home of THE LANCET, with its fascinating view along the main artery of John-street, remains undisturbed. Moreover the Adelphi at no time housed more than an occasional doctor, though medical practitioners some hundred years ago found in the neighbouring streets on both sides of the Strand favourable opportunities for practice. But one doctor who lived on Adelphi-terrace made it famous in the painting world. This was THOMAS MONRO, member of a distinguished medical and artistic family. His grandfather, his father, and his uncle all made their mark in medicine, but two at least were men of high culture as well as distinguished physicians. THOMAS MONRO, himself an accomplished doctor, a leading authority on lunacy, and physician to George III. moved from Bedford-square to 8, Adelphi-terrace in 1793. He was a considerable artist and had inherited through his father or personally collected many pictures and drawings by famous eighteenth century painters, notably by GAINSBOROUGH and J. R. COZENS. The great English school of water-colour painters had its practical origin in 8, Adelphi-terrace, where THOMAS MONRO assembled a group of young artists in evening classes, lent his paintings and drawings to be copied, and stimulated in every way any promising achievement. He was astonishingly fortunate in his recruits, for among those who profited by his enthusiasm and generosity were TURNER, GIRTIN, VARLEY, PETER DE WINT, and JOHN LINNELL. How the work of these men and their followers became the starting-point of the peculiarly English achievement of water-colour painting is a well-known and interesting feature in the history of art, and the names of the Adelphi and Dr. THOMAS MONRO are thus assured of preservation.

THE Government of South Australia is collaborating with the University of Adelaide in establishing an institute of medical science. The sum of £15,000 has been privately subscribed for the purpose, and the Government will make an equal contribution. As announced on p. 927, Dr. E. Weston Hurst, of the Lister Institute, London, has been appointed the first director.

## ANNOTATIONS

## DISEASE AND WORK

At the Cambridge meeting of the Tuberculosis Association, of which some account was given in our last issue, Freiherr V. von Weizsäcker, director of the medical clinic at Heidelberg, had some provocative things to say about disease and work. At present, he remarked, we were wasting time and money in endeavouring to restore a function, instead of spending time and money in adapting the diminished or altered function to existing conditions of employment. A patient treated by a merely reparative therapy—no matter whether the primary disease was tuberculosis, concussion, ulcer, or sciatica—is apt to develop what is known in Germany as “secondary symptoms,” caused by a rupture of life’s coordination in work, wage-earning, respectability, and physical enjoyment. This “interruption factor” in recovery is usually reinforced by a number of typical conflicts of a more or less social nature, such as unemployment with its attendant poverty, disputes with a superior, family quarrels, political antagonism, or litigation, in which the patient is contesting only for his rights as such, and not for definite material advantage. Prof. Weizsäcker has in his own practice as internist and neurologist discovered the significance of these and similar factors in the treatment, not only of neurosis and incapacity for work, but even of purely “organic” disease. The definition of work is only to limited extent a question of physiological economy; even in the case of certain forms of manual labour the quality of the work—e.g., its exactitude or beauty—is of greater importance than the output of physical energy required in its performance. Capacity for work is not a question of physiological economy, but of will-power; of conditioned will, that is, not of conditioned reflexes. This being so, Prof. Weizsäcker does not find it surprising that neither the economic quotient, nor the basal metabolism, nor the absorption of oxygen shows characteristic alterations in the case of the tuberculous patient with impaired working capacity. More is to be expected from a searching social analysis than from a blood count. But then the Heidelberg professor does not regard work as a religion; in certain cases it may be better, he dares to suggest, to learn to use leisure—e.g., in reading, talking, observing, learning to think. His paper produced a remarkable impression. In the discussion which followed Dr. W. C. Fowler drew attention to the metabolic value of work, and deprecated the idea—so prevalent among patients, and even held by some doctors—that breakdown is always associated with work. It was much more often, he thought, associated with recreation. Dr. F. R. G. Heaf thought the sanatorium patient should be asked if he *liked* to do work; once his will was enlisted there was much less chance of any trouble over it. The educational side of work should be stressed.

## CHANGING ANÆSTHETICS

SOME years ago Mr. Bernard Shaw’s gibe against medical men that their anæsthetics “spare us nothing except the actual pain of operation” must have gone home. That day is fortunately past, and the patient who has to undergo an operation nowadays, whatever else he fears, need not fear the suffocation which used to precede anæsthesia or the prolonged discomfort which followed it. This improved state of affairs is due largely to the work of the chemists

and pharmacologists who have supplied the anæsthetist with effective drugs for easing the road into unconsciousness. These drugs have done more. When they have not abolished altogether the need for chloroform and ether, the two anæsthetics mostly responsible for after-effects, they have reduced the amount that has to be administered. The use and character of the various adjuvants at the anæsthetist’s disposal are well set out in a recent paper<sup>1</sup> by Dr. Frankis Evans, anæsthetist to St. Bartholomew’s Hospital. Although he applauds the methods which he describes, Dr. Evans does not fail to pay tribute to the results achieved by the older anæsthetists with their limited means, inviting us to marvel with due humility at the wizards who wielded drop-bottle and square of lint. In one respect the anæsthetist of to-day does not yet appear to have surpassed his forerunners. The patient’s comfort and the surgeon’s facility have both been enormously enhanced; we doubt whether it can be maintained that the patient’s safety has been increased to the same extent. The anæsthetist must not be content to rest on his laurels so long as ether convulsions, “status lymphaticus,” post-operative shock, and post-operative pneumonia continue to claim their victims.

## BIOLOGICAL PRINCIPLES IN ORTHOPÆDIC SURGERY

If the skeleton is regarded as still in process of evolution, with an imperfect adaptation to the erect posture and a partial obsolescence of certain of its structures, many problems of orthopædic surgery will become simpler. This is the main thesis of a paper<sup>2</sup> by Dr. George W. Hawley of Connecticut. He enunciates the general principle that “involuting structures are potentially weak and vulnerable, those in the process of evolution are particularly strong and resistant to disease and injury.” It is doubtful, however, whether this statement can be accepted in its present form. When he cites the shoulder-girdle as a structure that has largely lost its function and power in supporting and moving the body-weight—as in climbing trees—it is easy to follow him: undoubtedly the clavicle and the shoulder-joint are particularly liable to injury when the arm is held out of the pendent position. But the vulnerability of his “principle” is apparent when he describes the foot as also weak because in process of “involution.” The human foot is surely a highly differentiated structure, adapted for support and for the distinctly human function of walking. Hawley believes that the foot would be structurally and functionally stronger if all the bones below the astragalus were ankylosed. But that is to presuppose that dancing is not one of its functions. Nevertheless, it is probably right, in operations on the foot, to aim at an ankylosis, because in most feet the muscular and ligamentous elements are poor and will not be much help in rendering a foot both mobile and strong. The liability of the spine to sprains and injuries of all degrees of severity can also be related to its imperfect balance and adaptation to upright posture: spondylitis may be due to instability of the curves of the spine and the irregular strain to which they are subjected. The biological “law” is instability of form with instability of

<sup>1</sup> St. Bart.’s Hosp. Jour., March, 1936, p. 106.

<sup>2</sup> Amer. Jour. Surg., March, 1936, p. 438.

function; structures are weak which are in process of changing their form and function.

The effect of an individual injury to the skeleton is largely determined by the age of the bones and ligaments involved, and deformities are not likely to be corrected spontaneously in later life. It is a curious fact, however, that activity of bone repair differs very little at different ages. At all ages it is preceded by a retrogression to a primitive type of connective tissue, and this tissue may be in some sense "young" again. The healing of ligaments and of muscles, on the other hand, seems to be a much more perfect process in the young than in the middle aged or old. Who ever saw a child with a stiff knee after a fracture of the femur?

### SENSE OF SMELL

DURING the past year Dr. C. A. Elsberg of New York and his colleagues have been carrying out important researches on the physiology of smell.<sup>1</sup> Their objective is to devise methods which can be applied in clinical practice for diagnostic purposes in much the same way as are the refined tests for vision and hearing. There is no doubt that the sense of smell has been neglected in favour of the other two special senses, and that a suitable test might give a great deal of information, unobtainable by other methods, with regard to lesions within the cranial cavity. The idea is not new, but most of the previous tests used have been dependent on the patient's sniffing up some odorous substance, and are accordingly not clearly objective. Elsberg's method requires no coöperation on the part of the patient beyond a description of his sensations, which cannot very well be eliminated. A fixed quantity of odorous substance is placed in a bottle of known capacity so that the volume of air above the liquid is always constant. The stopper carries two tubes, one of which communicates with the patient's nostrils through an ordinary double nose-piece, while through the other tube a measured amount of air can be injected into the bottle by means of a syringe. In carrying out the actual test the nasal tube is occluded, a few cubic centimetres of air are introduced into the bottle, the pressure inside the bottle thus being raised. The patient is instructed to hold his breath and the clip on the nasal tube is opened. The result is that a puff of air is blown into the patient's nostrils, the volume and pressure of which depend on the amount of air previously injected into the bottle. With small quantities of air the subject smells nothing, but as the volume of successive injections is gradually increased he becomes able to detect the presence of an odour. He then recognises that the odour is familiar, and finally is able to identify it. (This recalls the stages in the visual perception of colour.) The least injection which leads to the identification of an odour is known as the olfactory coefficient of that odour, and this is expressed in cubic centimetres. If only one nostril is used for the test, the other being occluded, the quantity is known as the minimum identifiable odour (M.I.O.).

Preliminary tests on normal persons have revealed certain interesting facts, not the least important of which is that under standard conditions the olfactory coefficients of numerous substances are almost the same from individual to individual. Another interesting observation is that the olfactory coefficients vary as the boiling-point of the substance used, and

are therefore presumably dependent on its vapour pressure. This relationship is so constant that if the boiling-points of two substances are known, together with the olfactory coefficient of one of them, the olfactory coefficient of the other can be predicted with accuracy. The authors point out that very little is known about the properties on which odour depends, but the simplest explanation of these findings is that the amount of a substance which will dissolve in the film of liquid covering the olfactory nerve-endings depends on its partial pressure. This should also depend on a further factor—namely, the force of the "blast injection" and the degree to which this momentarily raises the pressure in the nose. This has been confirmed experimentally.

A second test is known as the "stream injection" test, whose title is self-explanatory. By this method it can be ascertained whether the substance under investigation stimulates the endings of the trigeminal nerve, and it is found that very few odorous substances which are likely to be recognised by a patient are free from a "trigeminal component." For clinical tests the actual perception of odour by each nostril, the fatigability of the olfactory sense, and the reaction to trigeminal component if this exists are determined. Although relatively few conditions have so far been investigated, it is found (1) that a neoplasm pressing on an olfactory nerve or tract increases the M.I.O. of that side; (2) in intracerebral tumours the M.I.O. remains normal but olfactory fatigue lasts longer on the side of the neoplasm—in a generalised increase of intracranial pressure the M.I.O. may be lower than normal; (3) intracerebral tumours which also press on the olfactory bulb (e.g., frontal lobe tumours) lead both to an increase of M.I.O. and a longer duration of fatigue.

This technique promises to be of clinical value. The apparatus is simple, the reagents suggested are few (namely, coffee, citral, benzaldehyde, and oil of turpentine), the procedure is harmless, and there seems no reason why it should not be widely tested.

### OSTEOPOROSIS OF ENDOCRINE ORIGIN

A CASE of localised rarefaction of bone leading to fracture and relieved by administration of ovarian extract is reported by Baumgartner and Berthoud.<sup>1</sup> The patient, a woman of 33, had had both tubes, one ovary, and the greater part of the other removed eight years previously for a bilateral salpingo-oophoritis. When first seen she complained of a painful swelling of the right knee, for which she had undergone manipulative treatment without relief. A radiogram showed osteoporosis of the upper end of the right tibia and fibula. Rest and cold compresses relieved the pain, but six months later the upper epiphyses of the tibia and fibula were fractured by a trivial fall. The fractures were reduced and the leg put up in plaster. Because the patient showed signs of ovarian deficiency—almost complete amenorrhœa and hot flushes—it was thought that the osteoporosis might be due to an endocrine imbalance, and she was treated for three months with injections of an ovarian preparation. At the end of this time it was found that new trabeculæ had been laid down and the bony structure resumed its normal radiographic appearance. According to Leriche and Policard osteoporosis follows local hyperæmia; and the fact that deficiency of ovarian secretion may cause vasomotor disturbances is obvious from the hot flushes so often seen at the menopause. In the

<sup>1</sup> Bull. Neurol. Inst., New York, 1935, iv., 1, 5, 20, 26, 31, 264, 270, 286, 479, 498, 501, 511.

<sup>1</sup> Baumgartner, J., and Berthoud, F.: Presse méd., 1936, xxiv., 495.

interesting syndrome accompanying basophil adenoma of the pituitary (Cushing's syndrome) localised rarefaction of bone is frequently found and may give rise to kyphosis or to spontaneous fractures of long bones. This condition is usually associated with loss of function of the sex glands—with amenorrhœa in the female and impotence in the male. Osteoporosis associated with ovarian deficiency does not appear to be due to generalised disturbance of calcium metabolism, for the serum-calcium level both in Cushing's syndrome and in the other cases recorded is within normal limits. It seems to be attributable rather to a vasomotor disturbance, leading to localised hyperæmia, than to disturbance of parathyroid secretion.

#### TREATMENT WITH LARGE DOSES OF ATROPINE

INTEREST in the action of large doses of atropine in man has been aroused again by the Kleeman<sup>1</sup> method of treating cases of post-encephalitic parkinsonism. Bremer's<sup>2</sup> observations, out of which this form of treatment arose, seemed to indicate that parkinsonians have an unusual degree of tolerance to this drug. D. Danielopolu and N. Radulesco in Bucharest have re-examined the problem of tolerance to atropine in man, and have applied the method of high dosage to conditions other than the post-encephalitic syndrome. Their observations were communicated at the first meeting of a new body, the Rumanian Academy of Medicine, and are recorded in a series of articles in the first issue of its journal, the *Bulletin de l'Académie de Médecine de Roumanie*. Prof. Danielopolu is the secretary-general of the Academy, which has two divisions: one is devoted to the medical and biochemical sciences and the other is concerned with medical organisation, public health, and conditions of practice.

Danielopolu and Radulesco do not consider that post-encephalitics are especially tolerant to atropine, since they were able to show that tolerance can be developed by most people if the drug is given in gradually increasing doses. Patients with pyloric ulcer were studied and were given at first injections of a milligramme (1/64 grain) of atropine a day in divided doses; the dose was raised by a milligramme a day until as much as 19 mg. a day in one case, or (averaging the dose in eight cases) 10 mg. a day was being taken. Such doses brought about surprisingly little alteration in heart-rate, blood pressure, or gastric acidity. It is believed that atropine given in this way diminishes the tone of the whole autonomic nervous system, sympathetic as well as parasympathetic, and it is proposed to apply the results to the treatment of a number of disorders such as asthma and thyrotoxicosis. Sea-sickness has already been treated successfully by this method. For short crossings it is sufficient to take 0.5 mg. (gr. 1/120) of atropine sulphate about an hour before embarking. Before long voyages, however, subjects susceptible to sea-sickness are given atropine as follows. Four days before embarking, 1 mg. is given in four doses; the dose is increased by a milligramme a day so that 4 mg. is taken during the day of departure, and this dose is maintained throughout the voyage. The dosage must be reduced gradually after the voyage ends. The administration of atropine in exactly the same way is advised before operations in which chloroform is used, for it is believed that fatalities during anæsthesia may thus be avoided, and nausea

and vomiting during recovery eliminated. If respiration stops in patients who have been prepared in this manner, pressure on the carotid sinus causes breathing to recommence without affecting the heart.

These authors remark on the dangers attached to the sale of mixtures of morphine and atropine. A morphinomaniac may mistake a mixture of morphia and atropine for pure morphia and thus receive a toxic dose of atropine. The morphia habit, moreover, is especially easily acquired by those who use a mixture of atropine and morphine, since they become tolerant to the unpleasant effects of atropine, while the atropine continues to relieve many of the unpleasant actions of morphine.

#### THE YOUNG DOCTOR IN AMERICA

Mr. G. H. Edington, addressing the students of St. Mungo's College, Glasgow, last month, is reported to have expressed the view that nowadays "there is far too much talk of remuneration" for work done by doctors. Do the recently qualified men in this and other countries agree with him, or are they inclined to regard as cant the suggestion that their professional aims are less mundane than those of their fellow-men? Certainly those practising in some European countries at the moment would not agree that the question of remuneration could safely be neglected. That is not to say that it should obsess the student, or be the motive power in his choice of a profession. Dr. Nathan B. van Etten has attempted<sup>1</sup> to discover whether young persons in the United States of America take up the study of medicine from a desire for social service or from a taste for pure science, or whether they seek merely social distinction or material gain. His comments, doubtless authoritatively, on the high code of ethic maintained by the bulk of the profession during the past 2000 years. Of the 150,000 doctors in the United States, two-thirds belong to the American Medical Association and, in increasing numbers, are joining county medical societies "prompted by a desire for group protection, by a desire to follow the currents of scientific thought and by a growing appreciation of the importance of political organization." The United States medical service, he holds, perhaps naturally, to be the best in the world. In that country institutional treatment is replacing home treatment; municipal hospitals are superseding voluntary hospitals. The time is coming, he thinks, when every citizen will be entitled to treatment in a municipal hospital and when the staffs of these hospitals will be paid for their work. These changes, if they come, will profoundly affect the private practice of the future. Nevertheless more and more young persons wish to practise medicine. The proportion of patients to doctors is already less than 800 to 1 and still twice as many doctors are licensed annually as die. Dr. van Etten thinks that too often the young doctor is ignorant of economics and the practicalities of medical problems. So abstract is his education that it leaves him no opportunity for the proper study of mankind. For this he blames the academic detachment of the teacher who "does not care for general contacts" and "fails to function as a citizen." Dr. van Etten would have the teacher prepared to teach practical economics and to be "a good mixer" at any rate with his medical colleagues in private practice. At the December examination, 190 candidates from 42 medical schools applied for 16 internships at the Morrisania City

<sup>1</sup> Kleeman, A.: Deut. Zeits. f. Nervenheilk., 1929, cxi., 299.  
<sup>2</sup> Bremer, F. W.: Deut. Arch. f. klin. Med., 1925, cxlix., 340.

<sup>1</sup> Jour. Amer. Med. Assoc., March 7th, 1936, p. 772.

Hospital. Many of these candidates had achieved considerable academic success at their various medical schools. They were asked questions of a severely practical nature and only five of them were found suitable for appointments. In answering the questions most of them concentrated on inessentials. Dr. van Etten concludes that the young doctor's social objective may not point higher than making an honest living, but if this aspiration is based on respect for a high quality of service the health of our people will be in safe hands. To achieve it, teachers must become active members of medical organisations, select fewer students, teach clinical medicine intensively, promote "inspirational preceptual contacts" (whatever that may mean) between themselves and their pupils, and finally try to develop a spirit of civic responsibility. With all respect to Dr. van Etten's views, we question whether the problem is really so serious. Assuming, fairly or unfairly, that the American medical student may lack the same measure of liberal education and intensive clinical teaching as obtains in this country, we doubt very much whether, once established in private practice, he will long remain ignorant either of practical economics or of his fellow-men.

### THE PHLYCTEN

THE phlycten, it seems, is not a specific localised reaction of the conjunctiva; it occurs also in acne rosacea, Koch-Weeks conjunctivitis, and a number of other conditions besides phlyctenular ophthalmia. The pseudophlyctens observed in tropical countries and the adult preponderance in the incidence of phlyctenosis in Japan are other points in favour of the multiple aetiology of the phlycten, which was the theme of a paper contributed by Mr. Arnold Sorsby, Dr. R. Hamburger, and Dr. L. R. Benham to the congress held this month in London.<sup>1</sup> Since 1887 Burchardt has claimed that inoculation of staphylococci can produce phlyctens. More recent work however makes it unlikely that extraneous factors are responsible; a mass of experimental evidence supports the view that the phlycten is an anaphylactic response of the conjunctiva in a sensitised subject. This sensitisation may be tuberculous or produced by a wide range of substances such as tyramine, calcium caseinate, horse serum, and cocaine. A positive tuberculin reaction is common in phlyctenular ophthalmia; among 4000 cases collected from the literature the proportion was generally between 80 and 90 per cent. A higher incidence was noted among 688 cases under the age of 6 years analysed by the authors, and in these the suggestion of tuberculous infection was re-enforced by detailed radiological study of the chest. Among 130 phlyctenular lesions under the care of Mr. Sorsby and his colleagues at White Oak Hospital, Swanley, 75 per cent. were Mantoux positive, against 20 per cent. in a control series of 122 blepharitis cases. If only cases under 6 years old were considered the corresponding percentages were 70 and 9.4. In 116 cases of phlyctenular keratitis and 87 control cases of blepharitis examined radiologically, tuberculous lesions of the chest were shown to be present in 71 and 16 per cent. respectively (with suspected activity in 20 and 3 per cent. respectively); distinctly negative X ray findings were obtained in 13 and 58 per cent. respectively. Clinical tuberculosis was however present to a much smaller extent, there being only 3 cases in the phlyctenular group. The results of stomach washings were completely

negative for a series of 50 phlyctenular cases and a control group of 8 blepharitis cases. The evidence for a tuberculous factor in phlyctenular ophthalmia was strengthened by the finding of 14 cases of active tuberculosis subsequently admitted to L.C.C. hospitals out of a series of 238 phlyctenular cases admitted to Swanley from 1924 to 1930, making a percentage of 5.9, or approximately ten times the notification rate for children of the corresponding ages. Mr. Sorsby concluded by drawing a distinction between tuberculous infection and tuberculous disease. In the great majority of cases phlyctens are to be regarded as a manifestation of tuberculous infection at an early age; phlyctenular cases, like the majority of infected children, generally overcome the infection. A larger proportion of the phlyctenular cases than of the normal child population do however fall victims to tuberculosis, probably because of their early infection. In the discussion that followed Mr. R. E. Bickerton supported Mr. Sorsby's contentions. The importance of tonsillar sepsis as an aetiological factor was emphasised by Mr. C. B. Goulden, of intestinal toxæmia by Dr. A. J. Ballantyne.

### THE NEW ERGOT ALKALOID: A QUESTION OF NOMENCLATURE

THE Council on Pharmacy and Chemistry of the American Medical Association<sup>1</sup> announce the result of their consideration of the question of the proper name to be applied to the new ergot alkaloid, which has been described by Dudley and Moir as "ergometrine," and to which the names ergotocin,<sup>2</sup> ergobasin, and ergostetrine have been applied by other investigators, who obtained the substance at about the same time. A statement recently published in *Science* and in *Nature*,<sup>3</sup> and signed on behalf of the four laboratories concerned, had settled an outstanding question by stating definitely, on the basis of comparisons of samples carried out in all four laboratories, that the alkaloids to which the four different names had been given are one and the same. It was therefore only the question of choosing one suitable name, for general application to the one substance, on which the Council had to deliberate. "It is necessary," they state, "that a suitable, non-proprietary name not therapeutically suggestive be adopted for the new alkaloid. Not one of the several names that have been proposed by the discoverers complies with these requirements."

The name ergometrine was given to the alkaloid by Dudley and Moir, in their paper containing the first description of it, as a purely scientific name. Afterwards Dudley published a full description of the method of isolating this alkaloid from ergot, and obtaining it in pure condition. This method was published for the information of anybody who desired to undertake the practical preparation of the alkaloid; and there is no reason to suppose that any method differing from it in essential particulars has, in fact, been used for this purpose. There was therefore no question in this case of any attempt to obtain for anyone a proprietary interest in the alkaloid, by secrecy, or by protection either of the method of its preparation or of the name ergometrine proposed for it. It must, accordingly, be supposed that the members of the Council on Pharmacy and Chemistry regarded ergometrine as an unsuitable name for the alkaloid, not on the

<sup>1</sup> Jour. Amer. Med. Assoc., March 21st, 1936, p. 1008.

<sup>2</sup> Ergotocin and ergostetrine are known commercially in U.S.A. as ergotrate and ergokline respectively.

<sup>3</sup> Nature, March 7th, 1936, p. 403.

<sup>1</sup> THE LANCET, April 11th, p. 842.

ground that it is a proprietary name, but on the alternative ground that it is "therapeutically suggestive." This seems to us far-fetched; it is certainly not as suggestive as the names of many more familiar alkaloids—morphine and narcotine for example. Knowledge of Greek is not so widespread that the ordinary reader will connect ergometrine with a stimulant action on the uterus; and if this is the difficulty it may be argued that the word ergot, embodied in the Council's new name "ergonovine," is equally obnoxious.

In issuing their list of New and Non-official Remedies for the guidance of the medical profession the Council do work of great value; and nothing but respect can be felt for their motives and general policy. But such a service does not, as they admit, give them a right to put aside the traditional prerogative of the discoverer to propose, for scientific use, a name for a substance which has been made or isolated as the result of his researches. The workers who in 1932 first demonstrated the existence of a hitherto unrecognised active principle in ergot, who in 1935 isolated and identified this principle as a new alkaloid, and who were the first to describe its chemistry and pharmacology in terms by which it could be clearly recognised and differentiated by other workers, named the substance ergometrine. We see no need to depart from this name. It seems a clear case for an international ruling.

#### PSYCHIATRIC IN-PATIENTS AT A GENERAL HOSPITAL

St. George's Hospital has issued the first number of a magazine called *Rebuilding*, in which the editor expresses the hope, which must be unique among editorial aspirations, that the number of issues published will be few. Three or four numbers are to appear every year until the new hospital is so well on its way that the need for such publicity comes to an end. The rebuilding of a great London hospital must interest a considerable number of people in addition to those actually associated with the institution, and we have no doubt that the energy with which the campaign to get the necessary money for St. George's is being pursued will accelerate to the point at which building operations can actually begin. The sketch plans are already made and under discussion; the number of complicated questions which have to be solved before a modern hospital can begin to arise, and the difficulties in reconciling the architectural requirements with those of the medical, surgical, and special departments make it desirable that as much time as possible shall be spent in considering them. An interesting innovation for a general hospital will be a psychiatric in-patient department—a clinic with some sixty beds to be divided between men, women, and children, which will be filled mainly from patients attending the out-patient psychiatric department. This seems to us a progressive step. Not only will it provide increased facilities for treating the many patients whose disability is really not so much physical as mental, but, almost more important, the student will be enabled to see, as at present he cannot in hospital practice, how large a part in determining the inefficiency of human beings is played by influences that cannot be classified under any of the recognised organic diseases. The young doctor beginning private practice is generally more puzzled than by any other experience by the fact that many of his patients are suffering from no definite complaint in the cure of which he has been trained. Many of

these people are in the early stages of what may become definite neuroses or even psychoses. Others perhaps could be put into no definite category of nervous disease, but are none the less in need of expert help. A department such as that outlined for St. George's should do much to teach the future practitioner to give it to this large groups of patients.

Summer Time will commence in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday morning next, April 19th, at 2 A.M., when the hands of timepieces should be advanced one hour. It will end on Sunday, Oct. 4th.

We regret to announce the death of Mr. John Gordon Harrower, professor of anatomy at the Medical College, and consulting surgeon to the General Hospital, Singapore, at the age of 46.

We have also to record that Prof. Robert Bárány, of Vienna and Upsala, died on April 8th. Prof. Bárány, who was 59 years of age, was awarded the Nobel prize for his work on the physiology and pathology of the vestibule of the ear, and his name is applied to tests which he described. It will be recalled that only six weeks ago he contributed to our correspondence columns a letter advocating intranasal submucous injections of calcium in the treatment of excessive nasal secretion.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Lt.-Comdr. A. N. Forsyth and Surg. Lt. (D.) H. V. Pell to *Victory* for R.N.B.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. W. H. Roberts promoted to Surg. Lt.-Comdr.

### ROYAL ARMY MEDICAL CORPS

Lt. J. O'Connell to be Capt.

### TERRITORIAL ARMY

Lt.-Col. R. I. Dacre, T.D., resigns his commn. and retains his rank, with permission to wear the prescribed uniform.

Capt. C. J. L. Wells relinquishes his commn. and is granted the hon. rank of Capt.

Capt. A. D. Rope resigns his commn. and retains his rank.

To be Lieuts.: 2nd Lt. W. B. R. Monteith (late R.G.A.), T. W. Preston (late Cadet Corp., Alleyn's Sch. Contgt., Jun. Div., O.T.C.), and F. G. Maitland.

### ROYAL AIR FORCE

*Dental Branch*: Flight Lt. A. Maben to R.A.F. Hospital, Aden. The undermentioned are granted non-permanent commissions as Flying Offrs. for three years on the Active List: O. F. Brown, I. St. C. Alderdice, J. H. G. Fensom, S. Hill, R. A. Pepper, and W. A. H. Smith.

### INDIAN MEDICAL SERVICE

Capt. A. M. Fraser retires, receiving a gratuity.

The undermentioned officers have vacated appts. in India:—D.A.D.H.: Maj. J. W. F. Albuquerque. D.A.D.P.: Capt. M. K. Afridi.

The undermentioned appt. has been made in India:—D.A.D.P.: Maj. J. W. F. Albuquerque.

### ROYAL NATIONAL OPHTHALMIC HOSPITAL, LONDON.

Last year 3739 in-patients and 62,000 out-patients were treated at this hospital which constituted a record. The maintenance cost increased by £5000 and last year for the first time for seven years there was a deficit on the year's workings. Of the £167,000 needed for the enlargement, which is now practically completed, only £10,000 is still to be raised.



## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### XCVII.

#### PROGNOSIS OF TROPICAL SPRUE

THE syndrome of tropical sprue is explicable in terms of a metabolic breakdown of the gastrointestinal tract characterised by malabsorption in the small intestine of such substances as fat, calcium, and glucose, and defective secretion of Castle's *intrinsic* factor. Whether this breakdown is related to primary dietary deficiency or is dependent on some underlying endocrine disturbance is unknown. The view of Castle and his colleagues, based on observations in Porto Rico, that deficiency of *extrinsic* factor in the diet is responsible for sprue is not in accord with experience of this disease acquired in other parts of the tropics. In India, for example, both Hindus and Moslems living on diets deficient in extrinsic factor develop tropical macrocytic anæmia, whereas the well-to-do European, who enjoys a diet containing adequate sources of extrinsic factor, such as red meat and eggs, acquires sprue. Similarly in Africa, when disease develops associated with a diet deficient in extrinsic factor, it is tropical macrocytic anæmia and never sprue which results.

Like pernicious anæmia, tropical sprue shows a natural tendency to remission and relapse, and in the tropics, before modern treatment was practised, it generally terminated fatally from (1) asthenia and uncontrollable diarrhœa with or without tetany; (2) profound megalocytic anæmia; (3) intestinal ulceration and perforation; (4) intercurrent disease. On the other hand, if the patient suffering from the disease could afford to return to Europe and underwent treatment which included prolonged bed rest and an initial dietary of low caloric value, recovery was not infrequent, provided the scales were not weighted against the patient by excessive age or intercurrent disease.

#### PROGNOSIS FOLLOWING MODERN TREATMENT

Granted the coöperation of the patient and the absence of intercurrent disease, patients with tropical sprue both in the primary attack and in relapse are now almost invariably restored to health by modern treatment. This treatment aims at restoring alimentary function and reinforcing demonstrable deficiencies and consists of (1) adequate bed rest; (2) a series of graded diets high in protein,\* adequate in vitamin, and low in fat and carbohydrates; (3) liver extract in adequate dosage for a sufficient period administered by the oral or parenteral route or by both; (4) calcium salts per os reinforced in some instances by vitamin D. Liver extract is not nearly so effective when given alone; unless combined with a strict dietary it often fails to relieve alimentary symptoms and anæmia.

As a routine patients should continue liver extract therapy for 3 months in doses equivalent to 1½ lb. daily for the first month, 1 lb. daily for the second month, and ½ lb. daily for the third month. A high protein type of diet including cooked liver and plenty of fruit and vegetables should be adhered to for at least 6 months after freedom from symptoms. Conditions are to be avoided and the carbohydrate and fat intake only gradually increased. If there is a

\* The caloric value of these diets varies from 700 to 3000 per day and the ratio of protein : fat : carbohydrate is approximately 1·0 : 0·3 : 1·3. Either meat (Trans. Roy. Soc. Trop. Med. and Hyg., 1930, xxiv., 131) or milk casein (Ibid., 1932, xxv., 297) may constitute the source of protein.

history of repeated relapses or any doubt regarding complete restoration of the blood to normal, an adequate maintenance dose of liver extract should be advised, the oral dosage being generally equal to ½ lb. whole liver daily or injections of Campolon (6 c.cm.) each week for another 3 months or longer if indicated.

#### INDICES TO RECOVERY

*Clinical features.*—The clinical effects of combined treatment are very obvious. The stools rapidly decrease in bulk and number and assume a normal colour and consistency. Abdominal distension and intestinal flatulence disappear and the appetite improves; cramps and tetany cease. The nutritional state of the body becomes more satisfactory; the skin assumes a normal colour and consistency, and the nails lose their brittleness. The patient puts on weight, becomes contented and cheerful, and in a period of some 8 weeks is free from symptoms and on the high road to normal health.

*Hæmatological findings.*—Provided the alimentary features are controlled by an adequate diet the response to liver extract per os (equivalent to 1½ lb. daily of whole liver) is efficacious in restoring the blood picture to normal in at least 90 per cent. of cases. A maximal reticulocyte response occurs from the sixth to the tenth day and rapid blood regeneration follows. The blood loses its megalocytic characteristics as judged by the Price-Jones curve, and normal blood counts are generally established within 2 months of beginning treatment. In gravely anæmic patients, where an early maximal response is urgently required, oral liver therapy should be reinforced with daily intramuscular injections of 6 c.cm. of campolon or another suitable preparation. A submaximal reticulocyte response and sluggish blood regeneration following the oral administration of liver suggest insufficient dosage, and are an indication for large doses of liver given parenterally (campolon 6–12 c.cm. daily). The failure may arise from (1) malabsorption; (2) insensitiveness to liver extract, a larger dose being required to get a given effect; (3) the presence of complications.

*Biochemical data.*—With cessation of diarrhœa and the reappearance of normal stools, the total faecal fat decreases, the serum calcium increases, and the glucose-tolerance curve tends to assume a normal contour. Similarly, after the administration of glucose intravenously, normal curves are found, showing that the sluggish utilisation of sugar has disappeared. The fractional test-meal in most instances also shows an improved acid secretion, though many months or even years may intervene before the curve resumes its normal shape. That secretion of intrinsic factor by the pyloric and Brunner's glands is also restored is beyond doubt, for, unlike sufferers from pernicious anæmia, many patients who have had sprue and recovered maintain a normal blood picture on a normal diet.

#### FACTORS INIMICAL TO RECOVERY

Various factors inimical to recovery, such as age, the presence of complications and of intercurrent disease, call for consideration.

*Age.*—Tropical sprue is exceedingly rare under the age of 20 years, and formerly patients contracting the disease during the third or fourth decades were regarded as having much better prospects of cure than those developing it later in life. With modern

treatment, however, old age per se does not necessarily affect the prognosis adversely; it is the concomitant degenerative cardiovascular or renal changes and intercurrent infection common to this period of life which make for anxiety. Of five patients over 70 whom I have had under observation during the past three years, only one has failed to respond satisfactorily; that patient is over 80 years of age and suffers from an enlarged prostate and *B. coli* cystitis; only temporary improvement has followed treatment in his case. Two others relapsed mildly but immediately responded to another course of treatment.

*Intestinal ulceration and other complications.*—Ordinarily the course of sprue is afebrile, but occasionally fever develops, and when it does so it is a warning signal suggestive of intercurrent disease or intestinal ulceration. The latter may be suspected from the presence of pathological exudate or occult blood in the stools, and calls for rigorous restriction of carbohydrates and fat, as distension of the bowel may lead to perforation, peritonitis, and death. Similarly, thrombosis of the cæcal veins may follow hypotension and intestinal distension and lead to local rupture and general peritonitis. Neuritis and tetany are two of the commoner complications. Both conditions clear up as the general health improves. Occasionally tetany persists, and here fat analysis will always show persistent steatorrhœa. If fat is further eliminated from the diet and the fat content of the fæces reduced to a normal level, calcium is adequately absorbed and hypocalcæmia and tetany rapidly disappear. Vitamin D and ultra-violet irradiation may be of assistance under such circumstances.

*Intercurrent disease.*—Cardiovascular degeneration, thyrotoxicosis, sepsis, respiratory infections, and *B. coli* infections of the genito-urinary tract are conditions which militate against recovery. Their existence may be reflected in a submaximal reticulocytosis and sluggish production of erythrocytes or hæmoglobin. The presence of hypochromia always suggests intercurrent disease, as does also undue lag in the production of hæmoglobin following liver extract therapy at a time when erythrocytes are being satisfactorily produced. Iron in full dosage is indicated for hypochromia, and the possibility of associated ankylostomiasis and amœbiasis must receive special attention.

Lack of response to modern treatment suggests either that the condition is not tropical sprue or that complications or intercurrent disease exist. In their absence health should be restored and no patient should to-day succumb to this disease. The position is quite the reverse with the idiopathic steatorrhœa of cooler climates, where therapy holds out little prospect of success.

#### RELAPSE AND CURE

The question of when a patient with sprue is cured is more easily asked than answered, for patients may recover from the primary attack and remain perfectly well in a non-endemic area as long as 7 years before relapsing with typical features. Statistical information is not yet available on the relapse rate, but many patients have remained well for periods up to 5 years following the treatment outlined. On the other hand, some relapse repeatedly after becoming apparently fit. Mental worry, poverty and all that it entails, indiscretions of diet, chill, and respiratory infection are factors tending to precipitate relapse. Sore tongue, abdominal flatulence, and looseness of the bowels, especially in the

morning, are danger signals and indications for rest in bed and appropriate treatment. The therapeutic response in relapses is just as satisfactory as in the primary attack.

#### RETURN TO THE TROPICS

An attack of sprue used to be regarded as a definite contra-indication to return to the tropics. Nowadays patients who have recovered may be allowed back provided (1) they have remained free from all sprue symptoms for 6 months on a normal diet; (2) the hæmatological and biochemical findings are normal throughout this period; (3) they are otherwise healthy and are under 55 years of age.

N. HAMILTON FAIRLEY, M.D., D.Sc., F.R.C.P.

Assistant Physician and Director of Pathology,  
Hospital for Tropical Diseases, London.

## MEDICINE AND THE LAW

### A Reasonable Income-tax Deduction

THE annual requirement of the filling up of income-tax forms is an opportunity for recalling a fact with which every medical practitioner may not be acquainted. The inspectors of taxes allow it to be known that the practitioner is entitled to deduct the cost of his annual subscription to a defence society when computing his professional profits for assessment under Schedule D. Where a doctor is assessed under Schedule E in respect of salaried employment, the deduction is not allowed unless membership of a defence society is a condition of the holding of the appointment. While it is not the purpose of this note to commend any particular society, it is reasonable to remind practitioners that valuable benefits accrue from membership of such bodies and that the cost of the subscription is deemed by the Inland Revenue a necessary expense for the conduct of a practice.

### Local Authority and Sale of Diseased Meat

In an astonishing case at the Clerkenwell police-court lately the corporation of the borough of Swindon was fined £10 (with an order to pay £10 10s. costs) for sending to London for purpose of sale two hind-quarters of beef which were unfit for human consumption. Last February the Wiltshire county veterinary inspector had to deal with a cow suspected of tuberculosis. On his report to the local authority the existence of the disease was confirmed by the Swindon veterinary inspector and the animal was slaughtered. The Swindon inspector examined the carcass and condemned the offal and forequarters (which were destroyed) but apparently regarded the hindquarters as good enough to be sold for human food in London. Fortunately the sanitary inspector for Finsbury detected the transaction. He found the meat affected by generalised tuberculosis and quite unfit for human food. It was condemned on a magistrate's order. In the Clerkenwell proceedings there was an uncomfortable suggestion that the Swindon officials were anxious to relieve the rates of the incidental expense of compensating the farmer and of dealing with the case. It was not, of course, the fact that the officials themselves stood to profit in any way. The local authority, under the Tuberculosis Order of 1925, became the owner of the meat. It is a horrible idea that a local authority may have a financial interest in marketing diseased food. The Ministry of Agriculture will doubtless consider the possibility of stopping this disgusting traffic.

## SPECIAL ARTICLES

BRITISH CONGRESS OF OBSTETRICS  
AND GYNÆCOLOGY*(Concluded from p. 865)*

Dr. DOUGLAS MILLER presided at the morning session on April 2nd when Dr. J. HEYMAN described the

**Radiumhemmet Methods and Results in  
Cancer of the Corpus**

He said that the difficulties of presenting statistics on corpus cancer related mainly to (1) its distinction from the other forms of uterine carcinoma, (2) the requirements with regard to the histological diagnosis, (3) the criteria determining which patients should be regarded as "symptom-free." These criteria were rigid at the Radiumhemmet. Cases were regarded as symptom-free only if there was both an objective and a subjective cure after five years. Written reports from the patient were useless without examination because she might feel well and yet have a carcinoma of the body of the uterus. She must feel well, be able to work, and show no palpable changes due to cancer. The standard dosage given to fundus cases was now 1500 milligramme-element hours for each of two treatments. There was no risk of rupturing the uterus in packing it, but it was sometimes difficult to remove the radium because the cervix contracted. It should therefore be anchored by strong ligature. Tests with various ligatures had been made, and Irish linen thread proved the strongest. (Applause.) Many cases of carcinoma of the fundus were combined with other forms of carcinoma, notably of the cervix or of the ovaries. The figures presented concerned only cases of carcinoma of the fundus alone. It was very difficult to attain international uniformity of classification, but it should be possible if the pathologist attached to the clinic verified every diagnosis. At the Radiumhemmet between 1914 and 1930 inclusive, 232 cases of corpus cancer had been examined with a view to treatment. Of these, 224 were treated, and had been observed for at least five years. With radiological treatment, and operation in cases of failure, an absolute cure-rate of 42.2 per cent., and a relative cure-rate—i.e., in cases treated—of 43.7 per cent., had been obtained. The relative cure-rate of the cases treated radiologically only was 33 per cent. The series included 37.9 per cent. clinically operable cases, 44.6 per cent. technically operable, and 17.4 per cent. inoperable cases. The relative cure-rate obtained in these three groups was: 55.3, 41, and 25.6 per cent. respectively, cases operated upon being included, and 41.2, 30, and 23.1 per cent. respectively, cases operated upon being excluded. In comparing the Radiumhemmet results with those obtained by surgery, the absolute cure-rate could not be used as a basis for comparison, because the initial material in the surgical and radiological series was not uniform. Conclusions from a comparison of the relative cure-rates in operable cases had to be drawn with the greatest care because of the small number of cases, particularly in the radiological statistics. Another way had been tried to find an answer to the question of operative versus radiological treatment in operable cases. In the years under review 63 cases of corpus cancer had been referred to the Radiumhemmet after radical operation, and had been submitted to

post-operative radiation. Fifty of these cases were alive and symptom-free five years after treatment, thus giving a five-year cure of 79.4 per cent. In this cure-figure, which was nearly twice as high as for those mainly radiologically treated, Dr. Heyman found support for the view that cases of corpus cancer suitable for operation should be operated upon. Meanwhile, the radiological methods of treatment should be improved. At the Radiumhemmet since 1930, a new method of intra-uterine application for treating corpus cancer had been adopted. The uterus is packed with a number of radium tubes each placed in a separate small lead capsule. Dr. Heyman described the calculation of the dosage, a new method of packing the uterus, and the technique of application, and reviewed the early results obtained with this method.

Dr. GRAY WARD agreed that classification was a great difficulty. In a joint corpus and cervix case there was a tendency to assume the growth had begun in the cervix if it were of the adeno-type, but this was not necessarily so. The absolute cure-rate was the only real criterion of results, and he defined this as the relation between the number of the cases who applied to the clinic for treatment and the number of those who survived. He emphasised the value of a personal follow-up, which was achieved in New York in at least 90 per cent. of the cases. Dr. Heyman's cases were registered by the Government and it was therefore possible to have 100 per cent. follow-up. There was an increasing tendency to prefer a ten to a five years time limit, and patients lost sight of within that time must be assumed to be dead of cancer. Dr. Gray Ward's favourite technique in the treatment of carcinoma of the fundus was hysterectomy, preceded by radium one month earlier, and followed by deep X ray treatment.

Mr. MALCOLM DONALDSON said that the radio-sensitivity of malignant disease of the corpus must be considered. Dr. Heyman had implied that the treatment was a purely physical problem—viz., the insertion of enough radium, but while the radio-sensitivity of cervical carcinoma was very high that of corpus carcinoma was very low. He had once left radium in the uterus for 14 days, and had then done a hysterectomy, when comparatively little change was found in the uterus.

Prof. C. G. LOWRY said he had had very little experience of radiotherapy, as he operated on practically all operable cases. He had had encouraging results, however, in a few technically inoperable cases. He had long thought that the association of corpus and cervical carcinoma was commoner than statistics suggested. The field for operation was widening owing to better anaesthesia and the introduction of blood transfusion.

Prof. R. J. JOHNSTONE assumed that Dr. Heyman only advocated the packing method of inserting radium when the body of the uterus was dilated.

Prof. FARQUHAR MURRAY said he had stopped operating for carcinoma of the fundus. He asked for details of post-operative radiation, and wondered whether it delayed healing.

Prof. MILES PHILLIPS said he operated whenever possible. He wondered whether carcinoma of the isthmus should be regarded as a special type, for it appeared to be particularly virulent, and operative results were poor.

Dr. HEYMAN, in reply, said that he was not convinced that there was any difference between the

radio-sensitivity of corpus and of cervix carcinoma. He thought that the reason why adeno-carcinoma was considered less radio-sensitive was that it was usually a rapidly spreading tumour. Cases of adeno-carcinoma of the cervix usually fell into groups 1 or 4 because metastases formed very rapidly. The principle in radium treatment was to cover the entire surface of the tumour with radium. He had not much use for deep X rays, but he occasionally employed them if there was any recurrence after radium. He agreed that his new packing method was only applicable in cases where there was a large uterus. It was difficult to diagnose cases arising in the isthmus without operation; in attempting to ascertain the origin of the disease he curetted the cervix and then passed ring forceps into the body. He looked upon the growth as combined only if tumour material was collected both by the ring forceps and the curette, not if subsequent curettage revealed growth in both positions.

Prof. GILBERT I. STRACHAN then reviewed the possibility of

#### Uterine Carcinoma following Radiotherapy for Benign Lesions

He reported two cases in detail, in which radium was applied for benign uterine bleeding, and the absence of carcinoma was established microscopically; amenorrhœa followed, but in one case two and in the other seven years later carcinoma of the body of the uterus followed. Prof. Strachan discussed the action of radium, on the uterus or on ovarian tissue, also the differences of morphology in corporeal and cervical epithelium after the menopause. He concluded that there was no evidence to show that the radium was in any way causative of the carcinoma. The fact that radium did not shield the patient from later carcinoma was no justification for reverting to hysterectomy in these cases, as the operative risk would be greater than the very slight possibility of subsequent carcinoma.

Mr. PERCY MALPAS read a communication on

#### Radium in the Treatment of Uterine Bleeding

based upon nearly 200 cases of benign uterine bleeding treated with radium in Liverpool and available for after-study. He discussed the subject under the headings: (a) mode of action of radium, (b) technique, (c) permanent amenorrhœa, (d) control of bleeding with conservation of menstrual and reproductive function, (e) other lesions of the uterus. The results obtained depended upon a combination of the action of the radium upon both the endometrium and the ovaries, but the only readily calculable effect was that upon the endometrium. Once a certain critical point of endometrial reaction, such as was certainly obtained with a dose of 2500 mg. hours, was attained, then the ovaries, even if incompletely irradiated, could not restore menstruation and would undergo a secondary degeneration, as happens in cases of hysterectomy with ovarian conservation. In cases where the endometrium had received a submaximal dose, the possibility of ultimate restoration of function depended upon the degree of ovarian reaction to the radium. As regards technique, he considered that the use of intra-uterine radium had outstanding advantages over other routes. The most important point in the technique was the exclusion by preliminary curettage of an early carcinoma of the uterus, since otherwise by the use of a sub-lethal dose a fibrous reaction might be set up masking its presence until

it was too advanced for treatment. Essen-Møller had had malignant change appearing later in the uterus in 6 cases out of 200 despite an initial curettage, and for this reason had given up the method, and one similar case had been encountered in the present series. Mr. Malpas held that the occurrence of such cases did not invalidate the value of the method of radium castration, but emphasised the need for thoroughness in its technique. It must be remembered that curettage might not reveal growth, but pyometra or watery discharge following irradiation should be looked on as suggesting malignancy and be treated by hysterectomy.

For the production of permanent amenorrhœa the simplicity and certainty, the freedom from undesirable systemic reactions, and the opportunity it affords of a confirmatory curettage, made it preferable to X ray sterilisation. The use of radium in sub-menopausal dosage to control bleeding with conservation of menstrual and reproductive function had a definite scope, the main limitation of the method being its uncertainty. There was no special age limit, but most patients were at menopausal age. Precautions to be taken before treatment was undertaken were the exclusion of gross inflammatory appendage disease, and the presence of fibroids if submucous and pedunculated or degenerating, or larger than a three months' pregnancy. The total dosage given was 1500 to 2000 mg. hours, rarely 2500 mg. hours. In the Liverpool series of cases the mortality was *nil* and there were no injuries. Thirty cases (16 per cent.) continued bleeding up to ten weeks. Post-irradiation carcinoma occurred in 0.6 per cent. There was late return of transient bleeding in 4 per cent. and menopause symptoms in 23 per cent. Failure to control bleeding occurred in 4 cases (2.2 per cent.). The disadvantages of temporary control of bleeding were uncertainty of dosage, the possibility of uterine scarring, and the permanent impairment of reproductive functions. In submaximal doses the effect was chiefly on the ovaries. A dose of 600 mg. hours should not be exceeded for this purpose. The risk of cervical stenosis leading to dystocia was only very slight if the dose was less than a carcinoma dose. There was probably no risk of fetal lesions following pre-conceptual irradiation. Despite much inquiry it was still uncertain whether the primary effect of radium was on the ovaries or on the endometrium. Probably if permanent amenorrhœa was produced, there was an irreparable change in endometrium whatever the effect on the ovaries, because if the dose was big enough the bleeding never recurred.

#### Miss L. MARTINDALE read a paper on the treatment of Uterine Hæmorrhage in Non-malignant Disease

with special reference to the choice of surgical operation versus irradiation by radium or X rays. She said that in deciding upon the best type of treatment for each individual case it was of primary importance: (1) to diagnose the cause of the hæmorrhage and the physical signs, (2) to consider the age of the patient and the degree to which future capacity for child-bearing was important to her, (3) to have in hand a full report of her general health. With regard to (1), Miss Martindale's study had been confined to hæmorrhage caused by metropathia hæmorrhagica, selected cases of uterine myomata, and functional, idiopathic, or essential hæmorrhage.

*Surgical operation*, either abdominal myomectomy (the operation of choice in young patients) or hysterectomy, was performed in 54.07 per cent.

of Miss Martindale's series of 762 cases. The case-mortality rate varied from 1 to 3 per cent., depending upon the type of operation and general condition of the patient. *Irradiation* was performed on 45.93 per cent. of the cases (radium treatment 9.19 per cent., deep X ray therapy 36.74 per cent.) with no mortality. Miss Martindale described the technique used by her with radium and with deep X rays. The advantages of radium treatment over operation were, briefly, the conservation of uterus and ovaries, and in many cases also of their function; and the short time spent in hospital and short convalescence. The disadvantages were nausea, occasional continuance or reappearance of bleeding, leucorrhœa (the "bestrahlungs" endometritis), and the possibility of acute nephritis. Also a case-mortality rate according to various observers of between 0.3 and 2 per cent., deaths being due to acute peritonitis or acute purulent salpingitis. Other disadvantages included the possibility of a future pregnancy, and, in that case, the effect of radium in causing stenosis of the cervix and obstruction of labour; further, the direct effect of radium on the fœtus (microcephalic idiocy). Cases were cited to illustrate these points. The conclusion was drawn, however, that pre-conception irradiation in non-malignant cases with few exceptions leads to no difficulties in labour, but that should a fibrosed cervix cause obstruction, Cæsarean hysterectomy is indicated.

*Deep X ray therapy* Miss Martindale regarded as a specific in all cases of metropathia hæmorrhagica or small interstitial fibroids. She emphasised the importance of an exact technique with careful calibration of X ray tubes and apparatus. Of 280 cases treated only 3.5 per cent. were not cured by X rays alone. There was no death in this series. In four cases hysterectomy was performed subsequently for malignancy, one 15 years after for carcinoma of cervix, one 7 years after for carcinoma of fundus, one 3 years after for carcinoma of fundus, and one 5 years after for sarcoma of fibroid. The risk of malignant disease occurring in an irradiated uterus was thus no greater than the risk in an untreated case. Miss Martindale cited mass statistics of several thousands of cases in support of her thesis that X ray treatment was superior to radium treatment. X ray therapy had no mortality, produced no resulting complications, and there was no fear of a stenosed cervix or of the stirring up of a latent adnexal inflammation. Radium therapy was, however, preferable to X ray therapy in very anæmic patients, in whom a quick cessation of hæmorrhage was important; in these cases a blood transfusion was indicated and a diagnostic curettage imperative.

Dr. HEYMAN said that there was no sharp limit between benign and malignant tumours of the ovary, and that possibly the same applied to uterine carcinoma. He thought, therefore, that the cases reported of carcinoma following treatment might have been due rather to failure in the pathological diagnosis than to subsequent development of carcinoma. As an example, he referred to a patient, aged 40, who was twice treated with apparent success by radiotherapy for large fibroids; on her return on a third occasion she was curetted and carcinoma was found.

Prof. FARQUHAR MURRAY recalled four cases of cancer following radium treatment for non-malignant conditions, and thought their presence must have been overlooked at the time. He said that 87 per cent. of cases of non-malignant uterine lesions were cured by radium, and that he always inserted radium if possible after curetting. He did not agree

that contra-indication to radium should be limited to gross pelvic inflammation; in his view it was very risky to use it if the patient had any pain at all. He also doubted the wisdom of using radium for a fibroid as large as a four months' pregnancy.

Dr. GRAY WARD thought that the failure of radium in certain cases might be due to unsuccessful anchorage of the tubes. He always threaded a stitch through the cervix and secured it at the vulva.

Mr. MALCOLM DONALDSON thought it was unjustifiable to treat a patient under the age of 40 by radiotherapy, because it was impossible to foretell the effect on the ovaries. Radiotherapy might lead to extreme menopause symptoms even in quite small dosage. The great objection to treating large fibroids by this method was that it was impossible to say whether inflamed tubes were present.

Dr. G. W. THEOBALD wondered how Prof. Strachan and Miss Martindale had satisfied themselves that radium and X ray treatment did not increase the tendency to subsequent development of carcinoma. He thought all cases should be followed up for 30 years, and then compared with the general incidence of cancer in the country.

Prof. DANIEL DOUGAL, referring to Dr. Malpas's paper, said that he used a dosage of 2000-2400 milligramme hours; 94 per cent. of his cases either had no further bleeding at all, or only during the first week or so. Flushes were present in 75 per cent., and 83 per cent. said their general health had improved. He agreed that the action of radium was very largely on the ovaries, and that it was therefore probably better to do a subtotal hysterectomy in young people.

Prof. STRACHAN could not agree that curettage was an imperfect way of examining the cavity of the uterus. It was likely that most of the patients under consideration, and the gynæcologists now present, would be dead in 30 years' time. He did not think that the action of radium was on the ovaries. He had known two patients, aged 20 and 24, die of functional uterine hæmorrhage.

Miss MARTINDALE, in reply, said she was grateful to Dr. Gray Ward for his suggestion of anchoring radium. She agreed that X rays were useless in very young women because it might be quite impossible in these cases to get amenorrhœa. She had never seen X rays do harm in the presence of inflamed tubes, but radium might be very dangerous in such cases. She agreed that the action of radium was not on the ovaries. X rays acted on the ovaries, but only on the Graafian follicles, and not on the interstitial cells.

At the afternoon session, Prof. STRACHAN presiding, Dr. GEORGE GRAY WARD spoke on

#### Reconstructive Pelvic Surgery for Genital Prolapse

He showed an interesting series of lantern slides, demonstrating among other things the importance of retaining the uterus in an anteverted position, to prevent the intra-abdominal pressure from forcing the bladder down. He said that all forms of genital prolapse must be discussed together, as they were usually associated in varying degrees. Where prolapse of the uterus itself existed it must always be corrected, or whatever operative procedure was employed—e.g., for cystocele—would be unsatisfactory. For the cure of prolapse of the uterus, the principle of reefing the base of the broad ligaments—the cardinal ligaments of the upper pelvic floor—by approximating them in front of the cervix (or its stump if

amputated), thus elevating and anteverting the uterus by throwing back the lower pole of the organ, was a *sine qua non* if the uterus was to be retained in its normal position and condition for future child-bearing. This basic principle was common to various techniques; to Donald of Manchester belonged the credit for first appreciating and employing it definitely in 1888. That the principle of the so-called "Manchester operation" was sound was not open to dispute, but Dr. Ward believed that in certain cases it should be supplemented by shortening the round and uterosacral ligaments, in order to restore all the supports and steady apparatus that have been overstretched in a prolapsed retroverted uterus. Furthermore this technique did not fulfil the requirements in *all* cases; for women past the menopause and sometimes in younger women other types of operation might be more suitable and equally satisfactory. Dr. Ward outlined some of these and reported results of operations for genital prolapse at the Women's Hospital, New York. No one operative technique, he said, was suitable for all cases. The surgeon must individualise each case and utilise the appropriate technique to correct all the defects. Approximately 95 per cent. cures could be obtained by appropriate means. It was only advisable in very rare cases to combine abdominal with vaginal operation, since this added to the mortality and morbidity of the operation. The Watkins' interposition operation was good in suitable cases; it was better than colporrhaphy in resisting stress in old women. A preliminary curettage should always be done to exclude malignancy. The Mayo operation of vaginal hysterectomy was valuable for procidentia. What remained after amputation of the cervix was practically useless. The uterosacral ligaments must be shortened and the floor of the pouch of Douglas removed to prevent enterocele. Dr. Gray Ward described his own modification of Mayo's operation. Results were very difficult to compare, since there was no agreement about time limit for cure. At Dr. Ward's clinic there had been an organised follow-up since 1918; 94 per cent. of his own cases showed satisfactory results.

Prof. FLETCHER SHAW found that any relapses were almost always due to enterocele. He did not find it necessary to do any operation other than the Manchester one, although very rarely there was so little muscular tissue in the vagina that it was necessary to combine the operation with abdominal fixation. After the menopause 97 per cent. of cases were cured of their symptoms. He only removed the uterus if it was diseased and said that in such a case the repair must be done with particular care if recurrence was to be avoided.

Prof. MILES PHILLIPS said that in young women it was sometimes best to combine a moderate anterior colporrhaphy with Gilliam's suspension. He considered enterocele was best treated by some plastic procedure after hysterectomy. He favoured combined vaginal hysterectomy with repair of prolapse.

Dr. C. KAUFMANN read a paper on the

#### Clinical Uses of the Female Sex Hormones

He said that follicular hormone was responsible for formation of genitalia and had an effect on the whole body, while corpus luteum hormone prepared the uterus for pregnancy and maintained the pregnancy. When *dosage* was under consideration it must be remembered that the results obtained from investigations on castrated women did not necessarily apply to healthy women. The results of deficiency of

ovarian follicular hormone were (1) primary amenorrhœa in which the genitalia might be undeveloped or normal and (2) secondary amenorrhœa. It was useless to try to produce *spontaneous* menstruation with follicular hormone. In secondary amenorrhœa it was essential to exclude extrinsic causes such as pulmonary tuberculosis. The results of treatment of this condition on the whole were poor, for though follicular hormone was uniformly successful in producing menstruation, this only continued in 25 per cent. of cases when the treatment was stopped. These results would probably be improved if follicular hormone were combined with corpus luteum hormone. Blood transfusion, with blood of pregnant women, was done in 14 cases of secondary amenorrhœa last year, of which 50 per cent. continued to menstruate. For sterility follicular hormone was only valuable if there were signs of deficient ovarian function—6 out of 7 such cases in Dr. Kaufmann's series had children. The type of hormonal hæmorrhage which led to repeated miscarriage might be arrested by the administration of corpus luteum hormone. His practice was to give 10 mg. of corpus luteum hormone daily for five days. For menopausal hæmorrhage, where carcinoma had been excluded, 2 mg.<sup>1</sup> of corpus luteum hormone should be given daily for five days. Threatened miscarriage and habitual abortion could be stopped by corpus luteum hormone, 10 mg. injected weekly, with a double dose during the week in which the period should have come. Ovarian therapy gave good results in climacteric disturbances; it relieved flushes, cardiac neuroses, and psychological disturbances, but objective evidence of activity must always be looked for. On pruritus vulvæ, with or without ulceration, at the menopause, follicular hormone had a marvellous effect. Dr. Kaufmann showed convincing coloured pictures of very severe senile ulceration of the vulva at the menopause, before and after treatment. He also described a case of amenorrhœa with pruritus where irritation ceased and menstruation returned after three weeks' treatment. It would be of interest to ascertain whether follicular hormone cured idiopathic neuritis at the menopause. He warned members of the congress not to expect too much, and to use hormone treatment in a rational manner.

Mr. T. N. A. JEFFCOATE spoke on

#### Organotherapy for Functional Uterine Hæmorrhage

He said that before 1930 whole gland preparations used empirically, usually by the mouth, were almost devoid of biologically active principles. His present communication was only concerned with therapeutic agents of standardised biological activity. In attempting to assay the results of the treatment of functional uterine hæmorrhage with these substances he had collected the results of over 500 cases recorded between 1930 and 1935; made inquiry into the immediate and remote results of 80 cases, treated in Liverpool since 1932, and hitherto unpublished; and considered views expressed by foreign authorities in reply to a questionnaire. The conclusions reached were that the use of oestrin was theoretically unsound. Corpus luteum and gonadotropic hormones were equally efficacious, but they were of greater value in the treatment of puberty bleeding than in the control of hæmorrhage occurring later in life. These

<sup>1</sup> One international unit of progestin (corpus luteum hormone) = the activity of 1 mg. crystalline progesterone standard. This is approximately equivalent to 4 German clinical units and to 1 to 1½ rabbit units hitherto quoted for progestin. 1 mg. of corpus luteum hormone therefore = 1 international unit.



hormones controlled the immediate hæmorrhage, but it was doubtful whether they had any action in re-establishing a subsequent regular menstrual cycle. "Anovular" bleeding, commonly associated with endometrial hyperplasia, gave the best response to this form of organotherapy, which adequately controlled hæmorrhage in two out of every three cases. It was difficult to assess the value of hormone preparations because two different observers might describe the results in the same case, one as "no response to treatment," and the other as "cured." In a collected series, only 68.7 per cent. were cured, and many relapsed. The best results with antuitrin S (gonadotropic hormone) were obtained at puberty. Of those treated at puberty, 77.7 per cent. were cured; at ages 20 to 40, 61.2 per cent.; and after 40 only 50 per cent. The best results were obtained with metrostaxis, the worst with epimenorrhœa. The dosage was 1 c.cm. daily till bleeding ceases. Unless the bleeding was cyclical it was useless to inject except when the patient was actually bleeding. Relapses did not yield so well to treatment as did the primary condition, possibly owing to the formation of antihormones, but this was not proved.

Additional short papers on this subject were read by Dr. P. M. F. Bishop, Dr. Gregor, and Prof. E. C. Dodds. Prof. DODDS stressed the danger of attributing too much significance to urine and blood analyses in these cases. These hormones were just as real as thyroxine—viz., *real chemical entities*. The only reason that the results were not better was that their use was not yet understood. Dr. BISHOP said that his experience at the Endocrine Clinic at Guy's Hospital corresponded closely with that of Dr. Kaufmann and Mr. Jeffcoate. Small doses, 1000 international units of follicular hormone daily by mouth, might control the flushings of the menopause. The dose should be kept as low as possible because care was necessary in withdrawal. Injections should only be given if oral treatment had failed. He confirmed the fact that good results would be obtained with pruritus, but warned members that this treatment might cause alarming temporary swelling of the vulva. The recent synthesis of progestin was a very great advance and had led to a reduction in price.

On April 3rd, the concluding day of the congress, papers were read by Dr. Leonard Colebrook (Prevention of Puerperal Sepsis), Dr. H. R. MacLennan (Contracted Pelvis in Scotland), and Dr. G. W. Theobald (Relationship between Pregnancy and Chronic Nephritis).

## UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

### CASE FINDING IN TUBERCULOSIS

You have recently (March 7th, p. 561) drawn attention to the use of tuberculin tests with X ray follow-up of positive reactors as a routine method in the Scandinavian countries for early diagnosis of pulmonary tuberculosis. The same method is now in use in the United States. It is being tried on a State-wide scale in New Mexico where three organisations have pooled their resources in order to extend the early diagnosis campaign, not only to every institution of higher learning in the State but also, so far as is practicable, to senior high school students as well. The Mantoux test, using the new P.P.D. tuberculin, is given to all students. A single X ray chest film is taken of all those who react positively.

Coöperating in this survey are the New Mexico Bureau of Public Health, the Maztag Research Laboratory of the South-western Presbyterian Sanatorium, and the New Mexico Tuberculosis Association. The survey is regarded not only as a public health measure for early diagnosis but as an interesting project in clinical research. For more than a generation now health seekers in all stages of pulmonary tuberculosis, and from all parts of the United States, have flocked to New Mexico in the expectation that its climate would enhance their chances of recovery. Hundreds of these pilgrims have indeed recovered and now direct the business and take a large part in the professional activities of the State. Thousands, of course, lie buried in New Mexico cemeteries, and of these less is remembered than of the more fortunate survivors. Probably no one will ever know whether and to what extent climate has contributed to the quota of those who regained their health. But another question presents itself: What is to be the effect of this mighty pilgrimage upon succeeding generations of New Mexico citizens? A survey made two years ago showed that whereas twice as many English-speaking (i.e., in the broad sense immigrant) citizens suffer from active tuberculosis as do the Spanish-speaking (indigenous) citizens, nevertheless among the children of the former only one-half as many react positively to the Mantoux test as among the children of the indigenous group. The present study is expected to tell what is the heritage of early adult type tuberculosis among the generation of offspring who have at present reached undergraduate age. It will also tell the cost of this method of case-finding in the undergraduate age-group.

Ulster county, New York, has developed a very economical method of case-finding by X ray. They first use the fluoroscope on positive reactors and then subject suspicious chests to photography. The proportion of films used to cases fluoroscoped is 11 per cent. Up to November of last year 8000 tuberculin tests had been given, 1956 fluoroscopic examinations made. This last figure represents 652 grade school-children positive to the tuberculin tests, and 804 parents of these children, together with 500 high school-children. The cost of discovering active tuberculosis has averaged \$7 per case. Four cases were found in the grade school group, 6 in the high school group, and 26 among the parents. In addition 18 "suspicious" cases were recorded and 29 non-tuberculous but pathological conditions were discovered. This investigation in Ulster county, N.Y., has now progressed into its fourth year.

### TRENDS OF MORTALITY

Complete returns in last year's mortality are not yet available, but all indications point to another year of low mortality. Indeed, the wage-earning population as represented by the 17 million policy-holders of the Metropolitan Company in Canada and the United States have achieved an all-time low record of 8.4 per 1000. It is a remarkable fact that the rate in this group has been 7 per cent. lower in the depression years 1930-35 than it was in the prosperity years 1924-29. The tuberculosis death-rate last year reached 55.6 per 100,000, a reduction of 6.4 per cent. below the previous low record in the previous year. Again it is remarkable that the tuberculosis death-rate should have continued its decline among wage earners throughout the depression and even declined at an accelerated pace. Death-rates from diarrhoeal diseases, chronic nephritis, and causes incidental to childbirth also reached new minima. Rates for cancer, diabetes, and heart

diseases were lower than in 1934. The death-rate from alcoholism is the lowest in many years; there has been a marked decline since the repeal of prohibition.

## SCOTLAND

(FROM OUR OWN CORRESPONDENT)

### THE HEALTH OF SCOTLAND

THE seventh annual report of the Department of Health for Scotland, which has just been published, shows a general death-rate of 13·2 per thousand, which is slightly higher than last year's. The maternal mortality-rate was 6·3 per thousand births, which approximates to the average for the past five years. The urgent need of improvement in the standard of midwifery is emphasised and it is apparent that the need for antenatal supervision is not sufficiently realised by the general public. The number of deaths of infants under one year of age again reached a low record rate (76·8 per thousand births). The general health of the population was maintained, but the incidence of sickness among insured persons remains high, there being a total of over 18,500,000 days of unfitness for work among insured persons. The output of houses by local authorities was 18,651, which was the highest ever achieved in Scotland. Of these, 15,000 were built under slum clearance schemes.

### THE "EDINBURGH MEDICAL JOURNAL"

The current issue of the *Edinburgh Medical Journal* records the resignation of the editor, Mr. Alexander Miles. For no less than 25 years Mr. Miles has skilfully supervised its publication and has maintained a high scientific and academic standard. As a surgeon, teacher, and administrator he has done important work and his long and successful editorship constitutes a further service to medicine of which the members of the Edinburgh school are highly appreciative. Dr. A. Rae Gilchrist, who takes over the duties of editor, has our best wishes for the prosperity of the journal.

It is 131 years since the *Edinburgh Medical and Surgical Journal* was issued as a quarterly magazine under the editorship of the younger Andrew Duncan. In January, 1841, the *Edinburgh Monthly Journal of Medical Science* made its appearance. Later in the same year its name was altered to the *London and Edinburgh Monthly Journal of Medical Science*, and in 1846 it became simple the *Monthly Journal of Medical Science*. The latter was amalgamated with the *Edinburgh Medical and Surgical Journal* in 1855, and in July of that year the *Edinburgh Medical Journal* made its first appearance as the successor to both the periodicals. The first editor was Henry Duncan Littlejohn, professor of medical jurisprudence. A further alteration in the journal has been that since 1922 the transactions of the Medico-Chirurgical and Obstetrical Societies have been published within its covers.

### NEW FACILITIES FOR OPHTHALMOLOGY

The late Dr. Gavin Paterson Tennent, formerly a physician to the Western Infirmary, Glasgow, directed his trustees to pay over to the University of Glasgow a sum sufficient to found a chair of ophthalmology, and also allocated a sum to provide, in connexion therewith, a suitable building at the Infirmary. The new ophthalmological department thus established, which has cost £45,000, was opened last week. It is in charge of Prof. A. J. Ballantyne

and is to become a centre of higher study and research. It should be of great value since it will provide opportunities for advanced study in ophthalmology which are at present not easily obtained.

### A PUBLIC ASSISTANCE MEDICAL SERVICE

A new medical service for the poor has been set up in Clydebank. Since 1930 the service has been carried on by dividing the burgh into three districts and appointing a part-time officer for each. The number of visits and consultations in a year has been about 12,500. Under the new scheme a panel of 14 local practitioners has been formed and these will be paid, according to the number of visits and consultations made during the year, from a pool of £900 to be divided annually by the town council.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

### COMPULSORY RETIREMENT OF THE OFFICERS OF LOCAL AUTHORITIES

A FEW weeks ago the Minister for Local Government and Public Health of the Irish Free State issued to all local authorities throughout the country a circular letter in which he advised them that officers in their employment should normally be compulsorily retired at the age of 65, and that in some cases, examples of which were given, the retiring age should be 60. As a retiring age was not mentioned in the terms of appointment of any of the officers concerned, much discontent was roused, and some doubt expressed as to the powers of the local authorities to compel retirement. The Minister has been asked in the Dáil to quote the statutory powers possessed by local authorities which would enable them to follow his advice, but he did not respond. He admitted that his circular was not an order, but merely a recommendation, a point which had been misunderstood by many of the local authorities. Further questioned as to whether a local authority had power to retire an officer compulsorily on the ground of age alone, he replied that other circumstances would be taken into account. Last week it was reported in the daily press that the central council of the Local Government Officers' Union had taken the opinion of senior counsel as to the legality of the Minister's action. The opinion of Mr. M. J. Ryan, K.C., as quoted in the press, was to the effect that the action of the Minister was ultra vires and that the circular need not be acted on by local authorities, as there was no law by which compulsory retirement could be enforced. Should the department advise a local authority to retire an official on reaching the age of 65, the authority could refuse to do so, and the only step then open to the department would be to call for the retirement of the official on the grounds of incompetency or incapacity, and the whole circumstances would have to be investigated. Counsel's opinion, as quoted, does not appear to deal with the situation which would arise if the local authority were willing to follow the Minister's advice, but the officer refused to retire. It seems unlikely that the Minister should have acted without making sure of the legal position, but his reluctance to answer questions in the Dáil suggests that he is not quite satisfied on the point. Should the compulsory retirement be made effective it will press hard on medical men who had entered public service relatively late in life, for the pension depends on the number of years' service.

## PROGRESS OF PHYSIOTHERAPY

A LUNCHEON was held at the Langham Hotel, Portland-place, on April 8th, in connexion with the coming International Congress of Physical Medicine to be held on May 12th-16th. Lord Horder presided and took the opportunity of making a presentation to the principal guest, Dr. Richard King Brown, medical editor of the *British Journal of Physical Medicine*, in recognition of his services to physiotherapy. Lord Horder gave a short account of Dr. King Brown's career—his ten years as medical officer of health in Bermondsey, the foundation in 1926 of the first municipal solarium in London, his translations of notable German works on his specialty, and, latterly, his arduous work for the *Journal*. Referring to the Sixth International Congress, he said that the decision to hold it in London was a tribute to the work of the English group and would give a great fillip to the march of physical medicine in Great Britain. The help and sympathy received from the Foreign Office and from the Ministry of Health had been very valuable, and 30 of the 35 countries invited had already accepted. He himself had the privilege of being honorary president of the Congress, but he very much regretted that he would not be present, because some time before the dates had been arranged he had accepted an invitation to visit America.

Lord Horder said that he had advocated the claims of physical medicine in season and out of season. He welcomed the Congress because it would stimulate this growing branch of preventive and curative treatment. Physiotherapy was not a new form of medicine; he believed that it was the oldest, for when Adam delved it was the first attempt to keep fit, though psychotherapy might claim Eve's spinning as the first contribution making for equanimity. It was only recently, however, that control had become absolutely essential. The wealth

of methods and apparatus almost made him hope that nothing more would come, to allow breathing space to test and prove the means already available. Physical medicine went on from strength to strength; its achievements had been considerable, its potentialities were incalculable. The pitfalls, however, were perhaps more and deeper than in any other branch of medicine. The greatest was the temptation, enhanced by the public's faith in machinery, to apply it indiscriminately to all types of disease. There was also the danger of the physiotherapist losing touch with the physicist on the one hand and with the clinician on the other. Ideally, of course, he ought to be both but he ought still to look for guidance and support from each; he had much to teach them, but he had also much to learn, and there was no end to learning. Another danger was that he might wander from the bed-rock of pathology and lose himself in the sea of speculation; or, worse, he might construct a pathology of his own, which could only be a pseudo-pathology. There was, lastly, the peculiar danger that he might be commercialised by the astute business man. The only real safeguards from these pitfalls were those that applied to all branches of medicine—namely, the integrity of the practitioner; colleagueship and all that it implied; the group spirit, which was essential to advance; and the opportunities given for free discussion, criticism, and the dissemination of knowledge and improved technique. The Congress would help to establish these.

Dr. King Brown replied, thanking the president for his tribute and for the presentation. He had begun his work of editing the *British Journal of Physical Medicine* with little knowledge of journalism and its success, he said, was due to the help he had received. It was the only one of its kind in the English language.

Sir Francis Fremantle proposed a vote of thanks to Lord Horder and said that the coming Congress would be a valuable contribution at this time to international peace and goodwill.

## PANEL AND CONTRACT PRACTICE

### Fitness for Work: Who Decides?

Dr. A, an insurance practitioner in Scotland, certified a patient to be unfit for work. The approved society referred the case to the regional medical officer who certified him not unfit. The man again consulted Dr. A who advised him to try some light form of work, but the patient decided not to do so and appealed to the Scottish Department of Health against the R.M.O.'s decision. In the meantime, pending the result of the appeal, Dr. A continued to issue certificates of incapacity. In due course the medical service subcommittee considered the matter and according to the *Journal* of the National Association of Clerks to Insurance Committees "decided that the insurance practitioner should not have given unfit certificates after the regional medical officer had given a contrary opinion." Eventually the committee decided that the doctor had failed to comply with the terms of service and recommended a deduction of five guineas from his capitation fees. If the facts are as stated this decision is extraordinary. What probably happened is that the decision against Dr. A was taken because he had given certificates of incapacity after he had himself concurred in the R.M.O.'s opinion of the case to the extent of advising the patient to try some light form of work. The functions of the R.M.O. in rela-

tion to incapacity for work are advisory, and the responsibility for deciding whether a certificate of incapacity should be issued or not rests with the insurance practitioner. If he is honestly of the opinion that the patient is incapacitated for work, even though the R.M.O. is of contrary opinion, the practitioner should continue to certify if the patient so requests. Whether benefit should be paid or not rests not with him but with the approved society.

### A Distinction Without a Difference

A case recently reported to an insurance committee has attracted considerable attention in the lay press. An insured person, who was a maid in the employ of a lady of title, had been suffering from quinsy, and Dr. B upon whose list her name appeared had attended her until Saturday, Feb. 29th, on which date he visited her twice. On the Sunday Dr. B received a telephone message requesting him not to call that day. On the Monday he called at the house and was informed by the housekeeper that he could not see the patient, whereupon he gave the housekeeper to understand that it was necessary that he should do so. Dr. B was then told that if he did not go away the police would be called in, and he, therefore, communicated with the insurance committee stating that he could not hold himself responsible for the patient's treatment. The

committee wrote to the employer recapitulating the facts and pointing out that an insurance doctor is required by his terms of service to visit at his or her place of residence any patient whose condition so requires, but that owing (it would appear) to the housekeeper's attitude Dr. B had been prevented from fulfilling his obligations. The employer was invited to offer any observations she might deem proper on the circumstances. A letter received from the employer's private secretary indicated that the first time the secretary saw Dr. B she "distinctly told him that, as Her Ladyship wished the patient to have the very best attention, he need not treat her as a panel patient but as a private patient, and to send a note of his fees, in due course, which if he will do in respect of the calls he made, he will be paid at the ordinary medical rate." The letter went on to say that subsequently the patient wished to be seen by the family doctor and upon the employer's instructions his services were requisitioned.

There is no reason to doubt that in this case the employer genuinely wished to do the best thing possible for her employee, but it is unfortunate that what was described, at the meeting of the insurance committee, as the atmosphere prevalent at the commencement of the last reign, should still be in evidence. Under Clause 8 (1) of the terms of service, the treatment which a practitioner is required to give his patient comprises all proper and necessary medical services other than those involving the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess. Moreover, under Clause 10 (1), a practitioner is not permitted to demand or accept any fee or other remuneration in respect of treatment which he is required to give under the terms of service. The report of the sub-committee which dealt with the matter notes the employer's view that the medical treatment available under the Act is inferior to that which a person would receive if treated as a private patient. It also notes that the reports submitted to the insurance committee from time to time with regard to the treatment provided by insurance practitioners for insured persons—e.g., the nature of medicaments and preparations ordered at the cost of insurance funds—should go far to dispel the idea that there is any difference between what is popularly known as "panel treatment" and that which a private patient would receive. A letter has been sent to the employer pointing all this out and deprecating her action, taken doubtless in ignorance, in having invited the practitioner to treat an insured person on his list as a private patient. It rests with insurance practitioners themselves to demonstrate that there is no difference between the treatment provided for their insured patients and that provided for their private patients.

**BRITISH EMPIRE CANCER CAMPAIGN.**—The 58th quarterly meeting of the grand council was held in London on April 6th, when it was announced that the King had been pleased to become patron of the Campaign. Invitations to become members of grand council were extended to, among others, Lady Barrett, M.S., and Sir David Wilkie, F.R.C.S. The following grants, amounting to £5530 and making a total to date of £30,990 for the year 1936, were approved: £1100 to the Radium Beam Therapy Research; £1750 (in addition to the grant of £1850 already made for the year 1936) to the Mount Vernon Hospital; £500 (in addition to the grant of £600 already made for the year 1936) to the Marie Curie Hospital; £100 and £80 to Dr. C. R. Amies, at the Lister Institute, and Dr. P. R. Peacock, of Glasgow,

## OBITUARY

### ALFRED MASON VANN, M.R.C.S. Eng., L.S.A.

Dr. Alfred Vann, for many years medical officer of health for Durham City, was born in Durham and began his medical training as a student at the local hospital, but proceeded for its later stages to King's College Hospital, London, where he obtained a Warneford scholarship. He qualified as M.R.C.S. Eng., L.S.A. in 1883, but did not complete his university course although he took honours in the preliminary scientific and intermediate M.B. Lond. examinations, while he also gained the silver medal in botany from the Society of Apothecaries, London. He began practice in Durham nearly fifty years ago and promptly made his mark, holding within a short space of time a local post under the poor-law as medical officer and public vaccinator, then surgeon to the Durham City Constabulary, and then surgeon to the Durham County Hospital. Simultaneously with these appointments he was elected medical officer of health for the city, a post which he held for 34 years, resigning in 1918 but retaining his position of medical inspector of school-children under the city education committee. He also took charge of the X ray and electrotherapeutic department of the county hospital where on retirement he was appointed consultant. Dr. Vann was a man of considerable accomplishments. He had edited certain sections of "Bentley's Botany," he contributed interesting cases to the *Transactions of the Northumberland and Durham Medical Society*, and had marked artistic talents. He was 75 years of age.

### SIDNEY ISAAC PRITCHETT, L.R.C.P. Lond., M.R.C.S. Eng., D.P.H.

Dr. Sidney Pritchett, who died recently in Rochester, was born in the old cathedral city and educated at King Edward's School, Birmingham. He received his medical training in Birmingham and at St. George's Hospital, qualified in 1890, and held several resident appointments at Queen's Hospital, Birmingham. He was for a time in the P. and O. service, but went into practice in Rochester nearly forty years ago and soon became a prominent civic official. He was appointed full-time M.O.H. for the city in 1902, school medical officer, and medical officer to the city and port. He was also surgeon to St. Bartholomew's Hospital, Rochester, and medical officer to the Rochester and Chatham Joint Hospital (the St. William's Hospital). He resigned these posts in 1934, having thus been in charge of the city's health services for 32 years, and was the recipient of gratifying public appreciations. He was a bachelor and 70 years of age at the time of his death.

respectively, for the purchase of special types of centrifuges; £1000 to the Manchester Committee on Cancer to cover the cost for two years' investigations into the possible connexion between the use of heavy oils in motor vehicles and the apparent increase in the incidence of cancer of the upper air-passages and the lungs; £1000 to the North of England branch of the Campaign to meet the cost for the second year of the short-wave investigations being carried out at Newcastle, on behalf of the Campaign, under the direction of Prof. W. E. Curtis and Mr. F. Dickens, D.Sc.

Notification was received that the Royal Society and the Medical Research Council had nominated Prof. Matthew Stewart to succeed Prof. R. T. Leiper, F.R.S., who has retired, as one of their five nominees on the scientific advisory committee of the Campaign.

## CORRESPONDENCE

## PROPHYLACTIC ENUCLEATION OF LOWER WISDOM TOOTH FOLLICLES

To the Editor of THE LANCET

SIR.—In my lectures before the Royal College of Surgeons<sup>1</sup> I have produced the evidence of 622 case-reports of abnormality and complication of the third molars in support of my contention that, cramped



FIG. 1.—Skiagram of a male, aged 21, showing the type of impaction which may be expected to result if the germ of the wisdom tooth shown in Fig. 2 continues to maturity.

as they are for room in the modern jaw, these teeth when mal-erupted constitute a definite clinical menace. The mandibular tooth is responsible for much the greater number of complications as well as the larger proportion of grave ones. The abnormality is dental—but the complications are medical and surgical. They range from severe and incapacitating neuralgias of one or other of the branches of the trigeminus to grave spreading infections involving the cavernous sinus or the mediastinum



FIG. 2.—Skiagram of a female, aged 9½, showing the germ of the wisdom tooth already badly inclined in the "impacted position." This also shows the latest optimum stage of development at which enucleation is best performed.

<sup>1</sup> Arris and Gale lecture (Feb. 21st, 1934), THE LANCET, 1934, i., 416; Hunterian lecture (Feb. 9th, 1935), *Ibid.*, 1935, i., 313 and 463.

and ending in death. I have produced, as well, evidence not only of the severity of the operation for removal of this tooth, when buried or impacted, but also of the gravity of the post-operative complications, which range from ununited fracture of the jaw to fatal septicæmia.

It became obvious that a great deal of unnecessary suffering would be saved if a prophylactic measure could be devised to eliminate the risks attendant upon mal-eruption. A critical study of a large mass of osteological material, correlated with the radiograms of children and young animals arranged in growth series, made it plain that probable impaction of the lower wisdom tooth could be assessed with great accuracy from 9 to 11 years of age, and that the removal of the whole dental follicle with the embryonic tooth, if it could be accomplished satisfactorily, would be a desirable prophylactic operation. So far as I can trace I am the first person to attempt this operation, the simplicity of which I announced in my former lecture (Feb. 21st, 1934), when I showed a slide of the technique. I hope to publish the

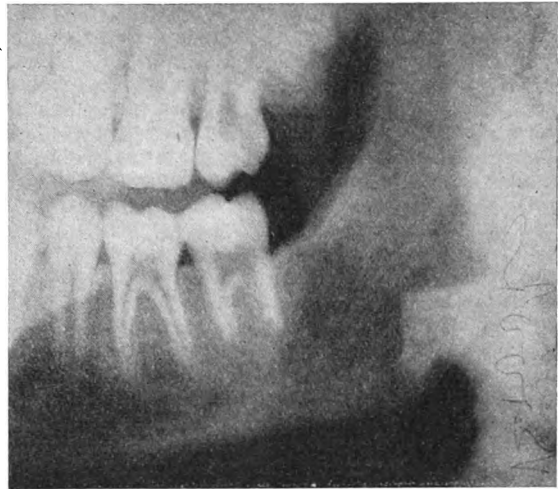


FIG. 3.—Skiagram of the same patient as Fig. 2 a year and 10 months after operation, showing obliteration of the dental crypt by ossification.

operative details in due course, but surgical colleagues who have seen it have urged me to make this preliminary announcement now that I have completed 70 cases.

The operation is exceptionally free from trauma if made early enough. The small wound inside the mouth heals by first intention and the children leave the ward on the following day. This contrasts most favourably with the trauma and long convalescence involved in operating on the fully developed misplaced tooth (Fig. 1). The operation is, however, essentially one of surgery rather than of dentistry. Fig. 2 reproduces a skiagram showing a suitable case in a child of 9½ years. The crown of the wisdom is beginning to calcify in such an oblique angle that normal eruption could not be expected. The third skiagram (Fig. 3) shows the same case 22 months after operation. Obliteration of the dental crypt has proceeded satisfactorily. The molars in front have not been injured or disturbed.

I am, Sir, yours faithfully,

London, W., March 30th.

C. BOWDLER HENRY.

## MENTAL HYGIENE IN MENTAL HOSPITALS

To the Editor of THE LANCET

SIR,—We would suggest that, as an elementary axiom of asylum hygiene, every medical officer should be compelled to spend one day a week out of his hospital.

We are, Sir, yours faithfully,  
April 13th. FOUR ASYLUM PSYCHIATRISTS.

## MANDELIC ACID IN THE TREATMENT OF URINARY INFECTIONS

To the Editor of THE LANCET

SIR,—The interesting article of Drs. Holling and Platt in your issue of April 4th adds to the accumulating evidence that in mandelic acid we have a really valuable means of attack on *B. coli* urinary infections, both in the acute and the chronic stages. A proportion of the cases of acute pyelitis treated by the older methods were permanently cured, but many became chronic. The real test of mandelic acid treatment will be the duration of its sterilising effect after cessation of treatment. Relapses undoubtedly occur, but they appear to respond well to a second course of treatment. Even if treatment had to be resumed for a week or more every few months, the result would still be a godsend to many sufferers from chronic pyelitis. Drs. Holling and Platt suggest that in cases which tend to relapse, two consecutive days of treatment should be given every month. They also emphasise the careful regulation of the bowels, both constipation and the over-use of purgatives being avoided. My impression is that even during the course of treatment a period of constipation increases the turbidity of the urine. The treatment appears to increase the constipation from which most of these patients suffer, and it is sometimes necessary to order, or increase the dose of, aperient during treatment. I find a paraffin emulsion with phenolphthalein very effective.

The appearance of finely granular casts does not seem to be any contra-indication to continuing the treatment. I have never found it accompanied by albuminuria or oliguria, and the casts are frequently absent from the next specimen of urine which is examined, even though the administration of mandelic acid is continued. Moreover, as Holling and Platt point out, the treatment apparently has no deleterious effect in cases of nephritis or nephrosis.

In a series of 26 cases, most of which were under the care of Mr. E. W. Riches at the Middlesex Hospital, I have found so great a variation in the amount of ammonium chloride required to keep the pH of the urine between 5.0 and 5.3, both in different patients and during the course of treatment of a single patient, that I doubt whether any combination of mandelic acid or its salts with the non-specific acidifying agent will prove entirely satisfactory. While 6 or 8 grammes of ammonium chloride is the usual daily dose required, I have had one patient for whom 1.5 g. was sufficient, and others who required 10 or 12 g. One patient's requirements varied from 4 to 12 g. during the course of treatment. Of Holling and Platt's three adult cases treated with ammonium mandelate, in only one was the recommended dose of mandelic acid (12 g. a day, or four doses of 51 grains of ammonium mandelate) given with no additions. In order to obtain the correct pH in the other cases, in one the dose of mandelic acid was reduced below the amount recommended, and in the other ammonium chloride had to be added. The tendency of ammonium chloride to produce anorexia, indigestion, nausea,

and occasionally vomiting, is certainly a grave disadvantage in a few cases, though I have never had to stop treatment on this account. If the claims made for Gelamon are not exaggerated, this preparation of ammonium chloride may solve the problem. It is swallowed in the form of tablets which swell up into a gelatinous mass in the stomach; this is slowly dissolved and absorbed without giving rise to any disturbance of gastric function.

The method of estimating the pH by methyl-red is a very rough one, though the good results obtained by Holling and Platt suggest that accuracy in this respect is not of great importance. Personally I use the B.D.H. Capillator, which takes very little longer.

Cases of uncomplicated *B. coli* infection are undoubtedly the most favourable. In my series there have been five in which other organisms were present (on more than a single occasion) in addition to *B. coli*; no anatomical abnormality of the urinary tract was discoverable. The results were as follows:—

Case.	Secondary organism.	Sterilised to <i>B. coli</i> .	Sterilised to other organism.	Symptomatic result.
1	<i>Staph. albus.</i>	Yes.	No.	Improved.
2	"	Yes.	No.	Not much improved.
3	"	Yes.	No.	"
4	"	Yes.	Yes.	"
5	Streptococcus.	Yes.	Yes.	Improved.

I think mandelic acid should be tried in these cases, but one would be less confident of success.

Some patients—usually those whose main complaint is of pain in the loin or the iliac fossa, with or without frequency of micturition—are unrelieved as regards the pain in spite of sterilisation of the urine; in these cases the pain may be due to spasticity in some part of the musculature of the upper urinary tract.

Another type of case in which the treatment has been tried is that of massive infections with much pus in the urine, such as occasionally occur after pyelolithotomy or prostatectomy in previously infected cases. There is usually a mixed infection, often with *B. proteus*, the urine is very alkaline, and the pH cannot be lowered below 5.8 or 6.0, even with 12 g. of ammonium chloride daily. These cases are only slightly, if at all, benefited by the treatment.

I am, Sir, yours faithfully,  
London, W., April 11th. ALAN W. CUBITT.

## VITAMIN B<sub>1</sub> BY INJECTION IN THE TREATMENT OF NERVOUS DISEASES

To the Editor of THE LANCET

SIR,—Dr. Leak criticises me for going to a continental firm for supplies of vitamin B<sub>1</sub> when British firms are able and willing to provide experimental products. The facts are not, however, as Dr. Leak imagines. My first observations were made with a preparation made by British Drug Houses containing 100 international units in 2 c.cm. Their supplies were quickly exhausted, and further I knew of no firm who could supply the vitamin in a more concentrated form except Hoffmann-La Roche, who have provided me, free of charge, with a large number of ampoules containing 400 international units in 1 c.cm. for clinical trial. It is not surprising, therefore, that I feel indebted to them for making my investigations possible. The British



Drug Houses' preparation is now again available, and I can testify to its efficacy though I prefer the more concentrated solution prepared by Hoffmann-La Roche.

I was much interested in Dr. Leak's account of his investigations, but deplore his desire to introduce politics into the realm of research!

I am, Sir, yours faithfully,

Edinburgh, April 9th.

W. RITCHIE RUSSELL.

### ANNIVERSARY OF A REFORM

To the Editor of THE LANCET

SIR,—On April 23rd and 24th the Association for Moral and Social Hygiene is celebrating an historic anniversary: the jubilee of the repeal of the Contagious Diseases Acts in 1886. To many people to-day the words "Contagious Diseases Acts" may have no significance at all, yet these Acts were the cause of a successful agitation which lasted 16 years, and had remarkable results throughout the world. Moreover the " repealers," led by Josephine Butler, presented a challenge to contemporary ideas on the social evil of prostitution which has largely changed the thought of the Western world in regard to it and is now affecting the East as well.

The British example has since been followed in the Dominions and Colonies, and by Norway, Denmark, Finland, Holland, United States, Czechoslovakia, Bolivia, Palestine, U.S.S.R., Germany, and Switzerland. (Germany under the present régime has since reintroduced the old system in certain towns.)

Great Britain never had the full continental system of registered women and licensed houses, but it made a beginning between 1864-69 with the C.D. Acts and introduced the "registered prostitute," under special police control and regular medical inspection, for use of the Army and Navy in certain garrison towns. The object was to reduce venereal

diseases in the Services but the results were nil. We now know that such medical examination of one sex only for the benefit of the other does not protect the other; but it was not known then, or not generally accepted, by the medical profession and the officials. A certain small number of doctors and administrators did criticise the Acts for medical reasons, but the deep and passionate revolt against them came from men and women who opposed them not only on moral grounds but primarily on grounds of the gross violation of the principles of law and justice involved in the Acts. Mrs. Butler warned the people of this country:

"Never forget that if we allow persons belonging to any class of the citizens to be enslaved—however obscure, despised or degraded that class may be—these will not long continue to be the only slaves. The principle of individual liberty, once infringed, will be gradually lost."

The agitation was eventually successful and it brought not only repeal of the Acts but sweeping changes of the English law in regard to sex morals. Moreover, it led to improvements in the Service conditions which have brought venereal diseases down from 267 cases per 1000 men in 1886 to 10 per 1000 in 1933. These and many other changes for the better we celebrate on April 23rd and 24th. Lady Astor, Prof. Gilbert Murray, and two descendants of Josephine Butler, Mr. R. A. Butler, M.P. (Under-Secretary for India), and Mr. Andrew Butler, will speak at the public luncheon at the Criterion on the 23rd, which will be followed by a service of thanksgiving at St. Martin-in-the-Fields at 6 p.m. at which the Bishop of Liverpool will preach a special sermon. Tickets and further particulars of the meeting on the 24th can be obtained at this office.

I am, Sir, yours faithfully,

ALISON NEILANS,

Secretary, Association for Moral and Social Hygiene.

Livingstone House, Westminster, S.W., April 7th.

## PARLIAMENTARY INTELLIGENCE

### NOTES ON CURRENT TOPICS

#### Easter Adjournment

BOTH Houses of Parliament adjourned on Thursday, April 9th, for the Easter recess. The House of Lords will reassemble on April 28th and the House of Commons on April 21st. On the latter date the Chancellor of the Exchequer will open his Budget.

#### Magistrates and Birching of Children

In the House of Commons on April 7th Mr. PARKER moved that leave be given to bring in a Bill to abolish the power of a court of summary jurisdiction to order a child to be whipped. He said that it had been suggested that when children mutilated animals birching was a desirable punishment. It was not. If serious cases of that kind were brought up birching was not the right punishment. Where a child committed a crime of that sort he should be subjected to some sort of treatment so that he would not do it again. The child should be examined medically, and if necessary be sent to a Home Office school and treated. There had been a very big decline in the number of birchings. In 1913 the number was 2079, in 1930 it was 130, and in 1933 it was 151. Birching had declined largely because magistrates had not found it effective. Unfortunately children were treated very differently in various parts of the country. There had been a very big decrease in juvenile crime from the war down to 1930. Between 1917 and 1929 the number of juvenile convictions decreased from 27,290 to 5936. There had been an increase of convictions since that day, and to his

mind that increase had been due to widespread unemployment among juveniles of 14 to 21. An unfortunate example had been set to younger children. The right way to secure a decrease in that crime was partly by raising the school leaving age, partly by providing better recreation facilities for children and young persons over 14, especially in the way of clubs, playing fields, and so on, and partly by placing new industries in the depressed areas.

Leave to bring in the Bill was refused by 166 votes to 119.

#### The Means Test

##### POSITION OF THE UNEMPLOYMENT ASSISTANCE BOARD

On the motion for the adjournment in the House of Commons on April 9th Mr. D. GRENFELL called attention to the condition of the unemployed, and in particular of those who came under the administration of the Unemployment Assistance Board. He said that the House had been informed on the previous day that there was a live register of nearly 2,000,000 persons. Nearly half that total came under the inquiry under Part 2 of the Unemployment Act. After referring to individual cases of hardship the hon. Member said that there existed a scandalous condition of affairs. The private affairs of men and women were inquired into in a way that was quite intolerable to a person of average pride. If a house showed evidence of cleanness, neatness, and of family pride, that was a disability, and those concerned received less assistance because of the good appearance of the house. People must not only be poor but also in debt before they received the attention of the officers of the Board.

Mr. FORT complained of the delay in introducing the fresh unemployment assistance regulations.—Mr. BATEY said that he would not be satisfied with the abolition of the household means test. He stood for the abolition of the family means test and the personal means test as well.

Mr. GUY said that the great justification for an inquiry into special circumstances was that some special provision might be made in cases of particular need. Everyone knew that there were cases of hardship under the present means test. There should be a distinction between the standard of assistance given in this case and that given under the poor-law. They did not want a destitution test for the able-bodied unemployed. They wanted a certain standard of living for them, so that they might be maintained as efficient units ready to take their place again in industry.

#### REPLY BY THE MINISTER OF LABOUR

Mr. ERNEST BROWN said that the problem could be simply stated, but it could not be simply solved. The trouble was that the new system was applied to thousands of towns and villages where an infinite variety of practice had previously reigned. They had to consider the effect of the regulations and to see how they could meet what fair-minded people would regard as genuine hardships. Those investigations were almost at an end, and what the Government put in their election manifesto they meant to carry out. The House would not have long to wait. His own impression was that the local area officers were doing their work extraordinarily well, with a great understanding of the circumstances of those who came to them, with great sympathy, and with a desire to do what the Act intended—namely, to make the new system a more humane means of dealing with the able-bodied unemployed. It was easy to urge the abolition of the means test and to bring forward hard cases. He had been surprised in the last nine months, not at the number of hard cases, but rather at the smallness of the number. They had to face the issue whether they ought to give public assistance without consideration of the question of means. There were two points—was there to be a test at all? and what kind of test was it to be? There had been many investigations into the question of whether or not there could be another test of need, and with one exception each investigation had come to the conclusion that if there was to be a test of need regarding applicants for public funds it must be in terms of the household. Whereas some local authorities administered State funds with the same care as that with which they administered their own ratepayers' money, there was another class of local authority that did not. The Government would do their best, and that very soon, to bring before the House improved arrangements for administering a uniform system with due regard to local opinion over the whole of Great Britain. The investigations were nearly complete and the House would not have to wait long after Easter.

### HOUSE OF COMMONS

TUESDAY, APRIL 7TH

#### Poison Gas in Warfare

Mr. CARY asked the Secretary of State for War what type of training, if any, was carried out by the War Office in the use of poison gas as a legitimate weapon of warfare; and if chemical experts were employed to work to this end in consultation with Army authorities.—Mr. DUFF COOPER replied: No training in the use of poison gas as a weapon of war is carried out in the Army, but possible methods of the use of gas have naturally to be studied in connexion with training in defence against gas. Chemical experts have, of course, been closely associated with Army authorities in connexion with such training.

Mr. SHINWELL asked the Secretary of State for War the names and basis of the gases with which the anti-gas protectors for the troops had been recently tested; and whether the results had been proved effective.—

Mr. DUFF COOPER replied: As I informed the hon. Member in reply to a question on 31st March last, the present pattern of mobilisation container is considered to provide adequate protection against the gases likely to be encountered. The hon. Member will doubtless realise that it is not in the public interest that I should answer the first part of his question.

Mr. SHINWELL asked the Secretary of State for War whether any protective clothing other than oilskins were in issue for the protection of the troops from corrosive and incendiary chemicals; whether he was aware that the German and other governments were now experimenting with rubber clothing.—Mr. DUFF COOPER replied: The answer to the first part of the question is in the negative, and to the second in the affirmative.

Mr. KIRKWOOD asked the Home Secretary whether the ability of infants and young children to breathe normally, if at all, in a gas mask had been satisfactorily established; whether the period of time was known that must elapse before gas lost its harmful effects when the populace could emerge from cover with safety; what was the penetrating quality of gas; was it capable of reaching those taking cover at, say, the underground railway level; and what action the Government proposed to take to prevent food and water, both under cover and otherwise, becoming contaminated by gas.—Mr. G. LLOYD replied: The question of the protection of infants and young persons is receiving attention and various alternative methods of protection are under investigation. The period of time during which poison gas continues to exercise its harmful effects depends upon a number of factors, such as the nature of the gas employed, the quantity liberated, and the meteorological conditions prevailing at the time. The instructions to be issued to the public will give advice as to when it is safe to emerge from cover. When poison gas is liberated it mixes with the air in the vicinity. This leads to a progressive dilution of the gas cloud which tends to follow the path of the normal air currents existing at the time. The question whether gas could reach the tube railways would depend upon the protective measures adopted in connexion with the supply of air to the railway. Consideration has already been given to this question. The Government have considered the action necessary to prevent food and water becoming contaminated by gas. Protective measures are quite practicable and will be embodied in the instructions to be issued to the public.

Sir GIFFORD FOX asked the Home Secretary whether he was yet in a position to make a statement about the supply of anti-gas respirators to the civilian population in case of air attack.—Mr. G. LLOYD, Under-Secretary, Home Office, replied: Yes, Sir. A simple but effective form of respirator, for use by the civil population, has been devised and the final design is now being settled. The Government propose to accumulate sufficient stocks of this respirator to enable issue to be made to all persons in areas exposed to danger in the event of air attack. The issue would be made free of charge. In the event of attack from the air everyone would be advised to remain indoors in a gas-proofed room in order to avoid danger of contamination; and the respirators for the use of the civil population would primarily be of service for the purpose of enabling people who were out of doors when a raid occurred, or whose gas-proofed rooms had been damaged, to get to a place of safety. The Government are fully alive to the need for providing for the needs of young children and babies, and special methods of protection are being developed for this purpose. It may be anticipated that many factories in this country will seek to put on the market respirators of their own design, and the Government have devised a scheme, the details of which are about to be published, by which manufacturers who make approved types of respirators and who accept various conditions, including liability to Government inspection, will be licensed to affix a Home Office certification mark to their respirators. Purchasers will be well advised not to regard respirators as satisfactory unless they bear this mark.

#### New Cost-of-Living Index Number

Mr. BOOTHBY asked the Minister of Labour whether he proposed to revise the basis of the cost-of-living index number.—Mr. E. BROWN replied: Yes, Sir, I have recently

given further consideration to this matter and have decided that a revision of the basis of the cost-of-living index number should now be undertaken. For this purpose, it will be necessary to collect data with regard to the distribution of the main items of expenditure of working-class households at the present time. An inquiry of this character, on a scale sufficiently comprehensive to provide representative information covering different seasons of the year, cannot be completed before the end of next year. In the meantime, the cost-of-living index number will continue to be calculated on the existing basis, and I anticipate that the new index number can be so linked on to the previous numbers as to continue the series without a break. I should add that as regards the methods to be adopted in the conduct of the inquiry, I hope to have the assistance of a small advisory committee which will include representatives of employers and trade unions.

WEDNESDAY, APRIL 8TH

### Danger Spots and Road Accidents

Mr. ANSTRUTHER-GRAY asked the Minister of Transport if he could state from statistics of the last two years which were the three most dangerous spots in London, rural Scotland, and Glasgow, and the number of accidents that had occurred at each during that period.—Mr. HORE-BELISHA replied: The following statement shows certain streets in London and Glasgow in which road accidents involving personal injury have been particularly numerous. Information regarding accidents in the rural areas of Scotland cannot readily be given in this form:—

LONDON—	Six months ended Sept. 30th—	
	1934.	1935.
Sections of Commercial-road and East India Dock-road .. .. .	236	251
Lewisham High-road and Eltham-road .. .. .	158	155
Chiswick High-road and King-street .. .. .	194	121
GLASGOW—		
Dumbarton-road from Church-street to Balshagray-avenue .. .. .	121	128
Paisley-road and Paisley-road West, from Morrison-street to Lorne-street .. .. .	92	97
Garscube-road, from Burnside-street to Possil-road .. .. .	47	61

Sir ALFRED BEIT asked the Minister of Transport whether he would arrange for fuller publicity to be given

regarding the ages and physical defects, if any, of the victims of road accidents.—Mr. HORE-BELISHA replied: Yes, Sir. The ages of persons killed and any physical defects from which they suffered, so far as they were considered to have been a cause of the accidents, will be shown in the Report on Fatal Accidents on the roads during 1935, which will be issued shortly. Similar particulars will be available in the reports on road accidents involving personal injury which are being obtained from the beginning of this month.

Captain STRICKLAND asked the Minister of Transport whether he had observed the reports of accidents to children cycling in the streets; and whether, when legislation was being introduced, he would consider fixing a minimum age for persons using bicycles, as was the case with motor cyclists.—Mr. HORE-BELISHA replied: Yes, Sir. The figures before me are alarming and show that nearly 40 per cent. of the cyclists killed in road accidents are under 21 years of age.

### Out-patient Clinics for Mental Treatment

Mr. SORENSEN asked the Minister of Health the number of out-patient clinics for mental patients that had been established to the present date.—Mr. SHAKESPEARE replied: The latest available information indicates that there are now 143 out-patient clinics associated with public mental hospitals. More comprehensive particulars will be secured by a questionnaire which is shortly to be issued to local authorities by the Board of Control.

THURSDAY, APRIL 9TH

### Maternity and Child Welfare

Mr. EDWARD WILLIAMS asked the Minister of Health whether he had been in touch with the British Medical Association with regard to maternity services; and, in view of their contention that a unified public health service was the most sure means of reducing maternal and infant mortality, what action he proposed to take in this matter.—Sir KINGSLEY WOOD replied: Yes, Sir. I have recently received a deputation from the Association on this subject. I stated that I should give further consideration to their proposals after I had received the report of my medical officers who are making special investigations in the areas in which the maternal mortality-rate is high.

## PUBLIC HEALTH

### Public-school Boys Learn About Public Health

ON the joint invitation of Sir Kingsley Wood, Minister of Health, and of Mr. Herbert Morrison, leader of the London County Council, a party of public-school boys and masters, 25 of each, spent three days in studying the problems of local administration in London. The qualification for admission of a boy was that he must have the school certificate and be over 17 years of age. In all 28 schools were represented. The party was welcomed by Lord Snell, chairman of the L.C.C., and then listened to an account by Mr. Morrison of the duties of the L.C.C. and how their functions are carried out by the various committees and departments. Dr. W. Allen Daley and Dr. Andrew Topping explained the work of the public health department, the former dealing with the broader aspects of hygiene. Dr. Daley told of the great epidemics of the past, of the work of the commissioners who investigated the conditions of life of the labouring classes nearly a hundred years ago, and of the rise and development of public health work. He described the environmental services, drains, sewers and sewage disposal, the collection and disposal of refuse, town-planning and building by-laws, the steps which are taken to ensure that houses are maintained in a satisfactory condition, and problems of unfit houses and clearance

areas. And so on through the provision of pure air, pure water, and pure food, and the measures to control infectious disease, to the various medical services for the individual and the steps taken to educate the public. The importance of public health work to everyone was emphasised, examples being the economic burden to the community of the care of those who are disabled by mental or physical illness and of the dependants of those who prematurely die because of preventable illness. Mention was made of the epidemic which attacks rich and poor alike, of the serious effect which disease in our ports would cause to our shipping, and of the part played by medical discoveries in reducing the death-rate.

Interest was shown by the number and nature of the questions put to the lecturer. Only ten minutes had been allotted to questions, yet more than twice that time had to be given before the closure could be applied in order that the next item on the programme could proceed. Questions came almost entirely from the boys, the masters being interested to observe the first reactions of the boys to an address of this character. The first was an invitation to say what the next big development in public health work was likely to be. The answer hazarded in reply was that it might be a reorganisation of medical benefit as now provided under the National Health Insurance Acts so as to provide consultant and pathological services for insured persons and a medical

service for the dependants of the insured. The next questioner asked for a detailed description of the various grades of milk and, as a supplementary, an opinion on the nutritive value of pasteurised as compared with raw milk. Then came a question familiar to all lecturers on public health: what was the answer to the contention that modern hygiene was preserving the lives of the inefficient and the degenerate. From this it was an easy stage to a question what was being done for the mentally defective and what could be done to prevent the births of more mentally defectives; then euthanasia was raised and what doctors thought of it. Questions followed as to how the medical needs of the non-insured casual employed were provided, and what the L.C.C. was doing for the sleeper on the Embankment. Finally the lecturer's attention was invited to those just above the National Health Insurance level: what about the "black-coated worker" who had lost his job and who needed an operation?

In the afternoon the party divided into two groups and visited St. James's and St. Giles's Hospitals. On their return Dr. Topping addressed them on problems of hospital organisation and administration, after which he, too, was subjected to a barrage of questions. Dr. Topping referred to the provision made for the sick by the religious orders and the development from that of the great voluntary hospitals. He traced the provision made by the guardians of the poor for the destitute sick and showed that since 1929, when the old poor-law system was abolished and the work transferred to the councils, the hospitals were preparing to undertake every kind of medical treatment, particularly where, as in London, they had been "appropriated" from the poor-law and were now administered under the Public Health Acts. The two succeeding days were devoted to education and housing. The party

was addressed by the valuer and the architect of the L.C.C., by a district inspector, and one of the assistant education officers. Visits were paid to various types of schools, to cottage housing estates, and slum clearance schemes.

### INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 4TH, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2232; diphtheria, 1134; enteric fever, 16; pneumonia (primary or influenzal), 1119; puerperal fever, 41; puerperal pyrexia, 121; cerebro-spinal fever, 27; acute poliomyelitis, 5; acute polio-encephalitis, 2; encephalitis lethargica, 8; dysentery, 27; ophthalmia neonatorum, 87. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 10th was 6778, which included: Scarlet fever, 999; diphtheria, 1112; measles, 3284; whooping-cough, 648; puerperal fever, 14 mothers (plus 9 babies); encephalitis lethargica, 282; poliomyelitis, 5. At St. Margaret's Hospital there were 29 babies (plus 11 mothers) with ophthalmia neonatorum.

*Deaths.*—In 121 great towns, including London, there was no death from small-pox, 3 (2) from enteric fever, 81 (24) from measles, 10 (2) from scarlet fever, 32 (5) from whooping-cough, 29 (3) from diphtheria, 44 (15) from diarrhoea and enteritis under two years, and 71 (15) from influenza. The figures in parentheses are those for London itself.

The mortality from measles is still falling, the figures for the last eight weeks (working backwards) being 81, 104, 114, 105, 84, 88, 78, 58 for the country as a whole, and 24, 33, 62, 58, 47, 38, 18, 14 for Greater London. Liverpool reported 7 deaths, Sheffield 6, Manchester 4, Gateshead 3, no other great town more than 2. Leeds reported 3 fatal cases of scarlet fever, Birmingham 3 of whooping-cough. Deaths from diphtheria were reported from 19 great towns, 3 each from Manchester and Sheffield.

The number of stillbirths notified during the week was 320 (corresponding to a rate of 49 per 1000 total births), including 49 in London.

## MEDICAL NEWS

### Royal College of Surgeons of England

A quarterly meeting of the council was held on April 6th, with Sir Cuthbert Wallace, the president, in the chair. The Jacksonian prize for 1935 was awarded to Mr. R. C. Brock, F.R.C.S., of Guy's Hospital, for his dissertation in the pathology, diagnosis, and treatment of intra-thoracic new growths, including neoplasms of the oesophagus, and a certificate of honourable mention and an honorarium of ten guineas was awarded to Mr. H. P. Nelson, F.R.C.S., of St. Bartholomew's Hospital. The subject for the Jacksonian prize for 1937 will be the pathology, diagnosis, and treatment of tumours of the pituitary gland.

The Walker prize for 1931-35 was awarded to Prof. E. L. Kennaway, M.D., F.R.S., of the Cancer Hospital, London, in recognition of the inspiration and direction he has given to investigations leading to the discovery of a pure chemical compound by which either carcinoma or sarcoma can be induced. The John Tomes prize for 1933-35 was awarded to Mr. Alfred William Wellings, M.D.S., for his original work on dental histology. The Cartwright medal for 1931-35 was awarded to Mr. Arthur Bulleid, M.R.C.S., L.D.S., of Guy's Hospital, for his essay on the relationship of pulpless teeth to general disease and their treatment, with special reference to periapical rarefaction. It was decided that the subject of the Cartwright prize for the years 1936-40 should be general and local diseases as factors in the causation of pathological oral conditions.

Reginald Seymour Lawrie, of Middlesex Hospital, was appointed Begley student for the ensuing three years. The president reported that he had appointed Mr. Sydney Scott as representative of the College at the International Congress of Laryngology, Rhinology, and Otology, to be

held in Berlin in August, 1936. At the request of the director-general of the Indian Medical Service it was decided, subject to satisfactory arrangements being made, to hold a primary fellowship examination in India at the end of 1937.

Mr. H. L. Eason, vice-chancellor of the University of London, and Dr. Egbert Morland, assistant editor of THE LANCET, were elected fellows of the College under the charter which permits the council to elect annually to the fellowship without examination two members of twenty years' standing. A diploma of membership was granted to James Firth Heslop, of Manchester University.

Diplomas in child health were granted jointly with the Royal College of Physicians to the following candidates:—

Cécile H. D. Asher, L. I. S. Campbell, E. H. Capel, Meyer Carr, Anne A. Craig, R. H. Fish, Margaret L. Foxwell, S. C. Gawne, Constance M. Hall, Irene M. Holoran, A. H. Khan, Hah-Liong Lee, B. F. Longbotham, W. H. Patterson, Margaret R. Price, C. K. Rowan-Legge, W. I. D. Scott, J. M. Watt, and R. A. Wilson.

### International Society of Medical Hydrology

The annual meeting of this society is to be held this year in Austria, from Oct. 10th to 16th. The opening ceremonies and the first medical discussion will take place in Innsbruck; the party will then proceed to Badgastein and Hofgastein, and go from there to Salzburg. After the meeting visits may be paid to the Salzkammergut and also to Vienna and Budapest. The two principal subjects for consideration are the spa treatment of disorders of old age, to be introduced by Sir Humphry Rolleston, and radio-activity in medicinal waters. A party will be formed to travel from London on Oct. 9th and non-members of the society may attend the meeting on payment of a small fee. Further particulars may be obtained from the general secretary at 109, Kingsway, London, W.C.2.

**University of London**

At the London School of Hygiene (Keppel-street, W.C.), at 5.30 p.m. on May 5th, 7th, and 8th, Prof. A. Butenandt, of the institute of organic chemistry at Danzig, will lecture on the biochemistry of the sterol group.—Mr. H. M. Traquair, ophthalmic surgeon to the Edinburgh Royal Infirmary, will give his (postponed) lectures on perimetry on May 18th and 19th at 5.30 p.m. at University College Hospital medical school.—On May 12th, 13th, and 14th, at 5.30 p.m., at the College of the Pharmaceutical Society (17, Bloomsbury-square, W.C.), Prof. Arthur Stoll, of Basle, will speak on cardiac glucosides.—On May 15th, at 5 p.m., at King's College, Strand, Dr. Henri Fredericq, professor of physiology in the University of Liège, will give a lecture on the laws of excitation of the autonomic nervous systems with reference to chemical mediators.—On May 21st Dr. Alfred Adler, of Vienna, will lecture on some developments in individual psychology; the meeting will be at University College at 5.30 p.m.—On May 7th and 8th, at 5.30 p.m., at the Royal Veterinary College, two lectures on mineral deficiency diseases of farm animals will be given by Prof. Henry Dryerre and Mr. J. Russell Greig, Ph.D.—Admission to the lectures is free, without ticket.

**University of Adelaide**

The South Australian Government has appointed Dr. E. Weston Hurst to be director of the new Institute of Medical Science which is being established in Adelaide.

Dr. Hurst, who is 35 years of age, graduated at Birmingham in 1922. He obtained the degree of M.D. two years later and of D.Sc. in 1932, when he also became M.R.C.P. Lond. In 1923-24 he was the Walter Myers travelling student of Birmingham University and he worked at the National Hospital, Queen-square, until in 1926 he was appointed pathologist to the Miller General Hospital, Greenwich. In 1928, for the Milbank Fund, he began investigations into poliomyelitis, and from that time he has been on the staff of the Lister Institute, holding the university appointment of reader in experimental pathology. From 1932-34 he was given leave of absence to work at the Rockefeller Institute at Princeton, New Jersey. His William Withering lectures, delivered at Birmingham and published in THE LANCET last September, formed an authoritative review of the neurotropic virus diseases, and his views on this subject are further expanded in the current issue of *Brain*. His own work includes original observations on the viruses of poliomyelitis and rabies.

**Royal Faculty of Physicians and Surgeons of Glasgow**

At a meeting of the Faculty, held on April 6th, with Prof. Archibald Young, the president, in the chair, the following were admitted to the fellowship:—

Edmund Denis Cooper, Thomas Neilson Fraser, Robert Sinclair Kerr, James Anthony Waring McCluskie, William John Brownlow Riddell, and Laurance David Wellwood Scott (Glasgow), Susilananda Sen (London), and Edgar William Thomas (Rhonda).

**Royal College of Surgeons of Edinburgh**

At recent examinations of the College the following candidates were successful:—

**FINAL EXAMINATION FOR L.D.S.**

Robert Lawrie, D. L. Mackenzie, Annie McA. Douglas, L. A. P. Cantin, H. R. Inglis, Elsbeth Grunberg, E. O. Rossetti, Mary D. Shepherd, Kurt Bronne, Werner Sachs, and James Hughes.

**Indian Medical Service**

The annual dinner will be held at the Trocadero Restaurant, London, on Wednesday, June 17th, at 7.15 p.m., when Major-General Sir Robert McCarrison, C.I.E., will preside. Officers can arrange to sit near their friends, as separate tables to seat eight will be provided. Tickets from the joint hon. secretary, Sir Thomas Carey Evans, Hammersmith Hospital, Ducañe-road, London, W.12.

**Hunterian Society**

At the annual general meeting of this society held on April 9th, the following office-bearers were elected:—

President: Mr. H. L. Attwater; vice-presidents: Dr. W. Brander, Dr. A. Westerman, Mr. M. Oldershaw, and Dr. W. H. F. Oxley; hon. treasurer: Dr. Irwin Moore; trustees: Sir Bruce Bruce-Porter and Dr. A. P. Gibbons; orator: Lord Horder; hon. secretaries: Mr. A. E. Porritt and Dr. John Leobody; members of the Council: Dr. Thomson Brown, Dr. S. Monckton Copeman, Dr. W. S. C. Copeman, Dr. G. R. Mather Cordiner, Dr. John Eyre, Dr. F. Howard Humphris, Dr. B. H. Jones, Dr. E. W. McCormick, Dr. W. Mailer, Dr. D. O. Norris, Dr. Basil Parsons-Smith, and Dr. A. Wilson; hon. librarian: Mr. A. E. Mortimer Woolf; auditors: Dr. Ernest Young and Mr. Andrew McAllister.

Prof. Grey Turner has been elected a corresponding member of the Surgical Society of Vienna.

**King Edward's Hospital Fund for London**

The King has signified his intention to give an annual subscription of £1000 to this Fund.

**St. John Ambulance Brigade**

The chief commissioner of the Brigade announces that he has appointed Dr. William C. Bental to be his staff officer for air-raid precautions.

**International Pædiatric Congress**

This congress, which was to be held in Rome in September, has been postponed until the spring of next year.

**Lectures on Nutrition**

On April 21st, 22nd, 23rd, and 24th, at 6 p.m., Dr. J. Alison Glover will lecture at Gresham College, Basinghall-street, London, E.C. His subject is Some Aspects of Nutrition, and the lectures are open to all without charge.

**West End Hospital for Nervous Diseases**

A Savill prize is offered for the best thesis on a neurological subject submitted by a candidate who has attended the practice of this hospital on at least ten occasions. The subject chosen for the thesis should be submitted to the examiners not later than May 31st, and the thesis itself by Nov. 30th. Further information may be had from the secretary of the hospital, Welbeck-street, London, W.1.

**Bayliss-Starling Scholarship**

An award of this scholarship, which is of an annual value of £120, will shortly be made. The scholar will be required to follow a course at University College in the principle and methods of research in physiology and biochemistry. Further information is obtainable from the secretary of the college, Gower-street, London, W.C.1.

**British Institute of Philosophy**

The Wright memorial lecture, on the Romantic Factor in Modern Politics will be delivered by Prof. Ernest Barker at University College, Gower-street, London, W.C., at 5.45 p.m. on Thursday, May 7th. Cards of admission can be obtained from the director of studies at University Hall, 14, Gordon-square, London, W.C.1.

**A Congress of Cardiologists**

We are informed that a meeting of specialists in cardiology will be held at Royat over Whitsuntide (May 31st to June 1st), when the subject of discussion will be Vascular Spasm. British members of the foreign committee include Sir Thomas Lewis, F.R.S., Sir Farquhar Buzzard, Sir Walter Langdon-Brown, Sir Maurice Cassidy, Sir StClair Thomson, Dr. John Parkinson, Dr. F. W. Price, Dr. Basil Parsons-Smith, Dr. T. F. Cotton, Dr. Maurice Campbell, Dr. Evan Bedford, and Dr. A. P. Cawadiaz.

**North Kensington Women's Welfare Centre**

A lecture-demonstration on the theory and practice of contraception will be given at the gynaecological and birth control clinic on Thursday evening, April 30th, at 8.30 p.m. Dr. Helena Wright will be the lecturer, and a fee of 5s. is charged to meet the expenses incurred. There are daily clinic sessions at which further experience can be acquired and a fee of 1 guinea admits to two or three of these sessions as well as to the lecture-demonstration. Applications to attend the lecture and sessions should be made in advance to the secretary of the clinic, 12, Telford-road, Ladbroke-grove, W.10.

**Rowett Research Institute**

Dr. J. T. Irving has been appointed head of the physiology department of this institute, near Aberdeen, in succession to Dr. R. C. Garry who has become professor of physiology at St. Andrews.

Dr. Irving was born in Christchurch, New Zealand, and educated at Christ's College there. He came to England in 1920 as a student at Caius College, Cambridge, and was placed in the first class in both parts of the natural sciences tripos. From 1924 to 1928 he was engaged on research in biochemistry being awarded a Beit fellowship at Oxford during the last two of these years. In 1927 he received the degree of Ph.D. at Cambridge and in the following year he entered Guy's Hospital, London, to complete his medical studies. Since qualification in 1931 he has been lecturer in physiology at Bristol and Leeds. His investigations have been chiefly concerned with carbohydrate metabolism and with abdominal sensation.

## PHYSICAL EDUCATION

THE report of the Physical Education Committee of the British Medical Association, published to-day by the Association and obtainable for the modest price of 6d., makes many important suggestions for the improvement of the physical efficiency of the nation. The Committee was appointed early in 1935 "to consider and report upon the necessity for the cultivation of the physical development of the civilian population and the methods to be pursued for this object." It consisted of 22 members, including the following 15 doctors: Dr. E. Kaye Le Fleming, Dr. S. Watson Smith, Mr. H. S. Souttar, Mr. N. Bishop Harman, Sir Henry Brackenbury, Mr. W. McAdam Eccles, Sir Crisp English, Dr. W. N. West-Watson, Dr. Adolphe Abrahams, Dame Janet Campbell, Dr. G. P. Crowden, Dr. Henry Herd, Dr. L. R. Lemprière, Mr. R. C. Elmslie, and Miss M. Forrester-Brown.

The Committee has received evidence from numerous expert witnesses and has circulated four different questionnaires which have been completed by schools, colleges, voluntary organisations and industrial firms, and representatives of foreign countries.

The report begins with a discussion of the importance of exercise, fresh air, sunshine, diet, clothing, and so forth in the maintenance of bodily fitness. This is followed by a survey of the position of physical education in the general educational system. The Committee finds that the existing arrangements in schools leave much to be desired. Usually too little time is devoted to the subject, and many schools possess neither suitable accommodation for gymnastic training nor sufficient playing field space for outdoor games.

It recommends that properly equipped gymnasias, together with changing rooms and shower baths, should be provided in senior elementary, central, and junior technical schools, and that facilities for games and swimming should be greatly increased. The importance of physical exercises being performed in appropriate costume is emphasised and local education authorities are urged to supply a stock of suitable clothing and gymnastic shoes for children who cannot provide their own. The appointment of expert organisers of physical education by all education authorities is strongly recommended and suggestions are made as to the numbers of organisers of both sexes required for different school populations.

The Committee deprecates the tendency, especially evident in many public schools for boys, to subordinate physical education in gymnasias to field games and athletics, and "to regard games as an unduly serious business rather than to play them for the pleasure of playing." It also condemns the practice, common in public and secondary schools, of curtailing the physical activities of senior pupils who are preparing for examinations. Instruction in elementary physiology and hygiene is considered to be an essential part of physical education and it is recommended that such instruction should be given in all schools as a branch of general science.

The provision made for the promotion of physical fitness among persons no longer attending school was found on investigation to be seriously inadequate. Despite the valuable contributions of local authorities, voluntary organisations, and business firms to the bodily well-being of this section of the population, it appears that at least 40 per cent. of persons between the ages of 14 and 40 take no part in organised physical

recreation. It is recommended that the existing facilities should be greatly extended and that, as one means to this end, there should be closer coöperation between all organisations concerned with the physical welfare of the community. Hope is expressed that the recently established Central Council of Recreative Physical Training may act as an authoritative coördinating body, uniting in a common policy the endeavours of the Board of Education and the voluntary organisations.

The training of teachers of physical education is next discussed, and here the need is stressed for a greatly increased supply of men suitably trained to teach the subject in public and secondary schools for boys. The comparative neglect of physical education in the university training departments for teachers is deplored, and it is recommended that universities should not only provide for the physical education of undergraduates but should also establish an internal diploma in the subject.

### Medical Supervision of Physical Education

Finally, the Committee envisages a much closer relation between physical education and the science and art of medicine. The recommendations (LV. to LXV.) arising from this aspect of their deliberations are set out in full below.

#### IN SCHOOLS

There should be close coöperation between the head master (or mistress), the school doctor, the parents, the gymnastic teacher, and the general teaching staff in all matters pertaining to the physical welfare of the individual pupil.

Such coöperation is especially desirable in the prevention of the strain which girls are liable to suffer in mixed schools.

Adequate medical supervision should be available to ensure that unfit children do not participate in unsuitable or excessive exercises or games and that undernourished children receive sufficient supplementary feeding to enable them to participate with benefit in the regular physical exercises undertaken by the other children.

#### IN VOLUNTARY ORGANISATIONS

There should be closer coöperation between the health services and the educational services, whether central or local, in relation to the physical education of the population. The medical and physical training staff of the local authority should be available for consultation in connexion with "keep-fit" and other recreative classes in the area.

Leaders should be trained to watch for signs of physical disability, and should advise any member of the class who appears distressed or unduly fatigued to consult his or her doctor before resuming attendance.

Clubs should attempt to provide suitable non-technical lectures, preferably by medical men, on physiology and hygiene.

Recreative physical activities provided by industrial firms should be linked with the medical supervision of the employees.

#### IN PHYSICAL TRAINING COLLEGES

Entrants to the physical training colleges should be subjected to a thorough medical examination.

Medical examinations of students in training at the physical training colleges should be held at frequent intervals, and the work of individual students regulated in accordance with the examination results.

The medical profession should coöperate with the gymnastic profession by investigating the physiological requirements and effects of the various exercises with a view to the scientific arrangement of the syllabus of training. To facilitate such investigation, efforts should be made to establish some uniform system of physical assessment of the individual student. In particular, a standard method of testing exercise tolerance should be devised.

Post-graduate courses should be established to provide



medical men and women with the special training which the medical supervision of physical education demands.

Appendices to the report contain an interesting historical sketch of physical education through the ages, a brief outline of the position of physical education in various foreign countries, and a description of a "standards" scheme for school athletics which is suggested as an alternative to the usual school sports system.

### ROYAL MEDICAL BENEVOLENT FUND

At a recent meeting of the committee of this fund 13 new applicants were assisted and 41 grants were renewed to beneficiaries. In all £1398 was voted. The following particulars of a few cases helped indicate the kind of work undertaken.

M. B., 1933, aged 27, who was responsible for the maintenance of his mother and two younger brothers, had been prevented from taking up a salaried post owing to being in hospital for an operation and was without means. Fund voted £45.

L.R.C.P. Irel., aged 71. In 1935 he had a severe attack of hemiplegia, which affected his speech and legs. Although improved in health he has great difficulty in obtaining employment owing to his deafness, speech, and age. He is earning 10s. a week and is in receipt of the old age pension of 10s. a week. His wife was operated on in 1934 and is in a very weak state of health. She has the charge of a mentally defective daughter, and is endeavouring to increase her income by taking lodgers. Fund voted £40 per annum to the doctor and £26 to his wife.

Widow of medical man aged 67. Suffering from pernicious anemia; has been operated for cataract and has lost one eye. On the death of her husband in 1936 she was left with her daughter in great financial difficulties, the only asset being the possible sale of the practice for £400. Two sisters-in-law, both in very poor circumstances, have given all assistance within their powers. Fund voted £26 per annum and a special gift of £10.

Widow of medical man aged 33, left on the death of her husband with three children aged 5, 2½ years, and 6 months, and a capital sum of under £2000. The Ladies' Guild will help with education.

Daughter of medical man aged 54, suffering from diabetes, has an income of £60 per annum. Fund voted £26 per annum.

This is the centenary year of the fund and a special appeal is being made for new subscribers to raise the annual income by subscriptions and donations to £20,000. From the present income of £14,000 allowances of £40 and £26 are made to medical practitioners and their dependents respectively. The increased income would enable the committee to raise these allowances to £52 and £36. An appeal is also being made this year for special donations to create a fund from which larger grants can be voted to very urgent and distressing cases, and which may be used to help with the training of widows and orphan sons and daughters of medical practitioners to enable them to be self-supporting. Cheques should be made payable to the hon. treasurer of the Fund, 11, Chandos-street, London, W.1.

**LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY LIMITED.**—The annual general meeting of this society will be held at Victory House, Leicester-square, London, on Wednesday, May 6th, at 4 P.M., to receive and adopt the annual report and balance sheet, and to transact other business of the society.

**INTERNATIONAL ASSOCIATION FOR PREVENTION OF BLINDNESS.**—The general assembly of this association and of the International Organisation of the Campaign against Trachoma will be held at 3 P.M. on Monday, May 11th, at the Centre Marcelin Berthelot, 28 bis, rue St.-Dominique, Paris. Prof. de Lapersonne, the president, will take the chair, and communications will be made by Dr. Park Lewis, Prof. F. Terrien, Mr. R. P. Wilson, Mr. A. F. MacCallan, and Mr. Bishop Harman. Further particulars may be had from the secretary at 66, Boulevard Saint-Michel, Paris.

## Medical Diary

### SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**  
**TUESDAY, April 21st.**—5.30 P.M. Meeting of Fellows.  
*Psychiatry and Disease in Children.* 8.30 P.M. Dr. William Moodie and Dr. Reginald Miller: Enuresis.
- THURSDAY.**  
*Dermatology.* 5 P.M. (Cases at 4 P.M.) Dr. H. W. Barber: 1. Hereditary Alopecia in Mother and Daughter. Dr. G. B. Dowling: 2. Congenital Developmental Abnormality. Dr. A. C. Roxburgh and Dr. R. Klaber: 3. Case for Diagnosis. Dr. Klaber: 4. Idiopathic Hypochromic Anæmia with Dermatitis Herpetiformis. Dr. Klaber and Dr. Freundenthal: 5-6. Blue Nævi (Jadassohn). Dr. G. Bamber: 7. Keratosis of the Nipples. Dr. G. Heggs: 8. Aplasia Phalangium. Dr. R. D. Moyle: 9. Cystic Hygroma with Recurrences in the Skin. Prof. L. J. Witts: 10. Dermatomyositis.  
*Urology.* 8.30 P.M. Mr. O. L. Addison: Urology in Children.
- FRIDAY.**  
*Disease in Children.* Cases will be shown at 4.30 P.M.  
*Epidemiology and State Medicine.* 8.30 P.M. Dr. A. D. Gardner: Prophylaxis, Treatment, and Bacteriology of Pertussis.
- MEDICO-LE GAL SOCIETY.**  
**THURSDAY, April 23rd.**—8.30 P.M. (Mansion House, 26, Portland-place, W.), Prof. Laurie: The Application of Microscopic Methods to Deciding the History and Origin of Pictures.
- CHELSEA CLINICAL SOCIETY.**  
**TUESDAY, April 21st.**—8.30 P.M. (Hotel Rembrandt, Thurloe-place, S.W.), Prof. J. A. Gunn and Dr. A. J. D. Cameron: The Trend of Modern Therapy.
- PADDINGTON MEDICAL SOCIETY.**  
**TUESDAY, April 21st.**—9 P.M. (Great Western Royal Hotel, Paddington, W.), Dr. Maurice Shaw: The Backward Bowel.
- SOCIETY FOR THE STUDY OF INEBRIETY.**  
**TUESDAY, April 21st.**—4 P.M. (11, Chandos-street, W.), Annual General Meeting. Dr. J. D. Rolleston: On Snuff-taking.
- ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY,**  
 5, Lisle-street, W.C.  
**WEDNESDAY, April 22nd.**—4.15 P.M., Clinical Cases. 5 P.M., Dr. George Bray: The Cutaneous Manifestations of Allergy.
- LECTURES, ADDRESSES, DEMONSTRATIONS, &c.**
- UNIVERSITY OF BIRMINGHAM.**  
**TUESDAY, April 21st.**—3.30 P.M. (General Hospital), Mr. A. B. Danby: Recent Advances in the Diagnosis and Treatment of the Toxæmia of Pregnancy.  
**FRIDAY (Queen's Hospital), 3.30 P.M.,** Dr. J. F. Brailsford: The Possibilities of Antenatal Radiography in General Practice.
- BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.**  
**MONDAY, April 20th.**—2.15 P.M., Dr. Duncan White: Radiological Demonstration.  
**TUESDAY.**—2 P.M., Prof. E. H. Kettle: Pathological Lecture-demonstration. 3 P.M., Mr. E. J. King, Ph.D.: Phosphatase in Bone Formation and in Bone Disease.  
**WEDNESDAY.**—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).  
**THURSDAY.**—2.30 P.M., Dr. W. S. C. Copeman: Arthritis. 3 P.M., Dr. Chassar Moir: Operative Obstetrics.  
**FRIDAY.**—2.15 P.M., Dr. A. A. Davis: Gynecological Pathology. 3.30 P.M., Dr. Alan Moncrieff: Hygiene of the New-born Child. 5 P.M., Sir James Walton: The Surgical Aspects of Dyspepsia.  
 Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetric and gynecological clinics or operations, refresher course for general practitioners.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**  
**MONDAY, April 20th, to SATURDAY, April 25th.**—**ROYAL EYE HOSPITAL, St. George's-circus, S.E.** Afternoon course in ophthalmology.—**ST. MARK'S HOSPITAL, City-road, E.C.** All-day course in proctology. Courses are open only to members of the fellowship.
- HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.**  
**WEDNESDAY, April 22nd.**—2 P.M., Mr. Denis Browne: Cleft Palate and Hare-lip. 3 P.M., Mr. H. C. Apperly: Irregularities of the Teeth and Jaws.  
 Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.
- NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.**  
**TUESDAY, April 21st.**—5.30 P.M., Dr. F. W. Price: Chronic Myocardial Disease.
- MANCHESTER ROYAL INFIRMARY.**  
**TUESDAY, April 21st.**—4.15 P.M., Dr. F. E. Tylecote: The Physician and the Menopause.  
**FRIDAY.**—4.15 P.M., Mr. John Morley: Demonstration of Surgical Cases.
- GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.**  
**WEDNESDAY, April 22nd.**—4.15 P.M. (Western Infirmary), Mr. J. Mill Renton: Toxic Goitre and its Treatment.

## Appointments

**ARMIT, ADAM, M.B. Edin., D.P.H.**, has been appointed Medical Officer for Chadderton.

**BROWN, C. METCALFE, M.D. Glasg., D.P.H.**, Medical Officer of Health for Middlesbrough.

**EDWARDS, L. M., M.D. Wales**, Assistant Resident Medical Officer at the City of London Maternity Hospital.

**GARLAND, H. G., M.D. Leeds, M.R.C.P. Lond.**, Consultant Assistant Physician to St. James's Hospital, Leeds.

**HARTFALL, S. J., M.D. Leeds, M.R.C.P. Lond.**, Consultant Assistant Physician to St. James's Hospital, Leeds.

**HUDSON, E. H., M.B. Camb., M.R.C.P. Lond.**, Hon. Assistant Physician to the West London Hospital.

**KIMBELL, C. W., M.B. N.Z.**, Resident Medical Officer at the City of London Maternity Hospital.

**MURRAY, D. S., M.B. Glasg.**, Assistant Pathologist to the West London Hospital.

**ROBERTSON, MARGARET F., M.B. Leeds**, Medical Officer to Maternity and Child Welfare for Middlesbrough.

**WADE, C. H. T., M.B. Manch., D.P.H.**, Deputy Medical Superintendent, Baguley Sanatorium, near Altrincham.

**Certifying Surgeons under the Factory and Workshop Acts:**  
**Dr. D. J. EVANS** (Cowbridge District, Glamorgan); **Dr. J. PRINGLE** (Manchester South East District, Lancs.); **Dr. W. R. MAXWELL** (Rhondda (Porth) District, Glamorgan); **Dr. G. R. GARDNER** (Larkhall District, Lanarkshire).

## Vacancies

*For further information refer to the advertisement columns*

**Accrington, Victoria Hospital.**—H.S. £150.

**Altrincham General Hospital.**—Jun. H.S. At rate of £120.

**Ashton-under-Lyme District Infirmary.**—H.S. At rate of £150.

**Ayr County Council.**—Asst. M.O. £500.

**Birmingham, St. Chad's Hospital.**—Jun. Res. M.O. At rate of £150.

**Birmingham, Selly Oak Hospital.**—Jun. M.O. At rate of £200.

**Bradford Royal Infirmary.**—Two H.S.'s. Each at rate of £135.

**Bristol Eye Hospital.**—Jun. Res. H.S. £100.

**British Postgraduate Medical School, Ducane-road, W.**—H.P.

**Burnley Victoria Hospital.**—H.P. At rate of £150.

**Burton-on-Trent, Brelby Hall Orthopaedic Hospital.**—Res. H.S. At rate of £150.

**Cambridge, Addenbrooke's Hospital.**—Res. Anaesthetist, &c. At rate of £130.

**Canterbury, Kent and Canterbury Hospital.**—H.S. At rate of £125.

**Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.**—Hon. Assts. in Out-patient Dept.

**Chester City Hospital.**—Sen. Res. M.O. £400.

**Cowentry and Warwickshire Hospital.**—Res. H.S. £125.

**Doncaster, Royal Infirmary and Dispensary.**—Res. Anaesthetist. Also H.S. Each at rate of £175.

**Ealing, King Edward Memorial Hospital.**—Sen. Res. M.O. At rate of £250.

**Eastbourne, Princess Alice Memorial Hospital.**—Psychologist.

**Evelina Hospital for Sick Children, Southwark, S.E.**—H.S. £120.

**General Lying-in Hospital, York-road, Lambeth, S.E.**—Jun. Res. M.O. and Anaesthetist. At rate of £100.

**Hampstead General and N.W. London Hospital.**—Physician to Out-patients.

**Harrogate and District General Hospital.**—H.S. At rate of £150.

**Home Office, Whitehall, S.W.**—Medical Inspector for Children's Branch. £738.

**Hospital for Sick Children, Great Ormond-street, W.C.**—Res. M.O. for Country Branch. At rate of £250. Also Surg. Reg. £200.

**Hove General Hospital.**—Res. M.O. At rate of £150.

**Huddersfield Royal Infirmary.**—Cas. O. £200. Also H.P. and Res. Anaesthetist. Also two H.S.'s. Each at rate of £150.

**Hull, Beverley-road Institution.**—Asst. M.O. £350.

**Hull Royal Infirmary.**—H.P. to Sutton Branch Hospital. At rate of £160. Also Second Cas. O. At rate of £150.

**Ipswich, East Suffolk and Ipswich Hospital.**—Cas. O. £168. Also H.S. £144.

**Kidderminster and District General Hospital.**—H.S. £150.

**Lancashire Mental Deficiency Acts Committee.**—Asst. M.O. £550.

**Leicester, City General Hospital.**—Res. M.O. At rate of £300.

**Liverpool, Fazakerley Sanatorium.**—Res. Asst. M.O. £200.

**Liverpool, Ministry of Pensions Hospital, Mossley Hill.**—Asst. M.O. At rate of £300.

**Liverpool Sanatorium, Delamere Forest, Frodsham.**—Second Asst. to Med. Supt. £200.

**London Jewish Hospital, Stepney Green, E.**—Res. M.O. and H.P. At rate of £150. Also H.S. and Cas. O. Each at rate of £100.

**Macclesfield General Infirmary.**—Second H.S. At rate of £150.

**Manchester, Christie Hospital and Holt Radium Institute.**—Asst. M.O. £400.

**Manchester City P.H. Dept.**—Asst. M.O.H. £700.

**Manchester Royal Children's Hospital, Pendlebury.**—Res. Surg. O. At rate of £125.

**Manchester Royal Infirmary.**—H.S. to Special Depts. At rate of £50.

**Margate, Royal Sea-Bathing Hospital.**—Asst. Med. Supt. £500.

**Nottingham City Mental Hospital.**—Jun. Asst. M.O. £350.

**Also Locum Tenens M.O. £7 7s. per week.**

**Nottingham General Dispensary.**—Res. Surgeon. £250.

**Oldham Royal Hospital.**—H.S. for Special Depts. and H.P. At rate of £175.

**Penshurst, Cassel Hospital for Functional Nervous Disorders, Swaylands.**—Locum tenens. 10 guineas per week.

**Plymouth City General Hospital.**—Jun. Asst. M.O. £250.

**Princess Beatrice Hospital, Earl's Court, S.W.**—Res. M.O. At rate of £150.

**Queen Mary's Hospital for the East End, Stratford, E.**—Asst. Radiologist. £150.

**Radcliffe-on-Trent, Notts. County Mental Hospital.**—Second Asst. M.O. £459.

**Rotherham Hospital.**—H.P. £180.

**Royal Chest Hospital, City-road, E.C.**—Res. M.O. At rate of £150. Also H.P. At rate of £100.

**Royal London Ophthalmic Hospital, City-road, E.C.**—Two Out-patient Officers. Each £100.

**Royal Naval Medical Service.**—M.O.'s.

**Royal Society, Burlington House, W.**—E. Alan Johnston and Lawrence Research Fellowship in Medicine. £700.

**Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.**—Res. Cas. O. £150. Also H.P. At rate of £100.

**Sheffield Children's Hospital.**—H.S. At rate of £100.

**Surrey County Council.**—Jun. Asst. M.O. for County Sanatorium. At rate of £350.

**Surrey Standing Joint Committee.**—Part-time Pathologist and Medico-Legal Advisor to Surrey Constabulary. 100 guineas with extras.

**Swansea County Borough.**—Asst. M.O. £500.

**Swansea General and Eye Hospital.**—H.P. At rate of £150. Also Cas. O. At rate of £150-£175.

**Taunton and Somerset Hospital.**—H.S. At rate of £100.

**Wolverhampton Royal Hospital.**—H.P. At rate of £125.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Bruton (Somerset), Carlton (Notts), and Keswick (Cumberland). Latest date for receipt of applications April 21st.

## Births, Marriages, and Deaths

### BIRTHS

**CALLENDER.**—On April 6th, at Whitstable, Kent, the wife of Dr. T. A. R. Callender, of a daughter.

**CAPPS.**—On April 6th, the wife of F. C. W. Capps, F.R.C.S. Eng., Park-square East, N.W., of a daughter.

**CUMMING.**—On April 4th, the wife of Dr. John Cumming, of Hove, of a son.

**EAGGER.**—On April 2nd, the wife of Dr. A. A. Eagger, of Exeter, of a son.

**FOWLER.**—On April 7th, at Devonshire-place, the wife of Dr. Eric Fowler, of Crowborough, of a daughter.

**HUDSON.**—On April 11th, at Welbeck-street, the wife of Rupert Vaughan Hudson, F.R.C.S. Eng., of a daughter.

**LEWIS.**—On April 7th, the wife of Dr. Windsor Lewis, Cambridge, of a son.

**NORRIS.**—On April 2nd, at City-road, Finsbury-square, E.C., to Hélène Norris, M.D. Geneva, the wife of Donald C. Norris, M.D. Lond., F.R.C.S. Eng.—a son.

**SINCLAIR.**—On April 6th, at Lewes, the wife of C. Gordon Sinclair, F.R.C.S. Eng., of a son.

**WOODD WALKER.**—On April 13th, at Pembroke-crescent, the wife of Geoffrey Woodd Walker, F.R.C.S. Eng., of Queen Anne-street, W., of a son.

### MARRIAGES

**ASHTON-WOLFE.**—At St. Clement Danes, London, on Feb. 29th, 1936, Eric G. Ashton, M.B., Ch.B. Dub., to Sylvia K. F. Wolfe, M.B., B.S. Lond.

**LIST-CARR.**—On April 4th, at Stone, Staffs. Dr. Howard Meredith List, to Elizabeth Maud, elder daughter of Mr. R. H. Carr, of Stone.

### DEATHS

**BINGLEY.**—On April 10th, at Little Causey, Cranleigh, Ernest Horsford Bingley, M.R.C.S. Eng.

**MITCHELL.**—On April 12th, at Portsmouth, Arthur Martin Mitchell, M.D. Camb.

**PAYNE.**—On April 7th, at Leicester, Alfred Ernest Payne, M.B. Lond.

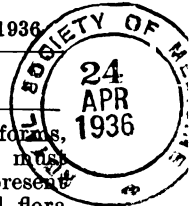
**PRATT.**—On April 11th, suddenly, at Morchard Bishop, Charles Claridge Pratt, L.M.S.S.A. Lond.

**PRESTON.**—On April 12th, at Mannings Heath, the residence of his sister-in-law, Joseph Charles Preston, L.D.S., of Brighton.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

**HOSPITAL ACCOMMODATION FOR SOUTH MIDDLESEX AND RICHMOND.**—The Minister of Health has sanctioned the raising of a loan of £96,650 by the South Middlesex and Richmond Joint Hospital Board for further accommodation in connexion with the treatment of infectious disease other than small-pox. The money is to be spent on erecting two new pavilion blocks, each containing 24 beds, and three cubicle blocks, each containing 12 beds, a new administration block, a nurses' home, and an operating theatre, together with a house for the medical superintendent and a lodge for the porter.

## ADDRESSES AND ORIGINAL ARTICLES



## ASSESSMENT OF DENTAL SEPSIS AS A FACTOR AFFECTING MEDICAL AND SURGICAL PROCEDURES\*

BY ARTHUR BULLEID, M.R.C.S. Eng., L.D.S.  
ASSISTANT DENTAL SURGEON TO GUY'S HOSPITAL

In defining dental sepsis most dental surgeons agree that the terms "open" and "closed" largely meet the needs of the case. There is no clear-cut difference between the possible effects of the two groups, yet the terms do suggest two clinical pictures. If we accept "open" sepsis as applying to such diseases as caries, gingivitis, and pyorrhœa, we at once visualise conditions in which drainage into the mouth is possible. If we confine the term "closed" sepsis to those dental lesions in which there is no possibility of drainage into the mouth then we shall be able to confine it to pulpless teeth with or without radiographic evidence of apical osteitis; to the so-called "live" teeth with heavy artificial restorations; and to residual infection left in the alveolus after the removal of teeth in late pyorrhœa. I think that it is now becoming more and more generally recognised that dental sepsis, whether of the open or closed type, is but a superadded streptococcal infection and not a sole cause of general disease. This does not lessen its importance but it makes its assessment more difficult. Eradication of the sepsis does not necessarily mean the extraction of teeth, and this is why I think the terms "open" and "closed" are useful from a clinical point of view. No one will deny that caries, gingivitis, and early pyorrhœa can be treated adequately by conservative means, and I shall attempt to show that by adequate clinical and bacteriological methods it is possible, in a large proportion of cases, to assess the importance of the sepsis present.

### BACTERIOLOGY

Open and closed sepsis are similar in that streptococci are the organisms universally found in both types. It must be admitted that the obvious fallacies in the bacteriological findings in open sepsis are almost insurmountable, but in spite of this it seems highly probable that the general manifestations associated with dental sepsis are streptococcal. It can be stated definitely that no other group of organisms that can be cultivated from dental lesions, with the exception of staphylococci, give rise to specific antibodies in the blood-serum of the patients concerned.

It seems to me that much can be learned from an investigation of the bacteriological flora and of the cytology of the exudate from pyorrhœa pockets. In cases of pyorrhœa in which the disease is progressing and in which there is the possibility of toxic absorption, the type of leucocyte is highly important. Polymorphonuclear leucocytes denote active pus-formation. After adequate conservative treatment active pus-formation should have ceased and what leucocytes are present in the smears are chiefly mononuclears. After pockets have been eradicated, either by conservative or surgical means, and the gums have been kept healthy by simple hygiene, direct smears from the gingival trough show hardly any leucocytes, the few present being almost all mononuclears.

The symbiosis of fusiform bacilli and spiral forms, which has been described by many observers, must receive special note. All that can be said at present is that the appearance of the fusospirochaetal flora merely denotes a gum inflammation; there is no evidence that the oral spirochaetes by themselves can produce disease in man, and they confer no humoral immunity. Two other organisms also deserve mention—*Amœba buccalis* and *Leptothrix buccalis*. The former is a protozoan which is actively phagocytic but bears no causal relationship to pyorrhœa. Its presence denotes stagnation and therefore serves an important function in showing that the treatment of the condition is inadequate. The leptothrix is the causal organism in seruminous tartar formation, and its presence shows a particular patient's liability to that condition, a factor of some import in pyorrhœa. In a study of the organism begun in 1921, I was able to grow it on artificial culture medium and produce tartar experimentally in cats' mouths that had previously been tartar-free. I was also able to demonstrate that the organism attracted calcium. Smears made from the exudate expressed from just below the gum margins in patients in whom there is much tartar reveal a large amount of leptothrix mycelium, while in those patients in whom the liability to tartar formation is slight the organism is found in relatively small numbers.

The effect produced on the cytology and flora in cases of open sepsis by both conservative and surgical treatment is very similar. With adequate and effective conservative treatment the ratio of polymorphonuclear to mononuclear leucocytes swings to the side of the latter; the fusospirochaetal flora will mostly be absent and that no amœbæ and only very little leptothrix mycelium will be detected. If this result is not brought about by simple conservative methods then surgical removal of the pockets by gingivectomy is called for, the value of the procedure being checked by the examination of smears from the gingival trough, coupled with the clinical appearance. In those cases in which the desired effect cannot be obtained by these two methods the only logical procedure is to extract the teeth in order to do away with stagnation and to prevent toxic absorption.

We can discuss the bacteriology of closed dental sepsis with a greater degree of certainty, because one of the manifestations of this pathological condition is the presence in the peri-apical space of an encapsulated mass of granulation tissue, firmly adherent to the peri-odontal membrane and remaining attached to the tooth on extraction. By appropriate means it is possible to sterilise the exterior of this granuloma and make cultures from its interior. In 1928 I commenced an investigation on the bacteriology of pulpless teeth and since that time I have examined the bacteriology of more than a thousand teeth.

In all the 400 pulpless teeth with apical granulomata that had been extracted the interiors of the granulomata yielded a growth of streptococci, usually of the *viridans* or indifferent groups, sometimes in pure culture, at other times associated with other organisms.

I have also investigated 600 extracted pulpless teeth, some showing apical osteitis in skiagrams but others with no such evidence. After most careful preliminary sterilisation of the supporting structures, apical cultures were made, using both aerobic and anaerobic methods. None of the teeth in this series had attached granulomata. In all a

\* A Hunterian lecture delivered before the Royal College of Surgeons of England on Jan. 22nd, 1936.

streptococcus was isolated, usually of the *viridans* or indifferent types. In a large percentage of the single-rooted upper teeth in this series the streptococcus was in pure culture, but in the multiple-rooted teeth it was accompanied by other organisms; the only organism consistently found, however, was a streptococcus.

In 20 cases in this series the method of open operation—i.e., cutting down on the apex of the tooth "in situ" by removing the overlying structures—was adopted and in all cases the apical cultures revealed a streptococcus. This suggests, though it does not prove absolutely, that the streptococci isolated from the apices of the extracted pulpless teeth were in fact responsible for the pathological condition. The absence of an area of apical osteitis in the skiagram does not indicate the absence of infection nor does the size of the area denote the potentialities of the infection. On the contrary, pulpless teeth showing no areas of apical osteitis in skiagrams may be passed as harmless, when in fact they are definitely infected.

I have examined bacteriologically 20 teeth with associated acute alveolar abscesses—16 were approached through an external incision and the remaining 4 by evacuating the pus in an exploratory syringe. In all a streptococcus was recovered; it was noted that the percentage of true  $\beta$ -haemolytic streptococci was higher in this series than in the chronic apical infections.

The epithelial linings of 20 cystic new growths have also been examined bacteriologically, 16 being dental cysts and 4 dentigerous; all were approached by the open method, using strict surgical asepsis. All yielded growths of streptococci in aerobic or anaerobic culture, or both. The fluid of the cysts, if clear, was sterile, but if opalescent or purulent, gave a growth of streptococci.

Another type of dental sepsis that is, I think, often missed is connected with the absorption and rounding off of the apices of "live" teeth. This destruction is shown in the skiagram, and bacteriological examination of the apices of these teeth either by open operation or by extraction reveals once again the presence of the ubiquitous streptococcus. I have been able to investigate only 6 of these cases, but in 4 the streptococcus was of the true haemolytic type. The following illustrates the importance of this type of infection.

A patient developed phlebitis in his right leg, which in time cleared up. The only history he gave was that he had previously grazed his heel on a nail in his boot, and this soon healed. Later the phlebitis recurred and yet no obvious focus of infection was found. His teeth were radiographed and it was discovered that one of the lower premolars seemed a good deal shorter than its fellows. There was no pain and tests for vitality were positive. As the phlebitis cleared up there was no dental treatment. Later a recurrence of the trouble led to further skiagrams and another lower premolar tooth had become shortened. Both these teeth were extracted and apical cultures gave a growth of a haemolytic streptococcus. Further absorption of "live" teeth took place and the end-result was the extraction of all his remaining teeth, and subsequent vaccination with the haemolytic streptococcus. Not until this was done did the phlebitis finally disappear.

The case is interesting I think in that it suggests that the infecting streptococcus, which must have gained entrance via the grazed heel, had been carried to the teeth where it manifested itself by eroding the apices. As the primary focus had long since healed the dental focus became all important.

Another type of closed dental infection which I have investigated is that known as residual

osteitis. This is shown in skiagrams as a feathery appearance of the alveolus and may occur in late pyorrhœa when extraction of teeth has been too long delayed. If this feathery alveolus is removed and cultivated the cultures invariably reveal the presence of a streptococcus, usually of the *viridans* or indifferent groups. The following case typifies the importance of this class of infection.

A patient had an early infective arthritis of both knees, which disappeared with the enucleation of tonsils and a few badly infected teeth. Three years later the arthritis of the knees recurred; no focus of infection was discovered until the edentulous lower jaw was radiographed. An area of residual osteitis was revealed extending from the premolar region on one side to the premolar region on the other. This was removed and cultivated, and a streptococcus of the *viridans* group recovered. Subsequent vaccination with this streptococcal antigen brought about a gradual cure.

The last type of closed dental sepsis that I have investigated in collaboration with Ellingham is that found in connexion with "live" teeth in which heavy artificial restorations have been inserted. In a series of 30 cases, 22 were found to contain living bacteria. In 90 per cent. of the latter the organism cultivated from the pulps was a streptococcus occasionally associated with a staphylococcus. In this research all we have been able to demonstrate so far is the presence of the micro-organisms in the "live" pulps and I cannot state dogmatically what their significance is. It seems essential to study the histological appearances of these "live" pulps in conjunction with the bacteriological findings before the results can be correctly interpreted.

It is wise, I think, to group the streptococci found in these areas of closed sepsis because it is well known how deleterious are the effects of the true haemolytic group, whereas the effects of the *viridans* or indifferent groups are much more problematical. In a series I investigated, only 10 per cent. of the cases had streptococci of the true haemolytic group; the other 90 per cent. were divided between the *viridans* and indifferent groups, chiefly the former. In dental lesions the true haemolytic streptococci are found in a higher proportion in acute conditions such as acute alveolar abscess and acute Vincent's infection, in which systemic involvement is always present, though possibly it may not be dangerous.

I attach importance to the possible symbiotic relationship of the yellow staphylococcus and the *viridans* streptococcus. Staphylococci, particularly the *aureus*, are infrequent in dental lesions and their presence is very important, particularly if the patient is also subject to staphylococcal infections such as boils or carbuncles. The following is an example:—

A schoolboy had "toothache" in a lower premolar which had been rather heavily restored and the tooth was extracted under nitrous oxide anaesthesia. Nothing untoward happened for three days and then swelling appeared which spread along the jaw from the symphysis to the articulation on the same side. An incision was made over this swelling by the doctor but no pus was evacuated. The remaining teeth on the same side of the lower jaw were loosened, the periosteum being stripped up. The mouth was intensely dry and hot, and the boy had a high, swinging pyrexia. My colleague, Kelsey Fry, saw the patient with me and inserted a drainage-tube from the site of the original incision right down to the jaw, but found no pus. I cultured the blood and obtained a pure growth of *Staphylococcus aureus*; from the apices of the teeth, which had become so loosened that I was able to pick them out with dressing forceps, I obtained a heavy growth of the yellow staphylococcus, as well as the usual *Streptococcus viridans*. The boy died.

On several occasions I have noted the general disturbance occasioned by the removal of teeth, that on culture have grown streptococci plus yellow staphylococci. It suggests a focus which might give rise to a staphylococcal bacteræmia and so supply the organisms which could cause an osteomyelitis of the long bones, particularly in children. The following case is of interest in this connexion :—

A boy of 14 received a blow on his right shin during a game of hockey. The leg was painful for a few days and showed some bruising, but there was no fracture. The bruising and swelling soon disappeared and no further notice was taken of the injury. Some six weeks later the boy developed an acute alveolar abscess in connexion with an upper premolar tooth, which was extracted. Cultures from the evacuated pus gave a heavy growth of *Staphylococcus aureus* associated with *Streptococcus viridans*. Recovery from the extraction was uneventful, but about a week later the right leg became painful at the site of the original blow. A surgeon was called in and diagnosed osteomyelitis, which was confirmed by operation. It was suggested that the staphylococcus gained access to the blood at the time of the extraction of the tooth and that the previous injury to the leg localised the organism.

#### CHANGES IN THE BLOOD

Recently Elliott, instigated by Okell, has carried out an investigation in which I have had a practical interest. Elliott has proved that the multiple extraction of teeth in mouths showing severe dental sepsis of both open and closed types resulted in a large percentage of cases in a temporary *Streptococcus viridans* bacteræmia. Positive blood cultures of this group of streptococci were recorded in 75 per cent. of the cases investigated, the bacteræmia lasting about a quarter of an hour following the extraction of the teeth. In 10 per cent. of the cases, patients with severe dental sepsis were found to have a positive *S. viridans* bacteræmia irrespective of any operative interference. It seems logical to suggest that this "leak," which in normal patients in good health is of little import, might determine the infection of more remote structures if they were in a condition of lowered resistance.

Whether the streptococcus isolated from the blood is identical with that found at the apices of the extracted teeth or from the pyorrhœa pockets is difficult to prove, but at least they are both of the *viridans* group. I am at present engaged in an investigation to show whether this leak of streptococci into the blood is greater numerically and in a larger proportion of patients with clean mouths but who have pulpless teeth, than it is in those in whom the sepsis is chiefly of the open type. It may be merely the extent and degree of the trauma rather than the type of sepsis which is responsible for the bacteræmia, though it must not be forgotten that there was a bacteræmia in 10 per cent. of those in whom there was no operative interference.

The blood picture of patients with open dental sepsis is not abnormal enough to be very informative. In 70 patients suffering with pyorrhœa, in whom no systemic disease was observed, the blood counts showed very little difference from normal. Occasionally a slight decrease was noted in the hæmoglobin percentage, or in the number of red and white corpuscles, but otherwise there was no difference from normal. In 4 patients in whom the pyorrhœic state was very advanced there was a slight leucocytosis. In 10 cases of acute alveolar abscess there was a definite leucocytosis of 12,000–15,000 per c.mm., and differential counts showed an absolute increase in the polymorphonuclear neutrophils and a corre-

sponding decrease in the lymphocytes; the hæmoglobin percentage and the red cell count were only slightly decreased from normal. In 5 cases of acute Vincent's infection of the gums there was a slight but definite leucocytosis. In 30 patients with four or more pulpless teeth of long standing, the blood picture was slightly abnormal, irrespective of whether the radiograms of the teeth revealed apical osteitis or not. The chief points noted were a leucopenia, a decreased hæmoglobin percentage, and a lessened number of red cells; in the differential leucocyte counts there was a slight swing to the lymphocytic side. It seems, however, true to say that dental sepsis by itself, whether open or closed, does not produce changes in the blood picture that are of great significance when one realises the normal daily variations. All I can say from my own observations is that the changes in the blood which I have noted have been rather more marked in closed than in open sepsis.

#### RELATION TO SYSTEMIC DISEASE

Now for a consideration of those patients in whom the dental sepsis and some systemic condition are found together. It must not be thought that because both may be found in the same patient that the dental sepsis is necessarily the cause of the general disease.

Knott and others have confirmed the germicidal effect of the hydrochloric acid of the gastric juice and have shown that the germicidal effect of organic acids is almost negligible in the absence of free hydrochloric acid. When chronic gastritis is present, owing to prolonged mechanical irritation of the gastric mucous membrane by bolting food, and by alcohol, tobacco, &c., the normal secretion of hydrochloric acid suffers. If the exciting cause of the gastritis continues even when complete achlorhydria has developed, the gastritis becomes progressively worse; it is in these cases that the streptococcal flora that is swallowed becomes important. There seems no reason to doubt that the swallowed pus itself may act as an irritant.

We are rather prone to think of open dental sepsis purely in relation to the bacterial flora found and to forget the chemical side of the picture. We swallow more than bacteria, and it seems feasible to suggest that the swallowing of pus and of the decomposition products of protein and carbohydrate metabolism may irritate the gastric mucous membrane. Removal of the decomposing food material and the pus found in pyorrhœa pockets is of undoubted importance.

In some preliminary work on the chemistry of the products of decomposition of food material found in mouths with open dental sepsis, some interesting results have been obtained, and it seems as if further investigation is indicated. If the material found around the teeth and gums in pyorrhœic mouths is washed out with sterile water and analysed it has been possible to detect the decomposition products of both carbohydrates and proteins. The decomposition products of the former are the higher alcohols, and of the latter putrefactive alkaloids, which possess basic properties and are nitrogen derivatives; some are toxic, some harmless. At present I cannot say definitely if the higher alcohols are present in these pyorrhœic mouths, though the furfural test was always positive, because mucin possesses a carbohydrate group and will give this reaction. Members of the amine group have been isolated as dry salts and primary, secondary, and tertiary

amines have all been demonstrated. The toxic nature of these amines has been tested on the heart of the pithed frog. The primary and tertiary amines were non-toxic but the secondary were definitely toxic, and the heart did not recover after introducing atropine sulphate, which suggests that these amines are not of the muscarine group.

Another interesting experiment was to grow the organisms found in the washings from the pyorrhœic mouths on culture medium well enriched with sugars. The amines derived from the inoculated culture medium were all non-toxic to the frog's heart, and so were the amines derived from the uninoculated culture medium.

In any assessment of the importance of open sepsis the feasibility must be considered of preventing these decomposing food products from being swallowed by removing them from around the teeth. If this can be done by conservative methods, well and good, but if not, extraction of teeth is a logical procedure.

Now it is recognised by all that if a gastric or duodenal ulcer of long standing fails to react to medical treatment the aid of the surgeon is essential, and it is in these cases that I would assess the importance of dental sepsis, whether open or closed, much higher than previously. When the surgeon operates it is important that the interference shall be successful, and that any condition which might prejudice the success of the operation must be eradicated. It is notorious that streptococci, even those of low virulence, attack wounds, and as we know that the streptococci from pulpless teeth can reach the site of operation via the blood stream, pulpless teeth should not be tolerated. Even the streptococci from open dental sepsis, which when swallowed normally fail to pass the acid barrier, may yet survive in the stomach in the first 48 hours after operation and lodge at the operation site. This would be a definite risk when the acid barrier is replaced by one of hypo- or achlorhydria following the gastrojejunostomy or partial gastrectomy. Thus if there is any dental sepsis in a patient before a contemplated operation its treatment must be more radical than when surgical measures are thought unnecessary. In these cases I would advise against the retention of any teeth that are the site of a streptococcal infection and would strongly suggest that the necessary dental treatment is carried out as early as is conveniently possible before the major operation. It must be realised that the general surgeon has every reason to object to the presence of pus and "dirt," even if it is sterile.

Statistics prove that the breaking down of operation wounds or the recurrence of malignant disease is greater in mouths in which sepsis is present than it is in those in whom it has been eradicated. One fact which most observers have noticed is that, if any teeth are spared in a mouth in which a major surgical operation has been performed, they subsequently show clear evidence of infection, even if at the time of operation they appeared healthy. This suggests that it is wise to render a mouth edentulous before an extensive operation. In fact, if a major operation is contemplated in any region of the body I think it is wise to remove at least all pulpless teeth, because of the potential risk of streptococci passing via the blood stream to the site of operation, a risk which I think is definitely greater in closed than in open sepsis. If one always followed sound surgical opinion all possible foci of infection should be removed, and with this we must neces-

sarily agree, even though the infection is only an "overload." If the removal of teeth did not result in any mutilation of the patient there would be no sound reason for keeping teeth once they had become the seat of disease. As, however, they do serve a most useful as well as aesthetic purpose, then we must modify our treatment accordingly. This is, I think, a justification for the dental surgeon who at first attempts to remove open dental sepsis by conservative methods and who admits the necessity for the extraction of teeth only when this fails. As the sepsis in pulpless teeth cannot be eradicated by any known conservative method there seems to be no sound justification for retaining them. The only exception I would make is in the single-rooted upper tooth on which apicectomy can be performed with some hope of success.

Now is there any possibility of correlating the dental and systemic conditions, when such are present, by any known and accepted bacteriological methods? Personally I am inclined to think that in the present state of our knowledge there is as yet no certain means of doing so. The work of Okell and Elliott, to which I have already referred, offers a very useful method which should be more fully explored. In a series of 500 cases I carried out complement-fixation tests on the patient's serum and the dental streptococcal antigen, but they were all universally negative. Agglutination seems to be a little more hopeful, but it is impossible to state dogmatically what reliance can be placed on the results. Over a period of some six years I have made a practice of testing the dental streptococcus isolated from the apices of extracted teeth against the patient's serum. In some I have obtained positive agglutination in a sufficiently high dilution of the patient's serum to suggest a specific connexion between the dental and systemic conditions. The results, of course, depend on obtaining the correct strain of streptococcus from the dental lesions and this is by no means always certain. Recently I have been using the streptococcal strain isolated from the blood after the extraction of teeth and, with this as antigen, the agglutination results have been more encouraging, but that is all I can truthfully say.

#### ASEPSIS IN ORAL SURGERY

Opening up cavities in bone is always fraught with some risk; this is minimised if surgical asepsis is observed as far as is possible. There is always the risk of the spread of streptococci, and sometimes the yellow staphylococci, by the blood stream when surgical procedures in the mouth are being carried out, particularly if they are accompanied by trauma and laceration of tissues, which unfortunately is rather common in the oral cavity. This should make the dental surgeon pause before he carries out multiple extractions of teeth or causes unnecessary trauma by extensive surgical procedures when simpler methods would suffice. It is unusual to find dangerous reactions following dental operations in the mouth only because the dental streptococci are of low virulence, but this does not exonerate us if untoward results do follow. If the tissues of any organ are in a state of receptiveness for bacterial invasion, then extensive dental operations are apt to cause local infection that less extensive operations might prevent.

#### CONCLUSIONS

It must be allowed, I think, that dental sepsis per se is very rarely the sole cause of any systemic



condition. It is, rather, a streptococcal overload that should be eradicated if possible. This does not mean that all open dental sepsis such as pyorrhœa necessitates the removal of any or all the teeth, but it does mean that this sepsis should be treated and eradicated. If conservative methods are sufficient to preserve the balance between infecting agent and the patient's resistance, by all means employ conservative methods. If the balance swings against the resistance, then the overload should be removed and the dental surgeon should not be bigoted in refusing to extract infected teeth if conservative methods fail to prevent the infection spreading to more remote parts.

I am of the opinion that, as no conservative procedures yet known are capable of rendering pulpless teeth sterile, or rather, of preserving sterility for any length of time, they should not be tolerated. The only exceptions are the single-rooted upper teeth on which apicectomy can easily and safely be performed. If surgical procedures are necessary in any part of the body, as it is recognised that streptococcal invasion prejudices the success of such operations, no gross dental sepsis should be allowed, particularly if it is connected with pulpless teeth. This also suggests that everything possible should be done to prevent infection of the dental pulp.

Bacteriological investigations have a very important place in the assessment picture, but I sometimes feel that the magnification conferred by the microscope is nullified by the microscopic mind. Careful blood culture work and serological tests such as agglutination are of undoubted value and importance, and may become more so as our technique improves. Only experience, and particularly clinical experience, can at present guide our faltering steps along the right path of a more rational assessment of the evils of dental sepsis. Clinical experience can be aided by laboratory methods, which must, however, remain complementary. Every case must be treated on its merits. Some can shoulder a load of sepsis with much greater impunity than others, but sooner or later, the streptococcal overload will take its toll and therefore should never be entirely neglected. The habits and environment of patients may decide whether the dental sepsis is only a pin-prick or a knock-out blow.

If we can only employ a sweet reasonableness and yet remember Euclid's axiom that the whole is always greater than the part, I feel sure the storm of controversy that has so long raged around this question of dental sepsis will die down, and out of the tempest there will come a ship.

#### BIBLIOGRAPHY

- Andrewes, F. W., and Christie, E. M.: The Hæmolytic Streptococci: Their Grouping by Agglutination, Med. Research Council, Spec. Rep. Ser. No. 169, 1932.
- Bulleid, A.: An Experimental Study of Leptothrix Buccalis, Guy's Hosp. Rep., 1924, lxxiv., 444; Bacteriological Studies of Apical Infection, Brit. Dent. Jour., 1931, liii., 65, 105, 145, 197; Dental Sepsis and its Relationship to Mental Disease, Brit. Dent. Jour., 1930, li., 1221.
- Conybeare, E. T.: Atopic Hypersensitivity, Jour. Clin. Research, October, 1935.
- Ellingham, G.: Bacteriological Investigation into Some Filled Teeth, Brit. Dent. Jour., Feb. 1st, 1936.
- Griffith, F.: Types of Hemolytic Streptococci in Relation to Scarlet Fever, Jour. of Hyg., 1926, xxv., 385.
- Hitchcock, C. H., and Swift, H. F.: Studies of Indifferent Streptococci, Jour. Exper. Med., 1929, xlix., 637.
- Hurst, A. F., and Stewart, M. J. S.: Gastric and Duodenal Ulcer, London, 1929, pp. 5 and 44.
- Knott, F. A.: The Gastric Germicidal Barrier, Guy's Hosp. Rep., 1923, lxxiii., 429.
- O'Kelly, C. C., and Elliott, S. D.: Bacteriemia and Oral Sepsis, THE LANCET, 1935, ii., 869.
- Ross, W. S.: Apicectomy in the Treatment of Dead Teeth, Brit. Dent. Jour., May, 1935.

## INDUCTION OF LABOUR FOR DISPROPORTION

A CRITICAL ANALYSIS OF ONE HUNDRED CONSECUTIVE CASES OF SURGICAL INDUCTION FOR REAL OR SUSPECTED DISPROPORTION

By J. H. PEEL, B.M. Oxon., F.R.C.S. Eng., M.C.O.G.  
FIRST ASSISTANT IN THE OBSTETRIC DEPARTMENT,  
KING'S COLLEGE HOSPITAL, LONDON

THE problem of the correct way to deal with minor degrees of disproportion between the foetal head and the maternal pelvis is one which has given rise to a good deal of discussion in recent years. Three ways of treating these cases are universally accepted—viz., Cæsarean section, trial labour, and induction of premature labour. I think I am justified in saying that few, if any, obstetricians resort to induction of labour before the thirty-sixth week of pregnancy, unless in very exceptional circumstances. If the disproportion is so great that induction would be necessary before the thirty-sixth week, it is better, in the interest of the mother as well as the child, to deliver the baby by Cæsarean section. In other words, the treatment of gross degrees of disproportion, except when due to such foetal abnormalities as hydrocephalus, by deliberate Cæsarean section done just before term is universally accepted.

It is in considering minor degrees of disproportion that one finds two schools of thought—one advocating induction of labour at the appropriate date between the thirty-sixth week and term, the other preferring to allow all such cases to have a trial of labour. So far as the statistical part of what follows in this article is concerned, it is offered as a negative piece of evidence in favour of the method of trial labour, because to my mind it demonstrates the unsatisfactory result of surgical induction of labour.

I am well aware that the theoretical advantages of premature induction of labour are many. I am also well aware that at some future date, when the exact physiological cause of the onset of labour is fully understood, and one is able to apply the exact physiological stimulus, either by injection or by mouth, so as to constitute a medical induction of labour, one will probably have to modify one's views very considerably. But at the present moment medical induction of premature labour is both uncertain and not without danger, whereas surgical induction, though more certain, is fraught with very considerable danger, both to mother and child.

The ultimate object of antenatal care is to reduce to a minimum both maternal and foetal mortality and morbidity. One reason at least why antenatal care seems to be failing in this object is that not infrequently, in trying to prevent one possible disaster, interference is made which leads to a disaster more serious than the imaginary one which an attempt has been made to avoid. Many deliberate Cæsarean sections and instrumental inductions of premature labour can be unquestionably regarded as meddling midwifery. Writing on the subject of Cæsarean section and induction of labour, Prof. F. J. Browne<sup>1</sup> says:

"Much of the interference is probably unnecessary, and constitutes meddling midwifery, for in most cases delivery would have taken place without trouble had the patient been left alone. The intervention would not matter if these operations were always safe, but we know they are not. I have shown, for example, that out of 173 deaths in nine maternity hospitals, all staffed by experts, 8, or 1 in 20, followed directly on induction;

death being due to sepsis, hæmorrhage or anæsthetic complications."

#### ADVANTAGES AND DISADVANTAGES OF INDUCTION

Before considering the actual statistics of the cases I have analysed, it will be useful to discuss the theoretical and practical advantages and disadvantages of premature induction of labour for disproportion. The outstanding advantage is obviously that the dangerous results of disproportion in labour are avoided. This is true in the majority of cases, but because the induction is often left until the latest possible moment, and because errors of judgment are inevitable, even by experts, obstructed labour will occasionally occur after induction. One is then faced with the alternative of craniotomy or Cæsarean section, and the latter operation following on the insertion of bougies, bags, or the like, is a most dangerous risk to the patient and one which has a relatively high mortality. If, on the other hand, one resorts to craniotomy after induction the whole object of the interference is nullified. The second great advantage is that a Cæsarean section, with the attendant risks, may be avoided. But because the induction of labour is so often entirely unnecessary, and the patients induced would have delivered themselves quite easily when they started labour spontaneously, the Cæsarean section rate is not greatly increased if the practice of giving the patient a trial of labour is carried out. At King's College Hospital the practice of inducing labour for disproportion in primigravida has practically been abandoned for the past three years. In 1930, 31 total Cæsarean sections were performed and 76 inductions of labour. In 1934, although the Cæsareans had increased to 46, the inductions had been reduced to 18. Actually in 1934, 40 more patients were delivered in the maternity ward. I realise that these figures cannot be taken too literally, but they illustrate the point I am trying to explain.

What then are the disadvantages and risks of surgical induction of labour in these cases? They are both maternal and fetal. Of the maternal risks first and foremost comes sepsis. Even the most enthusiastic supporter of induction of labour will have to admit the danger of sepsis. The literature shows clearly that this risk of sepsis is not a figment of the imagination. Hewitt, Towart, and Baird,<sup>2</sup> reporting 34 cases of bougie induction, mention 2 deaths from uterine sepsis, and stress the risk of sepsis even though the bougies are unsuccessful in inducing labour and have to be removed. Morton<sup>3</sup> in 1929 reports 132 cases of bougie induction. There were 4 deaths—2 being due to sepsis. The notifiable morbidity-rate was 18.6 per cent. He compares a series of bougie inductions and bag inductions and concludes that the risk of sepsis is even greater in the case of bag induction. Reis<sup>4</sup> in 1929, also reviewing the history of induction of labour and all the known methods, states that even medical induction increased the rate of morbidity by 15–20 per cent., and quoted a 33 per cent. morbidity for induction by means of a bag. On the other hand Bannister,<sup>5</sup> opening a discussion at the British Medical Association in 1926, reports much better results from the point of view of sepsis. He had only 1 maternal death in 745 cases and only a 4 per cent. morbidity. My own figures amply confirm the great risk of sepsis.

The other maternal disadvantages, although of less importance than the disadvantage of sepsis, are none the less real. Cases are recorded of the uterus having been perforated by a bougie. Occasionally, in unskilled hands, a great deal of placental separation may be caused by bougies with resultant

hæmorrhage and fetal death in utero. In addition there is the strong objection which can be raised against all known methods of induction of labour—namely, that quite often the uterine action in labour is inadequate, so that such complications as inertia, contraction rings, spasm of the lower segment, and retention of the placenta are more common after induced labour than after labour which starts spontaneously. Barnes,<sup>6</sup> writing as long ago as 1868 on the question of induction of labour, says: "Labour finds the uterus in an imperfect state of development, with imperfect contractile power, and with greater resistance of the cervix," and again: "The uterus is called upon—suddenly and before its time—to do that for which it is not prepared." These complications at first sight are not themselves so serious, but with them goes the necessity for increased manipulations—the inevitable increased exhaustion of the patient and so the increased risks of maternal mortality and morbidity. In addition they lead to, in fact are chiefly responsible for, the increased fetal mortality. This increased fetal mortality is a further disadvantage of this time-honoured way of dealing with these cases. Bannister,<sup>5</sup> in the same address in 1926 in which he quotes such low figures for maternal mortality and morbidity, has to admit a 12.6 per cent. fetal mortality, and one is rather amazed to read that this is regarded as a satisfactory state of affairs. The chief object of the interference is nullified if a dead baby is born.

#### ANALYSIS OF CASES

I have taken 100 consecutive cases of surgical induction of labour during the period 1927–34 at King's College Hospital. I have entirely excluded induction for any other reason such as toxæmia or antepartum hæmorrhage, because in these cases there are additional factors to affect the maternal and fetal mortality and morbidity. In every case induction was done primarily because it was feared that if pregnancy were allowed to continue there might arise serious disproportion between the baby's head and the maternal pelvis. Only three methods have been employed—bougies, artificial rupture of the membranes, and the stomach-tube (one case). From a perusal of the literature I have come to the conclusion that the result of other methods of surgical induction are little if any better. Of the 100 cases 90 were induced by bougie, 9 by artificial rupture of the membranes. Reliable conclusion obviously cannot be drawn from 9 cases, but the results with artificial rupture of the membranes are better than those with bougies, so that the total figures are improved by their inclusion. I have included them in order to make the sequence consecutive and not in any way selective.

#### Results of Surgical Induction

Method.	Hours before onset of labour.		Total duration of labour.	
	Pgr.	Mgr.	Pgr.	Mgr.
Bougie (90 cases)	35 hrs., 40 mins.	24 hrs., 5 mins.	32 hrs., 49 mins.	18 hrs., 59 mins.
Artificial rupture of membranes (9 cases)	3 hrs., 30 mins.	1 hour.	22 hrs., 30 mins.	6 hrs., 35 mins.
Stomach-tube (1 case)	48 hours.	—	33 hours.	—

Pgr. and Mgr. = Primigravida and multigravida respectively.

Of the 100 cases 60 were primigravida and 40 multigravida. The accompanying Table shows the average time of onset of labour and duration of labour in each group.

The Table shows the prolongation of labour in those cases induced by bougies. Analysing the labour still further in the 90 cases induced by bougies I find that of the primigravidæ 49 per cent., of the multigravidæ 43.2 per cent., were classified as having inertia (average 46.6 per cent.). The forceps rate in the two groups was as follows :—

Primigravidæ ..	..	..	..	..	35.8 per cent.
Multigravidæ ..	..	..	..	..	5.4 " "
Average ..	..	..	..	..	23.3 " "

The average forceps rate at King's College Hospital during the past five years is 8.7 per cent., so that in these cases the necessity for forceps was increased nearly threefold. There was abnormal postpartum hæmorrhage in 9 cases, necessitating manual removal of the placenta in 3.

The total stillbirth-rate worked out to be 14 per cent., the average of all cases in the past five years was 5.05 per cent. In the case of the primigravidæ induced by bougie the stillbirth-rate was 20.8 per cent. This single figure alone should surely make one hesitate ever to induce labour by bougie in cases of suspected disproportion in a primigravida. The two reasons for the high stillbirth-rate in these cases are probably the following :—

1. The baby is often premature and therefore less able to stand the stress and strain of a difficult labour, particularly instrumental delivery, than a mature infant.
2. Labour is often prolonged and has to be terminated by forceps.

Bannister mentions the high incidence of prolapse of the cord (1.6 per cent.) but this did not occur at all in this series of cases.

There was one maternal death in the series. The patient was a primigravida, and the induction was by bougies. She was in labour 70 hours, delivered by forceps of a stillborn baby, and had a postpartum hæmorrhage necessitating manual removal of the placenta. There is little wonder that she developed uterine sepsis, after this series of catastrophes. The maternal morbidity was as follows :—

Group 1.—Total notifiable morbidity ..	..	11	Per cent.
Group 2.—Total morbidity (temperature persisting above 99.6° F. with evidence of mild uterine infection) ..	..	45	

The average duration of pyrexia (Group 2) was 10 days. In all but one case the pyrexia followed bougie induction, and they are further classified as follows :—

Notifiable pyrexia.		Pyrexia above 99.6°.	
	Per cent.		Per cent.
Primigravidæ—	} = 12.2	Primigravidæ—	} = 48.8
10 cases .. 18.8		31 cases .. 58.5	
Multigravidæ—	}	Multigravidæ—	}
1 case .. 2.7		13 cases .. 35.1	

The fact that the morbidity is higher in the primigravidæ than the multigravidæ suggests that the increased maternal exhaustion and increased necessity for interference in the delivery are additional factors.

It may be asked why I have mentioned morbidity other than notifiable morbidity, and argued that pyrexia less than the notifiable one of 100.4° are of little significance. But notifiable pyrexia can often be very misleading. A patient can run a temperature of 100.2° for a month without being regarded as a notifiable case, whereas a patient may have a temperature of 100.6° on two successive evenings and therefore have to be notified. In studying the temperature charts of these cases I noticed what a large number showed a pyrexia about 100° for seven or eight days and sometimes longer, associated clinically with evidence of uterine infection, mild it

may be, but none the less definite, and therefore capable of developing at any moment into something much more serious. I think it is very significant that 45 per cent. of the cases should show definite evidence of infection of the uterus. Ninety-nine of these cases were discharged alive and apparently well, but it would be instructive to know the number suffering at a later date from such conditions as chronic salpingo-oöphoritis, chronic subinvolution, chronic endometritis, chronic cervical infection and retroversion, with their accompanying chronic ill-health.

CONCLUSIONS AND SUMMARY

The present article is not designed primarily to discuss the details of trial labour. These are sufficiently well known now. But a few positive points in favour of this method of dealing with cases of minor degrees of disproportion cannot be emphasised too much. It cannot be stated too often or too strongly that the uterus, given a chance to act spontaneously, is often capable of remarkable efforts. The character of the pains, as well as the degree of moulding and flexion of the foetal head, are unknown factors at the commencement of any labour. No amount of experience or skill can foretell them before labour starts—so why not be honest and admit that these are unknown factors? A uterus acting spontaneously and well at the appointed time will often accomplish with ease, what it may fail to do, and only do with difficulty, if driven into activity two or three weeks early. The argument that trial labour is unsuitable for domestic midwifery is not really as good as it sounds. It is not the method that is employed, but the patient herself and her unfortunate disability that renders her unsuitable for delivery in a private house, whatever the management of the case may be. And if the doctor argues that he cannot afford the time to bear with the uncertainty these difficult cases often occasion, he is not a suitable person to deal with them. We cannot hope to lower maternal mortality if we allow arguments like that to weigh with us.

In the primigravida, therefore, induction of labour, in my opinion, plays no part in the treatment of minor degrees of disproportion, apart from very exceptional circumstances. The points against induction are : (1) high maternal mortality and morbidity; (2) high foetal mortality which accompanies all methods of surgical induction of labour in primigravidæ.

With multigravidæ the position is very different. In the multigravidæ the method of choice for inducing labour is artificial rupture of membranes. This can be carried out with almost no added risk of sepsis or foetal death; it is often a very wise measure in order to avoid the results of disproportion. In the case of the multigravida one is dealing with a uterus that has become accustomed to childbearing, and with a passage through which the foetus will pass, which has been dilated and stretched once before. Therefore because it is safe to employ artificial rupture of membranes as a means of inducing labour in the parous woman, it is often wise midwifery to do so.

I am indebted to Mr. W. Gilliatt and Mr. A. C. Palmer for permission to publish the results of their cases.

REFERENCES

1. Browne, F. J.: Antenatal and Postnatal Care. London, 1935.
2. Hewitt, Towart, and Baird: Jour. Obst. and Gyn. Brit. Emp., 1927, xxxiv., 520.
3. Morton, D. G.: Amer. Jour. Obst. and Gyn., 1929, xviii., 849.
4. Reis, R. A.: Ibid., 1929, xvii., 392.
5. Bannister, J. B.: Brit. Med. Jour., 1926, ii., 519.
6. Barnes: St. George's Hosp. Rep., 1868, iii., 130.

## THE EFFECT OF CHLORAL HYDRATE ON THE HEART

BY STANLEY ALSTEAD, M.D. Liverp., M.R.C.P. Lond.,  
F.R.F.P.S. Glasg.

POLLOK LECTURER IN MATERIA MEDICA AND THERAPEUTICS IN  
THE UNIVERSITY OF GLASGOW; PHYSICIAN TO OUT-PATIENTS  
AT THE WESTERN INFIRMARY OF GLASGOW

CHLORAL HYDRATE was introduced as a hypnotic by Liebreich in 1869, 37 years after its discovery by Liebig. It was a welcome addition to the *materia medica*, which at that time had only opium and morphine as reliable hypnotics.

Gradually an increasing knowledge of the potential toxicity of the drug has made many clinicians reluctant to use it, particularly in the presence of diseases of the cardiovascular system. Nevertheless it is rare to find an experienced practitioner who can recall any serious mishap attributable to this hypnotic. Hutchison<sup>1</sup> mentions the practice of Dr. G. W. Balfour, of Edinburgh, who "used as his 'routine' treatment for pneumonia a mixture containing 10 gr. of Chloral and ℥ 10 of Tincture of Digitalis given every four hours, which he found enabled most of his patients to sleep through their pneumonia." This is also recalled by Stockman<sup>2</sup> who states that no untoward effect from chloral hydrate was seen in these cases. Allan<sup>3</sup> has frequently used this hypnotic in fairly large quantities—e.g., grs. 60 per day—in cases of cardiovascular disease even when accompanied by Cheyne-Stokes respiration, and he has found no evidence of myocardial weakening as a result. Over 20 years ago Gunn<sup>4</sup> declared that he knew of no reliable clinical or experimental evidence to prove that therapeutic doses of chloral hydrate had any depressant action on the heart. Cushny<sup>5</sup> has voiced the same opinion.

Experiments of toxicological interest have often been carried out with chloral hydrate on laboratory animals. Notwithstanding Gunn's observations<sup>4</sup> to the effect that further clinical evidence was required before the odium of a heart-depressant action should be permanently associated with one of the most certain and reliable of hypnotics, there has been remarkably little clinical investigation of this subject. Glaus<sup>6</sup> has reported a series of cases of cardiovascular disease treated with chloral hydrate. In addition to the hypnotic action of the drug the effects upon blood pressure and urinary output were noted. This author sees need for caution in the use of chloral hydrate when there is evidence of congestive cardiac failure. It is clear, however, from the protocols published that the dosage was usually greatly in excess of the B.P. dose (grs. 5–20).

With a few exceptions<sup>7, 8, 9</sup> the standard textbooks of pharmacology and therapeutics continue to give the impression that chloral hydrate is a dangerous hypnotic. Bastedo,<sup>10</sup> arguing from experimental pharmacology, maintains that:

"In good-sized doses it is a circulatory depressant, acting most strikingly to depress the heart-muscle, but also to depress the vaso-constrictor centre and the muscles of the arteries. . . . With only slighter than ordinary therapeutic doses the circulatory depression may supervene, so that the drug becomes distinctly dangerous. There are reports of death from only double the dose to which the patient or habitué had been accustomed. Hence the margin of safety with chloral is a narrow one."

In the English edition of the late Prof. Poulsson's<sup>11</sup> valuable text-book it is stated that chloral "must

be used with great caution in cases of valvular defects and all kinds of cardiac depression (high fever), and also in pulmonary diseases (pneumonia, phthisis, profuse pleuritic exudations)." Clark<sup>12</sup> mentions "a depressant action upon the heart," and adds "the action is exerted by doses but little above the full therapeutic dose." With regard to the effect of chloral upon blood pressure Clark doubts whether the depressing action is greater than that produced by "equivalent doses of the other powerful hypnotics." Whitla<sup>13</sup> pleaded for "great caution" in its use for patients suffering from fatty hearts or atheromatous vessels and went so far as to say that prolonged administration would cause the heart-muscle rapidly to become fatty. An additional warning is given regarding administering chloral hydrate after delirium has lasted several days, "the heart at this time being especially susceptible to its action." Dilling<sup>14</sup> contends that the combined effects of a depressant action on the cardiac muscle and the lowering of blood pressure, which results from vasodilatation accompanied by depression of the vasomotor centre, make chloral unsuitable for use in heart disease.

### CLINICAL TESTS

The present investigation was undertaken in order to assess the value of chloral hydrate as a hypnotic and to note any ill-effects arising directly out of its use. Particular care was taken to record any changes in the cardiac action and in the blood pressure. Observations were made on 55 patients, 6 of whom were children. In 33 cases (60 per cent.) there was clinical evidence of heart disease. Of the remaining 22, though the heart was apparently normal, marked emphysema was found in 7 patients, and 2 others of this group were suffering from acute rheumatism and exophthalmic goitre.

In all but 4 of the patients with cardiac disease, enlargement of the heart was detected clinically. There were 13 with chronic myocarditis, as judged by decrease in the cardiac reserve, alteration of the first heart sound, and hypertrophy of the heart-muscle. Mitral stenosis was the most obvious abnormality in 9 cases and aortic regurgitation occurred either alone or in association with this condition on 4 occasions. Degeneration of the myocardium was attributed to hyperthyroidism in 5 patients. Objective evidence of heart failure—e.g., dyspnoea, cyanosis, and dropsy—accompanied the cardiac lesion in 5 cases. Acute carditis was present in 3 at the time they were receiving chloral hydrate and 1 of these was suffering from subacute infective endocarditis. Conductive disturbances were also represented; 1 of the female patients with a failing myocardium showed electrocardiographic evidence of bundle-branch block, and in an unusual case of hyperthyroidism a succession of cardiac irregularities, including complete dissociation and auricular flutter, were recorded before the administration of chloral hydrate.

Other therapeutic measures were not withheld during the investigation. Thus iodine was given in 2 cases of Graves's disease and probably accounted for a fall in the pulse-rate of these patients. Salicylates were prescribed as usual in rheumatic fever, protein shock therapy with *Bacillus typhosus* was used in rheumatoid arthritis, and injections of bismuth were continued in cases of tertiary syphilis. In 10 patients the administration of digitalis may have modified the action of the heart. The quantity of digitalis and the time when it was given in relation to beginning chloral hydrate therapy make it unlikely that this was of any significance in at least 4 of these cases.

*Dosage.*—It was not found necessary to exceed the official dose (B.P. grs. 20) to produce a hypnotic

effect. In order thoroughly to test the possible toxic action of such quantities without prolonging the investigation unduly for the patient, two doses of grs. 10 each were given during the day and one of grs. 20 at night. This was continued for 7-10 days in most cases, about grs. 350 of chloral hydrate being given during this time. The well-known potency of this hypnotic was very evident. Sleep was induced within half an hour and lasted until the patients were wakened some seven or eight hours later. One man (a sailor) described the effect in characteristic fashion when he said that after his evening dose he was soon "dead to the world" and he knew nothing more until breakfast-time the following morning. After his meal he received a further grs. 10 of chloral hydrate and, he declared, this sent him off again, so that he was awake only a few hours out of the 24. Drowsiness was often so persistent that it was sometimes difficult to rouse patients sufficiently to take their meals. This degree of hypnosis seemed to be as much as would ever be required under clinical conditions. It is not suggested that excessive drowsiness on waking is characteristic of chloral. On the contrary, in the cases studied drowsiness during the day was clearly due to the doses of the drug given in the daytime; for when these were omitted, only the hypnotic action of the evening dose was observed.

#### ILL-EFFECTS

**Stomach.**—Chloral hydrate is known to be irritating to the stomach unless well diluted with water. For this reason its use is generally avoided in patients suffering from gastro-intestinal disturbances. In the present series 6 of the patients (11 per cent.) complained of nausea and vomiting attributable wholly or in part to this hypnotic. On two occasions the stomach was probably irritable owing to congestive heart failure and in a case of uræmia nausea was already troublesome before chloral hydrate was given. One man who was being treated for hyperchlorhydria (Case L) complained that his gastric discomfort was intensified. The stomach was certainly normal in the remaining patient and all disagreeable symptoms ceased on further dilution of the drug with weak peppermint-water.

**Skin.**—The eruptions that are sometimes described as a result of giving chloral hydrate did not occur once in this group of 55 patients. Three patients, however, suffered from smarting or burning of the edges of the eyelids. The conjunctivæ were injected and excessive lacrymation was a source of annoyance. In another patient the eyes were obviously suffused but no complaint was made. This complication is mentioned by Ghosh.<sup>15</sup>

**Respiration.**—During sleep the respiratory rate was diminished, but not more than might occur in natural sleep, and evidence of excessive medullary depression—e.g., cyanosis, irregularity of breathing, and so forth—was never seen.

**Tolerance.**—A neurotic woman suffering from Graves's disease noticed that the hypnotic action of the drug became very much less after about seven days. No other instance of tolerance was seen.

#### EFFECTS ON CIRCULATION

**Heart.**—Examinations of the heart were made before, during, and after giving chloral hydrate. Special attention was paid to changes which might be regarded as indicating depression of the myocardium, such as (a) changes in rate or rhythm, (b) alteration in the position of the apex-beat and the character of the cardiac thrust, (c) weakening

of the heart sounds, especially the first sound at the apex, (d) the appearance of bruits, or alteration in the character of pre-existing murmurs, and (e) evidence of diminished cardiac reserve.

In a case of disseminated sclerosis (Case A) slight softening of the heart sounds was noted towards the end of the period of observation. There was no other abnormality in the heart and except for drowsiness the patient was unaware of any change in his general condition. The electrocardiogram before and after giving chloral hydrate was normal and unaltered by the drug. The blood pressure changed from 125/70 to 110/70 mm. Hg but the pulse-rate remained at about 75 throughout. These findings applied also in Case B, but here the blood pressure increased from 100/55 to 115/65 mm. Hg and early slurring of Q R S was seen subsequently in lead II. of the electrocardiogram.

In Case C the volume of the first heart sound, which was diminished at first owing to cardiac failure, gradually increased as the patient's condition responded to rest in bed and digitalisation, despite a total of grs. 390 of chloral hydrate given during 11 days. The blood pressure also increased from 139/95 to 145/100 mm. Hg. Though the electrocardiogram showed the early effects of digitalis there was no alteration in the final record.

The cardiac thrust became more forcible in a boy known to be suffering from rheumatic carditis. He received chloral hydrate for 19 days but the change in physical signs was consistent with an advancing rheumatic lesion rather than depression caused by the hypnotic. The blood pressure changed from 105/50 to 95/65 while the pulse-rate was unaltered. The P-R interval in the electrocardiogram measured 0.22 sec. before and after giving the drug.

In Case D the abnormal accentuation of the first sound which accompanied left-sided hypertrophy was considerably diminished after grs. 150 of chloral hydrate, and a systolic bruit previously heard at the apex was no longer audible. The blood pressure fell from 150/70 to 120/60. Though the cardiac action was apparently regular on physical examination the first electrocardiogram showed auricular fibrillation. The record obtained after the chloral hydrate had been stopped was normal except that P-R measured 0.2 sec. and the voltage was low. It was impossible to continue with the investigation as the patient wished to go home; this she was able to do without developing shortness of breath, &c., on ordinary exertion.

In Case E an aortic diastolic murmur was not so easily heard after the patient had received a total of grs. 630 of chloral hydrate over a period of 15 days, otherwise the physical signs in the heart were unchanged.

**Pulse-rate.**—The trend of the pulse-rate was noted carefully throughout the investigation but sudden and temporary variations were ignored. In 43 patients (78 per cent.) there was change in heart-rate. In 8 cases (14 per cent.) the rate diminished appreciably, but circumstances other than the use of chloral hydrate would account for the slowing of the heart in at least 6 of these patients, 3 of whom were receiving digitalis, 1 salicylates, and 1 iodine, while it was known that the pulse-rate in another was variable owing to heart-block. In only 2 patients could the slowing of the pulse-rate be attributed to chloral hydrate and in both instances the fall was to the extent of 10 beats per minute—i.e., from 110 to 100, and from 80 to 70 respectively. Neither of these patients showed any deterioration in physical signs on re-examination of the heart.

A slight degree of tachycardia was observed in 4 patients. Pyrexia, progressing uræmia, and infective endocarditis were regarded as accounting for this in 3 of the cases and in none did the increase in rate exceed ten beats per minute.

**Blood pressure.**—Readings were taken with a baumanometer within two hours of giving the morning dose of chloral hydrate. On every occasion

the right arm was used and the patient was in the recumbent posture. It was often necessary to rouse patients from sleep in order to attach the apparatus. In 13 cases (23 per cent.) there was no change in the blood pressure. A fall in pressure was noted in 29 patients (53 per cent.); with a few notable exceptions, however, the decrease was not very considerable. In 13 patients (23 per cent.) there was

TABLE I  
*The Effect upon Blood Pressure*

—	Fall of blood pressure (systolic).								Increase of blood pressure (systolic).			
	5	10	15	20	25	30	35	40	5	10	15	30
Mm. Hg ..												
Number of patients ..	14	5	2	1	2	1	2	1	4	6	2	1
Percentage of series ..	25.5	9.1	3.6	1.8	3.6	1.8	3.6	1.8	7.3	11	3.6	1.8

actually an increase of blood pressure between 5 and 30 mm. Hg following the administration of chloral hydrate (Table I.). The original ratio between the systolic and diastolic blood pressures tended to be maintained in 40 of the 55 patients (73 per cent.). In 10 cases (18 per cent.) in which the systolic pressure was raised the diastolic reading was unchanged. Five patients (9 per cent.) showed alterations of 5–15 mm. Hg in the diastolic pressure while the systolic pressure moved in an opposite direction.

The way in which these changes in blood pressure were distributed between the two groups of patients—(1) those with heart disease, and (2) those with normal hearts—is shown in Table II.

TABLE II  
*Comparison of Two Groups of Patients*

Patients with heart disease.				Patients with normal hearts.	
Blood pressure (systolic).	Number of patients.	Percentage of group.	Number of patients.	Percentage of group.	
Unchanged .. ..	8	24	5	22	
Lowered .. ..	15	45	14	61	
Raised .. ..	10	30	3	14	

The condition of 3 patients calls for special mention.

*Case D* (chronic myocarditis).—There was a decrease of 30 mm. Hg in the systolic pressure but no apparent deterioration in the action of the heart occurred. On the contrary, the disappearance of fibrillation and the return of a normal rhythm may be regarded as evidence of a favourable response to other measures notwithstanding the simultaneous administration of chloral hydrate.

*Case F* (chronic myocarditis).—During the period of observation signs of cardiac failure disappeared though chloral hydrate was being given. On resuming work, however, signs of failure returned and with the fall in blood pressure (35 mm. Hg) the T-wave in lead III. of the electrocardiogram became deeply inverted. These circumstances hardly justify incriminating chloral hydrate as the chief cause of the decrease in blood pressure.

*Case G*.—For two years this patient had suffered from palpitation accompanied by attacks of giddiness. The transient irregularity turned out to be auricular fibrillation and giddiness was attributed to fluctuations in the blood pressure likely to occur under these conditions. The electrocardiogram showed that a paroxysm of fibrillation

immediately preceded the final reading of the blood pressure.

*Electrocardiogram*.—As might be expected from the diseases enumerated many of the electrocardiograms were abnormal from the beginning. Significant changes were observed in 14 patients (25 per cent.) during the administration of chloral hydrate. The alterations did not always indicate deterioration of the heart; sometimes, indeed, the reverse was true. Thus in 1 patient, though the myocardium had been severely affected and grave interference with conduction was evident in the electrocardiographic records, auriculo-ventricular rhythm was resumed despite medication with chloral hydrate. Similarly, on two occasions (Cases H and D) auricular fibrillation disappeared while the hypnotic was being given in therapeutic doses. Serial records in Cases I and J showed that chloral hydrate did not interfere with the usual stages of recovery of the heart from digitalisation.

TABLE III  
*Changes Indicating Depression of Conductivity*

Case	Heart-rate before chloral	P-R interval (secs.)	Heart-rate after chloral	P-R interval (secs.)	Remarks.
K	88	0.16	116	0.18	Choreic movements again present at last exam.
L	84	0.20	82	0.22	Clinically normal heart.
M	72	0.24	78	0.26	
N	84	0.28	86	0.30	Bundle-branch block.

While it seemed probable that the prolongation of the P-R interval was due to chloral hydrate in the last 3 patients, in Case K tachycardia actually resulted from a recurrence of chorea and the slight change in the electrocardiogram also could reasonably be attributed to this, especially as three intermediate records showed no change. Shortening of the P-R interval was noted in Case O where it measured 0.22 sec. when the heart-rate was 88, whereas after chloral hydrate it diminished to 0.2 sec. with a slightly greater heart-rate of 92 per minute. Early slurring of QRS developed in 1 patient but the significance of this is doubtful as the same feature disappeared from the records of 2 others in the same circumstances. Bundle-branch block in Case N became more definite under chloral hydrate—i.e., inversion of the T-wave in lead I. was more pronounced. Separation of the P- and T-waves contributed to this appearance.

#### DISCUSSION

That chloral hydrate in ordinary doses is a remarkably effective hypnotic almost entirely free from the disadvantages of tolerance and habit formation is confirmed by this investigation. On the whole it seems that the drug is best avoided in the presence of gastro-intestinal irritation, but this drawback can be practically eliminated by diluting sufficiently with water. Smarting of the eyelids and lacrymation were troublesome in about 5 per cent. of the patients under observation. This occurred only after several days during which the dosage had been frequent and substantial. Under ordinary clinical conditions, when a single dose is given every night for a week or two, it is reasonable to assume that these ocular complications would be less likely to develop.

Physical examination of the heart yielded no unequivocal evidence of weakening of the cardiac



action by chloral hydrate. Only 3 patients (Cases A, B, and D) appear to admit of some discussion on this point. From the clinical data it will be seen, however, that though some slight abnormality is mentioned the results of further investigation of the cardiovascular system were inconsistent with cardiac damage. On the other hand, clinical evidence of improvement in the action of the heart (attributable to rest in bed, &c.) was seen in 2 cases. No significant changes occurred in the heart-rate.

About half of the patients showed some fall in blood pressure. In the great majority of these the decrease did not exceed 15 mm. Hg and as there was no alteration in the condition of the heart the change in blood pressure was regarded as being consistent with prolonged periods of sleep and almost continuous drowsiness. In the few cases where the blood pressure was depressed more than 15 mm. Hg conditions other than the administration of the hypnotic were regarded as being the main causes. Nearly a quarter of the patients were found to have an increased blood pressure after taking chloral hydrate. It is difficult to say what may be the exact significance of these findings, but they certainly discount to some extent (though not entirely) the results which show the opposite effect on the blood pressure. The figures in Table III. do not lend support to the view that chloral hydrate is particularly detrimental in the presence of heart disease.

In Cases L, M, and N (Table III.) slightly delayed conduction was noticed. These must be compared with Case O in which the findings were exactly the reverse. These changes are regarded as being too trivial to be of clinical importance.

#### CONCLUSION

Chloral hydrate in therapeutic doses has no harmful effect upon the heart. When the blood pressure is lowered during chloral hydrate administration the effect is not much greater than occurs in natural sleep.

I am indebted to Dr. John Gracie, visiting physician to the Western Infirmary, for permission to publish this work, and to Sister J. R. Thompson for her willing coöperation.

#### REFERENCES

1. Hutchison, R.: *Elements of Medical Treatment*, Bristol, 1927, p. 52.
2. Stockman, R.: Personal communication.
3. Allan, G. A.:
4. Gunn, J. A.: *Brit. Med. Jour.*, 1913, ii., 665.
5. Cushman, A. R.: *Hypnotics*, XVIIth Int. Congr. Med., 1914, Part 5, Sect. 2, p. 127. Quoted by Sollmann, T.: *Manual of Pharmacology*, Philadelphia and London, 1917.
6. Glaus, A.: *Schweiz. med. Woch.*, 1920, i., 841.
7. Cushman, A. R.: *Text-book of Pharmacology and Therapeutics*, London, 1918, p. 240.
8. Gunn, J. A.: *Introduction to Pharmacology and Therapeutics*, London, 1932, p. 101.
9. Hale-White, W.: *Materia Medica, Pharmacy, Pharmacology and Therapeutics*, revised by A. H. Douthwaite, London, 1932, p. 278.
10. Bastedo, W. A.: *Materia Medica, Pharmacology, Therapeutics and Prescription-writing*, Philadelphia and London, 1932, p. 415.
11. Poulsson, E.: *A Text-book of Pharmacology and Therapeutics*, London, 1923, p. 31.
12. Clark, A. J.: *Applied Pharmacology*, London, 1933, pp. 187, 188.
13. Whittle, W.: *Pharmacy, Materia Medica and Therapeutics*, London, 1933, p. 335.
14. Dilling, W. J.: *Materia Medica and Therapeutics*, London, 1933, pp. 387, 388.
15. Ghosh, R.: *Materia Medica and Therapeutics*, Calcutta, 1915, p. 344.

FOLKESTONE HOSPITAL.—Extensions to this hospital, at a cost of £85,000, are contemplated. The institution would then have 165 beds, 16 maternity beds, 25 private wards, a new children's ward, and a pathological department. Some funds are in hand, but £60,000 will have to be raised.

## ON THE POSSIBLE TRANSMISSION OF HÆMOLYTIC STREPTOCOCCI BY DUST

BY ELIZABETH WHITE, M.B. Lond., D.P.H.

ASSISTANT BACTERIOLOGIST AT THE BERNHARD BARON MEMORIAL  
RESEARCH LABORATORIES, QUEEN CHARLOTTE'S  
HOSPITAL, ISOLATION BLOCK

RECENT attempts to trace the source of puerperal infections (D. C. Colebrook, 1935)<sup>1</sup> have suggested very strongly that in the majority of cases—at least 80 per cent.—the streptococci had been conveyed to the genital tract from the nose or throat of the mother herself, or of someone in contact with her. In a minority of cases no such probable source was found, and the question arises whether in these cases the hæmolytic streptococci may not have reached the genital tract by the agency of air-borne particles. This possibility seems the more likely in view of the recent finding by Cruickshank (1935)<sup>2</sup> that the air of wards in which patients suffering from burns were nursed frequently yielded fairly abundant cultures of hæmolytic streptococci, whereas the air of the medical wards in the same hospital yielded none, and that of the surgical wards only a few colonies. In private houses at the time of a confinement there must sometimes be persons with septic foci infected by these streptococci, such as children with otorrhœa or impetigo, or adults with infected wounds who, although not in close contact with the mother during labour or in the puerperium, may have contaminated the dust, which in turn may originate a puerperal infection. This possibility must be increased where there is overcrowding.

In Queen Charlotte's Isolation Hospital for puerperal fever all cases are admitted into single bed wards. In a considerable number the hæmolytic streptococcus is the infecting organism. It was decided in such cases to investigate whether the dust in the ward became contaminated with hæmolytic streptococci and, if so, to what degree and for what period. By the examination of such special cases some further knowledge of the possibility of infection by dust might be obtained.

#### INVESTIGATIONS

Tests on the air and the dust in the wards were carried out between the third and the sixth day after admission as follows.

Two horse blood-agar plates were exposed by the night nurse after she had settled the patient for the night. One was placed on the trolley about 1½ yards from the foot of the bed and the other on the locker beside the bed. These were closed by the nurse when she woke the patient in the morning and were therefore exposed for about six hours. Two more plates were exposed in the same places by the nurse who made the first perineal toilet of the patient. These were left open while she was doing this and then closed. They were open for about twenty minutes to half an hour. There would be more movement in the ward during this period than during the night.

While the ward was being swept and polished two more plates were opened, one being placed on the trolley at the foot of the bed, as in the other cases, and the other on the floor. These were exposed for about twenty minutes and were in a more dusty atmosphere than the others.

The six plates were incubated over-night in anaerobic conditions, because this helps to keep down the saprophytic organisms and also shows up the hæmolytic streptococcus colonies more clearly (R. M. Fry, 1933).<sup>3</sup> The number of the latter were counted and one or more subcultured and tested for soluble hæmolysin production. The total number of hæmolytic streptococcus colonies on all these six plates was taken as an "index of contamination" of the ward.

RESULTS

It was found that the hæmolytic streptococcus occurs in the dust of single bed wards where cases infected with this organism are nursed, and not to anything like the same extent in the wards of patients with sepsis due to other organisms. This is shown clearly in Table I. The index of contamination for the six control cases is low, while that of the other cases is much higher in general.

TABLE I

Index of contamination of ward.	0	1-2	3-5	6-10	11-20	21-50	51-100	Over 100
Cases infected with— Hæmolytic strep. . .	0	2	3	5	3	9	3	2
Other organisms . . .	3	3	0	0	0	0	0	0

With regard to the occasional presence of hæmolytic streptococci in the dust of a ward used as a control, there are two possibilities. The organism might have been left by a previous occupant, or it might have been carried there on the broom, or on the shoes or clothing of the staff, as the five single bed wards on each floor open along the same side of one corridor. In one case the latter possibility was considered likely, as the hæmolytic streptococcus was found to be the same type serologically as the infecting strain of a case of puerperal scarlet fever with a high index of contamination on the same floor.

A similar result to that shown above was obtained from experiments made in two wards of five beds each. In one of these were convalescent cases infected with hæmolytic streptococci, and in the other, patients recovering from other infections.

Two plates were exposed in the middle of each ward during sweeping, one on the floor and the other on the table. Their incubation and further examination was as previously described. The index of contamination, calculated as the total number of colonies on the two plates in this experiment, was 55 in the first ward and only five in the second. (The control ward, i.e., with patients not infected by hæmolytic streptococci had, a week or two previous to the experiment, housed some patients who were convalescent from an infection with that organism, and had not been disinfected since their discharge.)

The twenty-seven cases infected with hæmolytic streptococcus, the dust of whose wards was tested, were not selected in any particular way. Their clinical condition varied from a mild localised infection of the genital tract to a local infection plus pelvic cellulitis, general peritonitis, puerperal scarlet fever, and septicaemia. In a proportion of all these types of infection the hæmolytic streptococcus was isolated from the respiratory tract, either the throat, nose, or naso-pharynx. While the number of cases in each class is too small to allow any definite conclusions to be drawn, there is no evidence that the degree of contamination of the dust is correlated with the severity of the clinical condition or infection of the respiratory tract. The data for the twenty-seven cases is classified in Table II. according to their clinical condition. It is of interest to note that in only two cases was the amount of lochia in excess of the normal. It was found, however, that in two cases that were examined in greater detail the index of contamination did decrease as the patient recovered. The cases examined were two of the puerperal scarlet fever cases of Table II. The six plates, from which the index of contamination was found, were exposed at intervals of twenty-four to forty-eight hours

during the whole of the patients' stay in hospital—thirty-one days in one case and seventeen days in the other. In both, the hæmolytic streptococcus persisted in the cervix until the day of discharge.

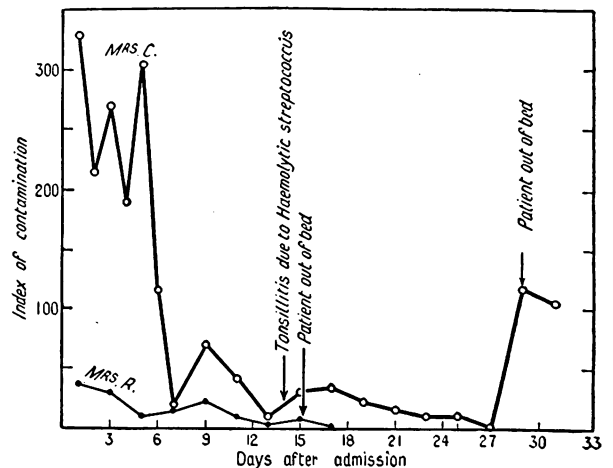
TABLE II

Type of case.	Source of hæmolytic streptococcus		Cases.	Index of contamination for each case.
	Cervix.	Resp. tract.		
Mild local . . . . .	+	..	4	10, 16, 29, 66, 12, 84
Infection . . . . .	+	+	2	
Severe local . . . . .	+	..	3	4, 6, 7
Infection . . . . .	+	+	2	3, 13
Mild local and pelvic . . . . .	+	..	1	4
Severe local . . . . .	+	..	2	23, 33
and pelvic infection . . . . .	+	+	5	2, 2, 23, 25, 78
Puerperal scarlet fever . . . . .	+	..	1	6 (a)
2 cases with septicaemia . . . . .	+	+	4	29 (a), 32, 271, 981 (a, b)
General peritonitis (opened and drained) . . . . .	+	+	1	20 (a)
Septicaemia . . . . .	+	..	2	10, 43 (b)

(a) = patient died. (b) = lochia in excess of normal.

The decreasing index of contamination is shown in the Figure.

It is interesting to notice that Mrs. C. developed tonsillitis on the fourteenth day after admission, and a culture from the throat showed a nearly pure growth of hæmolytic streptococcus, serologically identical with the cervical strain. The figure shows that there was a slight increase in the index of contamination at this time, though whether this is



Daily variation of index of contamination.

caused by the tonsillitis it is impossible to say. The experiment also shows that when this patient was out of bed, and therefore more likely to disturb any dust, there was a marked rise in the number of colonies.

VIABILITY OF THE HÆMOLYTIC STREPTOCOCCUS IN DUST

It is of some importance to know if the hæmolytic streptococcus will live in the dust of the room when the source of contamination is removed. Two experiments were made to investigate this.

In the first, two plates were exposed for six hours in a room immediately after the patient had died and the body been removed to the mortuary. The windows were shut and the doors locked so that there were no currents of air, and the bedding, &c., was left in situ. Plates were exposed on three more occasions with the same conditions and finally while the floor was swept and the bedding shaken. The results are shown in Table III.

TABLE III

Date.	Index of contamination.	Remarks.
19/10/35	320	Two days before death.
21/10/35	28	After removal of body.
22/10/35 A.M.	0	Room undisturbed.
22/10/35 P.M.	0	" "
23/10/35 A.M.	0	" "
23/10/35	90	While sweeping for 15 minutes.

In the second experiment, after the original test, the patient was transferred to another ward. At various intervals two plates were exposed while the bed, which she had occupied, was stripped and remade and the dust swept from one corner of the room to the other. The results obtained are shown in Table IV.

TABLE IV

Date.	Index of contamination.	Remarks.
5/2/36	5	Patient in room. Routine sweeping.
6/2/36	42	No patient. Room swept and bed remade.
7/2/36	36	" "
8/2/36	21	" "
10/2/36	70	" "

There seems to be no doubt that the streptococcus will live in the dust for several days and that its presence can be detected more readily when the air of the room has been disturbed.

Dr. L. Colebrook has kindly allowed me to quote an experiment carried out by him on the same subject. A broth culture of hæmolytic streptococcus was sprayed into a dusty cupboard. At intervals the dust was raised and allowed to settle on horse-blood agar plates. After incubation, hæmolytic colonies were subcultured and tested in the way described above. It was found that the organisms lived for ten weeks. The experiment is still continuing. Some of the contaminated dust was also kept in a Petri dish exposed to light and under these conditions they also lived for ten weeks.

#### DISINFECTION OF ROOMS CONTAMINATED WITH HÆMOLYTIC STREPTOCOCCI

Since it was found that hæmolytic streptococcus can live in dust for many days or weeks, tests were made of the efficacy of the method employed for disinfecting the rooms after they were vacated by the patient. The procedure was to spray the room, using an Enot's spray, with half to one pint of commercial formalin (40 per cent. formaldehyde) either undiluted or diluted with one or two parts of water. The room was sealed and left for at least twenty-four hours. The windows were then opened, and when the room was sufficiently aired it was thoroughly cleaned in the usual way. The two blood-agar plates were exposed for half an hour during this cleaning. The 40 per cent. formaldehyde was strong enough to kill the hæmolytic streptococcus, and it was noticed that very few saprophytic organisms grew on the plates. With the weaker solutions hæmolytic streptococcus was found to persist on two of the five occasions on which this test was made, and the growth of saprophytes was much greater.

#### IDENTIFICATION OF THE DUST STRAINS

Since hæmolytic streptococcus is found in the wards occupied by patients infected with this organism and not to any extent in other wards, it suggests that the patient is the source of the organism. This was confirmed by the serological examination of the patient's infecting strain and that recovered from the dust of her ward. Dr. Dora Colebrook very kindly undertook these tests. The method employed was the direct slide agglutination with absorbed sera by the technique introduced by Griffith (1935).<sup>4</sup> The details of the test, its interpretation, and any technical difficulties that may arise have been fully dealt with by Dr. Colebrook in her paper (1935).<sup>1</sup>

Out of twenty-seven cases the infecting strain was typed in 18. The remainder may not have been one of Griffith's types, or the suspensions tested may have been insensitive or were unusable. Among these 18 cases there were 12 types of streptococcus, and not more than 3 of any one type. This was fortunate as it enabled the strain from the dust to be definitely associated with one patient. The strains from a few only of the plates exposed for each patient were tested, as the task of examining every one appeared an unnecessary labour. The results were as follows (Table V).

TABLE V

Number of dust plates of 18 typed cases from which hæmolytic streptococci were isolated	.. ..	199
Dust strains tested	.. ..	51
Dust strains the same as the corresponding infecting strain	.. ..	39

Those obtained from a room after fumigation were in each case the same as the infecting strain of the patient who had occupied that room. On three occasions two types of hæmolytic streptococcus were isolated from one plate. One of these was the patient's own type and the other that of the previous occupant who had been removed to the convalescent ward a week before. As mentioned above a strain recovered from the dust of a ward occupied by a control case was the same as the infecting strain of a case of puerperal scarlet fever, with a high index of contamination, who was nursed on the same floor but in a different ward.

#### AN ACUTE THROAT INFECTION ATTRIBUTABLE TO DUST

With regard to the experiments set out in Table IV, it is of interest that the person responsible for making the bed and sweeping the floor, in spite of wearing a mask consisting of two layers of muslin with paper in between, over nose and mouth, contracted an acute pharyngitis and adenitis due to a hæmolytic streptococcus on Feb. 10th, 1936. This organism was serologically identical with that grown from the dust, and from the cervix of the patient who had been in the ward. There was no direct contact with the patient but only with the dust after the patient had been removed to another ward. Here apparently is a clear case of infection by dust.

In contrast to this experience, it may be mentioned that two nurses who spent several hours each day in the room of a dying patient with an index of contamination of 981 did not become carriers or contract an infection. They wore similar masks to that described above all the time they were in the ward.

An experiment made by Dr. L. Colebrook has shown that hæmolytic streptococci maintain their mouse virulence in dust undiminished for 25 days.

## SUMMARY

The dust of twenty-seven single bed wards housing patients who are discharging hæmolytic streptococci was always contaminated with that organism, and in most cases the strain isolated from the dust was proved to be identical with that infecting the patient.

The dust of similar wards housing patients infected with other organisms seldom yielded hæmolytic streptococci, and then only very scanty growths.

Spraying with formalin (40 per cent. formaldehyde) destroyed the hæmolytic streptococcus in rooms contaminated with that organism.

A case is reported in which exposure to dust carrying hæmolytic streptococcus was almost certainly responsible for an acute pharyngitis.

Although no opportunity has occurred for investigating the point, it would seem unlikely in view of the experiments reported by Dr. L. Colebrook (1933)<sup>5</sup> that a healthy throat carrier of hæmolytic streptococcus creates a zone of streptococcus-carrying particles around himself.

I wish to express my thanks to Dr. L. Colebrook for his encouragement and interest in this work; to Dr. Dora Colebrook for undertaking the serological investigations described; to the resident medical officer, Dr. M. Kenny, and to the sisters and nursing staff of the hospital for their willing coöperation.

## REFERENCES

1. Colebrook, D. C.: Medical Research Council, Special Report Series No. 205, 1935.
2. Cruickshank, R.: Jour. Path. and Bact., 1935, xli., 367.
3. Fry, R. M.: Ibid., 1933, xxxvii., 337.
4. Griffith, F.: Jour. Hyg. Camb., 1935, xxxiv., 542.
5. Colebrook, L.: Brit. Med. Jour., 1933, ii., 723.

## THE TREATMENT OF PHLEBITIS IN VARICOSE VEINS \*

BY H. I. BIEGELEISEN, M.D.

CHIEF, VARICOSE VEIN CLINIC, STUYVESANT POLYCLINIC,  
NEW YORK CITY

THE conservative treatment of phlebitis in varicose veins has proved unsatisfactory and the purpose of this paper is to present a new method of treating this rebellious disorder, which so often terminates in a permanently damaged extremity.

Varicophlebitis differs from ordinary phlebitis because the blood stream that feeds it is stagnant. One would therefore expect, as indeed one finds, that the activity of the inflammatory process is related to the speed of the blood stream. In other words, subacute or chronic infections are the rule; and quiet latent infections, which may be symptomless, occur frequently. Occasionally an acute inflammation is met with; it may follow the establishment of a septic focus elsewhere or be produced by severe trauma. This acute phlebitis tends to subside and then falls into the large group of subacute, chronic, and latent infections which will now be considered.

Phlebitis in varicose veins is extremely common (Fig. 1). At least half of all varicosed extremities have infected veins. This startling fact was first pointed out by de Takats,<sup>1</sup> who actually cultured bacteria from isolated vein segments that he excised in a general group of varicose vein cases; half of these developed a bacterial growth in 5-10 days. These bacteria were slow-growing and of low virulence. As I recently pointed out,<sup>2</sup> clinically one

meets with unexpected "flare-ups" following the injection treatment which have an incubation period resembling that of the bacteria in de Takats's cultures. It is apparent from this experimental and clinical evidence that phlebitis is often present in a quiescent state and may be innocently excited by the inexperienced operator.

The sedimentation-rate, which I suggested in 1934 as the best diagnostic sign of phlebitis, has been used by me consistently since then with the result that my original confidence in this test has been strengthened. With its assistance, after proper evaluation, the injection treatment of phlebitis is made safer and more controllable.

What has been done in the past for phlebitis of varicose veins? With the establishment of the diagnosis, the patient was put to bed, the extremity elevated, and cold applications applied locally. After a variable uncertain period the patient was allowed up and the phlebitic extremity treated in a variety of fashions. Elastic supports, X ray therapy, and thermal baths were some of the procedures used. A few bolder spirits advised injections after healing was completed, setting arbitrary time limits of six months to two years for this to take place. The whole picture was a confused and timid one, with the result that few patients escaped permanent leg damage. The old conservatism was due to two reasons: the first was the fear of injecting an inflamed vein and thereby spreading the process, and the second the dread of embolism.

The modern method of treating inflamed varicose veins is to sclerose them as soon as possible. This newer form of attack is rationally sound and is based on the following premises: (1) phlebitis in varicose veins rarely heals spontaneously; (2) the danger of embolism is greater in the untreated cases; (3) temporising means permanent lymphatic and tissue damage; and (4) sclerosing injections can safely occlude the dilated infected vessels.

The chronicity of varicophlebitis has been stressed before. It is, however, not generally recognised that evidences of infection may be present many years after the apparent subsidence of acute phlebitic infections. I have seen many patients in whom traces of phlebitis persisted 5-20 years after the original attack. The following is a short history of such a case.

Mrs. A., aged 52, had had varicose veins for eighteen

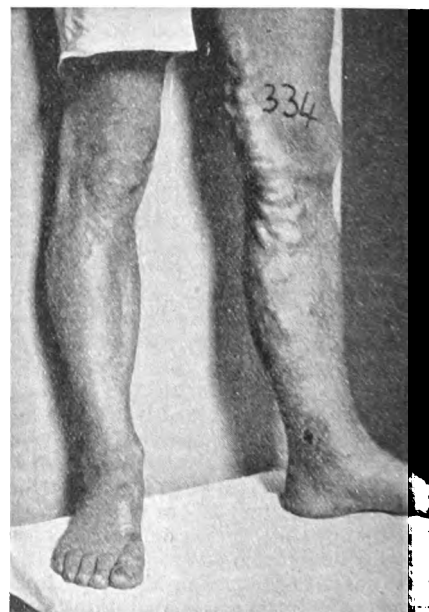


FIG. 1.—Phlebitic varicose veins: no tenderness, thrombosis, or hyperthermia. Varicose ulcer present. Sedimentation-rate 20 minutes.

\* Read before the East Side Clinical Society, New York, 1935.

years. The first attack of acute phlebitis ten years ago was treated by rest in bed for two weeks. A second attack of phlebitis occurred eight years ago. In her last attack she was in bed three weeks; spontaneous tender thromboses were noted, and a mild state of lymphœdema with fibrosis was present on both legs. The sedimentation-

of an ordinary varicosity which does not migrate and appears in 1-3 days after a treatment.

The injection method should be so gauged as to avoid flare-ups. A careful technique must be followed. The only patients excluded from treatment are those with the relatively rare acute widespread processes. In these occasional cases treatment is delayed until the phlebitis is subacute or chronic. The vast majority of cases of phlebitis are immediately amenable to the following plan.

#### TECHNIQUE AND RESULTS

After a careful history and physical examination, the sedimentation-rate is taken by the Linzenmeier technique using 5 per cent. sodium citrate. The interpretation of this test is important. In the absence of any other infection, a rapid rate points to phlebitis. The latency of the infection is roughly proportional to the sedimentation time, as follows:—

- Below 30 mins.—an active infection.
- 30-60 mins.—a fairly active infection.
- 60-90 mins.—a probable latent infection.
- Over 120 mins.—probable absence of infection.

The initial injection should always be a mild one. I begin with 1 c.cm. of 60 per cent. invertose solution in all cases with a sedimentation-rate over 30 mins. With a more rapid rate, one should start with normal saline solution or 2 minims (0.1 c.cm.) of invertose. It is dangerous to begin any treatment with quinine or other strong irritants, no matter what the sedimentation-rate may be. The succeeding injections are gradually made stronger, endeavouring at all times to keep the reactions below the flare-up point. The strength of action may be increased by using larger quantities of the same irritant or by substituting the next stronger irritant in the series. The three most generally used solutions in the order of increasing sclerosing action are: invertose, sodium morrhuate, and quinine.

It will be found that the reactions produced even by careful treatment will be different from those obtained in uninfected veins. In phlebotic vessels they will often be delayed, depending upon the incubation period of the bacteria involved. Slight migration of the response may be noted and healing is slower than usual. Sometimes a double reaction will be noted. The initial chemical irritation may subside, to be followed by a second phlebotic reaction a week later. It is therefore important not to treat these patients more often than once a week.

The reactions following injection become more normal as the case progresses until no signs of phlebotis remain. All the cases in my series were finished with strong irritants. After the fifth injection, in most instances, a fairly strong solution like sodium morrhuate 5 per cent. was well borne. In 60 per cent. of the cases quinine was used for the final injections with good results. Apparently the successive mild phlebotic responses to chemical irritation increased the patient's resistance to his own infection. In this connexion it is interesting to note that Du Laurier<sup>5</sup> in 1931 advocated vaccine therapy as a preliminary to the injection treatment of phlebotis. The 300 patients that have been injected by me under this plan of treatment have all gone on to an uneventful cure. I feel sure that phlebotis should no longer be considered a contra-indication to the injection treatment of varicose veins.

#### CONCLUSIONS

- (1) Phlebotis in a subacute, chronic, or latent form complicates about 50 per cent. of cases of varicose



FIG. 2.—Bilateral lymphœdema resulting from untreated varicophlebitis. The pigmented areas are hard and tender.

rate was 45 minutes. There was latent phlebotis as a result of the original acute infection eight and ten years ago. Injection treatment was uneventfully successful.

In other patients, a puerperal or post-operative varicophlebotis which has been treated conservatively is the starting-point of a chronic infection which often persists indefinitely although the original insult dates back many years. It is evident, therefore, that time does not cure these cases. Delay in treatment on this score is unwarranted and is more dangerous than careful obliteration of the infected varices. It is a common experience to find flare-ups due to trauma of phlebotic dilatations. There is also the danger of an acute activation following a general infection or the establishment of a new septic focus. These recrudescences may cause the formation of friable clots and become a dangerous source of emboli. Furthermore, any future obstetrical or operative procedure becomes a hazardous affair in the presence of infected veins. Quiet careful obliteration, in the manner to be described, effectively removes these potential sources of embolism.

Lymphœdema, to some degree, invariably complicates varicophlebotis as time goes on, and once it has been established it tends to persist.<sup>3</sup> The lymphatic damage goes on to fibrosis and ulceration, causing deformity and disability. One should consequently aim to stop the spread of infection into the lymphatic system before this permanent damage occurs (Fig. 2).

That sclerosing injections can be safely used has been my experience in 300 cases. Working independently, Delater and Chailly<sup>4</sup> in 1934 reported on their method of arresting active varicose phlebotis by the injection of sclerosing fluids. They did not present any definite technique, merely advising the usual injections. This is incorrect as will be pointed out later.

In order to safely treat phlebotis in varicose veins one must understand the flare-up reaction following an injection. This inflammatory phlebotic response points to the existence of an active phlebotis. It is identified by an incubation period of 5-10 days and a tendency to migrate along the course of a vein. This is in contrast to the non-phlebotic response

veins. (2) In such cases it is the starting-point of a pernicious cycle which permanently damages the superficial tissues of the extremity. (3) It can and should be treated early by a special injection technique. (4) The sedimentation-rate is useful as a guide for treatment. (5) By this method 300 cases have been treated with uniformly good results.

REFERENCES

1. de Takats, G.: Amer. Jour. Surg., 1932, xviii., 26.
2. Biegeleisen, H. I.: Ann. of Surg., 1934, xxix., 661.
3. : Arch. Derm. and Syph. (in the press).
4. Delater, G., and Chailly, M.: Presse méd., 1934, xlii., 274.
5. Du Laurier, V.: Clinique (Paris), 1931, xxvi., 140.

TREATMENT OF TUBERCULOUS CERVICAL GLANDS

BY BRIAN C. THOMPSON, M.D. Camb.

ASSISTANT TUBERCULOSIS OFFICER, DURHAM COUNTY COUNCIL

THOUGH cervical-gland tuberculosis is steadily becoming less frequent<sup>9</sup> it remains a relatively common condition, particularly in certain parts of this country.<sup>8</sup> On my dispensary register for 1934 were 978 patients suffering from all forms of tuberculosis, drawn from the north-eastern district of the county of Durham, on the south bank of the Tyne, and 195 of these (20 per cent.) were cervical-gland cases. Yet despite this frequency and the fact that most practitioners must encounter the disease from time to time, medical text-books as a whole<sup>2 4 6 8 10 11 13-16</sup> appear to have no unanimous opinion about treatment, though methods in common use are variously recommended. To test certain of these methods I have applied them proportionately to a total of 277 personal cases, and by comparing the results I have evolved a routine for dealing with any given case.

METHODS OF TREATMENT

*Sanatorium.*—Pure sanatorium routine, under ideal conditions of hygiene and climate, is regarded as preliminary treatment for all cases by several authorities.<sup>2 4 6 7 10 13-16</sup> I am opposed to it primarily on grounds of expense and inexpediency. For any State-aided tuberculosis scheme, the cost of providing sanatorium accommodation for such numbers as I have quoted, or, alternatively, the exclusion for their benefit of sufferers from other forms of tuberculosis, could only be justified if cervical-gland patients were not able to be as effectively cared for at home. In view of results obtained by ambulant methods I have satisfied myself on this point, and now admit to institutions only patients with certain complications, which form a very small percentage of the whole.

*Iodides.*—The glands had not reached the stage of gross caseation in 64 cases, and these were given syrup. ferri iod. (B.P.) in full doses over periods ranging from two months to three years, those reacting favourably being afterwards kept under observation for at least one year. It was found that complete clinical disappearance occurred in only 4 patients, and then in glands which had never progressed beyond the earliest stage of lymphoid enlargement. It appears that complete resolution is seldom, if ever, attained under this treatment, and that the optimum result to be hoped for is defined by shrinkage, mobility, and firmness, indicating progressive fibrosis and showing later to X ray the dense shadows of calcium deposition. This must constitute a "cure,"

so far as that term may be applied to any tuberculous focus. The continued presence of living tubercle bacilli in such latent foci, even when encapsulated by calcification, has been abundantly demonstrated by Opie<sup>12</sup> and others, but the likelihood of exacerbation becomes progressively less with time and may be anticipated by prolonged and careful observation.

In order to study the results of this group in detail, a classification of the disease according to its clinical stages, modifying that of Mest,<sup>5</sup> has been found convenient:—

1. Glands enlarged, firm, mobile, and not matted.
2. Peri-adenitis, with matting but no gross softening.
3. Liquefaction with fluctuation; no reddening of the overlying skin.
4. Skin thin, reddened: ulceration inevitable.
5. Sinus.

In the present group 34 cases were at Stage I. when treatment was begun. The glands in 4 patients disappeared, in 19 became permanently small and shotty, and in 11 remained stationary in size; that is, a satisfactory result was obtained in all. Of 30 cases in Stage II. with associated peri-adenitis, 18 became "cured" and 12 went on to softening and abscess-formation.

The part played by iodine in this series is questionable, as improvement in some may have been spontaneous or due to some other factor, but the fact that not one of the early stage cases became worse while under treatment suggests that its value is not inconsiderable.

*Tuberculin.*—A standard preparation of old tuberculin was given to 42 cases by subcutaneous injection over periods of from two months to three years. Of these 4 were at Stage I. and 28 at Stage II., and in all a "cure" was obtained as defined above. The remaining 10 patients showed gross signs of softening prior to commencement of treatment, and all eventually broke down or were incised. This bears out the general opinion<sup>2</sup> that tuberculin is not likely to arrest a tuberculous process once extensive liquefaction has occurred. On the other hand, the results when treatment was begun in the stage of peri-adenitis without softening compare strikingly with those obtained by iodides (100 as against 60 per cent.), and in view of this virtual control series, argue strongly in favour of tuberculin.

*Surgical excision.*—Radical removal of tuberculous cervical glands had been attempted by a surgeon in 36 patients. In 25 of these there was a gross local recurrence of the disease; 1 patient developed phthisis and 1 a fatal generalised tuberculosis. Operation may therefore be said to have cured certainly not more than 25 per cent. Of the 35 surviving patients in this series, operation was followed in 13 by a persistent sinus. This is noted in relation to the argument often advanced in favour of surgical excision<sup>1 3 4 11 13</sup> that it anticipates the formation of a spontaneous fistula. In order to assess its ultimate cosmetic results, a control series was collected of 35 successive cases in which tuberculous cervical glands broke down spontaneously, owing to refusal or neglect of treatment in the earlier stages. The healed scars in both groups compare as follows:—

	Surgical excision.	Spontaneous ulceration.
Good .. .. .	8	8
Moderate .. .. .	15	12
Bad .. .. .	12	15

These figures suggest that the cosmetic results of surgical excision are not significantly better than



those of untreated cases which run a severe course under the least favourable conditions.

**Aspiration.**—Liquefaction occurred in 32 patients, and these were treated by aspiration, using the oblique approach of Calot.<sup>1</sup> Of these, 4 remained "closed" and subsequently subsided under iodide administration; in them a single aspiration sufficed and the cavity did not refill. In the remaining 28 patients a sinus ultimately formed along the needle-track. This was found to occur more frequently when rapid refilling took place, requiring repeated aspiration, and when the onset of softening had been acute, suggesting a superadded secondary infection. The injection of antiseptic and sclerosing solutions into the abscess cavity seemed rather to provoke sinus-formation than otherwise.

**Incision.**—Incision with drainage was performed in 70 cases. The cosmetic results were slightly inferior to those obtained by aspiration, but both compare very favourably with the results of surgical excision and spontaneous ulceration:—

Cases ..	Exoision.	Spontaneous ulceration.	Aspiration.	Incision.
		35	35	32
	Per cent.			
Good ..	23	23	37	37
Moderate ..	43	34	47	40
Bad ..	34	43	16	23

Of 16 patients giving "bad" scars, 15 were incised at Stage IV. with the skin thin and reddened, while of 26 giving "good" scars 14 were at Stage III. only. This suggests that to obtain the best cosmetic results the incision should be made through healthy skin, and should not be delayed until this has become involved in the tuberculous process; this is contrary to the practice of Miller<sup>11</sup> who allows softening to reach an advanced stage. Incision was followed in 12 patients by curettage of the abscess cavity. This did not appear to affect either the subsequent course of the disease or the ultimate cicatrix, and the percentage results were approximately the same as those obtained by simple incision. It is suggested that softening of a tuberculous gland and formation of "cold abscess" is not necessarily to be regarded as a catastrophe, but may on the contrary give a reasonably good result.

#### CONCLUSION

In the light of the foregoing observations of fact, I now adopt the following routine:—

1. When tuberculous cervical adenitis is in the earliest stage of simple hyperplasia, syrup. ferri iod. (B.P.) is given by mouth until the glands are permanently firm and contracted.

2. In the next stage of peri-adenitis, Beraneck's tuberculin is given by injection, according to the usual straightforward technique.

3. When there is enough softening to give physical signs of fluctuation, one of two surgical measures is adopted. If there is reason to believe that the process of liquefaction is slow, owing to its insidious onset and slow rate of increase, aspiration is performed: if, on the other hand, the abscess appears suddenly in a hitherto firm glandular mass, an early incision is made; this is also done in a patient, seen for the first time with the skin already involved in the

tuberculous process, as evinced by its being thinned and reddened. The old-fashioned Syme's "abscess knife" is preferred for this purpose. Free drainage is maintained until all discharge has ceased.

4. Whenever a sinus has formed, or has been produced by aspiration or incision, any residual glands receive conservative treatment according to their condition, on the lines indicated above. It has been observed that obstinate fistulae do well on tuberculin. Scrofuloderma is treated by ultra-violet irradiation.

5. Apparent cure is succeeded in all cases by observation for at least three years. Relapse and recurrence are not uncommon, but are equally amenable to the same methods of treatment. The average duration of iodide treatment is from 9–15 months, and of tuberculin from 3–6 months. An adequate supply of food and clothing is supplied through the care committee and home supervision is carried out by health visitors. Only in rare cases of grossly deficient home conditions is sanatorium treatment resorted to, or when the disease is accompanied by severe toxæmia or active tuberculosis in some other part of the body. Surgical excision is held to be unjustified by results and is never advised.

#### REFERENCES

1. Bailey, H.: *Brit. Med. Jour.*, 1932, i., 11.
2. Carr, J.: *Garrod's Diseases of Children*, London, 1929.
3. Clute, H. M.: *Ann. of Surg.*, 1927, lxxxiv., 666.
4. Dobson, J. F.: *Choyce's System of Surgery*, London, 1932, p. 6.
5. Edling, E.: *Acta Radiol.*, 1922, i., 455.
6. Fraser, J.: *Surgery of Childhood*, London, 1926, pp. 642, 643.
7. Gauvain, H.: *Brit. Med. Jour.*, 1935, ii., 1087.
8. Howarth, W. G.: *THE LANCET*, 1924, i., 664.
9. Landis, H. R. M.: *Amer. Rev. Tuberc.*, 1930, xxi., 195.
10. Lloyd, E. I.: *Parson's Diseases of Infancy and Childhood*, London, 1933, p. 1117.
11. Miller, R. H.: *Tuberculosis of the Lymphatic System*, New York, 1935, pp. 125, 135.
12. Opie, L., and Aronson, J. D.: *Arch. Path. and Lab. Med.*, 1927, iv., 1.
13. Romanis, W. H. C., and Mitchiner, P. H.: *Science and Practice of Surgery*, London, 1932, vol. i., p. 310.
14. Sauer, L. W.: *Abt's Pediatrics*, Philadelphia and London, 1924, vol. vii., p. 584.
15. Still, G. F.: *Common Disorders and Diseases of Childhood*, London, 1924, p. 491.
16. Thomson, J.: *Clinical Study and Treatment of Sick Children*, Edinburgh and London, 1921, p. 777.

## Clinical and Laboratory Notes

### THE SPECTROGRAPHIC ANOMALIES OF GASTRIC JUICE IN PERNICIOUS ANÆMIA

BY LADISLAS KARZAG, M.D., Ph.D.

PRIVAT DOZENT OF INTERNAL MEDICINE AT THE UNIVERSITY OF BUDAPEST; CHIEF OF THE FIRST DEPARTMENT FOR INTERNAL DISEASES OF THE ST. ROCHUS HOSPITAL, BUDAPEST

Castle, Wilkinson and Klein, Cohn, Witts, Muelengracht, Gänsslen, Bence and others have drawn attention to the special rôle of the stomach in regenerating the blood in pernicious anæmia. This note records some observations I have made with Miss Hanák on the contents of the fasting stomach removed through a duodenal tube and examined by ultra-violet spectrographic tests. These contents prove to have a selective absorption spectrum, which is also shown by the ultrafiltrate of the juice. Further we found evidence that the substances producing this appearance in the spectrum are actively secreted in the stomach.

Absorption spectra of samples of the juice of the fasting stomach before an alcoholic test-meal and

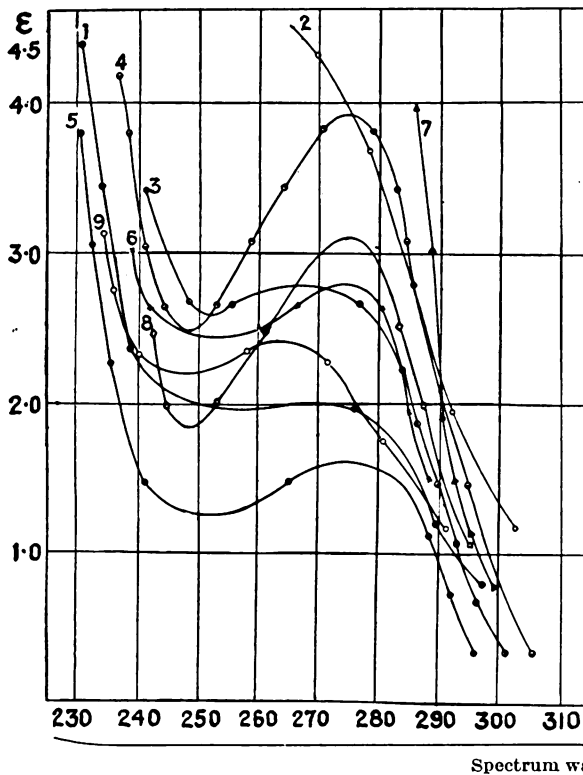


FIG. 1.—Control group: (1) diabetes mellitus; (2) chronic nephritis; (3) subacute endocarditis; (4) cardiac cirrhosis; (5) hepatic cirrhosis; (6) renal tuberculosis; (7) diabetes mellitus; (8) neurasthenia; (9) chorea minor.

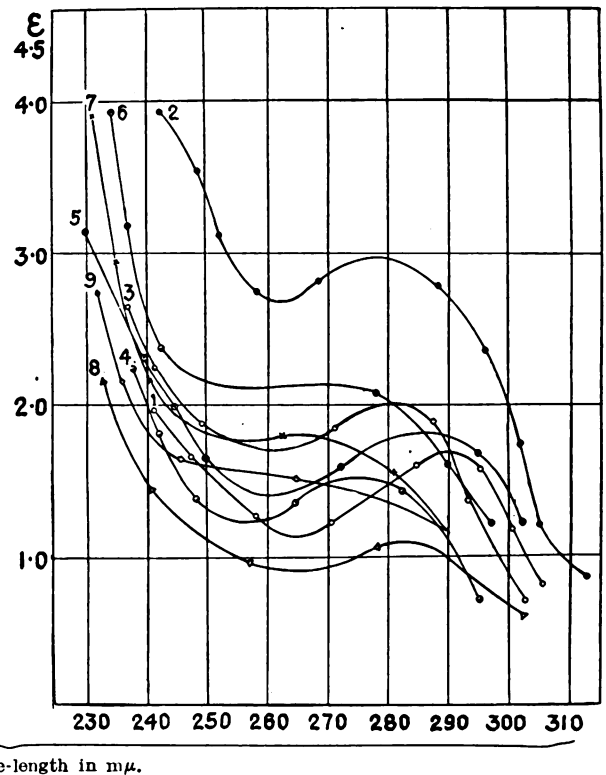


FIG. 2.—Extinction coefficients in pernicious anæmia: 9 cases.

then at 10-minute intervals show that the meal at first lowers the extinction coefficient (see  $\epsilon$  in Figures) by dilution, but further fractions show a slight rise in the curves associated with the increased activity of the stomach.

After this, with J. Várady and F. Császár, I carried out tests on ultrafiltrates of the juice from fasting stomach in three groups of patients. The first consisted of those suffering from a variety of diseases (Fig. 1); the second, from hypo-acidity, including cancer of the stomach; and the third, from pernicious anæmia, and already treated with liver (Fig. 2). We found that the absorption curves of the patients suffering from pernicious anæmia were remarkably like those in the other groups. The group of gastric disturbances and the control group showed a scattering of extinction coefficient values with a low limit of 2.0 and only in exceptional cases did these groups show a coefficient lower than this. In contrast to these the ultrafiltrates of the gastric juice in pernicious anæmia showed groups with a lower level, and the extinction coefficient values were between 1 and 2.

I have since attempted to discover the substance which develops the selective action in the fasting stomach contents. It has been shown by chemical and also by spectrographic tests that these substances are not proteins, polipeptides, aromatic amino-acids, lactic acid, or bile-pigments. The results of my investigations strongly suggest that, from their physico-optical and physico-chemical properties, and also from their reactions to heat, acids, and alkalis, their solubility, and their power of absorption, these selective secretions of the stomach are due to a vitamin-B complex substance.

We hope that these researches may be valuable in helping us to discover the pathogenic factor of pernicious anæmia.

The investigations have been made with the financial assistance of the Count Stephen Széchenyi Society for furthering the knowledge of natural science in Budapest.

#### REFERENCES

1. Karczag, L., and Hanák, M.: *Biochem. Zeits.*, 1935, cclxxviii., 105.
2. Karczag, L.: *Biochem. Zeits.*, 1935, cclxxviii., 108; *Verhandl. d. Deut. path. Gesell. f. inn. Med.*, XLVII. Kongr. Wiesbaden, 1935; *Compt. rend. Soc. de biol.*, 1935, cxiii. 1417; *Orvosi hetil.*, 1935, lxxix., 1188.

## TUBERCULOUS THROMBOPHLEBITIS OF THE LOWER EXTREMITY

BY EMIL ALTSCHÜLER

LATE SENIOR SURGEON OF THE JEWISH HOSPITAL,  
FRANKFORT-ON-MAINE

As far as I know, isolated tuberculous disease of veins, especially in the lower extremity, has not yet been described. I therefore consider it important to record two cases that I had occasion to observe while in Frankfort.

CASE 1.—A gardener aged 28. His father had died of pulmonary tuberculosis and his mother of asthma. He himself had suffered from several childhood illnesses and had been operated on for appendicitis.

In June, 1932, he had pain in the right leg. Painful cords appeared and he lay several weeks in the surgical wards of the University hospital. He left completely cured. When in October, 1932, the pains recurred he came under my care. Several thin cords 10–20 cm. long were found on the right leg and thigh; these were very

tender on the slightest pressure. He was otherwise healthy; X ray examination showed the lungs to be normal. The temperature was also normal and the Wassermann reaction was negative. I was struck by the absence of pyrexia and still more by the extraordinary multiple thin cords. They were about as thick as a knitting-needle and were very similar to those found in chronic inflammation of the lymphatic vessels. I suspected a specific disease of the veins and had an inflamed cord removed.

The pathological examination was made by Prof. Fischer-Wasels, director of the pathological institute of the University, and he reported that after examining numerous serial sections, several typical tubercles were found in the thickened and abundant intima of the veins.

Some time later the same symptoms recurred on the left lower leg. Being a public officer he was no longer allowed to be treated in a Jewish hospital and he therefore entered the surgical department of the University clinic. At my instance a diseased part of vein was removed for examination, and this also showed tuberculosis of the vein.

**CASE 2.**—A merchant aged 36. The family anamnesis was normal. He said he had had catarrh of the lung apex during his military service. A few years ago he was operated on for appendicitis. From July 20th, 1934, until August 2nd, 1934, he was in our hospital suffering from thrombophlebitis in the region of the saphenous vein. A thick painful cord stretched from the lower leg to the middle of the upper thigh, behind the knee. There was no raised temperature. The symptoms disappeared rapidly after treatment with leeches. On Oct. 10th he was again admitted because of the repeated thrombophlebitis in the same region. His organs were healthy and X ray examination showed the lungs to be normal. The surprising result of the examination in Case 1 led me to extract the diseased part of the saphenous vein and to send it to Prof. Fischer-Wasels. The microscopic examination showed a lumen completely filled with masses of thrombus, for the most part caseous. In the intima there were epithelioid cells and some quite typical tubercles.

In both cases I removed the inguinal glands and had them examined, but they were not diseased. The tissues in the neighbourhood of the diseased veins were also normal and the wounds healed by first intention.

Tuberculosis of veins has been described. Weigert published several cases with infection of the pulmonary vein, but there have been only a few with the thyroid, suprarenal, portal, azygos, or splenic veins affected. In all these, however, it was not a matter of a disease confined to the vein wall; the vein was infected by invasion from the surrounding tissues and there were always advanced tuberculous changes, with miliary infection of the viscera. In both our cases the organs are not demonstrably diseased. The tissue surrounding the vein was free from infection and only the intima was attacked. I cannot explain the ætiology; no portal of entry was discovered in the lower leg in spite of most exact interrogation of the patient.

I am no longer in a position, for want of material, to continue these examinations. I think that tuberculous disease of the veins of the extremities is not rare, and if this is so there is a wide field for research into its causes and its treatment.

Tel-Aviv, Palestine.

**TOXIC PURPURA HÆMORRHAGICA  
COMPLICATING SCARLET FEVER**

By J. E. MORRISH, L.M.S.S.A. Lond.

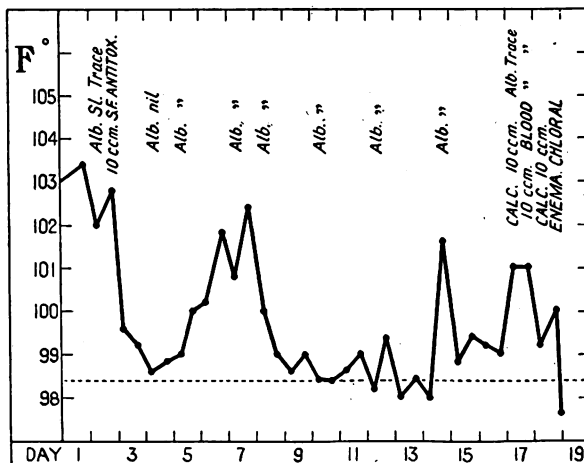
A GIRL, aged 7, was admitted to the Harrow Isolation Hospital suffering from scarlet fever.

On admission she had a brilliant erythema and a strawberry tongue; temperature 103.4° F.; pulse-rate 140. Scarlet fever antitoxin (10 c.cm.) was injected, and apart

from a trace of albumin in the urine on the second day she progressed without further complication until the eleventh day, when there was some pyrexia.

On the morning of the thirteenth day the night nurse discovered a small hæmatoma on the right hip which rapidly increased from the size of a penny to a circle of about 4 in. diameter. Both feet became bluish and painful in the sock area; the right eye showed conjunctival hæmorrhage and the temperature (see Chart) rose to 101° F.; pulse-rate 128, respiration 20. There were no adventitious heart sounds.

Calcium Sandoz (10 c.cm.) was injected intramuscularly and calcium lactate grs. 15 was given orally every four hours in a potassium citrate mixture. During the day the temperature dropped to 99° F. but the pulse-rate remained rapid. Other purpuric rashes appeared on the right knee and on the whole of the right thigh; both feet and ankles were swollen and dark purple in colour with



Temperature chart. Alb. sl. trace = albumin slight trace. S.F. antitox. = scarlet fever antitoxin. Calc. = Calcium Sandoz.

petechial spots showing through, causing the girl to cry with pain.

At 10.30 P.M. 10 c.cm. of the father's blood was withdrawn and injected into the child's buttock, and a draught of bromide and chloral was given to induce sleep and relieve pain. Next morning the child was obviously anæmic and there were hæmorrhages from the gums and nose. Both feet were now almost black and anæsthetic, but there seemed to be a ring of reaction around the edges of the smaller patches. Albumin had appeared in large quantities in the urine. The heart had a definite tic-tac rhythm; pulse-rate 160, temperature 100° F. She complained of abdominal pain, probably due to intestinal hæmorrhages; palpation was difficult, however, owing to rigidity, but no enlargement of the spleen could be felt.

Another 10 c.cm. of calcium sandoz was given intramuscularly. Dr. Robert Hutchison advised the further injection of serum into the buttock, as the veins were so collapsed that it was impossible to get into them. An enema was given late that night and grs. 10 of chloral was left in the rectum, following a bout of violent abdominal pain and sickness. The temperature dropped to 99.8° F. and she died at 3.45 A.M. From the onset of the purpura to death occupied about 48 hours.

I think I am right in saying that this case is unusual. Most authorities, with a few exceptions, describe these fatal cases attended with hæmorrhage as occurring in the first few days of scarlet fever, and not as late as the fourteenth day. The complete failure of treatment, even after two injections of serum, is noteworthy. Could it be that the serum activated the symptoms rather than controlled them?

## MEDICAL SOCIETIES

MEDICAL OFFICERS OF SCHOOLS  
ASSOCIATION

At the annual meeting of this association, held at the rooms of the Medical Society of London on April 17th, with Dr. J. LAMBERT (Wellington College), the president, in the chair, a discussion took place on

**Administrative Difficulties in the Construction of a School Sanatorium**

Dr. R. E. SMITH (Rugby School) said in building a new sanatorium the governing body had to consider not only the site and the cost, but also problems which arose in consultation with the selected architect. The latter should have had a wide experience of hospital construction, and this of itself was some guarantee that money would not be wasted. The Royal Institute of British Architects, in regard to competitive buildings, discouraged the award of the work automatically to the one whose tender was lowest, and a Fellow of that body would listen to constructive suggestions. Rugby School had a population of 600, and the number of days spent by boys in the sanatorium in three successive years was as follows:—

	Spring term.	Summer term.	Winter term.
1933 .. ..	2762 .....	897 .....	858
1934 .. ..	2340 .....	925 .....	1421
1935 .. ..	1486 .....	1508 .....	884

The average population in the sanatorium was 30, 12, and 12 respectively in the three terms.

The position of the site depended to some extent on whether all cases were to be dealt with in one building. In some schools infectious cases were housed in a separate building, but the modern tendency was to have all departments under one roof, when medical and nursing attention was more efficient. Dr. Smith had never seen an infection transmitted from an in-patient to an out-patient. A sanatorium in a central situation was visited more readily by boys than one at a distance, and also more convenient for housemasters. The number of beds in a sanatorium depended on many factors, discussed by Sir Weldon Dalrymple-Champneys in 1928. Less than the proportion formerly recommended (10 to 20 beds for each hundred boys) was now being advised by medical experts. Preparatory schools, where the number rendered immune by a previous attack of acute infectious diseases was relatively low, would need a higher proportion of beds than schools for older boys. Measles could now be controlled by convalescent serum therapy; at boarding schools this disease showed a biennial periodicity if attempts were not made to prevent contacts from returning. Diphtheria was the one disease against which prophylaxis was almost perfect; it had a low incidence in residential schools. Scarlet fever was troublesome, as patients had to be subjected to a long quarantine. Four weeks had been shown to be a better quarantine period than six weeks. The best policy, however, was active immunisation. Dr. Smith's view was that 10 beds for each 100 boys sufficed for a school sanatorium, provided each house in the school had in addition one sick room for every 30 boys. He was strongly in favour of a number of single-bed wards; two-bed wards he regarded as useless. Moreover, cases of measles were far better

nursed in single rooms than in large wards, though they should be transferred during convalescence. Only in this way could droplet infection be reduced to a minimum, and such serious complications as pneumonia, otitis media, and mastoiditis be avoided. The cubic capacity of the single-bed wards need not exceed 1500 ft., especially in the presence of adequate cross-ventilation. Possibly school sanatoria erected in the future would be equipped with air-conditioning plants. As to windows, his own preference was the double-sash window with metal chain sash cords. A fanlight above the door facilitated cross-ventilation. The public at large still needed convincing of the great value of the open window in pyrexial illnesses so long as the patient was kept warm.

The provision of facilities for operating in public schools was useful and might assist schools to secure the right type of men as health officers, though admittedly some conditions were best dealt with in a general hospital. For sterilising purposes Dr. Smith preferred electricity. The provision of sufficient recreation rooms was most important, as the management of boys during convalescence taxed the medical resources of the doctor as much as did the acute phase of their illness. Large wards should have coal fires in them and a varied library. Every effort should be made to reduce noise to a minimum.

Mr. LIONEL PEARSON, F.R.I.B.A., showed pictures of the new Masonic sanatorium for girls at Rickmansworth, designed by Mr. Denman, which was held to be one of the best sanatoriums in the country. Many of the points made by Dr. Smith were insisted upon in the Ministry of Health memorandum, but the school sanatorium presented rather a different problem when infectious disease and cases of ordinary illness were treated in the same building. Mr. Pearson had reason to believe that there was a strong desire among medical men for the provision of cubicles for cases of infectious diseases, one reason for this being that the length of stay of the patient was thereby shortened. It had been said on good authority that there were only two ways of dealing with children in hospitals: to segregate them into cubicles, or to insist on their wearing masks to prevent the spread of infection. He shared Dr. Smith's disapproval of two-bedded wards, though something could be said for them from the social standpoint of avoiding tedium. His own view was that the difficulty was best overcome by having cubicles with glass divisions, as supervision was very important. As to cubic capacity, it was no longer considered essential to provide 1500 cubic feet space for each acute case. The important point was floor space; for a single patient in a cubicle the floor space should be 12 by 10 ft., and in open wards 10 by 10 ft. per patient. Similarly a height of 15 ft. was no longer demanded, as nothing over 10 ft. from the floor apparently made any difference. A distance of at least 8 ft. between the centres of adjacent beds was important in order that infection should not be conveyed by coughing. A schoolmaster told him he had materially reduced the incidence of illness by forbidding coughing in class-rooms; boys with the urge to cough had to leave the class. If screens were objected to, the barrier system of preventing spread of infection could be adopted. As to fittings, sash windows tended to rattle in a wind and disturb sleep; casement windows were much more popular with matrons and nurses. He asked whether cross-ventilation was essential if plenty of air was entering the ward. In

side-lighted rooms fanlights over the doors would provide sufficient air currents. Air-conditioning he did not particularly favour; it must include filtering and washing the air, and unless the school was situated in a slum area there would be ample direct contact with the outside air. For heating he preferred radiators under the windows, but, despite the trouble of stoking and cleaning, open fires were good and cheering in a ward.

Dr. G. E. FRIEND (Christ's Hospital) said that occasionally he had to cope with a considerable number of sick boys, and in the presence of mixed epidemics it was necessary to convert one of the school houses into a hospital. Hopper windows were put in and proved satisfactory; the time of convalescence was reduced by 25 per cent. in the improvised building thus fitted, compared with the infirmary building. He thought the variations of hospital design in different countries might be largely dictated by the average amount of sunshine.

Dr. W. G. WILLOUGHBY (Eastbourne) said that in the infectious diseases hospital with separate blocks there was no difficulty about having the windows open in summer; the difficulty arose in winter, especially when cross-ventilation existed. In blocks built in 1902 open fires were provided; air coming in was heated by the fire and distributed throughout the ward without draughts. He referred to the grave illness and mortality statistics in inhabitants of back-to-back houses, due mainly to the lack of through ventilation. It was important to employ an architect with special experience.

Dr. L. R. LEMPRIERE (Haileybury) endorsed the praise given to the design of the Rickmansworth Hospital. He was opposed to the provision of an operating theatre in school sanatoria. Most public schools were conveniently near a well-equipped and well-staffed provincial hospital, and it was very much better, in his opinion, that operation cases should be dealt with there. He did not think that any school medical officer could be expected to be operating surgeon to the school, since his hand could easily lose its cunning when few operations were required. He was against coal fires in wards, quite apart from the dirt and the trouble of keeping them going. They failed to maintain an equable temperature, and schools catered not only for infectious cases, but for acute cases and convalescents. As soon as he was fit, the boy should be put down in the recreation room, a provision which most school architects ignored. An objection to large windows was that the blinding sun on a hot day could not be properly shut out. The amount of sunlight reaching patients in the summer could be overdone; it might interfere with sleep. The perfect flooring for a sanatorium had not yet been achieved, but the nearest approach, he thought, was cork. He agreed with the objection to two-bedded wards; a public school sick house could possibly be a starting-point of immorality. A vital necessity was the provision of a detention room. Sick boys who might be incubating an infectious disease must not be mixed with convalescents. He would like to see every sanatorium equipped with a dark room, for transillumination aids to diagnosis. The provision of a parents' room was desirable.

Mr. DENMAN, F.R.I.B.A., spoke of the modifications made from reasons of economy of his original design for the Rickmansworth sanatorium.

Mr. H. M. FAIRWEATHER, F.R.I.B.A., did not think there would be agreement as to the best kind of window; he would be sorry to feel that metal windows

only were to be used for hospitals and sanatoria. The chief inquiry made by parents concerning a school was about the provision made for caring for them when sick.

The PRESIDENT expressed his leaning towards single cubicles and separate rooms for school sanatoria. At the beginning of a school term a number of boys had a temperature and the uncertainty as to what would develop made a particular need for single cubicles. School sanatoria should have sufficient single cubicles, and sufficient three- or four-bedded rooms.

## NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

A MEETING of this society was held in Liverpool on March 20th, with Dr. RUTH NICHOLSON, the president, in the chair. Two cases of

### Simmonds's Disease

were reported by Mr. J. ST. GEORGE WILSON. He said that this syndrome, which is commoner in women, was first described in 1914, and is typified by progressive loss of weight and senile changes—such as loss of hair, an aged appearance, inhibition of genital function, and amenorrhœa. Lassitude and weakness are conspicuous. The basal metabolism is much lowered and the pulse is slow. There is anæmia and there may be hypoglycæmia. Radiologically there may be enlargement of the sella turcica if the lesion is a neoplastic destruction of the pituitary.

The first patient, aged 29, had complained of loss of weight, following a normal confinement; her weight, previously 11 st. 7 lb., had been reduced to 5 st. 11 lb. within four years. There had been daily vomiting, dizziness, and loss of power in the left hand. She had, however, no loss of hair and did not look prematurely aged. She had complained of amenorrhœa for the last 12 months, her periods having previously been irregular. On examination she was found to be poorly nourished. The blood pressure was 114/72 mm. Hg and the pulse-rate 44. The cervix was multiparous and the body of the uterus small. X ray photographs of the skull revealed no abnormality. The blood-sugar was 81 mg. per 100 c.cm., non-protein nitrogen 33 mg., Wassermann negative. She was treated with injections of insulin and Pregnyl and with extra salt in the diet.

The second patient, aged 37, also dated her symptoms to a confinement. She had complained of loss of weight for 21 months, nausea for 20 months, and weakness for 6 months. She was stated to be looking much older than previously, and had had amenorrhœa for 28 months. On examination her weight was found to be 4 st. 10 lb. She had hair on the face, pigmentation of the abdomen, a blood pressure of 98 mm. Hg, and a pulse-rate of 42. The urine was normal and a radiogram of the skull revealed no abnormality. She had complained of amenorrhœa constantly for the last 12 months, having previously had scanty periods at intervals of 5-6 months. On pelvic examination the uterus was found to be senile. She was treated by injections of Antuitrin S and Œstroform and was given olive oil. Eight months later she had gained 3 st. in weight.

In the discussion, Mr. S. B. HERD commented on the fact that in each patient the condition had closely followed pregnancy. He wondered if in the past these cases had merely been considered as instances of superinvolution.—Mr. T. N. A. JEFFCOATE said he considered superinvolution of the uterus always to be due to pituitary disease. He also questioned whether there was not in Simmonds's disease an element of suprarenal dysfunction as well.—Dr. E. A.

GERRARD referred to the relationship between super-involution and prolonged suckling. He did not agree that it necessarily meant a diseased pituitary.—Mr. F. E. STABLER asked if an Aschheim-Zondek test had been performed: he had seen a case of the condition in which it was slightly positive.—Mr. ST. GEORGE WILSON said that such a test had not been done, but he would certainly have one carried out.

Mr. C. MCINTOSH MARSHALL described two cases of  
**Uterine Rupture Associated with Placenta  
Prævia**

In the first the rupture was spontaneous and in the second it was traumatic.

The first patient was a 4-para aged 29. She was admitted to hospital, believing herself in labour, but the pains passed off. The pregnancy, according to the usual calculations, was at the forty-second week, the presentation was right occipito-posterior and the head high above the brim. Vaginal examination a week later revealed a lateral placenta prævia, the os admitting one finger. After a further week, pains began spontaneously and after nine hours in labour some blood and clots were suddenly passed from the vagina. Vaginal examination showed that the cervix, though not too well taken up, admitted two fingers and that the membranes were ruptured. The os was partially covered by the placenta which was on the posterior wall of the lower segment. The child's head was macerated and there was much overlapping of the parietal bones, the anterior over the posterior. Willett's forceps was applied to the scalp and a weight of 1 lb. attached. No further bleeding occurred. Four hours later the child, which weighed 5 lb. 11 oz., was delivered. It was macerated and had an offensive odour. No bleeding followed the birth of the child, but an hour later the patient's condition had deteriorated, she was pale, and her pulse was rapid and soft. The placenta had not been delivered. Morphia and a saline were given and the foot of the bed was raised. During the next few hours her condition improved a little and four hours after delivery it was decided to remove the placenta. As soon as anæsthesia had been induced a blood transfusion was commenced, and on passing the hand into the uterus a laceration was discovered in the lower segment. The abdomen was rapidly prepared and a laparotomy carried out on the labour bed. A large amount of free blood was found in the peritoneal cavity, also the placenta. There was a vertical tear 3-4 inches in length in the posterior wall of the lower segment and cervix. Subtotal hysterectomy was performed and a drainage-tube inserted. Convalescence was stormy, but eventually the patient made an excellent recovery.

Mr. Marshall referred to a case reported by H. D. de Sa in which spontaneous rupture of the uterus had also occurred through the placental site.

The second case was a primipara, aged 22, who was six days over her expected date, the head being still above the brim. A stomach-tube induction was carried out by an experienced house surgeon. A general anæsthetic was not employed, but the tube was passed under direct vision, a speculum being used and the anterior lip of the cervix grasped with a sponge forceps. When about 2 inches of the tube had been inserted some resistance was met with, but was easily overcome and the rest of the tube was inserted without difficulty. Pains commenced 5 hours later, and after a further 10 hours the cervix was almost fully dilated, the head however being still above the brim. The stomach-tube had not been extruded. A catheter being passed, the urine was found to be heavily stained with blood: Mr. Marshall was then called to see the case and on cystoscopy the stomach-tube, which had been palpated through the anterior vaginal wall, was clearly seen in the bladder. Delivery of a living child was effected by version and extraction, and the placenta, which was inserted low on the anterior uterine wall, was removed manually. It was noted that its lower edge was about 1 inch from the cervical lip. A median suprapubic incision was made,

and the uterovesical pouch of peritoneum was inspected. No injury was seen. The peritoneum was then closed and suprapubic cystotomy was carried out and the tube removed. The bladder was drained. Cystoscopic examination a month later revealed a small slightly raised puckered area lying behind the base of the bladder. This had a similar appearance to the cystotomy scar in the fundus.

Mr. ST. GEORGE WILSON expressed a doubt whether, in the second case, the stomach-tube had passed through the placental site. He was inclined to think that it had been forced through the wall of the cervix.—Mr. STABLER held that the first case could hardly be considered as one of spontaneous rupture, since Willett's forceps had been applied. Regarding the second case, he felt that a tube should never be passed without general anæsthesia. Apart from the difficulty which might be experienced, it was impossible otherwise to ensure an adequate aseptic technique.—Dr. GERRARD supported the latter observation and spoke of the morbidity associated with bougie induction.—Mr. C. H. WALSH questioned whether true spontaneous rupture of the uterus ever occurred. It was interesting to note that all cases reported had been in multiparæ, and the suggestion was that trauma at a previous confinement was really the ætiological factor.

In reply, Mr. MARSHALL said that he felt sure that the tube had not perforated the cervix but had been deflected by the edge of the placenta and had passed through the placental site. He also referred to blood transfusion as a most valuable and life-saving measure in cases of placenta prævia.

**Renal Calculi in Pregnancy**

Mr. WALSH said it had been noted that kidney stones were rare in pregnancy, this being accounted for by the fact that renal lithiasis occurs as a rule in women between the ages of 30 and 50, and most pregnancies before 35. The condition presented many interesting features regarding diagnosis, the value of biochemical tests as a guide to treatment and prognosis, and the particular line of treatment to be decided upon. A further point of interest was the ureteric dilatation normal in pregnancy.

He had seen three cases of renal lithiasis in pregnancy during the latter half of 1935.

The first patient, a 3-gravida aged 36, was seen at the fourteenth week. She had complained of pain in the left loin for two years, worse recently. The urine contained blood and *Bacillus coli*, but no casts were present. The blood pressure was 120/75 and the blood non-protein nitrogen 33 mg. per 100 c.cm. Radiography revealed two stones in the left kidney. Nephrolithotomy was decided upon in consultation with Mr. J. C. Ross, who removed the calculi. Convalescence was uneventful and the patient, whose urine became clear ten weeks after the operation and remained so, was delivered at term of a child weighing 7 lb. 12 oz.

The second patient, a 3-gravida aged 30, was first seen at the twentieth week of pregnancy. She then had albuminuria but the blood pressure was 120/75 mm. Hg. She was regarded as a mild case of toxic albuminuria and treated as such, but the albumin increased in amount, and she was admitted for investigation. The output of urine was up to 67 oz. per day and a trace of blood and pus was found, also *B. coli* in moderate amount. The blood non-protein nitrogen was 45 mg. per 100 c.cm., the urea concentration 1.85 per cent. at the third hour. She improved with rest and dieting, and was discharged two weeks later, the urine containing a trace of albumin only. She was readmitted at the thirty-sixth week with severe œdema and albuminuria, and, having slight hydramnios, she was radiographed. A large branched calculus was apparent in the right kidney. Mainly on account of the



hydramnios and oedema it was decided to induce labour at the thirty-eighth week. The labour and puerperium were normal. Three months later, after further renal investigation had revealed a functionless right kidney, nephrectomy was performed.

The third patient, a primigravida aged 20, was admitted at the twentieth week. She was acutely ill and had symptoms simulating acute appendicitis, though the urine contained some albumin and pus. An incision was made in the right iliac fossa, and an extraperitoneal abscess was found. Because the condition might have been a retro-cæcal appendix, it was felt necessary to open the peritoneal cavity. This was done after careful packing off but the appendix was found to be normal. The extraperitoneal tissues were drained and the wound partially closed. The wound drained freely and the acute symptoms settled at once. The pus contained *B. coli* and non-hæmolytic streptococci. Radiography ten days later revealed a large calculus in the right kidney. Blood non-protein nitrogen was 32 mg. per 100 c.cm., the urea concentration 1.95 per cent. at the end of three hours. The wound had completely healed in six weeks, and though the surgeon was anxious for the pregnancy to be terminated so that the kidney condition could be treated, Mr. Walsh decided not to interfere. She was kept under observation week by week, during which time her general health remained extremely good, went into labour at the thirty-eighth week, and was delivered by natural forces of a child weighing 5 lb. 4 oz. The puerperium was uneventful and she was discharged on the twelfth day.

Mr. Walsh remarked that only in the first case was it possible to suspect a renal calculus on the history, and in view of this, it seemed likely that renal stones were not infrequently missed. The second patient had been operated upon for chronic appendicitis and had been treated for toxic albuminuria before radiography on account of hydramnios revealed the true state of affairs. Regarding the investigations which are usually undertaken, he inquired if there was any biochemical test which would serve as a guide to prognosis and treatment in renal pathological conditions during pregnancy. After an investigation of the blood pressure, blood-urea, and urea concentration of a number of cases of toxic albuminuria, and a correlation with clinical results, he was of the opinion that only the blood-pressure reading was a reliable guide. The urea concentration and blood-urea were much too erratic to give any guide to prognosis. This applied particularly to toxic albuminuria, but it was not out of place in discussing renal calculi.

Ureteric dilatation during pregnancy was evident on the sound side in each of the three cases, and was demonstrated by injection of Uroselectan and radiograms. This was a normal state of affairs during pregnancy, and had originally been attributed to pressure on the ureters at the pelvic brim by the pregnant uterus. There seemed little doubt in view of recent work that this theory was quite wrong and that the true explanation lay in an altered endocrine function present in pregnancy and affecting all involuntary muscle, acting either directly or in conjunction with the sympathetic nervous system.

On the question of treatment of diseased organs complicating pregnancy, Mr. Walsh thought there was a widespread tendency towards terminating the pregnancy as a preliminary to surgical treatment. He considered this attitude to be entirely wrong and felt that, speaking generally, even severe surgical conditions could be treated with little risk of interrupting the pregnancy. Applying these principles to the three cases under review, he considered that the first case was correctly treated by nephrolithotomy at the fourteenth week. In the second the renal lithiasis was not diagnosed until the thirty-sixth week,

and there was thus little to be gained and much to lose by operation at that time; in the circumstances induction of labour at the thirty-eighth week appeared to be rational. Looking back on the third case, he felt that nephrectomy at the twenty-fourth week was the method of choice, despite the fact that, as things turned out, conservative treatment resulted in a live birth, leaving a diseased infected kidney to be removed later.

He summarised his conclusions as follows: (1) the diagnosis of kidney stone is difficult and liable to be mistaken for conditions peculiar to pregnancy; (2) in reading radiograms during pregnancy after intravenous injection of uroselectan, it should be remembered that there is normally a state of ureteric dilatation; (3) urinary and blood biochemical tests are of no help in prognosis or as a guide to treatment; and (4) the guiding principle to treatment should be to remove the stones or kidney and ignore the pregnancy.

Mr. J. W. BURNS agreed that the biochemical tests were of no value, and was pleased to hear that Mr. Walsh had the courage of his convictions. He felt that the blood pressure was more useful as a guide to treatment in albuminuria.

Mr. P. MALPAS could not agree with the previous speakers, and thought that the non-protein nitrogen index had a certain value in eclampsia, especially if taken together with other findings and the clinical condition of the patient. If there was gross liver damage, the index might not be grossly increased, although the patient was gravely ill. He referred to six patients whom he had recently come across suffering from renal calculi.

Mr. A. A. GEMMELL supported Mr. Malpas and attached some value to renal efficiency tests during pregnancy. These were useful if fitted in with the clinical condition. He had found the blood-urea and the urea-concentration tests improved in cases where the foetus died in utero.

Mr. C. J. K. HAMILTON referred to a patient of his own with renal calculi who gave an 8-year history of hæmaturia. There was a large branched calculus in the left kidney. Pregnancy was allowed to continue until the thirty-eighth week when induction was carried out for disproportion. The hæmaturia disappeared after delivery.

Mr. MARSHALL thought that the liver damage vitiated the blood non-protein nitrogen index and referred to a case in which he decapsulated the kidneys because of the clinical condition of the patient, although the index was under 40 mg. per 100 c.cm.

Mr. JEFFCOATE gave a demonstration of a suction curette which could be used as a diagnostic aid, particularly in cases of endocrine dysfunction; an important feature was that an anaesthetic was not required.—Mr. C. HENDERSON showed a specimen of a pregnant uterus and vesical calculi with bilateral pyonephrosis.

OPHTHALMIA NEONATORUM: TECHNIQUE OF IRRIGATION.—Mr. J. D. Magor Cardell, whose opening paper in a discussion at the Ophthalmological Society of the United Kingdom was reported on p. 842 of our issue of April 11th, writes to correct the impression given that the cornea should deliberately be massaged during irrigation. The actual words he used are these: "While the irrigating stream is still flowing, one finger of each nurse is gently drawing the lids apart without pressure on the globe, and at the same time travelling to and fro across the lid. This delicate massage avoids the cornea and coaxes pus out of the fornices."

## REVIEWS AND NOTICES OF BOOKS

**Recent Advances in Dermatology**

By W. NOEL GOLDSMITH, M.D. Camb., M.R.C.P. Lond., Physician to St. John's Hospital for Diseases of the Skin; Assistant Physician to the Skin Department, University College Hospital. London: J. and A. Churchill Ltd. 1936. Pp. 522. 18s.

THIS book is not merely a catalogue of advances in post-war dermatology. It is a notable attempt to tell a connected story, and although largely academic in substance and style, contains much that is practical and explanatory of the trend of thought in a subject that has become complex in the field of medicine. One must admire Dr. Goldsmith's acquaintance with the literature, and the discrimination that marks his selections from the immense amount of published matter he has obviously had to study. Dermatology is no longer a closed circuit. Its practitioners to-day must have at least a nodding acquaintance with the problems of immunology, biochemistry, psychology, and the interactions of the endocrine and sympathetic systems. These are all considered in this work. The author's recommendation to "plough bravely through the chapters in their proper order" will not, we think, be generally followed. For our part we would prefer to take the work in small doses, for it is concentrated stuff. It is satisfactory to note that Lewis's classical studies on the so-called "triple response" have at last achieved a place in dermatology. The chapter on allergy is the least clear, even though a brief glossary of definitions is supplied. To many of us it may appear that the problem of eczema, considered in the light of the allergic response, has not yet been finally solved, and it seems doubtful whether the issue is really as clouded as current theories would suggest.

In other sections of this work Dr. Goldsmith is more practical. That dealing with lupus erythematosus provides sound reasoning and a most useful summary of therapeutic experiences. It is impossible here to comment on more than a few sections of a work which, if rumour is correct, has occupied the author's leisure hours for a period of three years. It seems likely that serious students of dermatology in every country will find this book indispensable.

**A Glasgow Manual of Obstetrics**

Second edition. By SAMUEL J. CAMERON, M.B., F.R.F.P.S., F.C.O.G., Regius Professor of Midwifery, University of Glasgow; JOHN HEWITT, M.B., Ch.B., F.C.O.G., Hon. Lecturer in Clinical Surgery at the University; ROBERT A. LENNIE, M.D., F.R.F.P.S., F.C.O.G., Obstetric Surgeon to the Royal Maternity and Women's Hospital, Glasgow; and ELLEN D. MORTON, M.B., Ch.B., M.C.O.G., Hull Tutor in Obstetrics at the University. London: Edward Arnold and Co. 1936. Pp. 611. 21s.

GLASGOW and its surroundings appear to differ from any other part of the British Isles in the incidence and degree of cases of contraction of the pelvis. One result of this peculiarity is that this book, which provides an account of the teaching of the Glasgow school of obstetrics, devotes far more space to descriptions of varieties of bony deformities and to the management of such cases when pregnancy occurs than do corresponding productions emanating from other centres. The investigation, diagnosis, and

treatment of minor degrees of disproportion is described clearly and in great detail. Other chapters which deserve special mention are those on the treatment of antepartum hæmorrhage, on shock, and on puerperal infection. It is interesting to note that in Glasgow the condition of hyperemesis gravidarum is regarded primarily as toxic in origin, whereas in many English schools this variety is believed to be extremely rare. Narcosis in labour is obtained by the use of morphia, scopolamine, and paraldehyde rather than by the barbiturates. We would suggest that half a page is hardly sufficient space to allot to delay in the first stage, one of the most common difficulties experienced in labour. Under the same heading, and presumably considered as a cause, is placed carcinoma of the cervix uteri; nearly three pages are devoted to the treatment of this condition, which must be a rare complication of labour. Cæsarean section (the classical operation) is the method of choice in the treatment of placenta prævia, Willett's forceps being given a mere mention.

Apart from the differences to which we have drawn attention and a few others of minor importance, most English obstetricians would agree with the teaching here set out. The book is easy to read, and the illustrations, especially the photomicrographs, are extremely clear.

**Bacterial Endocarditis**

By C. BRUCE PERRY, M.D. Brist., M.R.C.P. Lond., Professor of Medicine in the University of Bristol. Bristol: John Wright and Sons Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 137. 10s. 6d.

ALTHOUGH there are maladies more consistently fatal than bacterial endocarditis, this disease is generally regarded as one of the most hopeless which affect mankind. So pessimistic is the outlook that interest in this condition centres on its relation to rheumatic endocarditis, and in bacteriological and diagnostic problems, rather than on therapeutics. Prof. Bruce Perry, who has conducted investigations on bacterial endocarditis under the R. L. St. John Harmsworth Memorial Research Fund, has now issued a monograph incorporating this work. The opening chapters are concerned with an exceptionally interesting historical survey in which the evolution of modern knowledge of these diseases is traced from the earliest records over 200 years ago to the present time. In the following section, on bacteriology, Dr. Perry has collected together 1000 cases from various sources in the literature. These show the following ætiological distribution: streptococci (all varieties) 68.1 per cent., staphylococci 10.3 per cent., pneumococci 11.2 per cent., gonococci 4.6 per cent., *B. influenza* 2.6 per cent., meningococci and *B. coli* each less than 1 per cent. The relation between rheumatic carditis and bacterial endocarditis is discussed in terms of morbid anatomy and ætiology; Dr. Perry finds that the weight of evidence is in favour of the hypothesis of Von Glahn and Pappenheimer that "the infection of cardiac valves with non-hæmolytic streptococci in rheumatic patients is due to the implantation of bacteria on unhealed rheumatic vegetations." It appears unlikely that the two diseases represent responses of different intensity to the same infective agent, since organisms other than non-hæmolytic streptococci may be implanted on active rheumatic vegetations, and since it is only in some cases of bacterial endocarditis

that evidences of active "rheumatic" changes in the valve are also found. Sections on clinical features, diagnosis, and hæmatology are, like the rest of the work, based upon an extensive bibliography and supplemented by personal observations and studies.

Dr. Perry's monograph brings up to date and endows with new interest a group of morbid conditions that have of late years received scant attention. It must not be forgotten that close scrutiny of clinical features may in the end yield the clue to successful therapy.

### Ideal Birth

By TH. VAN DE VELDE, M.D. London: William Heinemann Ltd. 1936. Pp. 269. 10s. 6d.

READERS of Dr. Van de Velde's books are familiar with his literary habits. He likes to interpolate aphorisms, and even intermezzos of aphorisms, throughout his text, to quote turgid German poetry, to exalt the subjects about which he writes to mystical levels. These habits have apparently been responsible for the large sale of his books, of which the best known is "Ideal Marriage" (1928). In the five books issued since then these characteristics have been becoming more conspicuous. This one has all the faults of its predecessors—long windedness, sentimentality, inaccuracy—with a new one added; it is badly translated. The book, we are told, is written for future fathers and mothers, for midwives and nurses, and the dust cover says that it can confidently be recommended to doctors. We do not endorse this recommendation.

### The Tuberculin Handbook

By HALLIDAY SUTHERLAND, M.D. London: Humphrey Milford, Oxford University Press. 1936. Pp. 96. 7s. 6d.

THE author of this handbook believes that, apart from the discovery of the tubercle bacillus, Koch's greatest gift to mankind was the introduction of tuberculin for the diagnosis and treatment of tuberculosis. He sets out in non-technical language the most important varieties of tuberculin, exotoxic and endotoxic, the standardisation of old tuberculin, and the recent work of American biochemists on tuberculin split products. Hypersensitiveness to tuberculin in tuberculous subjects is regarded as a specific phenomenon. In a chapter on the use of tuberculin the author describes the early symptoms, physical signs, and radiological appearances of pulmonary tuberculosis; in a subsequent chapter the percutaneous test of Moro, the cutaneous test of Pirquet, and the intracutaneous test of Mantoux. In practice he begins with a series of intracutaneous tests and when a reaction occurs he uses the subcutaneous test to determine whether the infection is latent or active. He does not aim at focal reactions—indeed he seeks to avoid them—but he has seen no harm follow them. A positive diagnosis of active tuberculosis having been thus established a course of tuberculin treatment is begun without delay. But Dr. Sutherland does not think that the diagnosis of pulmonary tuberculosis can always be made with certainty either by tuberculin testing or by radiograms alone; regard must be taken to history, symptoms, and physical signs. A tuberculin test may, however, help to correct interpretation of radiological evidence and vice versa. Of the essential value of tuberculin treatment the author has no doubt, whether for pulmonary tuberculosis, tuber-

culous adenitis prior to caseation, tabes mesenterica, or tuberculosis of eye and kidney. "Let it be noted," he writes, "that tuberculin gives the best results, and at a fraction of the cost, in those very cases which most sanatoriums are desirous of admitting. If tuberculin treatment can do as much or more than sanatorium treatment, then obviously it would be better that the febrile cases, needing rest and then graduated activity, should be sent to sanatoriums until they have become suitable cases for tuberculin treatment at home. In that way existing organizations could cope with the disease."

### Emergency Surgery

Second edition. By HAMILTON BAILEY, F.R.C.S., Surgeon, Royal Northern Hospital, London; Surgeon and Urologist, Essex County Council. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 842. 50s.

THIS popular text-book of surgery, which has been thoroughly revised and in part rewritten, now appears very conveniently in one volume instead of in two. Here emergency treatment in every branch of surgery is described in simple and sometimes even colloquial language. It is evident that the author has had an extensive and varied experience in this kind of work. His recommendations are essentially practical and his judgment is sound. We like particularly his advice to open, if possible, a subphrenic abscess in two stages when it must be done transpleurally; and, should a pelvic abscess after appendicectomy be discovered by laparotomy, to close the wound and to open the abscess by the rectal route. The method of opening the abscess by the forcible use of a blunt instrument (a procedure also advocated for evacuating a collection of blood in Douglas's pouch) does not however appeal to us. It is doubtful also whether the ligation of the ileocolic vein in appendicitis is so often necessary as the author seems to have found it in his practice. Nor is it generally accepted that intravenous mercurochrome is effective in appendicitis and osteomyelitis. The lower approach to a strangulated femoral hernia is held by Mr. Hamilton Bailey to be so objectionable that no description of it is included. There is other debatable matter, but for the most part surgeons in the earlier stages of their emergency experiences will find the book an excellent guide.

### Medical Guide for India and Index of Treatment

Fourth edition. By Lieut.-Colonel E. J. O'MEARA, I.M.S. (Retd.), O.B.E., F.R.C.S. Eng., D.P.H. Cantab., late Civil Surgeon and Principal of the Medical School, Agra. London and Calcutta: Butterworth and Co., Ltd. 1935. Pp. 1234. 25s.

THE author of this book set himself 16 years ago to provide practitioners in India with a compact medical guide to help them in dealing with their very varied daily work. The book has now reached a fourth edition in which all the more important sections have been recast and more articles by specialists have been included. The fact that some of these—notably those by Lord Horder and Lord Moynihan, Dr. E. P. Cumberbatch, and Prof. J. A. Ryle—are reprinted by permission from issues of medical journals published between 1930 and 1933 would diminish their value for workers who have easy access to current literature, but is probably of less moment to Indian practitioners. The work

consists of twelve sections of which the largest (312 pages) is an Index of Treatment, brought up to date and remodelled in this edition so as to provide more convenient facilities for reference. Therapeutic measures are considered in the next section; the subjects are discussed for the most part under such general headings as exercise, radium therapy, organotherapy, so that it is surprising to find a chapter devoted to such a subdivision of drug therapy as "organic arsenic compounds." Food and the principles of dietetics provide the material for the third section. Useful chapters here are those on articles of Indian diet and methods of their preparation, and on scales of diet for European and for Indian patients in general and in mental hospitals. The fourth section on surgery takes up 100 pages, with chapters on acute abdominal disease, general anæsthesia, anti-septics, dental surgery, ear and eye diseases, errors of refraction, colour-blindness, instruments, dressings

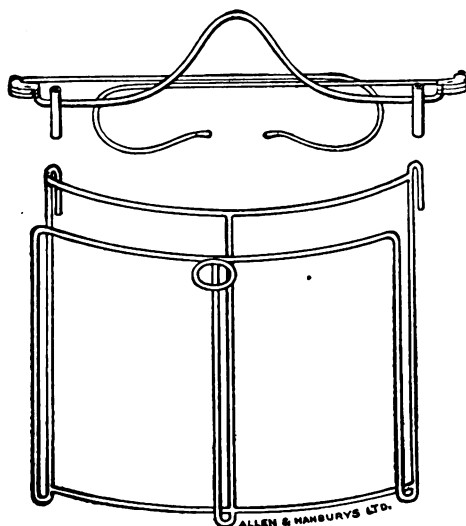
and accessories, manipulative surgery, preparation for operations, after-treatment and complications, and throat and nose diseases; whereas medicine gets only 50 pages, the three chapters being entitled Medical Notes, Recent Advances in Medicine, Examination for Life Insurance. Section VI. is devoted to obstetrics and gynecology, section VII. to surgical, medical, and obstetrical nursing, section VIII. to preventive medicine and sanitation, and section IX. to medico-legal questions and lunacy. Diagnostic methods and pharmacology (including a pharmacopœia) fill up the remainder of the book except for a miscellaneous section which sets out standard equipment for a model branch dispensary, a medical trades directory, a list of manufacturers of surgical instruments and appliances, and calendars for all the years from 1935 to 1938.

We have no doubt that doctors working in India will continue to find this book useful.

## NEW INVENTIONS

### AN ASEPTIC FACE MASK

THE examination of chest cases entails a certain amount of risk from contamination by particles or droplets of infected saliva when patients speak or are asked to cough. When patients do not cover the mouth whilst coughing, infected material is expelled into the consulting-room, and not infrequently into the face of the examining doctor. The simple face mask, here illustrated, consists of a nose-



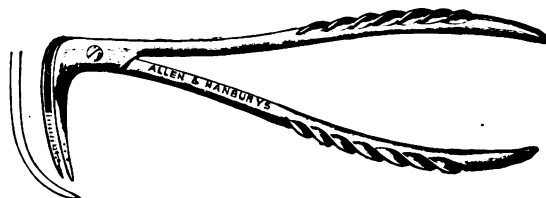
and ear-piece fitting in a similar manner to an ordinary spectacle frame, with a detachable mouth shield carrying a slip of filter paper. The patient is asked to put on the nose-piece which, with the light springs behind the ears, adjusts itself; the mouth-piece with its protective filter paper can then be slipped on, and this is effective in catching infected matter. Pieces of filter paper about 5×3 in. are prepared before a clinic; these can be easily slipped into the frame, and are as easily removed with forceps without soiling the fingers. If the ends of the paper are folded there will be no possibility of it slipping out sideways. The advantages claimed for this contrivance are: 1. It is simple and light (weight 1 oz. complete). 2. Easy to clean, being made entirely of silver-plated steel wire. 3. Easy to adjust without tying or stretching elastic bands, and does not interfere with patient's vision, talking, or breathing. 4. Can also be used for inhalant; a drop of Gutt. Cinnam. Co. (Brompton Hospital) is very soothing whilst mask is being worn.

The face mask has been made to my design by Messrs. Allen and Hanburys Ltd.

P. L. T. BENNETT, M.C., M.R.C.S., D.P.H.  
Tuberculosis Officer, Fulham.

### A FASCIA INTRODUCER FOR HERNIA REPAIR

THE necessity, in hernia operations, for an instrument of this type has arisen with the increasing use of fascial repair introduced by Gallie and LeMesurier. The operation formerly required between 40 and 60 minutes' work. The instrument which is described below will accelerate the operation 5 to 10 minutes for those surgeons who use and personally thread the Gallie needles. In practice it has two further advantages: (a) It diminishes tissue trauma in so far as it avoids the passage through the tissues of the mass formed by reduplicated fascia, suture material,



and the eye-end of the Gallie needle. (b) It enables the fascia during introduction to be touched by instruments only.

These two factors decrease the tendency to hæmatoma formation and sepsis. The principle is not entirely new in that a forceps, with the sharp ends curved in the long axis, has been used for this work by Keenan of Montreal. The arrangement of the blades at a right angle to the shaft, however, will be found more convenient in use. The closed blades are passed through the tissues, opened and the end of fascia grasped and drawn through in the desired situation. With practice this will be found a rapid method of introduction and will require little further time than that taken for the Bassini repair. I also use the introducer for inserting the non-fascial sutures for repair of femoral hernia by Lotheissen's method.

The instrument has been made for me by Messrs. Allen and Hanburys Ltd.

H. F. MOSELEY, M.Ch. Oxon., F.R.C.S. Eng.

# THE LANCET

LONDON: SATURDAY, APRIL 25, 1936

## STUDENTS AND TEACHERS

THE report<sup>1</sup> to the Treasury by the University Grants Committee, covering the six years since the last report was made, was published this week. It makes encouraging reading, and should inspire national pride in our university system, where the example of the old institutions has been wisely followed, where the lessons derived from the work of the newer bodies have been gratefully utilised, and where the State and individual donors have been open-handed in support. Considering that the period under review covers the unexpected prolongation of a grave financial depression which still exists, if with diminished force, it is a splendid omen for the intellectual, physical, and moral developments of the country that the Committee should be able to record, with full proof of their words, the substantial measure of progress which marks the present situation. There are on the grant list 16 universities and 3 independent colleges in Great Britain, while there may be added to the list the 2 technical colleges of Manchester and Glasgow. But certain of the universities, notably London, include a large number of separate units; under the heading of the University of London no less than 25 such bodies may be found, in which number is included the 13 medical schools, and it will be noted that medical education is here referred to only from a university standpoint. The Committee have inspected the buildings and equipment in connexion with all these centres, have interviewed representatives of the staffs, professorial and unprofessorial, and of the students, and with each and all have discussed the existing position informally. Such investigations lend a practical value to their words; these have no doubt been supplemented by returns submitted by the institutions, but however lucid and comprehensive such documents may be they must fail to give the accurate story in proper perspective which is derived from personal contact. Throughout the report the result of this interest in individual activities can be seen in the practical quality of the comments.

An increase in the total number of students has taken place wholly in England and Wales; the number of full-time students now stands at about 50,000, or 4500 more than six years ago, but while the figures for England and Wales show a rise in numbers there is a slight fall in the figures from Scotland, attributed mainly to the

abstention of women students. The allocation of the students over the main faculty groups is detailed in an appendix, and we see that numerous changes of their distribution in the various groups is marked by a sharp rise in medicine and a notable one in pure science. Six years ago in their last report the Committee recorded a substantial fall in the number of medical students, but the loss has now been more than made good. As a consequence the question of their residence is becoming a particularly vital one, and although it could hardly be expected that any special point should be made of the fact by the Committee, it will be gathered from the report that young men in training for medicine are benefiting from lavish expenditure which has taken place recently, not only on laboratories, libraries, research institutes, students' unions, but also on halls of residence and medical school buildings. Of the total number of all students at the universities and colleges under consideration (excluding of course the students at Oxford and Cambridge) the number living at home totals 22,000, of whom some 6300 are accommodated in halls of residence, but it is good to learn that, in spite of bad times and the severe competition of cheap lodgings, new residential halls are being opened, so that nearly 1000 more students now have residential provision than five or six years ago. To medical students this is of real significance. Where the medical students, either in London or elsewhere, are able to live at home in suitable circumstances, the need for the provision of hostels is not manifest, and it is arguable whether such students lose anything from pursuing their studies in the usual domestic circle. All to-day, however, regard university training as not only a means of acquiring knowledge, but as a medium for general culture and for the exchange of views, ideas, and aspirations leading to a philosophy of life. Many will think that the inestimable advantages of the community life are lost to the medical student who lives at home, and that for all medical students the provision of a hostel near the focus of their work would be an advantage. But life in the medical school must always be bringing all sorts of students in contact with each other in the course of the day's work, wherefore too much stress need not be laid upon the happy influence of the hostel. Looking at the whole question, we believe that there will be a predominant feeling that multiplication of hostels in connexion with the medical schools marks a step forward. And while it may be possible to obtain accommodation in lodgings at a lower figure than at many hostels, we have to remember that the number of students financially assisted in one way or another has now greatly increased. The Committee emphasise the extent to which an approach to the university institutions of this country is now made possible by scholarship allowances or eleemosynary grants.

Has the number of teachers increased in proportion to the increase of students? It would seem from the figures in an appendix that there has been an increase of 13 per cent. in the total numbers of the staff employed in the university institutions

<sup>1</sup> University Grants Committee. Report for the period 1929-30 to 1934-35. London: H.M. Stationery Office. Pp. 84. 4s.

of the country, a percentage which is rather larger than the percentage increase in the total number of students, though not when only the medical students are taken into consideration. But we are glad to learn that there has been a definite though modest improvement in the average salaries of the five grades of university teacher. How far the salaries of those concerned with the medical schools will benefit under average advancement is doubtful, but their work remains by no means overpaid while the responsibilities have greatly grown. Many a teacher in a medical school, when he thinks over his day's work, will envy the time, not so long gone by, when, save as a demonstrator, his routine duty could have been discharged by the delivery of set lectures and his fame as an educationist might have been established by his punctuality and his eloquence. He may also feel that the estimate now held as to the value of such discourses is unfairly low, knowing that he could communicate sound learning in this way. Undoubtedly many lecturers could thus prove of the greatest assistance to students, but the report indicates shrewdly why the lecture system has fallen into disrepute. Unless compulsory attendances will not be such as to maintain for the teacher an interest in fruitful labour; but if compulsory a spirit is introduced which is inimical to modern university training.

In reviewing a long and detailed report, while noting mainly certain of its medical messages, it is impossible to refer to much that has medical as well as general importance. But an expression of admiration is due for the wealth of information imparted, while the evidence of national progress in the greatest sphere of civilisation is heartening in the times we live in.

### VOLUNTARY HYPERTENSION

No simple explanation of "essential" hypertension is likely to be forthcoming. A promising approach has been through study of suprarenal secretion and attempts to correlate hypertension with an excess of pressor substances in the blood. Not only, however, has this line of inquiry proved disappointing, but it has revealed new difficulties regarding the relationship of the adrenal cortex to blood pressure. Thus it has been established that neuroblastomas of the suprarenal medulla do not result in hypertension, whereas chromaffinomas do so whether situated in medulla or cortex. Nevertheless, though no actual excess of pressor substances can be recognised in the blood of patients suffering from essential hypertension, it is not impossible that a relative excess may be brought about by deficiency of the hypotensive bodies, such as choline, acetylcholine, histamine, and vagotonine. This last substance, isolated from the pancreas, has a slow action compared with the better known parasympathetic stimulants, and is said to have given encouraging results in the treatment of hypertension.

The importance of psychical factors in the pathogenesis of hypertension has had much con-

sideration since ALLBUTT's pronouncement on the relation between mental anxiety and the development of granular kidney. AYMAN has described a "hypertensive personality," which is "dynamic" and "quick-tempered," and it is well known that emotional tension may be associated with a temporary increase in blood pressure just as it may affect visceral activity. ABRAMI, WALLICH, and BERNAL<sup>1</sup> now report that a number of subjects have been trained to raise their blood pressure (by as much as 100 per cent.) *voluntarily*. The rise is rapid and transient—lasting about a minute. The venous pressure, the intra-ocular tension, and the pressure of the cerebro-spinal fluid increase simultaneously, and it is also noticed that the internal temperature rises and the pupils are dilated. Curiously enough, the heart-rate is increased, despite the big rise in blood pressure. As an example of these remarkable observations the following figures may be quoted: a systolic pressure of 120 mm. Hg rose to 270–280, while in a few seconds the diastolic reading changed from 50 to 100 mm. Hg. The authors describe in addition changes occurring at the same time in other systems of the body, and mention that neither atropine, adrenaline, nor vagotonine affected the phenomena of "voluntary hypertension." Ergotamine seemed to delay the onset, and with strychnine the effect was obtained more easily and was of longer duration. The first to discover that he could raise his blood pressure at will was, it is stated, Mr. DINO GALARDI, aged 38; and he has been able to teach others to do it for themselves. Unfortunately, from the facts given, it cannot be understood just how the feat is performed, but it is emphasised that there is no question of straining or of generalised contraction of the body muscles.

It is to be hoped that Dr. ABRAMI and his colleagues will be invited to demonstrate their cases in this country.

### SCARLET FEVER IN HOSPITAL AND HOME

DURING the last few years our views about scarlet fever, from the epidemiological and clinical standpoint, have substantially changed, largely as the result of the work of the DICKS. SYDENHAM named the disease from the appearance of the rash, and from his time onwards the occurrence of a more or less characteristic erythema has been regarded as an essential element in the clinical picture. The rash is the visible result of the dilatation of skin capillaries by an erythrotoxic toxin produced by strains of a hæmolytic streptococcus implanted and growing upon the fauces. Since not all infections with causal strains result in the release of sufficient toxin to produce a clinically recognisable rash, this must be regarded as a by no means constant epiphenomenon. "Scarlet fever" is essentially an infective nasopharyngitis, and although there may not be agreement with all the views recently expressed in our columns by Dr. F. G. HOBSON,<sup>2</sup> it cannot be refuted—indeed,

<sup>1</sup> Abrami, P., Wallich, R., and Bernal, P.: *Presse méd.*, Feb. 26th, 1936, p. 321.

<sup>2</sup> THE LANCET, Feb. 22nd, 1936, p. 417.



it is admitted on all sides—that the hospitalisation upon a large scale of patients suffering from “streptococcal fever with a rash” has quite failed to control the incidence of the disease whether in its endemic or epidemic phase. The reasons are familiar to epidemiologists. With few exceptions, patients are not removed to hospital, or even isolated at home, unless the rash appears to clinch the diagnosis; the much more numerous and, because unrecognised, much more dangerous sufferers from sore-throats caused by the same organism, and the carriers, remain at large. Nevertheless, in spite of the prevailing mildness of the disease as generally conceived, the public insists, as a social service mainly, upon its hospitalisation.

After the patient's return home from hospital scarlet fever occurs in some other member of the household in 2 to 4 per cent. of cases. This has long been recognised, although in these “return” cases the source of infection is not necessarily the discharged patient. Genuine or not, return cases have led in the past, and on occasion still lead, to allegations of premature or improper release from isolation. We learn from the *Northern Despatch* that in a village in the north of England “widespread distress and something like a state of panic” exist among parents who are refusing to send their children to school “for fear of contact with cases recently discharged” from an isolation hospital in a neighbouring town. The main cause of complaint is that whereas the school managers are under the impression that the period of isolation for scarlet fever is at least six weeks, there is definite evidence of four children being discharged from hospital after not more than three weeks' stay. A counter-allegation of the “dirty condition” of the school as contributory to the outbreak, although illuminating, may be regarded as irrelevant for the present purpose, and the point at issue is whether the shortened period of detention resulted in return cases. It is the general experience of the medical superintendents of the large London fever hospitals who may admit and discharge during the year from one to two thousand scarlet-fever patients alone that a shortened period of detention of patients does not increase the return-case rate. It is an axiom of fever hospital practice that the scarlet-fever patient who is most likely to give rise to return cases is one who has been detained not for four weeks or less but, on account of some complication, for possibly fourteen weeks or more. Nearly ten years ago, as the result of evidence obtained from all over the country, the opinion was expressed<sup>3</sup> “that there is no good reason for prescribing a routine period of detention in hospital of more than four weeks in uncomplicated cases,” and the old six-week period which was based upon the now exploded belief in the infectivity of desquamation has long been abandoned by most fever authorities. There is no evidence that the adoption for the uncomplicated case, as a deliberate policy in properly spaced wards and not as a measure of exigency, of a period of detention of four weeks has had anything but a favourable

effect upon the return-case rate. Dr. H. STANLEY BANKS indeed advocates,<sup>4</sup> in conjunction with the intravenous injection of scarlet fever anti-toxin, a much shorter period. In a series of 1010 cases of scarlet fever thus treated the average duration of stay in hospital was 17.4 days and the return-case rate for the series 2.7 per cent.

The clues to the particular complaint of which we have spoken are to be found perhaps in a statement by the local medical officer of health. On the one hand, the isolation hospital was stated to be absolutely full and its medical superintendent therefore contended “that the mild cases, after three weeks, would do much better at home, owing to the congestion of the wards and the atmosphere being, naturally, full of virulent germs. . . .” On the other hand, it appears that most of the patients came from small two-bed-roomed cottages, and thus any measure of isolation after discharge was held to be impossible. Here then is a vicious circle—the demand not only for hospitalisation but for a fixed (and obsolete) period of detention; the packing of wards with patients who, under the circumstances, were better left at home since they would at least have been recognised as infectious and such precautions as were possible enforced; the efforts to make yet more accommodation in hospital by the early discharge, based upon necessity, of patients almost certainly reinfected by the hæmolytic streptococcus in the overcrowded wards; and thus the further dissemination of infection either in the inadequate homes or at school and the provision of fresh cases for the hospital. The time has surely come for local authorities to appreciate that adequate bed-spacing is the right of every fever patient; that overcrowding of wards in an attempt to cope with an impossible situation merely makes matters worse; and that under such conditions—be the stay long or short, six weeks or three—return cases, which can never be eliminated entirely, inevitably become more numerous. Outside London and other large cities and some smaller progressive towns, in how many fever hospitals in normal times, to say nothing of epidemic periods, is the minimum spacing of the Ministry of Health (12 feet between bed centres) adopted and adhered to?

WHEN, four months before his death last December, Dr. Griffith Evans celebrated his hundredth birthday, he was acknowledged as the father of the veterinary profession in this country. The University College of North Wales has decided to build an extension of the veterinary department in the school of agriculture at Bangor and to name it the “Dr. Griffith Evans memorial wing.” This will be an appropriate tribute to his memory, for he was the first lecturer in veterinary hygiene at the College, though the value of his contributions to science was not fully recognised until long after he made them. An appeal is being made to members of both medical and veterinary professions to subscribe to the memorial. Of the £4000 needed over £1000 has already been received, and the Ministry of Agriculture has promised to grant a pound for each pound of the first £2000 collected.

<sup>3</sup> Ministry of Health Repts. on Public Health and Med. Subjects, No. 35, 1927, p. 220.

<sup>4</sup> L.C.C. Ann. Rep. Med. Officer, 1934, vol. iv. (Part I.), p. 82.

## ANNOTATIONS

### ESSENTIALS OF FRACTURE TREATMENT

THE treatment of fractures is not new. A recent writer has pointed out<sup>1</sup> that we have evidence of quite efficient treatment of fractures of the forearm at least 4500 years ago, though at this early date the management of fractures of the femur was not so good as it is to-day. But the principles were well recognised and established. Hippocrates used traction and countertraction for reduction and the modern plaster-of-Paris casts were represented by splints made of strips of cloth passed through molten wax. The necessity for padding bony points was recognised, and orthopaedic tables and pulleys were in use. Hippocrates insisted upon the necessity for prompt reduction, advice which is too often disregarded, saying "extension of fractured or dislocated bones is not to be delayed to the third day, but is to be carried out on the first day." All that we have really gained since his time is the power of safe open reduction and of skeletal traction. Hippocrates insisted that broken bone-ends should be brought into apposition and that no movement should be allowed until the fracture became solid. If we add to this that all movements which do not endanger this fixity should be encouraged we have the three great principles in the modern treatment of fractures. These principles can be carried out if the practitioner has the common sense of everyday mechanics, a knowledge of anatomy, especially the anatomy of muscular action, a smattering of physiology which informs him of the advantages of elevation and the drawbacks of pressure upon bony points, and an acquaintance with the use of a few standard splints, particularly with the management of plaster-of-Paris. That there is no best way for treating any particular fracture is abundantly evident to anyone who visits different fracture centres of note. In each he will find excellent results obtained, but by very different methods. The factor common to all of them is a personnel which adheres strictly to the principles laid down above and is endowed with the necessary qualifications for carrying them out. Fractures must receive as much attention as any abdominal operation; a daily, or more than daily, inspection and control alone will ensure a uniformity of good results. In general surgical clinics, where such conditions prevail, the fracture work is fully of the standard of that in special clinics; indeed, it is likely to be of a higher standard, because of the greater breadth of outlook of general surgery. It is certainly true that the efficient treatment of fractures depends far more upon the quality and temperament of the surgeons who undertake the work than upon the possession of any special knowledge or indeed of any special skill. Effective methods of treating fractures have been worked out years ago, but not everyone can put them into practice.

### THE ACTION OF CYCLOPROPANE

WRITING on the use of cyclopropane in obstetrics, R. T. Knight<sup>2</sup> brings out the difference between its action and those of the other general anaesthetics. Cyclopropane, he maintains, has as its chief characteristic that the vital centres and the parasympathetic system are left unaffected long after the desired effects have been produced. It is well known by all who have used the agent that the slowing down and actual stoppage of breathing under cyclopropane

have not the sinister significance they usually bear during general anaesthesia. The quietness, and even absence, of respiratory movements of a patient under cyclopropane are not associated with the dilatation of the pupil or duskiess of complexion which are seen in respiratory depression caused by other agents. This is because the respiratory arrest is not due to any central action but is merely the result of inhibition of motor neurons in the cord and of relaxation of muscles of respiration. In accordance with this paralysis of reflex arcs brought about by cyclopropane the intestine lies small and contracted in the abdomen, just as when an endothelial injection of an analgesic has been made. Knight also shows that, so far as his comparatively small series is evidence, the blood loss during childbirth is less under cyclopropane than under other anaesthetics.

### EFFECTS OF RADIUM ON THE EYE

THE radiation treatment of malignant disease in the neighbourhood of the eye presents certain special difficulties. In a communication to the Ophthalmological Congress on April 3rd Mrs. Philippa Martin, F.R.C.S., described the investigation into the effects of irradiating the eye carried out by her while holding the Percival Alleyn scholarship at University College Hospital. She has previously<sup>1</sup> described the early and late effects. First a conjunctival reaction appears with chemosis, usually at the lower fornix, accompanied by a watery discharge which may become muco-purulent; pain is not a pronounced feature. Late effects include scarring of the conjunctiva, obliteration of the puncta, chemosis, and corneal ulceration. Iritis is an early complication which suggests severe injury, and may be followed by necrosis of the cornea or cataract. Mrs. Martin now gives a more detailed description of radium necrosis as seen in the eye, particularly the effects of radium on the cornea, and makes valuable suggestions as to treatment. Radium necrosis of the cornea may occur, she says, in any case in which intensive irradiation is used in the treatment of adjacent malignant disease. The time of onset varies with the intensity of irradiation. The reaction is much more severe and early after repeated irradiation or in the presence of sepsis, particularly when the infection has been intensified by surgical intervention. The earliest sign of damage to the cornea is a diminution of sensation—the response to light cotton-wool touch being slower than in the normal eye. After a few weeks or months the cornea may lose its polish, and in a few hours a small superficial ulcer may appear and spread slowly. The condition may be arrested at this stage or it may progress even to perforation, but even in these cases infection of the whole eye is slow to develop. The process of repair may not begin for months and in any case will be slow. It can be expedited or at least encouraged by methods which Mrs. Martin outlines. As soon as the first signs of ulceration appear a mydriatic should be used and the eye bandaged. This should not be a routine procedure in the early weeks following radiation even if pain is present, because the swelling of lids and conjunctiva makes the estimation of tension impossible. Where intense radiation is planned a mydriatic should be used to dilate the pupil beforehand and the exact size noted for purposes of comparison. In these cases it is often advisable to stitch the lids together during

<sup>1</sup> Magnuson, P. B.: *Surg., Gyn., and Obst.*, Feb. 15th, 1936, p. 276.

<sup>2</sup> *Anaesth. and Analges.*, March-April, 1936, p. 63.

<sup>1</sup> *Transactions of the Ophthalmological Society*, 1933, *liii.*, 246.

radiation. When radium necrosis appears to be spreading a tarsorrhaphy should be done, with special care in view of the delayed healing of irradiated tissues. Even when the ulcer perforates it is not always necessary to remove the eye; the infection is usually mild and healing may occur. The cases recorded were mostly treated some years ago with interstitial radium needles and the dosage is given in milligramme hours. It is encouraging to find that the damage to the eye was not as a rule very severe, though the dosage given was necessarily high.

During the last three years several patients have been irradiated by the 1-gramme unit without severe reaction. In this connexion Mrs. Martin points out that any attempt to protect the eye from the deleterious effects of irradiation by the use of a metallic screen is dangerous; the screen acts as a source of secondary radiation and increases the damage to the eye. It would seem that we have here a possible method of treating malignant neoplasms near the eye without necessarily destroying function. In the past many such neoplasms have been allowed to advance to an extent where both sight and life were lost in the attempt to save the eye.

#### A NEW CLASSIFICATION FOR MEDICAL LIBRARIES

Books on special library classification are rare, yet the subject concerns not only librarians but also the many who have occasion to visit libraries and wish to make the best possible use of them. Mr. Barnard has set out in a handy volume<sup>1</sup> the result of the experience he has gained in building up a fine collection of medical literature at the London School of Hygiene and Tropical Medicine. In a short explanatory introduction Mr. Barnard points out that he has devised his scheme of classification on an essentially practical basis, and in this respect he has undoubtedly made improvements on the Universal Decimal Classification (U.D.C.). The adoption (following Cutter) of an almost pure alphabetical notation, instead of a numerical one, certainly shortens the symbols for the same minuteness of subdivision, but at the same time some of the mnemonic value of the latter is lost. Another difference is that Mr. Barnard had adopted (independently) the method of specific entry in use in the Boston medical library—that is to say, all works are entered under one subject heading no matter what the aspect. The anatomy of the thyroid, for instance, is entered with physiology, pathology, and surgery of this organ under U Q O, whereas in the U.D.C. a definite line is drawn between organs in health and in disease, the biochemistry and physiology of thyroid being given the number 612.44, and the pathology and treatment of thyroid disease 616.44. The only real criticism of Mr. Barnard's scheme, from the point of view of a general medical library, is that, out of 26 main alphabetical divisions, he allots as many as 8 letters (H-O) to the sections of Bacteriology, Parasitology, and Medical Zoology, whilst an important division such as Midwifery is put in a subdivision U W. For libraries used chiefly by laboratory research workers this allocation is no doubt justifiable, but in any library intended for clinicians, the division U (Specialities of Medicine) is liable to become hypertrophied. Minor criticisms concern the logical arrangement and the placing of related subjects in the

scheme. Preventive Medicine (S), for instance, might be expected to precede Diagnosis and Therapeutics (Q and R). Apart from such details, however, this new alphabetical classification is certainly practical, and many medical librarians in the future are likely to adopt it; others may even think of exchanging existing classifications for this system. Even ardent and prejudiced "decimalists" are likely to admit that this new classification compares not at all unfavourably with the U.D.C.

#### EXPERIMENTAL MYOCARDIAL ISCHÆMIA

WHILE it is accepted that the essential anatomical lesion of nearly all cases of effort angina and myocardial infarction is atheroma of the larger coronary arteries, aggravation of ischæmia in the former case has been thought to occur as a result of vasoconstriction; which, experimentally, can be brought about by vagal stimulation. Myocardial ischæmia is not generally recognised in man as a result of vasoconstriction alone, but G. E. Hall, G. H. Ettinger, and F. G. Banting have now, by injecting acetylcholine, the chemical agent through which vagal and all other parasympathetic action is effected, produced changes in the myocardium of dogs.<sup>1</sup> Evidence of the temporary effect of the drug at the time of the injection was present in salivation, tachycardia, dyspnœa, and peripheral vasodilatation. After a time systolic murmurs appeared and the electrocardiogram showed changes; terminally there were signs of cardiac failure, the animals dying with extreme dyspnœa or cyanosis, or in some cases unexpectedly. Sections of the heart revealed varying degrees of pathological changes, those in older dogs being more severe; there was hyaline change in the medium and smaller arteries, fibrosis in the media, and in some cases thrombosis in the lumen. The myocardium showed recent infarcts and areas of fibrosis. In the young dogs there were myocardial but no arterial changes. The authors point out that the most severe vascular changes are found in just those areas where vagal action is unopposed by the sympathetic—namely, in the medium and smaller arteries.

Another report concerns the action of Euphyllin in opening up a collateral circulation after experimental coronary occlusion. W. M. Fowler, H. M. Hurewitz, and F. M. Smith found<sup>2</sup> that, after tying the anterior descending branch of the left coronary in the dog, the area of cyanosis which then appeared on the heart wall could be considerably reduced by an injection of this drug, which is a combination of theophylline and ethylene-diamine, the effect persisting for at least one and a half hours. A distinct fall in blood pressure occurred after the injection, but this could be almost eliminated by giving it slowly combined with a hypertonic glucose solution. The late effects of the ligature in dogs which received the drug daily for a period of three weeks were found to be much less extensive than in controls; at autopsy the infarcted area was definitely smaller in the former group. On the clinical side an effective action by euphyllin on symptoms suggesting coronary disease is claimed<sup>3</sup> by F. M. Smith, H. W. Rathe, and W. D. Paul. Of four cases of congestive failure in which it was tried two showed improvement coinciding with the administration of the drug; the control period however was short. The results in 100 cases with paroxysmal dyspnœa, angina of effort, and acute

<sup>1</sup> A Classification for Medical Libraries. By Cyril C. Barnard, B.A. Lond., Univ. Lond. Dipl. Librarianship, F.L.A., Librarian, London School of Hygiene and Tropical Medicine, London: Percy Lund, Humphries and Co., Ltd. 1936. Pp. 142. 10s. 6d.

<sup>2</sup> Canad. Med. Assoc. Jour., January, 1936, p. 9.

<sup>3</sup> Arch. Internal Med., December, 1935, p. 1242.

<sup>4</sup> Ibid., p. 1250.

coronary occlusion were favourable in 72, doubtful in 11, and negative in 17. Assessment of the results of treatment of these symptoms, as with most paroxysmal conditions, is difficult, and while Smith and his co-workers were careful to observe patients when the drug was withheld, no placebo appears to have been given at these times. It may be recalled that in the fully controlled study<sup>4</sup> of Evans and Hoyle on angina of effort the results obtained with a placebo were superior to those with euphyllin.

#### ANORECTAL GONORRHOEA IN WOMEN

THE medical mind is so accustomed to associate gonorrhœa with the genito-urinary tract that the possibility of extragenital infection is apt to be forgotten. It has long been recognised that this type is commonest in the anus and the rectum in the female, involvement of which is, as a rule, secondary to infection of the usual sites. Nevertheless it is an aspect of the disease that has received comparatively little attention and which presents a number of unsolved problems of considerable potential importance. There seem to be two reasons for this neglect. The symptoms of anorectal infection are generally either absent or so slight that the patient's anxiety is not aroused and no complaint is made, and there are seldom any external signs. Secondly, many who treat gonorrhœa in the female believe that the infection in this area is self-limited, and that unless there are serious symptoms and signs no treatment is required. This attitude is not necessarily due to carelessness or lack of interest, but may be due to the difficulty of persuading some women with gonococcal infections to continue with treatment after their symptoms have subsided. If they are subjected to additional annoyance and discomfort from manipulation and instrumentation of the anal canal, some of them will cease to attend. Whatever the reason, it is probable that the majority of women that are treated for gonorrhœa and passed as free from infection never undergo clinical and bacteriological examination of the anal canal and its contents.

Most of the reports on this subject have come from abroad, but Clements and Hughes<sup>5</sup> have shown that the condition is equally common in this country. Among 160 women in whom genito-urinary gonorrhœa was present or suspected, 69 had anorectal involvement as shown by smears or culture, or by both. The latter proved to be more effective in isolating the gonococcus, but the best results were obtained by combining the two methods. Observation without treatment was carried out in 10 of their cases for periods not exceeding seven months and this convinced them that the disease is not self-limited. Brunet and Salberg, of Chicago,<sup>6</sup> have now reviewed the results of their investigations over three years, and their series includes 250 cases of anorectal infection, forming 42 per cent. of all their female patients who were found to have gonorrhœa. Only 25 patients complained of symptoms which were referable to the anal infection, and in most of these the symptoms were not severe. The diagnosis was made by means of smears taken from the anal contents, and the presence of intracellular Gram-negative diplococci, together with 25 or more pus cells per field, was accepted as evidence of a gonococcal infection. As a control, smears were taken from more than 200 women without evidence of past or

present infection, and in these no Gram-negative diplococci were found; pus cells were discovered only occasionally and then not more than 5 to the field. Cultural methods proved to be too involved and inconclusive, and therefore of no practical value as an aid to diagnosis. On proctoscopic examination of 111 of the infected patients, 40 showed no changes in the anal and rectal mucosæ. In the remainder there were varying degrees of inflammatory change but nothing which could be described as characteristic of this infection. Complications were uncommon; there were no cases of rectal stricture, only 4 of perineal abscess, and 3 of rectal fistula. After treatment, mainly with medicated suppositories, hot sitz baths, and mineral oils by mouth, cure was judged to have been obtained in an average time of 19 weeks. It was found possible to re-examine 59 patients, who had defaulted, after intervals varying from 6 months to 2 years; all were symptomless, but in 10 the smears were positive; in the remaining 49 the smears were negative. These investigators adhere to the accepted view that infection occurs from the vagina, probably by the discharge passing over the everted anal mucous membrane during the act of defæcation. They believe with Rosser<sup>7</sup> that the anal crypts (sinuses of Morgagni) form ideal reservoirs for the infection, which may persist in the anal canal long after the urethra and cervix are clear.

The question as to the self-limitation of these infections when they remain untreated does not appear to be settled by the evidence at present available, but it is quite certain that the gonococcus can persist in the anus and rectum for considerable periods. If, as Brunet and Salberg believe, the urethra and cervix may be reinfected from this site, anorectal gonorrhœa must be regarded as one possible cause of the frequent and lamentable cases of "recurrence" and "re-infection" which occur among women who remain under observation after treatment for genital gonorrhœa. There is no evidence to show that infection in this site can act as the initial focus in the metastatic infections of gonorrhœa, but it is important that the possibility should not be overlooked when the origin of infections of this type cannot be traced. The disagreement as to the value of cultural methods for isolating the gonococcus, which is evident in these reports and in many others relating to gonorrhœa, is an example of the extraordinary lack of unanimity of opinion on many fundamental points associated with the study of these infections. There can be no doubt that many pathologists have failed to overcome the inherent difficulties of the artificial cultivation of the gonococcus, and that the quality and value of clinical work in gonococcal infections suffer accordingly.

#### TELEPHONES FOR THE DEAF

DEAFNESS is usually a bar to easy conversation on the telephone, and may deprive the sufferer of many of its benefits in society and in business. We are glad therefore to hear that the Post Office is now prepared to install a new type of instrument in which the volume of sound may be increased, according to the listener's requirements, by turning a control knob. This special telephone, with its speech-amplifying equipment, is said to be effective in all but extreme cases of deafness, and it is equally useful for local and for long-distance calls. A correspondent of the *Times* (April 18th) writes that though she suffers from almost complete deafness,

<sup>7</sup> Rosser, C.: *Texas State Jour. Med.*, 1933, **xxix.**, 390.

<sup>4</sup> *Quart. Jour. Med.*, July, 1933, p. 311.

<sup>5</sup> Clements, P. A., and Hughes, K. E. A.: *THE LANCET*, 1935, **ii.**, 13.

<sup>6</sup> Brunet, W. M., and Salberg, J. B.: *Amer. Jour. Syph.*, January, 1936, p. 37.

she is now able to hear the voices of her friends on the telephone—a pleasure previously denied her for very many years. The amplifying equipment is contained in a small cabinet which can easily be accommodated in any out-of-the-way position near the telephone, and the instrument can be fitted on any installation served by an automatic exchange, or by a manual exchange of the type provided in the more populous areas, at an extra charge of 10s. a quarter.

### MINISTERING TO THE SICK

THERE can be no sharp line drawn across the map of medical treatment which attempts to allot provinces on the one side to exact therapeutics and on the other to the various attentions on physical and moral well-being of patients such as fall under the headings of religious support, mental guidance, sympathy in family troubles, or the provision of diversions. The doctor's work may be assisted by the priest, almoner, and hospital visitor, and the medical profession knows very well the wide influence for good and the favourable impulses towards restoration that follow upon the intelligent aid of sympathetic persons outside the professional rank. And the priest may occupy the honourable and peculiar position of adjutant in the direct medical treatment. In domiciliary medicine this can be well observed where the patient belongs to the priest's flock, but in the hospital where the patient is personally unknown to the priest the value of religious ministrations has been much debated. To many his presence round the bedside appears to be nothing but a nuisance. He is needed, they would say, neither in diagnosis nor treatment, and being no expert in many social difficulties it cannot be expected that his coöperation can be of any practical value. Dr. Richard Cabot and the Rev. Russell Dicks, B.D., have written an interesting book setting out the claims of the minister to be present in the sick-room, paying regard to the limitations of his knowledge, while pointing to the unlimited value which spiritual assistance may be to the patient.<sup>1</sup> The authors believe profoundly in the value of coöperation between the doctor and the minister in hospital work—they only consider in any detail the patient in the institution—and they propose to show that the aims which will call the minister to the bedside are to counteract the evils of specialism, and to give devotion and spiritual care such as only religion can inspire. By the words counteraction of specialism it is implied that medical treatment, however broad, is of a special character, while social and spiritual diagnosis in the presence of disease require qualities which no doctor, unless by accident, can attempt to offer. Criticism of a work written with deep sincerity is made difficult because it is not possible to assess devotional belief as a method of treatment in the same sort of way in which therapeutic procedures and operative methods can be submitted to judgment. One does not know how far such belief is present in any given case of improvement or recovery. The dual treatment, as suggested in the book, comes into play mainly in institutional treatment, where it may be thought to be of less value than in the home, and where the circumstances of environment are so favourable to moral as well as physical change that the actual cause of any alteration for good must always be uncertain. The part allotted by the authors to the minister is magnificent, and brings

about with it the discharge of difficult and ungrateful duties: to discharge them he must be an extraordinarily endowed person, possessing faith, intuition, delicate tact, broad sympathy, scriptural knowledge, familiarity with topical literature. All these qualities are in the examples of religious treatments set out, and as we are apt to endow the ideal doctor in talking of him with many of them, we must not grudge them to the ideal priest. Each may hope to display them, and in their exhibition may find as a result physical and moral betterment of the patient in accordance with the well-known influence of mind on body. But the authors suggest that in institutional life the priest would find a proper rôle in supervising the amenities of the institution in a way that in this country would bring him into collision with the heads of the managerial and nursing departments. Every doctor knows the store that is set by many patients upon the ministrations of the clergyman and knows also their value from the therapeutic point of view in certain cases, even while unable to assess that value in any exact terms or predict its display in any particular case. But it seems highly doubtful if either the medical staff or the lay management would regard the visiting clergyman as a fitting mediator in staff troubles. If the secretary of the hospital and the superintendent of the nurses chose to consult him on points of difficulty no doubt they might benefit by his advice, but to interfere in these departments is not comparable to helping the sick; it is comparable to advising the doctor as to medical treatment, and that we do not commend. But we can commend the book to which we are referring as one dealing with questions that are often before the medical profession in this country, if not in exactly the same form in which they have presented themselves to the able and sincere American writers.

### WILLIAM B. COLEY

THE death in New York on April 16th of William Bradley Coley at the age of 75 years removes a forceful figure from American surgical life. In this country his name is chiefly associated with a fluid for the relief of inoperable cancer. Moved by Paget's observation that malignant tumours occasionally diminish or disappear after an attack of erysipelas Coley worked assiduously on the action of living streptococci in sarcoma and 45 years ago he published an extensive series of cases of inoperable sarcoma which had shown benefit after injection of the combined toxins of *B. prodigiosus* and *Strept. erysipelatis*. Other surgeons had like experience of benefit in 2 to 4 per cent. of such cases, and in 1910 Coley's fluid was included in the list of non-official remedies compiled by the American Council on Pharmacy and Chemistry. Coley never ceased to develop this treatment and ten years ago he and his brother recorded the completed story of 55 cases of sarcoma in which the diagnosis had been confirmed by well-known pathologists. A few months back the Council on Pharmacy in reviewing the whole of the evidence concluded that the combined toxins of erysipelas and prodigiosus may play a significant rôle in preventing or retarding malignant recurrence or metastasis, and on occasion may be curative in hopelessly inoperable neoplasms. But Coley was not a man of one idea. He held the chair of clinical cancer research at Cornell and was always a seeker after truth. His own papers are models of clinical presentation and so fully documented as to command attention from other workers in the same field. He was on the staff of the Hospital for Ruptured

<sup>1</sup>The Art of Ministering to the Sick. By Richard C. Cabot, M.D., and Russell L. Dicks, B.D. London: Macmillan and Co., Ltd. 1936. Pp. 384. 12s. 6d.

and Crippled in New York, and it was in connexion with the operative treatment of hernia that his name first came into prominence. Last month, in the *American Journal of Surgery*, he told the story of the radical cure of hernia during half a century. He had friends in many countries, for he was a man of wide general knowledge, interested in men and affairs. Evidence of this was afforded by his reception last October when the honorary fellowship of the Royal College of Surgeons of England was conferred upon him and he was later entertained by Glasgow surgeons. His country home in Sharon became a meeting-place for his European friends. There was determination and pertinacity in his nature which enabled him to do what he did in spite of the acromegaly from which he was a lifelong sufferer and the ulcer which necessitated gastro-enterostomy—performed under local anaesthesia. For many years he was consultant to one of the large American railway companies.

#### POST-OPERATIVE GANGRENE

Liedberg of Lund reports<sup>1</sup> two further cases of the rare post-operative gangrene of the skin, one following operation for gangrenous appendicitis, and the other complicating suppurative mastitis. The onset was, as usual, gradual and the progress unrelenting, "centimetre by centimetre, week by week." The ulcerating edge just outside the frankly gangrenous margin [gave rise to the same intense pain and tenderness as has been described by other authors, and the extending margin showed the three typical zones, of blackish gangrene, bluish-red, and bright red inflammation. The wound in which gangrene followed appendicectomy was clean-stitched, but the appendix was definitely gangrenous, so that the skin edge may very easily have been infected. In most reported cases the wounds have been drained, and this is of importance because the condition is generally attributed to symbiotic invasion by a streptococcus from the intestine (or at any rate from the peritoneal cavity) and a staphylococcus from the skin. In view of this supposed aetiology, the occurrence of the disease in the breast is somewhat unexpected; and indeed all previous reports have been of gangrene after operations on the serous cavities, either for empyema, or for diseases of the stomach or intestine. In the case of mastitis here reported the patient developed a swelling like a carbuncle, which was incised. The pain was severe and the wound broke down into an ulcer involving the inner and upper part of the left breast and the size of a child's hand. The process spread rapidly in the three weeks following, but was at once arrested by excision of the whole of the altered skin with the diathermy knife. The pain was completely relieved by the operation, and healing began; and though a subcutaneous abscess had to be opened about three weeks later, there was no further gangrene. The temperature was moderate throughout. The other case, in which the gangrene followed appendicectomy, was fatal; but apparently excision of the wound was not so thorough. Complete excision, extending out into the healthy skin, seems to be an almost certain cure, and no other measure is worth considering. Liedberg quotes Meloney as finding very little to choose between excision by the scalpel or the cautery knife. He himself rather prefers the cautery because its use prevents great loss of blood. A mixed growth of staphylococci and streptococci was obtained in the appendix case, but only staphylococci in the

one with mastitis. Liedberg gives a useful résumé of 40 cases recorded before his own.

#### TESTS FOR VITAMIN DEFICIENCY

IN our last issue Dr. L. J. Harris and Mr. P. C. Leong described a new test for vitamin-B<sub>1</sub> deficiency in human beings. As in Harris and Ray's test for vitamin-C deficiency, the patient is given a large dose of the vitamin and the urine is examined to find out how much of it is excreted. If a person has had ample supplies of the vitamin in his diet his tissues will be "saturated" and he will excrete a large proportion of this test dose; on the other hand, if he is suffering from a deficiency his "unsaturated" tissues will retain more and he will excrete less. Dr. Harris believes that these tests provide good objective evidence of specific deficiencies, and in a further article on p. 966 he argues that the methods now available should enable us to arrive at much more satisfactory standards of sound nutrition. To this end he wants to see surveys undertaken to discover the incidence of definite nutritional defects throughout the country; but the question arises how far the tests he enumerates can yet be taken as established. Confirmatory reports on the urinary excretion test for vitamin C are continually appearing, but the similar test for vitamin B<sub>1</sub> is, of course, only in its infancy, and the validity of the Jeans and Zentmire's photometer test for partial vitamin-A deficiency has not been fully accepted. Fortunately its authors have just furnished further confirmation<sup>1</sup> of their first observations, published in 1934, on the use of the photometer for the ascertainment of night-blindness. Failure in adaptation to darkness is regarded as one of the earliest symptoms of vitamin-A deficiency, and though it is not entirely specific its dependence on vitamin-A lack in any given case or series of cases can always be proved by giving this vitamin and noting the results. The photometer test is now placed on a far more satisfactory basis as a criterion of vitamin-A insufficiency by Jeans and Zentmire's study of the incidence of night-blindness in a widely varied group of Iowa school-children, including rural and village children, and also urban ones from various economic levels. The observers were astonished at the high percentage (36), even among rural children, who failed to react normally, while among the poorest urban children only 11 per cent. were regarded as normal, the village and better-off urban children showing intermediate results. Administration of halibut-liver oil or carotene brought back the photometer reaction to normal in all but a tiny fraction. The specificity of the photometer test as a criterion of vitamin-A insufficiency was thus corroborated and the existence of a widespread slight deficiency of this vitamin, at least in the State of Iowa, seemed to be established.

WE regret to announce the death last Tuesday of Dr. Henry Jasper Cardale, chairman from its inception of the London Panel Committee.

ON Thursday, April 30th, Prof. W. W. C. Topley, F.R.S., will give the first of the five William Withering lectures, on the chemical and biological aspects of immunology, which he and Mr. Percival Hartley, D.Sc., are delivering at the University of Birmingham. Prof. Topley will also lecture on May 14th and 28th, and Dr. Hartley on May 7th and 21st. All the lectures will be at 4 p.m., and members of the medical profession and students are invited to attend.

<sup>1</sup>Liedberg, N.: *Acta Chir. Scand.*, 1936, lxxvii., 354.

<sup>1</sup>Jeans, P. C., and Zentmire, Z.: *Jour. Amer. Med. Assoc.*, March 21st, 1936, p. 996.



## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### XCVIII.

#### PROGNOSIS IN FOOD POISONING

SINCE food poisoning is not a definite entity and hardly a definable conception it is only possible to discuss prognosis in the light of the different types of causation.

##### Poisoning by Chemical Substances

The chief mineral salts which give rise to poisoning are those containing lead, arsenic, antimony, zinc, copper, and tin. As regards symptoms they mostly fall into two groups. In one there is continued absorption of small quantities of the toxic metal, such as may occur with lead poisoning associated with beer or cider contaminated with lead. The prognosis has to take into account the risk of damage to vital organs such as the kidneys, this being more important than risk to life, although deaths have occurred in such outbreaks. The two main considerations are the dosage and whether the substance exerts a cumulative effect.

Poisoning associated with the ingestion of *arsenic* is naturally always serious both from secondary effects and risk to life. In the Manchester outbreak of arsenical poisoning from beer there were at least 6000 persons attacked and over 70 deaths were recorded. When the toxic substance is an acute gastro-intestinal irritant, as occurs for example with lemonade made in vessels treated with a soluble antimony salt, or with an acid fruit acting upon zinc retainers, the dose ingested sets up diarrhoea and vomiting and may be alarming from the prostration caused, but the symptoms are of limited duration and deaths are practically unknown, while no late harmful results are to be anticipated as there is no absorption of the mineral.

Occasionally rare types of widespread chemical poisoning occur. One of the most extensive was that due to the use of adulterated extract of Jamaica ginger, mostly in U.S.A. in 1930, involving some 15,000 cases, the toxic agent being tri-ortho-cresol. The actual case-mortality was not ascertained, but it was high, while the late effects were disastrous, resulting in extensive atrophy of muscles and nerves. Recovery when it did occur took from one to two years.

Alkaloidal poisoning may occur. This may be accidental, as when belladonna plant is mixed in with sage by mistake for stuffing. The prognosis depends on the dose and the rapidity of efficient treatment. Allied is mushroom poisoning, and the most important factor affecting prognosis is the species of mushroom and to a lesser extent the dose. With *Amanita phalloides* the mortality-rate is at least 50 per cent.; with *Amanita muscaria* recovery is usually rapid and complete and deaths are comparatively rare. Poisoning with *Helvella esculenta*, although it gives rise to jaundice and late hæmoglobinuria, has a low mortality-rate.

Another peculiar type of food poisoning with a considerable mortality is from *mussels* which have become poisonous from causes not yet completely understood. The most extensive recent outbreak which has been investigated is that on the Pacific coast of California in 1927 with 102 known cases and 6 deaths. The poisonous substance was a toxin of non-bacterial origin.

In general, prognosis depends upon the nature of the toxic agent, modified by the amount ingested and the promptness and efficiency of treatment.

##### Bacteria which Produce Gastro-intestinal Irritation

The commonest type in this country is due to various members of the salmonella group. Those members which cause food poisoning act as gastro-intestinal irritants and produce toxins which cause severe diarrhoea, vomiting, and prostration. They act, therefore as cleansers of the alimentary tract so that apart from treatment recovery after a few days is usual. The actual mortality-rate is low, only 1.2 to 1.3 per cent.

The interesting point as regards prognosis, even when the living bacillus is introduced, is that the usual course is purely the action of a gastro-intestinal irritant, without any circulation of the bacillus in the blood stream. Direct blood examinations are invariably negative even when the organism is very abundant in the faeces. In this they differ widely from paratyphoid fever (also due to a salmonella strain). On the other hand, in all fatal cases of salmonella food poisoning it is quite easy to recover the bacilli from the spleen, liver, and other internal organs. These facts suggest that the usual course in salmonella food poisoning is for the bacilli to be restricted to the alimentary tract and as such involves a very small risk to life, but should they establish a parenteral infection and set up a septicaemia there is grave risk of the case terminating fatally. Apart from this risk, which mortality figures show is not great, there may be long-continued prostration without permanent ill-effects.

Another group of food-poisoning cases have been shown within the past few years to be due to toxins produced by staphylococci and in rarer instances to streptococci. So far nearly all the recorded outbreaks have been in America. The poison here is an enterotoxin, is effective in filtered sterile cultures, and is only produced under certain conditions, not yet fully understood. The poisons act as gastro-intestinal irritants usually comparatively mild in character so that the symptoms are not severe and complete recovery always occurs.

Another important group, because fairly common, is one in which the poisoning is entirely associated with bacterial toxins without the presence of any living bacilli. There is no unanimity of opinion as to the bacterial source of the toxins, the evidence that they are associated with salmonella strains not being accepted by all workers. Whatever their nature they are a characteristic group of importance from the point of view of prognosis. The toxins being preformed, and all present at once, the symptoms are often very abrupt in origin, very severe in character, and sometimes alarming. The patients think they are going to die, but never do unless at the extremes of life or debilitated from disease. They rapidly and completely recover, apart from anything much in the way of treatment. The actual case-mortality from a large series is about 0.5 per cent.

##### Bacterial Poisons Acting Mainly on the Nervous System

The only food poisoning of this type is botulism. Here the fatality-rate is exceedingly high, between

60 and 70 per cent. In the Loch Maree outbreak all the 8 persons who took out and ate the wild duck paste sandwiches died. With such a high mortality it is of value to consider the factors which make for a lower rate. In man the cases may be caused either by type A or type B *Cl. botulinum*, but the toxins are of equal potency. The condition is one of intoxication not a bacterial infection, so the amount of ingested toxin is the primary factor and dosage is important. Like *B. diphtheria* the organism produces a true toxin outside the bacterial cell and the antitoxin is equally effective. The two types produce different toxins, and the antitoxins are specific and are useful only for the same type. There is not time to type the organism even if it can be

isolated, so a polyvalent antitoxin must be used, preferably injected intravenously. Animal experiments demonstrate its marked efficiency if given at the time or soon after the ingestion of the toxin; it is of little or no value if delayed long after the onset of the first symptoms. It must be available, polyvalent, and given early. Unfortunately these conditions are difficult to meet and this makes the prognosis bad. No other treatment seems to be of any use. The two factors affecting prognosis are the amount of the dose ingested (and this is not important in practice because the poison is so toxic) and the promptness of diagnosis with effective antitoxin treatment.

WILLIAM G. SAVAGE, M.D., B.Sc.  
Medical Officer of Health, Somerset.

## SPECIAL ARTICLES

### A PROGRAMME FOR NUTRITION SURVEYS

BY LESLIE J. HARRIS, Sc.D., D.Sc.

MEMBER OF THE SCIENTIFIC STAFF OF THE MEDICAL RESEARCH COUNCIL

(From the Nutritional Laboratory, University of Cambridge and Medical Research Council)

CONSIDERABLE discussion has taken place recently as to the most suitable formula to be used in the assessment of malnutrition, as based on measurements of physique (that is, on data for weight, height, and/or age).<sup>1</sup> Some workers have urged the desirability of substituting measurements of physical performance for those of physical development.<sup>2</sup> Others again would rely more exclusively on clinical appearance.<sup>3</sup>

It is apparent, however, that all these methods have serious limitations. In the first place they may easily fail to detect the earlier and less obvious stages of undernutrition. Secondly they may give inadequate information about the specific nature of the deficiency or deficiencies in question—more especially when the deficiency is partial or moderate only.

The above criticisms may at first sight seem rather sweeping, but one may illustrate their truth by reference to the results of a number of recent inquiries in which the incidence of undernutrition has been determined by more specific methods.

The observations of Helen Mackay on the prevalence of nutritional anaemia may be chosen as the first example. She observed<sup>4</sup> that 70 per cent. of a group of poor-class bottle-fed babies in London suffered from some degree of nutritional anaemia; the deficiency was associated with an increased morbidity-rate, so that when the anaemia was cured by provision of extra iron the morbidity-rate was duly diminished. A similar high incidence of anaemia has been observed elsewhere—e.g., for mothers at Aberdeen<sup>5</sup> and at London.<sup>6</sup> The important point to realise is that this specific evidence of malnutrition was detected only after laboratory test, and that reliance on the more cursory clinical methods or on "weight ratios" would have failed to reveal unmistakably the presence of undernutrition in most of these individuals.

As a further example, the figures relating to the incidence of rickets may be mentioned. According to official statistics in 1928, 87 per cent. of a group of 1635 five-year-old London school-children<sup>7</sup> were found after special examination to show evidence of "some degree of rickets"; yet in the great majority of cases their nutrition would have been returned as "normal" by the ordinary school medical examination.

Finally the experiments of Corry Mann may be alluded to. Carefully controlled experimental observations by

this worker<sup>8</sup> and by many others subsequently<sup>9</sup> have shown conclusively that for optimum development and health a school child needs not less than one pint of milk per day. Yet, although large sections of the population are unable to receive their daily pint, examination by the school medical service—which under existing conditions must frequently be somewhat cursory—is generally incapable of revealing such degrees of sub-optimum nutrition.

It is considerations such as the foregoing which indeed form the justification for basing estimates of malnutrition (or undernutrition) not so much on existing public health returns as on a knowledge of the amount of money actually available for food for given groups of the population. When the amount of money available is less than that which expert opinion<sup>10</sup> considers to be the minimum necessary for the maintenance of health, then a presumption must be raised that some degree of undernutrition is present. Orr<sup>11</sup> calculated in 1934 that no less than 10,000,000 individuals in this country were unable to afford even the bare minimum figure (at the present time perhaps 20,000,000, representing 40 per cent. of the population, are considered to have diets below the optimum<sup>11a</sup>).

To sum up the foregoing arguments, it may be said that three principal objections can be raised to attempts to assess undernutrition by methods based solely on physique, on physical performance, or on superficial clinical appearance. These objections are: (1) the absence of standards of reference, (2) that such standards as do exist may be debased standards, and (3) that the worst and more obvious of the effects of undernutrition may be delayed.

(1) *Absence of standards.*—The difficulties due to absence of standards are at once apparent from statistics such as the following: In comparable areas in Northumberland (as Dr. J. C. Spence has pointed out<sup>12</sup>) the official returns for malnutrition may vary from 0.5 per cent. to 7.5 per cent. ! At Bootle the malnutrition-rate is given as 12 times that of Liverpool—of which it is a suburb. Or, again a prosperous borough like Twickenham owns to a malnutrition-rate six times that of Wigan.

(2) As to the use of *debased standards*, it is sufficient to say that large numbers of returns are based on *past averages* instead of possible optimal figures, and it is often overlooked that there has been a steady improvement in height and weight values for elementary school-children in many parts of the country during the past decade or two; while in controlled experiments in which children have been allowed more generous dietaries their weights and heights have shown considerable advances over the

old average figures, which are still too often taken as "normal" values. No doubt the ideal standards for weights and heights under conditions of optimum nutrition have still to be determined.

(3) As to the difficulty of recognising the milder or earlier stages of malnutrition enough has already been said to show that disorders such as nutritional anæmia, mild or early rickets, and sub-scurvy, may be the cause of definite ill-health and lead to still more serious defects in later life and may yet escape notice unless special methods are used for their detection.

A consideration of these facts leads me to suggest that the time is ripe to draw up a schedule of the tests which are now available for the determination of specific nutritional deficiencies. It is greatly to be hoped that a series of surveys employing such methods of test should be undertaken (on random specimens of the population) in different areas, so that a conspectus may be obtained of the incidence of definite defects of nutrition throughout the country.

### Tests for Specific Deficiencies

#### VITAMIN A

(a) *Photometer test* (Jeans and Zentmire).—The most sensitive method so far proposed for the detection of vitamin-A subnutrition is based on sensitivity to light following partial dark adaptation. The principle of the technique depends on the well-known fact that visual purple is a compound of vitamin A, and that in the absence of an optimum dietary allowance of the vitamin the rate of regeneration of the visual purple is subnormal. As a check on the accuracy of the method, those subjects showing low values should be given an adequate source of vitamin A for a week or two, and if such treatment is found to be duly followed by a return to a normal visual value, it may be reasonably held to confirm the conclusion that vitamin-A deficiency was the cause of the defect.

Using this method Jeans and Zentmire<sup>13</sup> found that in a group of 213 children from Iowa City, U.S.A., whom they examined, no less than 45 had subnormal dark adaptation. Of the latter, a group of 21 were treated as controls with cod-liver oil, and were then found to return to normal in an average period of 12 days. The subjects chosen for investigation were, it is true, a group of physically afflicted children from the lower economic classes, but it is significant that as many as 21 per cent. were found to have some degree of vitamin-A deficiency.

(b) *Post-mortem determinations of liver reserves.*—Some indication of the variations in the vitamin-A reserves in different sections of the population may be obtained from post-mortem analyses of the liver (carried out by means of a colorimetric test, by the  $SbCl_3$  method). The vitamin-A reserves of the body are known to be stored almost entirely in the liver, and the amount so stored depends on that provided in the diet. For the sake of more accurate comparison, accident or surgical cases are best taken, since in medical cases the possible provision of a diet rich in vitamin A since admission to hospital may sometimes give a figure deceptively higher than that truly representative of the previous home conditions. Absolute standards of "normality" for the liver reserves are not yet known, so that results must be given a general qualitative significance rather than a strict quantitative interpretation. The most comprehensive results so far published are due to Moore,<sup>14</sup> and he gives the provisional finding

that about 16 per cent. of cases show "subnormal" vitamin-A reserves. For purposes of calculation it may be borne in mind that the minimum daily dose of vitamin A needed by a man, woman, or child is thought<sup>15</sup> to be in the region of 1000 "Sherman-Munsell rat units" (= about 1400 international units) per day.

#### VITAMIN B<sub>1</sub>\*

*Urinary excretion test.*—A method has just been described (Harris and Leong)<sup>16</sup> by which the amount of vitamin B<sub>1</sub> excreted in the urine may be used as an index of the dietary intake. Large-scale surveys have still to be undertaken, but as a provisional guide it may be held that subjects excreting less than 12 I.U. (international units) per day (for a ten-stone man) and failing to show a response to a single test dose of (say) 500 I.U. have been receiving a diet unduly low in vitamin B<sub>1</sub>. The significance of a suboptimal intake of vitamin B<sub>1</sub> in nutrition may be seen from the results of various workers who have shown that the weight and height gains of children were considerably improved beyond those of the controls when extra vitamin B<sub>1</sub> (or B) was added to the diet (mainly in the form of cereal preparations).<sup>17</sup>

#### VITAMIN C

(a) *The urinary excretion test* depends on the fact that the amount of vitamin C excreted daily in human urine and the response to a test dose depend on the past intake<sup>18 20</sup>: the measurements are made by a simple chemical titration, depending on reduction of the redox dye, 2 : 6-dichlorophenolindophenol under specified conditions. A considerable amount of quantitative work has already been done. It has been shown<sup>20</sup> that if less than a certain amount of specific reducing substance (expressed as ascorbic acid) is excreted daily (viz., 1.0 to 1.5 mg. per stone of body-weight) and if there is no response to a given test dose (viz., 70 mg. per stone of body-weight), a presumption must be raised that the diet of the subject has contained less than the reputed minimal-optimum dose of vitamin C<sup>21</sup> (e.g., 25 mg. per day for an adult).† A survey of subjects of the voluntary hospital class, recently concluded,<sup>22</sup> indicates that a suboptimal intake of vitamin C is indeed of common occurrence. It has similarly been pointed out that although current teaching recommends the consumption of orange juice daily by all bottle-fed babies, many do in fact receive too little—a conclusion confirmed by tests carried out on the urine.<sup>20</sup>

(b) *Capillary resistance test* (Göthlin).—An alternative method described by Göthlin<sup>23</sup> depends on the fact that with inadequate intake of vitamin C the capillary resistance becomes subnormal. This is apparently the earliest clinical symptom of sub-scurvy. As measured by Göthlin's method, a count

\* *Vitamin-B<sub>1</sub> complex.*—The significance of the various components of the vitamin-B<sub>1</sub> complex in human nutrition is not yet sufficiently well understood to warrant any detailed consideration here. The following points may be worthy of note however:—

*Lactoflavin* is excreted in the urine, and apparently in amounts depending on the dietary consumption, and it may be estimated readily by a fluoroscope test; but until more is known of the physiological rôle of lactoflavin and the effects of its deficiency, such tests are outside the scope of our present discussion.

*Vitamin B<sub>2</sub>*, the so-called rat-pellagra factor,<sup>14</sup> is also of unknown significance for human nutrition, and no methods of test for its deficiency in man are known.

*The pellagra-preventing (PP) factor*, although it has not yet been chemically identified, is of importance in many regions of the globe—e.g., over 7000 deaths per annum from pellagra occurred in the U.S.A. in 1928–30, according to official returns. Unfortunately no tests seem yet available for subclinical degrees of deficiency.

† This is approximately the amount said to be needed to restore to normal a diminished capillary resistance due to hypovitaminosis C: see below.

is made of the number of petechiæ which appear in a given area on the surface of the arm when a stated pressure is applied by means of a tourniquet. The objection which may be raised, that a diminished capillary resistance is not pathognomonic for scurvy but is seen in other conditions also, is largely met by a procedure described by Göthlin, according to which whenever a low value is found a source of vitamin C may be administered and a return to a normal value in the course of a week or two confirms the diagnosis. By this method Göthlin<sup>24</sup> found that in Norrland (in Northern Scandinavia) one child out of every five gave evidence of hypovitaminosis C.

#### VITAMIN D

(a) *Blood phosphatase test for active rickets.*—Probably the most sensitive test for detecting active or current rickets is based on a measurement of the amount of phosphatase in the blood, as described by Smith.<sup>25</sup> With the start of the rachitic process the phosphatase content of the blood rises above normal, and promptly sinks again once the curative action has begun. The laboratory estimation is fairly straightforward, and should be made the subject of surveys on a larger scale.

(b) *Examination for past rickets.*—As it is important to know not only whether the rachitic process is active at the moment when the test is carried out but also whether there is a history of rickets, an examination should be included for the stigmata of past rickets. The methods used (see for example the London inquiry of 1928<sup>7</sup>) are simple and well known; X ray investigation should be combined with examination for enlarged epiphyses and characteristic bony deformities (the Newman Committee of 1931 accepted the following<sup>26</sup> as "rachitic signs": parietal bossing, frontal bossing, radial epiphyses, spinal curvature, knock knees, bow legs, bowing of tibia, beaded ribs, changes in chest wall).

#### IRON (NUTRITIONAL ANEMIA)

The striking results of Mackay and others<sup>27</sup> on the high incidence of nutritional anaemia, and of the damage which it causes to health, have already been alluded to. When the laboratory method for its detection is so relatively simple, there is every reason why it should be included in nutritional surveys of the kind we have in mind.

#### OTHER ESSENTIALS

The above list, while making no claim to completeness, probably does summarise the tests which are most easily carried out.

Evidence of a deficient intake of other important dietary constituents, such as protein, or calcium, or phosphate is more readily determined by a direct study of the budget and of the food actually consumed by the members of the family—rather than by the necessarily complex procedure of estimation of "retention" in "balance" experiments. The latter kind of inquiry has, it is true, given invaluable information in a few well-chosen surveys which have been carried out, mainly in the hands of Sherman and his co-workers in America. Such tests are, however, generally beyond the scope of ordinary routine inquiries. An exception might, perhaps, sometimes be made for blood analysis for calcium and inorganic phosphate, a low phosphate (or low Ca × P product) being nearly always indicative of a rachitic process. Similarly, hypocalcaemia, giving rise to spasmophilia, may be detected by diminished resistance, on test, to electrical stimulus.

#### Summary

Limitations in the method of assessing under-nutrition by means of observations based on the

superficial clinical appearance, on physique, or on physical performance are: (1) the absence of standards of reference, (2) that such standards as are in use may be debased, (3) that the more obvious ill-effects of under-nutrition may be delayed, and (4) that such methods may fail to indicate the specific nature of the deficiencies responsible. The following methods, inter alia, are now available for the determination of specific deficiencies.

- (1) *Vitamin A.*—(a) Photometer test for dark adaptation (visual-purple formation). (b) Post-mortem estimates of vitamin-A reserves in liver.
- (2) *Vitamin B<sub>1</sub>.*—Urinary excretion test.
- (3) *Vitamin C.*—(a) Urinary excretion test. (b) Test for diminished capillary resistance.
- (4) *Vitamin D.*—(a) Phosphatase test for active rickets. (b) X ray and clinical examination (bony deformities) for past rickets.
- (5) *Iron* (nutritional anaemia).—Hæmoglobin estimations.

Surveys are required based on the collection of such data.

#### REFERENCES

1. See, for example, Roberts, L. J.: Nutrition Work with Children, Chicago, 1935; Editorial: THE LANCET, 1935, ii., 951; Watkins, A. G.: Brit. Med. Jour., 1935, i., 1256.
2. Magee, H. E.: Proc. Roy. Soc. Med., 1935, xxviii., 713.
3. Hutchison, R.: Ibid., 1935, xxviii., 728.
4. Mackay, H. M.: Ibid., 1929, xxii., 385; Mackay et al.: Med. Res. Council, Spec. Rep. Series No. 157, 1931.
5. Davidson, L. S. P., et al.: Brit. Med. Jour., 1933, i., 685; 1935, ii., 195.
6. Mackay, H. M.: THE LANCET, 1935, i., 1431.
7. Newman, Sir G.: Report on the Health of the School Child for 1928, London, 1929.
8. Mann, H. C. C.: Med. Res. Council, Spec. Rep. Ser. No. 105, 1926.
9. Orr, J. B.: Brit. Med. Jour., 1928, i., 140; Leighton, G., and Clark, M. L.: THE LANCET, 1929, i., 40.
10. Nutrition Committee, B.M.A., Brit. Med. Jour., Suppl., Nov. 25th, 1933.
11. Orr, J. B.: Chadwick Lecture for 1934.
- 11a. Orr, J. B.: Proc. Brit. Assoc. Ann. Meeting, 1935 (quoted in Nature, 1935, cxxxvi., 771).
12. Spence, J. C.: Quoted by THE LANCET, 1935, i., 268; see also Proc. Roy. Soc. Med., 1935, xxviii., 725.
13. Jeans, P. C., and Zentmire, Z.: Jour. Amer. Med. Assoc., 1934, cii., 892.
14. Moore, T.: THE LANCET, 1932, ii., 669; Chem. Ind., 1934, liii., 875; and Ibid., 1936, iv., 235-36.
15. Fraps, G. S., and Treichler, R.: Texas Agric. Exp. Station Bull., 1933, vol. cccxlvii.
16. Harris, L. J., and Leong, P. C.: THE LANCET, April 18th, 1936, p. 886.
17. Bloxson, A. P.: Amer. Jour. Dis. Child., 1929, xxxvii., 1161; Dennett, R. H.: Jour. Amer. Med. Assoc., 1929, xcii., 769; Morgan, A. F., and Barry, M. M.: Amer. Jour. Dis. Child., 1930, xxxix., 935; Hoobler, B. R.: Jour. Amer. Med. Assoc., 1931, xevi., 675; Summerfeldt, P.: Amer. Jour. Dis. Child., 1932, xliii., 284.
18. Birch, Harris, and György: Biochem. Jour., 1935, xxix., 2830.
19. See inter alia Harris, Ray, and Ward: Biochem. Jour., 1933, xxvii., 2011; Johnson, S. W., and Zilva, S. S.: Biochem. Jour., 1934, xxviii., 1393; Harris, L. J., and Ray, S. N.: THE LANCET, 1935, i., 71.
20. Abbasy, Harris, Ray, and Marrack: THE LANCET, 1935, ii., 1399.
21. See, e.g., Ann. Rev. Biochem., 1935, iv., 348.
22. Abbasy, Harris, and Yudkin: Unpublished data.
23. Göthlin, G. F.: Skand. Arch. f. Physiol., 1931, lxi., 225.
24. Falk, Gedda, and Göthlin: Ibid., 1932, lxx., 24.
25. Smith, J.: Arch. Dis. Childhood, 1933, viii., 215.
26. Newman, Sir G., et al.: Board of Education Committee on Adenoids and Enlarged Tonsils, 2nd interim report: The Association of Rickets and Dental Disease with Adenoids and Enlarged Tonsils, 1931.
27. Mackay, H. M.: Proc. Roy. Soc. Med., 1929, xxii., 385; Mackay et al.: Med. Res. Council, Spec. Rep. Ser. No. 157, 1931; Davidson et al.: Brit. Med. Jour., 1933, i., 685, and 1935, ii., 195; Mackay: THE LANCET, 1935, i., 1431.

CENTRAL JUBILEE FUND.—A grant of 50,000 rupees (about £3500) from this fund is to be spent by the Ludhiana Women's Christian Medical College, a hospital in the Punjab, on radium. The college, which was founded by Dame Edith Brown, M.D., 42 years ago, was the first medical school for training Indian women. It now has in training 150 medical students, 50 nurses, 20 compounders, and 80 dais. It is supported partly by Government grants and partly by British and American missionary organisations.

## MEDICINE AND THE LAW

### Claim for Negligence against Surgeon and County Council

Mr. Justice Finlay has an important judgment to deliver in the present legal sittings in the action brought by Mrs. Dryden against Dr. John Stewart and the Surrey County Council. The plaintiff claims damages for alleged negligent treatment during and after an operation performed at the Epsom Hospital in November, 1934. She alleges that surgical packing was inserted after the operation and that no proper precaution was taken for its removal. It is her case that the packing must have been inserted under an anæsthetic when the doctor was in charge; if inserted by a nurse, it could not have been done without the doctor's knowledge. Against the defendant county council she complains that her symptoms were not properly reported to the doctors in charge: she says she was discharged from the hospital as recovered when she was really a very sick woman, and that in consequence she developed pyelitis and cystitis and suffered pain and that this trouble was likely to recur at any future pregnancy. The case was opened at the Surrey assizes and adjourned to the High Court in London. The defence is a denial of the alleged negligence. Dr. Stewart says he is certain he left no swab at the time of the operation; if any packing or plugging had been used, the fact would have been noted on the patient's bed card. The county council says it is not called upon to explain the presence of the packing: it denies that the hospital nurses were negligent, and it contends that the nurses were not, when taking part in the operation, the servants of the hospital; the hospital and the nurses did not stand in the relative position of master and servant; the hospital could not tell the nurses how to do their duties. On the other hand, the plaintiff's counsel has asserted that this legal rule, whereby a hospital is not liable for the negligence of its skilled staff, is based on the view that the services of the hospital are gratuitous. He says it could not be argued that a nursing-home (where patients are paid for) is not responsible for the negligence of its staff. As 30s. per week were paid for Mrs. Dryden at the Epsom Hospital, it is contended by her counsel that she is in the same position as if she had paid 20 guineas a week in a nursing-home. It will thus be seen that the judgment which Mr. Justice Finlay is to deliver as soon as possible after the Easter vacation promises to be full of interest to the medical profession and to hospitals.

### Poor Prisoners and Their Witnesses

In commenting on the proceedings against Mrs. Harding (*THE LANCET*, April 11th, p. 860) where fresh medical evidence was admitted in the Court of Criminal Appeal with the result that her conviction was quashed, we suggested that it was strange that the evidence was not available at the trial. When this fresh evidence was tendered, her counsel apparently explained its previous absence by stating that she was defended under the Poor Prisoners' Defence Act. A correspondent has written to point out that, if Mrs. Harding's counsel was briefed from the dock, he deserves all possible credit for having ultimately obtained the necessary evidence and for having successfully submitted it to the appellate tribunal. Nobody will wish to belittle the advocate's unselfish work or the intervention of the medical

witness whose official position happily gave him an opportunity to serve the cause of justice. Exactly what happened in the appointment of a barrister to defend Mrs. Harding is not quite clear. A "dock defence" is the name usually given to the direct instruction of counsel by an accused person. There is an ancient forensic convention that anybody who is tried on a criminal charge can produce a guinea and claim to be defended by any barrister who is present in court and is not engaged for the prosecution. This is one of the exceptional cases where a lay client can instruct a barrister directly without the intervention of a solicitor. It naturally follows that there is scant opportunity for obtaining witnesses, since the barrister is acting on the spur of the moment and since it is not the province of a barrister but of a solicitor to seek out and mobilise prospective witnesses. Another method of extempore defence is illustrated when the judge asks some barrister in court to undertake the defence of an undefended prisoner. This the judge will do if he sees a possible line of defence; it is a chance for a young barrister to show his paces, and his services are given gratuitously. These two methods existed long before the Poor Prisoners' Defence Act was passed. The statute has made a twofold difference: in the first place both solicitor and counsel can be assigned and will receive a prescribed fee; secondly, since the solicitor is assigned in advance of the trial, there should be no difficulty in securing the attendance of necessary witnesses.

### Coroner on Medical Errors

Dr. R. L. Guthrie, the East London coroner, recently observed that, if every doctor was to blame for every mistake, medical practice would be impossible. He was completing an adjourned inquest on a patient who had undergone an operation for appendicitis but whose appendix was found to be free from disease. It was clear that the surgeon had examined the patient with all proper care; a medical witness said he considered the operation necessary "even in the light of after events." The surgeon was exonerated from blame and a verdict of "death by misadventure" was recorded. Dr. Guthrie's observation is a useful reminder that medical science makes no pretence to the exactness of the multiplication table and that there is certainly no liability in criminal negligence for a mistaken diagnosis, made after a reasonably careful examination of the conditions, if the resultant treatment should unhappily end fatally.

## UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

### A NEW SURGEON-GENERAL

Dr. H. S. Cumming having recently resigned as surgeon-general of the U.S. Public Health Service on grounds of ill-health, after a long and most distinguished career, President Roosevelt named Dr. Thomas Parran, Jr., to succeed him. A few days later this appointment was ratified by the senate and Dr. Parran was getting ready to leave Albany for Washington. He will be the youngest surgeon-general in the history of the service. He was born at St. Leonard, Maryland, in 1892 in a house built of English bricks; one of his ancestors brought these bricks across the Atlantic as ballast for a tobacco ship. After a successful career in the public health service Dr. Parran was appointed commissioner of health for New York State. That was in 1930 when

Franklin D. Roosevelt was governor. Last autumn in Milwaukee Dr. Parran became president-elect of the American Public Health Association. Dr. Parran holds somewhat advanced views on public health, and especially on what we call "socialised medicine." Members of the medical profession will watch with some anxiety to see what influence these views will have in shaping the policies of the public health service. Science Service news agency announces that Dr. Parran's programme has been summarised by himself as follows:—

1. To finish the job of wiping out tuberculosis.
2. To wipe out . . . syphilis, the end-results of which "crowd our jails, our poor-houses and our insane asylums."
3. To make available to people everywhere facilities for the proper diagnosis and treatment of cancer. . . .
4. To reduce the "disgracefully high" death-rates of mothers in childbirth and babies in the first month of their lives.
5. To correct the conditions resulting from improper diet.
6. To restore crippled children to lives of usefulness.

Dr. Parran visited Sweden last summer and came back deeply impressed with the success of that country's campaign to control syphilis. When he was refused permission to use the word syphilis even in the most general connotation in a radio address he resigned from the committee for education by radio.

## PARIS

(FROM OUR OWN CORRESPONDENT)

### SOME VENEREAL DISEASE STATISTICS

WHEN due allowance is made for the wide gulf between statistics and veracity, it is possible to glean interesting and sometimes instructive information from them. The Union des Caisses d'Assurances Sociales of Paris has recently issued a study of the incidence of, and campaign against, venereal disease in France. It appears that as many as 20 per cent. of men suffering from syphilis are aged 30-40, and only 5 per cent. aged 50-55; in other words, syphilis is pre-eminently a disease of the best working age. The same authority estimates that 10 per cent. of all cases of invalidism can be traced to syphilis. Still more arresting are the figures quoted by Dr. Cavaillon and Dr. Dufour in an appendix to this study. They calculate that, every year in France, syphilis causes 20,000 deaths between the sixth month of intra-uterine life and the third month of infancy. It prevents the birth of 40,000 infants every year, causes 80,000 deaths, and costs 140,000 human lives, even when no account is taken of the degenerate, the blind, the deaf-mutes, the paralytic, the ataxic, &c. What is perhaps the most startling statement of all is that 40 per cent. of the diseases for which treatment is given in hospital are venereal. Insanity costs France more than 200 million francs a year, and a quarter is attributed to syphilis. In 1916 a veritable epidemic of syphilis was a source of grave concern to the French public health authorities. Since then, the defensive reaction has been so effective that, at the beginning of 1936, the country was equipped with 1821 venereal disease services, not including the services attached to hospitals and certain dispensaries. Thanks to the activities of these centres, neurosyphilis has been reduced to such an extent that tabes is ten times less common

than it was before the war. It is a curious and not altogether satisfactory observation that the care of venereal disease patients is shared by well equipped, more or less public, services and unscrupulous quacks. The general practitioner is out of the picture.

### A FRENCH MEDICAL DEFENCE UNION

The Ligue Médicale de Défense Professionnelle, commonly and affectionately known as "Sou Médical," is very much of a going concern. It is affiliated to the weekly journal, *Concours Médical*, in the sense that you wash one hand with the other. Between 1926 and 1933 the average number of new members per year was 394; in 1935 they numbered 739. At the end of 1925 there were 4500 members, and at the present time there are 7273. A list of the cases dealt with shows that the recovery of medical fees is the sphere in which the aid of his defence union is most often invoked, and there is an increasing proportion arising out of accidents—road and occupational. Differences of opinion between doctors and tax collectors also seem to be common. The material resources of Sou Médical amount to more than two million francs; this backing helps it to insure its members, who pay 100 francs a year, for 100,000 francs against the risk of "la responsabilité civile," a term which even courageous linguists shirk translating. When a member pays 150 francs a year, he not only becomes a reader of, or at any rate a subscriber to, *Concours Médical*, but he has his aforementioned risk covered to the tune of 500,000 francs. With its six lawyers and experts in other fields, Sou Médical is in a position to render much useful service at a very moderate charge.

LOUIS HENRI VAQUEZ

The death is announced of Prof. Vaquez on April 15th at his home in Paris. Born in 1860, he had a distinguished medical career and he enjoyed an international reputation as a specialist in diseases of the heart. To many his name will be familiar in connexion with the instruments he devised for measuring the blood pressure. He was a professor of the faculty of medicine of Paris, a member of the Academy of Medicine, and an officer of the Legion of Honour.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

### COMPULSORY RETIREMENT OF OFFICERS OF LOCAL AUTHORITIES

At the last meeting of the joint committee of the Grangegorman and Portrane mental hospitals, a resolution was passed which stated: "That, in compliance with the instructions of the Minister for Local Government and Public Health as set forth therein, all established officers aged 65 years and upwards now eligible for full or partial superannuation under the 1890 or 1909 Superannuation Acts be requested to submit their resignations and applications for superannuation at the next monthly meeting." The action of the committee is an example of the confusion into which local authorities throughout the country have been led by the lack of clarity in the circular issued some weeks ago by the Minister for Local Government and Public Health. Local authorities still persist in regarding the circular as mandatory despite the Minister's repudiation of such an interpretation. On March 12th in the Dáil he



stated that no Order had been made, and on March 24th he repeated this statement explicitly: "The circular letter is by way of recommendation to local authorities; it is not an order." He further stated that the local authorities had powers enabling them to take the action recommended in the circular, but he was silent when questioned for the statutory reference to such powers. The possession of such powers is widely questioned, and it has been stated in the daily press that the Local Government Officials' Association—a body representative of the officers of local authorities—has obtained opinion of senior counsel that no such power resides in the local authorities. The council of the Irish Free State Medical Union has advised its members who might be adversely affected if the recommendations of the circular were carried out to take no step toward resigning at present.

#### MR. HENRY S. MEADE

The French Government has conferred on Mr. Henry S. Meade the rank of Chevalier de la Légion d'Honneur. Mr. Meade, who is one of the surgeons to St. Vincent's Hospital, Dublin, worked as a surgeon for a considerable time in French hospitals during the late war.

## PANEL AND CONTRACT PRACTICE

### Test Prescriptions

A PRACTITIONER in the Home Counties was asked to write a test prescription and did so, under protest, in such a way as to make it clear to any chemist to whom it might be presented that it was a test prescription. Approached in turn by the insurance and the panel committee he relented to the extent of saying he would be prepared to issue an amended prescription, but he was adamant in his intention to inform the local chemists that he was issuing it. His attitude is accordingly being investigated by the medical service subcommittee. During the discussion a medical member of the committee imputed to the sponsor of the Act the statement that the dispensing of medicines by chemists was designed to secure that doctors should not give their patients "bad drugs," but it now appeared that an elaborate intelligence system was necessary to ensure this. If there had to be a system of tests it should, he thought, be an efficient one. He seems to have been unaware that the schemes for testing drugs and appliances supplied to insured persons are designed simply to check the accuracy with which they are dispensed. Under their terms of service the drugs and appliances which chemists supply must be of a grade or quality not lower than that specified in the Drug Tariff, which is almost invariably that of the B.P. or its codex. If not included in it they must be of a grade or quality not lower than that ordinarily used for medical purposes. Inspectors under the Food and Drugs Acts see that drugs are of a proper degree of purity. In the early days of the testing scheme, before the issue of test prescriptions was made part of the practitioner's terms of service, the protestant would prescribe for Mr. B. Ware, Mr. O. B. Careful, or Mr. A. Test.

### Secrecy of Records

There has been some concern about the possible leakage of information on forms of medical record. The instructions to insurance committees lay it down that the obligation laid on them to maintain strict secrecy as to the information in their possession extends generally to all information, of any kind whatever (including names and addresses), about all classes of insured persons and their dependants,

### FOTHERGILL TESTIMONIAL FUND

THE following is the fifth list of subscribers to the testimonial to Dr. E. Rowland Fothergill received in response to the letter published in the *British Medical Journal* and *The Lancet* of Jan. 18th:—

Amount previously acknowledged, £1361 12s.  
R. L. Newell (Manchester), £2 2s.; Carnarvonshire Panel Committee, £5 5s.; E. R. Sweeney (London), 10s. 6d.; J. P. Davie (Chesterfield) and H. Downer (Hove), each £1 1s.; Bedfordshire Local Medical and Panel Committee, £21; Carmarthenshire Panel Committee, £5 5s.; Portsmouth Panel Committee, £13 8s.; Northampton Panel Committee, £2 2s.; Glamorgan Panel Committee, £10 10s.; C. J. Marsh (Yeovil) and A. T. Jones (Mountain Ash), each £1 1s.; J. Macfadyen (Newcastle-on-Tyne), £1; F. A. L'E. Burges (Birmingham), £2 2s.; Sir Thomas Dunhill (London), £3 3s.; F. H. Alexander (Littlehampton), H. Child (Brighton), —, Marshall, F. Hinds (Worthing), N. E. Chadwick (Hove), D. D. Macintosh (Worthing), W. N. Maple (Hove), Nora Crow (Brighton), A. Barnes, Sir Hubert Bond (Brighton), A. E. Cawston (Lewes), J. V. Banner (Brighton), W. A. Wood (Brighton), and Roderick Clapham (Hove), £27 9s. 6d.; W. P. S. Branson (Frimley Green), £2 2s.; B. R. Rygate (London), 10s.; C. F. T. Scott and W. Paterson (Willesden), each £1 1s.; Adam Fulton (Harrogate), £2 10s. Total £1466 17s.

It has been decided that the fund will be closed at the end of May and it is hoped, therefore, that any intending subscribers will forward before that date their contribution to the treasurer, Fothergill Testimonial Fund, British Medical Association, B.M.A. House, Tavistock-square, London, W.C.1.

which may come into the possession of the committee, its members, and officials in their official capacity. Even when application is made by the police for information as to the addresses of insured persons, the foregoing instructions are sufficiently explicit to warrant the refusal of information. In cases where the entries on a record card are likely to be of assistance to the investigation of a question by the medical service subcommittee, it is the practice to secure the consent of the insured person to the production of the medical record before it is even examined by the subcommittee.

### Grubby Envelopes

An insurance doctor had employed a surgery attendant who for many years had been in the habit of taking the medical records from the file as patients arrived so that each patient on passing into the consulting-room could himself hand the F.M.R. to the doctor or his assistant. After surgery hours the attendant would restore the records to the cabinet, but naturally over a period of years some of the envelopes became dirty. Recently the doctor appointed a new surgery attendant who developed pulmonary tuberculosis. The doctor pointed out to the insurance committee that it was difficult effectively to disinfect and clean the envelope records and asked for duplicate envelope records to which he might transfer the notes. The committee consulted the Department, who took the view that, in the special circumstances, if in the case of such records as the doctor considered should be renewed he would enter on the back of a new envelope a brief summary of the essential facts of the medical history, as indicated by the clinical notes on the old envelope, the latter might then be destroyed. No notes other than this summary should be made on the fresh envelope; particulars of further illnesses, for instance, should be recorded on continuation cards. Medical records have now been in existence since January, 1921, and the condition of some of them, especially where handled by the insured persons themselves, is certainly not hygienic. Other practitioners will be considering the desirability of substituting a clean new record where the condition of the existing record is unsatisfactory.

## CORRESPONDENCE

## PLACENTAL EXTRACT IN MEASLES

To the Editor of THE LANCET

SIR,—Several references have appeared in our medical journals, following observations reported in the American literature by McKhann and Chu and others, to the use of a new reagent for passive immunisation in measles. This reagent, known as placental extract or immune globulin (measles), has awakened wide interest, and I have received many inquiries from practitioners and medical officers of health as to its value in prevention and attenuation in measles. Through the foresight and courtesy of my laboratory and administrative colleagues in the London County Council, and Dr. Petrie of the Lister Institute, I have been able to try three samples of this reagent. As will be seen from the following the results have been favourable, and in view of the importance of the subject I have thought it desirable to give some details of these preliminary experiments.

The first step was to demonstrate if possible the fact that placental extract does in fact contain measles antibody, and an attempt was made to produce the immunity reaction of Ravina and Debré. Convalescent measles serum and placental extract were accordingly injected at separate sites intracutaneously in 0.2 c.cm. amounts into the skin of a patient in the early prodromal stage of measles. On the rash appearing three days later it was inhibited over the area of skin infiltrated by the two reagents. The convalescent serum area was however about twice as large as that produced by the placental extract, and the inhibition of the rash was complete, whereas with the placental extract, although the area of inhibition was quite distinct it was not quite complete in that there were faint traces of rash.

Having thus proved that the extract contained measles antibody, comparative passive immunisation experiments were carried out when opportunity arose as a result of measles cross-infection in various wards. In each ward outbreak the exposed susceptibles were divided into two groups of approximately equal number and similar age-distribution. One group received 5 c.cm. convalescent measles serum and the other varying doses of placental extract. The day of exposure varied from one to five days, but in only one outbreak was complete protection obtained with both reagents, whilst in another complete protection was obtained in the convalescent serum group but not with placental extract. Otherwise the occurrence of mild or modified cases was fairly equally distributed according to the numbers in the groups and the type of reagent. In all 69 children received injections, 35 receiving convalescent measles serum and 34 placental extract. In the convalescent serum group 7 contracted modified measles, and in the placental extract group 7 contracted modified measles and 3 mild measles. All cases were uncomplicated with one exception in the placental extract group, a child of two years suffering from severe whooping-cough developing double otitis media ten days after the onset of mild measles. Reactions after injection of placental extract consisted in a flicker of temperature to 99° or 100° F. the day after injection in most cases, whilst one case showed an erythematous rash a week later. The dosage employed with two of the extracts was 10 c.cm. and 3 c.cm. respectively, the dosage recommended by the laboratory of origin, whilst the third extract was employed in double the dose—viz., 4 c.cm. My

results are insufficiently numerous to lend themselves to analysis from this point of view, and in any case the dosage must vary with the degree to which the laboratory worker feels justified in concentrating his product.

From these results it would appear that in placental extract we have a reagent available for passive immunisation in measles, less potent perhaps than convalescent measles serum, but at least equal to adult serum. The importance of this can hardly be over-estimated in view of the difficulty in maintaining an adequate supply of the latter reagents. Obviously the routine commercial distribution of placental extract through the ordinary channels would present no difficulty.

I am, Sir, yours faithfully,

ALEX. JOE.

North Western Hospital, Hampstead, N.W., April 20th.

## HYPERVITAMINOSIS D

To the Editor of THE LANCET

SIR,—Dr. Thatcher's paper and Prof. Tanner Hewlett's letter, in your issues of Jan. 4th and 11th, leave unanswered the question: "What determines the toxicity of cod-liver oil? Does this depend on its vitamin-D content?"

The available evidence, both experimental and clinical, is conflicting. Thus A. F. Hess and Lewis<sup>1</sup> in 1928 found that patients receiving 2.5 mg. of irradiated ergosterol daily lost weight, developed slight fever, and had hypercalcaemia, hyperphosphatemia, and albuminuria. Bamberger and Spranger<sup>2</sup> in the same year observed vomiting, loss of weight, and albuminuria in 10 of 11 tuberculous children receiving varying doses of irradiated ergosterol up to 30 mg. daily (from 0.4–2.5 mg. per kg. of body-weight). Gyorgy<sup>2</sup> (1929) reports the same effects also, in children with tuberculosis, from daily doses of from 3–10 mg. Two deaths clearly attributable to irradiated ergosterol have been reported<sup>2</sup>: in Putscher's (1929) case an infant given six drops of Vigantol daily died at the age of five months; while Thatcher's (1931) patient was a boy aged eighteen months, for whom a quantity of irradiated ergosterol "equal to about twice the recommended curative dose" had been prescribed. Gough<sup>2</sup> (1933) produced lesions in the kidneys of rats by moderate doses of vitamin D combined with large doses of acid and alkaline orthophosphates. On the other hand, J. H. Hess<sup>3</sup> gave infants up to 52 times the prophylactic antirachitic dose for long periods and 250 times that dose for short periods without producing hypercalcaemia or any of the clinical signs of overdosage reported by other writers. Furthermore, I have notes of a case of a three-year-old male child who has been taking vigantol, five drops three times daily, and continuously, since he was two years old for treatment for one of the radiological heresies "hilum tuberculosis." His health, weight, appetite, and urine have all been normal throughout.

Healthy adults taking large quantities of cod-liver oil occasionally develop tachycardia and precordial discomfort, even when there is no question of gastric disturbance to account for this (E. Mellanby, 1924).<sup>4</sup> Agduhr<sup>4</sup> (1926–29) found that cod-liver

<sup>1</sup> Hess, A. F., and Lewis, J. M.: *Jour. Amer. Med. Assoc.*, 928, xci., 783.

<sup>2</sup> Quoted by Hadfield and Garrod: *Recent Advances in Pathology*, London, 2nd ed., p. 145.

<sup>3</sup> Hess, J. H., et al.: *Jour. Amer. Med. Assoc.*, 1930, xcv., 316.

<sup>4</sup> *Vitamins: A Survey of Present Knowledge*. Med. Research Council, Spec. Rep. Ser. No. 167, London, 1932.

oil, given continuously to animals, may produce toxic effects on the heart and the development of pigment and/or fatty degeneration of the heart-muscle, transformation of the muscle-cells into connective tissue, and calcareous incrustations. Norris and Church<sup>4</sup> (1930) have shown that small doses of isoamylamine, as found in cod-liver oil, and also choline, given continuously, may produce paralysis, convulsions, and lack of growth; they suggest that these bases may be the toxic agents in cod-liver oil. As evidence that cod-liver oil in large doses is not necessarily harmful I may mention that a man I know, a police officer 25 years old, who is exposed to the sun of the tropics most of the day, has been in the habit, since 1930, of taking two coffee-cups full of pure cod-liver oil three times daily, because he is thinly built. He has so far remained in perfect health and shows no sign of any toxic effect. It is a pity that, in spite of recent studies, we are still unable to establish for certain the factor or factors which prevent cod-liver oil from being, in Prof. Hewlett's words, "the entirely innocuous substance it is generally supposed to be."

I am, Sir, yours faithfully,

HOSNY AYAD,

P.M.O. Government Hospital, Shanshour, Egypt.  
March 26th.

#### "HYPERGLYCÆMIC COMA"

To the Editor of THE LANCET

SIR,—Perusal of p. 894 of your last issue has stimulated me at length to give voice to a protest against the term "hyperglycæmic coma." This term is inaccurate, coma not being produced by hyperglycæmia. The term is educationally misleading. As an examiner in medicine and in therapeutics, and to nurses, I have been struck by the large number of candidates who have been misled. The individual who first introduced the phrase has well merited a long term of penal servitude for the intellectual crime he has committed. Teachers who persist in using it, and writers who perpetrate it, are accessories after the fact. Why not talk of diabetic coma in contra-distinction to hypoglycæmic or insulin coma?—I am, Sir, yours faithfully,

London, W., April 20th.

GEOFFREY BOURNE.

#### MENTAL HYGIENE IN MENTAL HOSPITALS

To the Editor of THE LANCET

SIR,—Might I suggest, since apparently the pages of THE LANCET are now thrown open to such major issues, that as a further elementary axiom "Four Asylum Psychiatrists" should be compelled to learn that the word "asylum" in this country is by law non-existent, and that such an "hygienic" measure as they propose, and seem to need, can hardly prove effective during such a short compulsory evacuation.

I am, Sir, yours faithfully,

T. J. HENNELLY.

Cardiff City Mental Hospital, April 20th.

#### SEX AND CULTURE

To the Editor of THE LANCET

SIR,—My attention has been drawn to a leading article (in your issue of Feb. 22nd) on Sex and Culture by a pious adaptation in one of our American health periodicals. We puritans love to upholster our prejudices with scientific trimmings and the rather broad generalisations in your editorial give us ample opportunity. Let us suppose that Dr. Unwin has established a correlation between temple building and sexual restraint, and that his fellow anthropologists will agree to his thesis. Let us assume that temple building is evidence of cultural progress

amongst uncivilised people, though why it should be so regarded it is hard for a layman to imagine and your article does not explain. But suppose it is! Surely nobody wants us to believe that temple building and post-funeral attentions to the dead are evidence of culture in a *civilised* community? That would make the Quakers the least cultured of Christian sects and far less cultured than the Hindus. And see in the Old Testament the story of the Jews. Compare their sexual restraint in the days when they worshipped the Arc and built the Temple with their sexual morality when they discovered that "God dwelleth not in temples made with hands." Perhaps Dr. Unwin who lives after all in a civilised community needs to revise his social philosophy all over again.—I am, Sir, yours faithfully,

Santa Fé, N.M., April 4th.

J. ROSSLYN EARP.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. M. Brown to *Frobisher*; and R. W. Nesbitt to *President* for course.

Surg. Lt.-Comdr. F. B. Quinn to rank of Surg. Comdr.

Surg. Lt.-Comdr. T. W. Froggatt to *Pembroke* for R.N. Hospital, Chatham.

Surg. Lt.-Comdrs. (D.) C. J. Finnigan to *Pembroke* for R.M. Infirmary, Deal; R. M. Finlayson to *Rodney*; D. L. Simpson to *Boscawen* for R.N. Hospital, Portland; and H. J. Luck to *Pembroke* for R.N.B.

Surg. Lts. F. W. A. Fosbery to *Lupin*; M. A. Rugg-Gunn to *Repulse*; and W. W. Simkins to *Ganges*.

Surg. Lt. (D.) K. E. J. Fletcher to *Pembroke* for R.N. Infirmary, Deal.

Surg. Lts.—The following have been transferred to the permanent list: W. W. Simkins, W. J. F. Guild, F. W. Chippindale, M. G. Ross, W. A. Ryan, D. D. Steele-Perkins, G. H. C. Southwell-Sander, G. A. Lawson, and C. P. Collins.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. A. R. Thomas to *Rodney* and to *Encounter*.

Surg. Lt. G. F. Jones to *Drake* for R.N.B.

Surg. Sub-Lt. R. T. Gaunt promoted to Surg. Lt.

Proby. Surg. Lt. R. R. Prewer to *Victory* for R.N. Hospital, Haslar.

### ARMY MEDICAL SERVICES

Col. N. Low, D.S.O., O.B.E., late R.A.M.C., having attained the age for retirement, is placed on ret. pay.

Lt.-Col. F. R. Coppinger, O.B.E., from R.A.M.C., to be Col.

### ROYAL ARMY MEDICAL CORPS

Lt.-Col. R. Gale, D.S.O., is placed on the half-pay list on account of ill-health.

Majs. C. D. M. Buckley, M.C., and J. C. A. Dowse, M.C., to be Lt.-Cols.

Short Service Commissions: Lt. A. MacLennan to be Capt.

### ARMY DENTAL CORPS

Capt. R. G. Law to be Maj. and retires receiving a gratuity. (Substituted for notification in the *Gazette* of Oct. 15th, 1935, *vide* THE LANCET, Oct. 26th, 1935.)

### TERRITORIAL ARMY

Capt. F. A. Belam (late R.A.M.C., Spec. Res.) to be Capt. Lt. H. Dickie to be Capt.

Lt.-Col. S. J. C. Holden, T.D., retires on account of ill-health and retains his rank, with permission to wear the prescribed uniform.

### ROYAL AIR FORCE

*Dental Branch*.—L. C. Bellsham-Revell is granted a non-permanent commission as Flying Officer and is seconded for duty at Guy's Hospital, London.

### INDIAN MEDICAL SERVICE

Capt. J. W. Richmond forfeits two years' service for purposes of promotion.

Lt.-Col. R. B. Lloyd retires.

## OBITUARY

**SAMUEL OSBORN, F.R.C.S. Eng., L.S.A.**

Mr. Samuel Osborn, who died at his house at Datchet, Buckinghamshire, on April 16th, having attained the great age of 88 the previous day, was well known for his distinguished work in the Red Cross service and on behalf of the aims and efforts of the St. John Ambulance Brigade. He was born at Brixton, the son of Mr. Samuel Osborn, F.R.C.S., and was educated at Epsom and at Wren's famous coaching establishment. He received his medical training at St. Thomas's Hospital, where he qualified



MR. OSBORN

(Photograph by Elliott &amp; Fry)

as M.R.C.S. in 1871 and held the resident appointments of house physician, house surgeon, and accoucheur. He became F.R.C.S. in 1876, and was for a time surgical registrar at St. Thomas's Hospital, and from 1878 onwards held the post of anaesthetist for five years, during which period he was a frequent contributor to the hospital reports, and wrote papers also in *The Lancet* and

the *British Medical Journal* on diseases of the testis. He was elected surgeon to the Hospital for Women in Soho-square, and at one time had a bent towards gynaecological practice, as was manifested in a small book entitled "Sympathetic Affections of the Breast, Bladder and Rectum, with Uterus and Appendages," but he did not long pursue this line of practice.

Osborn's associations with the Order of St. John of Jerusalem began over 40 years ago, and his St. John Ambulance lectures on First Aid to the Injured and on Nursing were fully recognised for their practical value at the time of their issue. They were couched in simple and practical terms, ran through seven editions, and were translated into many languages—Chinese, French, German, Greek, Japanese, Spanish, and Hindustani—making of their author a truly international character in ambulance work. His practical contributions to that work were many and great, and made in situations which were often attended with notable hardship, calling for courage as well as intimate knowledge. In the Greco-Turkish war in 1897 he was surgeon to the Red Cross and was appointed to the Royal Order of the Redeemer of Greece. In the South African war he was surgeon to Lord Methuen's column in the South African Field Force and, acting also as Red Cross surgeon, he was attached to more than one field hospital, was mentioned in dispatches, and was decorated with a medal and clasps in connexion with the campaign. At the cessation of hostilities he was appointed a Knight of Grace of the Order of St. John of Jerusalem, and later became permanent secretary of the International Red Cross Congress. In the Balkan

war of 1912 he was surgeon to the Turkish forces, and two years later at the outbreak of the European war he served as Red Cross surgeon in Belgium. On arrival at the seat of hostilities he found the Germans already in occupation, and his unit gave aid to both sides impartially. Later he was for two years resident surgeon to Lady Dundonald's Hospital in London. He was decorated by the King of the Belgians, and received also the Japanese Royal Red Cross decoration, having previously been an honorary member of the Japanese Red Cross Society.

The public value of Osborn's services was recognised by county and civic authorities, as well as by his own profession. He was a Lieutenant for the City of London and a J.P. for the county of Buckinghamshire. He was consulting surgeon to the Surgical Appliance Society and the Metropolitan Convalescent Institute, and was for many years surgeon to the Royal Naval Artillery Volunteers; for a period he sat upon the General Medical Council as a representative of the Society of Apothecaries, and he was Master of the Society in 1919-20. He was a traveller and a keen horticulturist. In all his public and professional work and as a frequent collaborator at *THE LANCET* Osborn showed himself a sympathetic colleague. He was able, kindly, and courteous, and many will feel his death as a personal loss.

**MAURICE HAMBLIN SMITH, M.A. Camb., M.D. Durh.**

Dr. Hamblin Smith, who died in Oxford on April 15th, was a great public servant, although the extent of his greatness was realised only by those who worked closely with him. As the son of his father he naturally took a Cambridge degree in mathematics, afterwards entering as a medical student at Guy's Hospital, from which he qualified in 1896. Following some experience of private practice at Silverdale, Staffs, he joined the prison medical service. After serving as deputy in several prisons he was in medical charge in succession of Stafford, Portland, and finally Birmingham, where he remained until his retirement. At Birmingham he adhered closely to the one principle in penology which James Devon stated to be worthy of attention: "to find out why a man does wrong and make it not worth his while." His book on the "Psychology of the Criminal" (1922) showed a rare combination of long experience in prison work, knowledge of modern psychology, and courage in the expression of opinion. It was his experience in Birmingham that a court of law, when it trusts its examiner, is ready to accept his statement either that he has discovered a repressed complex which he believes to be the cause of delinquency, or that he is of opinion that further analysis would be of advantage in throwing more light upon the case or in benefiting the patient by freeing him from the impulse to commit similar offences. The human beings unfortunate or unhappy enough to become criminals owe a great debt to Dr. Hamblin Smith, for his life's work was the study of wrong-doers and the cause of their misdoing. He found in his investigations that some of the worst wrong-doing was due to inherent disabilities. During his long tenure of office he made such use of his opportunities for studying both mental defect and mental disorder that scarcely a case of either passed through the Birmingham courts without being recognised by him. He rendered equal service in his addresses on the

psychology of the criminal, given at Birmingham University and Bethlem Hospital, which he continued after his retirement from the prison medical service. He was an impressive, sometimes even poetical speaker, and a lucid writer. After his retirement three years ago to Oxford Dr. Hamblin Smith became honorary physician to the education clinic there, but his closing years were saddened by the death of his wife and his only son.

**SIR HAMILTON BALLANCE, K.B.E., C.B.,  
M.D. Lond., F.R.C.S. Eng.**

We regret to announce the death of Sir Hamilton Ballance, consulting surgeon to the Norfolk and Norwich Hospital, which occurred in Norwich on Monday last.

Hamilton Ashley Ballance was the son of the late Charles Ballance of Stanley House, Clapton, the brother of Sir Charles Ballance, whose death occurred in February last, and the youngest and only survivor of four brothers who entered the medical profession. He received his preliminary education

at Mill Hill School and his medical education at University College Hospital, where he early distinguished himself by his success in examinations. He graduated as M.B., B.S. Lond. in 1892 with first-class honours in medicine and obstetric medicine and gained the gold medal in surgery. In the same year he took the diploma of F.R.C.S. Eng. later proceeding to the degrees of M.D. and M.S. Lond. He served the resident

posts at his hospital, became senior obstetric assistant at the hospital, and assistant demonstrator of anatomy in University College. With a view to gaining all-round experience, he then held for a time the appointments of resident medical officer to the Victoria Hospital for Children and the General Lying-in Hospital, Lambeth, after which he entered general practice in Norwich. In 1898 he was elected assistant surgeon to the Norfolk and Norwich Hospital, but obtained leave of absence to serve as surgeon to the Imperial Yeomanry Hospital during the South African War. On his return he rapidly acquired a large surgical practice. At the outbreak of the European war, Ballance, who held already military rank in the Territorials, became at once attached to the 1st Eastern General Hospital at Cambridge, and in 1915 he went to France as a consulting surgeon with the British Expeditionary Force. His services in France were recognised by repeated mention in dispatches, he became Colonel A.M.S., and at the close of hostilities was made a C.B. and later a K.B.E. On taking up his career in Norwich he continued to carry on and develop a fine surgical connexion, but his work was brought to a sad close a year ago by incurable illness. To a surgeon of Ballance's experience and accomplishment the issue was clear;

he retired from practice to face the inevitable with the greatest fortitude. He possessed in high degree the poise and sound judgment about men and affairs that was characteristic of his family. He took a leading but unobtrusive part in local medical politics, and for 14 years he represented the Eastern Counties on the Council of the Medical Defence Union. Always a man of few words, his words here became more infrequent as time went on, but whenever uttered they carried weight and were apt to determine the issue of a difficult problem.

A colleague at the Norfolk and Norwich Hospital sends the following tribute: "Ballance worked untiringly for the welfare of the hospital both as administrator and surgeon. In all directions he performed his duties pleasantly, courteously, and with dignity. He was a careful and skilful operator over a wide range of surgery, his work being based on an accurate knowledge of anatomy and pathology. He was a loyal and trusted colleague with whom it was a privilege and pleasure to work. His life and personality will be held in affectionate memory by a wide circle of friends and patients, and his colleagues at the Norfolk and Norwich Hospital will treasure his example. It is fitting that a surgical ward of the hospital should bear his name."

Sir Hamilton Ballance married the daughter of the late Rev. G. S. Barrett, D.D., of Norwich, by whom he had two sons and one daughter. He leaves behind him a fine record of accomplished work, and very many friends, private and professional, to regret the tragic abbreviation of his valuable career.

**JOHN GORDON HARROWER, Ch.M. Glasg.,  
D.Sc., F.R.C.S., F.R.S. Edtn.**

It is with deep regret that we have received news of the sudden death, following a surgical operation, of Prof. J. G. Harrower, of Singapore, at the early age of 46 years. We owe to Sir Grafton Elliot-Smith the tribute which follows:—

"Prof. Harrower received his primary education at Shields-road School, Glasgow, and at 11 years of age was awarded two bursaries which enabled him to continue his education at Allan Glen's Higher Grade School, where he became an apprentice in an engineering shop. Then he joined the electrical power station of the Glasgow Corporation Tramways as a shift engineer. During his apprenticeship he attended the classes of the Royal Technical College, Glasgow, and incidentally acquired that mathematical skill which is revealed in his biometrical researches in craniology. He became so interested in electrical engineering, theory and practice, that he had the idea of devoting his medical career to practice in X ray work and radiology, but soon abandoned this intention.

"After a brilliant career as student and junior teacher in the University of Glasgow, which afforded him the opportunity of displaying his ability and versatility, he was appointed professor of anatomy in the King Edward VII. medical college at Singapore and went out to the Federated Malay States. There he was able to cultivate his interest in surgery, and eventually became consulting surgeon in the general hospital. The teacher of such intelligent students as the Chinese and Malays of Singapore soon realises that the essential discipline of instruction is to arouse the students' curiosity and encourage them to solve their problems by direct observation. Harrower realised that the best way to effect his purpose was to show them by his own example that research



SIR HAMILTON BALLANCE

(Photograph by Russell)

was the only means to cultivate interest and efficiency, and he at once plunged into research in anatomy and anthropology. In touch with the Raffles Museum he developed interest in the tree-shrews and in the lemuroid *nycticebus* and, like his nearest neighbour in the world of anatomy, Prof. Le Gros Clark, he became intensely interested in what the latter has called the 'earliest forerunners of man' and also in the human bones which were dug up in the Federated Malay States. In the dissecting-room he investigated the anatomy of the Chinese coolies, and not only did the usual recording of anomalies but also made intensive studies of the crania of different groups of coolies, the results of which were published in the *Transactions* of the Royal Society of Edinburgh and in *Biometrika*. This work raised criticism among his colleagues, who expressed doubts whether it was proper for a teacher to spend his time in this way. Harrower, who regarded research as the one thing that made life worth living in his isolation, fought for his rights and won his footing. But his research accomplished more. It brought him into contact with other anatomists of similar interests—Prof. O. Hill, of Colombo, Prof. J. Shellshar, of Hong-Kong, and Prof. Davidson Black, of Peking, so that he no longer was oppressed by isolation.

"As an influential link in this chain of British anatomists in Eastern Asia, Harrower played an important part in maintaining British prestige in medical education, and his death is a serious loss to the Far East."

Prof. Blair, regius professor of anatomy in Glasgow, formerly a fellow student of Prof. Harrower, writes: "What Harrower said or implied with reference to his interest and ability in teaching is nothing short of the truth, for he left behind with his fellow students a reputation as a brilliant teacher, of strong and forceful personality, and a man respected and admired."

#### PROF. ROBERT BÁRÁNY

As we announced last week, Prof. Bárány, the otologist, died on April 8th at Upsala in Sweden, which had become his second home. It was in Vienna, where he was born, that he first attained his great reputation. A graduate of the university there, he went in 1901 to Frankfort and Freiburg, and then for a short time to Paris—"to learn more than the rest," as he said to his friends. On returning to Vienna in 1903 he found a place in the aural clinic of Adam Politzer, then the Mecca of the specialty. Very soon his attention was directed to the nervous system of the ear and its connexions with the eyes, and he endeavoured to discover a new anatomical and pathological basis for disorders affecting them, and hence for the treatment of these disorders.

As he said in the lecture delivered later in Stockholm when they gave him the Nobel prize, his attention had been caught by the rhythmic nystagmus caused by syringing the ears with water. He soon found out that this had something to do with the temperature of the water, and by patient observation he was able to analyse the factors governing labyrinthine irritation. This work produced order out of chaos and has furnished otologists with a reliable and valuable method of examination. Bárány's observations dovetailed into those of Ramón y Cajal and Bolk, and meant a big advance in the diagnosis of disease of the brain and the localisation of tumours, especially those of the cerebellum. His first reports were published in 1906, three years

after he entered the Politzer Clinic, and though at first his ideas met with much scepticism—not to say ridicule—they soon won support abroad, and by 1910 were generally accepted. In 1908 he had been made Dozent (or teacher) in the University of Vienna, but his work was interrupted by the outbreak of war, on which he was called to the colours. He saw active service and was captured by the Russians; and it was during his imprisonment that he learned of his election as Nobel prizeman in medicine for 1914. He was the first Austrian to win a Nobel prize; and he was a Jew. The Russians were generous enough to release their celebrated prisoner, and in Sweden, on his way home, he was asked to take over the Upsala chair of otology. Not being altogether happy in Vienna he gladly accepted the offer, and in Sweden he made for himself a great name as an aural surgeon and an authority on head injuries. The surgical treatment of deafness, of sinus disorders, and of cerebral and cerebellar abscess were his favourite field of work, but professional interests did not prevent his attaining eminence also as philanthropist, pacifist, and humanist. It was on his initiative that in 1929 an International Academy of Politics and Social Science for the Promotion of World Peace was founded in Sweden: he was convinced that only "increase of knowledge, science, and insight would bring about final understanding among the nations," and he worked intensely at this problem. He was a prolific writer and for a time editor of several scientific journals.

Rather delicate in boyhood, Bárány was never very strong, and he never quite got over the effects of military service and captivity. After going to Upsala he became thoroughly Swedish, a faithful son of his new country; but he did not forget Vienna, to which his heart always drew him back. This week he would have reached the age of 60 and there was going to be a presentation to him from otologists throughout the world, who wished to express in this way their respect and admiration. But the occasion for rejoicing has been changed to one of mourning for an untimely death.

He leaves five sons.

#### ARTHUR BALDWIN DUEL, M.D. Harvard, F.A.C.S.

Dr. Arthur Duel, who has died in New York, will be remembered here for his association with the late Sir Charles Ballance in the surgical treatment of facial nerve injuries. Dr. Duel, on his own initiative, erected an experimental station in the grounds of his country home outside New York, and invited Ballance to carry on there his experimental work on nerve anastomosis and grafting. As the result of this coöperation Duel was able to elaborate and perfect his technique of nerve grafting for facial paralysis, and to use it in the treatment of over seventy cases. It is for others to assess the final results of this operation, but it can be said that it has already justified itself as a method of treatment, although it is one which demands a perfect technique and unremitting attention during the post-operative period. Filled with a boyish enthusiasm and a keenness for his work, Duel tested out his ideas and methods experimentally, making failures teach him and not allowing them to depress him.

"A few months ago," writes Dr. John Beattie, "Duel sketched out to me his plans for an attack on the problem of the 'tic' which he noted during the period of recovery in his human patients. His experiments were always simple, carefully planned,



and carried out with a surgical technique which was a joy to watch. Duel had a charming personality. Well-beloved by his contemporaries he occupied the highest offices in his own field of work, and enjoyed the friendship of those in the United States who were and are endeavouring to secure for medical research its proper place in medical education and post-graduate training. His lectures on his own speciality were simple and direct, neither claiming

too much for his method nor decrying the efforts of others."

Those who listened to Dr. Duel's lectures at the Royal College of Surgeons of England in October, 1934, will remember the stress he laid on sound principles, good handicraft, and the use of the experimental method in the development of surgery. The profession in America has lost a leader and we in this country a friend and admirer.

## PARLIAMENTARY INTELLIGENCE

### NOTES ON CURRENT TOPICS

#### Reassembly after Easter: The Budget

THE House of Commons reassembled on Tuesday, April 21st, after the Easter recess.

Mr. CHAMBERLAIN, Chancellor of the Exchequer, in his Budget statement said that his total revenue from all sources on the present basis was £776,606,000. The expenditure on the basis of the Estimates was £797,697,000, leaving a deficit of £21,291,000. Dealing with minor changes in taxation which he proposed, the right hon. gentleman referred to various methods of tax evasion which, he said, were being practised within the existing law. He said that an individual in this country could now avoid tax by transferring property to persons abroad though he himself retained control of the property and enjoyed the income arising therefrom. It was proposed that income arising from such property should be taken as the measure of taxable liability. Provisions of the existing law designed to avoid loss of surtax arising from manipulation of "one-man" companies at home had been proved to be defective. They would be strengthened to meet new devices to escape tax liability. These two proposals related mainly to surtax and necessary changes in the law would take effect as from 1935-36, surtax in respect of which was due in the current year. These changes were estimated to yield the revenue £2,000,000 in the current year and £4,000,000 in a full year. Another form of tax evasion, the Chancellor of the Exchequer said, was being carried on by means of so-called educational trusts. A parent signed a deed giving part of his income to his child and as guardian received that income from himself and used it for his child's maintenance and education. The parent did no more for his child than he would have done anyhow, but he obtained relief from income-tax on this income. This practice, said Mr. Chamberlain, was becoming widespread and was unfair. He proposed to amend the law so as to provide that the income-tax liability of parents would not be affected by these educational trusts. Legislation would take the form that any income of an infant and unmarried child which had been in any way derived from the parent should be aggregated with the income of the parent for all purposes of income-tax. Any income enjoyed by the child from other sources would not be affected. It was estimated that this proposal would yield a saving in a full year of £2,500,000. This saving would be applied to a continuing process of giving relief to those taxpayers who were so hard hit in 1931. Children's allowances would be increased from £50 to £60 (a higher level than ever before) for every child. The cost of this concession this year would be £1,000,000, and in a full year £2,000,000. The general allowance for married persons would be increased from £170 (to which it was raised last year) to £180. The cost (to be found from the general resources of the Exchequer) would be £1,000,000 this year and in a full year £2,000,000.

At present Estate Duty was not chargeable on personalty abroad which had been the subject of a gift or joint investment or foreign settlement. Advantage was being taken of this to place property outside the scope of the charge. It was proposed to

place personalty abroad in the same position in this respect as personalty at home. A surtax of £1 a barrel was to be imposed on imported beer coming from non-Empire countries; there would be no alteration in respect of Empire beer. The Finance Bill would give effect to the recommendations in the recent report of the Committee on Key Industry Duties—i.e., the duties would be continued for a further 10 years, with some modifications and additions, and with provision in certain circumstances for variation of the duties from time to time. The net result of these minor changes was estimated to be an increase of revenue amounting to £1,025,000, thus reducing the deficit to £20,266,000. The Road Fund's surplus of £5,250,000 would be taken into the Exchequer. The standard rate of income-tax would be increased by 3d. in the £, giving an estimated yield in the current year of £12,000,000. The duty on both Empire and foreign tea would be increased by 2d. per lb. thus preserving the preferential margin of 2d. per lb. From this source it was estimated that the revenue would receive in the current year £3,500,000. The provision in the present Budget for defence was £50,000,000 more than that in the 1935 Budget. The final balance showed an estimated revenue of £798,381,000 and an estimated expenditure of £797,897,000, leaving an estimated surplus of £484,000.

Reviewing the national finances of the past four years Mr. Chamberlain pointed out that in 1932 old age and widows' pensions, health insurance, housing, and education required a little less than £121,500,000. In 1936 the estimated expenditure on these services was nearly £138,000,000. The aggregate present value of tax remissions made in Budgets from 1932-35 was over £50,000,000 a year.

### HOUSE OF COMMONS

TUESDAY, APRIL 21ST

#### National Health Insurance

Miss RATHBONE asked the Minister of Health what had been the total amounts under health insurance of the contributions paid and benefits received by male and female contributors, respectively, during 1935 or for the last period of 12 months for which figures were available.—Sir KINGSLEY WOOD replied: The following is the answer. The total amount of contributions received in the year 1934, the latest period in respect of which complete information is available, was £18½ million in respect of men and £8½ million in respect of women. In the same period payments on account of benefits, including medical benefit, which can be definitely classified on a sex basis amounted to £17,700,000 for men and £10,100,000 for women. In addition a sum of £2,580,000 was expended on additional benefits not in the form of cash, the division of which between men and women is not available.

ROYAL VICTORIA INFIRMARY, NEWCASTLE.—The board and governors of this hospital have decided to launch an appeal for £100,000 for extensions which include a pathological department and the opening of a new throat, ear, and eye clinic. The appeal for £150,000 made in 1927, to which Lord Runciman contributed £75,000, has only recently been realised.

## MEDICAL NEWS

### University of London

A recent examinations the following candidates were successful:—

D.P.H.

*Part I.*—Karl Biden-Steele, D. K. McI. Chalmers, Mabel J. Cooke, Florence A. Craig, Patience Craig, Janet M. Done, W. K. Dunscombe, Helen M. Evans, Jane O. French, Mary L. Gilchrist, G. E. Godber, Irene B. M. Green, Marjorie K. Hall, H. D. Holt, Joyce B. Jewson, Winifred A. Kane, Elsa V. McLaggan, J. A. R. Murphy, Eric Pereira, W. J. Pinto, G. D. Pirrie, Eleanor G. Porter, T. R. Rama Pai, M. J. A. Sandrasagra, L. D. Sarronwala, P. N. Sathe, B. K. Sikand, G. B. Smart, R. L. Tiruchelvam, and Evelyn A. M. White.

### University of Glasgow

On April 18th the following degrees were conferred:—

*M.D.*—R. T. Fletcher, Matthew Jackson, and E. A. Underwood (with high commendation); \*R. MacN. Buchanan (with commendation); A. T. Elder, John Hill, A. R. Miller, R. H. Moyes, \*Helen I. Robertson, and Elizabeth N. Young.

*M.B., Ch.B.*—Isidore Zerlin (with honours); R. A. R. Taylor, Aloysius Dunn, John Devine, and Solomon Mair (with commendation); Ian Aitchison, J. G. Aitken, G. McG. Barr, J. B. Barr, G. F. Boyle, J. G. Brown, J. L. Burnet, J. G. Cairns, Kenneth Cameron, Barbara C. Carmont, Leon Cohen, P. J. Connolly, Daniel Cryan, A. D. Cuthbert, Janet B. Dalgetty, Matthew Dantow, W. L. Girvan, C. W. H. Gourlay, W. J. Gray, J. H. Hamilton, R. M. Hoggie, Robert Hillman, K. C. Hutchin, J. M. Livingston, J. P. S. McConnell, R. S. McDougall, R. M. Maxwell, J. W. Miller, W. S. Miller, A. S. Moodie, R. A. Murphy, W. Y. Smith, W. A. McE. Stewart, H. A. Sutherland, Alice M. Taylor, W. J. Walker, David Watson, D. B. Watson, Mary G. W. Watson, Samuel Weinbaum, W. E. Whyte, A. L. Wilson, John Wishart, and C. N. Young.

\* In absentia.

Three Bellahouston gold medals were awarded to Dr. Thomas Nicol, Dr. J. B. Rennie, and Dr. W. R. Snodgrass, and the Macowen medal in surgery to Dr. R. G. Henderson.

### Scottish Conjoint Board

As a result of recent examinations of the conjoint examining board of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, the following candidates have been granted the diplomas of L.R.C.P. Edin., L.R.C.S. Edin., L.R.F.P. & S. Glasg.

Clarence Abramson, Ernst Brauer, C. P. Bringle, Ganapathi-pillay Chelvadoray, D. G. W. Clyne, Y. M. Dadoo, W. J. Ess, F. H. Feldman, Samuel Fertig, Margaret A. H. Godfrey, Manuel Green, F. H. Haine, A. D. Hoffmann, Mildred P. Hudson, C. K. Joannidis, Ludwig Jost, Edith L. Kander, William Lees, J. D. Milne, B. K. Palit, Tiberius Reiter, J. C. Reveilland, S. J. Shapiro, Kenneth Shepherd, Hermann Simchowit, D. D. Simmous, Irma Simon, O. F. Warner, Amin Wassef, C. M. Wells, and J. D. T. Wilson.

### Royal College of Physicians of Edinburgh

On Friday, May 1st, at 5 P.M., the Dr. Alexander Black lecture will be delivered to the college by Dr. J. D. Gilruth, who will speak on the Legend of Chiron, the Father of European medicine.

### Course on Applied Helminthology

Under the auspices of the University of London a course of lectures on applied helminthology with special reference to the control of agricultural and horticultural pests and the internal parasites of farm animals, poultry, and game-birds will be held at the London School of Hygiene, Keppel-street, W.C., from July 13th to 31st. Further information may be had from the secretary of the school.

### Lectures on Individual Psychology

Under the auspices of the Medical Society of Individual Psychology Dr. Alfred Adler will give an address on Thursday, May 7th, at B.M.A. House, Tavistock-square, London, W.C., at 8 P.M. His subject will be the Psychological Approach, and tickets can be obtained free of charge on application to Margaret Watson Ltd., 15, Palace Chambers, Bridge-street, S.W.1. Dr. Adler will also deliver three public lectures in the Conway Hall, Red Lion-square, on May 11th, 12th, and 13th at 8 P.M. The subjects of these lectures will be the science of the individual personality, the science of social psychology, and the science of the prevention of neurosis and crime. The chairmen on these occasions will be Sir Walter Langdon-Brown, Dr. H. C. Squires, and Dr. W. Norwood East, and tickets are obtainable from Alfred Hays Ltd., 62, Strand, W.C.2.

### University of Manchester

Applications are invited from medical graduates of this university for two Dickinson scholarships, one in medicine and one in surgery. Further particulars will be found in our advertisement columns.

### Westminster Hospital Medical School

On May 11th and 12th an examination in chemistry and physics, with an English essay, will be held at this school for the allocation of four scholarships, of £75 each, to students preparing for a degree in medicine of an English university.

### British Red Cross Society

A course of seven lectures on air-raid precautions will begin on Friday, May 1st, at 5 P.M., at the house of this society, 9, Chesham-street, London, S.W.

### Orthopaedic Scholarship

Applications for the Lord Nuffield scholarship in orthopaedic surgery are invited before June 1st. The scholar will spend two years at the Wingfield-Morris Hospital, followed by three months' travel. Further information may be found in our advertisement columns.

### Flint Cottage Hospital

The foundation-stone of the children's Jubilee ward at this hospital has been laid. Half the cost of the ward is being contributed by the employees of Messrs. Courtaulds silk factory in Flint.

### Post-graduate Course at Freiburg

A medical post-graduate course is being held at Freiburg-in-Breisgau from June 28th to July 18th, at which members of the medical faculty will give lectures. Opportunity will be given for members of the course to take part in the work of the various clinics. Further information may be had from Dr. M. Bruecher, Schwimmbadstr. 8, Breisgau-i.-Br., Germany.

### Society for the Provision of Birth Control Clinics

A lecture on the theory and practice of contraception will be given by Dr. Gladys Cox on Friday, May 8th, at 6 P.M., at the Walworth Women's Welfare Centre, 153A, East-street, London, S.E. Practical demonstrations will be given on Friday, May 15th, at 6 P.M. and at 7 P.M. by Dr. Cox, and on Friday, May 22nd, at 6 P.M. and at 7 P.M. by Dr. Lynette Hemmant. Medical practitioners and students should apply for tickets to the secretary of the clinic.

### Fellowship of Medicine and Post-Graduate Medical Association

The following courses will be given shortly: psycho-logical medicine at the Maudsley Hospital (afternoons, April 27th to May 30th), medicine, surgery, and gynaecology at the Royal Waterloo Hospital (all day, April 27th to May 9th); while arrangements for May include courses in dermatology at St. John's Hospital (afternoons, May 1st to 29th), thoracic surgery at the Brompton Hospital (all day, May 11th to 16th), urology at St. Peter's Hospital (all day, May 18th to 30th), proctology at the Gordon Hospital (all day, May 25th to 30th), venereal diseases at the London Lock Hospital (afternoons, May 25th to June 20th). Week-end courses will be held in May on infants' diseases at the Infants Hospital (May 2nd and 3rd), in chest diseases at the Brompton Hospital (May 9th and 10th), and in surgery at the Cancer Hospital (May 16th and 17th). Courses in June will include an evening M.R.C.P. clinical and pathological course at the National Temperance Hospital; an evening M.R.C.P. clinical course in chest and heart diseases at the Victoria Park Hospital; an afternoon neurology and psychotherapy course at the West End Hospital for Nervous Diseases, and week-end courses in medicine at the Prince of Wales's General Hospital; in obstetrics at the City of London Maternity Hospital; in fevers at the Park Hospital; and in surgery at the Prince of Wales's General Hospital. Courses arranged by the fellowship are open only to members and further information may be had from the secretary of the Fellowship, 1, Wimpole-street, W.

**An Expedition to Lapland**

In our advertisement columns, Surgeon-Commander Murray Leveck invites application for membership of an expedition to Northern Lapland next August and September. It is organised by the Public Schools Exploring Society; one or two honorary physicians or surgeons are required.

**National Association for the Prevention of Tuberculosis**

The council of this association has appointed Lt.-Col. Gordon G. Jolly to the post of secretary-general. Lt.-Col. Jolly is at present officiating public health commissioner with the Government of India.

**Royal Institution of Great Britain**

On May 1st Major W. S. Tucker, director of acoustical research at the Air Defence Experimental Establishment, will give the first of the Friday evening discourses since Easter. He will speak on direction finding by sound. On May 8th Sir William Bragg, P.R.S., will give his second lecture on the electric properties of crystals, and on May 15th Sir Richard Gregory, F.R.S., editor of *Nature*, will speak on Science in a Changing World. The discourses will be held at 9 p.m. at 21, Albemarle-street, London, W.

**New Health Centre**

Southwark borough council is erecting a health centre in Walworth-road at the cost of over £36,000.

**New Dispensary at Lincoln**

The Mayor of Lincoln has opened a new dispensary attached to Lincoln General Hospital. It has been erected on a slum-cleared site at a cost of £4000.

**St. Leonard's Hospital, Sudbury**

A new wing to this hospital is to be erected as a local monument to the late King. The hospital was built in 1868 and a sum of £5000 will have to be raised.

**Plight of the Cornish Hospitals**

It is stated that the West Cornwall Hospital at Penzance needs at least £20,000 for extensions, and the Royal Cornwall Infirmary at Truro £40,000, while the West Cornwall Miners and Women's Hospital at Redruth must have another 20 beds. All three hospitals are badly overcrowded.

**Carmarthen County Infirmary**

A new maternity wing and other extensions are to be added to this hospital at an estimated cost of £15,000, of which some £8560 has already been subscribed. The foundation-stone is to be laid on May 14th and when the extensions are completed there will be accommodation for 56 more beds.

**Hampstead General Hospital**

This institution is faced with a debt which has risen from £4250 at the end of 1934 to £8240 at the end of 1935. The rebuilding and enlargement of the X ray and massage department has been made possible through a donation of £8500 and it will be opened by Princess Helena Victoria on April 30th.

**Kettering General Hospital**

The daily average of occupied beds for 1935 at this hospital was 91.97, as against 76.25 in 1934. The average cost per patient, without making any allowance for the cost of out-patients, was £10 3s. 4½d. as compared with £9 10s. 7½d., and the average cost per occupied bed has increased by 8½d. The hospital guild weekly contributory scheme collected the record amount of £7393, which is an increase of £62.

**Royal West Sussex Hospital**

At the annual meeting of this institution it was stated that last year expenditure exceeded income by about £1800. Unless more money is received the hospital will have to draw upon its invested funds which amount to about £18,000. Expenses are increasing as the building is 111 years old and frequent repairs are necessary. The chairman said that if someone would give them £100,000 so that they "could knock the place down" and have a new building the cost of maintenance would be far less.

**INFECTIOUS DISEASE**

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 11TH, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1788; diphtheria, 959; enteric fever, 18; pneumonia (primary or influenzal), 757; puerperal fever, 33; puerperal pyrexia, 95; cerebrospinal fever, 28; acute poliomyelitis, 2; encephalitis lethargica, 5; dysentery, 19; ophthalmia neonatorum, 79. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 17th was 6790, which included: Scarlet fever, 990; diphtheria, 1033; measles, 3428; whooping-cough, 625; puerperal fever, 14 mothers (plus 7 babies); encephalitis lethargica, 282; poliomyelitis, 5. At St. Margaret's Hospital there were 29 babies (plus 14 mothers) with ophthalmia neonatorum.

*Deaths.*—In 121 great towns, including London, there was no death from small-pox, 4 (1) from enteric fever, 103 (37) from measles, 2 (1) from scarlet fever, 36 (12) from whooping-cough, 28 (2) from diphtheria, 42 (14) from diarrhoea and enteritis under two years, and 57 (12) from influenza. The figures in parentheses are those for London itself.

There is a slight set-back in the mortality from measles, the figures for the last eight weeks (working backwards) being 103, 81, 104, 114, 105, 84, 88, 78 for the country as a whole, and 60, 43, 62, 62, 58, 47, 38, 18 for Greater London. Liverpool reported 9 deaths, Leeds 8, Barking, Leyton, Bristol, and Norwich each 3, no other great town more than 2. Gateshead had 4 fatal cases of whooping-cough, Liverpool 3. Deaths from diphtheria were reported from 14 great towns, 5 each from Liverpool and Sheffield, 4 from Hull.

The number of stillbirths notified during the week was 243 (corresponding to a rate of 40 per 1000 total births), including 39 in London.

**Medical Diary**

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

**SOCIETIES**

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, April 27th.

*Odontology.* 8 P.M. Mr. G. T. Hankey: Complete Caries of Erupted Permanent Dentition at the Age of 13—Agnesia of the Enamel. Dr. A. MacGregor: The Lymphatic System of the Teeth and Jaws.

TUESDAY.

*Medicine.* 4 P.M. Clinical Meeting at Charing Cross Hospital, W.C.

FRIDAY, May 1st.

*Otology.* Cases at 9.30 A.M., 10.30 A.M. Annual General Meeting. Dr. G. V. Th. Borries (Copenhagen): Diagnostic Problems in Orogenous Intracranial Complications. Mr. T. E. Cawthorne: Prescription of Aids to Hearing. Demonstration of Hearing Aids.

*Laryngology.* Cases at 4 P.M., 5 P.M. Annual General Meeting. Mr. W. S. Thacker-Neville: The Treatment of Quinsy by Tonsillectomy. Dr. G. V. Th. Borries (Copenhagen), Mr. F. J. Cleminson, and Dr. Gavin Young: Headache Associated with Disease in the Nose.

*Anaesthetics.* 8.30 P.M. Annual General Meeting. Dr. E. P. Poulton: The Future of the Oxygen Tent.

FRIDAY and SATURDAY.

*Neurology.*

May 1st. Meeting in Amsterdam. Morning: Demonstrations at the Neurological Centre and Presentation of Cases in the Wards by Prof. B. Brouwer. Afternoon: Meeting of the *Amsterdamsche Neurologien Vereeniging*.

May 2nd. Morning: Demonstration of Neurosurgical Cases by Dr. Oljenick.

*Odontology.*

May 1st. Meeting in Birmingham. 7.15 P.M., Dinner at Union Club. Mr. C. M. Strong: Pathology and Treatment of Dental Infection of the Antrum.

May 2nd. 10 A.M. (Medical Institute). Mr. Harold Round and Dr. H. J. R. Kirkpatrick: Bacteriological Infections of the Mouth. 11.15 A.M., Mr. Hugh Donovan, Mr. Russell Green, Dr. Baylis Ash, Prof. Humphreys, Mr. Harold Round, Colonel Broderick, Mr. Sampson, and Mr. Strong will show Clinical Cases. Mr. John Bunyan: The Injection Technique for Taking Plaster Impression.

**WEST LONDON MEDICO-CHIRURGICAL SOCIETY.**  
FRIDAY, May 1st.—8 P.M. (West London Hospital), Sir James Walton, Dr. Maurice Shaw, Prof. E. C. Dodds, and Dr. H. W. Post: Diseases of the Stomach.

### LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

#### UNIVERSITY OF BIRMINGHAM.

TUESDAY, April 28th.—3.30 P.M. (Children's Hospital, Ladywood-road), Mr. R. A. Broderick: Dental Aspects and Treatment of Cases of Cleft Palate and Hare-lip in Children.

THURSDAY.—4 P.M., Prof. W. W. C. Topley, F.R.S.: The Mechanisms of Immunity: the Antigen-antibody Reactions. (First William Withering Lecture.)

FRIDAY, May 1st.—3.30 P.M. (Queen's Hospital), Mr. Bernard Ward: Treatment of Retention of Urine in General Practice.

#### BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY, April 27th.—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Mr. Frank Cook: Dysmenorrhœa.

TUESDAY.—2 P.M., Prof. E. H. Kettle: Pathological demonstration. 3 P.M., Dr. A. A. Miles: Extensions of the Widal Test.

WEDNESDAY.—Noon, Clinical and pathological conference (medical). 2.30 P.M., Clinical and pathological conference (surgical).

THURSDAY.—2.30 P.M., Dr. W. S. C. Copeman: Arthritis. 3 P.M., Dr. Chassar Moir: Operative Obstetrics.

FRIDAY, May 1st.—2.15 P.M., Dr. A. A. Davis: Gynaecological Pathology. 5 P.M., Sir James Walton: The Surgical Aspects of Dyspepsia.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetric and gynaecological clinics or operations.

#### FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, April 27th, to SUNDAY, May 3rd.—MAUDSLEY HOSPITAL, Denmark Hill, S.E. Afternoon course in psychological medicine.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. All-day course in medicine, surgery, and gynaecology.—INFANTS HOSPITAL, Vincent-square, S.W. Sat. and Sun., course in infants' diseases.—Courses open only to members of the fellowship.

#### HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

WEDNESDAY, April 29th.—2 P.M., Dr. Wilfrid Sheldon: Oesophageal Obstruction. 3 P.M., Dr. G. H. Newns: Morbid Anatomy of the Intestinal Tract.

Out-patient Clinics daily at 10 A.M. and ward visits at 2 P.M.

#### NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Marylebone-road, W.

WEDNESDAY, April 28th.—5.30 P.M., Dr. John Parkinson: Aneurysm.

#### MANCHESTER ROYAL INFIRMARY.

TUESDAY, April 28th.—4.15 P.M., Mr. Wilson H. Hey: Round About Peptic Ulcer.

FRIDAY, May 1st.—4.15 P.M., Dr. William Brockbank: Demonstration of Medical Cases.

#### GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, April 29th.—4.15 P.M. (Western Infirmary), Mr. J. Mill Renton: Toxic Goitre and its Treatment.

Glasgow, Southern General Hospital.—Deputy Med. Supt. £500. Grocers' Company, Grocers' Hall, E.C.—Three Medical Research Scholarships. Each £300.

Hastings, Royal East Sussex Hospital.—Locum H.S. £5 5s. per week.

Hertford County Hospital.—H.S. At rate of £180. Heston and Isleworth Borough.—Asst. M.O.H. and Sch. M.O. £500. Home Office, Whitehall, S.W.—Medical Inspector for Children's Branch. £138.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. M.O. for County Branch. At rate of £250. Also Surg. Reg. £200.

Hove General Hospital.—Hon. M.O. for Brighton Branch. Hull, Beverley-road Institution.—Asst. M.O. £350.

Hull Royal Infirmary.—H.P. to Sutton Branch Hospital. At rate of £160. Also Second Cas. O. At rate of £150.

Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.

Ipswich, East Suffolk and Ipswich Hospital.—Orthopaedic Surgeon. £500. Cas. O. £168. Also H.S. £144.

Leeds, St. James's Hospital.—Res. M.O. Also Res. Surg. O. Each £350.

Leicester, City Isolation Hospital and Sanatorium, Groby-road.—Jun. Asst. M.O. At rate of £300.

Leicester Royal Infirmary.—Hon. Asst. Radiologist. Leyton Borough.—Temp. Asst. M.O. 10 guineas per week.

Liverpool Sanatorium, Delamere Forest, Frodsham.—Second Asst. to Med. Supt. £200.

Llanelli Borough.—Asst. M.O.H. and School M.O. £500.

London County Council.—Sen. Asst. M.O.'s, Grade II. Each £500. Also Asst. M.O., Grade II. £250.

London Jewish Hospital, Stepney Green, E.—Res. M.O. and H.P. At rate of £150. Also H.S. and Cas. O. Each at rate of £100.

London Lock Hospital, 283, Harrow-road, W.—Res. M.O. to Male Depts. At rate of £175.

Macclesfield General Infirmary.—Second H.S. At rate of £150.

Manchester, Ancoats Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £100.

Manchester, Baguley Sanatorium.—Jun. Asst. M.O. At rate of £250.

Manchester Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.

Manchester Royal Infirmary and University.—Dickinson Scholarships. £300 and £75.

Margate, Royal Sea-Bathing Hospital.—H.S. At rate of £200.

Mount Vernon Hospital, Northwood.—H.S. At rate of £150.

National Temperance Hospital, Hampstead-road, N.W.—H.P. At rate of £100.

Newcastle-upon-Tyne Education Committee.—Asst. School M.O. £500.

Northampton General Hospital.—H.S. At rate of £150.

Norwich, Norfolk and Norwich Hospital.—H.S. Also Cas. O. Each £120.

Nottingham City Mental Hospital.—Jun. Asst. M.O. £350.

Nottingham General Dispensary.—Res. Surgeon. £250.

Oxford, Wingfield-Morris Orthopaedic Hospital, Headington.—Lord Nuffield Scholarship in Orthopaedic Surgery. £200.

Penshurst, Cassel Hospital for Functional Nervous Disorders, Swanlands.—Locum tenens. 10 guineas per week.

Plymouth, Prince of Wales's Hospital, Greenbank-road.—Res. Anaesthetist and H.S. to Special Depts. Also H.S. Each at rate of £120.

Princess Beatrice Hospital, Earl's Court, S.W.—Res. M.O. At rate of £150.

Princess Elizabeth of York Hospital for Children, Shadwell, E.—Res. M.O. At rate of £200.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £100.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100. Also Clin. Asst. to Surgical Out-patients. 5s. per attendance.

Radcliffe-on-Trent, Notts. County Mental Hospital.—Second Asst. M.O. £459.

Redhill, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.

Rotherham Hospital.—H.P. £180.

Rotherham, Oakwood Hall Sanatorium.—Asst. M.O. £300.

Royal Naval Medical Service.—M.O.'s.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Res. Cas. O. £150. Also H.P. At rate of £100.

St. Albans, Hill End Hospital for Mental and Nervous Disorders.—H.P. At rate of £165.

St. Bartholomew's Hospital, E.C.—Surgeon.

St. Thomas's Hospital, S.E.—Visiting Anaesthetist.

Sheffield Children's Hospital.—H.S. At rate of £100.

Shorham-by-Sea, Southlands Hospital.—Part-time Radiologist. At rate of £125.

Southampton County Borough.—Asst. M.O.H. £500.

Southampton, Royal South Hants and Southampton Hospital.—Sen. H.S. £200. H.P. H.S. Also Res. Anaesthetist and H.S. to Ear, Nose, and Throat Dept. Each at rate of £150.

Stockport Infirmary.—H.S. and Cas. O. £150.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—Second H.S. Also H.S. for Aural and Ophth. Dept. Each at rate of £150.

Surrey County Council.—Asst. M.O. £600. Also Jun. Asst. M.O. for County Sanatorium. At rate of £350.

Swansea County Borough.—Asst. M.O. £500.

Swansea General and Eye Hospital.—H.P. At rate of £150. Also Cas. O. At rate of £150-£175.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Jun. Res. H.S. At rate of £100.

Winchester, Royal Hampshire County Hospital.—H.S. At rate of £125.

Wolverhampton Royal Hospital.—H.P. At rate of £125.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Banbury (Oxford).

## Vacancies

For further information refer to the advertisement columns

Aclon Hospital, W.—Hon. Consulting Surgeon.

Altrincham General Hospital.—Jun. H.S. At rate of £120.

Aylesbury, Royal Buckinghamshire Hospital.—Second Res. M.O. At rate of £150.

Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.

Birmingham and Midland Eye Hospital.—Res. Surg. O. £200.

Birmingham, Selly Oak Hospital.—Jun. M.O. At rate of £200.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.

Bradford Royal Infirmary.—Two H.S.'s. Each at rate of £135.

Bristol, Southmead Municipal General Hospital.—Jun. Asst. Res. M.O. At rate of £200.

Burton-on-Trent, General Infirmary.—H.P. and Cas. O. £150.

Canterbury, Kent and Canterbury Hospital.—H.S. At rate of £125.

Cardiff, King Edward VII. Welsh National Memorial Sanatorium.—Asst. Res. M.O. for Glan Ely Tuberculosis Hospital. £200. Also Res. M.O. for Kensington Hospital. £350.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Third Res. H.S. At rate of £75.

Charing Cross Hospital, W.C.—Hon. Clin. Asst.

Chester City Hospital.—Sen. Res. M.O. £100.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Gl. Barrow.—H.P. At rate of £150.

Coventry and Warwickshire Hospital.—Res. H.P. £160. Also Res. H.S. £125.

Doncaster, Royal Infirmary and Dispensary.—Res. Anaesthetist. Also H.S. Each at rate of £175.

Durham County Council.—District Tuber. M.O. £500.

Ealing, King Edward VII. Memorial Hospital.—Sen. Res. M.O. At rate of £250.

Eastbourne, Royal Eye Hospital, Pevensy-road.—H.S. £275.

Evclina Hospital for Sick Children, Southwark, S.E.—Part-time Pathologist. £250-£300.

Exeter, Devon Mental Hospital, Erminster.—Jun. Asst. M.O. £350.

Glamorgan County Council.—Med. Supt. for Penrhwytn Infirmary, Neath. £500.

## NOTES, COMMENTS, AND ABSTRACTS

## FEAR IN CHILDHOOD

BY HILDA WEBER, M.D., B.Sc., D.P.M.

PHYSICIAN TO THE INSTITUTE OF MEDICAL PSYCHOLOGY AND TO  
THE BRITISH HOSPITAL FOR MENTAL DISORDERS AND  
NERVOUS DISEASES, LONDON

FEAR is a danger signal evolved in the interests of race- and self-preservation. It has therefore ultimately a protective purpose. But, invaluable as a temporary measure, its continued existence is harmful. It is not merely that the condition of the body and mind to which it gives rise is injurious to the general welfare of the organism, but its very presence indicates that some exciting cause remains; fear and anxiety can in fact only be treated rationally when it is recognised that they are but symptoms.

For these reasons fear, with its derivative anxiety, lies at the basis of much ill-health. None the less, the value of fear as a danger signal remains; like pain it warns the individual of some threat to his welfare. Its presence in some cases, therefore, is normal, and the nature of its origin requires discrimination. It is the purpose of this paper to draw attention to this aspect of the question, for disregard of the protective function of fear is not only frequent but also has deleterious results. In the course of everyday life, for instance, the sensitive child is likely to find his doubts and fears met with lack of understanding, possibly with impatience, even reproof. Bewildered, with guilt added to an increased sense of fear, initiative and ability receive a severe check. At the same time the child may feel resentment, even hate, for those who have given in place of help an added load of difficulty. Some of the problems and delinquencies of childhood may well find their root in such a situation.

While ignorance explains much of this intolerance, it is more difficult to account for the small attention which medicine pays to the protective function of fear. Yet it is common knowledge that those species of animals which do not possess the capacity for fear have other means of defence at their disposal: the tortoise finds protection in the thickness of his shell, the skunk in the terrible odour with which he is able to repel his enemies. Similarly it is no chance happening that the existence of those animals who can experience fear depend at times upon defence or flight: for, in keeping with its position as an emergency reaction, fear prepares the organism to meet the need which such a situation requires. Well recognised as are these facts in the medical world, certain considerations suggest that medical practice and theory pay them insufficient attention. The following case-history may serve as a useful introduction to the subject.

## A Case of Fear

To be afraid of one's own shadow is a phrase popularly used to indicate excessive timidity. It is, however, so seldom met with that, apart from the intrinsic interest of the case itself, its occurrence in actual practice seems worth recording.

Thelma, an intelligent child of 19 months, was walking along the street with her mother one winter's evening, when, observing her own shadow cast by the light from a standard lamp behind her, she became filled with terror. Clinging to her mother she met any attempt to make her stand on the ground with passionate and frightened crying. Her mother, seeing how great was her terror, carried her home, thinking the phase would pass. She was mistaken. Not only did the child on her return home show the same dread of shadows, but in the course of the next nine days matters went from bad to worse.

Thelma's whole outlook became increasingly dominated by fear. The previously happy and

contented child, who had thoroughly enjoyed a romp, and yet would play for hours by herself when her mother was busy, now cried and demanded constant attention. She would not be left alone. Her parents, who had hitherto found her training an easy task, now found themselves in a quandary. They realised the danger which they ran of hopelessly spoiling the child; she was indeed beginning to dominate them with her screams and cries. But, they asked, what else could they do? If they left her to "cry it out" might not this make her ill? They received with relief the advice not to follow this course, which might well resolve itself into meeting fear with fear, and so could only increase the trouble. The aim of treatment was to make the more mature goal of adequate independence and coöperative action more acceptable than her present regressive mode of behaviour. When the subject of treatment was so explained the parents willingly coöperated in the ensuing interview, the main outlines of which follow.

The age of the child (19 months) precluding arguments by words, the possibility presented itself that the method used in overcoming fear in animals might have value. Two main methods are employed in training animals—namely, fear and kindness. Yet not only is fear a bad master, but to use it where fear is already in existence is but to increase the original trauma; at best it can but cover up, it cannot remove the trouble. Kindness, based on an attempt to comprehend the situation, achieves its purpose without these defects. When a horse shies at a piece of paper, for instance, if he is led up to the, to him, terrifying object, it is possible so to accustom him that he learns he has nothing to fear. The same method of procedure was now adopted with Thelma.

After she had become accustomed to the room, and a doll had effectively paved the way to friendly relations with me, I suggested that her father, who had the child in his arms, should carry her to the wall opposite the window. I then showed her the shadows of her own hands, those of her doll, and of a ball on the end of a string. Secure in her father's arms she took interest in the game and tolerated the shadows well. When on my suggestion, however, her father lowered her to within reach of the ground she screamed with fear: it was as though, since she had been walking when the fear of her own shadow first overwhelmed her, association with the floor reminded her again of her own fear. Possibly also, when on the ground, she became more acutely aware of her own defencelessness.

On the principle of not regarding her behaviour as mere naughtiness but rather as symptomatic of the difficulties which she was encountering, she was not forced in any way. Instead I advised her father to sit on a couch with Thelma in his arms. Again feeling secure, she soon became free enough to take interest once more in our game with the doll and the ball. After a time we made a further step. Her father holding her, she stood on the couch without fear. But when, on my suggestion, he sat on the floor, she again became fearful. At length, however, by similar stages as before, she passed from his knee to the ground, at the same time that she played with the toys and became further accustomed to their and her own shadows. Gradually, becoming more and more at home, the wish for exploration took the place of fear, and before the end of an hour Thelma's whole attitude and expression had completely changed. Whining, terror, and undue dependence had given place to freedom of action, to the contentment of the happy and self-confident child. She seemed as though she had been relieved of a load and was thankful to be freed from the unknown dread which had pursued her for days.

Subsequent as well as immediate progress was also good. The mother wrote some weeks later to say that Thelma had never gone back since the interview.

It is true that she had hesitated occasionally for a moment or so for two or three days afterwards, but she quickly recovered her self-possession and had no return of her fears. On the contrary she played with her own shadow and called it "Thelma." She began to make progress in every way. Her appetite and sleep were good, she put on weight, and became a normal and happy child. The good results so quickly obtained were undoubtedly satisfactory. At the same time it must be conceded that they in part depended upon Thelma's previous history, as well as upon the comparatively short duration of the symptoms themselves. Up to the time of the onset of her fear of shadows Thelma had been apparently well adapted in every way. The home atmosphere favoured this state of affairs. The parents were well adjusted and were fond of each other and of their child. Thelma, herself, was forward and intelligent—by the time she was 8 months old she was saying simple words such as "Mum" and "Dad."

#### The Place of Fear in the Development of the Child Mind

This picture of an intelligent, happy, and seemingly well-adjusted child, in a good environment both material and mental, renders the more surprising the pathological fear of shadows which arose for no obvious reason. Two broad possibilities as to the origin of this fear present themselves—namely, that it was a manifestation of a hitherto latent conflict, or that it was an atavistic fear of the unknown. Certain considerations support the latter and simpler possibility.

It was in the interests of self-preservation that primitive man should regard the unknown with diffidence, even with fear. But the very purpose of fear as a danger signal implies some discrimination, and discrimination is useless if there is not some corresponding power of independent action. The absolute helplessness of the new-born infant consequently renders it not surprising that at the outset of life fear plays little part. The infant's powers of exteriorisation generally are indeed very meagre: even the special senses are but imperfectly developed. It is significant, therefore, that his increasing powers of discernment, essential for the equipment of the relatively self-sufficient individual, have a corresponding correlation with a growing capacity for independent action.

These changes, however, require time. Even when the child can recognise his mother, for a while he is indifferent to most of his surroundings. For this reason his early easy acceptance of the attentions of strangers appears to depend rather upon the indifference born of lack of perception than actual friendliness. Similarly his later shyness may well indicate less an accession of hostility than the advent of a developing awareness of the need to distinguish the harmless and useful from the possibly harmful.

In connexion with the acute fear which the sight of her lengthening shadow aroused in Thelma, it is relevant that movement not only more readily attracts attention than does rest, but it also suggests a greater measure of life. To one who is beginning to be aware of the possible dangers of the unknown, the moving object is therefore especially apt to cause terror. This in turn accounts for the great fear which the sight of her lengthening shadow first aroused in Thelma. It is true that she must have seen shadows before. On the other hand her fear of them may well have arisen from her first observation of them (as opposed to mere seeing). For advanced enough to observe her lengthening shadow—she was rather a precocious child—she was not yet able to express in words what she dreaded. After all, absence of fear does not necessarily mean courage. It may depend upon lack of observation. Some of the timidity which intelligent children often display may arise from early perception of objects combined with incorrect interpretation. Certainly treatment which enabled Thelma to accept shadows as part of her normal environment resulted in the disappearance

of her fears. Well-justified assurance took the place of the state of regression into which the condition of fear had cast her.

The dependence of children on their parents lends a further interest to the lasting good of this one interview. It suggests that they as well as Thelma had benefited. Certainly both had been present at the interview, and both had consciously recognised the goal of treatment—namely, the replacement of fear by well-justified confidence. These facts might well have influenced their later management of their child in the direction of better understanding; for any means which helps parents to a better understanding of the child has value. At this one interview comparison with animal life had suggested a method by means of which Thelma's fear of shadows was overcome. This fact suggests that the comparative approach may have a wider value in connexion with child life in general, and with their fears in particular. With this idea in view the following notes have been set down.

#### Points of Likeness Between the Child and Animal Mind

*General management.*—At the onset it is evident that the management both of children and animals has much in common. As a trainer once remarked, patience, firmness and understanding are always required in dealing with horses. Many an animal has been ruined by mistaking playfulness and high-spiritedness for viciousness: beaten for what was only a manifestation of health, the animal became vicious and sour. Surely such an opinion is well in keeping with much recent work with children, more especially when taken with his further remark that to lose one's temper is a sign of weakness which lowers the man in the animal's esteem. It may be that he was considering the horse from too anthropomorphic a point of view; the extent to which the behaviour of animals should be construed in human terms undoubtedly is a matter for very careful consideration. Nevertheless, with this reservation in mind, animals are in many ways so like children, and vice versa, that even cursory examination would suggest that the study of animal behaviour may have real value as an additional means of gaining insight into the workings of the child mind.

*Difficulties of discrimination.*—The difficulty which some animals find in distinguishing substance from shadow is a case in point. A dog I once knew could be worked up into a paroxysm of excitement whenever his master caused the light reflected from a glass to move about the floor; and it is not uncommon for a cat to play with shadows. But not only pleasurable excitement, fear may arise in animals in much the same way: the horse which shies at a piece of paper is an example. Experience suggests that incorrect interpretation may similarly be a primary cause of fear in children.

*Sense of guilt.*—None the less circumspection is always required when making deductions from material of this kind. There is not only the danger of anthropomorphising animal behaviour, but also the interpretation of child behaviour from too adult a standpoint, less often recognised, constitutes a real danger. An unconscious wish to justify his conclusions may well lead the adult to that over-generalisation from the particular which inevitably produces error. For instance, it is true, as Klein points out in her work on "The Psycho-analysis of Children," that children suffer from an early age from a sense of guilt. But not only does she ascribe this guilt to conflict or conscience arising from difficulties usually if not always of a sexual nature, but she also appears to attribute all pathological anxiety to this origin, at any rate she does not refer to any other. Now whether or no she is right in her contention that all psychoneurotic reactions have their basis in the anxiety of children, anxiety in childhood is so common that knowledge of its causation in general and of this theory in particular deserves investigation.



The subject matter of this paper renders it of interest that the study of animal life offers a definite alternative: for with animals there is no constant relation between either conflict or conscience on the one hand, and anxiety on the other. A hen, for instance, exhibits unmistakable anxiety when she sees the ducklings she has hatched swimming on the water: their position is to her a dangerous one. But to credit her with conscience in the matter would certainly seem far-fetched. As Lloyd Morgan says, where the workings of lower mental processes can fairly explain an instance of animal behaviour, there is no justification for attributing it to those which stand higher in the order of development.

*Evolution and the inherited response.*—On the whole an animal's response, untutored by experience, gives insight into its primitive needs. None the less, as natural selection alone shows, this is not always the case. Pitt's observations on the effect of the temperamental characteristics which distinguish the mouse *Eutamias glareolus* from *E. skomerensis* are relevant here. The two species of mice are similar in physical structure. But the former's quickness, wariness, and readiness to take alarm have enabled him to flourish in surroundings in which his brother's slower movements and over-trustfulness have allowed him to become a prey to his enemies. The survival value of fear here comes plainly into view.

*Environment and the inherited response.*—At the same time an inherited reaction, though of advantage in the environment in which it was evolved, may be unsuitable in another. A lover of animals has ascribed the action of the horse which shies at a piece of paper to lack of courage, and contrasts it to that of the cat which tends to pause and examine the unfamiliar object. This opinion may be correct. On the other hand, in a given environment what is wisdom for one species of animal may be rash, even suicidal, for another. A herbivorous animal, such as the horse, in the wild state is well advised to regard the unexpected with caution, as a possible source of danger. But a carnivorous animal, such as the cat, whose livelihood in part depends upon his readiness to track down and spring upon the suddenly appearing quarry, is in a somewhat different position. Some degree of preparedness to examine, maybe to follow the suddenly appearing object, has for him a definite survival value. Hunger is a powerful master, and where it impels the animal the possibility of food may drive fear into the background.

### Relation of Fear to Security

The needs of the moment, therefore, to some extent determine whether fear or interest predominate when the unknown is in question. The question of security to a large extent sums up the situation. It is ultimately in the service of self-preservation that the need for food is able to overcome fear. The question of security, that complement to fear, has in fact a special interest in connexion with the subject matter of this paper. Both endogenous and exogenous factors are concerned in this question. Well-justified assurance in one's own powers, whether physical or mental, contributes to the sense of security in a measure at least equal to that which external shelter or support may give. Examples of pathological fear and anxiety would even suggest that endogenous factors are if anything ultimately of the greater importance.

*Security a counter to fear.*—As a counter to the sense of fear the feeling of security need be but partial—but it must be sufficient to give the individual assurance from which he may grow. The small child, safe behind the shelter of his mother's skirts, dares then to peep out at the unknown and therefore to him terrifying stranger. The wise mother does not rebuff the child nor scold him for displaying fear. She may not recognise the emergence of an atavistic trait, a primal fear in the presence of the unknown, but she appears to realise the value of adequate though not pampering protection.

*The sudden and unexpected.*—Within certain limits anything which decreases the sense of security predisposes to fear. In this way a summation of factors may produce a state of terror. A loud noise is not necessarily in itself terrifying. Yet when it is unexpected it arouses fear even in the new-born infant. It is the same with the sudden loss of support, and as Watson points out, this to some extent remains throughout life. A man crossing a bridge, which remains quite steady until he reaches the middle when it begins to bend, shows real fear. On the other hand, both a loud noise and loss of support when associated with a well-balanced preparedness may arouse pleasure instead of fear (incidentally well-poised preparedness postulates a certain degree of security). The healthy child secure in his home usually loves a noise, and, as adults know to their cost, likes it all the more if he makes it himself. Not only is it expected, but possibly the knowledge that the noise is due to his own efforts gives him a sense of mastery, and that self-confidence which in itself lends a sense of security. It is the same with loss of support. The small child enjoys being tossed in the air by the strong and kindly adult—he knows that he will be safely caught. Possibly the sense of defying danger adds a spice to the situation. In phantasy it may be as though he were stepping forth into a dangerous country which his own prowess enables him to master. But some sense of security must be maintained—once the child has been dropped he will with difficulty, if ever, tolerate the game again.

*Repetition in child play.*—In other ways the need of security is of interest in connexion with children: for instance, the repetitive process which forms such a marked feature of their play. Repetition brings with it increasing familiarity, and familiarity, as contrasted with the unknown, brings with it a feeling of security. But just as a feeling of security follows upon past experiences to which the child has been able to adjust—e.g., by means of repetition—so, as Diethelm points out, the feeling of insecurity is based upon experience of the past to which the individual has not been able to adapt himself.

*Emotion and intelligence.*—For this reason intelligence plays a far more difficult part when an opposing "emotional set" has first been established. The well-trained polo pony is able to treat with unconcern the ball which by chance may pass between his legs on the polo ground. It is doubtful whether a pony not early trained could ever become so accustomed. Similarly with the child, early experience is of great importance: the youngest infant learns to inhibit painful reactions and repeats those which are pleasurable. But dependent though these responses directly are upon the emotions and automatic mechanisms, even at this early age intelligence plays some part. For instance, as Pritchard has pointed out, aments are with difficulty trained in good habits and broken of bad ones, whereas normal infants only acquire such bad habits if they are brought up wrongly.

### Management of the Child

The above observation indicates that good management is in line with the normal child's best interests, and rather contra-indicates a too "go-as-you-please" attitude to his upbringing. Not only maldirection, no direction at all may have serious results. Experience is not necessarily the best teacher. The burnt child avoids the fire, but nobody would suggest that this is the wisest method of education. Apart from actual physical injury, the experience tends to make it more difficult for the child to avail himself of the useful properties of fire, whilst avoiding the dangers.

*The child's need for guidance.*—In short, nothing absolves the adult from responsibility towards the children in his care. Man owes his pre-eminence in the animal world to his intellect, and, as with other powerful weapons for good and evil, the child needs some initial help in the use of this potent and flexible instrument of adaptation. It is true that the child mind demands play for the development of

individuality and personal initiative; but he also needs some guidance and authority upon which he can rely. But though intelligence can achieve much, the emotional rapport between parent and child is of great importance; mishandling of the emotional life may wreck the whole. The behaviour of the parent therefore deserves careful consideration. Excessive severity tends to be equated with tyranny, undue leniency with weakness, whilst inconsistency of conduct the child finds especially hard to bear—it gives him no firm ground from which to grow.

*The parent's attitude to the child's fears.*—Good poise on the part of the parent is of inestimable value in connexion with childish fears. The realisation that these fears, far from being "mere cowardice" or "just stupidity," are rather symptomatic of something amiss, encourages a more constructive view of the situation. His resultant greater tolerance not only improves the relations between parent and child but also opens the way to a truer understanding. The child finds, in place of a seemingly tyrannical authority, a friend to whom he can turn in times of difficulty and stress.

Such a secure but not over-protected child is in a fortunate position. The need for the requisite degree of security satisfied, the wish to investigate the unknown takes the place of fear. Learning by experience that he is able to manage the problems which he encounters, difficulties come to be regarded as opportunities for action, not as responsibilities to be dreaded. Fears of the present, instead of forming an obstacle to progress, are converted into a scaffolding for further growth, a further impetus to right development.

#### Conclusion

Insufficient attention to the basic function of fear as an emergency reaction with a direct relation to race- and self-preservation is pernicious. It accounts for some of that misunderstanding and consequent mismanagement of the child's problems and fears, which not only gives rise to present trouble, but also leads to much unhappiness, even illness, in after-life. Means therefore which assist to a right estimate of a child's fears deserve attention. Comparative medicine as one such avenue of approach is dealt with in this paper. It not only offers an additional means of access to the understanding of the child mind, helping in the correction of certain misconceptions, but it also illustrates the sometime value of fear as a protective reaction.

Both clinical material and examples from animal psychology support the possibility that some of the fears of childhood represent the survival of an atavistic attitude to the unknown. A certain degree of security is necessary for normal development: fear calls attention to some disturbance of this balance. Its very insistency which emphasises the urgency for better adjustment has practical justification; for fears, which neglected or otherwise mishandled, may become a danger; but wisely dealt with as they arise in early life, become a stimulus for healthy mental development. A wise spirit of adventure takes the place of doubt and fear.

#### RURAL HOSPITALS IN THE UNITED STATES

AMONG many other beneficent activities the Commonwealth Fund furnished the means to build, between 1927 and 1930, six 50-bed hospitals in rural areas of the United States. These hospitals steadily grew in popularity up to the time of the trade depression when there was a set-back from which they have now recovered, and in the first nine months of last year they showed an average daily occupancy of 23.3, a figure almost equal to the highest peak recorded in the like period in 1931. (It might be observed in passing that the vision of a hospital never more than half full may excite envy among British practitioners accustomed to the cry of "no beds.") Last August a seventh hospital was opened at Kingsport and an eighth, at Tupelo, is

already projected which, it is estimated, will serve a population of 100,000. For this hospital 2790 contributors have promised a local quota of \$40,000. Five of these rural hospitals are already financially self-supporting. At first resident physicians were paid for by the Commonwealth Fund, but this is no longer necessary. The hospitals are staffed by local physicians and treatment tends to be concentrated in the hands of a few men tacitly adjudged by their colleagues to be the best in the vicinity. The hospitals are essentially general hospitals, and of every five cases admitted, two are medical or obstetrical and three surgical. At Kingsport an experimental prepayment scheme by potential patients is already in operation. Employed persons, enrolling by groups, pay one dollar down and nine dollars annually which entitles them to 21 days free hospital service and also to certain discounts. Another three dollars per annum entitles the member to further discounts in respect of services rendered to his dependents. The report includes a racy account of an average week's work in one of these hospitals.

"The day's first patient is Minnie Dale. She has an abscessed eye, and the best man in six counties for that is Dr. Coleman. Dale, a bright young farmer, knows the hospital and likes it; his brother has been in it three times in the last six months, and the doctors made just one little mistake: they said he wouldn't get well but he did. The clerk tells Mr. Dale that the charges will be \$13; that is more than they counted on, but they have \$10 and pay it. Mrs. Dale goes to the table and Dr. Coleman removes a diseased tear-sac and tear-duct; the threatened eye is safe."

Again, "Mrs. Midnight . . . was the clinic's first patient. When she learned that she was tuberculous the family had \$200. She paid her doctor at \$5 a treatment while the money lasted."

It is to be presumed that all the characters are fictitious, but we confess we should like to meet Mrs. Midnight.

#### R.A.M.C. TRAINING

AT a time when the policy of "si pacem vis, para bellum" has been adopted as a political necessity, the appearance of this manual<sup>1</sup> is appropriate. It is divided into two parts. Part A is concerned with military training and includes three chapters on the all-too-pressing subject of anti-gas measures. Chemical weapons are classified according to their effect or site of election into four groups: choking, nose, tear, and blister. The signs, symptoms, and treatment, both preventive and remedial, of poisoning by all these, and also by prussic acid and carbon monoxide which, though not strictly chemical weapons, might be encountered on active service, are clearly explained, and it is noted that the box respirator does not protect against carbon monoxide. Individual measures against chemical weapons comprise, in addition to the respirator, the wearing of protective clothing which may have to be decontaminated by various means such as exposure to the air, or to steam, baking, and boiling. Collective anti-gas measures aim at neutralising the poisonous substances, keeping trenches and dug-outs free from gas, or ridding them from contamination if it occurs. Personnel contaminated with gas but not actually casualties are dealt with by their units and not by the R.A.M.C. Those who have become casualties are treated first in gas-treatment centres and, if also wounded, are subsequently evacuated by the R.A.M.C. The organisation of a gas-treatment centre is described and illustrated by diagrams, and the syllabus for anti-gas training is tabulated at the end of the chapter.

Part B, for the technical training of warrant officers, non-commissioned officers, and privates, is divided into three sections. The first two—on anatomy, physiology, first aid, and nursing—go rather more deeply into these subjects than the ordinary

<sup>1</sup> Royal Army Medical Corps Training 1935. London: H.M. Stationery Office, 1935. Pp. 438. 3s. 6d.

manuals. The third section deals with food and cookery, and appended to it is a table of foods in season with times required for their cooking. The manual, profusely illustrated with figures and diagrams, is compact with information of medico-military importance.

#### A SURVEY OF ARTHRITIS IN FINLAND

In 1934 plans were prepared for a sociological campaign against arthritis in Finland. The aid of the General Mannerheim's League for Child Welfare was invoked, and its visiting nurses, after hearing special lectures on the subject, undertook a house-to-house canvass of 37 rural communities with a population of 195,000 souls. As non-articular rheumatic affections, such as endocarditis, chorea minor, sciatica, and neuritis were not included, as a rule, in these nurses' inquiries, the information they collected concerned not so much rheumatic disease as a whole, as those arthritic manifestations which social workers can easily recognise. It was found that 1702, or 0.9 per cent., of the people visited suffered from acute or chronic arthritis or had a history of such disease, and from these figures the calculation is made that some 34,000 persons suffer from arthritis in Finland. Incidentally it may be noted that the number suffering from pulmonary tuberculosis in Finland at the present time is about 45,000.

The geographical distribution of arthritis proved to be most uneven, its incidence ranging from a minimum of 0.3 to a maximum of 4.3 per cent. in the different communities studied. The farther west and north a community, the lower the arthritis-rate. Not one typical case of gout was found. The ratio of chronic to acute cases was as 2.2 to 1 (1177 to 525). Women were more subject to the disease than men in the ratio of 2.4 to 1, and when the disease was chronic and the nervous system involved (chorea) this sex inequality was 11 to 1. Acute arthritis had developed in most cases before the age of thirty, and there were very few such cases beginning after forty. On the other hand, new cases of chronic arthritis continued to develop throughout life. In more than half of all the acute and chronic cases, there was evidence of a heredito-familial character; and in a series of 771 that were very carefully studied, it was found that the disease could often be traced through several generations. In 62 of these 771 (about 8 per cent.) both husband and wife were found to suffer from arthritis. As for the disability entailed by this disease, women were found to be oftener, earlier, and for longer periods disabled than men.

Dr. Holsti and Dr. Rantasalo, whose note on this study appears in *Acta Medica Scandinavica* for March 20th, come to the conclusion that the frequent occurrence of several cases of acute and chronic arthritis in the same family points definitely to the existence of some inherent factor common to the genesis of arthritis. The element of contagion cannot be dismissed in view of the comparatively high incidence of this disease in both husband and wife. But on the other hand "there can be no doubt that other, non-infectious factors, inherited or acquired, in the form of some heredito-familial disposition to joint disease also enter into the pathogenesis." There is also the climatic factor as well as the unhealthy influence of bad housing and soil conditions. It was, perhaps, more than a coincidence that the incidence of arthritis was highest in an area in which endemic goitre was very common.

The authors of this note conclude with a brief outline of the measures they consider would be most effective against arthritis. Treatment, they find, has less prospect of success than prevention; and with regard to the latter they recommend the improvement of housing and soil conditions, the combating of endemic goitre, the weaning of dentists from the habit of retaining devitalised teeth in the jaws of their patients, and the removal of the tonsils of those persons who suffer repeatedly from attacks of sore-throat. It is to be hoped that the example set in

Finland of conducting an arthritis census will be followed in many other countries, for the information thus obtained is calculated to throw light on many aspects of this disease.

#### MILK IN A FEW WORDS

A MEMORANDUM entitled "The Nutritive Value of Milk," drawn up by the Ministry of Health's Advisory Committee on Nutrition, has just been published by H.M. Stationery Office (pp. 12, 3d.). It explains in simple terms the high value of milk as an article of food and mentions some of the investigations justifying the belief that the general health of the community, and especially of children, would be improved, and the incidence of disease diminished, if the present consumption of liquid milk, averaging about 0.4 pint per head per day, could be increased to about a pint. Children, it is stated, should receive 1-2 pints a day, and expectant and nursing mothers about 2 pints. Other adults, who need milk especially for the sake of its calcium and animal protein, should have at least half a pint daily. The memorandum speaks of the advantages of pasteurisation, and states that when milk is treated by heat there is little significant change in its nutritive properties, and such deficiencies as may be caused can readily be made good. It is therefore reasonable to assume that raw milk incorporated in other cooked articles of diet, such as bread and puddings, retains most of its nutritional properties. The report also calls attention to the degrees of nutritive value possessed by various milk products, especially separated milk.

#### THE MUNICIPAL YEAR BOOK

THE Minister of Health contributes a preface to the Year Book for 1936, and in commending it insists on the common enterprise in which the Ministry of Health and the local authorities are partners. One consideration especially he brings home to those who have the maintenance of our democratic institutions at heart and that is to encourage young people to study and appreciate their inheritance in the sphere of local government, so that the future will find people of integrity from all walks of life willing to shoulder its burdens and responsibilities. Of these burdens and responsibilities the Year Book gives accurate and comprehensive evidence. The volume this year contains two more sections than last although, fortunately, no more pages. Fully 80 per cent. of the volume, it is stated, has been rewritten. A list is given of conferences and meetings of associations in the coming year, and the whole book is worthy of the year which celebrates the centenary of the first Municipal Corporations Act in this country. The price of the Year Book is 30s. from the Municipal Journal Ltd., 3, Clements Inn, London, W.C.2.

#### NEW PREPARATIONS

STYPPVEN.—The value of the venom of Russell's viper as a hæmostatic has been established by Macfarlane and Burgess Barnett (*THE LANCET*, 1934, ii., 985). Under the name of Stypven the Wellcome Physiological Research Laboratories present Russell viper venom in convenient form. It is issued by Burroughs Wellcome and Co. (Snow Hill Buildings, London, E.C.1) in rubber-stoppered bottles (1 c.cm. or 5 c.cm.) accompanied by sealed ampoules of a solvent consisting of distilled water containing 0.5 per cent. phenol. A solution of the necessary concentration is readily prepared and in cases of hæmophilia the power of the venom to control external hæmorrhage allows of the performance of minor operations in reasonable safety. Apart from hæmophiliacs there are many patients who suffer from prolonged bleeding after extraction of teeth, and this may be relieved by local application of a pledget soaked in Stypven. It is also believed that this hæmostatic may prove valuable in general surgery and its use—perhaps in conjunction with adrenaline—is suggested as a means of stopping the

bleeding or oozing often encountered in operations on the nose and mouth.

**SKOL HEALING ANTISEPTIC** is an astringent liquid devised for application to injured tissues, over which it forms a non-greasy protective film. The manufacturers (Skol Products Ltd., Westminster, S.W.1) lay stress on its unusual light-filtration properties; it cuts out "irritating and destructive ultra-violet rays up to 3700 Angstrom units." Good results are claimed in the treatment of burns, and except in severe second-degree burns its application is said to render dressings unnecessary. Its use is also advised in the treatment of bedsores, cuts, chilblains, stings, and various skin conditions, including some forms of eczema and varicose ulceration; it is further recommended, diluted with water, as a mouth-wash, gargle, and nasal antiseptic. The formula given is: extract of galls, 5.00; methyl-propyl phenol hexahydride, 0.25; phenyl hydrate, 0.50; glycerin, 3.00; ortho-oxy-benzoic acid, 1.00; alcohol and water, 90.25.

**ENTORAL** is a vaccine given by mouth as a protection against colds and other respiratory infections. The makers, Messrs. Eli Lilly and Company of Indianapolis (2, Dean-street, London, W.1), point out that although the common cold may be primarily caused by a filtrable virus its effects are largely due to associated organisms, including pneumococci, influenza bacilli and streptococci. They quote evidence that oral administration of vaccines will produce appropriate antibodies, and they attribute the peculiar success of Entoral Lilly to its preparation from strains with a high content of heterophile antigens. Such antigens evoke immune bodies which hemolyse sheep corpuscles, and the observations of Rockwell, van Kirk, and Powell (Jour. of Immunol., 1935, xxviii., 475) suggest that after vaccination there is a definite correlation between the heterophile antibody content and the immunity established. These authors report that the use of an oral vaccine of pneumococci and streptococci was followed by a decrease of 57 per cent. in the annual incidence of colds among 500 treated persons; whereas 536 controls showed a decrease of only 12 per cent. for the same year. The best results were obtained in those most susceptible. Entoral Lilly is provided in capsules containing 25,000 million pneumococci, 5000 million *Hemophilus influenzae*, 15,000 million streptococci, and 5000 million *Micrococcus catarrhalis*. The dose recommended is one capsule daily for seven days, taken with cold water an hour before breakfast; two capsules are then taken weekly throughout the season. Usually there is nasal stuffiness or slight catarrh after the first dose or two, and very occasionally there is gastro-intestinal distress; but "reactions have not been particularly noticeable."

The British Drug Houses Ltd. have issued a short and informative account of the functions and clinical use of ovarian and gonadotropic hormones, with special reference to their own preparations GONAN, ESTROFORM, ESTROFORM B, and PROGESTIN B.D.H. It may be obtained from them at Graham-street, City-road, London, N.1.

We are informed that **RECRECAL** is now manufactured in this country and distributed by Messrs. Coates and Cooper Ltd., 94, Clerkenwell-road, E.C.1. It is a preparation of sodium dihydro-ortho-phosphate and its use is based on German work, dating from 1921, which led to the conclusion that muscular and mental output can be increased by regular administration of phosphoric acid in this form. Recreocal is also said to be useful in shortening the course of infectious diseases, in overcoming debility and exhaustion (especially in children), and in promoting the healing of wounds.

**CHICKEN-POX AND HERPES ZOSTER.**—Dr. A. G. P. HARDWICK (Newquay, Cornwall) writes: "A case

of academic interest has just occurred in my practice—that of a man, 76 years old, who contracted a severe attack of chicken-pox from a case of facial herpes zoster. On March 3rd I saw a man, aged 60, suffering from severe facial shingles. On March 5th, 6th, and 7th he was visited for two minutes each day by his next door neighbour. On March 20th I was called to see this neighbour, with a temperature of 103° F. and a profuse and typical rash of chicken-pox. There could have been no other chance of contracting the disease."

**CORRIGENDA: LARGE DOSES OF ATROPINE.**—An annotation in our last issue (p. 908) described experiments in Rumania in which atropine was given to patients in gradually increasing doses, to which they became tolerant. We stated that the doses mentioned were injected, but actually they were given *by mouth*.

The note about the work and needs of an ophthalmic hospital in our last issue (p. 910) referred to the Royal London Ophthalmic Hospital (Moorfields).

## Appointments

**PEGGETTER, G. Y.,** M.S. Durh., F.R.C.S. Edg., has been appointed First Assistant in the Department of Surgery at the British Postgraduate Medical School, London.

**JONES, E. R.,** M.D. Liverp., D.P.H., Assistant Pathologist in the Kent County Council Laboratories.

**MANSIE, J. W.,** M.R.C.S., L.D.S. R.C.S. Eng., Dental Surgeon to the Evelina Hospital for Sick Children, London.

Certifying Surgeons under the Factory and Workshop Acts: **Dr. E. A. R. EVANS** (Wrexham District, Denbigh); **Dr. T. V. FITZPATRICK** (Broughton District, Hants).

*Institute of Medical Psychology.*—The following appointments are announced:—

**ALLEN, CLIFFORD, M.D.,** M.R.C.P. Lond., D.P.M., Psychologist; **DOHERTY, WINIFRED, M.B. Leeds, D.P.H., D.T.M.,** Psychologist; **HAMILTON-PEARSON, E. A., M.B. Aberd.,** Psychotherapist; **HUTCHISON, ALICE, M.D. Edin., M.R.C.P. Lond.,** Psychotherapist; **MILLS, HERMIA, M.B. Lond.,** Psychotherapist; and **THOMS, AMY, M.D. St. And., M.R.C.P. Lond.,** Psychotherapist.

## Births, Marriages, and Deaths

### BIRTHS

**BAWTREE.**—On April 14th, at Tunbridge Wells, the wife of D. W. Bawtree, F.R.C.S. Edin., of a son.

**BONNER-MORGAN.**—On April 17th, at Lancaster-road, Hampstead, the wife of Dr. W. R. Bonner-Morgan, of a son.

**DINGWALL.**—On April 13th, at a nursing-home, the wife of Surg. Lt. R. G. Dingwall, M.B. Aberd., R.N., of a son.

**GARROD.**—On April 14th, at Harpenden, the wife of Lawrence P. Garrod, M.D. Camb., of a son.

**GREEN.**—On April 16th, the wife of Dr. Leslie E. Green, Eastleigh, Hants, of a son.

**LAWSON.**—On April 15th, at Cambridge, the wife of W. A. D. Lawson, M.D. Leeds, Whittlesey, near Peterborough, of a daughter.

**SAMMONS.**—On April 11th, at Kingswood, Bristol, the wife of Dr. R. A. Sammons, of a son.

**SHELDON.**—On April 13th, at Sutherland-avenue, W., the wife of Dr. Colin Sheldon, of Reigate, Surrey, of a son.

**TAYLOR.**—On April 16th, at Purley, the wife of Dr. C. E. Taylor, of a son.

### MARRIAGES

**PARKES—JAMES.**—On April 16th, at St. Thomas's Church, Douglas, I.O.M., Richard Quine Parkes, M.B., B.Chir. Camb., to Marjorie Whitehead, elder daughter of Mr. J. J. James of Douglas.

### DEATHS

**BROOK.**—On April 14th, Francis William Brook, M.R.C.S. Eng., of Harley-street, aged 59.

**HAMBLIN SMITH.**—On April 15th, at Oxford, Maurice Hamblin Smith, M.D. Durh., late of H.M. Prison Service.

**HUSBANDS.**—On April 15th, Harold Wessen Husbands, M.R.C.S. Eng., of "Fairlight," Babbacombe, Torquay (formerly of Taunton).

**LANE.**—On April 15th, in London, Major George Lane (late R.A.M.C., S.R., and Colonial Medical Service), previously of Rowlands Castle, Hants, in his 68th year.

**OSBORN.**—On April 16th, at Datchet, Bucks, Samuel Osborn, F.R.C.S. Eng., J.P., Knight of Grace, Order of St. John of Jerusalem.

**SHELDON.**—On April 15th, at Chepstow Villas, W., Walter Sir Sheldon, M.R.C.S. Eng., in his 60th year.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

## ADDRESSES AND ORIGINAL ARTICLES

THE PREVENTION OF CANCER<sup>1</sup>

By W. SAMPSON HANDLEY, M.S. Lond., F.R.C.S. Eng.  
SENIOR SURGEON TO THE MIDDLESEX HOSPITAL

It is quite possible that a medical or systemic cure of cancer will be discovered before the nature of the neoplastic process is fully understood, for the use of quinine and mercury, in malaria and syphilis respectively, preceded the discovery of the organisms of these diseases. On the other hand the technique of prevention of a disease would appear more closely dependent upon knowledge of its causation. The prevention of malaria waited upon that knowledge of the life-history of the malaria parasite which Laveran, Manson, and Ross supplied. I believe that a general conception of the origin of the cancer process, founded upon observed facts, can now be arrived at, however obscure the intimate nature of the process may remain. If so, the prevention of the disease can be approached in a more hopeful spirit, and my choice of subject may be justified.

## Theories of the Causation of Cancer

Any theory of the causation of cancer must cover and unify an extraordinary and miscellaneous range of observed facts. The late Prof. Archibald Leitch in 1927 collected these facts together without deducing from them any theory. He pointed to Pott's observation that chimney-sweeps were especially liable to cancer of the scrotum as the first gleam of light on the origin of cancer—showing it to be a disease of local and not of constitutional origin. Pott noted that the disease slowly and imperceptibly evolved from a simple wart resulting from prolonged contact of soot with the skin. It was Leitch himself who showed that the soot did not act mechanically, and that its admixture with the sebaceous secretion of the scrotum was necessary to activate it. The fatty secretion dissolved out of the soot some active cancerogenic agent in minute quantity.

In 1771 Volkmann described cancer of the anus and scrotum in workmen employed in lignite distillation plants and due to the crude distillates of tar or paraffin. Some years ago Alexander Scott described the cancers occurring in Scotland in workmen exposed to shale-distillation products. Crude petroleum and some refined oils also have been found to cause cancer. A. H. Southam and S. R. Wilson found that cotton spinners, exposed to a spray of mineral oil from the spindles, suffer from cancer of the scrotum. Workers in hot tar are liable to cancer on the exposed forearms and also on the scrotum. The chewing of betel-nut mixed with lime often produces cancer inside the cheek and upon the gums.

Reviewing such facts as these there is little cause for surprise if the inference was drawn that cancer is due to direct local chemical irritation of the epithelium. Soon however it appeared that physical irritants might be substituted for chemical irritants without any alteration in the final result. Theodore Maxwell in Kashmir noted that repeated burns of the skin, resulting from the wearing under the robes of the kangri basket containing hot charcoal, might eventually lead to cancer. Twelve years after the discovery of X rays the first X ray cancer was evolved.

Prolonged exposure to radium produced the same result. G. M. Findlay has produced papilloma and carcinoma in white rats by exposing the ear to ultra-violet light. Rodent ulcer and epithelioma of the skin are especially frequent in Queensland where a white race unprotected by pigment is exposed to a tropical sun.

The radiation cancers were brought under the fold of the irritation theory of cancer by a simple expedient. It was admitted that the irritation might be chemical or physical.

## ARSENIC AND ANILINE CANCER

About 1887 Jonathan Hutchinson drew attention to a form of cancer arising in patches of psoriasis in patients who had taken arsenic therapeutically for long periods. The same thing occurs in arsenic workers in Styria, and Leitch observed cases in men engaged in the manufacture of sheep-dip and weed killer. In arsenic cancers the metal inhaled or swallowed is excreted by the skin, and the growths may be widespread and multiple. Workers in aniline dyes are subject to cancer of the bladder, probably owing to the excretion of ingested dye-products in the urine.

There was no difficulty in applying the irritation theory to cases where the irritant acted during its excretion upon the excretory organs. Certain difficulties however showed themselves, particularly the fact that the cancer might show itself many years after the patient's last contact with the irritant, and that some violent irritants such as mustard oil have no cancer-producing power. It became necessary to define an irritant as any substance or agent which can induce cancer. It thus became clearer than ever that cancer is due to chronic irritation.

## LUPUS AND SYPHILIS CANCER

Many years after an area of lupus has completely healed, and apart from any therapeutic treatment, it may become the seat of squamous-celled carcinoma. A tongue which has suffered from mucous tubercles and syphilitic glossitis in the secondary stage of syphilis is likely in later life to be affected by chronic glossitis and epithelioma. The irritation theory was accordingly modified by including certain bacteria in the list of cancer-producing irritants, and later certain parasitic worms were added to it, following Fibiger's discovery that cancer could be produced in underfed rats by feeding them with cockroaches infected with gongylonema, a minute parasitic worm. The ova of ankylostoma duodenale invading the mucosa of the bladder were found to cause cancer of that organ. Peyton Rous and W. E. Gye found that a filter-passing virus was the cause of sarcoma in fowls. J. B. Murphy, of the Rockefeller Institute, maintained that the supposed virus was of the nature of a ferment. Recently a virus has been incriminated by R. E. Shope as the cause of an infective papilloma in rabbits which may become malignant, but this is the only instance in mammals where substantial evidence for a virus as a possible cancer agent has been produced.

## LYMPH STASIS AND CANCER

In such a tangle of miscellaneous causes it is fair to assume that links in the chain of causation are missing, and that as the final result—cancer, is approached unity of causation might be detected. I believe that in lymph stasis and its physiological

<sup>1</sup> Being the seventeenth Mitchell Banks Memorial Lecture delivered at the University of Liverpool on Nov. 21st, 1935.

consequences I have found the single immediate cause of cancer. All the various cancerogenic agents have I believe this quality in common that they can produce lymphangitis and consequent lymphatic obstruction. I have been able to demonstrate the presence of lymphatic obliteration and consequent lymph stasis in precancerous areas due to the ravages of syphilis, tubercle, X rays, or radium, or resulting from the chronic lymph stasis of chronic mastitis. No single organism or virus is specifically and exclusively associated with the production of cancer. Any physical or chemical agent, any organism or mixture of organisms, able to cause lymphangitis, may set going a process which in ten, twenty, or forty years may eventuate in malignancy.

#### The Pathology of Lupus Cancer

For the sake of brevity I desire to concentrate attention upon one particular form of cancer, lupus cancer, in which the stages of the process which leads to cancer are easily demonstrable. I would first insist that tubercle bacilli may have disappeared for many years from the original area of lupus before cancer appears in it. A sound scar with a few papillomata upon it may be the only residue of the original disease. The epithelium appears healthy and there is nothing to indicate that the tuberculous poison has produced any change in it. In the early stage of lupus, the stage of active extension and ulceration, before repair has begun, the epithelium seems entirely passive. It quietly disappears as the lupus nodules undermine it. When repair begins the epithelium spreads over the new granulation tissue in a normal way. Sometimes the lupus process is not intense enough to cause ulceration. It then gives rise to papillomatous elevations of the skin. A section through the growing edge of such an area of papillary lupus—a section taken outside its visible margin—shows with crystal clearness not only the nature of the lupoid process, but also the nature and mode of origin of papilloma. Just as a lacteal is the central structure of an intestinal villus, a capillary lymphatic end-sac is the central structure of a villus of the skin. It can be seen that over a zone about  $\frac{1}{2}$  inch wide outside the apparent edge of the lupus area the papillary lymphatics are blocked by proliferation of their endothelium.

Evidently lupus is essentially a tuberculous lymphangitis of the skin lymphatics. Furthermore it can be seen that the blocking of the central lymphatic has upset the hydrostatic arrangements of the papilla. The tissue fluid can no longer flow freely out of it and the papilla begins to swell and to elongate. From the edge of the specimen back towards the centre of the lupus area a gradual elongation of the skin papillæ up to ten times their normal length can be traced. Their connective tissue receives from this lymph congestion a powerful stimulus to proliferation in which at a later date the epithelium shares. How powerful is the nutritive stimulus of lymphatic obstruction upon the tissues subjected to it is well seen on a large scale in the huge legs of elephantiasis. Wherever a papilloma is found it may be presumed, and it can frequently be demonstrated, that this process of obliterative lymphangitis has previously affected the lymphatics of the papilla. It is a fact of the highest significance that nearly every form of cancer affecting squamous celled, transitional or columnar-celled surfaces is preceded by papilloma. In the case of glandular mucous membranes such as that of the stomach, cancer is preceded by adenoma, which is also a manifestation of lymphatic obstruction. The close and almost

universal association of papilloma and adenoma with cancer shows in my opinion that lymphatic obstruction is a precursor of cancer which may fairly be described as its cause.

It is easy to understand how the physical stimuli which cause cancer are able to cause lymphangitis and lymphatic obstruction. In X ray dermatitis the obliteration of some lymphatics and the dilatation of others are easy to demonstrate. But at first sight tar-cancer seems to be a difficulty. Here the tar is applied directly to the epithelium which subsequently becomes cancerous and direct irritation seems proved. But Ludwig Kreyberg has studied the changes in the mouse, produced by tar-painting, and has shown that the initial change is an infiltration of the subepithelial tissues by polymorphic leucocytes. The primary response to tar-painting occurs in the connective tissue and its appearances are those of an acute lymphangitis.

#### CHRONIC MASTITIS

A study of the physiology of the breast shows that nature's method of inducing proliferation is to pour out an excess of lymph into the tissue interspaces, and provides further evidence of the important part played by lymph stasis in physiology and in the genesis of cancer. The recurrent monthly physiological lymph stasis which occurs in the breast temporarily stimulates the proliferation of all its tissues. If lymphatic return from the breast is hindered by local areas of lymph obstruction, probably due in most cases to casual and unnoticed infections of one or more breast-ducts where they open upon the nipple, the stimulus of lymph congestion instead of being periodic becomes permanent. The lobe whose duct has thus been infected is unable to empty itself of lymph, and receives a permanent stimulus to proliferation. The lymphatics are blocked by proliferation of their own endothelium. The ducts are surrounded by a sheath of adventitious fibrous tissue due to proliferation and blocking of the periductal lymphatics. Papillomata appear within them as the nutritional stimulus begins to affect the epithelium, and finally carcinoma may supervene.

It is the fashion to ascribe the various diseases which affect the breast to endocrine disorders, and there is of course no doubt that the breast is under endocrine government. But morbid conditions such as chronic mastitis affecting single and separate lobes of the breast, and sparing other lobes of the same breast, cannot be accounted for by general endocrine influence. A local factor must be present, and that local factor is permanent lymph stasis. The various steps which lead from lymph stasis through chronic mastitis to cancer may be easily demonstrated histologically. Space forbids me to discuss other forms of carcinoma or to discuss congenital moles in which developmental defects of the lymphatic system lead to local areas of lymphatic obstruction and papillomatous hypertrophy, and sometimes to carcinoma or sarcoma.

#### Prevention in the Light of Ætiology

If the lymph-stasis theory of cancer is valid the simple recipe for the prevention of cancer is to maintain the lymphatic circulation throughout the body in a state of high activity. If, as is often stated, though without conclusive evidence, cancer is relatively infrequent in wild animals, this may well be due to the superior vigour of their lymphatic circulation, the result of an active life. Even in local areas of lymph stasis a sufficient minimum



flow may thus be secured to avert a threatened carcinoma. Civilised man may well take the hint, remembering that as E. H. Starling showed a resting limb produces hardly any lymph. Civilised man is apt to overstrain his glandular mechanisms, especially those of digestion, while at the same time he allows his muscles to fall into disuse. Glandular secretion increases the production of lymph without doing anything to promote the lymphatic circulation. Muscular exercise on the contrary brings into play all the forces which maintain the lymphatic circulation—the pulsation of adjoining arteries, the massage action of muscular contraction and of bodily movements, and the aspiration effects of deep respiration. Thus regular exercise and moderation in eating are likely to stave off cancer, but a heavier stress must be laid on the avoidance of infections and their prompt treatment, for the small local areas of lymph block in which cancer arises are most often due to bacterial infections, severe or slight. In this connexion dental infection requires special stress, for as F. St. J. Steadman<sup>2</sup> showed, cancer of a dentally clean mouth is a rarity.

#### PREVENTION OF CANCER IN PRECANCEROUS AREAS

Sometimes the best method of dealing with precancerous areas is to excise them. The enlarging mole, or the papillomatous area in chronic glossitis, may thus be dealt with. But the method is sometimes impossible and never popular.

*Irradiation of Precancerous Areas.*—It would appear quite feasible to administer to precancerous areas a sufficient dose of radiation to depress the activity of the potentially cancerous epithelium. In this connexion I will only refer to one variety of cancer, and give *prima facie* evidence that a short course of deep X rays will avert cancer in precancerous breasts.

I may remind you that in the year 1900 at the Pathological Society of London the late F. T. Paul<sup>3</sup> of this city first drew attention to the association between chronic mastitis and tumour formation. Though the question continues to arouse controversy there is in my mind no doubt of the intimate connexion between chronic mastitis and subsequent cancer.

In 1910 I advocated<sup>4</sup> the X ray treatment of chronic mastitis, which has since been widely adopted. The sector-shaped indurations of chronic mastitis frequently soften or disappear after three half-pastel doses of X rays. At that early period the modern hard X ray was unknown, and among several hundred cases of chronic mastitis treated in this way several developed cancer. Of late years I have continued to use the method, but have advised the high potential short wave X ray of 180,000 volts. Several hundred cases have been treated for me in this way by Dr. Russell Reynolds, Dr. Douglas Webster, and other radiologists, and in no single case has cancer supervened in the breast treated. When a breast has suffered from chronic mastitis and cancer, the other breast is likely in the course of years to follow the same course. I will give an instance.

Five years ago I operated upon a nurse with cancer of the right breast. Three years ago I found a mastitic thickening in the other breast and urged either mastectomy or X ray treatment for this breast. The patient rejected my advice, and was only seen again recently, when she had a hopeless carcinoma originating in the mastitic area of the remaining breast—not a recurrence but a second primary growth.

In another case I tapped a cyst in the left breast three years ago. Three doses of deep X rays were applied to the breast. The patient was seen again recently. The left breast was normal, but the right breast to which no X rays had been applied had to be removed for a suspicious induration which showed cystic changes and areas of papillomatous proliferation, undoubtedly precancerous, in the ducts (see Figure). In this case X rays appear to have arrested the morbid evolution in the breast which was primarily affected. The second or control breast, at first the healthier breast, continued to evolve towards carcinoma.



Precancerous changes in the untreated breast. The other breast, which had given earlier evidence of similar tendencies, remained normal three years after X ray treatment.

I could adduce other cases tending to show the preventive action of X rays upon precancerous breasts. The problem is one of great importance, and could be definitely settled if 1000 women would permit one breast to be irradiated at the age of forty, the other breast remaining untreated as a control. A complete follow-up in each case would of course be necessary. A preventive course of X rays to both breasts is at any rate harmless, and should certainly be given when the breast has done its work to all women with a strong family history of cancer, or suffering from chronic mastitis.

#### PENILE CANCER: PREPUTIOTOMY

Carcinoma of the penis is not a common, but not a very rare form of the disease. At the Mayo Clinic 195 cases were seen from 1907 to 1932; about one case in every 300 of male cancer. The institution of circumcision has provided for the Jews complete protection against penile carcinoma. The origin of the operation is lost in the mists of antiquity but it was practised by the Egyptians of the predynastic era, and the oldest known mummy, that of Ra-Nefer in the R.C.S. Museum, presents evidence of circumcision. A simpler operation would produce the same protective result. If the dorsum of the prepuce is slit up as far as the glans, and a stitch if necessary inserted at the upper end of the incision, within a few years time, owing to the gradual retraction of the lateral flaps of the prepuce, the result will be indistinguishable from that of circumcision. If performed just after birth the little operation can be done without an anaesthetic.

<sup>1</sup> British Dental Journal, 1923, xlv., 1325.

<sup>2</sup> Trans. Path. Soc., London, 1900, lli., 30.

<sup>4</sup> Practitioner, 1910, lxxxiv., 463.

In phimosi a delicate mucous membrane is exposed for life to the attack of a mixed bacterial flora living under complete shelter, and also to the chemical action of decomposing secretions. Recurrent attacks of lymphangitis of the glans, and the resulting lymphatic stasis, provide the basis for papilloma and cancer. S. K. Ngai, in reporting on 107 cases of carcinoma of the penis in China,<sup>5</sup> found that of 88 patients who made a positive statement on the matter 87 had had phimosi. Carcinoma of the penis is frequent among Chinese farmers and coolies, rare in the educated classes. That the Jewish immunity is not racial is indicated by Wolbarst's case occurring in an uncircumcised Jew, while there is no case in the literature occurring in a circumcised Jew.

PHIMOSIS AND UTERINE CARCINOMA

There is evidence that the existence of phimosi, or in its absence carelessness as to subpreputial hygiene and cleanliness, is a menace even more serious to the female sex than to the sex in which they originate. Briefly stated the evidence is this, that though certain forms of cancer—of the liver, the breast, and the rectum for instance—affect Jews more frequently than non-Jews, Jewish women show a much smaller liability to carcinoma of the cervix. In Amsterdam the non-Jewish inhabitants were found by Hoffman to show an incidence to cervix cancer of ten per 100,000, while the corresponding figure for Jewish women was less than four.

Cancer in Amsterdam 1919-29 (Hoffman)

	Catholics. Jews.			Catholics. Jews.	
	(per 100,000)			(per 100,000)	
Stomach	47.9	32.9	Breast	9.32	11.3
Liver and gall-bladder	13.21	17.16	Esophagus	9.51	3.63
Intestines	12.66	9.49	Rectum	6.48	8.37
Uterus	10.19	3.6	Lung	2.66	3.39

Maurice Sorsby comments<sup>6</sup> on the relative freedom of Jewish women from cancer of the uterus. Vineberg, in the out-patient department of the Mount Sinai Hospital of New York, observed among 19,000 patients, of whom 95 per cent. were Jewish, only 18 cases of uterine cancer and nine of these were in non-Jewish women. Thus the incidence among the Jewish women was only one-eighteenth of that among non-Jewish. Two other investigations by Rubin at the same hospital for other years gave incidence ratios of 1 to 7½ and 1 to 15 for Jews and non-Jews. Similar evidence is quoted by Sorsby from the Mayo Clinic. In every thousand non-Jewish patients seen at the Mayo Clinic six have carcinoma of the cervix; in every thousand Jewish patients only one has carcinoma of the cervix. Similar evidence is quoted by Sorsby from Paris, Budapest, Munich, Amsterdam, and Montreal. He concludes: "All the available evidence is therefore unanimous in pointing to a definitely lower incidence of uterine cancer among Jewish women." He believes that the hygienic ritual imposed on women by the Mosaic law accounts for their immunity, but the explanation seems unconvincing. The cervix exists normally under the same optimal conditions for bacterial life which are found under the phimotic prepuce. It is not surprising if marital infection with the subpreputial flora may lead to cervical cancer in the course of twenty or thirty years, just as in the male it leads to penile cancer. Immunity to penile carci-

noma and partial immunity to cervix cancer are not constitutional peculiarities of the Jewish race. There is another race which enjoys the same privileges, and that race also practises circumcision.

During a brief visit to Fiji in 1927, my attention was drawn to the occurrence of penile cancer in the Indian inhabitants originally imported from India, and to its absence among the aboriginal Fijians. The two races live side by side without mixing and the islands contain about 90,000 Fijians and 70,000 Indians. The Fijians, but not the Indians, practise circumcision at puberty. I endeavoured to find out the relative liability of the women of the two races to cervix cancer.

A search through the careful reports of the Colonial War Memorial Hospital at Suva, Fiji, shows that during the eight years, 1925-32 inclusive, three cases of cervical carcinoma in Fijians were admitted, and 26 cases in Indian women. Thus the smaller of the two population groups, the one not practising circumcision, shows an incidence of cervix cancer upon its women more than eight times greater than the incidence of the disease upon women of the other or circumcised nation. The total number of hospital cases of malignant disease of all kinds in Indians was 97 as compared with 61 in Fijians.

The freedom of the Fijian race from cervix cancer is therefore not due to any racial immunity to cancer, nor can it be explained as illusory and due to reluctance to seek hospital treatment. It must be attributed to the protection which the hygienic operation of circumcision affords against mixed bacterial infections of the cervix during coition. It is customary to ascribe cervix cancer to trauma of the cervix during parturition, but if this were the case both races should be affected equally.

PUERPERAL SEPSIS AND THE MALE

If chronic mixed infections are mainly responsible for cervical carcinoma, it is pertinent to inquire whether the obstinate persistence of high puerperal mortality, in spite of the vigorous campaign directed against it by our health authorities, may have a similar origin. The maternal death-rate per 1000 live and stillbirths, which in 1928 was 1.72, actually rose in 1933 to 1.75. The rise, otherwise difficult to explain in this aseptic era, is intelligible if, as I suggest, an important aetiological factor has been ignored. Educational insistence on strict personal hygiene for the man would be slow and uncertain in its action. Insistence on universal preputiotomy might very well prove to be a controlling factor for this particularly cruel and obstinate scourge of our national life.

In a discussion on Puerperal Blood Infections at the Fifth British Congress of Obstetrics and Gynaecology, held in London in 1925, the late Prof. W. Blair-Bell<sup>7</sup> expressed the view that coitus shortly before parturition might be an important factor in puerperal sepsis. In 20 per cent. of lying-in patients who gave a history of recent coitus, hæmolytic streptococci were found in the vagina.

I have endeavoured to obtain evidence of the relative incidence of puerperal pyrexia in Jewish and non-Jewish women. The Ministry of Health were unable to find for me any study of the subject. It urgently needs investigation. The relations of phimosi to puerperal sepsis should also be studied.

The subject has reached a stage when authoritative advice upon it should be given by the Ministry of Health, or by such a responsible body as the British Empire Cancer Campaign. The question which King Edward VII. asked about tubercle, "If preventable

<sup>5</sup> Amer. Jour. of Cancer, 1933, xix., 259.  
<sup>6</sup> Cancer and Race, London, 1931.

<sup>7</sup> Jour. Obst. and Gyn., 1925, xxxii., 243.

why not prevented?" is equally pertinent to the forms of carcinoma we have just considered.

#### DENTAL HYGIENE

The British Dental Association urges that dental benefit should be made a covenanted benefit under the National Health Insurance Act. The governing body of the British Medical Association resolved in 1928 that "the establishment of periodical medical and dental examinations of all persons insured under the National Health Insurance Acts is urgently called for as an economic proposition, having regard to the return so to be obtained in health and productive efficiency." But examination without treatment is not enough. The task that must be imposed on the dental profession is to maintain the oral hygiene of eighteen million insured workers and their dependants, a total of about forty million persons, most of whom at present receive no attention beyond occasional dental extraction. At a reasonable estimate this means forty million hours' work a year, or eight hours additional work each week-day throughout the year for every person on the Dental Register. The financial aspects of the question are no less alarming, for even at a capitation fee of 12s. 6d. per annum, the lower of two figures suggested by the British Dental Association, the cost would be twenty-five million pounds a year.

It is clear that the scheme can only be introduced by degrees, and that it must be accompanied by a large increase in the numbers of the dental profession, unless some of the work is delegated under supervision to partially trained persons, a plan which has been successfully adopted in New Zealand with the approval of the local dental profession. It is equally clear that self-help must be invoked. A weekly voluntary contribution of twopence from each beneficiary, to which Parliament or the approved society might be asked to add another penny, would launch the scheme, and it would gradually grow as the people came to realise its advantages.

Until dental hygiene is secured there is little hope for any further diminution in cancer of the mouth, tongue, pharynx, œsophagus, and stomach, and gastric and duodenal ulcers will continue to wreck many lives.

#### A Practical Programme

Let me now sum up my simple practical programme for the prevention of cancer: Preputiomy on all male infants at birth for the abolition of penile cancer, the diminution of cancer of the cervix in women to one-sixth of its present incidence, and a probable incidental lowering of puerperal mortality. Instruction of men in the importance of personal hygiene. A short prophylactic course of deep X rays to the breasts in all cases of chronic mastitis, especially if cystic, for the prevention of breast cancer. Dental treatment of the people on a national basis for the prevention of cancer of the mouth and alimentary canal.

**CHESTER ROYAL INFIRMARY.**—It was stated at the annual meeting of this hospital that it treated one person out of six of the local population during the last year. Ordinary income almost equals ordinary expenditure, but more income will be needed, since the full cost of the additional nurses engaged on completion of the nurses' home extensions has not yet been felt. The extension of the out-patient department is becoming urgent. The establishment of a preliminary training school has been approved and probationers will be admitted for courses of six weeks.

## ON THE POSSIBLE RÔLE OF THE ANTERIOR PITUITARY IN HUMAN DIABETES

BY O. L. V. DE WESSELOW, D.M. Oxon.,  
F.R.C.P. Lond.

PROFESSOR OF MEDICINE, UNIVERSITY OF LONDON; DIRECTOR OF THE MEDICAL UNIT, ST. THOMAS'S HOSPITAL; AND

WILLIAM J. GRIFFITHS, Ph.D. Lond., A.I.C.

HENRY GEORGE PLIMMER FELLOW IN PATHOLOGY, DEPARTMENT OF CHEMICAL PATHOLOGY, ST. THOMAS'S HOSPITAL

AN increasing appreciation of the factors involved in the control of the blood-sugar has again opened up the whole question of the aetiology of "diabetes." We may, perhaps, formulate the orthodox position somewhat as follows. After exclusion of certain well-recognised types of glycosuria, such as those associated with thyrotoxicosis, hyperadrenalæmia, and some pituitary lesions, the remainder of our patients who exhibit hyperglycæmia and glycosuria are assumed to form a more or less homogeneous group, and to be suffering from varying degrees of insulin deficiency. Inability to store and utilise carbohydrate is to be ascribed to this lack of insulin, with resulting hyperglycæmia, glycosuria, and ketonuria; their low respiratory quotient (R.Q.), both fasting and after ingestion of carbohydrate, appears to afford contributory evidence of a lack of carbohydrate oxidation. This conception of insulin inadequacy has been enormously strengthened by the success of insulin therapy.

Although insulin has made it possible to restore the diabetic to a normal state of carbohydrate metabolism the mode of action of this hormone has for long remained obscure despite the most searching inquiries. During the last few years, however, the importance of so-called diabetogenic factors of pituitary origin, resulting in a disturbance of the normal regulation of carbohydrate metabolism, has been established, mainly by the work of Houssay and his colleagues.<sup>1</sup> For details of this work the reader is referred to the recent publications of Collip.<sup>2</sup> Houssay was able to show, first in the toad and subsequently in the dog, that removal of the anterior lobe of the pituitary gland in the depancreatized animal is followed by amelioration of the diabetic symptoms: hyperglycæmia, glycosuria, and ketonuria are diminished, and there is a gradual rise in the R.Q. and a fall in the urinary D:N ratio (Soskin<sup>3</sup>). By injection of pituitary substance into these depancreatized-hypophysectomized animals the improvement in the diabetic condition was abolished. It appeared, therefore, that the symptoms arising from pancreatectomy are to some extent of pituitary origin. In further confirmation of this diabetogenic action of the pituitary, Houssay and his co-workers<sup>4</sup> showed that injections of anterior pituitary extracts into the normal toad, dog, and other animals lead to hyperglycæmia, glycosuria, and ketonuria. This work is of especial interest in view of the association of acromegaly and glycosuria and, indeed, it had been shown by Borchardt,<sup>5</sup> as early as 1908, that injections of extracts of bovine pituitary glands into rabbits result in hyperglycæmia and glycosuria.

In view of these striking experimental results in animals it is natural that the question of the significance of the pituitary in relation to human diabetes should arise: do any of the metabolic disturbances which we have hitherto regarded as due to insulin

deficiency in fact arise from a disturbance of the function of the anterior pituitary? The glycosuria which is so frequent in acromegaly lends support to the view that glycosuria in man may result from pituitary dysfunction; glycosuria is also a feature of the Cushing syndrome. There is, moreover, another group of cases showing disordered carbohydrate metabolism in which the possible rôle of the pituitary cannot be ignored; we refer to those patients, usually past middle age and obese, in whom glycosuria and hyperglycæmia, but little ketonuria, are present, and in whom the subjective symptoms are relatively mild and the course of the disease protracted. In such patients the glycosuria is not infrequently discovered accidentally, attention being first drawn to its presence in the female by the appearance of vulvitis; apart from this the often gross glycosuria does not appear to affect the patient's well-being. This class of patient differs materially from the typical young diabetic, in whom the disease is accompanied by marked ketosis, wasting, and if untreated a rapid progress to coma and death.

In the present unsatisfactory state of our knowledge these two classes of patients, in whom the course and prognosis of the condition are so widely different, are perforce included in a single group under the head of "diabetes." It is at least possible that the hyperglycæmia and glycosuria characteristic of both groups constitute a purely superficial resemblance and that the underlying causes of the condition are as different as those in the depancreatised animal and in the animal receiving anterior pituitary substance by injection.

#### EXPERIMENTAL

With the object of obtaining some insight into this problem we have studied the effect of a preceding injection of "diabetic" blood as compared with "normal" blood on the response of the rabbit to insulin.

We have used immature male rabbits of about 1 kg. body-weight, maintained on a diet of cabbage, oats, and bran. The animals were starved for 18 hours before the experiment. Three hours before the response to insulin was determined, 10 c.cm. of the plasma to be examined was injected subcutaneously into the animal. The plasma was obtained from heparinised blood, spun out immediately after withdrawal and preserved in a refrigerator, in most cases over-night; in a few instances the plasma was injected within one hour of bleeding the patient. Three hours after injection of the plasma the animal received 0.2 unit of commercial insulin (Boots) into the marginal vein of the ear. The blood-sugar was estimated by MacLean's method on 0.1 c.cm. of blood withdrawn from an ear vein before and at quarter-hour intervals, for one hour after injection of the insulin. Two or three days before testing the effect of plasma, an insulin curve was obtained on every animal without preliminary injection of plasma. Young animals were employed with a view to obtaining a larger dose of plasma per unit of body-weight, and in the hope that they would prove more sensitive as test-objects. With very few exceptions a fresh animal was employed for each plasma tested.

The patients whom we have studied may be divided into four groups and the blood-sugar curves obtained in each group, together with the corresponding control curves, are averaged and are shown in Figs. 1-4. These groups were as follows:—

(i.).—Controls. 9 middle-aged subjects; 4 males and 5 females, suffering from various chronic diseases but with no disturbance of carbohydrate metabolism and on an ordinary mixed diet.

(ii.).—7 young diabetic patients; 3 males and 4 females, of whom 6 were under thirty, while in the remaining case the disease had appeared at the age of thirty-six. All but 2 of these had been receiving insulin for some time.

(iii.).—16 elderly diabetic patients; 1 male and 15 females, all but 2 of whom were between the ages of fifty and seventy-five. With the exception of 1 female, the blood pressures of these subjects were abnormally high and the great majority were overweight. 3 only were receiving insulin, the remainder being dietetically treated.

(iv.).—6 subjects from Group III. whose plasma appeared definitely to affect the blood-sugar response to insulin; the average of ten curves obtained from these individuals is given.

#### RESULTS

Inspection of the curves shows that after injection of plasma obtained from the subjects of Groups I. and II. (i.e., the controls and young diabetic patients) there was no appreciable alteration in the form of the blood-sugar curve during the period following injection of insulin (Figs. 1 and 2). In the case of the elderly diabetic subjects of Group III., however, it would appear that a preliminary injection of the plasma into the animals resulted in an early arrest of the fall in blood-sugar after insulin; associated with this premature arrest there was a very definite tendency for the blood-sugar to be higher than the control values during the remainder of the experiment (Fig. 3). This effect of a diminished fall and a more rapid restoration of the blood-sugar after injection of the plasma of these patients is particularly evident in Group IV. (Fig. 4), in which the curves of those members of Group III. who seemed to us to give a positive response have been separated from those in whom the response was negative. We wish particularly to call attention to the following points: (1) that during the second 30-minute period following injection of insulin the blood-sugar had already begun to rise; and (2) that after 60 minutes the average blood-sugar exceeds the initial value; in these respects the curves obtained after injection of plasma are in sharp contrast with those of Figs. 1 and 2.

#### DISCUSSION

Our findings suggest that, whereas the plasma of normal and young diabetic subjects produces no alteration in the blood-sugar response of the rabbit to insulin, the plasma of some elderly diabetics, of the type which we have defined, injected under similar conditions profoundly modifies the action of insulin.

During the period of our experiments, and with the dosage of insulin used, the average blood-sugar of untreated rabbits shows a progressive fall, with some slight tendency to rise during the final period. In comparison it will be seen that the alteration in the average blood-sugar curve following injection of a plasma with which a positive result was obtained is confined to the end of the curve (Fig. 4); the curves of the injected animals and controls fall together during the first 15 minutes, and then diverge, the blood-sugar of the injected animals rising rapidly above that of the controls. Because the initial rate of fall of the blood-sugar is the same in both treated and untreated animals, it would seem that there is no question of any directly acting anti-insular substance in the plasma; in other words, there is nothing in the positive plasma capable of affecting the rapidity of the initial response of the animal to insulin.

In the normal animal a compensatory mechanism becomes effective when the blood-sugar falls to a level determined by the amount of insulin injected and the blood-sugar begins to return to its original level. The period of our experiments being relatively short, in our control animals this mechanism has not had time to produce an appreciable rise in blood-

sugar, but the injected animals giving a positive result appear to be sensitised to its action and in consequence their blood-sugar rapidly regains its initial value.

Observations on the action of anterior pituitary extracts on the blood-sugar response of animals to insulin which bear a close resemblance to our findings have already been recorded. Cope and Marks<sup>6</sup> have studied the effect of hypophysectomy on the response of the rabbit to insulin. These workers found that although hypophysectomy did not alter the rate of fall of the blood-sugar after insulin, the recovery phase was practically absent, so that the blood-sugar continued to fall during the late stages of the curve. Rupp<sup>7</sup> and Houssay<sup>8</sup> have shown

genolytic substances in human serum is that of Anselmino and Hoffmann<sup>10</sup> which appeared shortly after we began our experiments. These authors claim to have demonstrated that serum from diabetics, when injected into rats, results in a marked diminution of the liver glycogen which reaches a maximum in 2-3½ hours. They made no determinations of the blood-sugar of their animals but claim to have found a considerable increase in the blood ketone bodies coincident with the fall in liver glycogen. The active substance was found to be present in all diabetics and without relation to the type or severity of the disease. The same substance was absent from normal human serum during fasting but appeared in response to carbohydrate feeding. Anselmino and Hoffmann

EFFECT OF PRELIMINARY INJECTION OF PLASMA ON THE BLOOD-SUGAR RESPONSE TO 0.2 UNIT OF INSULIN INTRAVENOUSLY

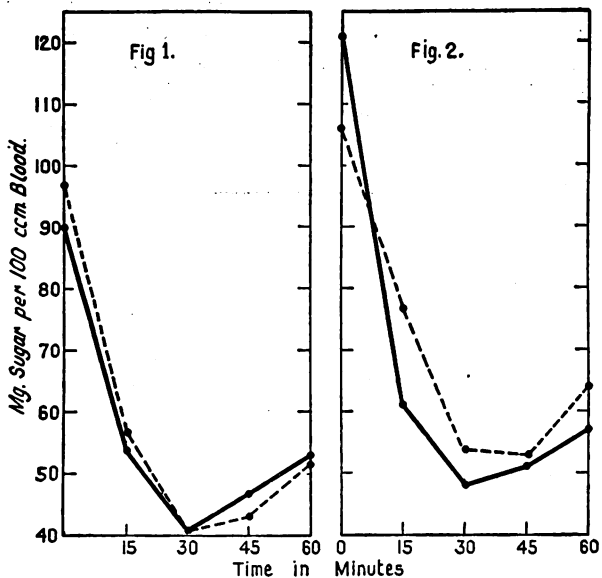
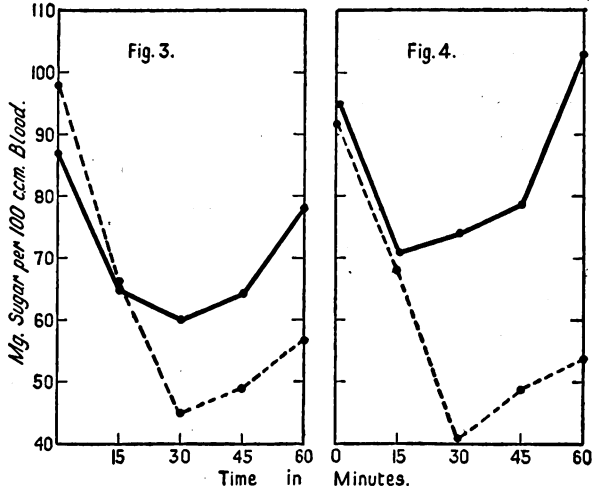


FIG. 1.—Group I.; 9 normal controls.  
FIG. 2.—Group II.; 7 young diabetics.



Dotted line = response of untreated animals;  
Continuous line = response after injection of plasma.  
FIG. 3.—Group III.; 16 elderly diabetics, unselected. Average of 20 curves.  
FIG. 4.—Group IV.; 6 members of Group III. giving positive response. Average of 10 curves.

that secretion of adrenaline by the adrenal glands is an important factor in the restoration of the blood-sugar in hypoglycæmia, and Cope and Marks<sup>6</sup> were able to demonstrate that adrenaline appeared in the blood of their hypophysectomised animals although no rise in blood-sugar occurred, and attributed this failure of the normal compensatory action of adrenaline to the absence of an anterior pituitary factor necessary for the discharge of glycogen from the liver by adrenaline. The effect of injection of a crude saline extract of the anterior pituitary on the blood-sugar response of the rabbit to insulin was also investigated by Cope and Marks.<sup>6</sup> After preliminary treatment of the animals with these extracts, insulin produced a greatly curtailed hypoglycæmia associated with a tendency for the blood-sugar to rise to a high level, very much as in our own experiments; with particularly potent extracts these effects were manifested within a few hours of injection. These findings have since been confirmed by Young,<sup>9</sup> whose diagram of the changes in the blood-sugar response of rabbits to insulin during the first hour after injection of Prolactin (an anterior pituitary product) bears an extraordinary resemblance to our own curve in Fig. 4.

The only work with which we are acquainted which bears directly on the question of the glyco-

believe the substance responsible for these effects is the same body as that which they have isolated from the anterior lobe of the pituitary.

While we have carried out a few experiments on the effect of injected diabetic plasma on the liver glycogen and the blood-sugar response to adrenaline in animals we are not, as yet, in a position to express an opinion on this aspect of the subject. Though we selected elderly, obese, hypertensive, glycosuric subjects as constituting a well-known clinical type, the only obese, non-hypertensive patient with glycosuria, whom we have examined, gave a positive response. It would seem, therefore, that hypertension is not an essential part of the syndrome. None of our patients who gave a positive response showed definite symptoms of pituitary dysfunction, with the possible exception of obesity, but in view of the known dissociation of pituitary symptoms we do not regard this as invalidating the hypothesis that their disorder was due to a disturbance of this gland. Though obesity in the Fröhlich syndrome is associated with increased sugar tolerance, a condition resembling that seen in the hypophysectomised animal, obesity in the Cushing syndrome is accompanied by a definite lowering of tolerance to sugar.

It may be pointed out that at the moment the position of the pituitary in the control of

carbohydrate and fat metabolism is obscure: from the literature it would seem that at least three principles are involved: (a) the glycogenolytic principle of Cope and Marks<sup>6</sup>; (b) the gluconeogenic factor of Soskin,<sup>11</sup> which controls the production of sugar from fat; and (c) a ketogenic factor described by Burn and Ling,<sup>12</sup> Anselmino and Hoffmann,<sup>10</sup> and others. The glycogenolytic and gluconeogenic principles are termed diabetogenic substances; there seems to be general agreement that the diabetogenic and ketogenic principles of the anterior pituitary are distinct bodies (see Collip<sup>2</sup> and Anselmino and Hoffmann<sup>10</sup>), a finding which has a possible bearing on the occurrence of glycosuria unassociated with appreciable ketosis in obese persons.

It is remarkable that injections of diabetogenic substances into animals do not immediately result in an elevation of the fasting blood-sugar level, although other signs of their presence are manifested. While Cope and Marks<sup>6</sup> found that an extract of the anterior pituitary in some instances raised the fasting blood-sugar to hyperglycæmic levels, Anselmino and Hoffmann<sup>10</sup> state that their purified extract had no definite effect on the blood-sugar; in Houssay's<sup>4b</sup> experience anterior pituitary preparations raise the blood-sugar only after a considerable latent period. In our animals the fasting blood-sugar was not altered by injection of positive sera.

Our knowledge of the metabolic disturbances in diabetes will undoubtedly be considerably extended as the thesis that the anterior pituitary gland and the pancreas act antagonistically in the control of carbohydrate metabolism is developed. It would appear that any alteration in the balance of these opposed influences must lead to abnormal carbohydrate metabolism. According to Houssay<sup>14</sup> the liver alone is essential for the manifestation of the diabetogenic action of pituitary extracts, and Soskin<sup>15</sup> has suggested a theory of the maintenance of the blood-sugar level based on the view that the pituitary and pancreatic factors act through the medium of the liver.

The significance of the low R.Q. characteristic of the diabetic condition has recently been called into question by Soskin.<sup>3</sup> Contrary to accepted opinion it would seem that the depancreatized dog, and, presumably, the human diabetic, is able to oxidise carbohydrate in a normal manner. The effect of the oxidation of carbohydrate on the R.Q. is, however, considerably masked by the simultaneous conversion of fat to carbohydrate, a process having a low R.Q.

Our finding that in certain cases of diabetes the blood contains a substance with a diabetogenic action is against the view that lack of insulin is always responsible for the disturbances of carbohydrate metabolism of the "diabetic." The close similarity between our results and those obtained by others with extracts of the anterior pituitary suggests that the blood of those of our patients who gave a positive response contained an excess of a factor capable of modifying the hypoglycæmic action of insulin in a manner resembling that of the anterior pituitary principle. Having regard to the relatively small volume (10 c.cm.) of plasma injected into the rabbits, the concentration of active substance in these bloods must have been very considerable.

#### SUMMARY

The blood plasma of some elderly, obese, glycosuric patients, when injected into rabbits, was found to diminish the hypoglycæmic action of insulin in a manner closely resembling that observed by other

workers with extracts of the anterior pituitary gland. The plasma of young diabetic patients and of normal control subjects gave entirely negative results. The possible bearing of this finding on the pathogenesis of human diabetes is discussed.

#### REFERENCES

1. Houssay, B. A., and Biasotti, A.: *Compt. rend. Soc. d. biol.*, 1930, civ., 407; 1930, cv., 121 and 124.
2. Collip, J. B.: *Jour. Amer. Med. Assoc.*, 1935, civ., 827 and 916.
3. Soskin, S.: *Jour. of Nutrit.*, 1930, iii., 99.
4. (a) Houssay, B. A., Biasotti, A., and Rietti, C. T.: *Compt. rend. Soc. de biol.*, 1932, cxl., 479; (b) Houssay, B. A., *Klin. Woch.*, 1933, xii., 773; (c) Houssay, B. A., and di Benedetto, E.: *Compt. rend. Soc. de biol.*, 1933, cxli., 494.
5. Borchardt, L.: *Zeits. f. klin. Med.*, 1908, lxxvi., 332.
6. Cope, O., and Marks, H. P.: *Jour. of Physiol.*, 1934, lxxxiii., 157.
7. Rupp, F.: *Zeits. f. d. ges. exp. Med.*, 1925, xliii., 476.
8. Houssay, B. A., Lewis, J. T., and Molinelli, E. A.: *Compt. rend. Soc. de biol.*, 1924, xci., 1011.
9. Young, F. G.: *Jour. of Physiol.*, 1936, lxxxvii., 193.
10. Anselmino, K. J., and Hoffmann, F.: *Zeits. f. klin. Med.*, 1935, cxxxix., 24.
11. Soskin, S., Mirsky, I. A., and Crohn, N.: *Amer. Jour. Physiol.*, 1935, cxv., 110.
12. Burn, J. H., and Ling, H. W.: *Quart. Jour. Pharm.*, 1929, ii., 1; *Jour. of Physiol.*, 1930, lxxix., xix.
13. Houssay, B. A., and Biasotti, A.: *Compt. rend. Soc. de biol.*, 1933, cxliii., 469.
14. Soskin, S.: *Amer. Jour. Physiol.*, 1934, cix., 155; *Ibid.*, 1934, cx., 4; Soskin, S., Allwiss, M. D., and Mirsky, I. A.: *Arch. Internal Med.*, 1935, lvi., 927.

### A CASE OF ACUTE FEBRILE ANÆMIA DUE TO DENTAL SEPSIS

BY PAUL C. GIBSON, M.D., B.Sc., M.R.C.P. Lond.  
PHYSICIAN TO THE TORBAY HOSPITAL

NEARLY fifty years ago William Hunter remarked on the similarity between what he called *septic anæmia* and *Addison's anæmia*. He was convinced that they were distinct diseases, but he believed that in both, oral sepsis played a part; that in the one case the relationship was a direct one, while in the other it was indirect. During the past fifty years attention has been mainly directed to Addison's anæmia, and controversy has been keenest about its relationship to focal sepsis. The discovery in 1923, by Minot, of the special efficacy of liver, completely reorientated our ideas about this and other allied anæmias, emphasising the prime importance of a deficiency factor in this particular group. To-day the scene has shifted; for the moment the theory of Addison's anæmia has been satisfactorily shelved, and the centre of dispute is another group of anæmias, which, although called by another name, resemble in many ways the *septic anæmia* of Hunter. Whether or not focal sepsis plays a part in their causation is still a moot point, but the story of these anæmias is not yet finished, and, in the light of more perfect knowledge, it may be found that Hunter was right after all.

In the course of a discussion at the Royal Society of Medicine in 1933, Tidy<sup>1</sup> referred to cases of *acute febrile anæmia*, recalling the kind of nickname given them by Parkes Weber, "acute breakdown of the blood," a term that was not intended as a distinctive label, but which has nevertheless a useful implication suggesting a severe, passing anæmia of sudden onset. Among this group of febrile anæmias is the *acute hæmolytic anæmia*, to which Lederer<sup>2,3</sup> drew attention in 1925. The outstanding features of his cases were the acuteness of the development of the symptoms; evidence of very rapid erythrocyte destruction;



extreme regenerative activity of the bone-marrow; rapid recovery after therapy; and absence of sequelæ. In the succeeding years a considerable number of similar cases have been reported. Lederer himself remarked that the disease was not an infrequent one. A review by O'Donoghue and Witts<sup>4</sup> in 1932, of 36 cases, and a report by Joules and Masterman<sup>5</sup> in 1935, of 4 cases, makes it probable that the condition is more common than is generally supposed.

O'Donoghue and Witts are inclined to believe that the disease is a distinct clinical entity, but in regard to its pathology they say "the morbid anatomy of the disease is as suggestive of an infection as the clinical picture, but there is no convincing evidence that streptococci or other familiar micro-organisms are the cause." A constant feature of these cases is the absence of demonstrable micro-organisms from the blood. If we assume that streptococci or other familiar micro-organisms are the cause, it follows that the materies morbi must be a soluble toxin. If this is so, it is not surprising that the source of the toxin is often hard to find. Cryptic infections are the bane of medical practice, and they are likely to continue to be so until a satisfactory test is found (perhaps on the lines of the pathogen selective culture test) which will supply convincing evidence of infection by a particular organism, isolated from a suspected focus.

If the toxæmic state resulting from focal infection is indeed the primary factor in the causation of *acute febrile anæmia*, we must look for other factors to account for the differences that distinguish a particular group, such as the Lederer group, from other anæmias of septic origin. From the almost specific effect of blood transfusion in most of the reported cases it may be supposed that anoxæmia is such a factor. It seems as though, in the course of a toxæmic process which is affecting the blood and producing anæmia, when the available hæmoglobin falls below a certain critical level, a breakdown of the hæmopoietic system follows—such a state being often associated with a febrile reaction. It is believed that the actual stimulus to hæmopoiesis in anæmic states is diminished oxygen tension. Presumably if oxygen tension falls below a certain level the stimulant effect is succeeded by depression. If, as a further result of the toxæmia, the source of hæmopoietic factor is poisoned, the scene is set for the production of an anæmia of Addisonian type. To restore the balance of health, one or more of three methods of treatment might be expected to be effective: (1) reinforcement of the hæmoglobin supplies; (2) reinforcement of the natural supply of hæmopoietic factor; (3) elimination of the infection. Of all these methods, the swiftest and surest, in the average case, would be an adequate blood transfusion. It is to be expected that an adequate supply of liver or stomach extract would be equally efficacious in some cases. But, assuming that focal infection is at the root of the trouble, these can only be regarded as palliative remedies; the tracking down and suppression of the source of infection must be of primary importance.

It is interesting to recall the case of Exner and Ive,<sup>6</sup> reported in 1925, and another case reported by Venables<sup>7</sup> in 1926. In both of these, acute hæmolytic anæmia was associated with dental sepsis. In the case of Exner and Ive, after two blood transfusions had been ineffective, a third one, given after the mouth had been cleared of infected teeth, was dramatically successful. In Venables's case, blood transfusion was ineffective, dental extraction was considered inadvisable on account of the patient's

condition, and a desperate situation seemed to be saved by the use of an autogenous vaccine prepared from a dental swab. In one of Lederer's six cases three transfusions of 500 c.cm. each were without beneficial effect; in fact the patient was worse after the third one, but she eventually recovered without any further treatment.

### Case Record

The case that is the subject of this communication has much in common with those reported by Exner and Ive and by Venables.

### HISTORY

Female, aged 23, domestic servant. Diphtheria at 4 years old. Jaundice at 14 and at about the same time she had two teeth extracted which was followed by a septic mouth and a septic toe. She was otherwise well until about two years before admission. She then began to get tired easily and found her work more and more of an effort. In March, 1934, she began to have pain in her left hip. After a week in bed the pain improved. She went home for six weeks, remaining more or less free from pain. Three days after starting work the pain returned and she was sent to St. Mary's Hospital, Paddington, for investigation. She went there on May 11th and attended as a surgical out-patient. She complained of pain in the left thigh, radiating to the heel, also of breathlessness on exertion and palpitation. It was considered that she was suffering from sciatica and she was transferred to the medical department. Radiograms of both hip-joints showed nothing abnormal, a group of calcium shadows appeared in the right pelvis which were thought to be calcified glands. Clinical examination showed that she was thin and pale and had very evident dental sepsis; temperature 98° F., pulse-rate 120. Nothing else was found wrong. She was sent to have dental treatment and told to report again afterwards.

In June she had four teeth extracted, after which her condition remained much the same. At the end of July she came to Torquay to recuperate. Shortly afterwards the pain became worse and the left shoulder became affected. She went to consult a doctor, walking some little way to his house. He noted that she was very pale and so sent her to the hospital for a blood count, telling her to come and see him again in a couple of days so that he might advise her in the light of the report. She did not come and when he called at her house he found her in bed very ill. He immediately sent her into the Torbay Hospital. She was admitted on August 17th, 1934.

By reference to the temperature chart the last illness can be divided into three phases: (1) A febrile phase, lasting for twelve weeks and two days. (2) An afebrile phase, lasting nine weeks and five days. (3) A final phase, also febrile, lasting five weeks and three days, which ended with her death, six months after admission. The accompanying Tables summarise the main features of blood counts and other special investigations and of the treatment adopted.

### THE FIRST PHASE

At the time of admission she was thin and very pale. There was no suggestion of jaundice then, or at any time during the illness. The pulse-rate was 120, the temperature swinging from 97° to 103°. Nothing notable in the lungs. First heart sound blurred. Blood pressure 120/80. Spleen easily felt two fingers-breadth below the costal margin. There was pain in the left hip and shoulder-joints. The gluteal muscles on the left side were wasted. The urine contained neither albumin nor sugar. The blood showed a megaloblastic anæmia. Bacteriological and serological tests gave no evidence of a blood infection. It was thought that she had a primary anæmia and liver injections were started on Sept. 2nd.

On Sept. 15th her condition was steadily deteriorating and she was given a transfusion of 200 c.cm. of her father's blood. We could not be sure that he was of the same group, his cells were unaffected by her serum but her own

cells auto-agglutinated. There was a slight improvement after this and so, on Sept. 20th, she was given another transfusion of 250 c.cm. from the same donor. On the following day the red cell count had fallen still lower and no reticulocytes were seen. On Sept. 27th we detected what we took to be a presystolic thrill and murmur. She seemed to be dying and her parents were summoned to await the end.

Six days previously Ventriculin had been started. This was repellent to her and it was only by constant persuasion that she could be induced to take it. On Oct. 10th, encouraged by a rise in the reticulocytes, we increased the dose of ventriculin. It was found that 20 g. could be given in four large cachets. From this time onwards her condition progressively improved. The rapid improvement in her colour was very striking. Within four weeks the red cell count had reached 3 millions; at this point the fever abruptly ended and the first phase came to an end.

The salient features of this stage were the alternations in the clinical picture. At first she seemed to have a primary anæmia, and then the appearance of what we took to be a presystolic murmur, at the time when hæmatinic treatment had apparently failed, was very suggestive of infective endocarditis, while, later, the sudden improvement soon after ventriculin was added to the daily ration of liver seemed to point conclusively to Addison's anæmia.

TABLE I.—Blood Counts

Date.	Hb. per cent.	Rbc's (mills.)	C.I.	Wbc's (1000).	Polys. per cent.	Retics.	Immature cells in 200 Wbc's.
1934. Aug. 14th	37	3.13	0.59	3.0	62.5	0.75	{ 2 meg. 5 norm.
21st.	25	1.25	1.0	2.7	58.0	0.2	3 norm.
31st. Sept.	..	..	..	..	..	0.5	..
3rd.	..	..	..	..	..	0.7	..
4th.	..	..	..	..	..	1.6	..
5th.	..	..	..	..	..	0.6	..
6th.	..	..	..	..	..	0.3	..
7th.	..	..	..	..	..	0.8	..
8th.	..	..	..	..	..	0.5	..
12th.	22	1.3	0.84	1.5	62.5	0.5	1 norm.
17th.	20	1.47	0.68	..	..	..	..
21st.	16	1.14	0.72	2.8	70.0	Abs.	..
25th.	22	1.33	0.84	2.1	68.0	1.2	..
Oct. 1st.	..	..	..	..	..	1.0	..
4th.	..	..	..	..	..	1.0	..
6th.	15	1.14	0.68	..	..	..	..
8th.	..	..	..	..	..	4.6	..
11th.	20	1.34	0.76	2.2	60.0	5.0	4 norm.
15th.	..	..	..	..	..	4.5	..
18th.	..	..	..	..	..	6.0	..
22nd.	27	1.73	0.79	1.5	61.0	2.3	1 norm.
25th.	..	..	..	..	..	2.5	..
29th.	33	2.93	0.56	2.4	61.5	1.2	..
Nov. 1st.	..	..	..	..	..	1.8	..
5th.	36	2.88	0.63	3.0	62.5	2.5	..
8th.	..	..	..	..	..	2.0	..
12th.	42	3.11	0.67	3.0	43.5	2.2	..
15th.	..	..	..	..	..	1.0	..
19th.	54	3.92	0.69	3.8	43.0	1.7	..
22nd.	..	..	..	..	..	1.9	..
26th.	60	3.95	0.75	6.3	66.5	2.1	..
29th.	..	..	..	..	..	1.5	..
Dec. 3rd.	60	4.23	0.71	4.3	65.5	1.9	..
6th.	..	..	..	..	..	1.0	..
10th.	58	4.35	0.66	5.5	51.5	2.4	..
13th.	..	..	..	..	..	1.7	..
17th.	58	4.54	0.64	5.8	59.0	1.0	..
24th.	62	4.67	0.66	4.5	55.5	0.7	..
31st.	64	5.15	0.62	5.5	60.0	0.5	..
1935. Jan. 7th.	63	5.12	0.61	6.1	62.5	0.4	..
14th.	68	5.41	0.62	5.5	59.0	0.8	..
21st.	66	5.5	0.60	3.5	49.5	0.4	..
28th.	62	5.96	0.52	3.5	62.5	0.6	..
Feb. 4th.	65	4.75	0.68	3.3	63.0	0.3	..
11th.	66	5.23	0.63	4.5	67.5	0.6	..
18th.	60	4.77	0.63	6.0	81.0	0.4	..

Hb. = hæmoglobin; Rbc and Wbc = red and white blood-cells; C.I. = colour-index; polys. = polymorphonuclear leucocytes; Retics. = reticulocytes. Meg. = megaloblasts; norm. = normoblasts.

TABLE II.—Special Reports

1934.		BLOOD	
Aug. 21st	..	Widal	.. No evidence of agglutination found against members of the enteric group.
..	22nd	..	.. Serum further investigated against <i>Brucella abortus</i> and <i>melitensis</i> with negative results.
..	27th	..	.. No agglutination against <i>B. typhosus</i> O.
Sept. 3rd	..	Platelets	.. 118,000 per c.mm.
..	5th	Blood culture	No pathogenic organisms found.
Dec. 6th	..	Van den Bergh	Negative in both phases.

URINE

No sugar or albumin found throughout the course of her illness.

FÆCES

Aug. 24th .. Bacteriology.. No evidence of non-lactose-fermenting organisms found.

FRACTIONAL TEST-MEAL

A = Free HCl. B = Total acid.

Nov. 29th.		½ hr.	¼ hr.	½ hr.	1 hr.	1½ hrs.	1¼ hrs.
A	..	0.046	0.088	0.200	0.119	0.109	0.190
B	..	28	39	72	46	43	72
							56

No pus seen. A trace of blood in resting juice. Bile present in later samples. Starch absent in resting juice, present in all others. Mucus present throughout.

TEETH

1935. Jan. 5th. Report on radiogram  
The radiological examination of the upper teeth shows them to be healthy, but there is a root tip remaining from upper right 8. In the mandible there are two partially absorbed roots of L.L. 7, while L.R. 5 looks to have an infected area in the alveolus consisting of a small abscess, in addition to some more generalised rarefaction of bone.  
Jan. 16th Bacteriology  
Pathogen selective and direct cultures show a *Streptococcus viridans*.

TABLE III.—Treatment

		Date in 1934.	
Iron, arsenic and strychnine	{ Intramuscular ..	Aug. 18th	Sept. 2nd.
		injections alternate days.	
Campolon	{ Intramuscular ..	Sept. 2nd	Oct. 6th.
		injections, 2 c.cm. daily.	
Liver extract	{ Oral—	1 dr. b.d.	Sept. 12th
		2 dr. b.d.	Oct. 17th
		2 dr. t.d.s.	Nov. 10th
		2 dr. 4 times	Nov. 24th
		2 dr. t.d.s.	Dec. 22nd
Ventriculin	{ Oral—	10 g. daily	Sept. 22nd
		20 g. daily	Oct. 10th
Colliron	{ Oral—	1 dr. t.d.s.	Sept. 12th
		2 dr. t.d.s.	Dec. 12th
Pil. ferri redact.	grs. 10 t.d.s.	Dec. 23rd	Death.

On Nov. 3rd it was recorded that the spleen was not felt and the first sound at the mitral area was clear. It was evident that we had been deceived by a doubled first sound. A reference from a paper by Poynton, Thursfield, and Paterson<sup>8</sup> on acute anæmia in children so exactly describes what occurred in this case that I feel justified in quoting it. They say:—

“As the anæmia progresses the first sound at the impulse becomes short and abrupt, and if in addition it is slightly reduplicated, the simulation of mitral stenosis is very close. We have not detected, in such cases, a definite thrill, but there is invariably a soft systolic murmur after the abrupt first sound. When the degree of anæmia is very profound, a diastolic murmur may become also evident at the base, with its maximum usually, just to the left of the sternum in the second intercostal space. When, in addition, there are fever, purpura and enlargement of the spleen, the resemblance to a progressive endocarditis is so close as to give rise to the greatest difficulty

in diagnosis. It is equally remarkable, when there is improvement in the anæmia, how completely these cardiac signs alter and return to normal."

THE SECOND PHASE

During the nine weeks that followed the abrupt cessation of the swinging temperature, she remained afebrile with the exception of four isolated rises, none of which lasted more than 48 hours. It was a period of steadily improving health. The blood count rose progressively and her weight increased from 7 st. 3 lb. on Nov. 20th to 8 st. 5 lb. on Dec. 29th. The results of a fractional test-meal and a van den Bergh test showed that she had a normal gastric acidity, and that there was no evidence of hæmolytic at the time of the test. And so the idea of Addison's anæmia had to be abandoned and the teeth again became suspect.

It was decided to wait, before having these dealt with, in order to get her as physically fit as possible. She was given massage, and, later, a course of ultra-violet light baths and she gradually resumed a normal life. About Christmas time arrangements were made for her to stay with friends to complete her convalescence. On Dec. 16th she began to complain again of pain in her shoulder and hip. On Dec. 23rd this was so severe that an injection of omnopon was needed to relieve it. Her general condition remained good. On Jan. 4th her teeth were radiographed. It was found that she had an apical abscess in one of her premolars and five other teeth appeared to be unhealthy. There was a brisk rise of temperature on the day following the X ray examination, which subsided after 48 hours. The pain continued and her weight began to fall and so it was decided that the infected tooth should be extracted. This was done under gas on Jan. 12th.

From the apex of the tooth a growth of *Streptococcus viridans* was obtained, both from a direct culture and from implantation into her own blood. A vaccine was prepared with which it was hoped to immunise her before proceeding to further extractions. One week after the extraction the swinging temperature returned and she entered on the final phase of her illness.

THE THIRD PHASE

The beginning of the final phase, which started on Jan. 18th, coincided with the onset of the first menstrual period that she had had since her admission. During the succeeding week the temperature was not alarming and it was thought that it might be associated with menstruation. But her general condition deteriorated rapidly, the pain in her hip and shoulder was continuous and at times agonising.

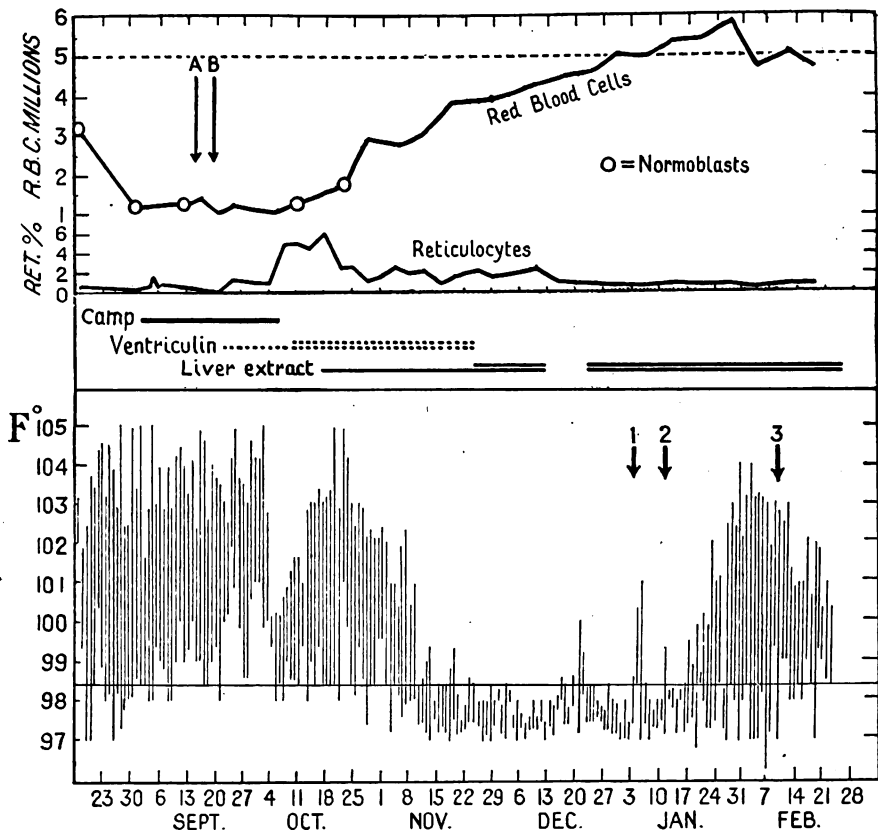
On Jan. 26th, the vaccine being ready, she was given a subcutaneous injection of 50,000 organisms. During

the succeeding 24 hours the temperature was subnormal. The same dose was repeated on Jan. 30th and on Feb. 1st without result. On Feb. 4th she was given 75,000, still without effect. The temperature was now swinging from 97° to 103°. We felt that there was no time to lose and decided to give her full doses of antistreptococcal serum and then to extract the suspected teeth. From Feb. 8th to 14th inclusive she was given, intramuscularly, 10 c.cm. of concentrated polyvalent antistreptococcal serum twice daily. On Feb. 9th the five suspected teeth were extracted. After this the temperature began to abate and we hoped that she was going to improve. On Feb. 10th she began to get serum reactions; she vomited frequently and a giant urticaria developed all over her body. These troubles added to the pain were becoming intolerable and so, on Feb. 15th, we stopped the serum. But it was soon evident that she was failing, the pulse-rate rose steadily, the liver became hard and enlarged (being palpable five fingers-breadth below the costal margin), there were crepitations at the bases of both lungs, and purpuric spots appeared on the abdomen.

On Feb. 24th she died, five days after the completion of her sixth month in hospital.

Conclusion

A peculiarly interesting feature of this case is the contrast presented by its initial and final phases. During the first phase the only symptom was extreme prostration, the pain was forgotten soon after admission. The dominating feature apart from pyrexia, which was common to both phases, was a grave anæmia. Although the heart sounds were altered there was no evidence of circulatory failure. During the final phase pain was the dominating



Showing temperatures, reticulocyte counts, and red cell counts accurately superposed. The maximum temperature range for each day is given, taken from four-hourly charts, except from Nov. 20th, 1934, to Jan. 27th, 1935, during which period morning and evening charts only were used. The dosage of the preparations referred will be found in Table III. Camp.=Campolon. A=Blood transfusion (200 c.cm.). B=Blood transfusion (250 c.cm.). 1=Radiogram taken. 2=One tooth extracted. 3=Five teeth extracted.

feature. The blood picture was normal and no alteration in the heart sounds was noted, but as the fever progressed her tissues were rapidly swamped by acute congestive failure.

The evidence that incriminates the *Streptococcus viridans* as the cause of death provides reasonable proof of the cause of the anæmia. It is extremely unlikely that the two febrile phases were related to essentially different causes. The presumption is that the first phase was one of the manifold effects attributable to streptococcal toxin, whereas the final phase was due to invasion of the blood and tissues by the organism itself. The acute onset, the rapid development of anæmia and its equally rapid subsidence, the megaloblastic reaction, and the extreme pyrexia remind one of the cases described by Lederer; but the absence of any evidence of hæmolysis excludes the use of the term acute hæmolytic anæmia. In the present state of our knowledge, admittedly very imperfect, it seems advisable when referring to this type of anæmia to avoid too precise a nomenclature. In attempting to define a new type it is desirable to explore the common ground thoroughly before emphasising points of difference.

There are two features of this case that are of special interest: that it was a true an hæmopoietic anæmia, and that it was caused by dental sepsis. To justify the first contention it will be necessary to show that the response to specific substance was of the same order as occurs in Addisonian anæmia. Minot and Castle<sup>9</sup> have recently summarised the essential features of the reticulocyte response to specific substance in pernicious anæmia. The points of interest to us are as follows:—

1. The reticulocyte response that follows the giving of active substance to cases of pernicious anæmia almost always begins within two to ten days.

2. If, following the administration of a substance during a first period, there is, during a second period, an orderly response of reticulocytes, no matter of what degree, to a second substance, this substance is known to be more potent than the first.

3. There is a direct relationship between the amount of specific substance given and the peak of the reticulocyte value.

4. The daily dose of liver or desiccated hog stomach that is needed to produce a maximal response is 500 and 30 g. respectively.

Daily intramuscular injections of 2 c.cm. of Campon—that is, the equivalent of 500 g. of liver—were started on Sept. 2nd. Except for a low peak reaching a value of 1.6 per cent. on Sept. 5th the reticulocytes diminished steadily, and on Sept. 21st they were reported as “absent.” Ventriculin was started on Sept. 22nd, the initial dose, 10 g., being only one-third of that considered necessary to produce a maximal response. Three days later the reticulocytes had risen to 1.2 per cent. On Oct. 11th normoblasts reappeared in the blood and the reticulocytes had risen to 5 per cent., the first peak in the curve. On Oct. 10th the dose of ventriculin was doubled; eight days later the reticulocytes had increased to 6 per cent., the second peak on the curve. Applying the principles of Minot and Castle it would seem that ventriculin was more potent than liver. While it is likely that the extent of the reticulocyte response was affected by the fever, it cannot be maintained that the eruption of normoblasts and the improvement in the red cells were attributable to this cause. The red cell count began to improve on Oct. 6th, when the fever had abated, but the progressive improvement in the blood was entirely

unaffected by the six weeks of fever that followed this temporary remission. It seems, therefore, that, in this case of febrile anæmia, ventriculin exerted its specific effect, and that this effect was of the same order as would be expected in a case of pernicious anæmia.

We have now to consider the second contention, that the illness was due to dental sepsis. It is unfortunate that a blood culture was not taken during the final phase and that a post-mortem examination was not done, but the clinical evidence alone is sufficiently convincing. Dental sepsis had marred her life from the age of 14, when she developed a septic mouth and septic toe after the extraction of two teeth. In May, 1934, when she was investigated at St. Mary's Hospital, it was thought that her pain was accounted for by sciatica, due to very obvious dental sepsis. During her last illness, immediately after her teeth were radiographed, there was a brisk febrile reaction, suggesting that the local tissues were damaged by the X rays, so facilitating the escape of organisms or their toxins into the blood. The X rays revealed an apical abscess in a premolar, which was extracted. Following this, after a latent period of seven days, there developed, with sudden onset, a condition that was indistinguishable from septicæmia. The accumulated value of this evidence should be as convincing as would have been the demonstration of a streptococcus in the blood.

By way of a corollary it seems appropriate to emphasise the risk attending the extraction of septic teeth. The fact that a scraping from the apex of an infected tooth, implanted into her own blood, yielded a growth of *Streptococcus viridans* is of some significance. It was an application of the pathogen selective culture test. E. C. Lowe,<sup>10</sup> applying this test to specimens from infected teeth, found in 57 per cent. of his cases, while the direct cultures yielded multiple types of growth, a pure growth of streptococci was obtained from the auto-blood cultures. The significance of the test is that it implies the ability of a particular organism to grow in the patient's blood, whereas other organisms not pathogenic to the patient are unable to do so. Supplementing this observation are the findings of C. C. Okell and S. D. Elliott.<sup>11</sup> These authors found that within a few minutes after the extraction of teeth from obviously septic mouths a transient streptococcal bacteriæmia, lasting a few minutes, was observed in 75 per cent. of their cases. These two observations taken together afford an explanation of the many fatalities, recorded and unrecorded, that have followed the extraction of septic teeth. If these findings are generally applicable they should serve as a serious warning, indicating that, in patients whose resistance has been lowered by prolonged illness, the extraction of infected teeth, without previous preparation of the patient, is an operation fraught with grave risk. What this preparation should be is suggested by the case of Venables,<sup>7</sup> in which a vaccine prepared from a dental swab seemed successful in suppressing the infection. In our case, action was forced by circumstances, the pain was incessant, and it seemed imperative to remove the suspected teeth in order to relieve it. With the greater courage of conviction we might have persisted with vaccine treatment with better effect. But conviction can only come of knowledge and, in dealing with focal infections, without means at our disposal for identifying the offending organism with any degree of certainty, we are still left to grope in the dark.

I wish to express my thanks to Dr. W. D. Brooks, medical registrar to St. Mary's Hospital, for a most helpful report, and to Dr. T. C. Hunt and Mr. C. W. G. Bryan, physician and surgeon respectively to the out-patient department at St. Mary's, for their kind permission to make use of this report. I would also acknowledge the valuable help received from Dr. H. A. Fielden and Dr. Basil Halliwell, pathologist and radiologist respectively to the Torbay Hospital, for various investigations.

I particularly desire to record my gratitude and indebtedness to Sister Tozer of the Torbay Hospital for her invaluable help in ensuring the accuracy of the temperature charts and of the details of treatment, and to Mr. Horace Mountford, Dr. Fielden's assistant, who was responsible for all of the blood counts. Without their help it would have been impossible to have collected reliable data for this publication.

## REFERENCES

1. Tidy, H. L. : Proc. Roy. Soc. Med., 1933, xxvi., 629.
2. Lederer, M. : Amer. Jour. Med. Sci., 1925, clxx., 800.
3. " : Ibid., 1930, clxxix., 228.
4. O'Donoghue, R. J. L., and Witts, L. J. : Guy's Hosp. Rep., 1932, lxxxii., 440.
5. Joules, H., and Masterman, L. M. : Brit. Med. Jour., 1935, ii., 150.
6. Exner, G. G., and Ive, C. : Guy's Hosp. Rep., 1925, lxxv., 122.
7. Venables, J. F. : Ibid., 1926, lxxvi., 82.
8. Poynton, F. J., Thursfield, J. H., and Paterson, D. : Brit. Jour. Child. Dis., 1922, xix., 57.
9. Minot, G. R., and Castle, W. B. : THE LANCET, 1935, ii., 319.
10. Lowe, E. C. : Brit. Dent. Jour., 1928, xlix., 457.
11. Okell, C. C., and Elliott, S. D. : THE LANCET, 1935, ii., 869.

## DECLINE AND FALL OF THE UNDESCENDED TESTIS

BY EDWARD MCLELLAN, M.B. Lond., F.R.C.S. Eng.

SURGICAL REGISTRAR, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, LONDON

NOTHING could encourage the enthusiastic investigator in the happy exercise of self-deception more than an inquiry into this subject, which has exercised the imagination and ingenuity of embryologists, biologists, anatomists, and surgeons for generations.

Theories abound on the cause and course of the descent of the testis, and few of them are supported by anything which resembles scientific proof. This is not surprising inasmuch as theory has been based upon embryological evidence, and this, in the human at any rate, is inevitably incomplete.

Recently a certain amount of valuable investigation has been carried out from the clinical standpoint by Spence and Scowen,<sup>1</sup> who have been able to effect the descent of the testis by the use of gonadotropic hormones, but no explanation of their results has been forthcoming, nor has it been possible to state which cases are suitable for this form of treatment and which are not.

At the Hospital for Sick Children, Great Ormond-street, I have had the opportunity of investigating 25 cases of undescended testis over a period of eighteen months, and in this paper I propose to make observations upon the following matters: (1) the normal descent of the testis and the processus vaginalis, and their relation to one another; (2) the types of undescended testis from the clinical standpoint; (3) an explanation of the satisfactory effect of Pregnyl in certain cases and not in others; and (4) the unsatisfactory late results of operative treatment and a suggested remedy.

### NORMAL DEVELOPMENT

Many factors have been described as contributing to the descent of the testis: the disappearance of

the cephalic end of the mesonephros causing a relative caudal descent; the return of the gut from the cord to the abdomen thus separating further the anterior from the posterior wall; the contraction or atrophy of the gubernaculum. All these play their part, but to them must be added two other factors which I believe to be of paramount importance: the testis must be of normal size, weight, and development, and its descent must be preceded by a normal descent into the scrotum of the processus vaginalis.

It is now known that the testis descends along the course laid down for it by the processus vaginalis, and in my opinion failure to descend may be due to:

- (a) A small, undersized, underactive testis.
- (b) An abnormal processus vaginalis.
- (c) The development of adhesions between testis and adjacent structures during its descent.

The gubernaculum acts as a guide in the descent, but I cannot believe that it plays an active part in drawing the testis down. It is possible in any male infant to displace the testis from the bottom of the scrotum to the external abdominal ring, and frequently into the inguinal canal, with the greatest of ease; and this would not be possible if the testis were in any way anchored to the bottom of the scrotum by a contracted or atrophied gubernaculum.

Keith's original description of the testis descending with the processus vaginalis "like a log on a sledge" has been accepted without question, but there is evidence, both embryological and clinical, that the descent of the processus vaginalis precedes in time as well as situation that of the testis.<sup>2</sup> From an examination of embryological sections, for which I am very greatly indebted to Dr. R. J. Gladstone of King's College, it is clear that the path which the processus vaginalis is to take is made plain by a dissolution of the cells, a cleavage of the tissues leaving a space which the processus then occupies. Kirk<sup>3</sup> has shown clearly, by a very full and painstaking research, that the same is true in rabbits and marsupials, and that the processus vaginalis is completely formed and is in the scrotum long before the testis has descended.

What causes the cleavage of the cells and the descent of the processus vaginalis? It is not unreasonable to suppose that the stimulus is hormonal and of an oestrogenic nature. Harold Burrows<sup>4</sup> in a most excellent investigation has proved that in mice it is possible to produce inguinal herniæ at will by the administration of oestrin, provided the testes were almost or quite mature. He has also shown that oestrin tends to inhibit the descent of the testes and prevent their maturation.

Now it is clear from the work of Zondek<sup>5</sup> that during the early months of pregnancy the oestrin content of the maternal blood is very low, and that towards the end of pregnancy it rises rapidly, while the anterior pituitary secretion remains at a relatively high level throughout and falls slightly towards the end. Suppose that this state of affairs is disturbed and there is an excess of oestrin or a relative lack of anterior pituitary substance during pregnancy. The result may easily be the development in the male fetus of a normal or greater than normal processus vaginalis, together with small and underdeveloped testes. The combination of these circumstances may be responsible for the imperfect descent of the testes.

If these views are correct it follows that there is a stage in the development of every male child when the processus vaginalis reaches the bottom of the

scrotum and the testis is still in the pelvis or in the inguinal canal, and a potential hernial sac is present. What then causes the closure of this sac? It is common ground that the processus first closes at the internal abdominal ring and later at the external abdominal ring. It is also agreed that the testis pauses in its descent at the internal abdominal ring for about three months (4th to 7th) and at the external ring for one month (8th). If we bear in mind that the fœtus is in an attitude of flexion with the thigh in contact with the abdominal wall it follows that considerable pressure must be made on the testis as it lies at these points of pause. The result may well be that which we hope to obtain clinically by applying a wool truss to a similar point after the birth of the infant in an attempt to cure an inguinal hernia. The pressure in the antenatal state is, however, applied more accurately and more consistently, and the result is equally more effective.

There may be a hormonal factor in addition to the purely mechanical one. If œstrogenic hormones have the effect of increasing the processus vaginalis it is possible that antagonistic hormones of the anterior pituitary group have an obliterative effect, and mention will be made of this in the clinical study later.

DEFINITION AND CLINICAL CLASSIFICATION

A testis may be said to be undescended if, after painstaking and persistent attempts have been made to push or pull it down into the scrotum, it remains at a higher level at some point on its normal course of descent.

For examination I place the child lying on a couch, with the legs slightly apart and slightly flexed, and with the abdominal muscles relaxed. I then attempt to press the testis downwards along its course by slow and firm and steady pressure, commencing this movement as high as the iliac fossa. If after repeated attempts the testis fails to enter the scrotum it is considered to be undescended. The importance of this examination will be apparent when I say that no less than 12 patients with "undescended testis" were sent to me for treatment by practitioners who all had special experience in the examination of children, and in all I was able to get the testes satisfactorily into the scrotum. These call for no treatment and will with certainty descend in the course of time. With a less energetic examination technique they would certainly have found their way into the "cures" column of the pregnyl treatment table.

Clinically my cases can be classified as follows:—

Group.	General physical development.	Development of testis.
I	Normal.	Normal.
II	Subnormal.	Subnormal.
III	Normal.	"

The results of pregnyl treatment in these cases according to the various groups are shown in the Tables.

In addition to these groups there were three patients in whom an operation had been performed in the inguinal region, and all three failed (Table II.).

The injections were given once a week and the dose was 500 rat units, given intramuscularly into the buttock. There was an interval of 2 to 3 months after each course of six injections. My idea was to make the testis descend as slowly as possible in the hope of causing an obliteration of the processus vaginalis, in the manner similar to that which I

believe to occur normally during the later months of intra-uterine life. In only one of the 25 boys that have been so treated is there any hernia that can be recognised clinically although there is a history of hernia in 4. This is a matter which calls for further investigation and which I am undertaking.

TABLE I.—Summary of Results

Group.	Type.	Cases.	Result.
I	Unilateral.	5	Failed.
	Bilateral.	6	Cured.
II	Bilateral, ♂	2	"
	hypospadias.	3	"
III	Unilateral.	3	"
	Bilateral.	3	Improved.

TABLE II.—Results of Treatment with Pregnyl

Group.	Case	Age	Unilateral and bilateral.	a. General physical development. b. Development of testis.	Injections.	Result.
I	1	10	Unilat.	a. b. Normal.	18	Failed.
	2	1			10	
	3	5			16	
	4	8½			12	
	5	6½			10	
II	6	10	Bilat.	a. b. Subnormal	4	Cured.
	7	1½			4	
	8	7			3	
	9	4½			3	
	10	9½			6	
11	4	9				
II	12	5½	Bilat.	a. b. Subnormal.	4	Cured
13	7			11		
II	14	5	Unilat.	a. b. Subnormal.	14	Cured.
	15	3½			7	
	16	3½			5	
III	17	8½	Unilat.	a. Normal.	5	Cured.
	18	7½		b. Subnormal.	7	
	19	6½		a. Normal. b. Doubtful.	4	
III	20	4½	Bilat.	a. Normal.	12	Imp.
	21	5½		b. Subnormal.	8	
	22	9½			8	
III	23	6½	Unilat.	a. b. Normal.	8	Failed.
	24	2½	Bilat.	a. b. Subnormal.	15	
	25	7½	Unilat.	a. b. Normal.	8	

Observations.—Cases 12 and 13: hypospadias; Cases 23 and 25: orchidopexy; Case 24: double herniotomy. Imp.= improved.

It appears from my series that cases in Group I are entirely unsuitable for treatment by pregnyl, those in Group II are eminently suitable, and those that come into Group III may or may not respond favourably.

It is, naturally, very difficult sometimes to say whether the testes are small and undeveloped for the size of the boy but in my opinion these doubtful cases are worthy of a trial. No harm, at any rate, will be done and an operation may be saved. I have experienced no alarming reactions from these injections and there are no contra-indications (other than that of expense) in healthy children. There is occasionally slight stiffness of the buttock for a day or two, and two children developed a rash after each course of injections; it only lasted a few days. Parents often volunteer the information that the boys improve in health and general development during their treatment.

EXPLANATION OF RESULTS

It is obvious that the type of case which responds to pregnyl (Groups II and III) is that which also



comes under the heading (a) and (b) in the classification given earlier in this article; during intra-uterine life he may have been subjected to an excessive amount of oestrin or a deficient amount of anterior pituitary substance. By administering pregnyl we simply remedy, at a late stage, this state of hormonal imbalance, with the result that the testis develops, becomes larger, heavier, more mobile, and more readily follows the course which has been prepared for it by the processus vaginalis. This change in the physical condition of the testis is a most noticeable and constant feature.

The failures (Group I) are the cases which occur under the heading (c)—namely, normal testes in normal children, which have been arrested in their descent by adhesions to other structures in the abdomen or inguinal canal. It is the rule to find, when operating on these children, that great difficulty is experienced in dissecting the testis free from the structures in its vicinity.

#### LATE RESULTS OF ORCHIDOPEXY

I have recently carried out an investigation of 15 cases of undescended testis which were operated upon by the late Mr. H. Tyrrell-Gray at the Hospital for Sick Children, Great Ormond-street, between five and ten years ago. In every case the testis was still in the scrotum, a testimony to the perfect technique of a brilliant operator, but in every case the testis was considerably smaller than its normal neighbour. The same condition has been noted by Burdick and Coley<sup>6</sup> in a very much larger series.

I would therefore suggest that in those patients with undescended testis that belong to Group I, and who undoubtedly call for operative treatment, a pre-operative and a post-operative course of pregnyl should be given. The pre-operative course of, say, six injections will bring about some increase in the size of the testis, and this will facilitate the operation, while the post-operative course of, say, twelve injections will do something to prevent the atrophy of the testis which is such a constant feature.

I am greatly indebted to Mr. Eric Lloyd and Mr. Simpson Smith who have referred all these children to me and have thereby made this investigation possible. I am also grateful to the Organon Laboratories for supplying the hospital with pregnyl.

#### REFERENCES

1. Spence, A. W., and Scowen E. F.: THE LANCET, 1935, II., 1335.
2. Arey, L. B.: Developmental Anatomy, London, 1934.
3. Kirk, J.: Communication before the Anatomical Society of Great Britain, January, 1936. (Unpublished.)
4. Burrows, H.: Brit. Jour. Surg., January, 1936, p. 658.
5. Zondek, B.: Nord. med. tidskr., 1934, vii., 257.
6. Burdick, C. G., and Coley, B. L.: Ann. of Surg., 1926, lxxxiv., 867.

**MORE HOSPITALS FOR ESSEX.**—Schemes for the erection of new hospitals by the Essex county council at Chelmsford, Saffron Walden, Colchester, and in the Thames-side district were outlined at a meeting of the county council at Chelmsford on April 8th. The Hospitals' Survey Committee are in consultation with Chelmsford Voluntary Hospital and it is hoped to raise the accommodation of the hospital to a maximum of 200 beds. There is a waiting-list here of 239 patients apart from adenoid and tonsil cases. At Saffron Walden it is suggested that the acutely sick should be dealt with by arrangement with the voluntary hospital. Sixty beds are needed for chronic cases and a site for such a hospital will have to be found. At Colchester the Pope's Lane Infirmary and the Stanway Infirmary will be united and will be in no way a rival to the Essex County Hospital.

## ON THE TREATMENT OF UNDULANT FEVER WITH FOUADIN

BY CHARLES ZAHRA NEUMANN, B.Sc., M.D. Malta

THE intensity and duration of undulant fever vary so much that it is hard to assess the curative value of drugs used in its treatment. Sometimes the illness lasts only ten or fifteen days and causes but little inconvenience; but on the other hand it is common to see patients ill for eight or ten months or even longer, reduced to living skeletons and suffering from the after-effects for perhaps another six months. The temperature, too, may never rise above 100° F. in some cases, whereas in others the hyperpyrexia and delirium give a clinical picture very similar to that of severe typhoid fever.

Several classifications for the different clinical manifestations of undulant fever have been proposed, such as the distinction between an acute type and a chronic. It is not unusual, however, for the acute illnesses to become chronic or for the latter to suddenly flare up into acute. Alternatively the fever may, for no apparent reason, disappear, and rapid recovery may set in; and if a drug has been administered at this period it may easily be given credit which it does not deserve. This illustrates the difficulties inherent in any inquiry into the effect of therapeutic agents used in this disease.

Through the courtesy of the I.G. Farbenindustrie I have been able to treat eight cases of undulant fever with Fouadin, and the results are described below.

Fouadin is a complex compound of antimony and pyrocatechin-disulphonic acid. Pyrocatechin (which is related to adrenaline) is easily oxidised and therefore many of its compounds are unstable. The acid derivatives of pyrocatechin are much more stable, and several metallic complexes have been synthesised by Prof. Hans Schmidt since 1922. Fouadin is antimony bis-pyrocatechin di-sodium sulphonate, and the metal is trivalent. Being non-irritant, it can be injected intramuscularly, and has been widely used in Egypt and in other countries against bilharzia infestations. It is usually injected into the gluteal region, and to adults 1.5 c.cm. has been given on the first day, with 3.5 c.cm. on the second day, followed by 5 c.cm. on alternate days. There is no pain at the site of injection and the drug is well tolerated, no secondary effects having been observed. The above doses are suitable for an average adult male, but the maximum dose in the female patients has been 4.5 c.cm.

**CASE 1.**—A woman aged 23. She was treated at first with anti-melitensis vaccine, both intramuscularly and intravenously. The shock accompanying the intravenous injection was so intense that it was thought advisable not to persist. A fortnight after the onset the temperature was oscillating between 102° and 103° F. and fouadin was injected according to the scheme described above. On the seventh day, after the fourth injection, the temperature ranged between 99° and 100° F. At the eighth injection the patient was afebrile and no further waves of fever were afterwards experienced. During convalescence rheumatic pains made their appearance but were moderate in severity and not unduly troublesome.

**CASE 2.**—The patient, aged 18, had been suffering from fever reaching 105° F. for about eight days when the practitioner was called in. His spleen was found to be enlarged and the Widal reaction was positive to *Micrococcus melitensis*. Fouadin was injected in the usual

manner and at the fifth injection the temperature returned to normal, while the general condition improved so quickly that the patient returned to his work about three weeks after treatment was begun.

CASES 3 and 4.—Two brothers, aged 9 and 11, had been suffering from undulant fever for about a week before treatment was begun. The adult dose was divided between them. The evening temperature was 104° F. in both cases when the injections were started, but at the end of ten days both children were apyretic, each having received a total of five injections. During convalescence, which was otherwise uneventful, rheumatic pains made their appearance; but these were slight and lasted only a week.

CASE 5.—A man of 21 developed a severe toxic form of undulant fever and at the end of the first week his temperature rose to 105° F. He was delirious and the urine contained a small quantity of albumin but no casts. Bronchial catarrh caused a distressing cough with viscid whitish expectoration. It was thought advisable not to exceed 4 c.cm. foudadin per single dose owing to the possibility of causing renal irritation, and treatment was begun as soon as the diagnosis was confirmed by agglutination tests. After three injections the temperature was 103° F. in the evening, and on the twelfth day it had dropped to 101° F., while the general condition had improved considerably. The delirium had disappeared and the appetite was returning. On the seventeenth day the evening temperature was 99° F. and the injections were discontinued, the patient having had a total of nine injections. After three weeks he was completely apyretic and he remained so even on the supervention of slight rheumatic pains about the ankles and the knees. No secondary waves of fever were afterwards registered and the patient returned to work seven weeks after the onset of the disease.

CASE 6.—A boy aged 7. This was a slight case, for the temperature was never above 101° F. and the general condition was fairly good. Only three injections of foudadin were given (1.5, 2.5, and 4 c.cm.). At the end of a week the temperature had dropped to normal, although the patient developed arthritis of the hip-joint. This complication, although not accompanied by fever, lasted for almost a month.

CASE 7.—A girl aged 13. The onset of the disease was very insidious and suggestive of tuberculosis. The child coughed slightly, expectorated a little, and lost weight as well as appetite. An evening temperature of 100°–101° F. made the diagnosis of tuberculosis plausible, but radiographic examinations were negative and no tubercle bacilli were found in the sputum. The fever abated for about a week but then again rose to 102° F., and when it was found that the serum reacted strongly to *Micrococcus meliitensis* in high titres the case was recognised as one of undulant fever. Foudadin was given as in the previous case and after five injections on alternate days the evening temperature dropped to 99° F. On the twelfth day the patient was afebrile. The appetite improved, the evening sweats ceased, and she gradually regained weight.

CASE 8.—A married woman of 32 contracted undulant fever at the eighth month of gestation and was delivered of a normal baby 15 days before the appointed time. On the day of the delivery the temperature rose to 104° F. and three days later it was still 103° F. At this stage foudadin was injected. At the fourth injection the patient's temperature was normal and she recovered completely within two weeks. Incidentally the baby's serum was tested and found not to agglutinate the micrococcus, although the mother's serum reacted in high dilutions.

The number of cases here recorded is too small for any definite conclusion, but further investigation into the action of antimony compounds on the disease seems desirable. In the treated cases there were no waves of fever after the first, although such waves are one of the characteristics of the disease. Foudadin does not appear to influence the onset of certain complications or sequelæ, such as arthritis.

Malta.

## STAPHYLOCOCCAL LEUCOCIDIN

(NEISSER-WECHSBERG TYPE) AND

## ANTILEUCOCIDIN

BY JOYCE WRIGHT, B.M. Oxon.

(From the Wellcome Research Laboratories, Beckenham, Kent)

DURING recent years there has been renewed interest in the properties of staphylococcal toxin and antitoxin; but, presumably owing to the practical difficulties of working with leucocytes, little experimental investigation has been undertaken on their leucocidal and antileucocidal properties.

The action of staphylococcal toxins on leucocytes may be demonstrated by—

(a) The "bioscopic" method of Neisser and Wechsberg (1901), which depends on the observation that, whereas freshly obtained leucocytes reduce methylene-blue to its colourless form under partially anaerobic conditions, similar leucocytes previously treated with toxic filtrates of staphylococci fail to do so.

(b) The microscopic method of van der Velde (1894), who found that, both in vivo and in vitro, staphylococcal toxins cause degeneration of the leucocytes of the rabbit.

(c) The microscopic method of Panton and Valentine (1932), who observed similar destructive action on human leucocytes.

The "Panton-Valentine leucocidin" is different from the  $\alpha$ -hæmolysin (Valentine, 1936) and would thus appear to be different from the toxin which, as here described, destroys the power of the rabbit leucocytes to reduce methylene-blue ("Neisser-Wechsberg leucocidin"). The latter is referred to for convenience as N.W.L. N.W.L. and anti-N.W.L. are the subject of this investigation, with special reference to their relationship to hæmolysin and antihæmolysin.

### TECHNIQUE

The method is a modification of the Neisser-Wechsberg technique, and is carried out with ordinary sterile precautions.

*Reagents.*—The following reagents are required:—

*Aleuronate* (5 per cent.) + *potato starch* (3 per cent.) in disodium phosphate (0.2 per cent.), steamed half an hour, after which the pH should be 7 to 8. (Aleuronate obtained from R. Hundhausen, Stärkefabrik, Hamm-in-Westfalia, Germany.)

*Sodium citrate* (1 per cent.) in saline (0.85 per cent.), steamed half an hour.

*Locke-Lewis fluid* (NaCl 0.90 per cent., glucose 0.10 per cent., KCl 0.042 per cent., CaCl<sub>2</sub> 0.024 per cent., NaHCO<sub>3</sub> 0.05 per cent.), candled through Berkefeld "N" filter.

*Methylene-blue* (Grübler).—Stock aqueous solution 1 in 250, steamed half an hour prior to use; diluted to 1 in 5000 with Locke-Lewis fluid freshly for each test. (All salts used were A. R. reagents (B.D.H.))

*Sterile vaseline.*

"Standard" toxin, B.8750 (0.5 per cent. phenol).—A toxin of  $\alpha$ -hæmolytic type prepared by combined use of modification of Parker's broth and Burnet's agar (Parish and Clark, 1932) from staphylococcus Wood 46.

"Standard" antitoxin, "K" (=B.8760) (0.3 per cent. T.K.B.).—Unconcentrated antitoxin (horse) of anti- $\alpha$ -hæmolytic type. (Both "standard" preparations were those recommended for use in the clinical investigation of anti-hæmolysin in human sera (Parish, O'Meara, and Clark, 1934).)

*Experimental staphylococcal filtrates.*—Prepared by the same method as "standard" toxin, B.8750.

*Experimental staphylococcal antitoxins.*—Rabbit, horse, and human.

*Leucocyte-suspension.*—Leucocytes obtained by intrapleural injection of aleuronate + starch suspension, whole technique being performed with sterile precautions. For each test (usually about six toxins or antitoxins) eight rabbits injected. Fur over the thoracic region removed by fine clippers, rabbit lightly anaesthetised with ether, skin treated with iodine, and incision made through skin, subcutaneous tissues, and superficial muscles in the thoracic region just below the scapula. Cannula pushed carefully between the ribs into the

\* It was found that these preservatives were not in themselves leucocidal at the dilutions used.

pleural cavity and 10 c.cm. of aleuronate + starch suspension injected. Needle withdrawn and incision covered with adhesive plaster. Eighteen hours later rabbits killed by intravenous injection of 10 c.cm. of air. Both pleural cavities opened with scissors, for, although injections made into one pleural cavity only, as good an exudate frequently found in the other. Non-hæmorrhagic exudates pipetted into tubes containing 10 c.cm. of 1 per cent. sodium citrate in saline; after pooling, centrifuged at low speed for 5 minutes, and leucocytes resuspended in Locke-Lewis fluid in boiling tube. Cells retain reducing power throughout the day if aerated at frequent intervals through pipette, and keep better at room temperature than at 37° C. Cell counts of suspensions were approximately 40,000 leucocytes per c.mm., about 92 per cent. being polymorphonuclear.

**Preliminary Test for Minimal Reducing Power of Leucocytes.**—Into a row of test-tubes (10 cm. by 1.0 cm.), 0.4, 0.35, 0.30, 0.25, 0.20, 0.15, 0.10, 0.05, and 0.00 c.cm. of leucocyte-suspension were pipetted, the volume in each tube being adjusted to 1.0 c.cm. with Locke-Lewis fluid. 0.1 c.cm. of methylene-blue 1 in 5000 was then added to each tube. The contents were thoroughly stirred with a wire loop, a vaseline seal being added finally. The tubes were incubated for 1 hour at 37° C. and the smallest amount of leucocyte-suspension to produce full reduction was noted. Twice this volume was used as the dose of leucocyte-suspension in the actual test.

**Titration of N.W.L. in Toxic Filtrates.**—"Doubling" dilutions of the toxin in Locke-Lewis fluid were made, the volume in each tube being 0.5 c.cm. The test dose of leucocyte-suspension was added, and the volume, if not then 1.0 c.cm., adjusted to that amount with Locke-Lewis fluid. The tubes were incubated for one and a half hours at 37° C., and 0.1 c.cm. methylene-blue was added to each. The contents were stirred with a wire loop, and each tube was sealed with vaseline and incubated for a further hour at 37° C., when readings were made. The minimal leucocidal titre was taken to be the least amount which produced complete leucocidal action—i.e., the amount present in the last tube in which the methylene-blue remained completely blue.

For purposes of comparison similar dilutions of "standard" toxin, B.8750, were included in each test series, as well as the following controls with methylene-blue: (a) leucocyte-suspension alone; (b) toxins alone, without leucocyte-suspension; and (c) leucocyte-suspension + uninoculated medium, which had been incubated and filtered as in the preparation of staphylococcal filtrates.

**Titration of Anti-N.W.L. in Antitoxic Sera.**—"Doubling" dilutions of the antitoxin to be tested were made in Locke-Lewis fluid, the volume in each tube being 0.25 c.cm. 0.25 c.cm. of "standard" toxin, B.8750, diluted 1 in 20, was added to each tube. The contents were then mixed, and incubated at 37° C. for half an hour. The test dose of leucocyte-suspension (see above) was added to each tube and the volume in each, if not then 1.0 c.cm., adjusted to that volume with Locke-Lewis fluid. The contents of the tubes were mixed and incubated at 37° C. for one and a half hours. 0.1 c.cm. methylene-blue 1 in 5000 was added to each tube. The contents were thoroughly stirred with a wire loop, each tube being sealed with vaseline and again incubated. It was found that the presence of serum so accelerated the reduction of methylene-blue by leucocytes that it was difficult to fix a definite time limit for this further incubation. In each test series were included therefore dilutions of "standard" antitoxin "K," and the whole test was read when dilution 1 in 400 of "standard" antitoxin showed complete reduction (white) and dilution 1 in 800 showed no reduction (blue). The end-point for each antitoxin was taken as the least amount which completely neutralised "standard" toxin, B.8750, diluted 1 in 20—i.e., in which complete reduction of methylene-blue occurred. Readings were usually "clear-cut" and easy to make after 20 to 30 minutes.

It has been customary, in the absence of a "unit" of anti-N.W.L., to express the potency of sera in terms of "standard" antitoxin "K."

**Hæmolytic Titrations.**—The minimal hæmolytic dose of staphylococcal toxins was determined by preparing a series of "doubling" dilutions, 0.5 c.cm. in each tube, and adding 0.5 c.cm. of saline to each. To determine (a) the  $\alpha$ -hæmolysin, 1.0 c.cm. of 2 per cent. washed rabbit

red cells was added to each tube, the contents being then mixed, and readings taken after one hour's incubation at 37° C. The minimal hæmolytic dose was taken as the least amount of toxin to produce complete hæmolysis; (b) the  $\beta$ -hæmolysin, 1.0 c.cm. of washed sheep cells was added to each tube, the contents being mixed, and readings taken after one hour's incubation at 37° C. and one hour at room temperature.

**Antihæmolytic Titrations.**—The method used was that described by Parish, O'Meara, and Clark (1934).

#### NEISSER-WECHSBERG LEUCOCIDIN (N.W.L.)

**Variability of Tests for N.W.L.**—It was regarded as important for the evaluation of quantitative leucocidin estimations to determine what variation in the minimal N.W.L. titre of any one toxin might occur when tested with different leucocyte-suspensions. The limits of titration of toxin, B.8750, in twelve different tests, varied from 1 in 400 to 1 in 50 (thrice 1 in 400, six times 1 in 200, twice 1 in 100, and once 1 in 50). The variation was not dependent on the test dose of the leucocyte-suspension nor on ageing of the toxin over a period of four months.

**Constancy of N.W.L. Production by One Strain of Staphylococcus, Wood 46.**—From the staphylococcal strain Wood 46 eight toxins, in addition to "standard" toxin, B.8750, were prepared by the routine method at different times on different batches of medium. Considerable amounts of N.W.L. were produced in all filtrates over a period of eight months, six having a minimal N.W.L. titre of 1 in 200 or more.

**N.W.L. Production by Differently Pigmented Colonies.**—In a few instances toxins prepared from differently pigmented variants of the same staphylococcal strain gave identical minimal N.W.L. titres—e.g., strain I., white and orange colonies, each 1 in 100; strain II., cream and orange colonies, each >1 in 200; strain III., white and orange colonies, each nil.

**Relationship of N.W.L. Production to Pathogenicity of Staphylococcal Strains.**—In all 33 filtrates were prepared. None of 7 toxins from strains from non-pathological sources contained N.W.L., whereas all of 26 toxins from strains from patients undergoing hospital treatment (for furunculosis, blepharitis, carbuncle, sycosis, breast abscess, osteomyelitis, or septicæmia) gave a N.W.L. titre varying from 1 in 25 to 1 in 200 or more.

**Relationship of N.W.L. to  $\alpha$ - and  $\beta$ -Hæmolysin.**—The relationship of N.W.L. to  $\alpha$ - and to  $\beta$ -hæmolysin (Bigger, Boland, and O'Meara, 1927; Glenny and Stevens, 1935) was studied by (a) tests of comparative thermostability; (b) quantitative comparison in filtrates; and (c) absorption tests.

(a) A toxin, Z.1815, containing both  $\alpha$ - and  $\beta$ -hæmolysin, which was prepared from the staphylococcal strain "Bigger albus A $\alpha$ ," and the control toxin, B.8750, containing  $\alpha$ -hæmolysin only, were heated for 30 minutes at 56° C. The N.W.L. and  $\alpha$ -hæmolysin were completely destroyed, but the  $\beta$ -hæmolysin titre was left unchanged. N.W.L. and  $\beta$ -hæmolysin are therefore not the same toxin.

Heating a toxin of  $\alpha$ -hæmolytic type for one hour at 50°, 70°, or 100° C. completely destroyed N.W.L. and  $\alpha$ -hæmolysin; heating the same toxin for one hour at 40° C. reduced N.W.L. and  $\alpha$ -hæmolysin in the same proportion—in two experiments to half their original titre, and in one to a quarter.

(b) A comparison was made of the N.W.L. and  $\alpha$ -hæmolytic titres of twenty-nine toxins prepared from different strains of staphylococci. In twelve of these neither N.W.L. nor  $\alpha$ -hæmolysin was detected, and in the remaining ones the titres ran roughly

parallel—i.e., where the N.W.L. titre was high the  $\alpha$ -hæmolysin titre was also high and vice versa. No toxin was found in which the one could be detected but not the other.  $\beta$ -hæmolysin was not found in any of these filtrates by direct titration.

(c) Absorption test using leucocyte-suspension macroscopically free from red cells showed that N.W.L. was absorbed by leucocytes, and that the  $\alpha$ -hæmolysin was also greatly reduced in amount. The experiments were not completely satisfactory because of technical difficulties; moreover, the red cells used for the titration of hæmolysin were possibly a more sensitive indicator than leucocytes, of any toxin which remained unabsorbed.

Absorption tests have been attempted by other experimental workers, but usually with inconclusive results (see Neisser and Wechsberg, 1901; Weld and Gunther, 1931).

#### NEISSER-WECHSBERG ANTI-LEUCOCIDIN (ANTI-N.W.L.)

*Accuracy of the Titration.*—It was thought necessary for the evaluation of subsequent results to determine what variation in titre of the same sample of antitoxin might occur from test to test. For this purpose 5 antitoxins (4 from immunised horses and 1 from an unimmunised rabbit) were tested on two different occasions and it was found that a difference in titre of 100 per cent. either greater or less may occur in successive tests on the same sample of antitoxin. In view of the small volume, 0.25 c.cm., in which the dilutions were made and the complicated nature of the test this discrepancy is not surprising.

#### *Anti-N.W.L. and Anti- $\alpha$ -hæmolysin Titres of 66 Sera. Values in Terms of "Standard" Serum "K"*

No.	Serum.	Anti-N.W.L.	Anti- $\alpha$ -hæmolysin.	No.	Serum.	Anti-N.W.L.	Anti- $\alpha$ -hæmolysin
1	Normal human.	0.005	0.003	43	'Immune' rabbit.	0.01	0.01
2		0.01	0.012	44		0.02	0.015
3		0.015	0.015	45-47		0.08	0.076
4		0.02	0.012	48		0.25	0.171
5		0.04	0.042	49			
6-7		0.02	0.015	50	Normal horse.	0.08	0.05-0.07
8-15	'Immune' human.	..	0.022	51	'Immune' horse.	0.133	0.125
16-18		..	0.034	52-54		0.5	0.46
19-21		..	0.051	55-56		0.66	0.66
22-25		0.04	0.034	57		1.0	0.8
26		..	0.051	58		..	2.0
27		..	0.076	59-60		1.3	1.8
28		0.08	..	61-63		4.0	2.0
29-41		Normal rabbit.	Nil.	Nil.		64-65	10.0
42	0.02		0.022	66	..	5.3	

'Immune' signifies only that the samples were obtained after a course of immunising injections of toxin or toxoid.

*Relationship of Anti-N.W.L. and Anti- $\alpha$ -Hæmolysin in Normal and "Immune" Sera.*—A series of normal and "immune" sera from human beings and animals were tested for anti-N.W.L. and anti- $\alpha$ -hæmolysin, both titres being expressed in terms of "standard" antitoxin "K," which contains 150 international units of anti- $\alpha$ -hæmolysin per c.cm. (see Table). The majority of the antihæmolysin titres were tested independently by other workers, using the method introduced by Parish, O'Meara, and Clark (1934). (In the case of human sera, Dr. D. Stark Murray has kindly allowed me to use his figures.)

Of the 66 sera titrated for anti-N.W.L. and anti- $\alpha$ -hæmolysin, 13 contained neither antibody. The

remaining sera in practically all cases showed agreement in titre for the two antibodies; where discrepancies arose these fell within the limits of error of the tests.

#### CONCLUSIONS AND SUMMARY

(1) A modification of the Neisser and Wechsberg technique for the estimation of staphylococcal (Neisser-Wechsberg) leucocidin (N.W.L.) and anti-leucocidin (anti-N.W.L.) is described, and the accuracy of the tests discussed. (2) One strain of staphylococcus, "Wood 46," produced N.W.L. of high titre consistently over a period of eight months. (3) Thirty-three filtrates were prepared from different staphylococcal strains. None of 7 toxins prepared from strains derived from non-pathological sources contained N.W.L., whereas 26 toxins prepared from strains isolated from pathological lesions yielded N.W.L. varying in titre from 1 in 25 to 1 in 200 or more. (4) N.W.L. is thermolabile at 56° C., and is largely destroyed by heating to 40° C. for one hour, being identical in this respect with  $\alpha$ -hæmolysin and differing from  $\beta$ -hæmolysin which is thermostable at 56° C. (5) Of 29 toxins prepared from different strains of staphylococci, 12 contained neither N.W.L. nor  $\alpha$ -hæmolysin. In the remaining 17 the titres ran roughly parallel—i.e., where the N.W.L. titre was high, the  $\alpha$ -hæmolysin titre was also high and vice versa. In no toxin was the one found without the other. (6) Absorption of N.W.L. and  $\alpha$ -hæmolysin by leucocytes gave inconclusive results. (7) Sixty-six sera from man, rabbits, and horses, normal and "immunised," had in nearly all cases corresponding titres of anti-N.W.L. and anti- $\alpha$ -hæmolysin, expressed in decimal fractions of "standard" antitoxin "K." In the few exceptions the titres fell within the limits of error of the tests. (8) It is suggested that N.W.L. and  $\alpha$ -hæmolysin of staphylococcal filtrates prepared by the method referred to in this paper are identical, and that anti-N.W.L. and anti- $\alpha$ -hæmolysin are the same antibody.

My thanks are due to Dr. H. J. Parish and Dr. R. A. Q. O'Meara for their kind help with this work; to Mr. A. T. Glenny and Miss M. F. Stevens for supplying "immune" horse sera; and to Dr. D. Stark Murray for kindly supplying human sera and allowing me to use the results of his antihæmolysin titrations.

#### REFERENCES

- Bigger, J. W., Boland, C. R., and O'Meara, R. A. Q.: *Jour. Path. and Bact.*, 1927, xxx., 271.  
 Glenny, A. T., and Stevens, M. F.: *Ibid.*, 1935, xl., 201.  
 Neisser, M., and Wechsberg, F.: *Zeits. Hyg. u. Infekt.*, 1901, xxxvi., 299.  
 Pantou, P. N., and Valentine, F. C. O.: *THE LANCET*, 1932, i., 506.  
 Parish, H. J., and Clark, W. H. M.: *Jour. Path. and Bact.*, 1932, xxxv., 251.  
 Parish, H. J., O'Meara, R. A. Q., and Clark, W. H. M.: *THE LANCET*, 1934, i., 1054.  
 Valentine, F. C. O.: *Ibid.*, March 7th, 1936, p. 526.  
 van der Velde, H.: *La Cellule*, 1894, x., 401.  
 Weld, J. T. P., and Gunther, A.: *Jour. Exp. Med.*, 1931, liv., 315.

BOND-STREET WARD AT THE MIDDLESEX HOSPITAL. The Bishop of Willesden, on April 23rd, dedicated the Bond-street ward at this hospital. Approximately 200 in-patients from Bond-street firms are treated every year in the hospital, and a much larger number of out-patients. Prince Arthur of Connaught said that Bond-street had its full sense of that civic pride which led centuries ago to the foundation of the great city companies with their traditions of service and charity. The ward is set aside to provide treatment for accidents and fractures.

## LATE ETHER CONVULSIONS

A STUDY BASED ON FOUR CASES

By R. F. WOOLMER, B.M. Oxon.

SENIOR RESIDENT ANÆSTHETIST TO ST. THOMAS'S HOSPITAL, LONDON; AND

STEPHEN TAYLOR B.Sc., M.B. Lond.

HOUSE PHYSICIAN TO THE MEDICAL UNIT AND LATE RESIDENT ANÆSTHETIST AT THE HOSPITAL

CONVULSIONS occurring during deep ether anæsthesia were first described by Wilson, and they are now recognised as one of ether's most serious immediate dangers. Fortunately they are rare; the longest series seen and recorded by one man is Pinson's 15 cases. The mortality is about 50 per cent.; two of our four cases were fatal. Each showed the characteristic clinical picture, with minor variations, but each was treated in a different way. All occurred in the theatres of St. Thomas's Hospital during 1935, and one or other of us was present on each occasion.

### TYPICAL CLINICAL PICTURE

The patient is a child or young adult with pyrexia, usually due to some acute septic condition. The theatre is overheated. Atropine has been given and the dose may have been excessive. The patient is deeply anæsthetised with ether, the pupils being dilated and inactive to light. The colour is, as a rule, good, and oxygenated ether is sometimes being given. The eyelids start to twitch, then the face, and the convulsions become general. In the immediately fatal cases, after 5–10 mins. of convulsions the respiration ceases, the patient goes blue, and the heart stops; in other cases, the convulsions stop, but the patient dies later from cardiac failure; alternatively, recovery may follow the cessation of the convulsions.

Ether convulsions have to be differentiated from ether clonus, which occurs in the early stages of anæsthesia. Clonic twitching starts in the limbs and may become very violent; it ceases as the anæsthesia deepens. True convulsions occur only after full anæsthesia has been established, and the term "late ether convulsions" is used to emphasise this difference.

### DESCRIPTION OF CASES

For comparison, the essential features of our cases are given in the Table.

In Case 1 oxygenated ether was being used; the convulsions were recognised the moment they started and were easily stopped. A subsequent ether anæsthesia was given without convulsions. McDonald, Willway, and Ashworth have described similar cases.

In Case 2 a second dose of atropine was given owing to delay with the previous operation. The day temperature was excessive, and the anæsthetist actually remarked upon the possibility of convulsions before starting the anæsthetic. As the surgeon needed complete relaxation however, open ether was used. So far as we know, this is the first case of ether convulsions in which the anæsthesia has been successfully continued with ether—and moreover ether from the same bottle.

In Case 3, as in Case 1, a pyrexial patient had a large dose of atropine on a hot day. All the usual methods of stopping the convulsions failed, and this is, we think, the first time Evipan Sodium has been used. Its success in stopping the convulsions justifies its being tried in the future.

In Case 4 the day was again hot. The heart stopped, but was successfully restarted by cardiac massage, and it beat strongly as long as artificial respiration was continued. All attempts to start spontaneous respiration, however, failed and ventilation was maintained by means of the Drinker automatic respirator. This kept the patient alive for 3½ hours, before the heart finally stopped. We therefore think the automatic respirator worthy of further trial.

### ETIOLOGY

In the past several theories as to the cause of ether convulsions have been advanced.

*Impurities.*—Wilson found acetaldehyde and peroxides in the ether he was using when convulsions occurred, and not in other samples of ether. Walton had a similar experience. Sykes, however, records a case where acetaldehyde was absent, and peroxides amounted to only 0.05 part per million of ether. Ross Mackenzie describes seven cases where the ether was carefully analysed. The largest amount of peroxides was 0.65 part per million, while the largest amount of acetaldehyde was 0.05 part per million; the toxic dose of each is ½ per cent., so that it is almost inconceivable that these impurities were the cause of the convulsions. Our case (No. 2), where the same ether was used after the convulsions had ceased, with no ill-effect, is strongly suggestive that ether, per se, or its impurities, is not to blame.

*Idiosyncrasy.*—Hadfield and Kemp have thought that some patients have an "ether convulsion diathesis." Four cases have already been mentioned where ether has been used successfully after convulsions had occurred at previous operations. Our Case 2 is even more important in discounting the suggestion of a diathesis.

*Congestion of the Rolandic area from jugular obstruction* is suggested by Hewer, who advises raising the chin to relieve it. In Case 2 the manoeuvre of lowering the chin was tried and the convulsions immediately became worse. Rolandic congestion may therefore be of some significance.

*CO<sub>2</sub> accumulation* is believed by Pinson to be the cause. Actually CO<sub>2</sub> is a most effective agent in treatment.

*Atropine overdosage.*—Hornabrook suggested this. It occurred in two of our four cases, and is a factor frequently but by no means always present.

*Sepsis.*—This too is often but not invariably present. Enormous numbers of septic cases have ether anæsthesia without convulsions.

*Over-oxygenation.*—Mennell thought this might be the primary factor. It was present in one of our cases, but another was definitely cyanosed. Cyanosis has several times been described as a precursor of ether convulsions.

It is obvious that none of these views is at all satisfactory. We suggest that ether anæsthesia upsets the normal heat-regulating mechanism of the body and we wish to support Dickson Wright's hypothesis that *heat-stroke* may play a big part in the aetiology of ether convulsions. Our evidence is as follows: (1) In three of our four cases the day temperature was excessively high. Hadfield's cases at St. Bartholomew's Hospital, London, all occurred during the summer. (2) The association of ether convulsions with pyrexia is well known. All our cases were pyrexial, and the post-operative temperatures were high. Temperatures during the convulsions were unfortunately not taken. Mackenzie records a case where, during the convulsions, the

temperature was 108° F. Cold sponging lowered the temperature and stopped the convulsions. When the patient was back in bed the temperature rose to 106.8° F., and convulsions started again. Once more cold sponging proved successful, though the patient died later. (3) By stopping sweating, an overdose of atropine tends to reduce heat loss. Its association with ether convulsions has already been mentioned. (4) The hyperpnœa which CO<sub>2</sub> produces, not only removes ether but also heat from the body. It has already been shown that ether itself is probably not the cause of the convulsions. The beneficial effect of CO<sub>2</sub> in relieving convulsions may well be due to its action in accelerating heat loss. (5) In 11 of Pinson's 15 cases the convulsions followed

the use of the ether bomb, the principle of which was to deliver superheated ether vapour into the patient. (6) Bull describes the case of an Arab woman who had convulsions under chloroform. The heat at the time was too great for the use of ether. (7) Convulsions are one of the manifestations of heat-stroke. Willcox describes the heat hyperpyrexia form of heat-stroke as follows: "The onset may be sudden, with rapid rise of temperature, coma and convulsions . . . the skin is hot and dry, and the face flushed and cyanosed . . . the pupils are dilated . . . fibrillary twitchings of the muscles and convulsions usually occur . . . and pulmonary œdema is a terminal event." This description would do very well for an ether convulsion.

## FOUR CASES OF ETHER CONVULSIONS

	CASE 1.	CASE 2.	CASE 3.	CASE 4.
Sex and age ..	Female, aged 14.	Female, aged 6.	Male, aged 39.	Female, aged 20.
Disease .. ..	Acute mastoiditis.	Acute appendicitis.	Acute appendicitis in a case of obstructive jaundice.	Acute appendicitis.
Day temp. ..	57° F.	77° F.	84° F.	69° F.
Patient's temp.— Before operation	101.5° F.	100.8° F.	103° F.	102° F.
After operation	103° F.	104.2° F. (rectal)	104° F.	—
Atropine dosage (gr.).	1/100	1/100 + 1/150	1/75	1/100
Anæsthetic ..	Clover→ open ether→ ether and oxygen by Mennell's bottle.	Ethyl chloride→ open ether.	Ethyl chloride→ open ether.	Clover→ open ether.
State under anæsthetic .. ..	Good. No cyanosis.	Flushed→ Cyanosis (O <sub>2</sub> given). Pulse-rate 120→150→180.	Fair. No cyanosis. Difficult gangrenous appendix removed.	—
Duration of anæsthesia before onset of convulsions (mins.)	10	12	65	50
Duration of convulsions (mins.)	3	5	25	10
Treatment of convulsions.	Ether stopped; O <sub>2</sub> and CO <sub>2</sub> given.	Ether stopped; O <sub>2</sub> and CO <sub>2</sub> given. Dropping chin forwards made convulsions worse.	Ether stopped; O <sub>2</sub> and CO <sub>2</sub> given: no effect. Chloroform: no effect. Cyanosis increasing. Trachea intubated, head raised. Colour improved, but convulsions continued. Amyl nitrite, then chloroform again. Convulsions and pulse worse. Adrenaline 1/10 intravenously. Evipan sodium 8 c.cm. intravenously.	Ether stopped. O <sub>2</sub> and CO <sub>2</sub> given.
Result of treatment of convulsions, and details of further general treatment.	Convulsions ceased after 2 minutes' hyperpnœa.	Convulsions ceased after 4 mins.' hyperpnœa. Anæsthesia was by then quite light.	Convulsions ceased within 2 mins. of injection of evipan. Operation quickly concluded. Pulse-rate 146, quality poor, on leaving theatre.	After 10 mins.' convulsions, heart and convulsions stopped. Trachea intubated and artificial resp. with McKesson's apparatus started. Adrenaline (4 c.cm. in all) given. Cardiac massage twice re-started heart. No spontaneous resp. after initial failure. After 1½ hours' artificial resp. with the McKesson, she was transferred to Drinker respirator.
Anæsthesia during rest of operation (and duration).	Chloroform and O <sub>2</sub> , by Junker's inhaler, for 40 mins.	Open ether, from the same bottle, with O <sub>2</sub> for 20 mins.	None needed.	None needed.
After-treatment.	Nil.	Nil.	In spite of cardiac stimulants, patient died 34 hours after operation without recovering consciousness.	After 3½ hours in the Drinker respirator, patient died from cardiac failure.
After-history ..	Developed streptococcal septicæmia and lateral sinus thrombosis; 13 days after first op., lateral sinus opened and jugular tied under prolonged open ether anæsthesia. No convulsions; uneventful recovery.	Rapid uneventful recovery.	P.M.: Extensive carcinoma of liver, dilatation of heart, and severe pulmonary œdema.	P.M.: Terminal dilatation right side of heart. Nothing else abnormal.



## PROPHYLAXIS AND TREATMENT

In the belief that the heat-stroke hypothesis provides the best explanation which has so far been offered for the aetiology of ether convulsions, we advise appropriate means of prophylaxis and treatment.

The anaesthetist should limit pre-operative atropine to gr. 1/150 in children and young people with acute septic diseases and a temperature of over 100° F., especially in hot weather, and he should avoid excessive coverings, above all mackintoshes, for such patients in the theatre. He must be constantly on the watch for the first twitch of the eyelids or mouth in these patients, and, if it occurs, he must apply treatment immediately.

To treat the convulsions, CO<sub>2</sub> and oxygen should be given at once. If they do not cease within a minute, evipan sodium should be injected intravenously. While preparing the evipan, cold sponges and ice should be applied to the body and face. If necessary,

the trachea should be intubated. To combat cardiac failure, adrenaline and Coramine should be given, and for respiratory failure, artificial respiration—manually, or mechanically by means of the McKesson machine and the Drinker respirator or Bragg-Paul pulsator; the latter is probably preferable, as the Drinker apparatus tends to conserve heat.

## REFERENCES

- Ashworth, H. K.: *Brit. Med. Jour.*, 1935, i., 851.  
 Bull, L. J. F.: *Ibid.*, 1927, ii., 471.  
 Haddfield, C. F.: *Proc. Roy. Soc. Med.*, 1928, xxi., 1699.  
 Hever, C. L.: *Recent Advances in Anaesthesia and Analgesia*, London, 1932.  
 Hornabrook, R. W.: *Brit. Med. Jour.*, 1927, ii., 471.  
 Kemp, W. N.: *Brit. Jour. Anaesth.*, 1932, xi., 169.  
 McDonald, N.: *Proc. Roy. Soc. Med.*, 1928, xxi., 1706.  
 Mackenzie, J. R.: *Brit. Med. Jour.*, 1931, i., 440.  
 Mennell, Z.: *Proc. Roy. Soc. Med.*, 1928, xxi., 1705.  
 Paul, R. W.: *Ibid.*, 1934, xxviii., 436.  
 Pinson, K. B.: *Brit. Med. Jour.*, 1927, i., 956.  
 Sykes, W. S.: *Ibid.*, 1930, i., 1123.  
 Walton, A. C. R.: *Ibid.*, 1928, ii., 8.  
 Willcox, Sir W.: *Price's Text-book of the Practice of Medicine*, London, 1933, p. 382.  
 Willway, F. W.: *Brit. Med. Jour.*, 1935, i., 764.  
 Wilson, S. R.: *THE LANCET*, 1927, i., 1117.  
 Wright, A. D.: *Brit. Med. Jour.*, 1935, i., 949.

## CLINICAL AND LABORATORY NOTES

ANEURYSM OF THE SPLENIC ARTERY  
SIMULATING CHOLECYSTITIS

By S. E. OSBORNE, L.M.S.S.A.

RESIDENT SURGICAL OFFICER, WORTHING HOSPITAL, SUSSEX

ANEURYSMS of the splenic artery, although uncommon, are not as rare as would at first sight be expected, and Anderson and Gray in 1929 were able to collect 58 recorded examples.<sup>1</sup> The present case has certain unusual features.

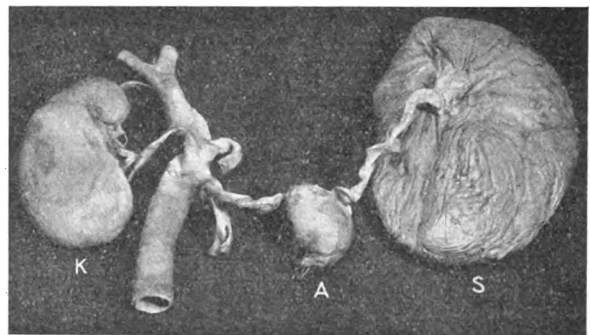
Miss A, aged 43, a cook, was sent to the Worthing Hospital as a case of acute cholecystitis. She gave a history that apart from pneumonia and influenza, her only illness was in 1909, 27 years previously, when an operation was performed for suspected disease of the gall-bladder. The operation scar is a paramedian supra-umbilical one: evidently the gall-bladder was inspected and found to be normal and the appendix removed through this high incision.

The present symptoms began six years ago, when the patient first complained of abdominal pain coming on in attacks at infrequent intervals, colicky in nature, beneath the right costal margin, radiating through to the right shoulder and aggravated by stooping. A feeling of fullness was noticed in the epigastrium, discomfort after meals, and very troublesome flatulence. There was continuous nausea but only occasional vomiting. Fatty foods were not tolerated and brought on pain. Occasionally after the attacks there was slight jaundice, but the urine was not noticed to be deeply coloured and clay-coloured stools were not a feature.

*Examination.*—The patient was stout, very nervous, and apprehensive. Temperature, 98·4° F.; pulse-rate, 96; respirations, 20. There was some tenderness over the gall-bladder on palpation, and slight tenderness in the epigastric region, which persisted for some time afterwards. The heart and chest were normal. No other abnormalities were to be found, and the diagnosis of gall-stones with cholecystitis was made. An opaque cholecystogram showed that the gall-bladder filled and emptied normally and no stones were demonstrated.

*Operation.*—Under ethyl chloride and ether anaesthesia the abdomen was opened through a midline incision and the gall-bladder inspected. Many adhesions were present, but no gall-stones were felt either in the gall-bladder or in the common bile-duct. A large whitish-grey round tumour then came into view, lying in the

gastrohepatic omentum above the stomach and midway along the lesser curvature of the stomach. The tumour was firm, fluctuant, and about the size of a tangerine orange. The walls were calcareous and cracked when pressed. No pulsation was seen or felt, and the tumour was thought to be a pancreatic cyst, and was incised. Blood escaped with considerable force and the stream was seen to pulsate. The diagnosis of an aneurysm was at once obvious. By firm pressure on the aorta with the fingers it was possible to control the hæmorrhage. The position of the aneurysm was such that removal was impossible, and an attempt to sew up the incision in the aneurysm failed because the walls were so calcareous



A photograph of the spleen (S), aneurysm (A), and kidney (K) dissected post-mortem.

that the stitches cut out as soon as they were inserted. The patient had by this time lost a considerable amount of blood, and as her condition was giving rise to some anxiety, the wound in the aneurysmal sac was closed by two pairs of curved artery forceps, which were left in situ. The abdominal wound was closed and the patient returned to bed.

*Post-operative treatment.*—The patient was given the usual restoratives and a blood transfusion of 26 oz., and on the following day her general condition had improved. On the third day the clamps were removed. On the ninth day after the operation she was taking food well and did not complain of pain or feeling unwell. There was some serous discharge from the wound. At 12.20 A.M. a sudden severe secondary hæmorrhage took place, and in spite of blood transfusions, morphia, and hæmoplastin serum the patient collapsed and died at 10.15 A.M.

*Pathology.*—Post-mortem examination revealed a large and flabby heart with excess of fat. The aortic valves were normal and free of vegetations. There was no

<sup>1</sup> Anderson, W., and Gray, J.: *Brit. Jour. Surg.*, 1929, xvii., 267; see also Brockman, R. St. L.: *Ibid.*, 1930, xvii., 692.

atheroma of the aorta. About a third of the way along the splenic artery from its origin at the celiac axis was a thick-walled partly calcified aneurysm, the size of an egg and containing laminated blood-clot, firmly adherent to the pancreas and splenic vein. The artery distal of the aneurysm was very tortuous. The spleen was very large, about three times normal in weight and size (see Figure). The liver was fatty, the gall-bladder was normal and contained no stone.

The interest in this case is that the symptoms resembled those of a cholecystitis with gall-stones. In the cases previously reported the symptoms have simulated those of a gastric and duodenal ulcer very closely in the majority of cases and the reference of the pain to the gall-bladder area is unusual. It is possible that the opening of the abdomen for suspected gall-bladder trouble 27 years previously marked the commencement of the formation of the aneurysm. A point in the differential diagnosis is the alteration of the intensity of the pain with posture, suggesting rather strongly a vascular lesion. As in the other reported cases there was no history of trauma. The Wassermann reaction was negative, and there was nothing to suggest a possible cause for the formation of the aneurysm.

### ACUTE APPENDICITIS IN AN INFANT RESEMBLING INTUSSUSCEPTION

By F. H. COLEMAN, M.B. Camb., M.R.C.P. Lond.

RESIDENT MEDICAL OFFICER, THE QUEEN'S HOSPITAL FOR  
CHILDREN, LONDON, E.

THE following case is recorded because the patient was unusually young and because there were symptoms suggestive of intussusception:—

A girl, aged 5 months, was brought to hospital by her mother, who said that for nine hours the baby had had screaming attacks, associated with drawing-up of the legs; the attacks had lasted a few minutes, the intervals between them being spent in sleep. At the onset of the attacks the mother had noticed the passage of bright blood and mucus per rectum; this also occurred just after arrival at the hospital. The baby was bottle-fed, but had not taken anything that day; there had been one moderate-sized food vomit. A fortnight previously there had been an alleged attack of broncho-pneumonia, treated at home.

The baby appeared to be fairly well nourished and not very ill. The temperature was 100.2°F. and the pulse-rate 176. Two more or less typical screaming attacks occurred during the examination. There were numerous coarse rhonchi in the chest, and the abdominal examination was negative, save for a suggestion of emptiness in the right iliac fossa. A rectal examination revealed no blood on the examining finger, nor any tumour.

The diagnosis was believed to be intussusception, although the possibility of the case being one of Sonne dysentery troubled us considerably, especially as an epidemic of the latter was raging in the neighbourhood. After admission the screaming attacks continued and it was thought advisable to make an examination under anaesthesia. The result of this was that we could just feel a lump deep down under the right costal margin, which decided us to carry on and open the peritoneal cavity. On opening this, a certain amount of free fluid was found; no intussusception was present, but the distal third of the appendix was very acutely inflamed. Apparently the palpable lump was accounted for by the right kidney, which had prominent foetal lobulation. The appendix was removed, and the operation was followed by very rapid and entirely uneventful recovery, the stools having a normal appearance two days after operation. A stool, passed the day after admission, was examined bacteriologically, and found to contain mucus, but no non-lactose-fermenting organisms.

This case leads one to wonder whether appendicitis is not a far commoner disease of early childhood than is usually appreciated. Simpson-Smith<sup>1</sup> states that in a series of 311 cases of appendicitis at the Hospital for Sick Children, Great Ormond-street, exploration of the abdomen revealed in 65 per cent. an appendix which was either gangrenous, perforated, or necrotic in an abscess cavity; and this suggests an earlier attack in at least a proportion of these.

The cases which actually have been diagnosed in infancy have often been discovered accidentally whilst operating for another condition. Thus Ham<sup>2</sup> reports the case of an infant 12 days old, with one day's history of swelling of the right side of the scrotum, associated with one vomit, which was found at operation to have a scrotal hernia containing the caecum and a gangrenous appendix. Pope<sup>3</sup> also reports the case of a baby 3 weeks old, with five days' history of swelling and inflammation of the penis and scrotum, and a temperature of 102.2°F., diagnosed as acute orchitis and treated by incision and drainage. A sinus formed soon afterwards, and this was followed by a hernia at that site. Two years later an operation for radical cure of a right scrotal hernia was performed, and the appendix was discovered adherent to the sinus and showing evidence of old inflammation, both testes being perfectly normal. The case here reported falls into the same category, since the true nature of the disorder was not suspected.

I am much indebted to Mr. D. W. C. Northfield, under whose care this patient was admitted, for permission to place the case on record.

#### REFERENCES

1. Simpson-Smith, A.: *Practitioner*, 1935, cxxxiv., 518.
2. Ham, C. I.: *Brit. Med. Jour.*, 1927, i., 1927.
3. Pope, S.: *Ibid.*, 1927, ii., 307.

### TWO CASES OF RETENTION OF URINE IN WOMEN

By H. P. WINSBURY-WHITE, M.B. Edin.,  
F.R.C.S. Eng.

SURGEON TO ST. PAUL'S HOSPITAL FOR GENITO-URINARY  
DISEASES, LONDON

THESE cases are of particular interest for two reasons: one is the prominence of the chronic inflammatory element in the aetiology, and the other is the satisfactory result of resection of tissue from the bladder neck, performed by the high-frequency cutting method.

CASE 1.—The first patient, a single woman aged 30, was first seen in December, 1934. She complained that she was in the habit of holding her water for two or three days, after which it was passed spontaneously. She gave the following history. After appendicectomy in 1928 a catheter had to be passed daily for nearly three weeks, but micturition became normal on her discharge from hospital. It remained thus until Christmas, 1933, when she was confined to bed for three weeks with a bruised shoulder and abdominal pain resulting from a motor-car accident, and resumed her former habit of holding her water for three days. On discharge from hospital normal micturition again returned, and it was maintained until August, 1934, when, after a cold in the head and chest, she returned to her old practice of urinary retention for two and three days at a time. This was the state of affairs when I saw her in December, 1934.

At this time the laboratory report on the urine showed it to be sterile, nor were any pus cells or any chemical abnormalities detected. The blood Wassermann reaction was negative. While interrogating the patient it was

noticed that she suffered from spasmodic twitchings of the face and one or other shoulder. She informed me that these had come on after the motor-car accident about a year before. On examining the vulva, swelling and redness were noted in connexion with the Skene's gland and there were also some small superficial ulcers surrounding the orifice of the introitus. These lesions were investigated carefully and the possibility of syphilis was thereby eliminated. A small introitus prevented a view of the cervix at this time. Cystoscopy showed oedema at the internal urinary meatus and a raising of the posterior lip of this structure above the floor of the trigone. Intravenous urograms failed to reveal any renal abnormality, and it was particularly noted that there was no evidence of back pressure on the kidneys from the distended bladder. The blood-urea was 27 mg. per 100 c.cm.

After six months' treatment with fortnightly and monthly urethral dilatations, the patient improved to the extent that she was able to empty her bladder once in 24 hours. At this stage I admitted her to hospital for examination of the pelvic organs under an anaesthetic and for treatment to the bladder neck. On bimanual vaginal examination no abnormality was detected but inspection showed erosion of the cervix. I therefore dilated and cauterised the cervix. With the McCarthy electrotome I then removed a piece of tissue from the floor of the internal urinary meatus measuring  $\frac{1}{2}$  by  $\frac{1}{2}$  inch. Microscopical examination of the excised tissue showed a certain amount of round-celled infiltration and fibrosis of the part. The result of this treatment was that the patient passed water twice in 24 hours, but a few weeks after discharge from hospital she returned to her old habit of micturating once only in 24 hours. Twitches of the face and shoulder, however, disappeared after this treatment and have not subsequently returned.

Four months after the operation I again admitted the patient to hospital and removed another small piece of tissue from the bladder neck. Since this time, which is now about five months ago, she has passed her water regularly two and three times a day.

CASE 2.—My second patient was a married woman of 44, who had had three children, now aged 22, 17, and 10. She had had an attack of complete retention of urine three weeks previously, which had to be relieved by catheterisation. The history of this complaint goes back 22 years to the time when she had a similar attack after her first confinement, and there have been several such crises at long intervals in the intervening period. Frequency of micturition has always followed, and when I first saw her, although she was able to hold her water as long as four hours during the day, she found it necessary to rise four times during the night. Her periods have been somewhat irregular.

On examination a tendency to procidentia was evident. A ring pessary was being worn for this. The cervix appeared somewhat hypertrophied but otherwise normal. Cystoscopy showed the retrotrigonal pouch which is characteristically noted with vesicovaginal displacement. Both kidneys were functioning well as indicated by the excretion of indigo-carmin. The posterior margin of the internal urinary meatus was seen to be somewhat raised above the level of the trigone. A laboratory report on the urine indicated the presence of *Bacillus coli*.

I admitted the patient to hospital and with the McCarthy electrotome removed a single piece of tissue about  $\frac{1}{2}$  by  $\frac{1}{2}$  inch from the floor of the internal urinary meatus. The patient was sent back to bed with an indwelling catheter for four days, during which time daily vesical irrigation was carried out. Microscopical examination of the tissue removed showed a well-marked fibrous change and round-celled infiltration, thus making it clear that chronic inflammation was the cause of the condition at the bladder neck.

When the patient was seen by me five months after her operation, cystoscopy showed a trigone which was healthy in appearance and which shelved perceptibly into the posterior urethra. There was no pus in the urine, and though coliform bacilli were still present on culture, she now stated that she had no urinary symptoms and that she no longer found it necessary to rise at night.

## MEDICAL SOCIETIES

### ROYAL SOCIETY OF MEDICINE

#### SECTIONS OF PSYCHIATRY AND THE STUDY OF DISEASE IN CHILDREN

A JOINT meeting of these sections was held on April 21st at 8.30 P.M. with Dr. H. J. NORMAN in the chair.

Dr. WILLIAM MOODIE opened a discussion on

#### Enuresis

He said that his communication resulted from a survey by Miss Robina Addis of the London Child Guidance Clinic. All possible information from the records had been collected to combat our depressing ignorance of the subject. Enuresis was not a disease by itself, nor necessarily a symptom of mental maladjustment. It occurred in all types of child, all classes, all environments, and after all kinds of training. Many inaccurate statements were made about it, and facts and figures were needed. A comparison had been made between the non-enuretic and the enuretic children, including those not specially sent for this symptom. Enuresis was present in 314 out of 1705 children (18.4 per cent.). When the cases treated by local doctors, or merely slapped at home, were added, the extent of the problem became evident. Boys predominated, the proportion of boys to girls with enuresis being 3 to 2, whereas the proportion of boys to girls among all the children

examined was 2.2 to 2. As regards intelligence the enuretics fell into two groups, high and low normals. There were less enuretics in the lower intelligence groups, and even at the idiot level only 2 out of 34 were enuretics. Enuresis did not depend on intelligence, so that attempts should be made to train imbeciles in toilet habits. The non-enuretic group increased in numbers between 10 and 14 years, whereas the enuretic reached its maximum from 8 to 10 years, decreasing with the onset of puberty. There was a definite relationship to sex difficulties, many cases clearing up when tension about sex was relieved.

A special analysis of 30 cases revealed some interesting facts. Of 19 boys, 8 and of 11 girls, 4 were cured (40 per cent.), the criterion of cure being six months without a wet bed. A change from home environment broke the vicious circle, but there was no factor of recovery common to all. A detailed study of symptoms was made as a possible guide to treatment. Results suggested that those who wetted regularly were more likely to clear up than those who wetted in bouts. The condition was attributed to "nerves," ill-health, rows at home, the East wind, or to a combination of several of these. Of 15 who showed both diurnal and nocturnal enuresis 4 cleared completely, while 5 became clean at night. A history of definite onset was obtained in 8 cases between the ages 2 and 9 years, nocturnal in 3, both nocturnal and diurnal in 5. Both types seemed equally likely to break down after control appeared

to be established. Where there was also incontinence of fæces the patient did better than was commonly anticipated, perhaps because "this can't go on" was said more firmly by parents and doctors than when enuresis alone was the trouble. In not one case was waking at night or restriction of fluids of value; these measures might do harm as a nightly reminder to the child that he was expected to wet. Habit training could be classed as good or bad; 6 recovered out of 17 good cases, and the same number out of 13 bad cases. Home conditions, birth weight, method of feeding had no demonstrable influence. The symptom appeared in the period of debility following illness, especially between the ages 2 and 3. Of 21 successful in school only 7 recovered, and cases were cured while still failing at school.

Dr. Moodie considered next the type of child in the series of 30 cases; 8 were timid, 7 withdrawn, 12 sociable, and 3 defiant, the last failing to recover. Analysis of pedigrees pointed to a high incidence of enuresis among siblings and relatives. Allergic symptoms were frequent, and possibly family trees were richer in neurotic and psychotic types. Although these figures had been worked out with great labour, they left us much where we were. In conclusion he confessed that the psychological explanation was by no means the whole story. Some physiological factor must be present also. There were chemical factors, bacillurias, fine balances between the various parts of the nervous system, anatomical anomalies not yet understood, and acting with them was the psychological factor.

Dr. REGINALD MILLER said that enuresis should be limited in this discussion to cases of urinary incontinence of functional origin. The condition either continued from infancy—"congenital" type, or arose after control had been established—"acquired" type. Males predominated and there was no enuresis problem in schools for girls as there was in schools for boys. Sometimes diurnal or fæcal incontinence coexisted. He stressed the importance of differentiating the factors that started enuresis from those that perpetuated it. The short interval between sleep and incontinence contrasted strangely with the large amount passed, which might be about three mattresses full. The automatic emptying of the bladder depended not only on the amount of urine, but on the rapidity of its accumulation. If fluid by mouth was withheld, it was attracted from the tissues, the result of some vaso-motor or secreto-motor activity. The influence of hot and cold weather emphasised the importance of rapidity of secretion. He had seen the symptom too frequently cease in summer, relapse in winter, and finally clear in the following summer, to be in any doubt on this matter, despite Dr. Moodie's disagreement. In psychological make-up bed-wetters were singularly like non-bed-wetters. Two types could be distinguished, the neurotic and the phlegmatic. The neurotic was emotional, had disturbances of conduct by day, with diurnal enuresis and perhaps fæcal incontinence; sleep was restless and disturbed, acquired enuresis was common, the proportion of girls high, and psychological disturbances maximal. In the phlegmatic type the reverse held in all particulars. There was no great difference in numbers in the two groups. The wet phlegmatic differed only from the dry phlegmatic in the regularity of his bed-wetting. Dr. Miller's contention that psychologists saw a selected group of the neurotic, emotional type was confirmed by the high proportion of females,

acquired cases, and cases incontinent of fæces in their reported series. The phlegmatic type presented the real problem. Many cases could be cured by drugs, and that this was not a form of suggestion was borne out by the failure of circumcision, undoubtedly a much stronger form, and the effect of altered doses for better or worse. Belladonna and strychnine were very successful, and if all cases were associated with nervous instability there could hardly be a less suitable mixture. There was no doubt that psychologists had got away with the disorder enuresis, but Dr. Miller urged that the psychological disturbances induced by enuresis in child and parents should be distinguished from the cause of the enuresis. The anxiety state resulting from enuresis could not also be its cause. The phlegmatic boy did not care; he knew that the condition had existed from infancy, occurred when he was fast asleep, and he had the sense to know that he was not to blame. He accustomed himself to bed-wetting just as he might to being fat or red-haired or called Ramsbottom. The psychological aspects of enuresis were more epiphenomena than causal. To his mind the cause was still obscure, and he felt that the fraternal cordiality between the two sections could be re-established if they united in declaring that they did not know the cause of enuresis.

Dr. D. W. WINNICOTT claimed that psycho-analytic discoveries had made possible further understanding of enuresis, besides the treatment of individual cases. Enuresis might be normal or an early symptom of dementia præcox, but usually it was part of a difficulty in emotional development, associated with other symptoms. Frequently the symptom ceased without treatment, or after medicinal treatment, sometimes reappearing at puberty as nocturnal emissions. He discussed the possible explanations of the act from the psycho-analytic point of view. The important element was the unconscious fantasy, the principal emotions expressed being love, hate, and reparation. Anxiety was always related to the fantasy. The infant used bodily pleasures to deal with anxieties, and in order to stand pain and frustration. The mother, training the baby to be clean, could from the baby's point of view be a creator of evil, turning love into anger inside him. Early induced cleanliness might be followed by refusal to use the pot at 1 to 1½ years, a real danger of modern teaching. Control of sphincters was only stable when it resulted from the child's unconscious identification with clean and self-controlled parents. The best advice to give mothers was to avoid conscious efforts at training, merely to give the opportunity to be clean. Clean babies normally become dirty at times, and then no special effort should be made. It was wiser to leave alone the mother who did not ask for advice, acted on intuition, and might well know more than the doctor how to bring up a child. Dr. Winnicott pointed out that complete analysis always included the symptom enuresis. Absence of enuresis itself might be a symptom. The anaesthesia of the sensitive parts of the urinary apparatus was an inhibition of physical sensation secondary to repression accompanying fantasy, disappearing as this became less intense. The most difficult case showed no anxiety or depression, since all emotional difficulties were dealt with by the one symptom, instead of by phobias, obsessional behaviour, moods, and so forth. These remarks did not make treatment easier, but the subject was highly complex, and he sought to understand the forces at work behind enuresis and kindred symptoms in childhood.

Much could be got out of such tricks in treatment as hypnosis, but more from the study of causation. Although this limited the therapy to few cases, it enabled better advice to be given to the mother who wanted to know how best to bring up her child.

Dr. C. J. C. EARL said that the feeble-minded was no more liable to enuresis than was the normal child, although he was usually later in developing toilet habits. Most mentally defective children could be trained. Enuresis was commoner in institutions, in orphanages as well as in mental homes, than outside, and doctors and superintendents would all agree that epidemics occurred, often after the public execution of an offender. One or two children with enuresis could "infect" a ward previously clean. Almost all cases from 10 to 14 years were of excitable type, and he regarded enuresis as a hysterical symptom, seeing that it could be cleared up and produced by suggestion. Drug treatment was as good as any other, but perhaps it was as well that most pædiatricsians gave belladonna in doses too small to have any action. He suggested that the success of any treatment that worked was due to suggestion, the highest common factor of them all. Hypnotism was valuable in high-grade mental defectives.

Dr. FRANKLIN BICKNELL had shown that as little as four ounces of water would swamp a mattress and drip through it. Where spina bifida was a causal factor, relapse was common. In an analysis of his own cases measles and whooping-cough were responsible for a large number with a late onset. There seemed to be two types of child: the flaxen-haired Teutonic type that bullied its mother and failed to clear up, and the small dark "chic" type, having frequent queer attacks of temper, that did well. An abnormally high percentage of cases had orthostatic albuminuria. As regards treatment he discounted the effects of suggestion.

Dr. C. H. ROGERSON objected to the name enuresis, implying a disease. The early English description of the young "piss-abad" suggested more accurately its symptomatic character. He agreed that it cleared up with any one of a number of treatments.

Dr. MARGARET LOWENFELD said that enuresis was merely the persistence of a characteristic normal for the first six months of life. She had been astonished at the number of children who really enjoyed bed-wetting, and said that it was nice. It had to be remembered that a child's scale of enjoyment differed from the adult's. The attitude towards bodily sensations was important. Some portrayed emotions with their bodies, some did not. She agreed that the psychologist's cases were selected from among the former, making special study possible. Boys, who predominated, all had continuous and unusually vivid fantasies. Their preponderance could be explained by the greater dramatic possibilities of the urinary function of boys compared with girls. In the type of child who lacked correlation between mind and body, sleep was so deep that the acquired control was lost.

## EDINBURGH OBSTETRICAL SOCIETY

At a meeting of this society on March 11th, with Dr. DOUGLAS MILLER, the president, in the chair, a paper on

**Radium and Cancer of the Neck of the Uterus** was read by Sir COMYNS BERKELEY (London). He referred to the tragic and often unnecessary delay

in making a diagnosis and instituting efficient treatment. In a group of cases he had investigated he had found that the average time from the initial symptoms till a doctor was consulted was five months, and before proper treatment was established after diagnosis another five months elapsed. The blame therefore lay partly with the patient and partly with the medical profession. As remedies for this state of affairs Sir Comyns stressed first the importance of disseminating knowledge, indicating when menstruation was to be considered normal, and advising vaginal examination if any irregularity developed. This should be done at post-natal clinics by leaflets and verbal instruction, by hanging a notice in gynæcological out-patient departments, and educating midwives to spread the information and persuade women with irregular vaginal bleeding to consult their doctors. Secondly, he said, not only was it the practitioner's duty to examine locally and investigate completely all cases of irregular vaginal hæmorrhage, but all cervical erosions should be treated thoroughly, and if they did not respond quickly, a biopsy was indicated. He fully realised the difficulties practitioners faced, especially when blamed for making an unnecessary fuss where the findings proved negative. Recently the British Empire Cancer Campaign had set up a central propaganda committee, lectures being organised for the lay public to be given by local doctors. This was at present being tried in certain districts.

Sir Comyns's cases showed that in 30 per cent. of cases of cervical carcinoma the patient was between the ages of 50 and 60, and childbearing was an important precursor, 95 per cent. of patients being married, and the average number of pregnancies being 5.4. In treatment a general anæsthetic should always be given because a more detailed examination was possible and efficient application even with a multiplicity of applicators was by no means always easy. Whether or not X rays should supplement radium treatment was still in debate. Heyman of Stockholm was not yet convinced of its benefit but found the radium bomb had a definite place in extreme cases. Theoretically, Sir Comyns felt, it was sound, and it was now being undertaken as a routine at his clinic. Before reliable statistics, which were badly needed, could be published, efficient follow-up systems, which meant much work and ingenuity, must be evolved; and the preliminary examination and grouping of cases, the treatment and the follow-up examinations should only be made by the chief and his first assistant so that the same standards were as far as possible maintained. To place a case in its proper group was often no easy matter, and in a difficult one Sir Comyns advocated "up-grading" as the proper course to follow—i.e., choose the group where there is the greater chance of recovery. A bimanual examination did not always indicate the real amount of spread—for example, to the bladder. On the other hand, parametrial masses suggesting malignant spread often turned out to be inflammatory. "Down-grading" was liable to result in this type of case being placed in too low a grade, and so statistics were falsified by improving both Stage I. and Stage IV. The only survival-rate of use for purposes of comparison between different centres was the absolute survival-rate—i.e., the calculation to be made from all cases seen whether treated or not. It would eliminate the effects of up-grading or down-grading, and was vastly superior to comparisons of the gross or net survival-rate.

## REVIEWS AND NOTICES OF BOOKS

**The Human Foot**

By DUDLEY J. MORTON, Associate Professor of Anatomy, College of Physicians and Surgeons, Columbia University. Columbia: University Press; London: Humphrey Milford, Oxford University Press. 1935. Pp. 244. 15s.

ANYONE who doubts whether a book on the human foot is likely to be wanted by enough readers to justify its publication has reckoned without the peculiar gifts of Dr. Morton. He has written a book on the foot, its evolution, anatomy, mechanics, and physiology, which is so good that it will undoubtedly create a demand. The first part deals lucidly with evolution, and the second with mechanics. Dr. Morton is at pains to emphasise the relation of the mechanics of the foot to the posture of the body as a whole in states of activity and in rest. From anatomical considerations alone it would appear that the foot is divided longitudinally into two parts, each with a different function: an inner part which is essentially the lever and spring, and an outer which is a base of support and a balancing organ for the lever, and takes relatively very little part in leverage action. Dr. Morton carried out, by means of an instrument of his own design called a staticometer, investigations which have a bearing upon this point. He was able to determine the amount of weight borne by each of the metatarsal heads when the foot was in action and at rest, and found that in action the line of stress came between the first and second metatarsal bone and at rest between the second and third. He therefore recognises two axes: an axis of leverage and an axis of balance. This differentiation of function is a useful conception, and gives to the outer part of the foot and even to the little toe a new significance. It helps to explain the mechanical disabilities of feet which fall even within the normal range, such as the relatively high arched and long narrow ones.

In discussing metatarsalgia Dr. Morton devotes a chapter, illustrated by good X ray photographs, to each of the three congenital conditions long associated with the name of Morton: a short first metatarsal bone, a mobile first metatarsal, and a backwardly placed sesamoid bone. He has rendered a service in once more drawing attention to these conditions, since they are probably responsible for far more cases of mechanical breakdown of the foot than is generally realised. Throughout the book he emphasises his points by ingenious diagrams, of which the one illustrating the mechanical ill-effects on the feet of a shortened tendo Achillis is a noteworthy example.

**From Rousseau to Proust**

By HAVELOCK ELLIS. London: Constable and Co., Ltd. 1936. Pp. 411. 12s. 6d.

In this book Dr. Havelock Ellis writes in his usual fluent style of the literature of France. In the opening chapter he tells how, by the age of 14, he had acquired French enough to read for pleasure in that language. The first French book he read for its own sake was Rousseau's "Rêveries." It was not till 1883, many years later, that he first had occasion to visit France. In 1889 he went again with his friend Arthur Symonds. Lightly and reminiscently he sketches the great literary and artistic figures with whom he came thus in contact—Coppée, Meissonier, Mallarmé, Rodin, Verlaine, Huysmans, and

many more. He had the unusual experience of hearing the great Bernhardt hissed at the end of a dull play. The brilliant study of Rousseau which follows includes a chapter on that enigmatic and attractive woman Mme de Warens, whose influence on Rousseau was so profound. Subsequent essays deal with Restif de la Bretonne, "le Rousseau de ruisseau"; Besenval who, though half Polish, was the perfect type of the French chevalier; Alexandre de Tilly, the typical roué of the eighteenth century; Victor Hugo, whose "colossal superiority-complex" was his defence against the world; and, by contrast, Verlaine, who "represents genius, naked and helpless." Next come Élie Reclus, one of those men who are ranked among the criminals while they live, among the saints when they are dead; Remy de Gourmont, critic, scholar, and recluse with the Kantian capacity for visualising conditions of which he had had no personal experience; Henri de Régner, who remained spiritually always a child; and Alain-Fournier, author of "Le Grand Meaulnes." Last comes a profoundly critical study of Marcel Proust, that erratic and contradictory figure who was a victim of nervous asthma. In the author's view Proust's work was largely conditioned and developed by this allergic state. This is not a book for the tyro nor even for the man with a mere nodding acquaintance with French literature, but those whose interest in the great and small men peopling this book is not perfunctory will appreciate the skill with which their characters are portrayed.

**Diseases of the Peripheral Arteries**

*Diagnosis and Treatment.* By SAUL S. SAMUELS, A.M., M.D., Chief of the Clinic for Peripheral Arterial Diseases, Bellevue Hospital, New York. London: Humphrey Milford, Oxford University Press. 1936. Pp. 260. 12s. 6d.

THIS book is concerned almost entirely with thrombo-angitis obliterans and is written to advocate conservative methods of treatment for all forms of obliterative arteritis in the extremities. The author has had very considerable experience as chief of the clinic for peripheral arterial diseases at the Bellevue Hospital, and though he does not give his figures in full he states that in his series of 350 cases of obliterative arteritis treated during the past ten years only *one* required amputation. This astounding result has been achieved not so much by special methods of treatment as by Dr. Samuels' determination to persist with conservative methods when most physicians would resort to some more drastic measures to alleviate the patient's suffering. There are clinical records of case after case in which to save a leg the patient has had to endure what the author describes as excruciating agony for several weeks while gangrenous toes were separating, and has been an invalid for 6 to 12 months before healing was complete. That sound healing may be obtained by conservative treatment after gangrene has appeared is in itself a matter worthy of note, and justifies the publication of this monograph, but it is regrettable that Dr. Samuels has given no indication of the after-history of these cases. Although all agree that everything should be done to avoid amputation, it must be remembered that the disease in the arteries is progressive, and one hesitates to adopt a method of treatment which involves much pain



and prolonged invalidism without some assurance that the healed stumps after loss of the toes are unlikely to break down again when the patient returns to his usual activities. The cardinal rules of treatment are rest with the limb horizontal, hot baths (but avoidance of radiant heat), intravenous salines, and baths and wet dressings of weak chloramine for ulcers and gangrene. The author lays great stress on complete abstinence from tobacco, and states that even moderate cigarette smoking can rob the patient of the benefits derived from the most painstaking practice of all the other methods of treatment. The arguments in support of conservatism are weakened rather than strengthened by the author's repeated refusal to consider any form of surgery to improve the peripheral circulation, and he condemns every kind of operation with unnecessary vehemence. Though lacking in depth of thought and width of outlook the book deserves the consideration of practitioners interested in these vascular diseases, of which the incidence seems to increase as the years go by.

### Plant Viruses

By KENNETH M. SMITH, D.Sc., Ph.D., Potato Virus Research Station, School of Agriculture, University of Cambridge. London: Methuen and Co. 1935. Pp. 107. 3s. 6d.

THOSE who wish to know something about the virus diseases of plants, but have not the time to tackle a large treatise, will find Dr. Kenneth Smith's little monograph the very thing they have been looking for. Despite its brevity it contains a clear and comprehensive outline of what is known about plant viruses. The book begins with a brief historical survey and a statement of the problem as envisaged to-day by plant pathologists, stress being laid on the great economic importance of these diseases. Following this is a chapter on the technical side of the question and here one gets a glimpse of some of the obstacles that the investigator of plant viruses has to cope with. The main portion of the book is devoted to a consideration of the behaviour of the virus in different environments, in the host, in the insect vector, in vitro, and of the way in which these virus diseases are spread. A chapter on immunity follows and the book closes with a brief comparison of animal and plant viruses. Considering the difficulties inherent in plant virus research it is extraordinary how much progress has been made in unravelling knots which seemed to be firmly entangled only a few years ago. In this work Dr. Kenneth Smith has taken a prominent part and his monograph may be regarded as authoritative.

### Behaviour Development in Infants

*A Survey of the Literature on Prenatal and Post-natal Activity, 1920-1934.* By EVELYN DEWEY. Published for the Josiah Macy, Jr., Foundation by Columbia University Press. London: Humphrey Milford, Oxford University Press. 1935. Pp. 321. 17s. 6d.

ALTHOUGH this volume comes into the class of "books about books," it is much more than a summary of other publications. The author has sifted a prodigiously large number of original works, and has presented a lucid and coherent account of the theories and observations of normal child development published since 1920, when the scientific and intensive study of the subject began to be pursued

on a large scale. An outline of the Behaviourist and Gestalt theories of child development is followed by an account of the various views of correlation of structure and function deduced from animal studies. The book is subsequently divided into sections dealing with the behaviour of the human foetus, neonatal behaviour, and behaviour during infancy. Although the obvious difficulties besetting the study of the behaviour of the human or any other foetus will probably make many of the theories here recorded appear grotesque in the light of subsequent knowledge, it will astonish most readers to find how much is actually known about the foetus as a sentient being, and on what clear evidence post-natal behaviour must be regarded as the direct continuation of intra-uterine behaviour. This book should prove of worth not only to those working on any branch of the subject, but also to the more general reader. The Josiah Macy, Jr., Foundation, to whose suggestion and support the investigation is due, deserves congratulation for having initiated a valuable piece of research, and for having chosen the right person to pursue it successfully.

### Infra-red Irradiation

By WILLIAM BEAUMONT, Honorary Physician and Medical Director, Institute of Ray Therapy; Lecturer in Electrotherapy, the Swedish Institute. With a foreword by Lord HORDER, K.C.V.O. London: H. K. Lewis and Co., Ltd. 1936. Pp. 139. 6s. 6d.

In this small volume Dr. Beaumont gives a lucid and concise presentation of infra-red therapy, suitable for consultation both by the practitioner who wishes to acquaint himself with principles and by the nurse who carries out the treatment. Apparatus is briefly described and indications are given for routine technique. The analysis of over one thousand cases treated by the author shows that relief of pain can be expected in a considerable number of cases of rheumatoid and osteo-arthritis, fibrositis, neuritis, and neuralgia. In a smaller number some permanent improvement is recorded. The subject is approached mainly from the clinical side. The manual makes no claim to be a scientific treatise, and indeed it adds little to our scanty knowledge of the mode of action of infra-red radiations in the relief of symptoms and to the relative value of any given region of the infra-red spectrum. But it has value as a practical guide to treatment and as a record of the results obtained by an experienced and fair-minded observer.

### Psychology and Practical Life

By MARY COLLINS, M.A., B.Ed., Ph.D., Lecturer in Psychology, University of Edinburgh; and JAMES DREVER, M.A., B.Sc., D.Phil., Professor of Psychology at the University. London: University of London Press. 1936. Pp. 307. 5s.

THIS is an elementary text-book which can also be read with interest and profit. Broadly speaking it is devoted to industrial and vocational psychology, but its introductory chapters give clear expositions of fundamental psychological processes and child development, without an understanding of which the untrained reader would not follow the application of psychology to industry and education. Those who are being educated and who ultimately find a place in the community have different capacities

of learning, and different temperaments; the authors have therefore included chapters on tests for emotion, temperament, and volition, as well as on acquisition of skill and methods of learning. Thus the ground is adequately prepared for chapters on vocational psychology, psychology of work, and advertising. Mental deficiency and crime are properly dealt with as social problems; but it is unfortunate that psychology and health have been disposed of in only twenty pages. Psychopathology and child guidance have made it clear to us that the dynamic of character formation influences life at all points; that the child's capacity to learn can be emotionally determined; that monotony can be due to individual peculiarities; and that accidents can be deliberate; and that advertisers must think of vanity, fear, prestige, and sex appeal. Surely this aspect of practical psychology deserved, even in an elementary book, some deeper and wider consideration. This omission, however noticeable to experts, does not detract to any extent from the value of the book, which is clear, informative, and fair in expression of opinion on problems not yet settled.

### British Journal of Surgery

THE April issue (Vol. XXIII., No. 92) contains the following articles:—

Radiography of the Duodenal Cap, by G. R. MATHER CORDINER and G. T. CALTHROP (London). Attention is drawn to the limitations of deformity of the duodenal cap as evidence of ulceration. A description is given of the Berg technique of aimed exposure. The variations in the mucosal folds, the ulcer niche, and fixation by adhesions and by penetration of the ulcer base are described and illustrated.

Encrustation of the Bladder as a Result of Alkaline Cystitis, by H. G. LETCHER and N. M. MATHESON (London). In the case described encrustation involved almost the whole of the mucosal surface, and was visible in a radiogram. Repeated lavage with weak acetic acid solution caused rapid disappearance of the deposit and healing of the underlying ulceration.

Spontaneous Rupture of the Extensor Pollicis Longus Tendon Associated with Colles's Fracture, by THOMAS MOORE (Newcastle). In the three cases described the fracture had been treated by the unpadded plaster cast. Early use of the thumb in the presence of a damaged tendon is suggested as a possible cause.

Solitary Plasmocytoma of Long Bones, by JUDSON T. CHESTERMAN (Sheffield). The features of the case recorded were history of injury, localised pain, and pathological fracture. The relation of this tumour to other types of myeloma is discussed, together with its prognosis. Treatment by curettage and bone-graft are advised.

The Bladder Function in Spinal Injury, by KENNETH H. WATKINS (Manchester). The conclusions reached from observation and repeated tests on eight patients are that in complete transverse lesions reflex involuntary micturition is established, while in lesions of the conus and cauda equina micturition involves voluntary strain, the function of the detrusor muscle being seriously impaired.

A Case of Spinal Tumour, by T. SATAKOPAN and N. MANGESH RAO (Madras). The tumour, a cellular fibroma, lay in the arachnoid unattached to the dura and caused spastic paresis of the legs. It was successfully removed.

A Carcinoid Tumour of the Lower Ileum, by W. QUARRY WOOD (Edinburgh). Successful radical operation was performed. The potential malignancy of these tumours is discussed, and their origin traced to the Kultschinsky cells of the mucosa.

Colloid Tumour of the Urachus Invading the Bladder, by R. CAMPBELL BEGS (Wellington, N.Z.). The patient suffered from recurrent attacks of hæmaturia and fre-

quency. Free excision was performed. The growth was found to be papilliferous with tall columnar epithelium.

Two Cases Illustrating the Latency of Large Renal Calculi and their Relation to Pregnancy, by JAMES COOK (Birkenhead). In one case a large branched stone was discovered owing to an attack of perinephritis during the puerperium; in the other, bilateral calculi threatened anuria in the early weeks of pregnancy.

Three Cases of Duodenal Diverticuli Removed by Operation, by H. N. FLETCHER and L. I. M. CASTLEDEN (Brighton). Pain, gastric flatulence, and vomiting were the most conspicuous symptoms. The justification for operation is discussed. No particular technical difficulty in removal was encountered and the results justified the treatment adopted.

Fracture of the Neck of the Femur, by R. WATSON JONES (Liverpool). A description of the technique and results of a modification of the Smith-Petersen operation. The author exposes the fracture site by a lateral incision and uses a heavier guide than usual over which the hollow nail is threaded and introduced by sight. He obtained bony union in 32 per cent. of the last 35 cases treated.

Two Cases of Cystadenoma of the Pancreas, by ROBERT M. JANES (Toronto). Operation in the first case presented great difficulty and removal was incomplete. A recurrent cyst was subsequently marsupialised.

Prostatectomy with Closure: Addenda and Some Observations, by S. HARRY HARRIS (Sydney). A new sucker-retractor is described. Some misconceptions as to technique are corrected and attention is drawn to the later method of trigonisation.

Intestinal Strangulation, by G. C. KNIGHT and DAVID SLOME, from the Research Department, Royal College of Surgeons of England. An account of experiments which go to prove that the important lethal factor is the production in the tissues of the gut of a toxic substance, which is absorbed into the circulation. Fluid loss was shown to be of very secondary significance.

Papers on rare and interesting cases are also included.

## NEW INVENTIONS

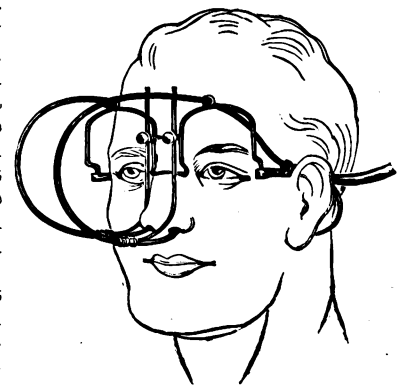
### A NASAL CATHETER HOLDER

THE nasal catheter is commonly employed for oxygen administration as it is often the most practicable method. The catheter is usually attached to the patient's face by adhesive tape. This method of fixation is insecure and may irritate the skin. Another method is to employ a band round the head. Such an appliance is not easily sterilisable and is not well tolerated; in patients who perspire freely it has been known to set up dermatitis of the forehead.

To obviate these disadvantages a modified spectacle frame was devised, the important features of which are: (1) it is light, durable, and does not grip the head; (2) the flexible wire supports are adjustable and ensure that the catheter is directed horizontally backwards and not upwards; (3) it can be readily sterilised.

The makers are Messrs. A. L. Hawkins and Co., Ltd., 66, New Cavendish-street, W.1.

C. ALLAN BIRCH, M.D. Liverp., M.R.C.P. Lond.



# THE LANCET

LONDON: SATURDAY, MAY 2, 1936

## OVERCROWDING OF HOSPITALS IN LONDON

A CERTAIN amount of prominence has recently been given to overcrowding in the hospitals of the London County Council and especially to the shortage of beds for the chronic sick. In taking over institutions of a great variety in type from a number of independent poor-law authorities, the L.C.C. was faced in 1930 with a complex problem. In addition to 31 hospitals proper, 12 of the 26 mixed institutions were handed over forthwith to the management of the central public health committee, as a provisional arrangement. In October, 1934, however, a new scheme of classification of patients was adopted and a reconstitution of institutions carried out to overcome the administrative confusion of having 4700 public assistance cases under the management of the hospitals and medical services committee and 1600 of their cases in public assistance institutions. It was recognised<sup>1</sup> that the reshuffle would be a difficult and necessarily gradual process, and entail substantial and costly improvements in some of the existing buildings. Until the final effect of these changes become demonstrable it seems wise on the part of the L.C.C. to have deferred its programme for new hospital provision. As Prof. R. M. F. PICKEN pointed out in a recent discussion at a sessional meeting of the Royal Sanitary Institute at Swansea, many questions in relation to hospitals have to be taken into consideration, such as the future numbers and location of the population, the most suitable size of hospitals, the advantages and disadvantages of specialisation, the prospect of extension of voluntary hospitals, and the readiness of the managers of the latter to pool their beds with the rate-aided. The voluntary hospitals, he said, should recognise that the staffs of council hospitals—which are training schools for nurses and may even be attached to medical schools—will not readily agree to the relegation to them of nothing but the chronic, hopeless, and uninteresting types of disease. On the other hand the council hospitals might, he thought, devote special attention to disabling but not emergency conditions which affect so many patients on voluntary hospital waiting-lists—the hernias, hydroceles, varicoceles, hæmorrhoids, and gynæcological troubles. This would be truly in line with the

preventive traditions of local authorities, since it would reduce disability and prolong the productive period of life.

In the meantime, the net effect of the L.C.C.'s efforts appears to have been a reduction in the nominal number of beds available for the sick, while the demand for admission has increased. In 1931 the number of poor-law institutions in London affording accommodation for the sick was 25, with 8890 sick beds, but these figures had fallen to 21 and 6882 in 1934<sup>2</sup>; general hospitals, so-called (they include children's hospitals, convalescent homes, and institutions for epileptics and venereal diseases), had increased from 35 to 40, and the contained beds from 20,141 to 21,210. Altogether, therefore, there has been a loss of nearly 1000 beds which, whether appropriately or not, had been at one time regarded as accommodation for the sick. In the same period the total number of admissions rose from 179,024 to 188,513, an increase of more than 9000 patients. It may justifiably be assumed that, if overcrowding has arisen during this period of adjustment, the patients are otherwise receiving far better medical and nursing care than those who were formerly admitted to the more ample accommodation which was ostensibly reserved for the sick. In the long view there is a strong case for hurrying slowly in this matter of hospital provision. Apart from questions as to the suitability of many former poor-law hospitals and institutions and the imperfect coördination so far established with the voluntary system, the whole complexion of the problem may change rapidly. In London some 1200 to 1300 beds may be occupied at any one time by cases of diphtheria and about 2000 by scarlet fever. If London can follow the American example and institute such a successful scheme of immunisation as Dr. GRAHAM FORBES has worked for over so many years; and if the public can be converted to a less intensive hospitalisation of scarlet fever, so long as it retains its present mild form, accommodation might become available which would be adequate for many forms of acute medical disease now admitted to general hospitals. The population, too, is ageing, a fact which may involve a proportionate increase of chronic illness, with a corresponding change in the type of provision needed. Moreover, as the last two censuses have shown, there is an outward drift of population from the area which the L.C.C. administers, thus creating new and very acute hospital problems for the home counties. If it continues London's difficulties may become less acute.

## AN EIGHTIETH BIRTHDAY

ON the sixth of May eighty years ago, at Freiberg in what is now Czechoslovakia, SIGMUND FREUD was born, the son of Jewish parents. Over forty years ago he began in Vienna the publication of observations and theories that have made his name known throughout the world and will, in the estimation of many people, give it a place in

<sup>1</sup> THE LANCET, 1934, ii., 1187.

<sup>2</sup> Sixteenth Annual Report of the Ministry of Health, 1934-35, p. 98.

the history of the development of human knowledge. FREUD describes in his autobiography<sup>1</sup> how interest led him to the study of organic diseases of the nervous system and how he came to realise the failure of therapeutics when faced



with the crowds of neurotic patients who, as he says, hurried, with their troubles unsolved, from one physician to another. It was with the aim of studying these conditions that he visited CHARCOT in 1886, and it is noteworthy that his accounts of hysteria in men and of the production of hysterical paralyses by suggestion were derided on his return to Vienna.

Further visits to BERNHEIM and LIÉBAULT at Nancy were followed by the development of the method of abreaction of hidden memories under hypnosis as a means of treatment, and the publication, with BREUER, of "Studien über Hysterie" in 1895. This was the end of the pre-analytic era, for FREUD, still dissatisfied with his results, patiently worked out the technique of free association which still remains the essential weapon of psycho-analysis. The existence of an unconscious part of the mind, which had for ages been a speculation of poets and philosophers, now emerged as the key not only to psychoneurotic symptoms but to a great part of human activity. Moreover, its contents were no longer a matter of speculation but of investigation.

Psycho-analysis has now found recognition in all spheres of life where human thought and behaviour are in question, and has so far permeated medicine that even those who still count themselves its opponents have often accepted many of its teachings whilst apparently remaining ignorant of their origin. A curious charge against it at one time was that it dethroned reason, whereas, by its recognition of unconscious emotional forces, it strengthens enormously the function of reason as a guide. In this quality we may see the cause, besides anti-semitism, of its suppression in the totalitarian States of Europe, where publication of books on psycho-analysis is prohibited. The opposition that met psycho-analysis nevertheless calls for examination. FREUD's teachings involved a fundamental change of outlook, for they concern unconscious motives of behaviour, the recognition of which runs counter to our philosophy and our pride, and to this rather than his insistence upon

the importance of sex must be attributed the opposition encountered. This opposition, and the isolation that was forced upon him for years, undoubtedly influenced FREUD's attitude to the scientific world. He made no concessions and never attempted to bring his findings into relation with the general body of psychological theory. Confirmation has come chiefly from the medical side and there is now an attitude very different from that which once found expression in uncompromising hostility. Yet discussion has played little part in this change. FREUD rarely made a direct answer to his critics, nor have his followers in this country often troubled to defend their beliefs. Useful criticism has, indeed, been lacking, for knowledge of the observations upon which the theory is based can only be obtained by making those observations oneself, and most criticism has consisted of a denial of the observations. Hence psycho-analytical doctrine has grown up without that healthy criticism which is both a stimulus and a check to scientific theory. Yet FREUD has always shown himself capable of revising, correcting, or even casting aside his own views, and his writings, when not admittedly speculative, are marked by a realisation of the difficulty the man of ordinary training and beliefs has in understanding views that concern a sphere hitherto separated from his conscious experience.

FREUD has been acclaimed as another DARWIN, and there are resemblances between the opposition he has met and that met by the pioneer of modern theories of evolution. He certainly had as hard a road to travel. DARWIN wounded man's anthropocentric pride; FREUD struck deeper and shook his egocentric beliefs. We are now recovering from the shock and realise that we have lived through another of those controversies that, as much as the discoveries arousing them, form landmarks in the history of science.

## THE NEW GRADES OF MILK

THE grading of milk was introduced in this country in 1923. Its object was to reward producers who took the trouble to abide by certain rules and attain certain standards: they were given a right to call their milk by certain statutory names, which would, it was hoped, give them a commercial return for their pains. Alas, the public was slow to respond, and its apathy was strengthened by inability to understand what the various designations really signified. The passage of 13 years has not completely removed the difficulty of distinguishing between the status of Certified, Grade A (tuberculin-tested), Grade A, pasteurised, and Grade A (pasteurised) milk, and it has long been evident that the original regulations considered the producer too much and the consumer too little. The same may be said of the new Order, issued last Saturday and due to come into force on June 1st, which is summarised on p. 1036.

Whenever of late years the Ministry of Health or the Board of Agriculture has been pressed to deal with the scandal of the existing milk-supply

<sup>1</sup> An Autobiographical Study. By Sigmund Freud, M.D., LL.D. Authorised translation by James Strachey. London: Hogarth Press, 1935. 6s. The photograph here reproduced is taken from the *Galerie hervorragender Aerzte und Naturforscher*, issued in supplement to the *Münchener medizinische Wochenschrift* (1930).

the reply has been that the Government had set up a special committee of inquiry, and that action must wait on its report. This body, the Committee on Cattle Diseases, with Sir GOWLAND HOPKINS as its chairman, sat for nearly two years and studied the milk problem as it has never been studied before. Their conclusions, published in May, 1934, included definite proposals for regulating the whole milk-supply on scientific lines. They recommended, along with important measures for the control of bovine tuberculosis, that *all* milk for consumption in liquid form should be sold under official designation—either as certified milk, pasteurised milk, sterilised milk, or milk (uncertified). Even the last group, which was milk neither pasteurised nor from tuberculin-tested cows, had to reach a certain hygienic standard, and it is noteworthy that it was to be given a name that indicated its unreliable nature. After two years, during which no Government department has acted on these proposals, we have the new Milk Designations Order; and presumably it is all we shall get for a long time to come. This Order, it should be understood, has a very small scope and objective. Not only does it preserve the system by which the main bulk of the milk-supply escapes grading altogether—because the production of designated milk is purely voluntary—but it continues to give official blessing under the new name of “accredited” to the present “Grade A” milk. The accredited producers roll is a scheme by which the Minister of Agriculture is very properly trying to raise the general standard, and “accredited milk,” since it comes only from farms where his higher standard is enforced, should be preferable to the undesignated milk which now constitutes the bulk of the market. Nevertheless it does not deserve confidence. The quarterly veterinary examination of the cows, on which so much depends, is less of a safeguard than it may seem, for it notoriously fails to detect tuberculosis and is of limited value in preventing infection of the milk-supply with the tubercle bacillus. Since, in short, accredited milk is no better controlled than Grade A, it is essentially untrustworthy, and its distribution under a special name can only lead the consumer to a false sense of security. The present Order is in this respect worse than the original draft issued last summer: in suggesting the word “standard” in place of “Grade A,” this made the important reservation that the term was not to serve as a label on milk as sold to the public, and was only to be used in the internal administration of the accredited milk scheme. Is it even now too late to revert to this unobjectionable procedure and avoid the retrogressive step of including “accredited” as a designation approved by the Ministry of Health? The medical profession will remain dissatisfied—and rightly—until arrangements are made to secure a clean and safe milk-supply for the whole community. But failing that, it seems inappropriate that the Health Ministry should give countenance to a type of produce which must often be dangerous.

Under the new Order, or any other for a long time to come, the public will find its safety chiefly in efficient pasteurisation. That pasteurising is often inefficient is only too clear, and it is a minor but still serious ground for criticism of the new regulations that they put the inspection and supervision of pasteurisation in the hands of the local sanitary authorities who grant the licences. As we have urged before, this is highly technical work, and comparatively few of the officers of the smaller local authorities possess the knowledge required for it, whereas it could suitably and profitably be undertaken by fully trained officers of county councils and county boroughs. “The Minister is,” we are told, “pleased to learn that a test for pasteurised milk (the phosphatase test) has recently been devised”; and those who have followed the work of its authors, Prof. H. D. KAY and Mr. F. K. NEAVE<sup>1</sup> will share his satisfaction in a most promising piece of work. But for the present we should only accept it as an adjuvant to skilful and experienced inspection.

#### REHABILITATION AFTER INJURY

An Inter-departmental Committee has been appointed by the Home Secretary, the Minister of Health, and the Secretary of State for Scotland to inquire into the arrangements in this country for restoration of the working capacity of persons injured by accidents, and to report what improvements are desirable. The decision to appoint this committee has been taken after consideration of the report issued by the British Medical Association last year, in which suggestions were made for improving the organisation of fracture treatment, and in which attention was drawn to its industrial importance. The chairman is Sir Malcolm Delevingne, formerly deputy permanent under-secretary at the Home Office, and the medical members are Dr. Muriel Bywaters, Mr. W. A. Cochrane, Dr. Thomas Ferguson, Prof. E. W. Hey Groves, Mr. H. S. Souttar, and Mr. A. C. T. Woodward.

It is announced that the General Education Board, founded by Mr. John D. Rockefeller, has given three million dollars to the Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, to enable it to build a new hospital adjoining the Rockefeller Institute. There will be 200 beds.

THE award of the gold medal of the British Medical Association to Dr. H. Guy Dain will give general satisfaction. Dr. Dain has just retired from the chairmanship of the Insurance Acts Committee which, as everyone should know, and does not, is the executive of the annual panel conference. Both in the conference and the committee he has done much to obtain for medical men employed under the Insurance Acts the conditions they need to make their work satisfying and efficient. Coming as he does from a city where the standard of public service is conspicuously high, he has given skill and devotion to the causes he has at heart; and he has won friendly respect on all sides.

<sup>1</sup> THE LANCET, 1935, 1., 1516.

## ANNOTATIONS

## SPECIFIC CONTROL OF MEASLES

IN a recent address to the Hunterian Society on the control of measles Dr. J. A. H. Brincker emphasised<sup>1</sup> the fact that the older methods have failed and expressed the opinion that with the adoption of passive immunisation by means of human immune serum or placental extract we have entered on a promising stage of the battle against the disease. It has been the practice of the county medical officer to issue reports upon successive measles epidemics in London, and the most recent of the series which deals with the 1933-34 epidemic has just been published.<sup>2</sup> As in its predecessors, special attention has been paid to the results of the use of immune measles sera in the control of outbreaks of the disease in L.C.C. hospitals, institutions, and residential schools, and Dr. Wm. Gunn, in conjunction with Mr. W. T. Russell, F.S.S., is again responsible for a statistical study. As our readers are aware, the pooled serum, suitably collected, tested, and prepared, of convalescent measles patients or of adults (preferably young adults who have had an attack of measles not more than ten years previously) may be used either temporarily to prevent or to attenuate, with resultant active immunity, the expected attack of the disease in exposed susceptible children. For obvious reasons convalescent serum is difficult to obtain, but the collection of adult serum in considerable quantity presents no insuperable obstacles if collection is organised. It is the general experience, however, that since the protective value of individual samples of adult serum is lower than that of recent convalescent serum, and that wider variations in value occur, it has to be injected in larger doses and that some batches—due in part, perhaps, to the average attack-bleeding interval being too long—are of relatively low value.

Gunn and Russell base their present statistical study on data derived from 1874 individuals inoculated with either convalescent or adult serum. To confer complete protection a minimum dose of 5 c.cm. of convalescent serum or 10 c.cm. of adult serum was injected into children under 3 years of age within six days of exposure. For attenuation these doses were employed on or after the sixth day; or, alternatively, half these standard doses earlier than the sixth day after exposure. The doses of serum given to older children were graduated according to age. Among the conclusions reached from an analysis of the data is that adult serum prevented the attack in 78.2 per cent. of the instances in which this was desired—compared with 77.9 per cent. in the 1931-32 epidemic. Since in that epidemic experience was held to show that, under institutional conditions, 25 per cent. of exposed children escape attack whether injected or not, the conclusion is reached that injection secures that three times as many children escape attack as would have escaped if no serum had been given. For some reason convalescent serum produced results inferior to those obtained in the preceding epidemic: attenuation 80 per cent. as compared with 87.8 per cent.; prevention 38.5 per cent. against 40.2 per cent. Further, the superiority of convalescent serum over adult serum is not confirmed by the present study—a surprising finding for which, it is said, no ready explanation has been forthcoming. These observers emphasise that, for attenuation,

one-half the standard dose within six days of exposure is preferable to the full dose at a later period. They consider that a flat dose of 10 c.cm. of adult serum is as effective as an age-adjusted dose and that whereas this dose is perhaps too large for attenuation it is more effective for prevention than one of 5 c.cm. It is stated that the protection rates were significantly higher during March to May than in the previous quarter, and at any time were highest among children suffering from diphtheria and lowest among those suffering from scarlet fever and whooping-cough. To account for the high protection rate among diphtheria patients it may be surmised that other factors were operative, such as specially prompt removal of the infecting child.

Direct comparison of the clinical attacks of measles among the inoculated and the controls showed a significant advantage to the former in respect of initial manifestations, severity of main features, complications, and fatality-rates. The apparent equality of adult and convalescent serum must be regarded, even for attenuation, as a singular finding; a partial explanation may be found in the short attack-bleeding interval, the donors being chiefly young women, since, although the number of observations was too small for a decisive test, adult serum with an interval under ten years returned a protection rate of 100 per cent. Experience hitherto has been that although for attenuation there may be little to choose, for prevention convalescent serum is the more reliable. However this may be, it appears probable, as Dr. A. Joe pointed out in our last issue (p. 972), that in placental extract we are likely to be provided with a "reagent . . . less potent perhaps than convalescent serum, but at least equal to adult serum" and, as he says, in view of the difficulty of maintaining an adequate supply of either, its importance can hardly be over-estimated. Although Dr. Joe appears to have had little trouble with reactions following the injection of the products he employed, this is not the universal experience.<sup>3</sup> The earlier American preparations were by no means free from this defect which was believed to be due in part to the presence of tissue proteins. When it has been demonstrated upon a large scale that placental extract is at least as potent as adult serum—which, after all, might reasonably be expected to be the case—and that its injection causes nothing beyond trivial reactions, the control of measles, if the public permits, is in sight. The provision of a supply clearly presents no difficulties. That does not, of course, mean that measles can be prevented.

## FOREIGN BODIES IN THE OESOPHAGUS

FOREIGN bodies stuck in the oesophagus are rightly recognised by patients as surgical emergencies. Unfortunately some of the common oesophageal foreign bodies, such as chicken and fish bones, buttons and boluses of food are relatively non-opaque to X rays. Wendell G. Scott and Sherwood Moore<sup>4</sup> have evolved a routine technique for demonstrating such non-opaque bodies. The method is, briefly, as follows. Antero-posterior and lateral "scout" films of the neck are first taken. If these are negative, the patient is observed by the fluoroscope whilst swallowing a thick barium mixture and any abnormality is noted. Thirdly, antero-posterior and

<sup>1</sup> THE LANCET, Jan. 11th, p. 103.  
<sup>2</sup> London: P. S. King. No. 3180. 1s.

<sup>3</sup> THE LANCET, 1935, ii., 728.  
<sup>4</sup> Jour. Amer. Med. Assoc., March 14th, 1936, p. 906.



oblique radiograms are taken while the patient is rapidly swallowing a thin solution of barium sulphate. The presence of a constant filling defect and a persistent mass of barium in the lumen is regarded as sufficient evidence on which to diagnose a non-opaque foreign body. Rapid exposures and technically perfect films are necessary. The authors consider that œsophagoscopy should be done as soon as the X ray diagnosis is made, since foreign bodies are apt to shift. Even though radiographic evidence is negative, they think œsophagoscopy is warranted if the patient's symptoms point to foreign body, and that the public should be warned against attempting to shift sharp foreign bodies by swallowing large boluses of food, a procedure which may cause perforation of the œsophagus. Films and fluoroscopic studies should include the nasopharynx and stomach.

## THE DEVELOPMENT OF A GENERAL HOSPITAL

SOME 15 years ago Dr. C. J. Macalister wrote a short history of the Royal Southern Hospital, Liverpool, in connexion with the jubilee commemoration fund of new buildings. This work is now out of print and the purpose of a new edition is to provide a more inclusive record of the hospital and of those who have worked for it.<sup>1</sup> The result is an interesting history of a first-class institution and a pertinent commentary on the development of medicine and surgery through all but a hundred years, for the jubilee commemoration, alluded to above, had reference to the existing buildings which were opened in 1872 and not to the original foundation of the hospital whose inception dates from 1838. Consequently Dr. Macalister had vast developments in medical treatment to tell of as implied by the foundation of all the special departments in the Royal Southern, which to-day find their natural centre in a large general hospital. Among these accounts of special work none is more interesting than the rise of the Liverpool School of Tropical Medicine which is described with a detail justified by its seniority, for the Liverpool School of Tropical Medicine preceded the London School in the commencement of its activities by several months. Both schools had their origin in the decision by Joseph Chamberlain, in 1898, to advocate that medical officers selected for appointments in the tropics should have previous and special knowledge of the diseases with which they might have to deal, an opinion to which immediate effect was given by the General Medical Council in recommendations which were reflected in the medical curriculum. The foundation of the Liverpool school will always be associated with the name of William Carter, who had previously called attention to the large number of cases of tropical diseases which from the early days of the Royal Southern had been brought to the wards. Dr. Carter secured the immediate support of Sir Alfred Jones, the well-known shipowner, for the establishment of a tropical school, and in 1899 a laboratory in connexion with the new department was opened by Lord Lister, when the wards allocated for the tropical cases held occupants who represented many nationalities and had contracted their diseases in all parts of the world. The foundation of the fifteen other special departments is noted, and the clinicians associated are enumerated with an appropriate estimate of their work. A picture of successful administration

of a great charity is formed out of chapters upon the clinical teaching, the nursing and almoner's services, and an able study of the social welfare of patients belonging to different types and grades.

A second section of the book sets out brief biographies in order of appointment of past members of the medical and surgical staffs. Among these biographies we find the names of William Carter, Robert Jones, Mr. G. P. Newbolt, Dr. William Alexander, Ronald Ross, the first lecturer in the tropical school, Noel Chavasse, athlete and military hero, and, to end at the beginning, J. L. Minshull, the accredited originator of the hospital who started the school for the blind in Liverpool and remained consulting surgeon to the Royal Southern Hospital until he died at the age of 82.

Dr. Macalister is to be congratulated on a sound contribution to a chapter in medical history where he himself played a prominent part, having been for many years physician to the hospital, member of the board of management, and chairman of the nursing committee.

## PROPHYLAXIS OF WHOOPING-COUGH

It is doubtful whether vaccines have any value in the treatment of whooping-cough, but evidence in favour of their preventive use is steadily accumulating. Dr. A. D. Gardner, in a lucid account of the prophylaxis, treatment, and bacteriology of pertussis, given before the epidemiological section of the Royal Society of Medicine on April 24th, critically reviewed our present knowledge of the subject, to which he himself has made substantial contributions. The use of a vaccine made from *Hæmophilus pertussis* (bacillus of Bordet) usually implies acceptance of the view that it is the sole ætiological agent. Dr. Gardner considers this established by the constant presence of the organism in the early stages of the disease, its absence from healthy persons and those suffering from other illnesses, and its ability to produce experimentally a spasmodic cough in apes and man. An increasing number of workers are accepting this view.

In the preparation of vaccines, it is important to select cultures in the right phase, and those prepared from rough colonies of *H. pertussis* are useless. If, however, the organism is grown on human blood medium, and fresh colonies in the smooth phase are selected, a vaccine is produced whose antigenic power is demonstrable. The more objective evidence of the efficacy of such a vaccine is its ability to stimulate the production of complement-fixing antibodies, which are known to appear in the blood when immunity is acquired by infection, overt or latent. Unfortunately we have no simple test of immunity for clinical use, and it is impossible to determine whether inoculations have conferred protection against the disease. The cutaneous test is unsatisfactory: some claim it to be an immunity index comparable with the Schick and Dick tests; others regard it as a test of hypersensitiveness analogous to the tuberculin tests. The latter seems the more probable explanation. The difficulties of interpreting tests of hypersensitiveness in tuberculosis in terms of immunity need no emphasis, and it is probable that similar difficulties will be encountered with the cutaneous test in whooping-cough. There remains the evidence obtained from a comparison of the frequency and severity of attacks in the inoculated and uninoculated. The difficulty of obtaining properly controlled results in such circumstances is familiar to every worker in the field of artificial immunisation who knows

<sup>1</sup> The Origin and History of the Liverpool Royal Southern Hospital. By Charles J. Macalister, M.D. Edin., F.R.C.P.Lond., Honorary Consulting Physician to the Hospital. Liverpool: W. B. Jones and Co., Ltd. 1936. Pp. 214.

something of the mode of transmission of infectious diseases and the laws of chance. Nevertheless, very suggestive, and sometimes remarkably successful, results have been recorded which justify the prophecy that large-scale protection against whooping-cough is in sight. Even if complete protection is not obtained, attenuation of the disease should be possible; and robbed of its serious complications by attenuation, whooping-cough, like attenuated measles, will cease to exact its present heavy toll of child life.

If active immunisation by vaccines is not yet beyond question, passive immunisation by convalescent or adult immune sera is still less firmly established; but here again there is reason to hope for better success.

### THE TAKING OF SNUFF

THREE hundred pounds of snuff were issued to the 14 mental hospitals of the London County Council in 1934, as compared with 425 lb. issued to 11 hospitals in 1911. This information was given by Sir Robert Armstrong-Jones to Dr. J. D. Rolleston and handed on by him to the Society for the Study of Inebriety and Drug Addiction, when it met on April 21st. But outside mental hospitals the demand for snuff has, it seems, increased threefold during the last five years as the result of a statement in the *Times* by Sir Buckston Browne that the risk of a cold in the head was greatly reduced by taking snuff, its effect being attributed to a stimulation of the nasal mucous membrane, relief of congestion, and a free flow of mucus which washed away the peccant matter. The history of snuff-taking, Dr. Rolleston said, had received more attention from the antiquarian than from the physician. On its first introduction into Europe, in the middle of the sixteenth century, by Jean Nicot, the French ambassador at Lisbon, snuff was used as a medicine, being employed especially in the treatment of migraine, headaches, and colds in the head. It soon however became a luxury, and snuff was taken generally throughout Spain, Italy, and France during the early part of the seventeenth century. In Italy and Spain the clergy became so addicted to it, even during mass, that a papal bull forbidding snuff-taking in churches was issued by Urban VIII. in 1642 and again by Innocent X. in 1650. Snuff was introduced into England at the Restoration by the courtiers and officers who had attended Charles II. in France, and its popularity increased after the Great Plague. Henceforward, until about the middle of the eighteenth century, the snuff-box played an important rôle in the social life of the time; medical works and belles lettres were equally extravagant in praise and denunciation of the new habit. As late as 1870 Dr. J. C. Murray of Newcastle-on-Tyne was recommending its use for the relief of bronchitis and consumption; he stated his belief, in common with others at that period, that snuff was instrumental in preventing scarlet fever, measles, small-pox, pertussis, dysentery, cholera, diphtheria, rheumatism, erysipelas, influenza, and malaria. Other authorities, such as Sir Benjamin Ward Richardson, ascribed to its use various ill-effects, including impairment of the sense of smell, dyspepsia, nausea, loss of strength and appetite, formation of polypi, lead poisoning, and tremor of the hands. After the middle of the nineteenth century smoking rapidly replaced snuff-taking. Up to 1830 the sale of tobacco and cigars was insignificant compared with that of snuff; in 1850 they began to lead. The sanitary commission of 1853 found that snuff was often adulterated with things injurious to health, such as oxide of iron,

chromate and oxide of lead, bichromate of potash, along with considerable quantities of silica and orris root. If snuff was taken pure its effects were, in the commission's view, mainly local. In recent years there has been little or no medical pronouncement on snuff-taking. The chief morbid change due to the habit appears to be a rhinitis, described in 1913 by O. Seifert, which consists in a chronic hyperplasia of the inferior turbinate on one or both sides. Dr. Rolleston said he had been unable to discover how far snuff-taking might become an addiction. An inquiry might be made in printing houses where the habit seems to be fairly general.

### HEARING AIDS FOR THE TEACHING OF DEAF CHILDREN

OF recent years a close study of the factors that influence the audibility of spoken words has led to much improvement in the education of the deaf child. In the April issue of the *Journal of Laryngology and Otology* I. R. and A. W. G. Ewing describe the work done in the department of education of the deaf in the University of Manchester, and those concerned with the problem should not fail to read their paper in the original. It is found, they say, that even a moderately loud conversational type of utterance tends to fall short of complete intelligibility in the technical sense; some of the consonants, especially TH, F, V, and Z, are often heard imperfectly, and, though they appear to be audible, are really filled in by the listener. With normal hearing, moderately loud speech at an intensity of 60 decibels above the average threshold of audibility is intelligible to the extent of 95 per cent., while with very loud speech at an intensity of 70 decibels above the threshold vowels and consonants were perceived with approximately 100 per cent. of accuracy; but there was an increasing loss of distinctness when the intensity of the sound was raised further than this. Quantitative tests of hearing have been made on some 700 deaf children, with normal subjects as controls, by means of prepared lists of words transmitted at fixed levels of intensity through a high-quality amplifier in a sound-proof room. Children who have some residual hearing power—and they are very many—are taught to combine lip-reading and hearing to the fullest possible extent by means of suitable hearing-aid apparatus. But it is essential that the apparatus should be capable of high-quality reproduction, for any distortion is usually reflected in the children's own speech. The apparatus used contains four-stage valve amplifiers, and is not portable, since it has not been found possible to meet the requirements with the small portable hearing aids of wearable type. Three-quarters of the patients tested were severely deaf pupils from the Royal Schools for the Deaf, Manchester, or private patients. The remaining quarter were sent by school medical officers and other doctors. The latter can be divided into three groups: (a) The first comprised partially deaf pupils attending an elementary or private school who were reported as not making satisfactory progress, but whose speech and comprehension of speech appeared to be normal; in every case the degree of deafness shown accounted for the general backwardness. (b) Thirteen patients sent from schools for the backward or mentally defective were also tested, and in eleven of these there proved to be deafness to a degree sufficient to account for the retardation in speech, comprehension of speech and school subjects. It would seem very necessary that the hearing of all apparently mentally defective

children should be carefully examined. (c) Young children not yet attending any school. For these a series of tests with toys and objects has been devised, in which the young child learns in play to respond to certain sounds. In developing the hearing of children who are not completely deaf, an efficient hearing-aid apparatus is usually of immense help, but it is necessary that it should be used by teachers trained in the technique required for this specialised work. These methods usually bring about what can only be described as an extraordinary awakening of the mind, and Mr. and Mrs. Ewing report cases which show how shy and miserable children become cheerful and interested in school subjects. They are certainly justified in claiming that progress in learning to talk, and on every side, is more rapid and normal than it is when only the older means of teaching through sight and touch are used.

### THE DEATH OF A GRAMMARIAN

ALTHOUGH he was in his eightieth year the sudden death of Prof. Karl Pearson will come as a painful surprise to those who, in spite of arithmetical evidence, could not think of "K. P." as an old man or detect in his latest writings any sign of faltering. Championships are well enough in chess or boxing; they have no place in science or literature. It is idle—as K. P. himself would have said—to discuss whether this or that investigator was the greatest of his time. But it is safe to say that no English man of science of the last fifty years has more profoundly influenced the thought of his time. Most educated men and women over fifty will recall their first reading of the "Grammar of Science" as an event in their intellectual development, and to all who have had even the slightest contact with statistical science the name of Karl Pearson is a household word. Karl Pearson was indeed one of the last of the giants. It is probable that in any one of the fields of his activity, pure mathematics, mathematical statistics, philosophy, history, anthropology, eugenics, he has had contemporaries of equal or greater ability; it is certain that no individual has come nearer to the ideal of universal competence. There have been other men with the gift of inspiring enthusiasm in young workers, but none better endowed than Karl Pearson. And when one recalls that, as Johnson would have said, some anfractuosities of temper led "K. P." to reprove what he thought to be backslidings of his pupils with extreme severity, the fact that nobody who has ever worked with him will hear of his death without a painful emotion of bereavement is a proof of his unique power. When, nearly forty years ago, Karl Pearson opened the biometric campaign, statistical methods were almost unknown in the medical profession. There had been one or two great men in official service, such as William Farr and Shirley Murphy, who realised the power of the statistical method. The great Louis long before had perceived the importance of a numerical method to the clinician and William Osler had done something to popularise statistical tabulations. But the methods used were primitive and Pearson found little sympathy among brother mathematicians with his zeal to make mathematical methods available to those who had not been mathematically trained. He found even less readiness among members of our profession to welcome "mathematical" methods. It was almost common form in letters to or articles in the medical press for a writer to say that Prof. Pearson's work might be very interesting to "mathematicians, but——." By

sheer force of personality, "K. P." won his battle almost single-handed. He had indeed a little band of enthusiastic disciples, but he himself was always in the forefront of the battle. And an unfavourable criticism of the work of a pupil was sure to call forth a more trenchant counter-attack than any criticism of his own work. That he was always in the right, that all the methods he invented were useful, all the conclusions he reached correct, and all the opponents he trounced incompetent, nobody would maintain. Like the late Sir Victor Horsley—with whom he once raged battle furiously—he found it hard, in earlier years, to see both sides of a case. Almost the only sign of age noticeable in his later years was a mellowing in this respect.

His influence upon the medical profession has been almost wholly good. Wounds inflicted in controversial warfare have long been healed. The truths that when things *can* be measured and counted they *should* be measured and counted and that often in medical science things *can* be measured and counted much more often than we used to think, have been well learned. Much remains to be done, but, thanks to Karl Pearson, it is easier to do. Burke said that Chatham made the name of Englishman respectable upon the continent of Europe. Karl Pearson made the name of statistician respectable in medical circles. What Farr did for official statistics, Pearson did on a larger scale. There must be universal regret that he is no longer with us. But to pass away suddenly, still full of enthusiasm but conscious that the work he initiated will be continued, is a fitting close of an inspiring life.

### LONDON'S PRINCIPAL RHEUMATISM CLINIC

THE latest annual report of the British Red Cross Society's Clinic for Rheumatism, beside Regent's Park, is an account of services rendered and of aspirations to wider activity. The roll of new patients in 1935 was slightly smaller than in 1934, but the numbers of attendances and treatments are the highest so far attained by the Clinic; in the general out-patients' department there were 89,810 and 135,834 respectively, and in the private patients' department 8561 and 12,727. Mounting figures for attendance are not surprising, perhaps, in a clinic of only five years' standing. More remarkable is the fact that the patients discharged with treatment completed were almost as many as the new patients received, and that of the former 50.9 per cent. were cured or free from symptoms, 35.1 per cent. were definitely improved, 13.2 per cent. were unchanged or but slightly improved, and only 0.8 per cent. were worse. The work has increased in almost every department and new undertakings have been started; but any further development in the present building seems to offer considerable difficulty. The facilities for in-patient treatment at St. Stephen's Hospital, where the London County Council has set aside a number of beds for rheumatic patients, have been little used: the report points out that a considerable number of patients requiring in-patient treatment were unsuitable for admission to such a hospital and that for these there was little provision at the teaching and voluntary hospitals. Many were sent to the convalescent homes available, but the medical board think that better results could be achieved at a home especially designed for rheumatic cases. They state their need, therefore, of in-patient accommodation near the Clinic, where patients might be under the care of the visiting physicians, and of a

convalescent home with 20 beds and room for expansion.

Further provision, too, for research, they fairly claim, is essential if real progress is to be made in the treatment of rheumatism. During the year several books and papers have been published based on the results of investigations carried out at the Clinic, and work has been done on such subjects as the sedimentation-rate (as an index of prognosis and of the value of treatment); the treatment of menopausal arthritis; therapy with vaccines, gold, calcium, histamine, and ovarian preparations; colon irrigation; duodenal drainage; and various physical measures. It may be argued that the function of an out-patient clinic, well furnished with the apparatus of physical treatment, is to concentrate rather on therapeutics than on the wider problems of ætiology. But it is natural enough, no doubt, to find the staff of such a clinic yearning for the regular machinery of investigation—in-patient accommodation (with the chance of autopsy), the paid research workers, space for them to work in, and funds. The realisation of these hopes will presumably depend on the generosity of the public.

### TWO KINDS OF DIABETES?

THE history of diabetes during the last fifty years offers a good instance of how easily false conclusions can be drawn from biological data. The position of the pancreas in the ætiology of that disease was firmly impressed on the mind of the clinician by the observations of Minkowski and von Mering on pancreatotomy, and the much more recent discovery of insulin served only to strengthen the conviction. It was not until Houssay showed that the symptoms of experimental diabetes could be largely prevented by removal of the pituitary as well as the pancreas, that the pancreatic hypothesis of diabetes began to appear inadequate. The clinician has long recognised two distinct clinical types: a severe form occurring in young subjects, accompanied by wasting and gross ketosis, and a relatively benign form in older patients, in which glycosuria and its concomitant symptoms of thirst and pruritus are the presenting and sometimes the only features. The latter form has been from time to time attributed to some defect of carbohydrate storage, but on the whole the tendency has been to incriminate insulin deficiency in both forms. Elsewhere in this issue Prof. de Wesselow and Dr. Griffiths describe experiments which strongly suggest that the two forms may be ætiologically as well as clinically distinct. Their observations show that the blood of elderly diabetics contains considerable quantities of something which checks the development of insulin hypoglycæmia in rabbits. It is not yet clear what this substance is, but it seems to resemble extracts of the anterior lobe of the pituitary in its effect. This is perhaps the first direct piece of evidence to suggest that a common type of human diabetes may have nothing directly to do with the islets of Langerhans. It is interesting to note that patients in whom the unknown principle is present seem to belong to the group which Himsworth<sup>1</sup> describes as "insulin-insensitive." Himsworth attributes this insensitivity to lack of an unknown factor which sensitises the body to insulin. It is difficult to accept both of these two apparently contradictory views, but further knowledge will no doubt reconcile them. Observations of this kind should stimulate others to pay less attention to the

pancreas and more to other endocrine organs in diabetes. It has become almost a platitude to say that no ductless gland can be considered apart from the others. But the general tendency to pin a disease to one gland dies hard.

### INCIDENCE OF POST-VACCINAL ENCEPHALITIS

THE March issue of the *Bulletin* of the International Office of Public Health contains the following information about the recent incidence of post-vaccinal encephalitis in various countries. In Germany 4 cases are reported among 1,200,000 children vaccinated in the course of 1935. A few cases of encephalitis were also observed after vaccination in which it was suggested that activation of a tuberculous infection might be responsible. In England during the period October, 1934, to October, 1935, there was only a single case, which ended fatally, the patient being a woman aged 20. The necropsy revealed characteristic lesions in the brain. In the United States also only a single case was notified during the financial year 1934-35. In Holland, among the 4 patients examined by the neurologists specially appointed for the purpose, the diagnosis was in 2 uncertain and in 1 improbable. The last case was that of a child of 9 months who developed symptoms of encephalitis 28 days after vaccination. Only 17,000 vaccinations were performed in Holland during 1935, so that the proportion of encephalitis cases (1 per 5000 vaccinations) differed little from what it was in previous years. There were only 2 mild cases during 1935 in Sweden, where there have been no deaths due to post-vaccinal encephalitis since 1932. In Switzerland there were 2 cases in 1935 among about 35,000 vaccinated children. These figures show that the incidence of encephalitis after vaccination has been tending to fall in the countries most affected, except perhaps in Holland.

THE biennial dinner of the Royal Society of Medicine will be held on Wednesday, May 6th, at 7.30 for 8 P.M., at the May Fair Hotel, Berkeley-square, London, W.

Dr. J. Godwin Greenfield is to deliver the Morison lectures at the Royal College of Physicians of Edinburgh on Monday, Wednesday, and Friday of next week, at 5 P.M. His title is the Cerebro-spinal Fluid: Some Modern Problems.

WE regret to learn of the sudden death on Monday last of Mr. Albert Carless, consulting surgeon to King's College Hospital and editor of the manual of surgery, originally written in collaboration with the late Mr. William Rose, which maintains under recent editorship its authoritative position.

INSTITUTE OF MEDICAL PSYCHOLOGY.—A week-end course on psychological disorders in childhood will be given on May 9th and May 10th at this institute, Malet-place, London, W.C. Further details may be had from the educational secretary, and the full programme is given in our Medical Diary.

CHILD GUIDANCE COUNCIL.—Three fellowships in psychiatry are offered by this council for half-time work at the London Child Guidance Clinic in Islington. Further information will be found in our advertisement columns, and forms of application may be had from the secretary of the council, Woburn House, Upper Woburn-place, London, W.C.1.

<sup>1</sup> THE LANCET, Jan. 18th, 1936, p. 127.

## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### XCIX.—PROGNOSIS IN ARTHRITIS

To the lay mind the prospect before the patient attacked by arthritis of any kind is one of pain, crippling, and deformity, with little or no prospect of relief. Such a prognosis is not justified; in a few cases the disease becomes stationary and dies out without any special treatment, and in a large proportion steady perseverance with appropriate measures will lead to the same result, though if care has not been taken to counteract the effects of muscle spasm or atrophy some deformity will persist. In a few cases, probably less than 10 per cent., the disease follows a relentless course to complete crippling before it burns itself out.

The prognosis in osteo-arthritis is essentially different from that of rheumatoid, and all the cases included under the latter head do not present the same characters or tend to run the same course.

Age has a bearing on the incidence and course of both types, but it must be remembered that though rheumatoid arthritis is generally a disease of young adults it may appear later in life, and the condition is not infrequently seen beginning in the sixties or even later; while the first signs of osteo-arthritis may appear in the late thirties or early forties. To draw a sharp distinction may indeed be difficult, for the hypertrophic changes of osteo-arthritis, the formation of osteophytes, and the increase in the density of the bones as shown by the X rays are sometimes the late result of an arthritis of infective origin or of gout, and are in the nature of a reparative process, nature's method of reinforcing weakened ligaments where the active disease has died out. On the other hand, they may indicate a degenerative process due to lowering of local or general resistance to ordinary wear and tear, accelerated perhaps by toxic absorption, and mixed cases are not uncommon in the middle years from such causes. In this group should be included the so-called climacteric arthritis which attacks knee-joints in middle-aged women and here an endocrine deficiency probably plays a part of some importance.

#### Rheumatoid Arthritis

Rheumatoid arthritis is probably the result of a low-grade infection due to a relatively non-pathogenic microbe which has been enabled to attack the joints or other structures by reason of some factor lowering resistance or possibly sensitising the tissue cells to the specific infective agent. Such factors are to be looked for in the conditions of life, unhygienic dwellings or occupations, unsuitable diet due to poverty or to wrong ideas and tastes, excessive fatigue with lack of fresh air and recreation, nervous strain or shock due to prolonged anxiety, bereavement, and so forth. Sensitisation may result from septic foci of long standing, and it must be remembered that if from any cause resistance is lowered, tissues other than the joints may be attacked and pyorrhœa, for example, may be set up side by side with the arthritis and not (as is often supposed) be in itself the main ætiological factor. The general build of the patient must not be overlooked as a prognostic guide; the slender, flat-chested visceropototic type with defective circulatory tone, poor capillary circulation, cold hands and feet, probably chronic constipation and frequently achlorhydria, capricious appetite, and poor digestion is especially liable to develop arthritis of a

severe type. Upon a properly directed and vigorous attack on such predisposing factors the prognosis will materially depend. The one indisputably sound line of treatment in all cases is to raise the patient's resistance to a point which will enable the infection to be overcome, and the principles which have revolutionised the prognosis and treatment of tuberculosis must be applied in rheumatoid arthritis. The earlier the patient is brought under the influence of treatment along these lines the better the prospect is likely to be, but even when the disease has become well established arrest, if not cure, can be looked for in a large proportion of cases.

#### GENERAL MEASURES

Rest should be the key-note. In early cases, in those with pain and swelling of joints of any severity, in those with pyrexia however slight, in fact in all in which the disease is definitely active, this will mean bed for most of the day and often all the time for some weeks. The inflamed joints should be put up in plaster for a short period (not less than two nor more than six days) when the plaster should be bivalved to permit of gentle movement, preferably active rather than passive, in order that circulation and muscular tone may be improved. The splints must be worn at night and often for much of the day as well in order to counteract any tendency to deformity. With rest must be combined suitable diet on the general principle of moderate restriction of carbohydrates, but free consumption of milk, cream, eggs, meat, vegetables, and fruit, aiming at an ample but balanced vitamin supply, for which purpose cod-liver oil will be found a useful addition. Suitable physical treatment to treat constipation, to improve the peripheral circulation, and to re-educate the muscles is also essential and with perseverance along these lines great improvement is likely to be obtained and the patient prepared for further treatment if necessary.

Pemberton's figures of a series of patients with both types of arthritis at all stages who were placed on this line of treatment are remarkable: of 300 cases 89 per cent. were improved, 57 per cent. "definitely," and 32 per cent. "greatly"; 6 per cent. were cured (Jour. Bone and Joint Surgery, xvii, 4, 879). The proportions were similar in both types of arthritis and many of the patients had tried many other lines of treatment before this régime was instituted.

#### SUBSIDIARY MEASURES

The treatment of *focal sepsis* cannot be ignored but will be more effective and less liable to untoward results if carried out in connexion with the general treatment outlined above. Sometimes the removal of teeth or tonsils is followed by most remarkable improvement or even cure, but occasionally by a temporary increase in symptoms due to absorption of toxic material from the raw surfaces. The removal of septic foci can rarely be complete, but if the major ones are adequately dealt with the improvement in resisting power from general measures will keep the minor ones in check and the microbes may continue to exist as saprophytes until some circumstance leads to a renewal of their activity. The joints themselves may be the foci from which a fresh general infection develops. The importance of a

chronic inflamed gall-bladder or appendix must not be overlooked.

It is outside the scope of the present article to discuss the value of vaccines in any detail, but in view of their wide use it is necessary to say that vaccines have in many cases done much more harm than good, chiefly through excessive dosage. It may, in my opinion, be laid down as a principle that any reaction to vaccine is an indication for reduction of dose to a level which produces no reaction. Vaccines should be used as desensitising agents, and the best results may be obtained by a progressive reduction in dosage rather than by increase. Large doses may sensitise the tissues, lower the resistance, and thus cause the disease to become rapidly worse. By the use of minimal dosage no harm is likely to result; and even if there is no evident specific effect the patient feels that a definite line of treatment has been thought out and is being pursued, and gains encouragement from this fact and with it a real increase in power of resistance. One American authority of wide experience has said that though he is doubtful if vaccines have any specific effect he uses them in small doses in order to keep the patient under continual observation, and thus to be able to direct and control a general line of treatment.

*Gold treatment* is another method holding out definite prospect of good results if used cautiously, but it has often in the past been given in too large doses without sufficient precautions, and has thus fallen somewhat into discredit.

The *course of the disease* in all its forms is often characterised by remissions in the symptoms without any obvious cause; pyrexia especially is apt to be variable. The attack may appear to subside, the joints become less painful and swollen, and in early cases there may be an apparent recovery only to be followed by a fresh outbreak which may not subside until the joints have been permanently and seriously damaged. Such relapses may be caused by excessive fatigue, anxiety, or any depressing influences such as an attack of influenza or similar disease. Patients should, therefore, be kept under observation for months after the disease appears to have become stationary, and warned to lead a careful life on lines laid down for each case. The administration of cod-liver oil, especially during the colder months is, in my experience, a most useful measure. Apart from its effect on nutrition it lessens the liability to catarrhal attacks which are so often followed by recrudescence of the arthritis.

An *optimistic attitude* on the part of the doctor is a factor of much importance; the effect of depressing influences such as a lack of therapeutic resource does much to weaken the patients' power to fight the disease.

#### PROGNOSIS AS REGARDS MOBILITY

In most of the cases treated on the above lines by splinting and rest together with local heat, massage, and re-education of the muscles, there will be little deformity, but in a small proportion of them this happy result will not be obtained, and further measures will be required.

The characteristic deformities are due to contraction of the joint capsule or to adhesions between the joint surfaces, together with malposition induced by atrophy of some muscles and overaction of their opponents. Though rest is enjoined, movements should be carried out from the beginning in a systematic manner once or twice a day and should be active whenever possible, as this will help to maintain the tone and nutrition of the muscles. Massage

will aid in this direction, but it is better not to massage the joints themselves though very light friction with analgesic liniments may be permitted.

*Knee and hip-joint.*—The knees are often kept slightly flexed, as this is the most comfortable position for the patient, and there is consequently a danger of loss of full power of extension through contraction of the posterior ligaments. Weight extension will overcome this, if applied early, and is often effective in relieving pain both in knees and hips by keeping apart the inflamed articular surfaces while permitting movements to be carried out. When this can be dispensed with a light splint should be worn at night for a time. If straightening cannot be effected by these means the use of a succession of light plaster shells to support the joint, at each stage being made a few degrees straighter as the limb accommodates itself to the support, may prove successful. In more severe cases the operation of synovectomy may be employed, especially if there is a thickened and painful synovial pad behind and around the patella. Where the defect is due to contraction of the posterior ligament a plastic capsulectomy is sometimes useful. As a last resort, excision of the joint and fixation in a straight position may have to be adopted.

Forcible movement of joints under an anæsthetic is always accompanied by the risk of waking up the acute process which had become quiescent. It is obviously of no service where bony ankylosis or much thinning of the cartilage is evident from a radiogram, but in early cases where limitation of movement has resulted from adhesions and capsulitis the results may be very satisfactory.

The same principles apply to the treatment of *other joints*. There is difficulty in maintaining full and regular movement in an inflamed shoulder or elbow, and excision of the joint may become necessary if ankylosis occurs in such a position that the hand cannot be brought to the mouth. Pronation and supination may be restricted by adhesions in the radio-ulnar joint or in the wrist. The wrists are very frequently the seat of arthritis and rarely escape some restriction of movement, but much can be done for them by such measures as have been described. Light cock-up splints to be worn at night are often desirable. It is necessary to remember that a stiff wrist may be more useful than a weak one resulting from forced movement. If support is needed when the patient resumes walking elbow crutches are preferable to sticks, which throw a strain on the wrists and tend to cause pain and distortion as well as a faulty carriage of the body. When the ankles are affected care must be taken to avoid foot drop while the patient is in bed. When the mandibular joint is affected a screw wedge, which should be used by the patient himself, will help to secure better movement. For the fingers special splints have been devised to apply traction, but good results may be obtained by a little ingenuity with elastic bands. Occupational therapy is often of great assistance if carefully devised and directed.

*Local heat* will help as a preliminary to movement, and moist heat is often more effective than dry. Hot baths, both local and general, with the addition of common salt, soda, or Epsom salts often give much relief, and movements can be carried out more easily when the limbs are supported by water. Poultices are useful for knees and elbows, and these simple measures are often more useful than more

(Continued at foot of next page)



## SPECIAL ARTICLES

## PAGET'S DISEASE OF THE NIPPLE

By J. PATERSON ROSS, M.S., F.R.C.S.

PROFESSOR OF SURGERY IN THE UNIVERSITY OF LONDON  
DIRECTOR OF THE SURGICAL PROFESSORIAL UNIT,  
ST. BARTHOLOMEW'S HOSPITAL

The clinical features of Paget's disease of the mammary areola are well recognised, but the views held with regard to its pathology are often vague or erroneous. In spite of painstaking research by Cheate and by Muir, some text-books are still disseminating misleading and fallacious opinions about the relationship of Paget's disease to carcinoma of the breast, and it has even been suggested that the skin lesion may not be a pathological entity. Such misconceptions and the consequent uncertainty about the treatment of Paget's disease must be the excuse for this brief review of the subject.

## IS PAGET'S DISEASE A PATHOLOGICAL ENTITY ?

Paget's disease of the nipple is frequently referred to as "eczema," but it differs from simple dermatitis in that it does not spread beyond the areola, it is resistant to all methods of treatment, and it has a characteristic histology, the epithelium containing numerous large clear vacuolated cells which are not found in simple inflammatory lesions of the skin. It must be understood that Paget's disease is not peculiar to the skin of the nipple, and Susman has collected 34 cases which occurred in other parts of the body, most commonly on the skin of the perineum and external genitalia.

Susman (1928) laid special stress on Paget's disease of the glans penis, describing a case of his own which he added to 6 others which had been described previously. Though the clinical details of some of these earlier cases are incomplete it is clear that the nature of the lesion was well established, and in all of them there was a red moist shiny area surrounding the external urinary meatus. The average duration of the disease before the patients presented themselves for examination was two years, and in none of the records is there any mention of previous lymphatic obstruction or oedema. In 3 cases, it is stated, the neighbouring lymphatic glands were not involved late in the disease. Most of the notes refer merely to diagnosis and only 2 record the late results of treatment. In both these cases partial amputation of the penis was performed, and though the patients seemed to do well for a time they eventually died of uræmia resulting from carcinomatous stricture of the remaining portion of the urethra. The illustrations accompanying this article show that the macroscopic and microscopic appearances of Paget's disease in this situation are identical with those of Paget's disease of the nipple.

The term *dermatitis maligna* has the virtue of pointing out that Paget's disease of the nipple is

(Continued from previous page)

elaborate methods, with the advantage that they are inexpensive and available in every household, a matter of importance when treatment must be carried on for many months. The utmost perseverance will be demanded from doctor and patient, and if this is forthcoming the improvement will often astonish both.

C. W. BUCKLEY, M.D., F.R.C.P.,

Hon. Physician, Devonshire Royal Hospital, Buxton,  
and to the Buxton Clinic for Rheumatic Diseases.

(To be continued.)

malignant. But to call it "dermatitis" is a misleading half-truth, for although there is an inflammatory reaction in the cutis vera of the areola, this term suggests that the disease is confined to the skin, whereas similar changes are occurring simultaneously in the epithelium of the ducts of the breast.

## IS PAGET'S DISEASE A COMPLICATION OF A SUBJACENT CARCINOMA OF THE BREAST ?

The title of Paget's original paper in St. Bartholomew's Hospital Reports, "On Disease of the Mammary Areola preceding Cancer of the Mammary Gland," might be regarded as a sufficient answer to this question. Further inquiry, however, is called for, since there are still many teachers who cling to the hypothesis that the skin lesion is a sequel to a carcinoma beneath the nipple, being the result either of blockage of skin lymphatics by permeation, or of irritation of the surface epithelium by cancerous exudates.

Clinical records are unanimous in stating that the nipple lesion is present for a long period, sometimes for many years before carcinoma is palpable in the breast. In support of Paget's own statement to this effect there is a series published by Bowlby in 1891 in which out of 22 patients 9 showed no tumour in the breast when they presented themselves for treatment many months after the onset of the disease. During the ten years 1925-35 there have been 8 cases of Paget's disease of the nipple in the wards of St. Bartholomew's Hospital, and in 6 of these a tumour could not be felt in the breast.

## CASE REPORTS

1. A. B., aged 63. Single. June, 1923, eczema of the right nipple. March, 1925, breast excised. Section of nipple showed Paget's disease, but no carcinoma could be found in the breast. The patient died in 1934 without recurrence of disease.

2. C. D., aged 61. Single. December, 1924, eczema of right nipple. February, 1926, breast excised. Section of nipple showed Paget's disease, but no carcinoma could be found in the breast. Patient cannot be traced.

3. E. F., aged 66. Married, five children. May, 1925, eczema of the right nipple. November, 1926, nipple destroyed but no lump palpable in the breast. Breast excised. Section of the nipple showed Paget's disease, and dilated ducts were found deep to the nipple. A focus of spheroidal-celled carcinoma was discovered histologically. May, 1929, recurrence of carcinoma in scar; February, 1931, died with metastases in liver.

4. G. H., aged 58. Married, two children. June, 1927, eczema of the right nipple. June, 1930, nipple replaced by sore area, but no lump palpable in breast. Breast excised. Section showed Paget's disease of the nipple, and the ducts close to the nipple showed dilatation and cellular hyperplasia but no carcinoma was found. October, 1935, spheroidal-celled carcinoma appeared in the scar and in the right axillary glands.

5. I. J., aged 68. Single. January, 1927, eczema of the right nipple. July, 1929, nipple partially destroyed but no lump palpable in breast. Section from nipple showed Paget's disease. Three radon seeds (1.5 m.c.) inserted deep to nipple. September, 1929, nipple lesion healed. December, 1931, no evidence of disease on nipple or in breast. Patient cannot be traced.

6. K. L., aged 55. Married, no children. July, 1934, eczema of the right nipple. February, 1935, nipple destroyed but no lump palpable in breast. Section of nipple showed Paget's disease. Enlarged supraclavicular gland excised and found to be carcinomatous. X ray treatment to chest, but in July, 1935, the patient died with visceral deposits of carcinoma.

The tumour when it does appear may be found in any part of the breast, and is frequently remote from the nipple; there is no statistical evidence to favour the view that Paget's disease occurs when the tumour is closely related to the areola. Further, it is significant that no mention of pre-existing subjacent carcinoma has been made in the accounts of Paget's disease in other parts of the body.

A superficial carcinoma of the breast infiltrating the skin may resemble Paget's disease clinically, but histological examination reveals the true nature of the disease. This difficulty has not always been recognised, even in publications, and is undoubtedly responsible for some of the existing confusion.

On anatomical grounds it is hard to understand how a growth deep to the nipple could block the lymphatics of the areola, from which drainage is provided by vessels which run over the surface of the breast to enter the deep lymphatics at its periphery. The characteristic *peau d'orange* resulting from lymphatic blockage is associated with extensive disease in the breast, and is always regarded as one of the most serious features influencing the prognosis of carcinoma. But it cannot be too strongly emphasised that *peau d'orange* is neither a precursor nor even an accompaniment of Paget's disease.

The discharge which sometimes occurs from the ducts in chronic mastitis can cause simple eczema of the nipple, but there is no evidence that Paget's disease can result either from such a discharge or from the exudate of a carcinoma. If it were so Paget's disease might be expected to be more common. Injury and simple inflammation of the nipple do not seem to be factors, since Paget's disease occurs with equal frequency in women who have and those who have not borne children.

#### IS PAGET'S DISEASE OF THE NIPPLE FOLLOWED BY CARCINOMA OF THE BREAST?

Though a variable and often a long period of time may elapse between the appearance of the nipple lesion and the discovery of a tumour in the breast this question must be answered by an emphatic affirmative. Both Cheatle and Muir have given detailed descriptions of the hyperplastic changes in the epithelium of the ducts which are always to be found in cases of Paget's disease. The histological changes observed in the epithelium of the nipple and of the ducts are essentially malignant in nature.

Muir believes that the disease commences as carcinoma in the ducts close to their orifices, and that the nipple is involved by intra-epithelial infiltration from them. Cheatle regards the cellular phenomena in the skin and the ducts as the response to a common carcinogenic agent. If the fundamental conception that there is malignant disease in both situations be accepted, the question of their exact interrelationship may be regarded as a matter more of academic interest than of practical importance. The occurrence of Paget's disease in other parts of the body suggests that the production of the superficial lesion is not dependent upon the extension of a neoplastic process originating deep to the skin.

Cellular hyperplasia extends deeply into the breast along the ducts and, though malignant from the start, growth is confined for a time within their epithelial lining. Eventually, however, these abnormal cells burst through into the breast substance, it may be at a considerable distance from the nipple, and a carcinoma develops which resembles in every respect, both in its morphology and in its natural history, the usual carcinoma of the breast. The cellular

changes in the ducts and the earliest stages of the resultant carcinoma are clinically impalpable, and it is therefore possible for metastasis to occur before a lump is discovered in the breast.

The intimate relationship between Paget's disease and carcinoma is not confined to the breast, and both Paget and Susman refer to carcinoma of the urethra following Paget's disease of the glans penis.

#### HOW SHOULD PAGET'S DISEASE OF THE NIPPLE BE TREATED?

Experience has shown that excision of the nipple is futile, and though excision of the breast alone may sometimes eradicate the disease, complete removal of the breast, pectoral muscles, and axillary glands is the safest method of treatment. Thorough irradiation of the whole breast and the areas of lymphatic drainage may be considered as an alternative, but when the primary growth cannot be identified as a circumscribed lump radium treatment is less satisfactory than amputation of the breast.

Study of the eight cases already mentioned is instructive, for in three the treatment adopted was simple excision of the breast. There was no tumour to be found in the specimens after operation. One patient lived for nine years and died of heart failure; one cannot be traced; but the third returned five years after operation with spheroidal-celled carcinoma in the operation scar and in the axillary glands. A tumour was found in the breast after operation in two cases. In one of these the patient was treated by radical amputation of the breast, pectoral muscles, and axillary glands, but five years later she died with visceral deposits of carcinoma; and in the other the breast and lymphatic areas were irradiated, the disease of the nipple and the lump in the breast disappeared, but the patient died with visceral metastases two years later. One patient who was very obese had Paget's disease of the nipple, a lump could not be felt in the breast, but an enlarged supraclavicular gland was found to be filled with spheroidal-celled carcinoma. The breast, axilla, and mediastinum were treated with X rays but she died six months later with cerebral metastases.

It seems justifiable to conclude from such experiences and from the results of pathological research that Paget's disease of the nipple is evidence on the surface of an associated carcinomatous process in the breast; and since this deeper process can spread into the breast substance and even to the nearest lymphatic gland before there is any palpable evidence that it is no longer confined within the epithelial lining of the ducts, the disease must be treated by immediate radical removal of the breast with the axillary glands.

Complete and beautifully illustrated descriptions of the pathological changes which occur in the skin and in the ducts of the breast are given in the following articles:—

- Cheatle, G. Lenthal: Brit. Jour. Surg., 1923, xi., 295.  
Muir, R.: Ibid., 1935, xxii., 728.  
Susman, M. P.: Ibid., 1928, xv., 635.

---

LOWESTOFT AND NORTH SUFFOLK HOSPITAL.—There is a nursing staff here of 32 nurses but only 30 beds for their use, so that unless two nurses are always away on leave, beds must be hired outside the hospital. An appeal for £20,000 is being launched for the provision of a nurses' hostel and other improvements to the hospital.

## RADIOLOGY IN THE CURRICULUM

THE section of radiology of the Royal Society of Medicine, which has been considering the place of radiology in the medical curriculum, has now sent in its recommendations to the curriculum committee of the General Medical Council. These recommendations are based on a report to the section of a committee made up of Dr. F. M. Allchin, Mr. J. F. Carter Braine, Mr. Rock Carling, Dr. N. S. Finzi, Prof. F. R. Fraser, Dr. F. Hernaman-Johnson (chairman), Dr. G. Harrison Orton, Dr. Russell J. Reynolds, Dr. C. G. Teall, Dr. E. W. Twining, and Dr. Douglas Webster.

### Recommendations

I. Instruction in the physics of radiation should be given in the preclinical period.

II. Radiology should be utilised where practical in the teaching of anatomy, physiology, and pathology.

III. Instruction in the scope of X rays in diagnosis, and of X rays and radium in treatment, should be required during the clinical period of the curriculum. This may be accomplished by :

(a) Combined teaching by clinician and radiologist in ward rounds at the invitation of the physician or surgeon.

(b) The radiologist conducting demonstrations in the X ray department on selected films. Physicians and surgeons should attend these demonstrations and take part in the discussions.

(c) A number of lecture-demonstrations by a radiologist being included in the courses of lectures on medicine and surgery.

(d) The formation of an exhibition of radiograms illustrating typical cases.

The scheme adopted can best be left to the individual schools to decide upon, but a combination of either (a) or (b) with (c) and (d) would be most satisfactory. No opinion is offered as to the precise amount of time which should be spent on the teaching of radiology ; a schedule sets out the wide differences in the time devoted to organised teaching in British schools to-day. In some schools instruction is given in diagnosis only, in others in radiotherapy only ; any regulations which are framed should specify instruction in both divisions.

### Summary of Present Position at Home

RADIOLOGICAL ANATOMY is now taught to undergraduates at :

- University College Hospital.
- St. Thomas's Hospital (one hour daily by X ray assistant).
- St. Bartholomew's Hospital (about 30 lectures).
- Guy's Hospital.
- Oxford.
- Cambridge (and with physiology).
- St. Andrews.
- Dundee.
- Manchester.
- Birmingham.

LECTURE COURSES in radiology are given to undergraduates at :

- London Hospital (weekly through final year, and ward demonstrations).
- St. Mary's Hospital (11 lectures in autumn term, demonstrations in X ray department).
- Middlesex Hospital (11 lecture-demonstrations in autumn term).
- Charing Cross Hospital (6 to 8 lectures).
- St. George's Hospital (short course of lectures, and frequent demonstrations).

King's College Hospital (3 or 4 introductory lectures —supplementary course later).

St. Bartholomew's Hospital (3 lectures in therapy only).

Guy's Hospital (8 lectures in diagnosis only).

Liverpool (11 lecture-demonstrations).

Manchester.

Leeds.

Durham (6 lectures each term).

Dundee (occasional lectures, with clinical medicine course).

Glasgow (20 meetings and demonstrations).

Birmingham.

ATTENDANCES in the X ray department are required of undergraduates at :

Charing Cross Hospital (3 months as clerk).

Royal Free Hospital (1 month as clerk).

University College Hospital (a fortnight as clerk).

Westminster Hospital (12 attendances).

(In these hospitals attendances are all compulsory ; students must be signed up.)

St. Thomas's Hospital (demonstrations).

Middlesex Hospital (clerks appointed).

### And Abroad

For comparison a summary is appended of instruction in radiology as at present given in the United States of America and in Sweden.

*United States of America.*—There are 53 Class A medical schools, in about half of which instruction in radiology is given in the second year (average 10 hours) with anatomy and physiology. In 80 per cent. in the third year (average 30 hours), a general exposition of roentgenology. In 98 per cent. in the fourth year (average 25 hours), clinical applications. And in 42 per cent. laboratory courses are given in addition to the lectures.

*Sweden.*—Compulsory course : one term in X ray diagnosis (about 20 hours, lecture-demonstrations). Optional course : for eighth to tenth year students, 2 months' course (about 44 hours, X ray diagnosis and X ray and radium therapy).

## MEDICINE AND THE LAW

### Litigation Over Sale of Practice

IN litigation over the sale of a medical practice (With *v. O'Flanagan*) the Court of Appeal last month gave a decision which is likely to be noted in the text-books on the law of contract. It was a London practice, carried on at two different premises. The prospective purchasers naturally obtained information beforehand about the value. They were told that the practice had produced £2000 a year and that the number of panel patients was 1480. They agreed to pay £4000 (two years' purchase) as the price of transfer. The date for completing the contract of purchase was May 1st, 1934. During the four months preceding that date the vendor was obliged by illness to be absent from his work. He managed to return occasionally and worked for about 30 days at one of the premises ; meanwhile the practice was carried on by other doctors acting as locum tenens. One of the latter, who was acting from April 10th to May 1st, gave an account of the practice which showed that conditions had changed since the figures had originally been given to the purchasers. The average takings were said to be as low as £5 a week, and the panel patients had dropped to 1250. The vendor became very ill and died. The purchasers, finding that they had bought something which was worth very little, brought proceedings

against his executors, asking for rescission of the contract. Mr. Justice Bennett held that the vendor had been aware of the altered value of the practice and that the purchasers had not been told of the change. But he dismissed the claim for rescission, apparently on the ground that the representations were true at the time when they were made and that the buyers had no legal right to be told of the altered value.

Some observations of Sir Edward Fry in *Davis v. London and Provincial Marine Insurance Co. (1878)* seem material. When parties contract with one another, he said, they may (unless there is a duty to disclose facts) observe silence even as to matters which each thinks would operate on the other's mind. There is, however, a duty to disclose when an agent is contracting with his principal, a solicitor with his client, a guardian with his ward, or a trustee with the person towards whom he stands in a fiduciary relation. The agent, solicitor, guardian, or trustee can in these circumstances contract only after the most ample disclosure. Then there are contracts sometimes called contracts *uberrimæ fidei* (of the utmost good faith) where the courts will specially require disclosure from one of the contracting parties—such as contracts about marine insurance or partnership. Lastly, in ordinary contracts the duty of disclosure "may arise from circumstances which occur during the negotiations. If a man makes an honest misstatement of fact on some material point and during the negotiations he discovers it is wrong, he has a duty to correct his misstatement, although, if he had never said anything at all, he might have been entitled to hold his tongue." So again, continued Sir Edward Fry, "if a statement has been made which is true at the time, but which during the course of the negotiations becomes untrue, then the person who knows that it has become untrue is under an obligation to disclose to the other the change of circumstances." Following these views the Court of Appeal has overruled Mr. Justice Bennett. The judges say that the change in the circumstances of the practice ought to have been communicated to the prospective purchasers before they were allowed to close the transaction. The contract could not stand. Put in another way, the representation about the value of the practice, which had induced the purchasers to enter into the contract, was a continuing representation. As was remarked in the old case of *Kay v. Smith*, "the representation does not end for ever when the representation is once made; it continues on." The Court of Appeal has now decided that the purchasers are entitled to a declaration rescinding the contract of purchase. It is a situation which might often be created on the transfer of a practice.

#### Penal Servitude for Bogus Doctor

Edward Waugh Atkinson, aged 51, a male nurse, pleaded guilty at the Central Criminal Court last week to a charge of obtaining £124 10s. by false pretences, and was sentenced to five years' penal servitude. Though he was apparently not charged with infringing the Medical Act, he had assumed the description of doctor in order to impose upon his victims. He caused telegrams to be sent to himself describing him as possessing medical qualifications; he borrowed £10 to buy a stethoscope, and he introduced himself as a doctor. He even gave surgical treatment to a woman from whom he obtained £44, extracting pieces of bone from her injured shoulder. The prisoner asked that four other outstanding charges might be taken into account. The police

told the court that he had seven previous convictions, including two terms of penal servitude. In passing sentence the Recorder referred to him as a menace to the public.

Some people may draw the moral that any untrained person can perform a surgical operation with success. Others may deduce that the Medical Act is not without its value. Apart from any question of professional training, the presence of a name on the Medical Register is some evidence of the owner's non-criminal character. Those who summon a registered practitioner to their houses need not, we hope, lock up the spoons.

## SCOTLAND

(FROM OUR OWN CORRESPONDENT)

### DIMINISHING PRIVATE PRACTICE

THE increasing number of patients who attend for treatment at the Glasgow Ear, Nose, and Throat Hospital has necessitated the building of an extension which will cost about £25,000. Comparison with the figures of eight years ago shows that the number of patients attending the hospital for treatment has increased by 34 per cent.; in 1935, 14,746 new patients received treatment. In moving the approval of the medical report, Dr. John Dunbar said that the medical staff must view the growing attendances in no very favourable light. It meant that the medical staff must be increased to cope with the position and showed that the scope of private practice was becoming steadily less. He said that the surgical staff did not object to treating patients who could not afford to pay, but they did object to being exploited. Dr. Hinton Robertson, who seconded the motion, said that there was a large and growing body of opinion in the medical profession, particularly among the younger generation, which was uneasy about the present trend towards hospitalising increasing numbers of the sick population. This would lead to an economic deadlock, for the hospitals would require so many doctors to carry on the work that they would be far in excess of the number that could be maintained by the remaining private patients. As it is, the profession has tended in recent years to incur a certain amount of odium because pressure of circumstances had converted its members into Robin Hoods who rob the rich to pay the poor.

The exploitation of the voluntary hospital by many who are able to pay for medical attention is becoming increasingly apparent. The number of medical and surgical specialists has to be increased to meet the extra work, while the scope of private practice is steadily diminishing. The payment of the staffs in voluntary hospitals seems to be an inevitable result that should not be much longer delayed. The appointment of almoners who can investigate the income of patients attending hospitals has become a real necessity.

### CHAIR OF DENTISTRY

At a meeting of the university court of St. Andrews it was announced that a sum of about £17,500 has been offered to the University towards the establishment of a chair in dentistry. The donor is Mr. William Boyd who has already subscribed liberally towards improvements in the Dundee dental hospital, and his offer was gratefully accepted by the court. The annual income of the sum provided will amount to about £500 per annum.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

## UNIVERSITY REPRESENTATION IN DÁIL EIREANN

LAST week the Dáil took the final step in the abolition of university representation in that assembly. It is nearly two years since the Bill passed the Dáil, and was rejected by the Senate. The power of the Senate, however, is only to hold up a Bill temporarily, not to reject absolutely, the period of suspension being limited to eighteen months. At the expiration of that period early this year the Bill was again sent up to the Senate which gave it a second reading, but amended it by introducing a section which postponed its coming into effect until six months after the next general election. The Dáil refused to assent to the amendment, and last week exercised its power by resolution of "deeming the Bill to be passed by both Houses" when the period of six weeks had elapsed from the second reading of the Bill from the Dáil to the Senate, and the latter body had not passed it. The Bill now becomes law on receiving the signature of the Governor-General. There are two universities in the Irish Free State,

the University of Dublin (best known as Trinity College, Dublin) and the National University of Ireland. Dublin University has had the privilege of representation since 1613, a little more than twenty years from its foundation. Its members sat in the Irish Parliament up to the date of the Union in 1800, from which time until 1921 they sat at Westminster. The National University was first given the right of representation in 1918. By the Constitution of the Irish Free State which came into force in 1923 each university was privileged to return three members. At present Dublin University is represented by two fellows of Physic College and a professor of the School of Trinity; the National University is represented by two barristers and a writer. The Bill does not become effective until the next general election.

## DEAN OF THE SCHOOL OF PHYSIC, TRINITY COLLEGE, DUBLIN

Dr. Joseph Warwick Bigger, professor of bacteriology and preventive medicine since 1924, has been appointed dean of the medical faculty, Trinity College, Dublin, in succession to the late Prof. A. F. Dixon. Dr. Bigger has also succeeded Dr. Dixon as representative of the University of Dublin on the General Council of Medical Education and Registration.

## PANEL AND CONTRACT PRACTICE

## Drugs in Lancashire

WE have repeatedly referred to the growth in Lancashire of the habit of taking medicines. The insurance committee has had a report prepared on the cost and frequency of prescribing during the year 1935. This report quotes the opinion of the C.M.O. of the Ministry of Health that, while a certain increased demand is to be expected from the extending use of costly, though necessary, modern methods of treatment, a considerable proportion of the total outlay on drugs could be eliminated without detriment. Nor can he find evidence that the standard of health is higher in areas where the habit of taking medicines is highly developed. The report points out that during the last five years only one doctor under agreement with the Lancashire committee has been surcharged on the grounds of excessive prescribing; indeed, since the inauguration of the present system twelve years ago, money has been only withheld on four occasions. During the same period the cost of drugs has increased from 34 to 41 pence per person per year, and the number of prescriptions from 3.87 to 5.05. In the seven regions into which Lancashire (apart from its county boroughs) has been divided by the Ministry of Health for the purpose of investigation, the estimated average total cost of drugs per insured person varies from 37.36 to 51.45 pence while the number of prescriptions ranges from 4.74 to 6.14. It is curious to note that the average drug cost in non-mortgaged practices in Lancashire is 40.78 pence, against 44.23 in mortgaged practices. There are fortunately six times as many insured persons in the former category. Practitioners with colonial qualifications, it seems, show a rather heavier return than home-qualified men, while those who have qualified between 1926 and 1935 are definitely more generous with drugs than their elders. It might have been anticipated that small lists would show a heavier average drug cost than the larger ones, but actually the heaviest total (44.08 pence) is in panels of 2500 to 3000. Moreover in medical lists which are rapidly increasing there is a rising cost

per person; where for instance the practice is grown by one half in the year the average cost for drugs per person is nearly 70 pence. The insured person does not as a rule trouble to secure acceptance or transfer unless he requires treatment. The committee which drew up the report believe that a substantial economy would follow upon a careful investigation of the prescribing of doctors (1) who have qualified since the war; (2) whose medical lists are rapidly increasing; (3) whose practices are mortgaged; (4) whose lists exceed 2000; (5) who practise in the district around Manchester. They would like the panel committee to examine the data from a therapeutical standpoint.

## Appliances at Cost Price

A correspondent in the *Chemist and Druggist* draws attention to what he describes as the custom of a few doctors. Those practitioners who have ordered appliances other than those scheduled, or perhaps foods, on insurance prescription forms, will remember that if the chemist supplies what is ordered he is entitled to be paid and the cost is recovered from the doctor. This particular chemist has noticed that certain doctors are in the habit of ordering expensive appliances, and cheerfully accept the surcharges. He has made inquiries and one doctor gives the following explanation:—

"Let us take a proprietary inhalant as an example. The medicament I order is allowed as a charge on N.H.I. funds, but the cost of the atomiser or inhaling apparatus that the makers recommend is not a proper charge. If my patient wants it he must pay for it himself, and it may cost him 21s. Now, suppose I order it on a prescription form with the liquid medicament. The patient gets the inhaler just the same and they charge it to me, but only at cost price (according to drug tariff rules). The patient in turn pays me for it, and saves, say 5s. on the transaction; the value is deducted from my next cheque, so everybody is satisfied!"

The chemist is not so sure that everyone is satisfied. He has supplied a non-scheduled appliance, and instead of receiving his normal profit on the transaction he has to be content with a mere dispensing fee. But the idea is ingenious.

## OBITUARY

**SIR WILMOT HERRINGHAM, K.C.M.G., C.B.,  
M.D. Oxon., F.R.C.P. Lond.**

THE death occurred on April 23rd of Sir Wilmot Herringham, consulting physician to St. Bartholomew's Hospital, and widely known for his services to medical education and nursing, while his war record was of marked distinction.

Wilmot Parker Herringham was the son of the Rev. W. W. Herringham, of Old Cleeve, Somerset, a prebendary of Wells, by Matilda, daughter of the late Colonel J. B. Parker, commandant, Woolwich. He went to Winchester as a collegier and gaining a classical exhibition at Keble College, Oxford, graduated with classical honours in 1877. A decision to go to the Bar was marked by entrance as a student at Lincoln's Inn, but almost immediately he decided on a medical career and became a student at St. Bartholomew's Hospital. He qualified as M.R.C.S. in 1881 and graduated as M.B. Oxon. in the following year, taking also the diploma of M.R.C.P. Lond. He served as medical registrar at the hospital and was for two years casualty physician, but as was so commonly the case at his school had to wait a period for advancement, not being elected assistant physician to St. Bartholomew's until 1895. He was however elected physician to the West London Hospital and to the Paddington Green Children's Hospital, at both of which institutions he did excellent work. And he had to wait no excessive time at St. Bartholomew's for promotion, as he became full physician in 1904. He lectured for a time on clinical and forensic medicine and published papers on clinical subjects in the transactions of various learned societies and in the columns of the *Journal of Physiology, Brain*, and the *British Medical Journal* and the *St. Bartholomew's Hospital Reports*, but no manual or textbook came from his hand.

Herringham was elected F.R.C.P. Lond. in 1889, and was examiner for the College through two periods. In the course of his educational and hospital work he became deeply interested in the constitution and machinery of the University of London. The controversies involved made bewildering reading at the time, and even when the statutes and regulations made by the Commissioners of the University of London Act (1898) were published few could have followed their meaning, their implications, or their indications for development with any certainty. Herringham was among that small group and displayed in debating the difficulties of organisation a blend of fairness and acumen which led to his election to the vice-chancellorship of the University. This post he held for three years from 1912, and it

was an exceptional compliment to him on the part of the Senate to grant a tenure of office for three years. We have received from one who was admitted to a special degree of intimacy with Herringham during this period the following tribute to his work:

"The two epithets that spring to my mind as specially characteristic of him in that capacity are 'masterful' and 'greathearted' (*μεγαλόψυχος*). To which I may add a third Aristotelian virtue—versatility. These qualities, which were his in an exceptional degree, gave him the ability to control the Senate to their own frank enjoyment and to the speedy transaction of the complicated and frequently controversial business with which they were habitually confronted. Although this body contained a considerable number of experts in various branches of academic attainment, some of whom

moreover were not wholly in agreement with their immediate colleagues, not to speak of inevitable inter-collegiate difference, no one ever appeared to resent Herringham's handling of the situation—all recognised that their corporate choice had fallen upon the right man, and that his essential authority lay not in his office but in himself. His swift and orderly intelligence perceived at once the value and bearing of any suggestion that might however unexpectedly be sprung upon the meeting, both in its immediate application and (what is of wider and more vital consequence) in its relations to the other aspects and interests of the university; and his judgment was never, as far



SIR WILMOT HERRINGHAM

as I can remember, at fault. He had moreover in an especial degree the divine gift of humour, which never deserted him or offended those upon whom it was directed."

In 1913 Herringham had a notable opportunity for displaying similar powers of organisation when he was elected honorary general secretary to the International Medical Congress held in London in 1913 under the presidency of Sir Thomas Barlow. Any who can recall the conduct of the business arising out of that remarkable gathering of the nations will remember Herringham's careful but almost comically informal method of dealing with it. With various assistants round him he saw everyone who needed counsel, attended to all questions with promptitude, always apparently knowing at once to which of his assistants he could look for an exact reply. He could delegate as well as advise. He was precise in any instructions which he gave with regard to the delivery of contributions, and quite stern, even when he appeared to be flippant, with those who defaulted without adequate excuse from supplying promised assistance. The congress, to which notable contributions came from distinguished colleagues in



many lands, was a great success and Herringham received a knighthood which was fully earned.

The following year war broke out and Herringham went to France immediately as consultant physician to the forces overseas. He was already lieutenant-colonel commanding the medical unit of the University of London O.T.C., so that his qualities as physician were supported by complete familiarity with military routine. He did distinguished work as a consultant and it is noted in the "Official History of the War" that with J. W. McNee he reported the first case of relapsing fever where the initial period of pyrexia was shorter and the relapses more frequent and severe. This case led to investigations as to what type of fever was presenting itself, but during the early part of the war none of the exhaustion sequelæ of trench fever were observed, as the many observations were individual, and it was not until 1917 that the Trench Fever Committee was appointed. Herringham was also largely responsible for the sending in to the No. 3 mobile laboratory the notes and specimens which later were represented in a summary of the chief findings in a series of cases of war nephritis, collected by Shaw Dunn and later published in the reports of the Medical Research Committee and the *British Medical Journal*. Herringham recorded his general war experiences in a volume entitled "A Physician in France." This book appealed to a wide circle of readers and brought home to the lay public the important part played by the medical service in an army at war. The book appeared within a year of the cessation of hostilities and supplied information of great public value. He commented on many questions, social, political, and economic, and his criticisms and reflections were throughout relieved by his friendly humour. The work was timely as it defended the Royal Army Medical Corps effectively from much carping detraction which had been put forward by the ill-informed. In noting the advance in medicine during the war, he brought out the romance of scientific investigation as well as the value of organised research, and Herringham's lessons here are equally applicable to the conditions of peace or war. He was appointed C.B. (Military) in 1915, was promoted major-general A.M.S., and received the K.C.M.G. at the close of hostilities.

The nursing profession owes a large debt to Herringham. The General Nursing Council for England and Wales was appointed by the Minister of Health and held its first meeting on May 11th, 1920, and was therefore still in its infancy in February, 1922, when he was asked by the Minister to assume the office of chairman. We owe to Miss E. M. Musson, LL.D., chairman of the Council, this tribute of his work in the chair: "The Council was in 1922 passing through a crisis and it was primarily due to Sir Wilmot's knowledge of committee work and to his determination and prompt action that it became possible to continue. He spent unlimited time probing into every detail of office work and obtained an independent and expert opinion on the organisation with the result that additional staff and more equipment were obtained to cope with the tremendous rush of applications for registration as well as with the work of committees. He not only attended the meetings of council and of all committees, which then met weekly, but spent many hours at the office dealing with the numerous problems inseparable from such a great undertaking. His first concern was to arrange for the election of a new council—the preliminary to which was the formation of the electorate by publication of the first Register in July, 1922. The

first elected council met in February, 1923, Sir Wilmot being unanimously elected chairman, a position to which he was re-elected in 1924 and again in 1925. From the first he maintained that it was due to the dignity of a profession that the chair should be held as soon as possible by a member of that profession and that before the end of the first elected council, elected for five years, the chair should be occupied by a registered nurse. In 1926 he therefore declined nomination, but, at my urgent request, kindly consented to be nominated for the newly created post of vice-chairman, and for the two years during which he remained on the Council he gave me unstinted help and advice whenever I appealed to him. Sir Wilmot's experience in the examination work of a university and the help he was able to obtain for the Council from the University of London were invaluable in the drawing up of the rules and regulations for the conduct of the State examinations and their organisation, as were also his guidance, and that of Sir Jenner Verrall, in legal matters or those where disciplinary situations arose. The financial side of the work always received Sir Wilmot's careful consideration, and he was proud that he left the Council in a sound position in that respect."

At the Royal College of Physicians of London Herringham was a prominent figure. Early appointed an examiner, he became a member of the council in 1908 and served as senior censor. He represented the College on the Senate of the University of London for eight years and was Harveian orator in 1929. His Harveian oration, a fluent delivery without a manuscript, was completely different from all of those exercises. He took it for granted that his audience knew of the researches derived from experiment which had led Harvey to his great discovery, and that the bearings of that discovery on all subsequent medicine must be equally evident to them. He turned to the question of what were the family influences and social environment that accompanied Harvey's work and ministered to its accomplishment, and gave a graphic picture of the family life of the great philosopher. In this oration, an expanded edition of which was published in *THE LANCET* (Nov. 2nd, 1929, p. 911), Herringham displayed his deep and learned interest in late mediæval culture. This was an aspect of history on which he was singularly well informed. He read steadily to the end of his life history, especially French and English, from the time of Harvey until the beginning of the last century, and acquired a store of minute information on the science, art, religious movements, and general politics of the whole period, carrying apparently in his head the reactions of things as they occurred and their influence on the times that followed up till to-day.

Herringham was a member of the University Grants Committee from 1919, the year of the institution of the Committee, until 1932. He took from the first an important part in advising the Committee as to the needs of medical education, and his wide knowledge of the subject enabled him to give real impulse to the movement for the clinical unit system in the London medical schools. He worked in close association with the officiate throughout, and rendered high service from his technical knowledge, contributing also through his warm-hearted personality to the success of the periodical visits paid by the Committee to the university institutions.

Sir Wilmot Herringham married as a young man Christiana, daughter of Mr. T. W. Powell, of Piccard's Rough, Guildford. She was a highly accomplished painter both in tempera and water-colour, a scholar,

and learned in the arts she practised. Their only son was killed in the war, and Lady Herringham was an invalid for several years before her death in 1929. Towards the close of his life he sought consolation and pleasure from his historical studies and the practice of water-colour painting, of which he became an able exponent. An example of his skill appears in the Royal Academy exhibition this year, a drawing of Llanthony Abbey.

Dr. C. M. Wilson writes: "It is, I think, remarkable that in an age of journalism the death of so unusual a man as Herringham should pass almost unrecorded. Successful physicians are common, but good chairmen are rare, and many bodies profited by the fact that his days were not taken up in practice, for Herringham was born to preside over men. It was not a rôle for which he appeared to be cut out. Many would have predicted that he would have been impatient, intolerant, and even aggressive. They would have been very wide of the mark. He believed it was his duty as chairman to sink his own personality. This masterful man with strong opinions on almost everything appeared to have none as he sat there on the bench sifting the evidence. He had always mastered the subject under discussion, and his judgment was seldom at fault; besides he had the chairman's final gift—courage, for he was quite without fear. In the years of his prime it was no doubt this wisdom in council that set him apart from his fellows, and yet strong administrators with vision are common enough. What was unusual was that the man who possessed this gift was a scholar whose life was ruled by a passion for beauty.

"He had an insatiable thirst 'to learn something new and to see something beautiful,' and he had leisure after the war to feed these desires. He went through the countryside whenever he could in a small car—out of which, owing to his rheumatism, he was extracted with difficulty—perhaps to some Oxford or Cambridge college to read an old manuscript play, perhaps to see spring in the fields (for he was a countryman) or an old picture, or some ancient church. He would put some oatcake and a flask of whisky in his haversack along with painting things and start off after breakfast. His painting was not all plain sailing. 'I am doing it very badly. The greens puzzle me and they are not made any better by the continually shifting shadows from the clouds. I love the sunlight on a green hill and all the lines running down the face of it, showing the different slopes, are lovely too.'

"He had mellowed and was content to accept what fate had brought: not that there was much virtue in that, he would add, since it had laid his life in pleasant places under the shadow of old walls—Winchester, Oxford, and St. Bartholomew's, that great school of medicine which for more than forty years had been the centre of his life. It was as natural for him to turn to the past for an explanation of the present as it is to a lawyer to turn to precedents. And in the interpretation of history he sometimes found a key in his knowledge of the arts. He had been looking at some Dutch pictures, scenes of jollity: 'It looks,' he wrote, 'as if Calvinism which was as rabid in Holland as anywhere did not have much effect on popular life.' But when he tried to apply the same test to England, he found nothing but Herrick's *Hesperides*, which was about as foreign to Puritanism as anything could well be. When he was in the 'seventies he taught himself Spanish so that he might read Don Quixote in the original. He spoke French like his own tongue, and could

quote his Dante when it was apt and native to the occasion. But his most intimate friends were the Greeks, whom he read and re-read every day of his life until they were part of him, just as our forbears lived with their Bibles. Herringham did not exist in a land of memories, he lived in the present. Age kept at arm's length from the formidable old man, and it was only a few months before his death that he handed over his fishing tackle to my son. He grew rather lame, a little deaf, but his mind remained supple and his memory was never touched by time. When he was nearly eighty he thought he ought perhaps to retire in favour of a younger man as chairman of Bedford College, but they would not hear of it for the reason that he was so supremely efficient. To the very end Herringham enriched the lives of those who knew him."

#### HENRY JASPER CARDALE, M.B. Edin.

Dr. Henry Cardale, who died at his home in Cubitt Town, on April 22nd, in his sixty-sixth year, was the son of the late Vice-Admiral Charles S. Cardale, and was born at Alverstoke, Hants. He was educated at Kingsley College, Westward Ho! and at Sherborne. He studied medicine at Edinburgh University, winning distinction in many subjects, and graduated in 1895, afterwards holding resident appointments at the Royal Albert Hospital, Devonport, and Fisherton House Asylum, Salisbury. He started in general

practice at Harrow, but in 1902 he moved to the Isle of Dogs and remained there throughout his life. He became an assistant medical officer of the Education Department, and a district medical officer under the L.C.C. hospitals and medical services committee. He was medical officer to a number of societies and insurance companies, police surgeon of the K and Thames Divisions, medical

referee of the Ministry of Pensions, and from time to time acted as a regional medical officer of the Ministry of Health. During the war he was responsible for the medical service of the Inland Water Transport when it was stationed in the dock area, and he rendered service on war pensions under the British Red Cross Society. All this in addition to the grinding toil of a busy private and insurance practice.

The practice which the National Health Insurance Acts brought him Dr. Cardale abundantly repaid by services freely rendered to the administration of medical benefit. He was one of the original members of the London panel committee and became its chairman in 1914, remaining in that office until his death. He was a member of the Insurance Acts Committee, and in 1930 and 1931 was chairman of the annual panel conference. In 1921 he became



DR. CARDALE

(Photograph by Elliott & Fry)

a member of the London insurance committee, serving both on the committee itself and on various of its subcommittees. In March, 1925, he was appointed one of the medical members of the London medical service subcommittee, and his interest in its work may be gauged by the fact that, out of a possible 243 meetings held during the period of his membership, he attended no less than 226. A man of strong opinions, Dr. Cardale was sometimes regarded as intolerant of opposition, but those who knew him best realised that it was an honest conviction of the rightness of his own views which made him seem unappreciative of the viewpoint of others. For this reason he was more effective as a fighter than as a negotiator, although in either capacity he had the happy knack of friendliness. A born raconteur, he could often reduce to helpless laughter his opponents of a few minutes earlier. His passing removes one of the few people who have completely mastered the insurance acts and regulations.

#### THE LATE SIR HAMILTON BALLANCE

WE have received the following tributes to Sir Hamilton Ballance as a surgeon in supplement of the notice published last week. In that notice the statement that Sir Hamilton was originally in general practice was not correct.

Mr. A. J. Blaxland, surgeon to the Norfolk and Norwich Hospital, writes: "Ballance was wholeheartedly devoted to his profession, and even his hobbies of carpentering and deep-sea fishing had an indirect bearing on the perfection of his surgical technique. His enthusiasm for and untiring devotion to his work were a constant source of inspiration and encouragement to his colleagues, and they would all gratefully acknowledge the debt they owe to his example. Those of us who have had the privilege of being his house surgeons and also all his surgical colleagues on the staff of the Norfolk and Norwich Hospital would like to have recorded our deep respect and affection for him as a man, our great admiration for him as a surgeon, and our indebtedness to him for all that we have learnt from him. He was a man of absolute integrity and trustworthiness, and he had a great charm of manner. No one could wish for a better colleague. His chief characteristics as a surgeon were thoroughness and meticulous care, not only in the technique of an operation, but in diagnosis and preparation of a patient and in after-treatment. No time or trouble was too great for him if it were at all likely to add to the comfort or benefit of a patient." Mr. Blaxland adds that not content with being a pioneer in surgery in Norwich he devoted a large proportion of his time to the interests of the profession through official work with the B.M.A. where his high ethical standard proved invaluable.

Dr. A. J. Cleveland, senior physician to the Norfolk and Norwich Hospital, writes: "Ballance came to the hospital at a time when surgical technique was making great advances; the antiseptic method was being supplanted by the aseptic; pathological investigations were becoming a part of clinical surgery; and X rays opened a new field of diagnosis. No man was better equipped for the introduction of the new methods than Ballance, and in conjunction with his colleague Dr. S. H. Long he took up the task with enthusiasm. Extremely painstaking and possessing great powers of application, his work was marked by thoroughness and a conscientious attention to detail. For his clinical judgments he relied

on wide study of surgery and powers of sound deduction rather than on intuition, and these, added to a personality which inspired confidence, soon gave him a high place in his profession. He was unselfishly devoted to the interests of the Norfolk and Norwich Hospital, and all his life took a prominent part in its administration, bringing to the task the same qualities of sound and restrained judgment which marked his surgical work. After close association with him for 30 years it is difficult to express an opinion of the surgeon and the man which is not biased by the affection felt for a friend. But that he deserved the recognition he received and that he was in every way worthy of the position in his profession to which he attained, no one who knew him and his work would question for a moment."

#### THE LATE DR. HAMBLIN SMITH

W. N. E. writes: It was on account of the increasing importance of the medical work at Birmingham prison that it was decided in 1920 to send a medical officer there with special knowledge of mental diseases, and Hamblin Smith was the natural selection for the post. His ripe experience, clinical acumen, and sound judgment were invaluable assets in the daily work of a prison, and enabled him to determine with accuracy the mental states of the trial prisoners under his care. His opinion in the difficult and intricate problems connected with criminal responsibility was relied upon in the courts and by the Prison Commissioners, and his concise and complete reports were models of what a medico-legal report should be. He had not only the prisoners from the Birmingham area but also those sent from outlying prisons for medical observation, and he visited adjacent prisons to confer with their medical officers in capital cases. He was a loyal colleague and in all his work combined charity to the frailties of his patients with jealousy for the reputation of the service. An omnivorous reader of philosophy and speculative psychology, he maintained a clear distinction between assumptions and facts and his theoretical inclinations never obtruded on his daily duties. It was this scientific outlook tempered with common sense that captured and retained the confidence of the courts he worked in.

Dr. WALTER SIRR SHELDON, whose death occurred on April 15th, was educated at St. Paul's School and went for his medical training to University College Hospital where he was junior and senior Fellowes medallist in clinical medicine. He took the English double qualification in 1898 and filled the resident posts of house physician and house surgeon and obstetric assistant. He was also for a time clinical assistant at the Royal London Ophthalmic Hospital. During the war with the rank of temporary captain, R.A.M.C., he served in the Ypres and Etaples centres. He practised in the Bayswater district of London for many years, in succession to his father, the late Dr. Thomas Sheldon.

Dr. HARRY MASON, who died on April 23rd from pneumonia after a short illness, was 59 years of age and had been county medical officer for the North Riding of Yorkshire since 1924. He qualified at Edinburgh in 1900 and, after demonstrating both in anatomy and pathology, began to practise in

(Continued at foot of next page)

## CORRESPONDENCE

## TREATMENT OF PHLEBITIS IN VARICOSE VEINS

To the Editor of THE LANCET

SIR,—The article by Dr. Biegeleisen in your last issue calls for certain comments. Firstly, it contains many statements of fact with which I find myself in complete disagreement; and secondly, the treatment of phlebitis by means of sclerosing injections during the active phase of the disease is diametrically opposed to current teaching in this country.

Dr. Biegeleisen opens by saying: "The conservative treatment of phlebitis in varicose veins has proved unsatisfactory and the purpose of this paper is to present a new method of treating this rebellious disorder, which so often terminates in a permanently damaged extremity." Does clinical experience support this? The statement is also made that phlebitis in varicose veins differs from "ordinary phlebitis" in being subacute or chronic. Actually this so-called ordinary phlebitis is so rare as to provide no real comparison.

After characterising the existing treatment of phlebitis as "confused and timid," Dr. Biegeleisen makes the following statements: "(1) phlebitis in varicose veins rarely heals spontaneously; (2) the danger of embolism is greater in the untreated cases; (3) temporising means permanent lymphatic and tissue damage; and (4) sclerosing injections can safely occlude the dilated infected vessels." My own experience leads me to believe that the so-called phlebitis in varicose veins invariably subsides with conservative treatment, and in many cases does so almost irrespective of the treatment. As regards the danger of emboli, I feel sure an unnecessary bogey has been made of this. Statistics on the point are difficult to obtain but personally I have yet to see a fatal or a non-fatal pulmonary embolus following spontaneous phlebitis in varicose veins. Emboli certainly do occur from time to time, but patients with this complication are rarely seen in the out-patient departments, in the wards, or in the post-mortem room. The argument that conservative treatment of phlebitis leads to permanent lymphatic and tissue damage is only true of the very small group of cases in which the phlebitis really becomes subacute or chronic.

Dr. Biegeleisen states he has carried out immediate sclerosis in a series of 300 cases of phlebitis with good results. As a guide to the infective element in the phlebitis he uses the sedimentation-rate of the blood, and on the basis of his figures divides his cases into four groups, those with active infection and those with probable absence of infection as extremes. This very elaborate investigation is fol-

(Continued from previous page)

Barnsley. Having taken the D.P.H. Leeds he entered the public service as medical inspector of schools in the West Riding, later moving to the North Riding, but never leaving the county of his birth. He was an administrative officer of considerable breadth of view whose devotion to the public welfare made him widely beloved. One of his colleagues writes that his fellow workers found him courteous and kind, always determined to make their way easy for them.

lowed by injection treatment which has to be gauged very carefully to avoid the "flare-ups" which he admits occur after the injection of phlebitic veins. I think, however, the clue to Dr. Biegeleisen's article is to be found in the legend accompanying Fig. 1, which reads: "Phlebitic varicose veins: no tenderness, thrombosis, or hyperthermia. Varicose ulcer present. Sedimentation-rate 20 minutes." If the word phlebitis is capable of being used for a process in which tenderness, thrombosis, and hyperthermia are not present, then it has become too loose in its meaning to have any clinical application. It would appear that he is using the word in a sense other than the accepted one, and that many of his cases are really ones in which old, quiescent, and clinically hard and painless mural thrombi are palpable in varicose veins. Dr. Biegeleisen makes so many statements which are frankly contrary to my own experience, and his use of the word "phlebitis" seems to be so unusual that I must hesitate to accept his arguments in favour of immediate injection treatment in cases of phlebitis. The subject of phlebitis in varicose veins is a thorny one in relation to nomenclature, and the word may be used to cover anything from a thrombosis to a frankly suppurative process. Injection treatment of the type of case he deals with may be safe, but the most acute "flare-ups" I have ever been called to see have followed injection of veins recently the site of phlebitis. In addition to this some at least of the recorded cases of fatal pulmonary emboli have occurred when injections were carried out shortly after an attack of phlebitis.

The conservative treatment of phlebitis is satisfactory in almost all cases of the acute, subacute, and chronic disease. A few cases in all of these groups necessitate surgical treatment, but they are exceptional; the remainder are safely and efficiently dealt with by injections after the phlebitis has subsided. The interval of six months which I observe in these cases is purely arbitrary, but its observance has at least avoided any complications even where the antecedent phlebitis has been of the most acute type.—I am, Sir, yours faithfully,

Harley-street, W., April 25th. REGINALD T. PAYNE.

## VARICOSE VEIN INJECTIONS

To the Editor of THE LANCET

SIR,—I have read with interest Mr. Bennett-Jones's observations in your issue of March 7th (p. 537) on the empty vein technique for the injection treatment of varicose veins. He stresses what I preach in season and out, particularly in "The Cure of Hæmorrhoids and Varicose Veins" (London, 1934). If all injectors would use this method one would not encounter so many of other people's failures. That technique leads to smaller clots, a quicker cure, and less after-pain for the patient. Certainly the tourniquet is to be recommended as a routine measure, but in expert hands, particularly when great numbers have to be dealt with by teamwork at a clinic, there are two quick "dodges" that obviate a tourniquet:

(1) Stand the patient on a stool alongside the operating couch. Place one's left thumb over the vein. Quickly lay the patient on the couch, pierce the vein with the needle, release the thumb, make sure that the needle is in the vein, and inject; or

(2) With the patient standing with a full vein and no

tourniquet, pierce the full vein with a needle. Let it bleed a drop or two, catching the drops on wool. Gently lay the patient down backwards on the couch, affix the syringe to the needle (which is now in an empty vein), draw blood into the syringe (to make sure the needle is still in the vein), and inject.

The tourniquet moreover is unpleasant for nervous patients, especially when pumped up to the arbitrary level of 180 mm. Hg. These "dodges" also save time.

I note that Mr. Bennett-Jones uses exclusively sodium salicylate 30 per cent. Sicard's work was done exclusively with this. But, from long experience with various sclerosing fluids, I have come to the conclusion that different fluids are indicated in different types of veins and also in different types of patients. I largely use lithium salicylate 35 per cent. with 1 per cent. Ethocaine (an injection fluid we owe to R. Maingot), which has all the advantages of sodium salicylate and none of its disadvantages. It has however one drawback that I recently pointed out (*Brit. Med. Jour.*, 1935, ii., 229)—viz., that clots seem to get bigger even ten weeks after an injection and lead occasionally to ulcers many weeks later. Therefore I avoid this fluid in superficially placed or thin-walled veins. Quinine is, I think, the most constant fluid to be effective; but patients do not like its associated momentary flushing of the face, buzzing head, and palpitation. Sodium morrhuate is most useful for small superficial veins, and its froth for skin venules. But it has its dangers in susceptible people (see *Brit. Med. Jour.*, 1933, i., 430, 674).

I would commend to Mr. Bennett-Jones the value of firm pressure over a large strip of the vein, for three days subsequent to its injection, of a firm wad of wool held in position by Elastoplast. In this way one secures smaller clots, a greater likelihood of occlusion, and, I am convinced, less chance of ultimate recanalisation.

I am, Sir, yours faithfully,

Liverpool, April 21st.

STUART MCAUSLAND.

## GASTRIC ACIDITY AND ITS SIGNIFICANCE

*To the Editor of THE LANCET*

SIR,—In an article under this title in your issue of Jan. 4th Prof. F. L. Apperly states that it was he who with Crabtree showed in 1931 that the  $\text{CO}_2$  content of the fasting blood plasma governed the acidity of the gastric contents after a test-meal in any one individual, and that the  $\text{CO}_2$  content of the plasma was responsible for the differences in gastric acidity existing between different individuals. I wish to call attention to the fact that this observation was made and described first by me (*Klin. Woch.*, 1924, iii., 1951), and that I subsequently enlarged on this subject in several other publications (*A New Approach to Dietetic Therapy, Metabolism of Water and Minerals and Its Disturbances*, Boston, 1933, &c.). I showed, in addition, that in reality it is the concentration of all the acid substances in the blood rather than that of  $\text{CO}_2$  alone that, in accordance with the rules of physicochemistry, influences the concentration of hydrochloric acid in the gastric cavity. The acid substance of the blood which is quantitatively most important is  $\text{CO}_2$ , and since the variations in the concentration of this acid are the most common occurrences, in most (but not all) cases a parallel behaviour might be found between its concentration in the blood and the gastric acidity.

In addition to the concentration of the acid substances in the blood I showed that there is another factor that influences the concentration of hydrochloric acid in the gastric cavity. This is the permeability of the membrane formed by those cells of the mucosa of the fundus of the stomach in which the production of hydrochloric acid takes place. If the permeability of this membrane decreases, as may occur as a consequence of a chronic gastritis, a low hydrochloric acid concentration or, in other words, a hypochlorhydria or achlorhydria may be found, notwithstanding the presence of a high  $\text{CO}_2$  concentration in the blood or, generally speaking, in spite of a "hyperacidemia." (This relationship is similar to the association of a high urea-nitrogen content in the blood with a low urea-nitrogen content in the urine as a consequence of decreased permeability of kidney cells in chronic glomerulonephritis.) The existence of a chronic gastritis and the consecutive decrease in the permeability of the gastric mucosa would explain the seeming contradiction (to which Dr. Hurst calls attention in your issue of Jan. 18th, p. 168) that notwithstanding there is a high  $\text{CO}_2$  content of the blood the hyperchlorhydria postulated by Apperly is absent in bronchial asthma.

Another statement made by Apperly is that "there is a direct relationship between the red cell content of the blood and gastric acidity." This observation also was first published by me in the year 1924 (*Zeits. f. d. ges. exper. Med.*, 1924, xli., 342, &c.). I described my findings in a statement that the higher the percentual volume of the red blood-cells in the whole blood ("hematocrit value") the higher the gastric acidity. The existence of this relationship was explained by the observation that both the hematocrit figure and the gastric acidity are governed by the concentration of the acid substances in the blood. Mention should be made, however, that the behaviour of the red blood-cells is identical with that of acid substances in the blood, so that not only are these former influenced by the concentration of the latter, but that the red blood-cells in their turn influence the concentration of the acid substances in the blood, hence influence the gastric acidity as well. Consequently, a hypochlorhydria or achlorhydria may follow if there is a decrease in the red blood-cell content of the blood, an occurrence which I described in 1924 as "hematogenous hypochlorhydria or achlorhydria" (*ibid.*, 1924, xliii., 247) and to which Apperly's anæmic achlorhydria corresponds.

It would appear, therefore, that Hurst goes too far in his contention that the red blood-cells do not influence the gastric acidity. In the production of the hydrochloric acid concentration in the stomach, however, consideration must not be given to the presence and physiological significance of only one acid substance, such as the erythrocytes, but to the concentration of all the acid substances. Thus the acids of the blood represented by the red blood-cells may be decreased on account of anæmia and yet the sum total of all the acids may be normal or higher than normal. This would explain the observation that anæmia may exist without achlorhydria or with normal hydrochloric acid concentration or even with hyperchlorhydria, the existence of such cases contradicting, as pointed out by Hurst, the assertion of Apperly that, when the red blood-cell content of the blood falls to about one-half or two-thirds normal, free acid disappears from the stomach.

I am, Sir, yours faithfully,

New York City, March 14th.

EUGENE FÖLDES.

### PROPHYLACTIC ENUCLEATION OF LOWER WISDOM TOOTH FOLLICLES

To the Editor of THE LANCET

SIR,—I am sure that the medical profession as a whole will be grateful to Mr. Bowdler Henry for bringing forward such an easy and entirely satisfactory procedure to cope with what is often a menace—namely, a badly impacted unerupted lower molar tooth. By such a prophylactic measure as Mr. Henry has introduced, all the numerous risks which are attendant upon maleruption are eliminated. Surgeons are familiar with some of the complications which follow the extraction of a badly unerupted third molar and it has been my lot to be called into consultation several times when fracture of the jaw has resulted from attempts to remove such a tooth. I can vouch that prophylactic enucleation is entirely free from trauma, and is quite a simple operation; one only wonders why such an easy remedy had not been thought of years ago.

I am, Sir, yours faithfully,

CECIL P. G. WAKELEY.

Queen Anne-street, W., April 22nd.

### PURPURA HÆMORRHAGICA FOLLOWING MEASLES

To the Editor of THE LANCET

SIR,—Your last issue contained an account of purpura complicating scarlet fever, and it may be of interest to put on record a case in which it followed measles.

A girl, aged 4, was admitted to this hospital on April 8th, with the provisional diagnosis of "black measles." It appeared that she had a measles rash on March 29th; on April 7th she came out with a hæmorrhagic rash and passed blood in the fæces and urine. She had widespread petechial and purpuric hæmorrhages all over the body and sordes of coagulated blood. The hands were a deep dark blue, the face pale and the child obviously poorly. Temp.,

99° F.; pulse-rate, 120. She was given 20 c.cm. of whole blood from her father, as well as glucose and saline intramuscularly. Both punctures bled very freely, but curiously when 20 c.cm. of scarlatinal antitoxin was given, also intramuscularly, the puncture did not bleed. She passed a dark tarry stool; the urine was bright red with blood. Blood-platelets numbered 35,000 per c.mm.; otherwise there was nothing strikingly abnormal in the blood. Prof. J. F. Wilkinson was consulted and advised intensive vitamin-C therapy, both oral and hypodermic; ascorbic acid was used, and in addition eight lemons were given daily. She continued to pass blood until April 15th, when both fæces and urine were clear. The skin gradually cleared, but peeled profusely and serum continued to ooze in places. She is making good progress towards complete recovery. On April 24th the blood-platelets were up to 100,000 per c.mm., and the general condition has improved considerably.

I am, Sir, yours faithfully,

W. EDGE,

Medical Superintendent, Ladywell Sanatorium and Isolation Hospital, Salford.

April 27th.

### OMNIPRATICIENS

To the Editor of THE LANCET

SIR,—I have just observed that in a circular emanating from the publishers of a medical book in Paris they state that "Tous les médecins (omnipraticiens et spécialistes) doivent avoir ce petit volume sur leur bureau." The word "omnipraticiens" is new to me, and I suppose is nearer akin to the English "general practitioner" than was the old expression "médecin praticien." I have no knowledge of how far the new word is generally used in France, but it is certainly compact if it means "general practitioner" as in English, and it may be quite useful to our own doctors visiting France if they wish to describe their position concisely in modern language.—I am, Sir, yours faithfully,

London, April 24th.

BLANCUS.

## PUBLIC HEALTH

### Revised Milk Designations

THE Milk (Special Designations) Order, 1936, was made available last Saturday and will come into force on June 1st. It supersedes the two draft orders which have been issued and lays down the new system of milk grading.

The grades at present in force are :—

Certified  
Grade A (tuberculin tested)  
Grade A  
(Grade A (pasteurised))  
Pasteurised.

There is no necessity for producers to conform to the standards established for these grades, and most milk sold to the public is undesignated. The new regulations make no change in this policy: they do not require that all milk shall be graded. Instead they continue the plan by which designations are given as a mark of commendation for efforts to reach a better standard.

The new scheme is simpler than the old, and essentially there are only three grades :—

Tuberculin-tested  
Accredited  
Pasteurised.

Additional descriptions may, however, be added by

producers who are suitably qualified. If tuberculin-tested milk has been bottled on the farm—like the present Certified milk—it may be described as tuberculin-tested (certified); if it has been pasteurised it will be called tuberculin-tested (pasteurised). Furthermore accredited milk may be described as "farm bottled." Hence the varieties available to the public (not necessarily in order of merit) will be—

Tuberculin-tested (certified)  
Tuberculin-tested (pasteurised)  
Tuberculin-tested  
Accredited (farm bottled)  
Accredited  
Pasteurised

and, of course, undesignated milk.

It will be observed that all tuberculin-tested milk will now be described as such—whether or not the term "certified" is applied in addition. The old requirements were that certified milk should contain not more than 30,000 bacteria per c.cm. and Grade A (T.T.) not more than 200,000; and until the end of this year the latter standard will hold good for the new T.T. grade. After that time the bacterial plate-count will be discontinued in favour of a methylene-blue reduction test (see THE LANCET, April 11th, p. 866). In addition, no coliform bacilli should be found in 0.01 millilitre—a requirement similar to that for Grade A (T.T.). Tuberculin-



tested milk (pasteurised) must contain less than 30,000 organisms per millilitre.

Accredited milk corresponds closely with the present Grade A. To qualify under the Milk Marketing Board's scheme, the accredited herds, like the Grade A herds, undergo routine examination by veterinary surgeons every three months, and the milk they yield will have to pass the same methylene-blue test as the T.T. milk. The cows, however, are not tested with tuberculin.

The regulations governing pasteurised milk are not substantially altered from those of 13 years ago, except that temperature records must be made and kept for not less than a month. It must contain fewer than 100,000 organisms per millilitre at any time before delivery to the consumer. The licensing authority for pasteurising establishments is, as before, the local sanitary authority (i.e., the council of a borough—including a metropolitan borough—or of an urban or rural district). But licences to producers of tuberculin-tested milk will in future be granted by the councils of counties and county boroughs and not directly by the Ministry of Health.

### INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED  
APRIL 18TH, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1858; diphtheria, 892; enteric fever, 29; pneumonia (primary or influenzal), 897; puerperal fever, 27; puerperal pyrexia, 103; cerebro-spinal fever, 25; acute poliomyelitis, 2; acute polio-encephalitis, 1; encephalitis lethargica, 5; dysentery, 45; ophthalmia neonatorum, 93. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 24th was 6528, which included: Scarlet fever, 972; diphtheria, 904; measles, 3335; whooping-cough, 560; puerperal fever, 10 mothers (plus 6 babies); encephalitis lethargica, 282; poliomyelitis, 5. At St. Margaret's Hospital there were 24 babies (plus 10 mothers) with ophthalmia neonatorum.

*Deaths.*—In 122 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 102 (46) from measles, 6 (2) from scarlet fever, 42 (11) from whooping-cough, 26 (6) from diphtheria, 51 (26) from diarrhoea and enteritis under two years, and 52 (5) from influenza. The figures in parentheses are those for London itself.

Measles remains the most fatal infectious malady of the period, the number of deaths for the last eight weeks working backwards being 102, 103, 81, 104, 114, 105, 84, 88 for the country as a whole, and 68, 60, 43, 62, 62, 58, 47, 38 for Greater London. Birmingham reported 4 deaths, Barking, Leyton, Southampton, Bradford, Liverpool, and Manchester each 3, no other great town more than 2. Birmingham also reported 4 deaths from whooping-cough, Liverpool, Manchester, and Wigan each 3. Deaths from diphtheria were reported from 16 great towns, no more than 2 from any one of them.

The number of stillbirths notified during the week was 291 (corresponding to a rate of 44 per 1000 total births), including 41 in London.

**A Festschrift for Dr. Lambotte.**—In recognition of his contributions to surgery, the friends, pupils, and patients of Dr. Albin Lambotte, of Antwerp, have decided to publish a jubilee book in his honour. The value of his work in bone surgery particularly in the open reduction of fractures and their fixation by metal prostheses, has had world-wide acknowledgment, and it is fitting that the book also should be international in its scope. Among the more than fifty contributors will be Albee, Fairbank, Hey-Groves, Leriche, Putti, Sauerbruch, Smith-Petersen, and Steindler. The work will be devoted to the surgery of bones and joints, and particulars may be had from Dr. Jean Verbrugge, 75, Avenue Van Ryswyck Antwerp, Belgium.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. T. J. O'Riordan to *Royal Sovereign*; L. F. Strugnell to *Pembroke* for R.N.B.; H. H. Babington to *President* for R.N. Recruiting Headquarters; and E. L. Markham, O.B.E., to *Pembroke* for R.N.B.

Surg. Lt.-Comdrs. S. J. Savage to *Drake* for R.N. Hosp., Plymouth; and D. C. Drake to *Guardian*.

Surg. Lt.-Comdrs. (D) A. A. Gardner to *Greenwich*; H. A. Ginn to *Valiant*; and A. W. Wallace to *Maine*.

Surg. Lts. A. F. Ferguson and H. P. L. Rhodes to *Drake* for R.N.B.; D. N. Williamson to *Victory* for R.N.B.; and J. B. Morris to *Pembroke* for R.N.B.

Surg. Lts. (D) A. W. Y. Price to *Pembroke* for R.M. Infirmary, Deal; and W. C. G. Ford to *Malabar* for R.N. Hosp., Bermuda.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lts. J. E. L. Morris to *Ramillies*; and F. J. S. Gower (proby.) to *Curacao*.

Surg. Sub-Lt. R. T. Gaunt to be Surg. Lt.

Surg. Sub-Lts. J. Scott to *Pembroke* for R.N. Hosp., Chatham; P. de B. Turtle to *Vernon*; and R. T. May to *Royal Sovereign*.

### ROYAL ARMY MEDICAL CORPS

Lt.-Col. W. H. S. Burney, having attained the age for retirement, is placed on ret. pay.

Maj. R. E. Barnsley, M.C., to be Lt.-Col.

Short Service Commissions: Lts. G. S. Musgrove and N. I. McLeod to be Capt.

Maj. B. H. C. Lea-Wilson is secd. for serv. under the Foreign Office.

### REGULAR ARMY RESERVE OF OFFICERS

Maj. J. W. Houston, D.S.O., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

### ARMY DENTAL CORPS

Short Service Commissions: the undermentioned to be Lts. (on prob.): D. V. Taylor, D. S. Wilson, and R. Walker.

### TERRITORIAL ARMY

Capt. J. R. Robertson is restd. to the Estab.

Lts. A. Cowie and C. K. D. Edwards to be Capt.

Supernumerary for service with O.T.C.: S. M. Whitteridge (late Cadet, Univ. Coll. Sch. Contgt., Jun. Div., O.T.C.) to be Lt. for duty with the Univ. of Lond. Contgt. (Med. Unit), Sen. Div., O.T.C.

### TERRITORIAL ARMY RESERVE OF OFFICERS

Capt. R. M. Allardyce, from Active List, to be Capt.

### ROYAL AIR FORCE

Flight Lts. G. W. McAleer to Medical Training Depôt, Halton; C. G. Harold to Central Medical Establishment, London.

Flying Officer F. W. Whitehead to Medical Training Depôt, Halton, on appointment to a short service commission.

W. J. Fowler is granted a short service commission as Flying Officer with effect from Dec. 2nd, 1935.

Flight Lt. R. G. Freeman is promoted to the rank of Squadron Leader.

### INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: A. C. Craighead, P. H. S. Smith, and H. J. H. Symons.

Cpts. to be Majs.: M. K. Afridi and G. S. Chawla.

Lt. (on prob.) E. H. Wallace is seconded while holding an appt. at the Cumberland Infirmary, Carlisle.

Capt. V. A. Edge retires.

**ELIZABETH GARRETT ANDERSON HOSPITAL, LONDON.** The accounts for last year show an excess of income over expenditure of £385, and during the past year 2264 patients were admitted. An appeal was made in 1935 for £50,000 for the new nurses' home and private patients' wing.

## PARLIAMENTARY INTELLIGENCE

### NOTES ON CURRENT TOPICS

#### The Budget and the Social Services

ON April 22nd the House of Commons went into committee of ways and means on the Budget resolutions.

Mr. PETHICK-LAWRENCE said he doubted whether in peace time any Budget statement so staggering in its future outlook had ever been presented in that House. Was there no prospect that the resources of the nation were to be utilised for the development of the country as a whole? Were they to see an enlightened change in the treatment of the unemployed, and the abandonment of the cruel and indefensible means test? No. The policy of the Chancellor of the Exchequer squandered national prosperity by increasing armaments. The Labour Party, quite as much as their opponents, believed in the defence of the country, but they believed that defence depended on foreign policy.

Sir ARCHIBALD SINCLAIR said that the Liberal Party did not deny the necessity for adequate provision for defence against foreign aggression, but they said that defence problems must be considered as a whole. They urged that the Government should work for peace and economic co-operation between all countries with as much will and energy as they were throwing into their policy of rearmament.

Mr. MINTO RUSSELL said the rearmament programme was an insurance premium which had got to be paid; there were other fields in which the national expenditure could be drastically cut down. He suggested the setting up again of a committee on the lines of the May Committee to investigate how this could be done. He asked the Chancellor to consider the advisability of broadening the basis of direct taxation. There were at the last election some 31,000,000 electors, and only 3,000,000 direct taxpayers. He saw the gravest danger of certain sections of the electorate voting to themselves, either consciously or subconsciously, benefits and amenities at the expense of other sections. To lower the basis of direct taxation would help to bring into clearer relief the correlation between cause and effect. Unless there was some greater control over finance, the country would find itself again going down the slippery slope.

Mr. BENSON said that in spite of the tremendous growth of the wealth of the country, there was the shameful fact that 50 per cent. of the population still showed signs of malnutrition. In this Budget the Chancellor had thrown a still greater burden on the indirect taxpayer, who was primarily the small man. Of the proposed increase of £64,000,000 in expenditure, a bare £3,000,000 was allocated for the distressed areas. Apparently he did not anticipate any more social legislation for the next 12 months. He had made no allowance for the new scales of unemployment benefit.

Mr. M. BEAUMONT said that they could not redistribute wealth through high taxation and social services and through increased wages at the same time. He believed that the latter was the sounder way. They would be foolish if they believed that this increased expenditure on armaments was temporary. The country was now able to carry the burden because it was on the upward grade of a trade cycle. But they were approaching the point where they would not be able to find new sources of revenue with which to meet the national liabilities.

Mr. DAVID ADAMS urged special treatment for the distressed areas. There ought to be specific grants made for each of the social services in order to equalise to some extent the huge disparity in rating burdens.

Mr. R. J. TAYLOR regretted no mention in the Budget speech of the problem of maternal mortality. Those who were going into the Army wanted something to fight for, not surtax payers, but decent comfortable homes.

Sir ISIDORE SALMON said that he did not think a better method could be found of giving the people something in their homes than by finding work for them.

Mr. DALTON suggested that the Chancellor should consider next year whether the surtax limit should not be brought down from £2000 a year to £1500 a year. By that means he estimated they would bring in at least 40,000 more contributors, and bring under taxation at least £70,000,000 more of income each year.

Mr. W. S. MORRISON, Financial Secretary to the Treasury, replying to the debate, claimed that the securing in time of danger of adequate defences for the nation was a true work of national importance which every citizen had an absolute right to see carried out. All other expedients for using the public credit for various purposes of a sectional or local character, important and valuable as those works might be, faded into insignificance when compared with the primary task of seeing that the country had adequate defences which would enable it to play its full part in a policy of collective security and would put us in the last resort in a position, not to be a menace to our neighbours, but, if the idea of force prevailed in the world, to render it a more difficult and dangerous enterprise for anyone to attack us.

#### THE DEBATE RESUMED

ON April 23rd Mr. MCGOVERN said that during the financial crisis of 1931 large numbers of people were involved in considerable suffering and sacrifice. They were led to believe that those sacrifices were temporary, and that when prosperity returned the Government would make good the losses which the people were being asked to bear. As a result of this so-called crisis social reform seemed to have been relegated to the background, and since 1931 no first-class measure of social reform had been passed in this country. Changes were made by the Act of 1932 that took away the right to maternity benefit from a large number of wives of unemployed men and also took away medical rights. Surely they ought now to annul those extreme measures and give these people the security to which they were entitled.

Mr. CHURCHILL recalled that the Chancellor had referred with pride to the increasing growth of our social services. He shared in that feeling. The social services must not be considered as a weakening of the strength of the nation. He believed that those services had given us that foundation which was essential to national unity and without which it would be hopeless for us to attempt to make headway against the many perils which were moving towards us.

Mr. MORGAN JONES said that the distressed areas had been described as a creeping desert. The people in those areas were as much entitled as any other section of the community to generous consideration.

Mr. ELLIS SMITH said that unless the Government dealt with the means test very soon it would be faced with a similar position to that with which it was faced not very long ago. Throughout the country, particularly in the North, men were being driven to suicide, and domestic friction was being created unnecessarily. He asked for a drastic change in the administration of the means test and the early introduction of new unemployment regulations.

Mr. LYONS said that our social services—the greatest ever known—had continued unimpaired. Something had been said in the debate about the omission of the Budget to deal with maternal mortality, but in a few days the House would consider

a Bill providing, for the first time in this country, for a national system of paid nursing services to expectant mothers. It was no use saying that maternal mortality, deplorable as the figures were, was one of those things which could be related to unemployment. Nobody would deny that unemployment, malnutrition, and bad nursing were factors which had to be provided for, and which he hoped would be provided for when a full account was taken. But they were not all. Whatever might be our duty to the country and to collective security, there was to be no reduction in the social services and no halting in their progress.

Sir ARNOLD WILSON suggested that it was within the power of the Government to get better value for what they were spending. He found from the report of the Charity Commissioners for 1934 that there were 244 charities for blind persons. There were only 63,000 blind persons in England; one society for every 250 persons. That was a waste of money. As many charities were entitled to a rebate of income-tax the Chancellor might reasonably inquire from the Commissioners a certificate that they were efficiently organised, and that there was no overlapping. They would have to get back before long to the minority report which advocated the breaking up of the 6000 independent units of friendly societies and the reconstitution of them on a basis of county and county borough, making the cost of administration far less.

Mr. ARTHUR GREENWOOD said that this was a war budget with no consideration for the social services. The scale on which rearmament had been envisaged by the Government would necessitate an expenditure so large that it could only be met by increased taxation of the rich or by further impoverishing the poor and putting posterity in pawn.

Mr. CHAMBERLAIN, replying to the debate, said this was a Defence budget. He had deliberately put on fresh taxation because he believed that the people of this country ought to feel that they had to pay for the necessities of the situation.

#### Paying Patients in Voluntary Hospitals

On April 28th Standing Committee B of the House of Commons considered the Voluntary Hospitals (Paying Patients) Bill.

Clause 1, which defines the meaning of the terms "voluntary hospital," "committee of management," and "Order," was agreed to.

Clause 2 provides for accommodation for and charges to paying patients, and subsection (4) enacts that the Charity Commissioners may, from time to time on the application of the committee of management, vary or revoke an Order authorising the provision of such accommodation and treatment if in their opinion there has been any material change in the circumstances existing when the Order was made.

Mr. R. J. DAVIES moved an amendment to provide that the Order might be varied or revoked if for any other reason the Charity Commissioners thought it was expedient. He said that the object of the Bill was the very simple one of removing the legal obstacles that now stood in the way of providing private accommodation in hospitals for persons requiring surgical or other treatment and were able and willing to pay for such treatment. So far, they agreed to the full with that proposal. They had a feeling, however, that in the case of persons who could afford to pay they might, by the Bill, take up accommodation for what might be called members of the middle-class community, and that by doing that—although with the very best intentions and it was necessary it should be done—they might preclude the provision of accommodation for those who required the same treatment, but could not afford to pay at all. The amendment sought to give power to the Charity Commissioners so to vary the Orders that the point he raised would be met. If

the promoters of the Bill would accept the idea propounded in the amendment and put down words on the Report stage to meet the case, he would not unduly press the amendment.

Mr. STOREY said that the amendment was based on a misconception. He differed from Mr. Davies in the view that under the Bill accommodation which should be free might be taken up. His experience of hospitals was that the provision of accommodation for paying patients freed the ordinary beds. In a hospital with which he had been very closely connected for many years, they took into the ordinary wards patients who could afford to pay. They provided accommodation for paying patients and thereby freed beds in the ordinary wards because the paying patients went into the paying wards. Clause 4 of the Bill contained a general overriding provision that an Order should not be made if it would result in less accommodation being available. As Clause 2 was now drawn, any material change of circumstances would enable the Charity Commissioners to revoke or vary the Order. That would apply, for instance, if a hospital suddenly had more funds that would enable it to treat ordinary patients, or any other circumstance of that sort.

The point which really weighed with him was that if they were to go out and collect money for paying patients' wards, they must be able to give some security to the persons who provided the money. They would have difficulty in collecting money for such wards if they had to tell the subscribers that the Charity Commissioners could come along and, for any other reason unspecified, change the whole purpose of the trust for which the money was being given. If there were an unexpected demand for ordinary beds, and if a hospital had the ability to finance ordinary beds, that would be a material change of circumstances which would enable the Charity Commissioners to step in; but they ought not to be left with power for any other reason unspecified to vary a trust which had been created for a specific purpose. These Orders would be made for a period, and it would then be possible for them to reconsider the Order if there had been any material change in the circumstances.

Mr. DAVIES said he would withdraw the amendment and consider what should be done on the Report stage.

Mr. STOREY said he would be willing to discuss the matter before the Report stage and if they could agree on some form of words which would give the security required he would be very glad.

Mr. W. A. ROBINSON asked if there was any possibility of the Bill cutting across any existing schemes such as the penny in the £ scheme.

Sir ALAN ANDERSON, as one who had had a great deal to do with the finances of hospitals in London since the war, said that so far from the existence of pay-beds reducing the number of beds available for persons who could not pay, it had had exactly the opposite effect. The movement for paying wards was a very great advance in the facilities available for those persons who could not afford to pay.

Mr. FRANK ANDERSON asked if there was anything in the Bill which would safeguard the position of paying patients with regard to doctors' fees. He wanted to be assured that if patients came into this category they would not be subjected automatically to an increase in the doctors' fees. He had a case in mind, which occurred not long ago, where a patient went into a certain institution not far from Manchester. The doctor, in the first place, said that the fee would be two guineas, but when it was found that the person in question was possibly able to pay more, the doctor immediately increased the fee to three guineas.

Sir DONALD SOMERVELL, Attorney-General, said that the Bill was designed solely to provide a convenient procedure whereby certain hospitals could get over legal obstacles which now prevented them

from establishing beds for paying patients. Those hospitals, and there were many of them, which could start paying beds by the terms of the trusts under which they operated, without having to come to Parliament for a private Act, or to take any step of that kind, would be quite unaffected. The Bill was merely designed to provide a convenient procedure in the case of those hospitals which, by reason of a private Act of Parliament, or their original trusts, were not able, without parliamentary sanction, to undertake such a scheme. There was general agreement in the Committee that this was a desirable object. Penny in the £ schemes, or twopenny contribution schemes, which were so valuable an aid to hospital finance, were outside the Bill altogether and had nothing to do with it. The point raised by Mr. Anderson, as to the actual arrangements which particular hospitals might make as to doctors' fees, was also outside the Bill. They could operate with or without the Bill. The whole question of what charges should be made and what charges were proper, was one which affected all the hospitals of the country, and all that the Bill did was to say that those hospitals which could not proceed at present under their own powers, and would have to come to Parliament for a Private Bill could go to the Charity Commissioners and get an Order. It was quite true that that Order would, as part of its terms, deal with the general charges that should be made, and would no doubt follow what seemed to the Charity Commissioners—he thought they could be trusted in this matter—to be a proper and reasonable scale to apply to any scheme they might draw up.

Mr. STOREY, replying to points raised by other members, said that the Bill would ensure that the provision for pay beds would be met out of monies given for the purpose, and that existing funds available under the original trusts would not be used, except in circumstances that would cause no loss of facilities for ordinary patients. Land must not be used unless it would not in any case be used for ordinary beds; existing buildings would not be used unless it was not possible to use them for ordinary patients, or they were not required for ordinary patients owing to lack of demand: or unless the hospital authorities provided additional buildings in exchange. If he thought that the Bill would harm the Penny in the £ scheme he would oppose it. The question of doctors' fees for services from the resident staff was covered in the Bill. If special treatment was required that would be a matter for arrangement between the patient and the doctor concerned.

Mr. ANDERSON said that if a patient had entered an institution and it was found that possibly he could afford to pay more, he should have the right to know whether or not a proper charge was being made on him in accordance with the Order.

Mr. STOREY said that there would be a definite scale of charges laid down for the whole treatment rendered by a hospital and its resident staff. That scale of charges could not cover specialist fees for professional services rendered by visiting surgeons or physicians.

The amendment was withdrawn and the clause was agreed to.

[The remaining clauses were agreed to, and the Bill was ordered to be reported, without amendment, to the House.]

In the House of Commons on Wednesday, April 22nd, Mr. CLEMENT DAVIES presented the Buckingham Charity in Dunstable Bill, a measure "to confirm a scheme of the Charity Commissioners for the application or management of the Charity of Arthur Frederick Buckingham for a cottage hospital in the borough of Dunstable in the county of Bedford." The Bill was read a first time.

On Monday, April 27th, the Bill was read a second time.

## HOUSE OF COMMONS

WEDNESDAY, APRIL 22ND

### Medical Facilities in Palestine

Captain STRICKLAND asked the Secretary of State for the Colonies whether he was aware of the complaints as to the existing dangerous condition of the road between Jaffa and Haifa, and that on many occasions large communities were completely isolated, unable to market their produce or even secure medical assistance during one-third of the year; and if he was yet in a position to state to what extent the construction of the road between these two places was to be accelerated during the current year.—Mr. THOMAS replied: I am aware that complaints have been made. The expenditure of £25,000 on the construction of the road during the current year has already been approved, and I hope that, if the financial position permits, it will be possible to make increased provision later in the year.

### Poison Gas and Food Contamination

Mr. WILSON asked the Minister for the Coördination of Defence what steps had been or were being taken in Sheffield for the prevention of the contamination of food-supplies in the event of an air attack in which poison gas was used.—Sir T. INSKIP replied: I am not aware of any particular steps which have been or are being taken in Sheffield, but I am informed that the Home Office is preparing for general guidance a memorandum on the protection of food-supplies against gas contamination. When this is published local authorities will be asked to take whatever precautions seem desirable, acting in collaboration with local merchants and purveyors of foodstuffs.

### Death of Child at a Children's Home

Mr. LOVAT-FRASER asked the Minister of Health if his attention had been called to the death of a boy of six years of age at the Burnham-on-Sea Children's Home on Feb. 9th, in respect of which a jury returned a verdict that the cause of death was shock caused by intense cold in a case of malnutrition of body and multiple minor injuries; and if he would ascertain and inform the House what were the multiple minor injuries from which the child was suffering.—Sir KINGSLEY WOOD replied: I am aware of this case which has received careful consideration and has been fully investigated by a special committee appointed by the county council as a result of which the appointment of the matron of the home has been terminated.

MONDAY, APRIL 27TH

### Accredited Milk Producers' Scheme

Sir PERCY HURD asked the Minister of Agriculture how many milk producers had entered the accredited milk producers' scheme and the amount of their gallonage in relation to the total milk sales in England and Wales.—Mr. ELLIOT replied: The number of accredited producers as at April 1st, 1936, was 15,762. The number who were on the roll during March was 15,350, and sales by these producers in that month under the Milk Marketing Scheme amounted approximately to 24½ million gallons, equal to nearly 30 per cent. of the total sales under the scheme during that month.

### Cleanliness of Imported Butter

Mr. LAMBERT asked the Minister of Health if he had information as to the condition of the cows in the Soviet Union, Finland, Estonia, Latvia, and Lithuania from which countries butter was exported to Great Britain; and if he was satisfied as to the cleanliness of the methods employed in making such butter.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: No, Sir, but my right hon. friend is advised that practically all milk and cream used in the preparation of imported butter is pasteurised.

TUESDAY, APRIL 28TH

### Overcrowding in Scotland

Mr. MAXTON asked the Secretary of State for Scotland how many reports as to the state of overcrowding had

now been received, what percentage that number was of the total, and what was the percentage of overcrowded houses as revealed by the reports.—Sir GODFREY COLLINS replied: Reports have been received from 216 local authorities, representing 94.7 per cent. of the total number of local authorities in Scotland. The percentage of overcrowding in surveyed houses as revealed by these reports is 23.5 per cent.

#### National Health Insurance and Dental Benefit

Sir ARNOLD WILSON asked the Minister of Health (1) how many men and women, approximately, were entitled to dental benefit at the rate of 50 per cent., more than 50 per cent., less than 100 per cent., and 100 per cent. of the cost of treatment, respectively; and how many men and women so entitled in each category actually received treatment during 1934; (2) whether he was aware that the amount spent on dental benefit under the National Health Insurance Acts had fallen steadily from £2,425,000 in 1930 to £1,791,000 in 1934, whereas the sum of £2,437,000 was available in that year for dental benefit; and whether, in view of the need for an extension of dental benefit to all insured persons, he would initiate special inquiry into the position; and (3) whether he was aware that, out of an insured population of 12,000,000 men and 6,000,000 women, only 9,000,000 men and 2,000,000 women were at present entitled to dental benefit,

and of the 11,000,000 persons thus eligible only 700,000 received treatment of any kind during 1934; and whether, in view of this evidence that the dental benefit scheme was not meeting the needs of insured persons, he would initiate a special inquiry into the position.—Sir KINGSLEY WOOD replied: The figures given by my hon. friend are approximately correct. As he is aware, however, dental benefit can be provided under the National Health Insurance Act only by an approved society which has a disposable surplus on valuation and which elects to include it in its scheme of additional benefits. It is estimated that about two-thirds of the insured persons entitled to dental benefit are covered by schemes which provide for the payment of 50 per cent. of the cost of treatment. The proportion of the total entitled to receive the full cost of dental treatment is very small. No particulars are available as to the numbers of men and women in the various categories referred to, and to obtain this information it would be necessary to ask for a return from each of the 5000 societies and branches which provide the benefit. The Royal Commission on National Health Insurance in 1926 reported that the provision of dental benefit as a statutory benefit available to all insured persons could be met only by an increase in the contributions, and nothing has since arisen in the conclusion. I am not therefore prepared to institute a special inquiry as suggested by my hon. friend.

## MEDICAL NEWS

### Society of Apothecaries of London

At recent examinations the following candidates were successful:—

*Surgery.*—O. H. Galloway, Royal Colleges, Edinburgh; L. Gottlieb, Univ. of Frankfurt and London Hosp.; M. G. H. Jones, Welsh National School of Medicine and St. Mary's Hosp.; N. Mukherjee, Univ. of Durham; M. A. Partridge, Univ. of Oxford and Guy's Hosp.; E. C. Randell, Royal Free Hosp.; C. J. S. Sergel, Univ. of Cambridge and St. Mary's Hosp.; and P. Tobin, Middlesex Hosp.

*Medicine.*—B. Jensen, Univ. of Liverpool; P. D. Lynch, Guy's Hosp.; E. C. Randell, Royal Free Hosp.; H. M. Sinclair, Univ. of Oxford and Univ. Coll. Hosp.; and J. W. Thomas, Welsh National School of Medicine.

*Forensic Medicine.*—B. Jensen, Univ. of Liverpool; P. D. Lynch, Guy's Hosp.; E. C. Randell, Royal Free Hosp.; H. M. Sinclair, Univ. of Oxford and Univ. Coll. Hosp.; H. W. Smithies, St. Mary's Hosp.; and J. W. Thomas, Welsh National School of Medicine.

*Midwifery.*—C. L. Blacklock, Univ. of Cambridge and Guy's Hosp.; J. T. Boocock, Univ. of Leeds; E. R. Brown, Guy's Hosp. and Univ. of Leeds; N. Mukherjee, Univ. of Durham; E. C. Randell, Royal Free Hosp.; F. Schwartz, Charing Cross Hosp.; H. M. Sinclair, Univ. of Oxford and Univ. Coll. Hosp.; and R. L. Williams, London Hosp.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery: M. G. H. Jones, P. D. Lynch, M. A. Partridge, E. C. Randell, and H. W. Smithies.

### Institute of Medical Psychology

The Sir Halley Stewart trust has granted a research fellowship for three years to this institute, and it has been awarded to Dr. Erich Wittkower for the continuation of his research on the influence of the emotions on the functions of the organs. His monograph on this subject, based on work at the Charité in Berlin, and latterly at the Maudsley Hospital, was reviewed in our issue of March 21st (p. 673).

### Chadwick [Public] Lectures

On Thursday, May 7th, at 8.15 p.m., at the Royal Institute of British Architects, 66, Portland-place, London, W., Mr. S. D. Adshead, professor of town-planning in Liverpool University, will give a lecture on London under statutory town-planning. On Thursday, June 11th, at 5 p.m., in the Chelsea Physic Garden, Swan-walk, S.W., Sir William Wilcox will lecture on plant pharmacology and medical practice. Both meetings have been arranged by the Chadwick Trust, and further information may be had from the secretary at 204, Abbey House, London, S.W.1.

Mr. G. Gordon-Taylor has been elected a corresponding fellow of the Vienna Surgical Society.

### International Congress of Dentists

We are informed that the ninth International Congress of Dentists will be held in Vienna in August, and the International Dental Exhibition, which will be held there at the same time.

### University of London Medical Graduates Society

The annual general meeting and dinner of this society will be held at the Langham Hotel, Portland-place, London, W., on Tuesday, May 12th, at 7 for 7.30 p.m., when the guest of honour will be Mr. H. L. Eason, the vice-chancellor of the University. The hon. secretary may be addressed at 38, Queen Anne-street, London, W.1.

### Demonstrations of Contraceptive Technique

On Thursday, May 7th, at 2.30 p.m., a practical demonstration of the technique of the use of a variety of contraceptive methods will be given by Mrs. Marie Stopes, D.Sc., and Dr. Evelyn Fisher. Medical practitioners and senior students only should apply for tickets to the hon. secretary of the Society and Clinic for Constructive Birth Control, 108, Whitfield-street, London, W.1.

### The Guardianship Society

At the annual meeting of this society at Brighton on April 18th the gathering stood in silence as a tribute to the memory of the late Miss Grace Woodhead, the founder and hon. secretary of the society. When she was living at Heathfield in Sussex some 35 years ago, Miss Woodhead had the idea of boarding out London children for country holidays. This drew her attention to the large number of children who were mental defectives, and in 1913, in compliance with the Mental Deficiency Act of that year, she formed the society and moved her headquarters to Brighton. The growth of the work is marked by the fact that during 1935 no fewer than 1190 cases were under the care of the society in an occupational centre, on training farms, or in charge of foster parents. Dr. S. E. Gill, formerly a commissioner of the Board of (Lunacy) Control, has taken over the duties of hon. secretary, and he is also medical director. At the meeting an address was given by Dr. F. Douglas Turner, medical superintendent of the Royal Eastern Counties Institution at Colchester. He said that the higher-grade mental defectives could with proper care and training be made fit to play a useful part in the world's affairs. The society was playing an important part in the struggle for the ideal of a resocialisation of the mentally deficient.

**King's College Hospital, London**

An anonymous donor has given £4000 of housing stock to this hospital. The money is to be available for general purposes.

**New Municipal Hospital at Huddersfield**

A site has been chosen for a new municipal hospital which is to be erected at a cost of £100,000, and is to have 160 beds with accommodation to allow extension to 250 beds.

**Gift to St. Mary's Hospital, London**

Lord Beaverbrook has given £24,900 to this hospital. In 1929 he gave £63,000 towards the rebuilding of its medical school.

**Post-graduate Course at St. Bart.'s**

A post-graduate course, open to all medical practitioners, will be held at St. Bartholomew's Hospital medical college on June 18th, 19th, and 20th. On Thursday afternoon surgical and medical cases will be shown, and there will be a pathological demonstration. Members of the course will also be welcome in the operating theatres on that afternoon. Lectures will be given on Friday by Dr. F. G. Chandler (asthma and emphysema), Mr. Basil Hume (surgical treatment of gastric and duodenal ulcers), Mr. F. C. W. Capps (diagnosis and treatment of sinusitis), Mr. S. L. Higgs (deformities of the spine), Prof. L. J. Witts (anæmia in women), and Mr. R. S. Corbett (fractures of the leg), and on Saturday by Prof. Paterson Ross (head injuries), Dr. Geoffrey Bourne (the use and action of drugs in heart failure), Mr. John Beattie (contraceptives), Mr. H. W. Rodgers (technique and uses of gastroscopy), and Dr. A. W. Spence (recent advances in hormone therapy). The course will conclude with a lecture on anæsthesia and analgesia in labour. Further information may be had from the dean of the college.

**Progress in Maternal and Child Welfare**

Sir Kingsley Wood, Minister of Health, speaking on Monday at the annual general meeting of the East End Maternity Hospital, gave figures showing the progress and results of maternity and child welfare work in England and Wales during 1935. The outstanding event of the year was the establishment of a new low record in the rate of deaths of infants under one year of age, the figure for England and Wales being 57 per 1000 live births, as against 66 in 1931, 83 in 1921, and 130 in the year 1911. The key to the reduction of infant mortality had been in particular, he thought, the education and instruction of the mother through the infant welfare centres, the health visitors, and the institutions dealing more especially with maternal care. The number of infant welfare centres had increased by 117 during the year, and now numbered over 3300. The number of children under one year of age who attended them for the first time during the year was 351,000, being 58 per cent. of the total number of births during 1935. Visits were paid by health visitors to 584,000 children under one year of age, being over 97 per cent. of the total births. It was also satisfactory, though there was need for expansion, that 588,000 children between the age of 1 and 5 years attended the centres in 1935 against 546,000 in 1934. It was a matter of concern on the other hand that the recorded rates of maternal mortality had remained comparable with those of 30 years ago. The provisional figure for 1935 of maternal deaths per 1000 live births in England and Wales had however been found to be 4·10, which compared with a rate of 4·60 for 1934, and was the lowest figure recorded since 1925 when the rate was 4·08. The actual number of maternal deaths in 1935 was 2457, or 291 less than in 1934, although the number of births in 1935 was rather more than in 1934. But there was much more to be done in investigation and endeavour. It was a gratifying fact that for the years 1921-28 the maternal mortality-rate of the patients of the East End Maternity Hospital was only 0·68 per 1000 births, and that in the seven years that followed only 21 deaths had occurred in over 13,500 confinements.

**Air Ambulances in Britain**

Speaking at the annual meeting of the Surrey branch of the British Red Cross Society at Wimbledon last Monday, Mr. S. J. Noel-Brown said that Great Britain is much behind other countries in air ambulance services; "France, Sweden, Italy, Poland, and the United States all have organised ambulance organisations, but, generally speaking, we are years behind." The society had given a valuable lead by the formation of its air ambulance detachment, and one of the leading makers of civil aircraft was completing the first British complete aeroplane to be designed and built as a flying hospital. In addition to the usual equipment of a dressing station, the machine would carry blood transfusion apparatus and an oxygen tent. The air would provide rapid and comfortable transport for the sick and injured, and it was reasonable to anticipate that in the not distant future every municipal authority possessing its own aerodrome would have its own air ambulance units.

**Appointments**

- ASHBY, W. R., M.D. Camb., D.P.M., has been appointed Pathologist, St. Andrew's Hospital, Northampton.
- BRAMLEY, G. F., M.D. Leeds, D.P.H., Medical Officer of Health for Bexley.
- LOWE, JOHN, M.D., F.R.C.S. Edin., Chief Medical Officer and Superintendent to the G.W.R. Medical Fund Society, Swindon.
- POLLITT, ALFRED, M.B. Dub., D.M.R.E., Assistant Radiologist at University College Hospital.
- Medical Referee under the Workmen's Compensation Act, 1925: GEORGE LOUIS MALCOLM SMITH, M.B., Ch.B., F.R.C.P., of Edinburgh, for the Midlothian and Peebles Sheriff Court Districts (Sheriffdom of the Lothians and Peebles).
- London County Council Hospital Staff.*—The following appointments, promotions, and transfers are announced. A.M.O. (I.) and (II.) = Assistant Medical Officer, Grades I. and II.:
- GRAY, G. M., M.B. Edin., F.R.C.S. Eng., A.M.O. (I.), St. Mary Abbots;
- BAGSHAW, H. B., M.R.C.S. Eng., F.R.C.S. Edin., A.M.O. (I.), Lambeth;
- DORLING, G. C., F.R.C.S. Eng., A.M.O. (I.), St. Alfege's;
- JAMES, CLIFFORD, M.D. Lond., A.M.O. (I.), Lewisham;
- HURFORD, J. V., M.D. Belf., D.P.H., A.M.O. (II.), Colindale;
- MCILROY, ALEXANDER, M.B. N.Z., A.M.O. (II.), New End;
- GRIFFIN, T. F. R., M.B., A.M.O. (I.), Mile End;
- FARRINGTON, G. G., M.B. Lond. A.M.O. (I.), St. George-in-the-East;
- HART, V. E. L., M.R.C.S. Eng., A.M.O. (II.), Lewisham;
- OLDAKER, JOAN M., M.B. Lond., A.M.O. (II.), St. Leonard's;
- QUINN, T. R., M.B. Sydney, F.R.C.S. Edin., House Surgeon, St. Mary Abbots;
- MCWHIRTER, J. R., M.B. Belf., House Physician, St. Luke's (Chelsea);
- HYNES, H. T. J., M.R.C.S. Eng., House Physician, Dulwich;
- BURBRIDGE, D. H. D., M.R.C.S. Eng., House Physician, St. Andrew's;
- WARDALE, ALAN, M.R.C.S. Eng., House Physician, St. Giles';
- BARNES, J. E. M., M.R.C.S. Eng., House Physician, St. James';
- BARRITT, JOHN, M.D. Irel., House Surgeon, St. James';
- HENRY, T. C., M.R.C.S. Eng., House Physician, St. James';
- STEIN, SIDNEY, M.R.C.S. Eng., House Physician, St. Giles';
- LIPPIST, W. N., M.R.C.S. Eng., House Physician, St. Olave's;
- MACLEAN, W. E., M.B., Ch.B. St. And., House Physician, St. Olave's;
- SALKFIELD, J. P., M.R.C.S. Eng., House Physician, St. Mary Abbots;
- PARK, JACK, M.B. Edin., House Surgeon, St. Mary Abbots;
- SEGALOV, COLEMAN, M.R.C.S. Eng., House Physician, St. Alfege's;
- ERSKINE, DAVID, M.B. Lond., D.P.H., House Physician, North-Western;
- WALKER, E. O., M.R.C.S. Eng., A.M.O. (II.), St. Luke's (Chelsea);
- ANDERSON, I. G., M.B. Lond., A.M.O. (II.), Lewisham;
- ROSS, J. A., M.B. Edin., A.M.O. (II.), St. Andrew's;
- CLOTHIER, JOHN G., M.B., House Physician and House Surgeon, St. Alfege's;
- LILLIS, W. J. P., L.R.C.S. Irel., Senior A.M.O. (II.), Northern;
- LOYD, E. T., M.R.C.S. Eng., D.P.H., Senior A.M.O. (II.), South-Western;
- DENNISON, F. R., M.D. Lond., D.P.H., A.M.O. (I.), Colindale;
- BRADBURY, ERIC, B.Chir. Camb., A.M.O. (I.), St. Peter's;
- BAX, E. C., B.Sc., L.M.S.S.A., A.M.O. (II.), Constance-road Institution;
- FURST, H. C., B.Sc. Sydney, L.R.C.P. & S. Edin., A.M.O. (I.), Lambeth;
- BYRNE, P. A., M.B., B.Ch., B.A.O. Dub., A.M.O. (II.), Constance-road Institution;
- BJORREBOREN, MARGARET E., M.R.C.S. Eng., D.P.H., Senior A.M.O. (II.), Northern;
- PEARCE, RICHARD, M.D. Camb., A.M.O. (I.), Paddington.



NOTES, COMMENTS, AND ABSTRACTS

JOINT LUBRICATION

BY ERIC SHIRLEY JONES, M.R.C.S. Eng.

BECAUSE the engineer has an extensive knowledge of lubrication in machine bearings, it is instructive to apply his principles to the human joint, and in a former article I described experiments which showed the value of synovial fluid as a lubricant (THE LANCET, 1934, i., 1426).

In 1886 Osborne Reynolds formulated his law<sup>1</sup> which states that a well-lubricated shaft, rotating at a fair speed, becomes separated from its bearing by a film of liquid oil, which is under pressure. The frictional resistance is then entirely due to the viscosity of the oil. Much work has since been done and present knowledge may be roughly summed up by considering a horizontal shaft, at first stationary in its bearing, and then rotating at some speed.<sup>2</sup> At rest, the shaft lies in line-contact with the bearing, so that no fluid oil intervenes and there is a form of solid contact

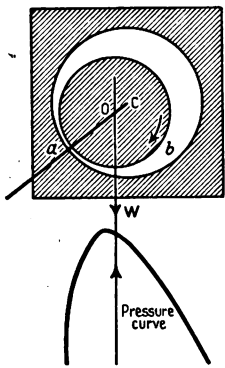


FIG. 1.—Transverse section of a horizontal shaft rotating in a bearing.

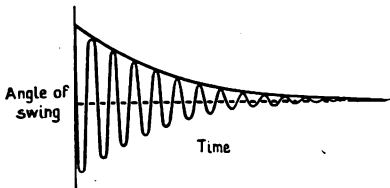


FIG. 3.—Graph of rate of slowing in fluid friction.

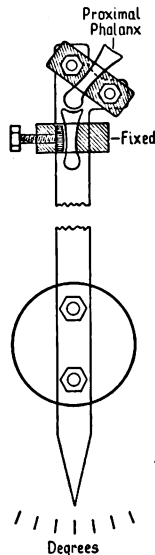


FIG. 2.—The modified Stanton pendulum. Length=7 ft. 6 in.

the shaft (w). The curve below shows the pressure. It will be noted that while the resultant acts in opposition to the load, the peak is beyond the load line on the outlet side of the film. Thus a heavily loaded shaft can rotate, literally floating on a pad of oil and having no contact with its bearing.

There are three essentials for the formation of this pressure-film: the viscosity of lubricant, the speed of rotation, and the eccentricity of the shaft.<sup>4</sup>

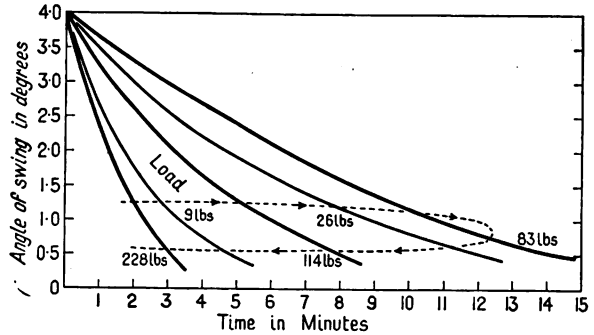


FIG. 4.—Graph of rate of slowing with different loads. Fluid friction.

In engineering practice all the following are known or can be calculated:—

- (a) Inlet and outlet thickness of the film.
- (b) " " temperature of the oil.
- (c) " " viscosity of the oil.
- (d) The pressure at all points in the film.

It seems probable that the physical laws which govern the behaviour of lubrication in a bearing also apply to that in a joint, and reflection on our ignorance of the matter should lead to a healthy feeling of humility. Since clearances are of the order of thousandths of an inch, it is not possible at once to decide whether there is solid or fluid friction. The relationships of friction, load, and speed, however, can be measured. In the first, friction is proportional to load and is unaffected by speed (Amonton's law<sup>5</sup>), while in the second, friction bears no relation to load, but varies with the square root of the speed.<sup>6</sup>

Some testing apparatus was needed to compare load and friction, and the Stanton pendulum<sup>7</sup> was modified (Fig. 2). The original apparatus was used by the late Dr. Stanton at the National Physical Laboratory for the study of friction in heavily loaded bearings and consists of a heavy pendulum swinging through a few degrees with the bearing under test as its pivot. The proximal interphalangeal joint of an amputated finger replaced the bearing; the middle phalanx was fixed, and the proximal phalanx was clamped to the side members of the pendulum. By studying the way in which it slows down, it is possible to see how the friction varies, and whether it is proportional or not to the fixed load.

It has been shown that if friction does not vary both the time and the loss of swing will be the same for each oscillation. It follows that a graph of the slowing down will show that a straight line can be drawn through the extreme points of all the swings. This is the criterion of solid friction. Should the friction, however, be related to a speed

COEFFICIENT OF FRICTION OF INTERPHALANGEAL JOINT. (LOAD, 13 LB. 5 OZ.; TEMP., 54° F.)

Angle of swing, degrees .. .. .	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5
Number of oscillations per half degree .. .. .	11	13	16	21	27	38	56	
Coefficient of friction .. .. .	0.114	0.097	0.079	0.060	0.047	0.033	0.022	
Rubbing speed, ins. per min. .. .. .	0.8	0.8	0.7	0.6	0.5	0.3	0.2	

that is steadily falling, a curve will result, since the friction tending to stop the motion will decrease with the speed (Fig. 3). This is to be expected where fluid friction is the stopping force.

The pendulum was first swung from a knife-edge to discover the effect of air resistance and this was found to be negligible. Fig. 4 shows the type of swing obtained with loads from 9 lb. to 228 lb., and it will be noted that all are curved, meaning that fluid film lubrication occurred in all throughout the main part of the swing. The result in the heaviest load (228 lb.) is particularly noteworthy, as it amounts to a surface pressure of about 900 lb. per sq. in. At this load crushing of bone set in. The coefficients of friction—

$$\mu = \frac{\text{friction}}{\text{load}}$$

can be calculated and these have been added in the Table. Mr. C. Jakeman, of the National Physical Laboratory, has kindly examined the curves, and believes that they represent mixed lubrication—i.e., a fluid film during movement and solid friction at the starting and stopping points. It seems to follow from Reynolds's law that there can be no fluid film between the surfaces while at rest or at the moment of beginning movement before the film has had time to form. There must then be some kind of solid friction, but the nature of this is not known. There may be friction equivalent to that between dry articular cartilage, or some form of "boundary" or "greasy" friction, for Timbrell Fisher has shown<sup>8</sup> that there is mucin inside the articular cartilage.

An inherent defect of the apparatus is that it allows one to estimate the friction only for a complete swing, and *not* that at the middle or end. A machine is now being made to allow the friction to be read at all points of the cycle of movement, and it is hoped to communicate results when they become available.

#### CONCLUSIONS

1. Fluid film lubrication is the usual form of lubrication in human joints.
2. The pressure-film is dependent for its formation upon (a) viscosity of lubricant, (b) speed of surfaces, (c) eccentricity of surfaces.<sup>9</sup>
3. The film survives a load which can crush bone.
4. Some form of solid friction must occur when speed and/or eccentricity are not enough to maintain a pressure-film.

The coefficients of friction so far obtained are high compared with those in machinery, but there was a high viscosity of the lubricant because the experiments were carried out at a temperature many degrees below that of the body.

My thanks are due to Mr. Dee, of Birmingham University, Mr. C. Jakeman, of the National Physical Laboratory, and Mr. E. C. Ulrich.

#### REFERENCES

1. Tower, B.: Proc. Inst. Mech. Eng., 1883, p. 632; 1884, p. 29; 1885, p. 58; 1888, p. 173; 1891, p. 111. Reynolds, O.: Phil. Trans. Roy. Soc., 1886, p. 157.
2. Archbutt, L., and Deeley, R. M.: Lubrication and Lubricants. London, 1927, p. 105. Boswall, R. O.: The Theory of Film Lubrication, London, 1928, p. 187. Goodwin, G., and others: The Mechanical Properties of Fluids, London, 1925, p. 127.
3. Archbutt and Deeley: Op. cit. (ref. 2), pp. 2 and 4.
4. Boswall: Op. cit. (ref. 2), p. 36.
5. Archbutt and Deeley: Op. cit. (ref. 2), p. 40.
6. Duncan, J.: Applied Mechanics for Engineers, London, 1913, p. 356.
7. Stanton, T. E.: The Engineer, 1923, cxxxv., 678.
8. Fisher, A. G. T.: Chronic (Non-Tuberculous) Arthritis. London, 1929, p. 30.
9. MacConaill, M. A.: Jour. of Anat., 1932, lxvi., 210.

#### HOSPITAL "CALL-SYSTEMS"

THE ancient sport of finding the house surgeon, played in various ways in different hospitals, is more or less difficult according to the technique employed and the size of the hospital. The system still obtains, in at least one large hospital, of using one or more porters as bloodhounds to track down the victim. These sleuths are forbidden to return to the base until they have delivered their message and the sight of them, travel-stained, weary, and hopelessly out of scent, is an all too common one. Improvements in this primitive and labour-wasting device has been made and in certain hospitals in the United States loud speakers, operated from the telephone-board, are fixed in the corridors. Two obvious disadvantages of the loud-speaker system are that it is impossible to call several persons simultaneously and that it disturbs the quiet so much to be desired in a hospital. The call-system, with signal-boards bearing electrically illuminated numbers, is better than the loud-speaker, but some time may elapse before the victim sees that his number is up; though doubtless, should he try to turn a blind eye, kind friends will hasten to point it out to him.

Mr. H. Ekman, chief engineer of the electric plants of the fire-brigade in Stockholm, has ingeniously improved the above system, and an account of his method, supplied by Prof. Einar Key, appears in the February issue of the *Hospital*. In every possible haunt of the house surgeon (or other person likely to be wanted at short notice) there is a marking-cabinet on which is a number of buttons, each marked with the name of one of the persons incorporated in the system. At the telephone-board is a "call" or "seeker" table furnished with a like number of similarly marked buttons. There is also, in full view of the operator, a light-signal table with a signal-lamp for each haunt (ward, operating-theatre, laboratory, &c.). The house surgeon, Mr. X, notifies his entrance to any particular haunt by pressing his button on the marking-cabinet. Should Mr. X be wanted, the operator presses the button marked X on the call table and the signal-lamp of the ward in which Mr. X last pressed his button lights up. At the Maria Hospital, Stockholm, the device has been still further improved. If the house surgeon is called by the operator and has neglected to check in anywhere by pressing his button, the next time he does press a button he receives not, as might be supposed, the shock he deserves but a buzzing signal which tells him that he is wanted. By pressing a special cancellation button he may temporarily "sport his oak" and cease to exist so far as the system is concerned. On the other hand, he may do so unwittingly by neglecting to indicate a fresh location and so become temporarily and inconveniently "lost."

A still more recent attempt has been made to improve on the above system by using display panels showing a double row of lamps. On one row, each lamp represents a calling party; on the other, an official required. To draw attention to the display, signals audible but not loud enough to disturb the patients or intermittent flashes are used, the whole being under the control of a telephone operator. This system, which is described in the April issue of the *Hospital*, can only call one person at a time, but appears to be the best so far devised. To the frivolously inclined these light-signal systems seem to offer facilities for practical joking on a large scale. As to what might happen were the apparatus to become slightly deranged so that everybody received somebody else's call, we must leave to the imagination.

#### PREDISPOSING CAUSES OF UTERINE CANCER

IN a study of 982 cases of carcinoma of the uterus, comprising 879 of cancer of the cervix and 103 of cancer of the body, P. Natale endeavours to determine the aetiological factors concerned (Tumori, 1935, ix., 185). He decides that the following are of minor importance: race, social position, functional dis-

turbances of the uterus or ovaries, sexual abuse, heredity, and individual constitution. As regards age, he emphasises that carcinoma of the uterus may develop at any period of life; in the present series the maximal incidence was at 50-54, while if cervical and corporal cases were separately considered, the former showed the highest incidence between 40 and 54, the latter between 60 and 64. Natale reaches the common conclusion that the most important predisposing factor is some antecedent lesion of the cervix, especially of an inflammatory character. A history suggestive of chronic cervicitis was obtained in a very large proportion of the cases of cancer of the cervix, and since none of these women had had any medical or operative treatment for the former condition, he believes that many of them would have been saved from developing carcinoma had such treatment been carried out. To support this view he quotes Bossi, who in a series of 7000 cases of plastic operations on the cervix, followed up for many years, had no cases of subsequent cancer. Unlike most investigators, Natale finds that multiparity has little influence upon the incidence of cervical carcinoma; of his 879 patients as many as 132 (15 per cent.) had borne no children. On the other hand, the 103 cases of cancer of the body of the uterus included 40 (38 per cent.) nulliparæ.

**PLACENTAL EXTRACT IN MEASLES.**—The Bioglan Laboratories, Ponsbourne Manor, Hertford, inform us that they are willing to supply Embryonin, a placental extract, to hospitals that wish to test its value in the prophylaxis of measles.

**SAN TOOTHBRUSH.**—One of the chief disadvantages of a toothbrush is that parts of the teeth are inaccessible to its action. It is difficult to remove the stagnant detritus accumulated in the inter-spaces, and the adjacent surfaces cannot be cleaned. The San toothbrush is constructed to overcome this in a simple way. Very similar to many brushes in common use, it differs in one particular—the end of the handle is U-shaped. The resilient prongs are notched and a thread can be fixed so that a length of about  $\frac{3}{4}$  in. is held taut by the notches. This can be passed to and fro between the teeth. Besides cleaning, another useful purpose is served when fraying of the smooth thread reveals a sharp surface, the result of hidden decay. The makers (S. Aki Shoten, 30, City-road, London, E.C.1) also supply lengths of floss silk that have been treated with an abrasive dentifrice.

## Vacancies

For further information refer to the advertisement columns

- Accrington, Victoria Hospital.—H.S. £150.  
 Acton Hospital, W.—Hon. Cons. Physician.  
 Altrincham General Hospital.—Jun. H.S. At rate of £120.  
 Belfast, Forster Green Hospital, Fortbreda.—H.P. At rate of £150.  
 Birkenhead Education Committee.—Asst. School M.O. £500.  
 Birmingham and Midland Eye Hospital.—Res. Surg. O. £200.  
 Birmingham, Selly Oak Hospital.—Jun. M.O. At rate of £200.  
 Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.  
 Brighton, New Sussex Hospital for Women, Windlesham-road.—H.S. £100.  
 Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £120.  
 Bristol City and County Mental Hospital.—Med. Supt. £1000.  
 Burton-on-Trent, General Infirmary.—H.P. and Cas. O. £150.  
 Cambridge, Addenbrooke's Hospital.—Res. Surg. O. £225. Also H.P. At rate of £130.  
 Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Assts. in Out-patient Dept.  
 Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Gt. Barrow.—H.P. At rate of £150.  
 City of London Hospital for Diseases of the Heart and Lungs Victoria Park, E.—Med. Reg.  
 Coventry, Gulsong-road Municipal Hospital.—2nd Asst. Res. M.O. £250.  
 Deansbury County Borough.—M.O.H. and School M.O. £900.  
 Doncaster, Royal Infirmary and Dispensary.—H.S. At rate of £175.  
 Durham County Council.—District Tuber. M.O. £500.  
 Eastbourne, Royal Eye Hospital, Pevensey-road.—H.S. £275.  
 Epsom County Hospital.—Res. Asst. M.O. At rate of £375.  
 Evelina Hospital for Sick Children, Southwark, S.E.—Part-time Pathologist. £250-£300.  
 Exeter, Devon Mental Hospital, Exminster.—Jun. Asst. M.O. £350.  
 Fareham, Hants, Knowle Mental Hospital.—Deputy Med. Supt. £700.  
 Folkestone, Royal Victoria Hospital.—Jun. Res. M.O. At rate of £120.  
 Glasgow, Southern General Hospital.—Deputy Med. Supt. £500.  
 Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W.—Res. H.S. At rate of £150.  
 Guildford, Royal Surrey County Hospital.—H.S. £150.  
 Hertford County Hospital.—H.S. At rate of £180.  
 Hospital for Sick Children, Great Ormond-street, W.C.—Res. H.P. and Res. H.S. Each at rate of £100.  
 Hull Royal Infirmary.—H.S. to Ophth. and Ear, Nose, and Throat Dept. Also Second Cas. O. Each at rate of £150.  
 Ipswich, East Suffolk and Ipswich Hospital.—Orthopaedic Surgeon. £500.  
 Ipswich Mental Hospital.—H.P. At rate of £150.  
 Isolation Hospital, Muswell Hill, N.—Res. M.O. £500.  
 Kidderminster and District General Hospital.—H.S. £150.  
 Kilmarnock Infirmary.—H.P. and H.S. Each £110.  
 Kingston District Hospital.—Res. Asst. M.O. At rate of £375.  
 Leeds, St. James's Hospital.—Res. M.O. Also Res. Surg. O. Each £350.  
 Leicester Royal Infirmary.—Hon. Asst. Radiologist. Also Visiting Anaesthetist.  
 Liverpool, Stanley Hospital.—H.S. At rate of £100.  
 Liverpool University.—Lecturer in Dept. of Bacteriology £600-£700.  
 Llanelly and District Hospital.—H.S. £150.  
 London Child Guidance Clinic, 1, Canonbury-place, N.—Three Fellowships in Psychiatry. Each £300.  
 London County Council.—Asst. M.O. £600. Sen. Asst. M.O.'s, Grade II. Each £500. Also Asst. M.O., Grade II. £250.  
 London Homoeopathic Hospital, Great Ormond-street, W.C.—H.S. At rate of £100.  
 London (R.F.H.) School of Medicine for Women, Hunter-street, W.C.—Demonstrator in Physiology. £250-£300.  
 Macclesfield General Infirmary.—Sen. H.S. At rate of £180.  
 Manchester, Ancoats Hospital.—H.S. for Ear, Nose, and Throat Dept. At rate of £100.  
 Manchester City.—Vacancies on Consultant Medical, Surgical, &c., Staffs of Municipal Hospitals. £125-£400.  
 Manchester Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.  
 Manchester Royal Infirmary.—Hon. Asst. Surgeon. Also H.S. At rate of £50.  
 Manchester, Victoria Memorial Jewish Hospital, Cheetham.—Cas. O. At rate of £125.  
 Manor House Hospital, Golders Green, N.W.—Jun. M.O. £200.  
 Margate, Royal Sea-Bathing Hospital.—H.S. At rate of £200.  
 Mount Vernon Hospital, Northwood.—H.S. At rate of £150.  
 National Temperance Hospital, Hampstead-road, N.W.—H.P. At rate of £100.  
 Newcastle-upon-Tyne Hospital for Sick Children.—Hon. Physician to Skin Dept.  
 Northampton General Hospital.—H.S. At rate of £150.  
 North Riding of Yorkshire C.C.—County M.O.H. and School M.O. £1200.  
 Norwich, Norfolk and Norwich Hospital.—H.S. Also Cas. O. Each £120.  
 Oxford, Wingfield-Morris Orthopaedic Hospital, Headington.—Lord Nuffield Scholarship in Orthopaedic Surgery. £200.  
 Plymouth, Prince of Wales's Hospital, Greenbank-road.—H.S. At rate of £120.  
 Preston, Whiston Public Assistance Institution, near Prescot.—Visiting Surgeon. £450.  
 Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £100.  
 Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100. Also Clin. Asst. to Surgical Out-patients. 5s. per attendance.  
 Redhill, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.  
 Rotherham, Oakwood Hall Sanatorium.—Asst. M.O. £300.  
 Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O. £350.  
 Royal Naval Medical Service.—M.O.'s.  
 Royal Northern Hospital, Holloway, N.—H.S. and H.P. Each at rate of £70.  
 Royal Society of Medicine, 1, Wimpole-street, W.—Nichols Fellowship. £150.  
 St. Bartholomew's Hospital, E.C.—Surgeon.  
 St. John's Hospital, Lewisham, S.E. S.E.—Hon. Ophth. Reg.  
 Sheffield Royal Infirmary.—Ophth. H.S. At rate of £120.  
 Southampton Isolation Hospital and Sanatorium.—Jun. Res. M.O. £200.  
 Southampton, Royal South Hants and Southampton Hospital.—Sen. H.S. £200. H.P. H.S. Also Res. Anaesthetist and H.S. to Ear, Nose, and Throat Dept. Each at rate of £150.  
 Stafford, Prestwood Sanatorium.—Jun. Asst. M.O. £250.  
 Stoke-on-Trent City.—Asst. Tuber. O. £500.  
 Sunderland Royal Infirmary.—H.S. and H.P. Each £120.  
 Surrey County Council.—Asst. M.O. £600.  
 Swansea General and Eye Hospital.—H.P. and Cas. O. Each at rate of £175.  
 Warwickshire and Coventry Mental Hospital.—Med. Supt. £1200.  
 Wembley U.D.C.—M.O.H. £1000.  
 Western Ophthalmic Hospital, Marylebone-road, N.W.—Hon. Asst. Surgeon.  
 Wolverhampton Royal Hospital.—H.P. At rate of £125.  
 Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.—Hon. Asst. Obstet. Surgeon. Also two H.S.'s. Each at rate of £100.  
 York County Hospital.—H.P. £150.  
 The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Penarth (Glamorgan) and Old Deer (Aberdeen).

## Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

### SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**  
**TUESDAY, May 5th.**  
*Orthopaedics.* 5.30 P.M. (Cases at 4.30 P.M.) Annual General Meeting. Mr. Laming Evans: 1. Osteochondritis of Lower Epiphysis of Femur. Mr. V. H. Ellis: 2. Pathological Fracture of the Tibia. Mr. H. J. Seddon: 3. Empyema Secondary to a Tuberculous Spinal Abscess. 4. Rupture of a Tuberculous Spinal Abscess into the Oesophagus.
- WEDNESDAY.**  
*History of Medicine* 5 P.M. Annual General Meeting. Dr. J. A. Glover: Finding an Asklepiion, and Some Minor Archeological Adventures in a Doctor's Life. *Surgery.* 5.30 P.M. Annual General Meeting.
- THURSDAY.**  
*Tropical Diseases and Parasitology.* 8.15 P.M. Dr. P. H. Manson-Bahr: The Diagnosis and Treatment of Dysentery and Colitis in Tropical Practice. (Presidential Address.)
- FRIDAY.**  
*Clinical.* 5.30 P.M. (Cases at 4.30 P.M.) Annual General Meeting. Cases. Dr. M. L. Rosenheim (for Dr. J. W. McNee): 1. Myxoedema Strongly Resistant to Thyroid Treatment. Dr. J. H. Lawrence (for Dr. McNee): 2. Extraordinary Recurrent Pyrexia of Over Two Years' Duration. Dr. Philip Ellman: 3. Bilateral Pulmonary Tuberculosis Treated by: (a) Partial Artificial Pneumothorax for the Right Lung. (b) Thoracoplasty for the Left Lung. (c) Insulin.
- MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.**  
**THURSDAY, May 7th.**—8 P.M. (B.M.A. House, Tavistock-square, W.C.), Dr. Alfred Adler: The Psychological Approach.
- WEST KENT MEDICO-CHIRURGICAL SOCIETY.**  
**FRIDAY, May 8th.**—8.45 P.M. (Miller General Hospital, Greenwich), Dr. J. R. Wylie: The Functions of a Radiologist. (Presidential Address.)
- BIOCHEMICAL SOCIETY.**  
**SATURDAY, May 9th.**—2.45 P.M. (Rockefeller Department of Biochemistry, Museum, Oxford), Short Communications and Demonstrations.
- LECTURES, ADDRESSES, DEMONSTRATIONS, &c.**
- UNIVERSITY OF LONDON.**  
**TUESDAY, May 5th. THURSDAY, and FRIDAY.**—5.30 P.M. (London School of Hygiene, Keppel-street, W.C.), Prof. A. Butenandt: Biochemistry of the Sterol Group.
- BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducaun-road, W.**  
**MONDAY, May 4th.**—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Prof. R. W. Johnstone: Hormone Therapy in Gynaecology.  
**TUESDAY.**—2 P.M., Prof. E. H. Kettle: Pathological Demonstration. 3 P.M., Dr. Janet Vaughan: The Monocyte-lymphocyte Ratio.  
**WEDNESDAY.**—Noon, Clinical and pathological conference (medical). 2.30 P.M., Clinical and pathological conference (surgical).  
**THURSDAY.**—2.30 P.M., Dr. W. S. C. Copeman: Arthritis. 3 P.M., Dr. Chassar Moir: Operative Obstetrics. 2.30 P.M., Sir Henry Gauvain: Surgical Tuberculosis.  
**FRIDAY.**—2.15 P.M., Dr. A. A. Davis: Gynecological Pathology.  
 Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetric and gynecological clinics or operations, refresher course for general practitioners.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**  
**MONDAY, May 4th, to SUNDAY, May 10th.**—St. John's Hospital, Lisle-street, W.C. Afternoon course in dermatology.—BROMPTON HOSPITAL, S.W.3. Sat. and Sun., course in chest diseases.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. All-day course in medicine, surgery, and gynecology.—MAUDSLEY HOSPITAL, Denmark Hill, S.E. Afternoon course in psychological medicine.—Courses open only to members of the Fellowship.
- INSTITUTE OF MEDICAL PSYCHOLOGY, Malet-place, W.C.**  
**SATURDAY, May 9th.**—11.30 A.M., Dr. Laura Hutton: Common Disorders in School Life. 2 P.M., Dr. J. A. Haddfield: Origin of Psychopathological Conditions in Early Childhood. 3.15 P.M., Dr. Grace Calver: Diagnostic and Therapeutic Methods. 5 P.M., Dr. Emanuel Miller: Common Behaviour Disorders of Early Childhood and their Treatment.  
**SUNDAY.**—11 A.M., Dr. E. A. Hamilton-Pearson: Physiological and Temperamental Factors in the Aetiology of Childhood Disorders. Noon.—1 P.M., General Discussion on Course.
- LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.**  
**MONDAY, May 4th.**—5 P.M., Dr. S. E. Dore: Epidiascope Demonstration of Skin Diseases.  
**TUESDAY.**—5 P.M., Dr. H. Thompson Barron: Common Skin Diseases in Childhood.

- THURSDAY.**—5 P.M., Dr. J. M. H. MacLeod: Infections of the Skin with Yeast-like Organisms.  
**FRIDAY.**—5 P.M., Dr. W. K. Sibley: Alopecia.  
**HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.**  
**WEDNESDAY, May 6th.**—2 P.M., Dr. R. T. Brain: Endogenous Factors in Eczema. 3 P.M., Dr. A. Signy: Intestinal Parasites.  
 Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.  
**NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.**  
**TUESDAY, May 5th.**—5.30 P.M., Dr. D. Evan Bedford: The Thyrototoxic Heart and its Treatment.  
**UNIVERSITY OF BIRMINGHAM.**  
**TUESDAY, May 5th.**—3.30 P.M. (Children's Hospital), Prof. Leonard Parsons: Demonstration of Cases of Diseases of Children.  
**THURSDAY.**—4 P.M. (Medical Faculty Buildings), Mr. Percival Hartley, D.Sc.: The Chemistry of Antigens and Antibodies. (Second William Withering lecture.)  
**FRIDAY.**—3.30 P.M. (Queen's Hospital), Mr. Harold Round: Teeth from the Points of View of the General Medical and Dental Practitioner.  
**MANCHESTER ROYAL INFIRMARY.**  
**TUESDAY, May 5th.**—4.15 P.M., Dr. W. Fletcher Shaw: The Use of Radium in Gynaecology.  
**FRIDAY.**—4.15 P.M., Dr. P. B. Mumford: Demonstration of Common Dermatological Conditions.  
**GLASGOW POST-GRADUATE MEDICAL ASSOCIATION**  
**WEDNESDAY, May 6th.**—4.15 P.M. (Royal Hospital for Sick Children), Dr. Stanley Graham: Gastro-enteritis in Childhood.

## Births, Marriages, and Deaths

### BIRTHS

- ALLEN.**—On April 22nd, at Fulwood, Shotley Bridge, the wife of Dr. R. Barclay Allen, of a daughter.  
**FOTHERGILL.**—On April 18th, at Ambleside, Westmorland, the wife of Dr. E. L. Fothergill, of a daughter.  
**HILLMAN.**—On April 23rd, at Newlands, Liss, the wife of O. Stanley Hillman, M.S., F.R.C.S., of Southsea, of a daughter.  
**HOUSE.**—On April 19th, the wife of Arthur House, M.R.C.S. Eng., of Bicester, Oxon., of a daughter.  
**HUMPHRIS.**—On April 25th, at King's Lynn, the wife of Dr. J. Howard Humphris, of a daughter.  
**LAWRENCE.**—On April 21st, at Albert Bridge-road, London, the wife of Dr. R. D. Lawrence, of a son.  
**MACIVER.**—On April 21st, at Edinburgh, the wife of D. P. Maciver, M.C., M.D. Edin., of a son.  
**REES.**—On April 24th, at Cardiff, the wife of Dr. Edward J. Rees, Pontypridd, of a son.  
**RUTHERFORD.**—On April 20th, at Longtown, Cumberland, the wife of Robert Rutherford, F.R.C.S. Eng., of a daughter.  
**SPENCER.**—On April 20th, at Chorley, Lancs, the wife of Dr. John Spencer, of a daughter.  
**STEELE-PERKINS.**—On April 23rd, at Rosemont, Exeter, the wife of Dr. Guy Steele-Perkins, of a son.

### MARRIAGES

- FLAVEL—LITTLEJOHN.**—On April 18th, at St. John's Church, Alton, Staffordshire, Sidney William Flavel to Mary Victoria Littlejohn, M.B. Aberd., D.P.H.  
**MIN SEIN—YIN MAY.**—On March 15th, at Rangoon, Burma, Captain Min Sein, M.B. Cal., M.R.C.P. Lond., I.M.S., to Ma Yin May, M.B. Cal., M.R.C.P., and F.R.C.S. Edin.  
**SHEARER—DANN.**—On April 24th, in London, Gavin Shearer, M.B. Glasg., Colonial Medical Service, Nigeria, to Rita Mary, eldest daughter of Major E. W. Dann, Reading.  
**SNELL—SUTHERLAND-HARRIS.**—On April 25th, at Burwash Parish Church, Vincent Clark Snell, F.R.C.S. Eng., to Joan Sutherland-Harris, of Heathfield, Sussex.  
**TAIT—POPE.**—On April 22nd, at Holy Trinity Church, Exmouth, Charles Brooke Vaughan Tait, M.B. Lond., D.O.M.S., to Roselle Mary Gladstone Pope, only daughter of the late P. G. Pope and Mrs. Pope, of Exeter.

### DEATHS

- ARMSTRONG.**—On April 14th, at Singida, East Africa, James Septimus Armstrong, M.B. Dub.  
**CARDALE.**—On April 22nd, at Glongall-road, Isle of Dogs, Henry Jasper Cardale, M.B. Edin., in his 66th year.  
**CARLESS.**—On Monday, April 27th, at Worthing, Albert Carless, C.B.E., M.S. Lond., F.R.C.S. Eng., of Overdale, Crief, Perthshire, in his 74th year.  
**HERRINGHAM.**—On April 23rd, at his sister's home, Lyminster, Hants, Major-General Sir Wilmot Parker Herringham, K.C.M.G., C.B., D.M. Oxon., F.R.C.P. Lond., in his 81st year.  
**JACKSON.**—On April 26th, suddenly, at Esher, John William Jackson, M.B. Glasg., late of Shanghai.  
**LOCK.**—On April 21st, in Chelmsford Hospital, the Rev. Lyonel John Lock, M.A. Camb., M.R.C.S. Eng., Rector of Walsoken Norfolk.  
**MASON.**—On April 23rd, at Northallerton, Harry Mason, M.B. Edin., D.P.H., County Medical Officer of Health, North Riding, Yorkshire, aged 59.  
**RUTHERFORD.**—On April 22nd, at Overstrand, Norfolk, Allan Freer Rutherford, M.B. Edin.  
**SEYMOUR.**—On April 15th, at Redhill, Lionel William Seymour, M.R.C.S. Eng., late of Oxford and of Sind Survey, son of Capt. L. W. Seymour, Bombay Light Cavalry, E.I.C., aged 81.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

## ADDRESSES AND ORIGINAL ARTICLES

## EXTIRPATION OF THE LUNG\*

By GEORGE A. MASON, M.B. Durh., F.R.C.S. Eng.  
HONORARY ASSISTANT SURGEON TO THE HOSPITAL FOR SICK  
CHILDREN, NEWCASTLE-UPON-TYNE; THORACIC SURGEON TO  
THE NEWCASTLE GENERAL HOSPITAL AND THE  
SUNDERLAND MUNICIPAL HOSPITAL

(WITH ILLUSTRATIVE PLATE)

CERTAIN patients with unilateral pulmonary disease not amenable to other therapeutic measures, for whom the outlook is otherwise hopeless, may be relieved or even cured by removal of the affected organ.

Sauerbruch and the German school, with true international courtesy, credit Macewen<sup>1</sup> with the first successful operation of this kind in 1895; but the published account of this case reveals that although the necrotic remnants of a broken-down tuberculous lung were removed in several stages, no formal pneumonectomy, in the modern sense, was performed; the hilus was not interfered with, and it was considered inadvisable to remove the adherent apex completely. Another interesting case is that reported by Sauerbruch<sup>2</sup> in 1923; accidental interference with the blood-supply of the left lung during removal of a large ganglioneuroma from the posterior mediastinum of a young woman led to necrosis of the whole lung, the sloughs of which were removed, and the patient recovered.

A host of investigators, commencing with Gluck<sup>3</sup> in 1881, demonstrated the possibility of the successful extirpation of an entire lung in the experimental animal. Thirty years later Kümmell<sup>4</sup> performed the operation, but unsuccessfully, in man, and although others, notably Meyer,<sup>5</sup> Lilienthal,<sup>6</sup> and Archibald,<sup>7</sup> repeated the attempt, it was never successful until a further twenty years had elapsed—i.e., in 1931, when Nissen,<sup>8</sup> working in Sauerbruch's clinic in Berlin, resected the entire left lung of a girl of 12, who was suffering from bronchiectasis secondary to a traumatic rupture of the left main bronchus. In the following year Haight,<sup>9</sup> working in Alexander's clinic in Michigan, repeated this success when he removed the entire left lung of a girl of 13, in whom bronchiectasis had followed delayed removal of an aspirated foreign body.

The greater risk of sepsis may possibly make the operation more hazardous for bronchiectasis than for neoplastic disease, and although additional successes have been reported during the last three years, these have been mostly with growths.

A year ago a preliminary report was published of two of my cases in each of which an entire lung had been successfully removed some months previously for bronchiectasis.<sup>10</sup> About the same time, in an issue of the *Post-Graduate Medical Journal*, specially devoted to lung surgery, the most radical treatment suggested for bronchiectasis involving more than one lobe, even when unilateral, was thoracoplasty. The successful cases of pneumonectomy recorded by Tudor Edwards and Roberts<sup>11</sup> show that this view is no longer held. Ferrari<sup>12</sup> and Haight have both published excellent papers in which the relevant literature is critically reviewed, and reference to which is well worth while.

A personal series of six cases of bronchiectasis in

which a whole lung has been extirpated, in four with success, is the experience on which this communication is based. Additional experience, derived from a considerably larger series in which lobectomy only was performed, is also drawn upon when necessary.

## Indications

Pulmonary diseases for which this operation may be required include gangrene, suppuration, tuberculosis, and new growth.

*Gangrene* of the lung is frequently found without any considerable degree of adhesion-formation between it and the parietes. As yet no opportunity has arisen, but I am impressed with the probability in these cases of success attending the application of mass ligatures to the hilus and amputation of the gangrenous mass beyond.

*Suppurative diseases* of the lungs include congenital multicystic lung, unresolved pneumonia, and multiple pulmonary abscesses, with or without some degree of accompanying bronchial dilatations; it is to these pathologically diverse yet clinically similar conditions that the term bronchiectasis is loosely, but at present often conveniently, applied. Their gravity is such that the indications for extirpation are necessarily elastic, it being for some of them the only form of curative treatment.

"Dry" cases are naturally among those most likely to survive operation, and this is generally advised. Its recommendation is of much more importance if hæmoptysis has occurred, or if the case has once been "wet," because relapse is likely. Here it should be mentioned that in clinically "dry" cases it is not unusual to find quantities of purulent secretion expressed into the bronchus during operative manipulations of the lung, even if it has been collapsed for some time. Constitutional treatment and postural drainage are employed in an endeavour to abolish or diminish sputum production before operation, but too much time can be wasted over such measures. Tonsillectomy may be a dangerous preliminary measure, for the operation area may be readily infected by the sputum. Vaccine therapy is advocated by some, but in my experience no improvement has followed other than could be accounted for by the measures already alluded to; nor have I observed any favourable influence exerted thus on the post-operative course. Artificial pneumothorax, pleural tamponnage, extrapleural pneumolysis (plombage), phrenic paralysis, and thoracoplasty are amongst the measures available to collapse a lung, and on occasion they prove useful by diminishing the previously excessive production of sputum before proceeding to the major operation.

A history of a previous empyema, in connexion with the affected lung, has not proved a contra-indication to operation. The adhesions in such cases, although generalised, are more often than not easily separated.

Occasionally cases are encountered in which bronchography shows one lung to be replaced by large saccular cavities, while there is a less serious but similar condition in the contralateral lobe. At present in such cases collapse therapy, rather than extirpation, seems indicated and, indeed, sometimes does give considerable relief by diminishing expectoration.

*Tuberculosis* when strictly unilateral seems to offer scope for this operation. Macewen's case has already been referred to. Although not a pneumonectomy in the modern technical sense of the word,

\* Based on a Hunterian lecture delivered before the Royal College of Surgeons of England on Jan. 31st, 1936.

it was one to all other intents and purposes. It demonstrated not only the possibility of even a gross tuberculosis lesion being unilateral, but also the possibility of the patient's survival for many years of active life after its successful elimination. The increasing popularity of the conservative—and hence apparently safer—collapse therapy has diverted interest from the possibility of extirpation. It has gradually become appreciated, however, that many cases, especially those of a predominantly “exudative” nature, are unsuitable for such treatment, and it is for this material that more radical measures may possibly be adopted with success. Actually Reinhoff,<sup>13</sup> adopting a technique to be mentioned subsequently, has successfully resected an entire lung for tuberculosis.

*New growths* of the lung are being recognised with increasing frequency. The situation of most of them, malignant or benign, is usually such as to preclude lobectomy. Further, complete removal of an organ affected with malignant disease is a generally accepted principle in surgery. The vast majority of these growths have progressed beyond the bounds of legitimate surgical enterprise when first seen by the thoracic surgeon; this has been my own experience, but Graham,<sup>14</sup> Archibald, and Reinhoff,<sup>15</sup> among others, have successfully resected lungs thus affected.

When hæmoptysis, abnormal expectoration, &c., are regarded as symptoms requiring investigation just as urgently as hæmaturia or optic neuritis, many cases will be diagnosed during a phase amenable to extirpation.

#### Technique

*Anæsthesia* is obtained with either chloroform or ether vapour and oxygen, administered by the intratracheal method to facilitate both the use of differential pressure and the evacuation, when necessary, of sputum. The patients in this series being young, Avertin was employed in each as a preliminary basal narcotic: Omnopon-scopolamine is preferable as a sedative before operation in older subjects.

The approach is usually by a posterolateral incision through an intercostal space, the patient lying on the opposite side with a sandbag under the chest. A long incision extending from the spine almost to the sternum was employed in the first three cases of the present series; this crossed the lower end of the scapula, which was then retracted to permit access between the 5th and 6th ribs: a shorter incision below the angle of the scapula sufficed in the later cases. Forcible separation of the ribs by a suitable retractor gives adequate exposure, but with a shorter incision it is advisable to divide or, better still, to resect subperiosteally small portions of the adjacent ribs. More extensive costal resections may be required with chest walls of a more rigid type.

An incision which, although similar, is predominantly anterior, is required for those cases in which a formal dissection of the individual elements in the hilus is undertaken.

Incisions entailing the use of an osteoplastic flap have been generally discarded, but such an incision is an essential feature of the method suggested and described by Ferrari,<sup>12</sup> “la exoneumopexia extrapleurale”; through this incision, after mobilising the lung and ligaturing its hilus, extensive subperiosteal resections of the ribs are carried out transpleurally. Thus, the cavity being obliterated, it is possible to exteriorise the exsanguinated lung which subsequently sloughs off. The lung is mobilised by

division of the pulmonary ligament and of such adhesions as may be encountered.

There are three methods by which the actual removal of the lung may be effected:

1. A careful dissection is made of the pulmonary pedicle, the vascular elements are divided between ligatures, and the bronchus, having been divided at a convenient level, is closed by interrupted sutures to allow approximation. The chest is then closed. This method should be employed in neoplastic disease, being the most radical and hence approximating most closely to the ideal for such cases. An artificial pneumothorax may with advantage be induced and maintained during the ten or fourteen days preceding operation. Adhesions render the operation difficult, and it should be avoided where there is reason to suspect any induration of the pedicle, the thin-walled vessels being only too easily lacerated, and, under such circumstances, difficult to control.

Reinhoff,<sup>13 15</sup> using this technique, had performed successfully five such operations before February last year. All, except one which was for tuberculosis, were for growths. The youngest patient was aged 3, and the oldest 70.

2. The Brunn-Shenstone technique for lobectomy may be applied to these cases. The pulmonary pedicle being controlled by either a tourniquet or a clamp, the lung itself is then amputated about  $\frac{3}{4}$  in. beyond this. A series of hæmostatic and stay sutures are used to transfix the vascular and bronchial elements in the pedicle, such parenchyma as may be available is utilised to cover over the stump by suturing. The chest is then closed, and airtight drainage provided through a small separate wound below.

Evarts Graham<sup>14</sup> in 1933 successfully used this technique for a case of bronchial carcinoma, the first successful one-stage pneumonectomy with closure of the chest to be performed. An almost identical technique was used in three of the present cases, although only one lobe was removed at a time. This was necessary because of the somewhat ambiguous bronchograms available, the state of the upper lobe being undetermined in two of the cases until a second instillation of lipiodol was made after removal of the lower lobe. The condition of the patient after mobilisation of the lower lobe may also be such as to make this procedure sometimes advisable.

3. The remaining or two-stage method is that in which the pulmonary circulation is abolished by the application of mass ligatures either to the pedicle of the lung as a whole, or to the pedicles of the individual lobes, after their mobilisation. Tampons are arranged around the lung, and the wound closed temporarily after provision is made for irrigation with antiseptic solutions. The chest is reopened after a period of 10–12 days, the packs changed and the necrotic lung removed. Tardy separation of the sloughs may necessitate removal of the lung just beyond the ligatures, which will be extruded spontaneously shortly afterwards.

This technique should probably be used only when the mediastinum is known to be comparatively immobile and when a previous inflammatory process has so altered the pleura that its normal absorptive powers are likely to be greatly diminished. Its adoption in the presence of a virgin pleura seems to be little more than criminal, and in such cases the Sauerbruch and Alexander schools, both of whom favour the method, endeavour to promote adhesions between the visceral and parietal pleuræ at a preliminary operation—the former by using an extra-



pleural "plombe" and the latter by stroking the pleura with gauze.

Inadequately tied ligatures, or retraction of the hilar tissues within them, may lead to the development of moist rather than dry gangrene. If this is recognised by the occurrence of a profuse foul discharge, tighter ligatures are applied, but this detection



FIG. I.—Air embolism in the brain after lobectomy.

is not always possible until the patient is in extremis (Case 3). To obviate this danger rubber tubing is used by some instead of, or in addition to, the silk ligatures already mentioned. Alexander now recommends for this purpose an automatic tourniquet introduced by Carr. Confidence in the efficacy of the mass ligatures may justify immediate amputation of the lobes, and so minimise the amount of sloughing tissue. This step may be imperative when deterioration in the general condition after a difficult mobilisation contra-indicates the completion of an operation originally intended to be one-stage. Secondary hæmorrhage from the hilus, due to infection of the clot in the large vessels after or during separation of the sloughs, is not unknown, and appears to have been invariably fatal.

The two-stage method has many disadvantages: more than one severe operation is required; it involves the presence of a foul suppurating wound; and convalescence is delayed by a prolonged and serious illness extending not only between the stages, but often for some time afterwards, undoubtedly throwing a very great strain on the recuperative powers of the patient. Deformity is likely to be much greater because of the necessity of maintaining the wound open for a considerable period so that the sequestration process and its sequelæ may be to some extent under visual control; indeed, it may be necessary, as in two of the present series, to assist obliteration of the cavity by means of some type of thoracoplasty—this aid may also be necessary in other methods of pneumonectomy.

#### Difficulties and Complications

*Hæmorrhage* is an ever-present danger during a dissection in the vicinity of the pulmonary pedicle, and has usually proved rapidly, if not immediately, fatal. Meyer<sup>5</sup> and Lilienthal<sup>6</sup> have both reported their experiences in this connexion.

Premature or accidental release of the tourniquet is attended by serious hæmorrhage, but this accident need not necessarily prove fatal if suitable large

hæmostatic clamps are kept ready for such an eventuality. The situation may be retrieved, as it was in three cases of mine in which the accident occurred during lobectomy.

Serious loss of blood may occur from the numerous small vessels torn during the separation of dense adhesions, but this can usually be obviated by applying gauze pads to the raw area whenever possible whilst working in some other part of the chest. The loss may be so great as to require replenishment of the circulation by a transfusion of blood at, or even before, the termination of the operation.

The risk of secondary hæmorrhage, especially associated with separation of hilar sloughs, has already been alluded to.

*Shock*.—Retgression of the general condition during a difficult mobilisation is usually transient, but may compel cessation. Hence it is important to avoid lacerating the lung unless its removal is certain, otherwise serious septic complications will follow. Dr. Philip Ayre, the anæsthetist who is associated with me in this work, has lately in adult cases administered a spinal anæsthetic before inducing general anæsthesia. With this technique we have observed that the patients have been singularly little, if at all, disturbed by mobilisations of the most difficult and severe type.

*Air embolism* has not as yet been reported in connexion with this operation, but it has caused the death of two patients of mine on whom lobectomy was performed (see Fig. I.). There seems to be no reason why pneumonectomy should be completely immune from this accident and brief reference will therefore be made to it. In each case the upper lobe had been torn near the hilus. In the first this was being repaired when air was suddenly aspirated into a pulmonary vein because of a mishap to the anæsthetic apparatus, causing a sudden fall of the intrapulmonary air pressure. In the second patient a similar but smaller and not so accessible laceration was controlled merely by packing, and the fatal aspiration of air occurred about four hours later.

*Lung-root reflexes* were dealt with by O'Shaughnessy<sup>16</sup> in his Hunterian lecture last year. Certain

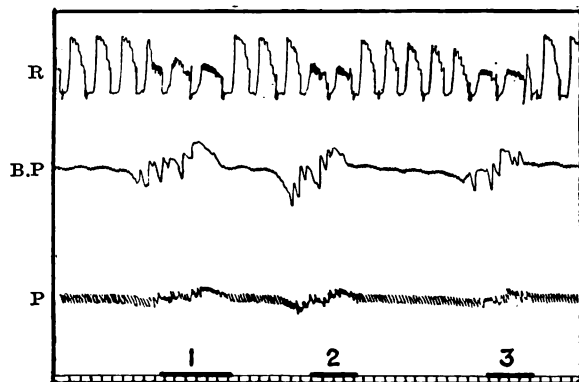


FIG. II.—Synchronous tracings (respiration, blood pressure, and pulse) showing effect of electrical stimulation (1, 2, and 3) deep in the interlobar fissure.

phenomena of this order have been observed in connexion with a variety of intrathoracic operations, but those experienced in Case 1 of the present series are worthy of mention. During manipulations in the interlobar fissure at the hilus and whenever the mass ligatures were tightened, there were curious bodily jerks, which appeared to be violent expiratory movements; in addition and simultaneously, the

auricles were seen to distend the pericardium, whilst the aorta apparently ceased beating. These occurred at least fifteen or twenty times. Somewhat similar phenomena were noticed recently in a lobectomy patient.

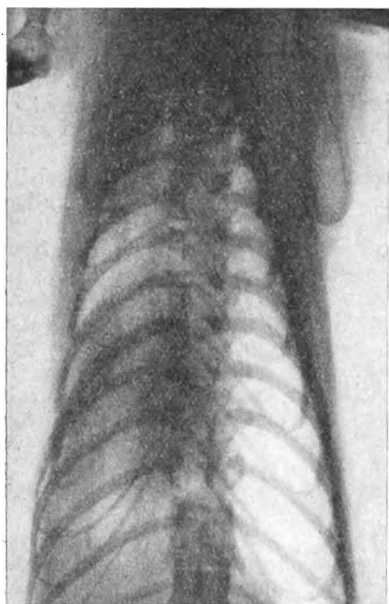


FIG. III.—Radiogram of cat's chest after pneumonectomy.

These disturbances can be reproduced with comparative ease in the cat by electrical stimulation applied deep in the interlobar fissure. Their nature may be studied with the help of simultaneous and synchronised tracings, recording changes in respiration, blood pressure, and pulse-rate (Fig. II.). This suggests the probability of these phenomena being reflexes of a nervous, probably vagal,

nature, and this is proved by their prevention when novocain is infiltrated into the tissues between the point of stimulation and the mediastinum. While dissecting the main pulmonary artery of a cat preparatory to pneumonectomy a similar bodily jerk was noticed; it coincided with immediate and permanent cessation of the heart beat and of respiration. Such a sudden fatality is rare, not only in the experimental animal, but fortunately in man. Sauerbruch, however, tells of a patient who died at the moment of application of a ligature to the pedicle of a lobe. As a precautionary measure the mediastinum near the hilus may be infiltrated with novocain. This, however, is usually only practicable

when the pleura is free; when pleural adhesions are a prominent feature, it is difficult and often impossible to make the necessary injection under visual control. This precautionary measure is therefore often withheld.

Delayed reflex phenomena, conveniently so-called, include a variety of conditions becoming manifest at a varying time after operation, such as tachycardia, dilatation of the right side of the heart, acute oedema of the contralateral lung, asthmatic wheezing, &c. Certain of these have been encountered in connexion with lobectomy rather than with pneumonectomy; but again there is no obvious reason why they should be regarded as unlikely in the latter.



FIG. V. (Case 1).—Bronchogram showing bronchiectasis of entire left lung.

Tachycardia is occasionally a prominent feature which may persist for some considerable time after operation. A rapid pulse was present for almost a fortnight in two of the patients in whom mass ligatures were employed; in the third, who died at the end of a week, it was present throughout the post-operative course. In certain of these cases the possibility of toxic absorption from the gangrenous lobe, due perhaps to shrinkage of the pedicle within the ligature, must be considered as a possible cause. Sometimes this acceleration of the pulse is progressive and fatal. In Case 5 the vagus nerve was found to have been damaged during the application of the tourniquet (Fig. XVII.). The patient, whose condition seemed satisfactory at the conclusion of the operation, had an increasingly and uncontrollably rapid pulse.

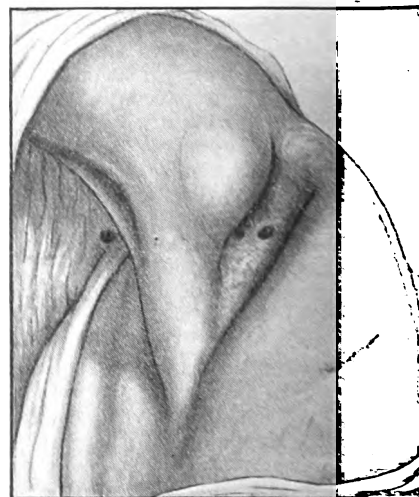
Dilatation of the right side of the heart may



A



B



C

FIG. IV Case 1).—Obliteration of the cavity after pneumonectomy.

possibly be associated with the increased mechanical strain thrown on the pulmonary circulation by these operations, but the compensatory abilities possessed by the circulatory system are well known. Both this and the experience that the onset of the complication may not be until many hours after the operation suggest the possibility that it may be essentially a reflex phenomenon of a delayed type. The same remarks apply to acute œdema of the remaining lung.

*Bronchial fistulæ* cause little disability when they open directly on to the surface of the chest wall. One such patient of mine even works in a coal-mine without any protective covering over a small fistula persisting after drainage of a pulmonary abscess. The danger of an aspiration pneumonia and of abscess formation in the other lung, due to these fistulæ, is increased if they open into a cavity between it and the parietes; it is still greater if these cavities are infected, and especially if they are inadequately drained. Reinhoff deliberately fractures the cartilage to overcome its spring-like action, which tends to reopen a bronchial wound. Others rely upon cauterising the bronchial mouth with silver nitrate prior to its closure by suture. The certain prevention of fistulæ is almost impossible, and the majority of patients develop one during some period of their convalescence. Admittedly some are so slight as to be recognisable—often unexpectedly—only with the aid of lipiodol.

*Tension pneumothorax* is a complication encountered much less often than would be expected despite the frequency with which the post-operative course in these cases is complicated by the presence of bronchial fistulæ. It is likely to arise only where drainage of the pleural cavity has either not been employed or has ceased because the tube has been obstructed or removed. Recognised by the sudden occurrence of severe respiratory distress it must be promptly relieved by the establishment of efficient drainage.

**Effects on the Chest**

The fate of a cavity from which the lung has been removed is a study of some interest. In the experimental animal the mediastinum moves towards the side from which the lung is removed (Fig. III.). To a less extent the chest wall falls in, and the diaphragm ascends, even when it is not paralysed, though naturally not to so high a level. A residual pneumothorax, roughly pyramidal in shape, with its base in

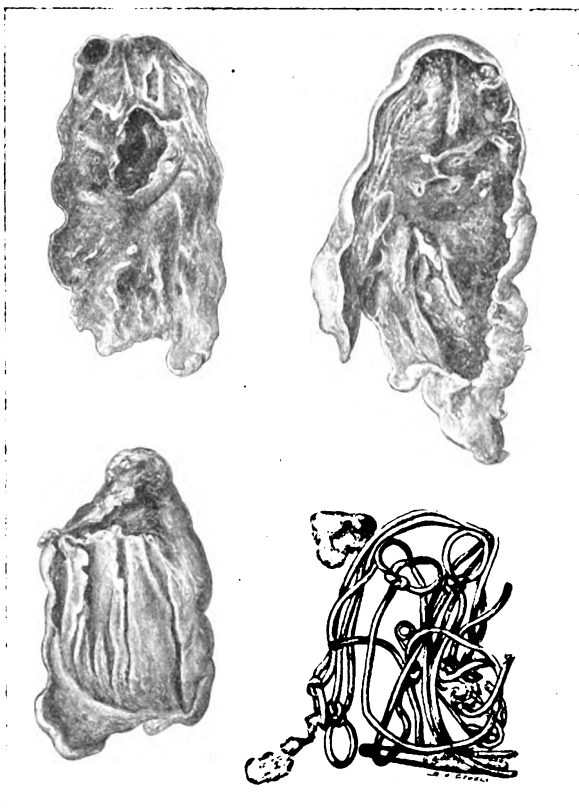


FIG. VI. (Case 1).—Necrotic lobes of the left lung removed 12 days after ligatures (below) had been tightly applied to the hilus. Half scale. (Specimen in Museum of Royal College of Surgeons of England.)

the pleural dome, persists between the axilla and the mediastinum. Exactly the same process happens in the human subject. This statement is supported by radiological evidence obtained in Case 4 (Fig. XII. a, b, and c on Plate), and also in Cases 1 and 2, where it was possible to watch the process through parietal wounds kept widely open (Fig. VI. A, B, and c). When there is no large or persistent bronchial fistula, and when the parietal wound has remained closed *ab initio*, the residual pneumothorax space is probably permanent. If, on the other hand, a major bronchial fistula persists with or without an associated external sinus, some form of thoracoplasty is required to obliterate the cavity (Fig. VII. A and B). Experience suggests that this should be carried out much sooner than was done in Cases 1 and 2, so that convalescence may be shortened and a more satisfactory final result obtained.

**The Cases**

**CASE 1**

M. V., a girl aged 13, referred by Dr. Horsley Drummond. Since the age of 5 she had suffered from recurrent attacks of "pneumonia," each of which was followed by profuse expectoration of foul sputum. In 1931, following such an attack, an empyema in connexion with the base of the left lung was drained at another hospital. She was admitted to the Royal Victoria Infirmary, Newcastle-

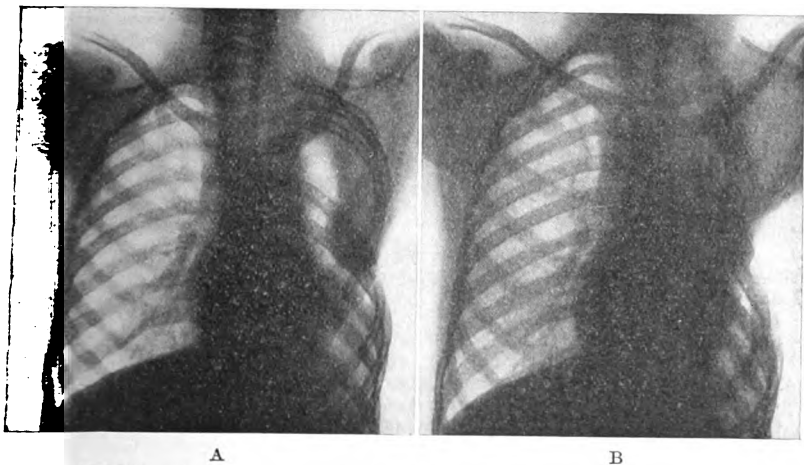


FIG. VII. (Case 1).—Radiograms after pneumonectomy, (A) partial obliteration of residual cavity, (B) after thoracoplasty.

upon-Tyne, in April, 1934, suffering from a pneumonic attack. Subsequent lipiodol examination demonstrated bronchiectasis of the entire left lung (Fig. V.). The sputum diminished and almost completely disappeared with general treatment, but pallor and clubbing of the fingers



FIG. VIII.—Case 1 one and a half years after pneumonectomy.

persisted. The chest wall was retracted on the left side and the sternum unduly prominent.

**Operation** (May 4th, 1934).—Anæsthesia was administered by Dr. W. J. Phillips. Preliminary basal narcosis with avertin (80 per cent. of the charted "Bayer" dose followed by intratracheal insufflation of oxygen, warmed) ether vapour, and a small quantity of nitrous oxide. A second intratracheal tube was also introduced to facilitate evacuation of pulmonary secretion. The patient was placed on her right side with a sandbag under the chest. A long incision was employed, extending from the spine behind to the sternum in front, and crossing the scapula about 3 cm. above its angle. The latissimus dorsi, &c., were divided in the line of the incision and the scapula retracted forwards and upwards. The 5th and 6th ribs were divided close to the spine, and their intercostal muscles divided throughout the length of the incision. These ribs were then widely separated with the help of a de Quervain retractor. The lung was completely adherent, but the two lobes were freed and mobilised with comparative ease. Two stout braided-silk ligatures (Pearsall No. 22) were tightly applied to the pedicle of each lobe, and the phrenic nerve was divided above the root of the lung to facilitate subsequent obliteration of the cavity. During manipulation of the hilus, and while the ligatures were being tightened, the curious bodily jerks were seen that have already been described and attributed to lung-root reflexes. Gauze tampons were wrapped round the lobes to prevent readhesion, and the wound was almost completely closed, except posteriorly for the tampons. Flavine was instilled daily.

The wound was reopened on the sixth day and the tampons changed. This was repeated on the eleventh day, but on this occasion the lobes were ablated with the help of a thermocautery (Fig. VI.), and the wound left widely open throughout its entire length (Fig. IV. A). Two or three days later the small remaining fragments of the pedicles in the ligatures sloughed off, and the cavity immediately began to diminish in size (Fig. IV. B). There was slight pyrexia, and the pulse-rate was about 120 for almost a fortnight after the sloughing lung was removed from the chest, but the thoracic cavity appeared clean

and the general condition steadily improved. For two or three days after the operation there was some degree of œdema of the opposite lung, evidenced by frothy expectoration, but this was easily controlled by atropine.

**Progress.**—Massage and appropriate exercises were carried out from an early stage in order to prevent the development of scoliosis. Having gained over a stone in weight, and with the general health greatly improved, the patient was allowed to return home on Sept. 30th. She attended as an out-patient at frequent intervals. The cavity has become greatly obliterated by flattening of the chest wall and elevation of the paralysed diaphragm until only the size of a walnut (Fig. IV. c). On its floor were two bronchial fistulae. Further spontaneous obliteration not having occurred, the patient was readmitted to hospital in October, 1935. Small portions of the upper five ribs were resected paravertebrally (Fig. VII.). This thoracoplasty has sufficed to diminish the cavity still further, and to such an extent that the upper bronchial fistula is now occluded, but the lower still persists in the floor of the depressed scar; it is hoped that applications of silver nitrate will suffice to obtain this closure. In any case it is unlikely that any other treatment will be adopted, the condition causing little or no disability.

The patient has remained free from cough and expectoration for more than eighteen months, clubbing of the nails has disappeared, and she leads a more or less normal life (Fig. VIII.).

#### CASE 2

H. V., a youth aged 18, referred by Prof. W. E. Hume. When he was 5 years old a small stone became impacted in the right bronchus and was not coughed up until two years later. Since then there was a constant and copious expectoration of foul sputum. He was in a sanatorium at one period, but tubercle bacilli were never detected in his sputum. Recently signs of toxic absorption became evident—clubbing of the fingers, night sweats, and loss of weight. He coughed up daily 8–10 oz. of foul sputum after admission to the Royal Victoria Infirmary. A lipiodol examination revealed the presence of such a gross degree of bronchiectasis that only scattered pools of lipiodol were seen in the right lung (Fig. XV. on Plate). The heart and trachea were much displaced to the right side. The right phrenic nerve was evulsed in September, 1934, as a preliminary to pulmonectomy. The sputum subsequently diminished in amount to 2 oz. a day.

**Operation** (Oct. 18th, 1934).—Anæsthesia similar to that in the first case was again given by Dr. Phillips. The incision was also the same; the right side of the

**chest was opened.** Despite radiological appearances the right lung was not adherent, except by a few bands at the apex and by a dense symphysis to the paralysed and elevated diaphragm. The lung was small and shrunken, and as it was difficult to demonstrate the interlobar

fissure, only one stout braided-silk ligature (Pearsall No. 22) was tightly applied to the whole hilus after mobilisation. No obvious reflex phenomena were observed, but the blood pressure at this stage having fallen to 30 mm. Hg (as recorded in the arm), the operation was rapidly terminated, as in the first case. The condition rapidly improved after the patient returned to bed, but a persistent pulmonary œdema, evidenced by frothy expectoration, developed, which required the repeated administration of atropine during the subsequent fortnight. The wound being opened, under light anæsthesia, on the seventh and again on the thirteenth day, the tampons were changed. It was hoped that the lung,



FIG. IX. (Case 2).—Lung after removal. About half scale.

which was now very much shrunken, would slough off, but as it failed to do so, it was removed with the galvano-cautery thirty days after the operation (Fig. IX.).

*Progress.*—The wound and the cavity diminished in size with amazing rapidity, the diaphragm rose steadily, and the mediastinum moved across in a striking manner.

The cavity itself, three months after the operation, was only about one-fifth or one-sixth of its original size, and at that time it appeared highly probable that a thoracoplasty would be required to obliterate it completely. There were three small bronchial fistulae, through which a certain amount of flavine-stained discharge was aspirated from the cavity, but this only amounted to approximately  $\frac{1}{2}$  oz.

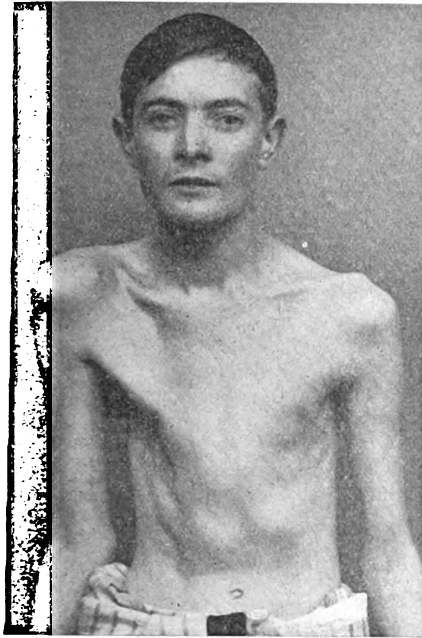


FIG. X.—Case 2 after pneumonectomy.

a day. But further obliteration was very slow. The cavity, especially in its lower part, never seemed so singularly free from infection as in the previous case, and about four months after operation this was aggravated by an attack of scarlet fever. Subsequently this infection, which gave rise to occasional periods of hyperpyrexia, was found to originate in a localised area of osteitis in the rib immediately below the wound. This was removed and the attacks ceased.

In October, 1934, the patient, who had been allowed home for a while, was readmitted to hospital, and a thoracoplasty operation, similar to that employed at this juncture in Case 1, was performed. As a consequence the cavity is now represented by a deep chink, in the floor of which bronchial fistulae can be heard but not seen.

The general condition of this patient fluctuates considerably. There is still daily expectoration of approximately  $\frac{1}{2}$ –1 oz. of sputum, but it is not clear whether this originates in the wound or in the opposite lung, although no abnormal physical signs have been elicited in the latter (Fig. X.).

#### CASE 3

F. B., a boy aged 7, referred by Dr. J. R. Beal. Three years previously, whilst in a sanatorium for "chest trouble," he developed scarlet fever; under observation at tuberculosis clinic since because of occasional pain in chest and constant irritable cough accompanied by expectoration of foul sputum. A year later he was in hospital for thirteen weeks when râles were noticed in left lung; he was admitted to department of thoracic surgery, Sunderland Municipal Hospital, in March, 1935, because of a recent aggravation of symptoms and the onset of headaches, pain in the back, and vomiting. Coarse râles were audible throughout the left lung, and a few could also be heard posteriorly in the right lung; the heart was displaced to the left of the middle line. Bronchography demonstrated a gross degree of bronchiectasis involving the whole left lung.

*Operation* (April 15th, 1935).—Anæsthesia similar to that in the previous cases was administered by Dr. Philip Ayre. The left side of the chest was opened by a similar

incision through the fifth intercostal space, the ribs above and below being divided to give adequate access. Adhesions, which although numerous were not generalised, were separated with relative ease, and the two lobes of the lung were mobilised separately. Two stout braided-silk ligatures (Pearsall No. 22) were applied as tightly as possible to the pedicle of each lobe. Gauze tampons, soaked in flavine, were arranged around the lobes, and the wound closed as in the previous cases. The pulse-rate was 160 at the conclusion of the operation, but its volume was good.

*Progress.*—The general condition seemed satisfactory during the subsequent five days, the pulse-rate varied between 130 and 160, and the temperature between 97° and 101° F. It had been arranged to reopen the wound and change the tampons on the sixth day, but early that morning the patient collapsed. The pulse-rate did not increase markedly, but its character was much weaker; a greyish, slightly cyanosed appearance became apparent, and a foul odour from the wound was noticed.

Although apparently in extremis, it was decided to proceed with the intended toilet of the wound. On reopening, the chest and the lobes of the lung were in a state of moist gangrene, and the pleura was coated with lymph. Ligatures originally tight were no longer so, presumably because of the retraction of the tissues within them. The stinking lobes were cut away and slight bleeding from the pedicles was easily controlled by the application of new ligatures. Clean tampons were inserted, and the wound quietly closed. The patient, however, died a few minutes later.

Necropsy confirmed that death was due to intoxication from the necrotic lung already described. A probe was easily passed from the left auricle along the pulmonary veins on that side, there being no evidence of clotting.

#### CASE 4

L. G., a girl aged 10, referred by Dr. T. C. Hunter, had suffered from pneumonia on four occasions, the first being at the age of 8 months. She was in a sanatorium for observation for six months about two and a half years previously. She always had a very bad cough accompanied by expectoration of foul sputum. On admission to the Royal Victoria Infirmary she was stated to have "no life about her," a poor appetite, and to be losing weight. Bronchography indicated bronchiectasis limited to the left lung, but the extent of that organ's involvement was not clear, for, though sacculations were obvious in the lower lobe, their presence in the upper was uncertain (Fig. XI. a on Plate). The general condition improved considerably as the result of general treatment, the sputum rapidly diminished in amount and ultimately ceased. The patient was transferred to the Hospital for Sick Children for operation.

*First operation* (June 17th, 1935).—Anæsthesia similar to that with previous cases was administered by Dr. Ayre. The chest was opened through a posterolateral incision in the 7th interspace, additional access being obtained by removal of short pieces of the adherent ribs just behind their angles. Apart from a few adhesions at the base, the lung was free. Both lobes being normal in appearance, it was decided to remove the lower only at this juncture. The lobe having been mobilised, and its pedicle controlled by a tourniquet, it was removed. A series of hæmostatic sutures were used to close the vessels and bronchi in the pedicle, which was finally buried by a continuous suture in its own parenchyma. An airtight drainage-tube was inserted through a lower intercostal space, and the wound closed in layers.

A rapid and untoward recovery followed this operation. The upper lobe expanded so rapidly that the residual cavity became obliterated in about a fortnight, although the drainage-tube was retained for some time longer. The general condition also continued to improve. A further bronchogram, made on July 22nd, demonstrated the presence of a similar type of bronchiectasis in the upper lobe (Fig. XI. b on Plate).

*Second operation* (Sept. 14th, 1935).—Anæsthesia similar to that for the previous operation was again administered by Dr. Ayre. The chest was reopened through the same incision, but, in addition, about 5 in. of the 6th rib as



well as small posterior portions of the 5th and 7th ribs were removed. The upper lobe was only adherent below and to the diaphragm, which appeared to have ascended considerably since the previous operation. The removal of the upper lobe was carried out in the same way as that of the lower. The chest was closed as before, and an airtight drainage-tube provided below.

**Pathology.**—Both lobes of the lung removed in this case were occupied throughout by smooth-walled cysts communicating with, and indeed being an essential part of, the bronchial system. These appearances, taken in conjunction with the history, suggest the probability of this being a true example of congenital bronchiectasis (Fig. XIII.).

**Progress.**—Four days later the drainage-tube appeared to be blocked, and an X ray examination showed the presence of fluid in the cavity up to the level of the 2nd rib anteriorly (Fig. XII. a on Plate); the tube was changed, but without effect, presumably because a layer of lymph lay between it and the fluid. As the latter was not purulent, drainage was abandoned. A further X ray examination two days later showed that the fluid had disappeared (Fig. XII. b on Plate). The patient made an uninterrupted recovery without any elevation of temperature and was allowed up on the eighth day after the operation.

A bronchogram made on Oct. 19th demonstrates the division of the stem bronchus into two branches which abruptly terminate (Fig. XI. c on Plate); the heart is displaced completely into the left side of the chest, the diaphragm was elevated, and there was a pneumothorax, which has persisted. The patient has remained in good health and free from sputum (Fig. XIV.).

#### CASE 5

R. V., a boy aged 11, referred by Dr. Harbinson. Enjoyed good health until a year previously, when he became ill with pneumonia, subsequently complicated by an empyema for which drainage was performed. He remained in a chronic state of ill-health, constantly coughing up moderate quantities of offensive green sputum, and he was under observation for three weeks in a sanatorium during this period. On admission to the Hospital for Sick Children the sputum had diminished, and its daily production varied from 1-3 oz., but was still offensive. X ray exami-

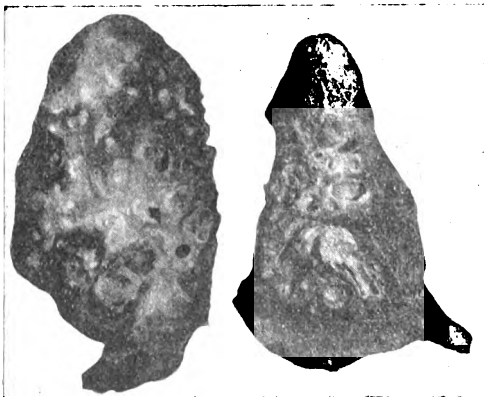


FIG. XIII. (Case 4).—Upper and lower lobes after removal. Half scale. (Specimen in Museum of Royal College of Surgeons of England.)

nation of the lungs revealed a collapsed lower lobe on the left side, a subsequent bronchogram demonstrated dilatation of the bronchi in this lobe and possibly in the adjacent part of the upper lobe (Fig. XVI. a on Plate).

**First operation** (August 10th, 1935).—Anæsthesia similar to that in the other cases was administered by Dr. Ayre. An incision like that in the previous patient was employed. The upper lobe, which appeared healthy, was adherent to the parietes by fine, moderately firm adhesions. The lower lobe was purple, small, and collapsed, and it was mobilised and removed; the chest was closed as in the last case.

On the second day the temperature reached 100.5° F.—

the only post-operative elevation noted. Sputum production immediately increased to 4 oz. for three days and then varied between a trace and 3 oz. for the next few weeks. Convalescence was delayed by collapse of the upper lobe evidenced radiologically by tracheal displacement, although this was gradually corrected. A further bronchogram made on Sept. 29th confirmed the original suggestion that the lower part of the upper lobe was bronchiectatic (Fig. XVI. b). Because this was known to have been of a "wet" type after the first operation, removal of the lobe was determined upon.

**Second operation** (Oct. 5th, 1935).—Similar anæsthesia to that

for the previous cases was again administered by Dr. Ayre. The old incision was reopened and the upper lobe removed as in the previous case. The tourniquet at one stage, however, was readjusted because of the proximity of the vagus nerve.

At the conclusion of the operation the patient's condition seemed in every way satisfactory, the pulse-rate, for instance, being 90. About five hours later the boy became very ill. Marked pallor and restlessness developed and the pulse was weak and almost uncountable; restorative measures failed, and death occurred fourteen hours after operation. Approximately 18 oz. of fluid escaped by the tube; although this was heavily blood-stained



FIG. XIV.—Case 4 after pneumonectomy.

#### LEGENDS TO ILLUSTRATIONS ON PLATE

MR. MASON

FIG. XI. (Case 4).—Bronchograms. (a) Bronchiectasis in lower lobe of left lung. (b) After removal of lower lobe (first operation) bronchiectasis of upper lobe. (c) After removal of upper lobe (second operation). Heart displaced to left, diaphragm elevated, and pneumothorax.

FIG. XII. (Same Case).—Radiograms. (a) Sept. 14th, 1935. Four days after second operation. Fluid at level of 2nd rib anteriorly. (b) Sept. 24th. Fluid has disappeared. (c) Condition five months after pneumonectomy showing residual pneumothorax.

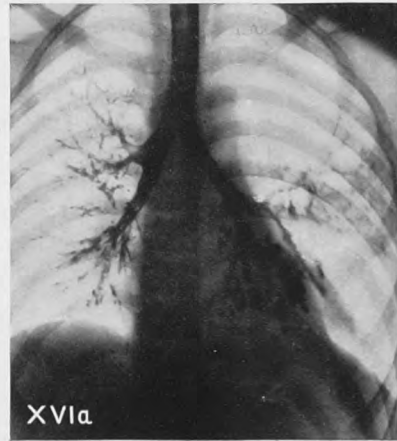
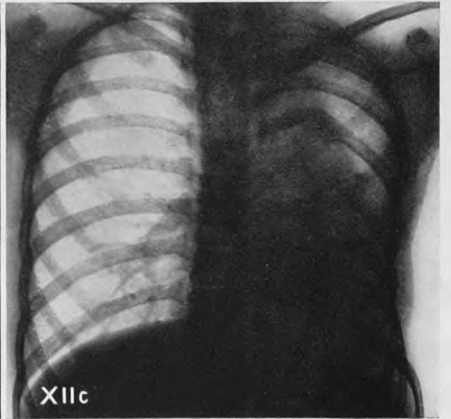
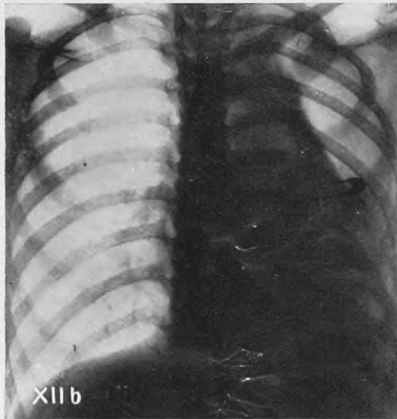
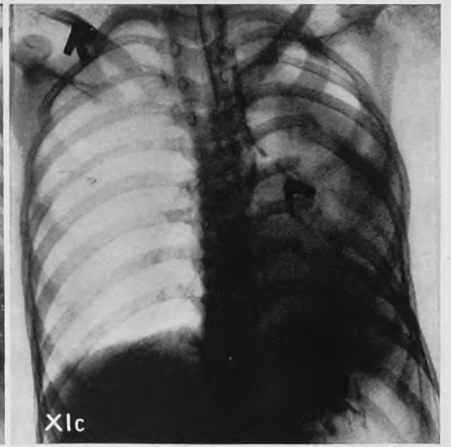
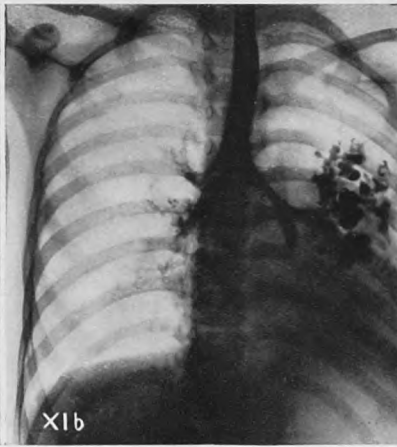
FIG. XV. (Case 2).—Bronchogram showing gross bronchiectasis of right lung. Heart and trachea much displaced to right side.

FIG. XVI. (Case 5).—Bronchograms. (a) Bronchiectasis in lower left lobe and possibly in adjacent part of upper lobe. (b) After removal of lower lobe (first operation) showing bronchiectasis of upper lobe.

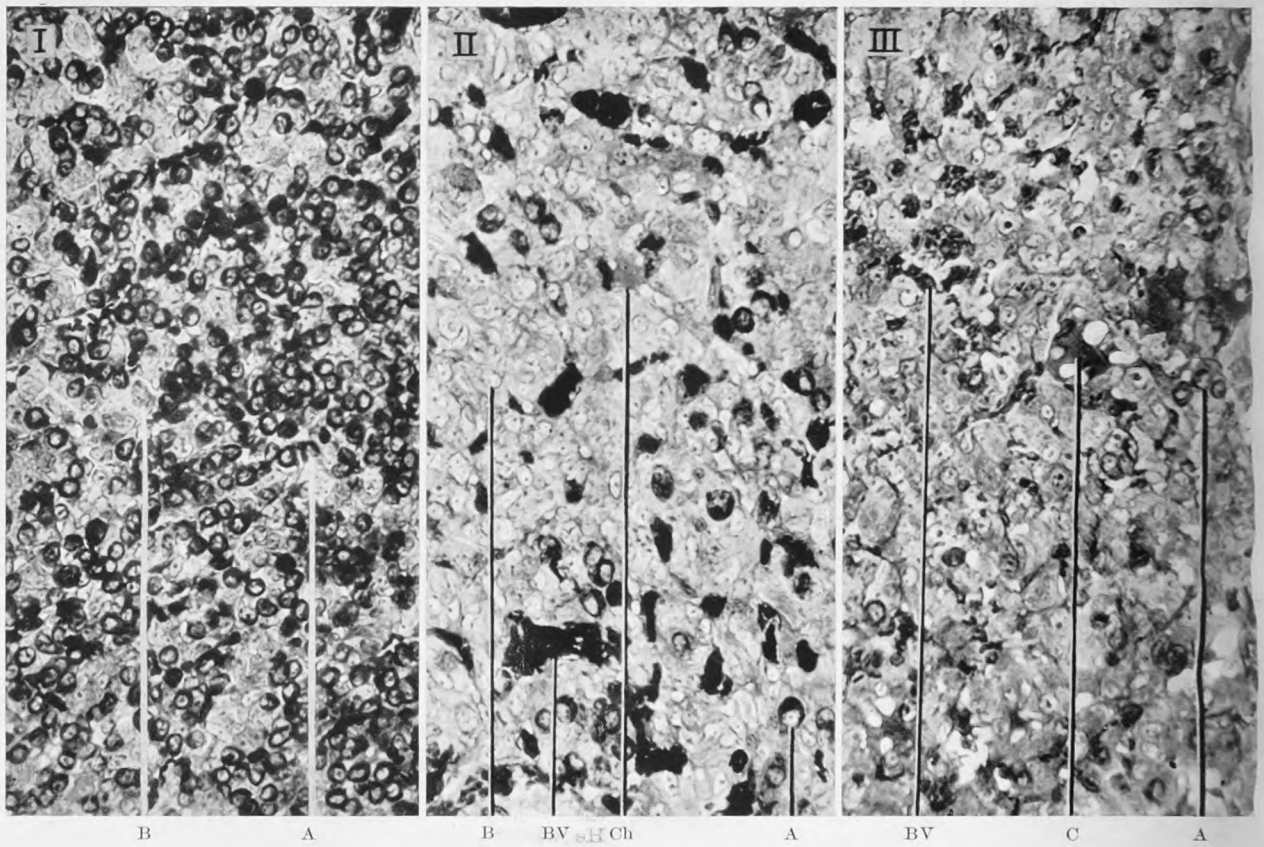
FIG. XVIII. (Case 6).—Bronchograms. (a) Bronchiectasis throughout left lung. (b) A year after removal of lower lobe (first operation). Disease confined to upper lobe. (c) After removal of upper lobe (second operation). Heart displaced completely to left side; trachea central; small pneumothorax on the left side.



MR. MASON : EXTIRPATION OF THE LUNG



DRS. CRAMER AND HORNING : EFFECT OF ŒSTRIN ON THE PITUITARY GLAND



DR. BAUER : TREATMENT OF CONGENITAL DISLOCATION OF THE HIP



the blood was well diluted, and the boy's condition was not attributed to hæmorrhage.

The appearance of the viscera and vessels at necropsy were not such as would have been expected in a case of death from severe hæmorrhage. In point of fact, the only lesion discovered was that the vagus nerve had been damaged close to the root of the left lung. Prof.

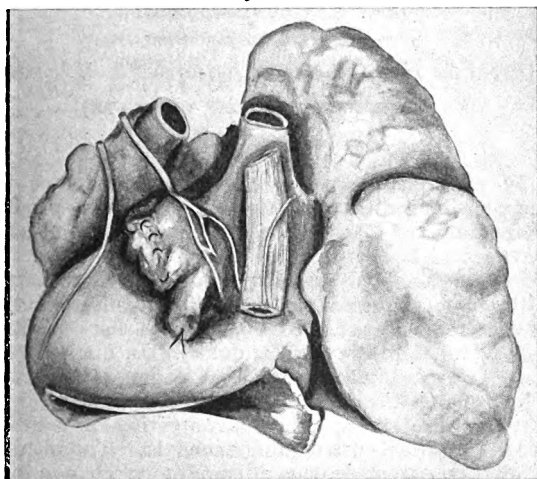


FIG. XVII. (Case 5).—The damaged vagus nerve.

R. B. Green kindly dissected this and sketched the parts (Fig. XVII.). The vagus, just above the root of the left lung, was grooved transversely, and when the nerve at this level was teased a break in approximately half its fibres was demonstrated, a possible explanation of the fatal and uncontrollable tachycardia.

#### CASE 6

B. S., a boy aged 8, referred by Dr. J. Skinner, of Jarrow, and by Dr. Glen Davison. Since the age of 3 he had suffered from recurrent colds accompanied by coughing, expectoration of green sputum, pain in the chest, and night sweats. He had not suffered from

measles, scarlatina, or whooping-cough. On admission to the Hospital for Sick Children amphoric breathing and crepitations were heard in the lower part of the left lung, and 1-2 oz. of purulent sputum were expectorated daily. A bronchogram revealed the presence of bronchiectasis throughout the entire left lung (Fig. XVIII. *a* on Plate).

*First operation* (Feb. 12th, 1935).—Anæsthesia similar to that in the previous cases was administered by Dr. Phillips. A similar incision was also employed. Generalised easily separable adhesions were present and the lower lobe, which was purple and collapsed, was mobilised and removed; the chest was closed after the provision of syphon drainage. The external appearance of the upper lobe was comparatively normal.

Convalescence was delayed by a pneumonic infection in the opposite middle lobe and by a cervical herpes zoster. The wound healed well after a transient period of infection, but for a while 5-6 oz. of sputum were expectorated daily. The patient was discharged to a convalescent home on May 22nd. On returning home in October the general condition began to deteriorate and the sputum returned. Accordingly, removal of the upper lobe was decided upon after bronchography had demonstrated that bronchiectasis was still confined to that lobe (Fig. XVIII. *b* on Plate).

*Second operation* (Feb. 8th, 1936).—Similar anæsthesia to that for the first operation was administered on this occasion by Dr. Ayre. The chest was reopened by an intercostal incision at a slightly higher level than previously. The diaphragm was observed to be elevated although the phrenic nerve was intact, and the heart displaced markedly so as to occupy largely the space from which the lower lobe was previously removed. The upper lobe was removed in the same way as the lower lobe, and the chest closed with provision of syphon drainage.

An uneventful convalescence followed, the tube being removed on the seventh day and the patient allowed up, the wound being healed, on the tenth day after operation. He was then ready to go home. A bronchogram on March 28th demonstrated the division of the stem bronchus into two branches which abruptly terminate; the heart was displaced completely into the left side of the chest; the diaphragm was elevated, but the trachea appeared

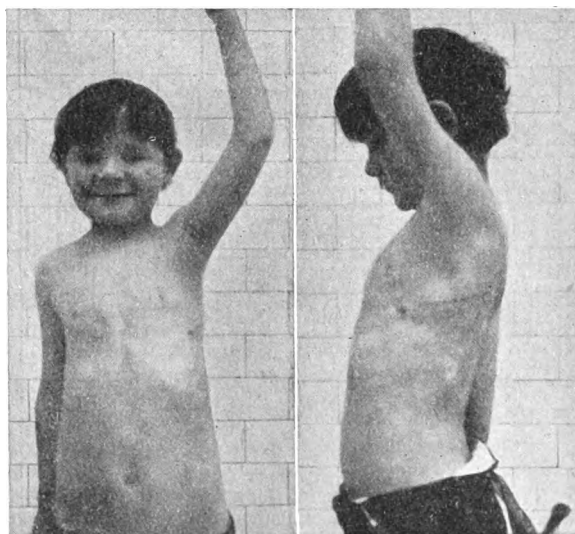


FIG. XIX.—Case 6 after pneumonectomy.

to be centrally situated and to its left a small pneumothorax was visible (Fig. XVIII. *c* on Plate). The patient is now (April 2nd, 1936) in excellent health and free from sputum (Fig. XIX.).

#### Conclusion

The question of which technique should be employed in pneumonectomy is as difficult to answer as it is in lobectomy. In point of fact, both problems

#### LEGENDS TO ILLUSTRATIONS ON PLATE

DRS. CRAMER AND HORNING

Photomicrographs of sections cut through the pars anterior of the pituitary gland of one normal and two œstrin-painted mice. All sections were differentially stained to show the acidophil, basophil, and chromophobe cells. A = acidophil. B = basophil. Ch = chromophobe. C = colloid. BV = blood vessels. ( $\times 450$ .)

FIG. I.—Untreated male mouse (No. 283) showing the normal number of acidophils in the anterior lobe. The blood-vessels are almost entirely closed.

FIG. II.—œstrin-treated male mouse (No. 271) showing the decreased number of acidophils and of basophils after 5½ months' œstrin administration. Intense vasodilatation and congestion.

FIG. III.—œstrin-painted female mouse (No. 247) after 6 months' treatment, showing, in addition to the diminution of the chromophil cells and the congestion, the presence of large amounts of colloid in the anterior lobe.

DR. BAUER

FIG. III.—(a) Unilateral dislocation; fairly good position. Child aged 14 months. (b) After 3 months' treatment; dislocation reduced and development of a good acetabulum.

FIG. IV.—(a) Right hip, subluxation; left, dislocation with severe displacement and beak deformity of the head of the femur. Child aged 2 months. (b) After 5 months' treatment. A good functional and anatomical result.

are the same. When the direct operation is successful, it is brilliantly so; but its failures can be equally disastrous. Alexander has shown that the mortality of the two-stage operation is lower. My first three patients were treated in the former manner, following the precedent of the only two previously successful extirpations of the lung for bronchiectasis—those of Nissen and Haight. A different technique was adopted in the three later cases because an increasing experience with lobectomy suggested the likelihood of such being attended with success in these particular cases.

My present belief is that those cases in which there is no reason to suspect the presence of adhesions, or of induration around the hilus, and consequent increased friability of its vessels, the technique successfully practised by Reinhoff should be employed. Its scope would seem limited to certain cases of neoplastic or tuberculous disease; the advisability of its use for occasional cases of bronchiectasis is not yet known. In other instances an attempt should be made to amputate the lung through its pedicle, which may then be closed by suture, or, if the gravity of the patient's condition—usually after a mobilisation made difficult because of the density and distribution of adhesions—is such that cessation is necessary, the operation may be concluded by applying mass ligatures to the hilus.

Experience derived from such a small series of cases does not justify dogmatic assertions; it is merely offered as a contribution to the general stock of knowledge that is now rapidly accumulating concerning the surgery of the thorax.

I must express my gratitude, first to the Council of the Royal College of Surgeons of England for permission to use the facilities for experimental work at the Buckston Browne research farm; secondly, to the authorities of my own medical school, in the University of Durham, for their constant encouragement and support; and finally to my friend Mr. Laurence O'Shaughnessy not only for his stimulating criticism but also for the generous way in which he has given me the benefit of his extensive experience in this branch of surgery.

## REFERENCES

1. Macewen, W.: West London Med. Jour., 1906, xi., 163.
2. Sauerbruch, E. F.: Münch. med. Woch., 1923, lxx., 1011.
3. Gluck, T.: Berl. Klin. Woch., 1881, xli., 645.
4. Kümmel, H.: Verhandl. d. Deut. Gesellsch. f. Chir., 1911, xl., 147.
5. Meyer, Willy: Arch. of Surg., 1923, vi., 361.
6. Lilienthal, H.: Ann. of Surg., 1922, lxxv., 257.
7. Archibald, E.: Jour. Thoracic Surg., 1933, ii., 265.
8. Nissen, R.: Zentralbl. f. Chir., 1931, lviii., 3003.
9. Haight, C.: Surg., Gyn., and Obst., 1934, lviii., 768.
10. Mason, G. A.: Brit. Med. Jour., 1935, i., 299.
11. Edwards, A. Tudor, and Roberts, J. E. H.: Proc. Roy. Soc. Med., January, 1936, p. 220.
12. Ferrari, R. C.: Bol. y trab. de la Soc. de cir. de Buenos Aires, 1935, xix., 189.
13. Reinhoff, W. F.: Private communication, Feb. 18th, 1935.
14. Graham, E. A., and Singer, J. J.: Jour. Amer. Med. Assoc., 1933, cl., 1371.
15. Reinhoff, W. F., and Brayley, E. W.: Jour. Amer. Med. Assoc., 1934, ciii., 1121.
16. O'Shaughnessy, L. F.: THE LANCET, 1935, i., 476.
17. "": The Vagus and the Surgery of the Chest, Jour. Thoracic Surg. To be published.

**THE MENTAL AFTER-CARE ASSOCIATION.**—The annual report of the council of the Association, covering the year 1935, shows solid extension of work and records growing effort. Last year 3307 patients were helped, being an increase of 117 over the previous year, and while the question of employment remains one of the chief difficulties of those responsible for the conduct of the Association, 200 situations were found last year. The balance sheet and financial statement show how carefully the resources must be husbanded to meet so many methods of rendering assistance, and once again the Association records its deep indebtedness to the chairman, Lord Wakefield of Hythe, for large and repeated generosity.

## THE EFFECT OF OESTRIN ON THE PITUITARY GLAND

BY W. CRAMER, Ph.D. Berlin, D.Sc. Edin.,  
M.R.C.S. Eng.

AND

E. S. HORNING, D.Sc.

BEIT MEMORIAL RESEARCH FELLOW

(From the Imperial Cancer Research Fund, London)

(WITH ILLUSTRATIONS ON PLATE)

In a recent paper<sup>1</sup> we recorded the fact that the prolonged application of oestrin produces adenomata of the anterior lobe of the pituitary gland, which are of the chromophobe type. The appearance of pituitary adenomata after oestrin, without any indication of their histological type, has since been confirmed by other workers (McEuen, Selye, and Collip<sup>2</sup>; B. Zondek<sup>3</sup>). In our paper we also referred briefly to the more general effects of the prolonged application of oestrin affecting the whole endocrine system and creating a condition of hypopituitarism including cachexia. The pituitary is always enlarged, the adenomatous change being only an extreme and exceptional manifestation of this hyperplasia. Enlargement of the pituitary after oestrin has been recorded by several observers (Korenchevsky and Dennison<sup>4</sup>; Selye, Collip, and Thomson<sup>5</sup>; B. Zondek<sup>6</sup>; Halpern and D'Amour<sup>7</sup>). But the enlargement of an organ tells us nothing about its functional activity. A priori, one would expect hyperplasia of a gland to produce the general effects of an excessive rather than a diminished functional activity. The fact that the hyperplasia of the pituitary produced by oestrin is associated with conditions in other organs resembling those produced by complete removal of the pituitary appears paradoxical and requires an explanation, which is the object of this communication.

It is well known from Cushing's clinical observations on man that pituitary adenomata produce very different effects according to the type of cell—chromophobe or chromophil—of which they are composed, the chromophobe adenomata being associated with the general condition of hypopituitarism. The fact that, as stated in our previous paper, the adenomata produced by oestrin are of the chromophobe type explains, therefore, the condition of hypopituitarism observed in those animals with pituitary adenoma. We have now been able to establish by histological examination of an extensive material, differentially stained to show the three types of cells in the anterior lobe, that a corresponding cellular change is produced by oestrin in the anterior lobe of the pituitary even when no adenoma is produced and the gland is merely enlarged; there is then an extensive diminution and sometimes an almost complete disappearance of the chromophil cells—both basophil and acidophil—of the anterior lobe, which is the part of the gland undergoing hyperplasia (see Figures on Plate). In addition, there is always a congestion of the anterior lobe, which is so intense that it is noticeable with the naked eye and that it sometimes leads to hæmorrhages of varying degree. Frequently colloid is found lying between the cells of the anterior lobe, sometimes in considerable masses. Occasionally we have seen indications of colloid degeneration in the cells of the pars intermedia.



Since the chromophil cells are generally held to be responsible for the formation and secretion of the specific hormones of the anterior lobe, their disappearance after the prolonged administration of œstrin offers a satisfactory explanation of the development of a condition of hypopituitarism which comprises together with a general condition of cachexia, the degenerative changes in the adrenals and in the gonadal organs, the extensive hyperplasia of the islets of Langerhans, and the atrophy of the thymus already referred to in our previous paper, also changes in the thyroid and parathyroid, which require further study.

In our experiments with mice males and females were about equally affected by œstrin. In both, there is an enlargement of the anterior lobe and an extensive diminution of the chromophil cells together with the general changes in the organism. Zondek's experience<sup>6</sup> that females do not respond to œstrin by enlargement of the anterior lobe is exceptional. Two other groups of workers (McEuen, Selye, and Collip<sup>4</sup>; Halpern and D'Amour<sup>2</sup>) using rats, as Zondek did, record an enlargement of the pituitary in females as well as in males. In any case this is a point of minor importance. For Zondek's observations agree with ours in finding that œstrin produces an arrest of growth and atrophy of the genitals in females as well as in males. The appearance of adenomata of the anterior lobe is also not confined to one sex. We found adenomata in two male mice and in one castrated male, Zondek observed one adenoma in a female rat, Collip and his colleagues in three castrated female rats. If there is a difference between the two sexes in their reaction to œstrin it can only be one of degree, and the difficulty is to select among the extensive changes produced by œstrin the one that represents the most direct and fundamental effect and that could give measurable data, which could be analysed statistically. At present our impression is that castration renders the animals of both sexes more sensitive to the action of œstrin.

#### SUMMARY

The prolonged application of œstrin results functionally in a condition closely resembling that following hypophysectomy. Morphologically it produces a hyperplasia of the anterior lobe of the pituitary, in which, however, the chromophil cells are greatly diminished, so that the enlarged anterior lobe consists mainly of chromophobe cells. There is also an intense congestion which may lead to hæmorrhages in the anterior lobe together with an excessive production of colloid which sometimes permeates the anterior lobe. On the assumption that the chromophil cells are responsible for the production of the specific hormones of the anterior lobe, the general condition of hypopituitarism and the extensive changes in the other endocrine organs produced by œstrin find their explanation in this disappearance of the chromophil cells of the anterior lobe.

#### REFERENCES

1. Cramer, W., and Horning, E. S.: THE LANCET, Feb. 1st, 1936, p. 247.
2. Halpern, S. R., and D'Amour, F. S.: Amer. Jour. Physiol., 1936, cxv., 229.
3. Korenchevsky, V., and Dennison, M.: Biochem. Jour., 1934, xxviii., 1474.
4. McEuen, C. S., Selye, H., and Collip, J. B.: THE LANCET, April 4th, 1936, p. 775.
5. Selye, H., Collip, J. B., and Thomson, D. L.: Proc. Soc. Exp. Biol. and Med., 1935, xxxii., 1377.
6. Zondek, B.: THE LANCET, April 4th, 1936, p. 776.

## CONGENITAL DISLOCATION OF THE HIP

ITS PREVENTION AND TREATMENT WITH ABDUCTION BRACES

By Dr. FELIX BAUER

ORTHOPÆDIC SURGEON, REICHSANSTALT FÜR MÜTTER- UND SÄUGLINGSFÜRSORGE, VIENNA

(WITH ILLUSTRATIONS ON PLATE)

The cause of congenital dislocation of the hip is under-development of the joint. In a shallow acetabulum with a poor roof, the head of the femur is not held firmly enough and in due course it comes out, usually in the first months of life. Hitherto the usual non-operative treatment has been to reduce the dislocation—usually a long time after it occurs—and then to fix the joint for several months; shrinking and contraction of the soft parts keep the head of the femur in place. There is no growth of the joint during the period of fixation: it is not until several months later that very slow development begins, when the joint is used again; and only in a minority of cases does this lead to an approximately normal anatomical structure. This fact is very important, for when the patient treated is examined ten or twenty years after reduction it is very often apparent that the anatomically imperfect joint cannot be much used on account of arthritis and subluxation, even if its function was good immediately after treatment, when cure seemed complete.

My study of the causes of congenital dislocation of the hip has shown that the joint needs, even more than a good inherited constitution, function with plenty of movement and the abduction natural in the fetus. If the intrauterine posture is very cramped, the limitation of movement and the adduction of the joint hinder its development. My new method of treatment rests on these facts, as well as on prophylaxis and early diagnosis of deformities—dislocation, subluxation, and the flat acetabulum. From the very beginning treatment is directed not only against the mechanical error in the joint, the dislocation, but also against the under-development which predisposes the joint to dislocation and later to arthritis and subluxation. The latter may occur in cases in which there was no dislocation at an early age. Treatment must therefore offer the backward joint both function and abduction. Fixation, which until now has played the chief part in conservative (non-operative) treatment I repudiate as injurious; it hinders the growth of the joint, and makes it extremely atrophic in all its elements. It is also necessary that treatment should begin as soon as possible after birth, for the joint should remain empty for the shortest time. My aim is to cure as early as possible not only mechanically, but also anatomically. Treatment by my "abduction braces," which leave the joint mobile, has now been tried on 27 cases—21 in the first year and 6 in the second year. Up to the present, with the fixation method, the joint after reduction has been held in place in an unnatural manner by shrinking and contracture of the atrophic soft parts, leaving the acetabulum poor and unchanged. With my treatment this is achieved by the strengthened soft parts and by improvement in the joint in its most important part, the roof of the acetabulum. This begins at once and can always be seen in the skiagram as early as 4–6 weeks after reduction.

## METHOD OF TREATMENT

The first step in my treatment is reduction as early as possible; this is perfectly harmless for the infant when done by a practised hand, and never needs an anæsthetic. Immediately after the reduction the abduction braces are applied. These consist of cotton webbing so arranged as to draw the knees apart by attaching them to a band round the lower thorax (Figs. I. and II.). Natural mobility is

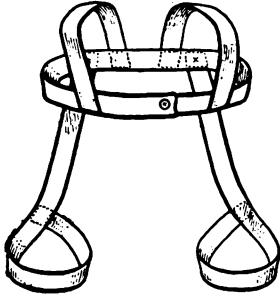


FIG. I.—The braces from the front.

unhindered, only adduction and extension of the hip being prevented, to an extent varying with the state of the joint. The braces cause mother and child no trouble and do not hamper care of the infant in the least. The child can lead a natural, happy life with much movement, and develops very good musculature, especially around the hip-joint. The child must be able to kick and to lie on his abdomen a good deal, and to crawl as soon as possible. The treatment is not to be disturbed even by severe illness. A twin whose dislocation was reduced at 2 months became dangerously ill with pneumonia, but in the children's hospital the abduction braces were left on all the time, as they were no hindrance to nursing.

This proves that there is no lower age limit for this treatment and that it can be carried out easily, even with the youngest infants and under difficult conditions. Two other children had severe phthisis in the first and second year of life, and the treatment was continued uninterrupted. Admission to hospital has never been necessary; children living outside the city can be taken home immediately after the reduction and put in charge of their own doctors. The braces can be changed easily by the mother herself. The younger the child, the simpler and more natural is the course of treatment, as it gives the infant a position natural to him from the foetal period. During the second half of the first year, when the child's desire to move increases and he begins to sit up, a light stick between the knees is added to the braces, which only prevent adduction and extension, and leave plenty of freedom for other movements of the joint except extension. It allows crawling, and, later, standing and walking with the legs spread apart. As a rule, the treatment lasted 7-8 months in the first year; if it is begun in the second month, as I require, an anatomically normal joint is usually obtained during the first year. But even at the beginning of the second year I have succeeded in treatment without fixation. Abduction braces and stick were always quite enough to ensure reduction with the best position of the femoral head in the joint. These children also lead a happy life, full of movement, in the braces. They crawl about a fortnight after the reduction, and according to the condition of the joint, they may soon stand and walk. The development of the joint is at this time, also, decidedly better than with fixation, and it begins in the second month after reduction.

At the time when the child would otherwise be taken out of the plaster-of-Paris cast with an undeveloped, atrophic joint and poor musculature, and would be taught to walk with great difficulty and enormous care, I have after my treatment a

child who can walk normally, with excellent hip muscles developed by exercise in the abducted position, and, most important of all, as the X ray pictures show, with a normal, or at least much improved, joint with a deep acetabulum and a good roof, which continues to develop rapidly (Figs. III. and IV. on Plate). The outlook for such a joint is certainly much better than the outlook for the undeveloped, atrophic joint left by the fixation method.

## EARLY RECOGNITION

The earlier the better, without qualification, is my principle for beginning treatment. It may start in the first weeks of life, and it is easier and more natural to carry out while the infant is still recumbent. The latest time is as soon as possible after dislocation, but it is far better to avoid dislocation by beginning at an earlier stage. Practitioners, especially those concerned with infant welfare, should diagnose the congenital subluxation and dislocation at the earliest possible moment. This is easy, as I have shown that the cramped posture of the foetus in the uterus is the usual and most important cause of the under-developed joint, and that it persists in the infant, after a short period of disturbance at birth (lasting 2 or 3 weeks) and is almost always easy to recognise, because as a rule it is associated with asymmetry. Such an infant is compelled to lie on one side and usually its skull is noticeably asymmetrical. The cramping causes contractures and limitation of movement in the hip, usually much more marked on one side than on the other. On the soft parts of the inner side of the thigh the forced position of the limb causes a different formation of the folds on the two sides, and finally, in the joint, the delay in ossification and in the growth of the acetabulum is usually greater on one side than on the other.

To diagnose in an infant an undeveloped joint due to its cramped posture in the foetus attention should be paid therefore to the following points:—

- (1) Does the child lie on one side only? Does the pelvis take part in this? Is there asymmetry of the skull?
- (2) Do the folds of the inner side of the thigh differ in depth, number, or position?
- (3) When lying on the back as symmetrically as possible, is there a difference in the position of the hip-joints? Is one adducted, bent, or externally rotated more than the other? Or are both much adducted or rotated?
- (4) Is one leg moved less than the other?
- (5) Does one leg appear shorter?
- (6) When an attempt is made to spread the legs apart, is there a stronger resistance on one side than on the other, or is it very strong on both sides?

The positive findings must be completed by X ray



FIG. II.—The braces in use.



photography of the joint and consultation with a specialist. In such an examination as this the hip which is above as the child lies on the side it prefers is always the poorer, with the flatter acetabulum and retarded development of the centre of ossification in the head of the femur; it shows more severe contractures, chiefly in abduction, often is decidedly sparse in movements, and as a rule there are numerous long folds in the skin of the upper part of the thigh; this leg also often appears shorter. Every infant should be examined by the doctor for these signs from the fourth week. The symptoms of the dislocation itself—real shortening of the leg, broadening of the flanks, flattening of the nates, inward and downward displacement of the axis of the thigh, prominence of the great trochanter, and other asymmetries of the body—are discernible in only a few infants, because of the slight degree of dislocation at this age, and they hardly come under consideration for diagnosis at the general examination. Even the specialist will be able to distinguish between subluxation and dislocation only in a minority of the cases. On the other hand, the X ray picture gives the experienced person reliable information; apart from this, in almost all cases the clicking sign can be elicited during reduction, when the femur head is introduced into the acetabulum.

With my methods of examination, not only congenital dislocation itself (with an incidence of about 3 in 1000) but also a much larger group of high-grade undeveloped joints due to foetal cramping (3 in 100) can be recognised. We may expect a dislocation in about every 8th female infant and every 50th male infant with the signs of a high degree of cramping. At any rate, the large majority (possibly all) of the dislocations are caused by this foetal position, and heredity is of much less importance. There is no doubt that some degree of under-development, as shown by these tests, is within physiological limits; others are destined for arthritis and other joint changes. It is necessary to recognise this larger group in order to treat the hip in the stage before dislocation, because contraction and poor movement make the joint worse during the first year of life, just as they do in the foetus, and must therefore be relieved. This is done in any case by reduction and exercise, in higher degrees, exactly as in complete dislocation, with functional treatment by the abduction braces. In 36 higher-grade subluxations, a good anatomical result was usually achieved in 3 to 6 months by reduction and the spreading band.

#### CONCLUSIONS

The natural functional treatment of congenital dislocation of the hip is carried out with abduction braces, according to the following principles: (1) Treatment begins as early as possible. (2) Function is as natural as possible, and the legs are spread as far as is necessary. (3) The injurious fixation hitherto used is avoided. (4) The necessary early diagnosis is made in the 4-8th week by recognising the effects of the foetal posture. (5) The result of the treatment in all cases is rapid mechanical cure without danger of recurrence, owing to the natural development of the joint and its soft parts. (6) When the treatment begins at the right time, good development of the joint always begins immediately after reduction and anatomical cure is achieved usually in a short time. (7) The treatment does not give rise to any complaints and has shown consistently good results when applied during the first and second years of life.

## THE CAUSE OF HYPERTENSION IN PRE-ECLAMPTIC TOXÆMIA

### A STUDY OF BLOOD PRESSURE IN MOTHER AND INFANT

BY F. J. BROWNE, M.D. Aberd., D.Sc. Edin.

DIRECTOR OF THE OBSTETRIC UNIT, UNIVERSITY COLLEGE HOSPITAL; PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY IN THE UNIVERSITY OF LONDON; AND

GLADYS H. DODDS, M.D., M.C.O.G., D.P.H. Edin.

ASSISTANT IN THE OBSTETRIC UNIT

RECENT researches have tended to show, but so far without bringing forward convincing evidence, that the cause of the hypertension that is the earliest and the most constant of the three cardinal signs of pre-eclamptic toxæmia is likely to be found in the presence in the patient's circulation of a blood-pressure-raising substance, derived from a gland of internal secretion—perhaps the pituitary or the adrenal. An alternative and older hypothesis is that the pressor substance is derived from the placenta, possibly from degenerative changes therein. In either case it is to be presumed that the substance is soluble in the mother's blood, and being so, might pass freely via the placenta and cord into the foetal circulation, where it would lead as in the mother to a rise of blood pressure, which should be demonstrable in the child immediately after birth. We therefore decided some three years ago to study the blood pressure of the infants of hypertensive mothers, and this we have done in several cases. Most of the infants were born by Cæsarean section and in every case the blood pressure of the mother was at a very high level just before the section was performed. The pressure was measured in both mother and child by the same instrument—a baumanometer using the auditory method. In the infants a specially small armet had, of course, to be employed.

In none of our cases have we been able to demonstrate a rise of blood pressure.

#### ILLUSTRATIVE CASES

The following are three typical examples.

CASE 1 (A.638).—Aged 38. History of one miscarriage at three months in January, 1934. No other pregnancy. In the present pregnancy she was sent in as an emergency case by an outside doctor on account of pre-eclamptic toxæmia which was said to have been present for a month. On admission on May 8th, 1935, the B.P. was 198 systolic, 120 diastolic; there was oedema of the legs as high as the knees and also of the face; there was headache of two days' duration and epigastric pain had been present for some hours. Albumin was so much that the urine was too solid for Esbach estimation; hyaline casts alone were present and a few red blood-cells. Blood-urea, 29 mg. per 100 c.cm.; urea concentration, 2.35; urea-clearance, 49 per cent. Routine expectant treatment was carried out for seven days but the condition improved but little, the B.P. varying between 210 and 150 systolic and between 130 and 90 diastolic. Though the epigastric pain disappeared on the day after admission and did not return, severe pain was complained of in the back of the neck on May 12th, on which date the B.P. was 200 systolic, 130 diastolic. The pain continued till delivery. Cæsarean section was done on May 16th, the patient being then about three weeks short of full term. A premature child was delivered which weighed 5 lb. 2½ oz. and was 18 inches long. Three hours before operation the mother's blood pressure was 200 systolic, 150 diastolic. Half an hour after its birth the infant's blood pressure was 80 systolic. Daily readings were taken till June 6th. During this time the infant's systolic B.P. varied from 92 to 72 mm. Hg

with a mean of 80. On discharge from hospital on June 6th the mother's B.P. was 143 systolic, 80 diastolic; there was still a trace of albumin, but no casts, and no visible œdema. When she was seen six weeks after delivery the B.P. was 144 systolic, 102 diastolic, and the urine contained albumin.

*Comment.*—This was probably a case of pre-eclamptic toxæmia.

CASE 2 (A.332).—Aged 31. One previous pregnancy which ended in eclampsia for which she was admitted as an emergency in 1931. A macerated foetus was born. In the present pregnancy she was first seen on Sept. 12th, 1934, at the eleventh week of her pregnancy. Her B.P. was 176 systolic, 100 diastolic. Except for a short period in hospital for renal efficiency tests she was treated as an out-patient till Feb. 10th when she was admitted to hospital. Blood pressure then was 190 systolic, 100 diastolic, there was a trace of albumin, and some œdema of the legs and abdominal wall, but no abnormal symptoms. Blood-urea, 32 mg. per 100 c.cm.; urea concentration, 2.6; urea-clearance, 64. The blood pressure remained high after admission, the systolic varying between 220 and 152 and the systolic from 110 to 80. Cæsarean section was done on March 3rd at 2.30 P.M. The mother's B.P. at 10.30 A.M. on that day was 220 systolic, 100 diastolic, and at 12.30 the systolic and diastolic pressures were 210 and 100 respectively. The infant was at term and weighed 8 lb. 2 oz. at birth. At 6 P.M.—i.e., 3½ hours after birth—its systolic B.P. was 70 mm. Hg. Daily readings till March 24th showed that the systolic B.P. varied between 84 and 64, the mean being 76. The diastolic pressure on the four occasions on which it was recorded varied from 50 to 40. The patient was seen on March 4th, 1936, when her B.P. was 162 systolic, 90 diastolic. She has a trace of albumin that comes and goes.

*Comment.*—This patient probably had a mild chronic nephritis and hypertension dating from the first pregnancy. It is noteworthy that at the eleventh week of the present pregnancy the B.P. was considerably raised, and that the hypertension still persists a year after delivery.

CASE 3 (A.339).—Para-5, aged 38; is said to have suffered from "kidney trouble" in each of her five previous pregnancies, but has three children alive and well, all being apparently born somewhat prematurely. In her first pregnancy she had been in City-road Maternity Hospital for three weeks before delivery for "kidney trouble." In 1924 had a stillborn child at term. First came under our observation in 1930 when she had pre-eclamptic toxæmia; the hypertension persisted after delivery, and four months after delivery the B.P. was 220 systolic and 110 diastolic. In the present pregnancy she was first seen on Nov. 19th, 1934, when 22 weeks' pregnant. The blood pressure was then 200 systolic, 110 diastolic, albumin absent. She was treated as an out-patient till Feb. 19th, the blood pressure readings during all that time never being below 200 systolic and 140 diastolic. On Feb. 13th albumin was found in a catheter specimen but the patient remained free from symptoms. She was admitted to hospital on Feb. 19th and was under constant treatment there till delivery on March 18th, when after a medicinal induction followed by a precipitate labour a child weighing 4 lb. 8½ oz. and 20 inches long was born in good condition. According to the patient's menstrual dates and judging from the length of the child it was at full term. During the patient's stay in the antenatal ward the B.P. remained constantly very high, and was little or not at all influenced by rest and other routine treatment, including ultra-violet rays, which were given on alternate days throughout the period. Results of kidney function tests were as follows: blood-urea, 28; urea concentration, 2.8; urea-clearance, 122. Albumin was constantly present and on March 13th had increased to 3 per 1000. Hyaline and granular casts and a few red blood-cells were present on all the three occasions on which the urine was examined microscopically. The patient's blood pressure on discharge on March 23th was 208 systolic, 116 diastolic, and there was still a trace of albumin but no casts. In August the B.P. was still 212 and 140 systolic and diastolic respectively, and there was still a trace of albumin, but no casts nor blood. The baby's blood pressure nine hours after delivery was 76 systolic, 34 diastolic.

*Comment.*—The diagnosis here lies between chronic nephritis and chronic hypertension. Against the former are the good results of the kidney function tests. On the other hand, the appearance of albumin on Feb. 13th and its persistence and increase till term point to a super-imposed kidney lesion or to an exacerbation of one already present.

As controls we carried out estimations of the blood pressure in six normal infants at periods varying from 2 to 18 days after birth. The systolic pressure varied between 68 and 86 with a mean of 73.

#### SUMMARY AND CONCLUSIONS

The paper is concerned with a study of the blood pressure in infants born of mothers who had hypertension before delivery. It might be supposed that if the cause of the hypertension in pre-eclamptic toxæmia and other hypertensive conditions in pregnancy were a substance, hormonal or otherwise, circulating in the mother's blood, this substance would diffuse through the placenta to the foetal circulation, and that the infant would then have a raised blood pressure at birth. Three typical and representative cases are reported in detail, and it is shown that there was no rise of blood pressure in the infants. It is, therefore, concluded that whatever be the cause of the hypertension in pre-eclamptic toxæmia, it is not a substance that is capable of passing across the placenta into the foetal circulation.

### BRAIN AND LUNG ABSCESSSES AND BENIGN SPONTANEOUS PNEUMOTHORAX AS COMPLICATIONS OF OTITIS MEDIA

By P. R. ALLISON, M.B., B.Sc. Leeds, F.R.C.S. Eng.  
SENIOR SURGICAL TUTOR AND REGISTRAR, GENERAL  
INFIRMARY, LEEDS

F. F. HELLIER, M.A. Camb., M.D., M.R.C.P. Lond.  
MEDICAL TUTOR AND REGISTRAR; AND

G. S. SEED, M.B. Leeds, D.L.O.  
RESIDENT AURAL OFFICER AT THE INFIRMARY

BRAIN and lung abscesses are well-recognised complications of otitis media and lateral sinus thrombosis, but for a patient to have both of these and to regain normal health must be uncommon. The case here presented is also of considerable interest because following lung abscesses and empyema on the right side there occurred on the left side a complete spontaneous pneumothorax. Although this was not associated with any infection of, or effusion into, the pleural sac, the evidence points to its having arisen as a result of an infective process in the lung.

#### CASE REPORT

A man, aged 22, was admitted to the General Infirmary at Leeds under the care of Mr. W. M. Munby on April 29th, 1934. There was a history of left-sided otorrhœa for three months, and for six days before admission there had been pain in the ear associated with an increase in the discharge. The patient had no symptoms to suggest intracranial complications. His temperature was 98.4° F., with pulse-rate 84 and respirations 24, and he complained of slight headache. The left external auditory meatus was filled with foul-smelling discharge which was escaping from a large perforation in the posterior part of the tympanic membrane. There was a leucocytosis of 23,150, and coliform bacilli, *B. proteus*, and diphtheroid organisms were isolated from a meatal swab. An examination of the central nervous system and the fundus oculi revealed

nothing abnormal. During his first night in hospital he had a rigor. The suggested diagnosis was acute mastoiditis with lateral sinus thrombosis.

**Operation on mastoid.**—On April 30th a simple Schwartz operation was performed by Mr. Munby. Much necrosed bone and foul pus were removed from the mastoid cavity. Exposure of the lateral sinus revealed a grey sloughing wall locally, but enough bone was removed to discover normal looking sinus beyond. After incision of the sinus and removal of the clot free bleeding occurred from the torcular but not from the jugular end. In the middle cranial fossa a large extradural abscess was found and into this a fistulous track opened through the dura mater from a temporo-sphenoidal abscess. The track was opened and a drainage-tube inserted. The mastoid cavity was packed with gauze. A swab was taken from the brain abscess and culture of this showed the presence of organisms similar to those isolated from the external auditory meatus (coliform bacilli and *B. proteus*). For about ten days the fever was intermittent, the temperature occasionally rising to 105° F. but most often being between 97° and 100°. The mastoid wound and the abscess drained freely and there was no sign of further intracranial disturbance.

**Right-sided lung abscesses and empyema.**—About a fortnight after his mastoid operation the patient first complained of a pleuritic pain in the right side of his chest and a few days later he coughed up a large quantity of foul sputum. A lung abscess of embolic origin was diagnosed and it was treated by simple medical measures until June 4th by which time it had become obvious that an empyema had developed. After confirmation of this by X ray examination (Fig. 1) the chest was explored on the right side, and thick foul pus was withdrawn, which yielded *B. coli* on culture. An open operation was therefore performed. Under local anæsthesia an oblique incision was made over the eighth rib on the right side starting just internal to the scapular line and passing outwards to the axilla. About 2 in. of rib were removed, and after confirmation of the site of the pus by exploration the pleura was freely opened. When the rib spreaders were introduced and a large quantity of malodorous pus had been removed from the pleural sac, on the surface of the lung a ragged abscess cavity about 2½ in. in diameter was found. The abscess had developed from a septic infarct in the cortex of the lung and its appearance suggested that the whole outer wall of the cavity had sloughed away and liberated the pus into the pleural sac. Some large sloughs of lung tissue were removed and the empyema cavity carefully wiped out with gauze soaked in Dakin's solution. When the patient coughed there was little expansion of the lung but the presence of a bronchopleural fistula became evident. Open drainage of the pleural sac was instituted.

**Ligation of internal jugular vein.**—The post-operative progress was unsatisfactory. There was intermittent fever with occasional rigors. Since drainage was adequate and X ray examination after injection of lipiodol through the drainage-tube showed a steady diminution in the size of the empyema cavity (Fig. 2), on July 15th the latter was carefully explored under direct vision. The abscess previously described was only represented by a saucer-shaped depression on the lung surface covered with healthy granulation tissue. There were, however, two further disruptions in the lung similar to the first but somewhat smaller. On the strength of this finding it was suggested that the internal jugular vein should be ligated. This was done by Mr. Munby and thereafter progress at once became satisfactory. The temperature and pulse were normal after the operation and frequent inspection of the empyema cavity showed no further abscesses. The bronchial fistulæ were treated by cauterisation with silver nitrate stick, the lung expanded well, and the tube was left in position until the empyema cavity was completely obliterated. Some time before this end had been reached however he was sent to the convalescent home.

**Left-sided pneumothorax.**—At this time the patient's general condition was satisfactory; he was afebrile, the empyema was only small, and the drainage-tube was in position. But on August 31st he suddenly became desperately dyspnoeic with pain in the left side of the chest. One of us (F. F. H.) who was called to see him found a complete tension pneumothorax on the left side, and as an emergency measure withdrew a considerable quantity of air with a 20 c.cm. syringe and returned him to hospital. Following this attack the pulse and respirations remained high though there was no rise of temperature; the lung did not expand and yet no effusion occurred into the

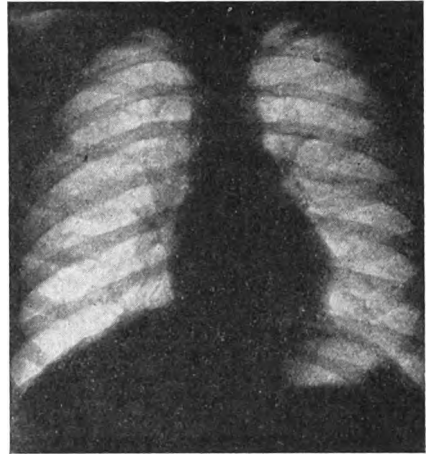
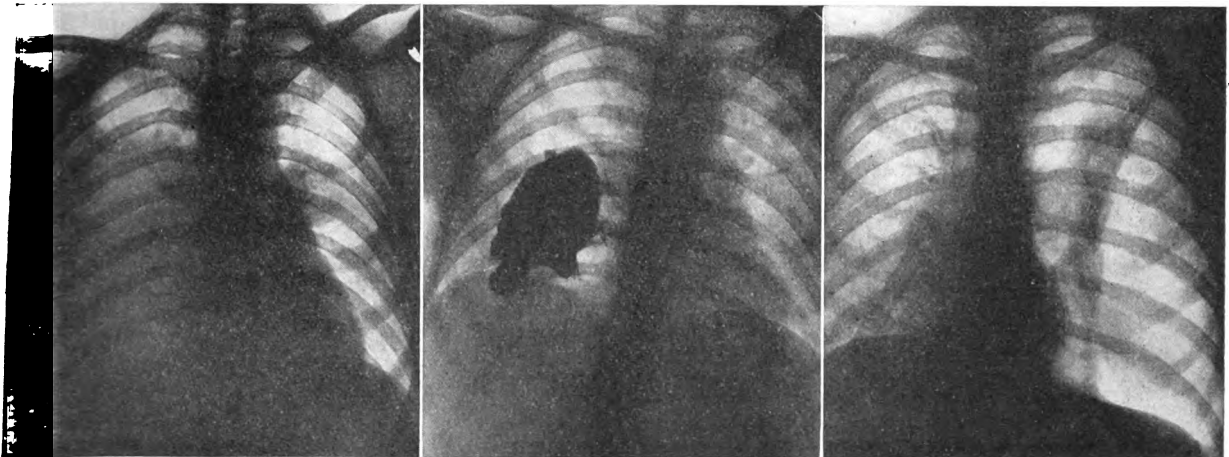


FIG. 4.—The chest after complete recovery.



1.

2.

3.

FIG. 1.—Empyema on right side of chest.  
 FIG. 2.—Empyema cavity filled with lipiodol after open drainage. There is a circumscribed cavity in left subapical region.  
 FIG. 3.—Drainage-tube in position on right side and spontaneous pneumothorax on left. The adhesion on the left side is in the position of the opacity in Fig. 2.

pleural cavity (Fig. 3). The initial assumption had been that a small abscess in the left lung had ruptured, but when no effusion and no infection developed the accident was considered to be independent of the affection in the right side, and in all probability to be due to a ruptured emphysematous bulla. Subsequently, however, a more careful examination of the X ray plates which had been taken before his transfer to the convalescent home showed beyond all doubt that there was in fact a cortical opacity in the left subapical region, and that this was of recent origin was proved by inspection of some of the earlier plates (Fig. 2).

*Return to health.*—Eight weeks later radiography showed no evidence of re-expansion of the lung, and so 2000 and 3000 c.cm. of air were removed from the left side on successive days, the pressure falling from + 2 cm. to - 4 cm. of water. As this operation did not result in any expansion of the lung it was felt that there must be a small bronchopleural fistula although the patient was unable to taste peppermint injected into the pleural sac. An attempt was made to produce an effusion under which the lung might expand and become adherent to the parietal pleura. Following the advice of Dr. W. S. Gilmour, who has had success in the injection of irritant fluids into the pleural cavity where the lung has failed to expand, a solution was made up consisting of tinct. iodi 2 drachms in half a pint of distilled water, and the whole of this was injected into the left pleural sac. No reaction, either local or general, followed this treatment; there was no effusion as seen on the X ray screen, and in fact the fluid injected was rapidly absorbed, leaving the pneumothorax unchanged.

By now the patient felt very well, the empyema on the right side was healed with complete expansion of the lung, but the left lung was still collapsed and the heart displaced to the right. He was loth to undergo further treatment; but a final effort was made, and on Nov. 5th and 6th 3000 and 4000 c.cm. of air were withdrawn. This was followed by a return of the heart nearly to the normal position and expansion of the lung which rapidly became complete. The patient is now working, radiography shows two normal lungs (Fig. 4), and, except for slight deafness in the left ear, he is perfectly well.

#### COMMENT

At first this patient was believed to be suffering from an acute mastoiditis with lateral sinus thrombosis, and the presence of a brain abscess was unsuspected. There can be no doubt that this was the focus from which infected emboli were detached into the pulmonary circulation. It is interesting that the first indisputable indications of a lung abscess occurred a fortnight after operation, for this is also the typical time-interval for the manifestations of an inhalation abscess.

The effect on the temperature of removal between ligatures of the internal jugular vein was dramatic, and it seems probable that an earlier ligation might have prevented the chest complications. Consideration of the lung abscess and empyema emphasises the advantage of an adequate exposure of the pleural cavity at operation, particularly from the point of view of accurate diagnosis. A careful examination of the lung surface through a generous intercostal incision after resection of 2 in. of rib furnishes information which is invaluable in the subsequent treatment of the case. This procedure is not associated with undue danger to the patient so long as the operation is delayed until such time as repeated aspiration has relieved the immediate toxæmia and respiratory embarrassment. The prognosis in pleural infections secondary to lung abscess is not nearly so grave as is frequently supposed. The majority of such cases recover after simple drainage of the empyema, and when the lung expands the abscess is usually found to have healed completely. A bronchial fistula is not often a source of much difficulty and

where these can be attacked directly with the silver nitrate stick rapid healing is the rule.

The spontaneous pneumothorax on the left side raises some difficult problems. It was followed by no constitutional symptoms whatever apart from breathlessness, and it resembled in every way the so-called benign spontaneous pneumothorax. The cause of this condition is supposed to be a sub-pleural bulla with a valve-like orifice so that it gradually increases in size until it ruptures. Occasionally cases of this nature have been demonstrated pathologically, but the condition is comparatively common, and ten cases have been admitted to this hospital in the last three years. There is no proof that the cause is always the same. In this instance it is difficult to avoid the conclusion that the pneumothorax was due to an inflammatory lesion in the left lung similar to that which had existed in the right lung, and yet the pleura remained free from infection. It demonstrates therefore the very important fact that it is possible to have a benign spontaneous pneumothorax—i.e., one without any constitutional upset, without infection of the pleural cavity, and non-tuberculous—secondary to a pyæmic lesion in the lung. Moreover, since the pneumothorax occurred six weeks after the internal jugular vein had been tied it is possible to say that it was caused by a lesion in the lung which had been in existence at least six weeks. Whether this ætiology is of wider application in benign spontaneous pneumothorax is uncertain, but it is sufficient to suggest that the commonly accepted cause should be subjected to careful scrutiny and particular inquiry made for any hint of a more or less recent lung infection. It is important to note that by the time the lung had re-expanded there was no evidence on the X ray plate of the original causative factor.

#### THE DENTAL PROP

BY WILLIAM W. MUSHIN, M.B. Lond.

HON. ANÆSTHETIST TO THE CENTRAL LONDON THROAT HOSPITAL  
AND TO THE DREADNOUGHT HOSPITAL, GREENWICH; HOUSE  
ANÆSTHETIST AT THE ROYAL DENTAL HOSPITAL

THE dental prop, to function correctly, must be fashioned in accordance with sound mechanical principles. A search of English medical and dental literature has failed to reveal any attempt at a historical, scientific, or mechanical survey of the dental prop, although its near relative, the mouth gag, has received this attention.<sup>1</sup> Indeed I have found only two references to the prop and its use.<sup>2,3</sup>

The first mouth props were of vulcanite or hard wood, some being covered with rubber pads and others having removable handles for introduction. Clover brought out the first spring-action prop to prevent displacement in the mouth. Hewitt about 1889 designed a set of steel props; these were made in five sizes and shaped so that they adapted themselves to the angle made by the lower jaw as it recedes from the upper jaw; they are now made of aluminium or German silver. Barth in 1908 adapted these props for children and for small mouths, these models being some of the most useful props at the present time.

The ideal prop should be of robust construction and not likely to break under the strain of the bite, especially with nitrous oxide anæsthesia. It should be comfortable, simple to insert in the conscious patient, easily cleaned and sterilised, and it should

not collect blood-clot and debris on its surfaces. Lastly and most important, when once inserted it should show no tendency to slip, even in edentulous mouths.

THE ORDINARY PROP

The props now in common use are of three main types. First, there are the variations of Hewitt's original pattern, which consist of two plates or biting surfaces, lead or rubber lined, separated by a rod; they are all alike in that one of the biting-plates is set at an angle of 90° to the rod (Fig. 1). Secondly, there are the "spring" and adjustable props such as Hutchinson's and Wingrave's. Nearly all of this type were designed to fit on to the incisor teeth and to be adjustable for different widths of separation of the jaws. They suffer from the drawbacks that they are uncomfortable, liable to break in use—pieces of spring and mechanism being lost in the mouth and pharynx—difficult to sterilise and they may damage the front teeth.

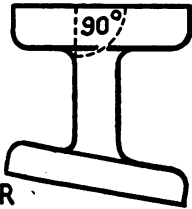


FIG. 1.

Thirdly, there are the solid rubber props and wedges, such as the De Pass prop. These, although quite efficient, are clumsy in use and are of value chiefly in the unconscious patient; they have also a tendency to slip forwards towards the front of the mouth, leaving less room for the surgeon to carry out his manipulations.

No attempt will be made to describe the correct clinical use of the prop, as this has been admirably done by Mr. Frank Coleman.<sup>2</sup>

It is common knowledge that props of the Hewitt type tend to slip, especially when there are no teeth to provide a grip, and it has been observed that they always slip in the same way. Fig. 2 shows how this happens.

Let AB and BC be the upper and lower jaws respectively acting from a hinge at A. Let XY represent a prop as now in common use, with the angle AXY = 90°. Now when the two jaws bite on the prop, the forces exerted by the jaws act at right angles to the line of the jaws, since the latter are rotating round A; the force acting from the upper jaw is F and that from the lower jaw is F<sub>1</sub>, and these are equal (law of action and reaction). The prop being at right angles to AB has the full force F acting along XY from the upper jaw. But the force acting along YX

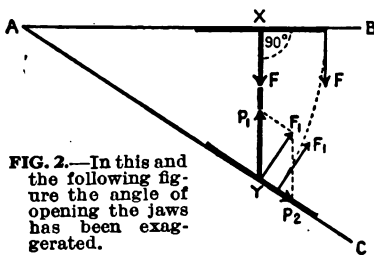


FIG. 2.—In this and the following figure the angle of opening of the jaws has been exaggerated.

from the lower jaw is only P<sub>1</sub>—a component part of F<sub>1</sub>, since F<sub>1</sub> is resolved into P<sub>1</sub> and P<sub>2</sub> acting along AC towards C (parallelogram of forces). Thus F is greater than P<sub>1</sub> and the end of the prop Y tends to slip in the direction of C. Further, as soon as the end Y moves towards C the angle AXY immediately becomes more than a right angle and by the force exerted by the upper jaw, X moves towards A, increasing still further the rotation of the prop.

The following observations have been made, which confirm the above reasoning and conclusions. If lead-lined props which have been in use for some time be examined, it will be found that wear and sometimes even bending takes place at the point R (Fig. 1)—i.e., at the proximal end of the angled

plate. This is the spot where only the grip of the teeth on the lead prevents the rotational movement of the prop already described.

A NEW PROP

In order to have a stable and non-slipping prop, the forces acting along the prop should be equal and opposite. This is shown in Fig. 3.

If the prop XY is placed so that <AXY = <AYX, then the components P and P<sub>1</sub> of the forces F and F<sub>1</sub> are equal and opposite, and the prop has no tendency for its ends to slip. The prop as a whole may now slip in the direction Z, owing to the residual component forces (F-P and F<sub>1</sub>-P<sub>1</sub>), and this will be prevented by the frictional forces between the end X and AB and Y and AC.

A prop was therefore designed embodying these principles and differing radically from previous props of the Hewitt type, in that the two biting-plates are set at equal angles to the central rod (Fig. 4). The two plates have been made to subtend an angle of 20°, which was found to be an average degree of

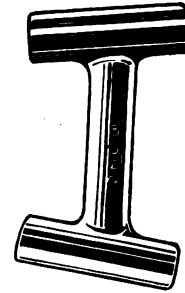


FIG. 4.—The improved prop; it is made of chromium-plated German silver.

opening after observation and measurement of a large number of cases of tooth extraction. The biting-plates have fairly hard pieces of rubber with a moderately fine canvas impression, inserted in the manner of the well-known Trewby prop. This was found to be the best after experimenting with several frictional surfaces. It does not get soiled, it can be sterilised repeatedly, and although not so important as the biting-plate angles, helps considerably in preventing slipping. The biting-plates are slightly curved in a transverse direction for added comfort and stability. The canvas-impressed rubber is so fixed that it cannot fall out, and when worn out it can be renewed in a moment at negligible cost.

The prop therefore complies with the theoretical mechanical requirements for stability, in that the biting-plates are set at equal angles to the central rod, and an attempt is made to increase the frictional forces between the plates and the gums. To further this, it is recommended

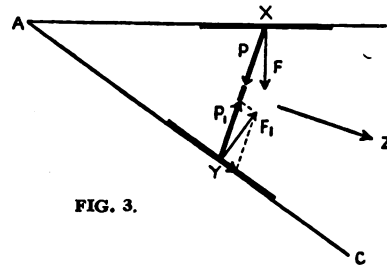


FIG. 3.

that the patient should thoroughly rinse his mouth with water immediately before inserting the prop. This will reduce the viscosity of the saliva between the prop surface and the gum, and will help still further to prevent the prop slipping.

This prop has been in use for some time in the general anaesthetic room of the Royal Dental Hospital; no tendency to slip was found in the several hundred edentulous patients on whom it was tried. The largest size possible for any particular mouth should be used, for if a smaller one is inserted the patient may involuntarily open his mouth a little during anaesthesia and cause the prop to slip or fall out. The prop was originally intended for edentulous

mouths, but for those who prefer to use lead it may be substituted for the rubber surfaces in patients with teeth.

I wish to thank Mr. Frank Coleman and the staff of the Royal Dental Hospital for their encouragement and help, and the Dental Manufacturing Company who made the props for me.

## REFERENCES

1. Colt, G. H.: THE LANCET, 1907, II., 1011.
2. Coleman, F.: The Extraction of Teeth, London, 1933, p. 143.
3. Hewitt, F.: Anaesthetics and Their Administration, London, 1922, p. 221.

## Clinical and Laboratory Notes

### UNSUSPECTED PLACENTA PRÆVIA AND POST-PARTUM HÆMORRHAGE

BY DOUGLAS M. LINDSAY, M.D., F.R.F.P.S. Glasg.

LATE OBSTETRIC AND GYNÆCOLOGICAL SURGEON, MAYDAY HOSPITAL, CROYDON; AND SENIOR ASSISTANT VISITING SURGEON, ROYAL SAMARITAN HOSPITAL FOR WOMEN, GLASGOW

WHEN one meets post-partum hæmorrhage in its most severe and sudden variety the experience is one which leaves a lasting impression. Recently it was my misfortune to have such a case, and on the score of its unusual pathology and because only one line of treatment—and that an infrequently practised one—was applicable, it deserves record and consideration.

## CASE RECORD

The patient, a primipara aged 26, was first visited when she was six months' pregnant. Apart from some pruritus due to a congestive leucorrhœa she felt well, and examination showed her to be a woman in good health; obstetrically the findings were normal.

At eight months the patient reported to the nursing-home thinking that labour had commenced. She had some backache, and after a night in the home there was a slight mucohæmorrhagic "show" on a diaper. A colleague, acting in my absence, kept her under observation for two days, and then sent her home as things seemed to have settled. From the time of her return home till the day on which labour was anticipated there was nothing to suggest anything unusual.

Labour began at 8 P.M., the first warning being the rupture of the membranes. Readmitted to the home, the patient experienced her first pains about 10 P.M. From the onset till the child was born uterine contractions were severe, long, and following fast one on another. The progress was so rapid that by 12.30 A.M. the head was crowned, and sufficient chloroform to produce analgesia was administered. Delivery was completed normally at 12.40 A.M., without perineal injury and with the child breathing and crying immediately. Until the cord was clamped and cut there had been not so much as a staining of blood throughout the whole process.

I stood by the patient with a hand gently supporting the fundus, waiting for the next contraction or any sign of the beginning of placental separation. After a few minutes the fundus hardened suddenly, and immediately the placenta and its membranes were expelled forcibly. As the placenta left the vagina there came the most alarming hæmorrhage, exceeding in suddenness and amount anything I had previously known. It arrived with the splashing and volume of a bucket of water sluiced on a floor, and in a matter of two or three seconds my patient had changed from a healthy coloured, softly breathing, fit young woman to a waxy pallid creature, gasping, restless, and seriously distressed.

The uterus seemed to have retracted as well as contracted in its last expulsive effort, as it rested "cricket-ball hard" under my hand. It was so firm that assuredly it was not at fault, while the fact that there had been no bleeding from the onset of labour right up to the time

of the placental escape ruled out cervical or vaginal lacerations, which, short of involving a very large vessel, could not possibly have accounted for the volume so suddenly lost. The only source could be the lower uterine segment.

I introduced the right hand into the vagina and clasped the lax cervix, gripping it tightly in a clenched fist and pressing upwards while the external hand pressed downwards producing through the hard fundus a rigid bimanual compression. Though only seconds had elapsed between the first sign of the flooding and this control being applied, the patient was already in extremis. The step taken immediately controlled the loss. Realising that a further bleeding, even of a few ounces, would prove fatal, I determined to maintain the pressure until I felt reasonably confident that the bruising and stasis I had produced had made clotting in the open sinuses fairly certain. I waited therefore for a full half-hour and then gradually released the pressure, removing the vaginal hand only when satisfied that the bleeding had ceased.

While I had been thus occupied the theatre staff had elevated the foot of the bed, applied hot bottles and an electric blanket, and commenced the administration of submammary saline. Only after these matters were attended to, and I had controlled the loss, was a stimulant given, the choice being camphor in oil.

Later, examination of the placenta made the cause of the hæmorrhage clear. The placenta was larger than usual, and one half was much thinner than the other. The opening in the sac of membranes was situated at the edge of the thinner portion of the placenta, and placental tissue formed quite half the edge of the perforation in the membranes. Over the thin area of placenta the maternal surface was covered with a layer of highly organised blood-clot. The pathology became apparent: this had been a case of placenta prævia, and the very free sudden hæmorrhage after placental expulsion had been from the sinuses of the flaccid non-contractile lower uterine segment.

## DISCUSSION

When, as is usual, placenta prævia lives up to its name as an unavoidable ante-partum hæmorrhage the attendant is forewarned, and steps are taken to control the further bleeding which is expected when the placenta separates. For years my practice, and I have found it a sound one, has been to remove the placenta manually and apply the bimanual compression described above in all births attended by placenta prævia. Here, however, the abnormality in placental implantation was discovered only after labour, and the hæmorrhage was unfortunately fait accompli before one realised the position.

In retrospect there are two points of moment—the mucohæmorrhagic "show" at eight months, and the fact that labour started abnormally in the rupture of the membranes. Viewed in the knowledge of the pathology of the bleeding, that "show" was important, but in the absence of other pointers this was not appreciated. Had it been larger, or repeated, one would have become suspicious; though the fact that the pregnancy carried on to the very day on which delivery was anticipated, and that the labour was completed without even a staining, would probably have put any such fears at rest. Nature asserted herself to save this patient from blood loss. The membranes ruptured early, the head was well down in the lower uterine segment, and the labour was strong, long, and unrelenting. As the cervix dilated and the placenta was peeled from its attachment in the lower uterine segment, the strong contractions kept the head braced firmly into the cervical canal and pressed the placenta against the gaping sinuses, controlling the loss like a swab held firmly over a cut surface. To a point Nature did her job well—one is tempted to speculate if she may not do this particular job oftener that we suspect



and with better results—but she failed in her last difficulty. When the placenta came away the all-important sinuses were reopened and the flood released.

From the clinical viewpoint this type of unsuspected placenta prævia is important, as the only way of controlling the post-partum hæmorrhage associated with it is the practice of bimanual compression. The bleeding from a lower uterine segment is controlled primarily by clotting. The administration of pituitary preparations or ergot, or resource to stimulants likely to raise blood pressure are not only useless but dangerous. Hot intra-uterine douches, that old reliable favourite never at hand when most required, are not permissible, for they remove clots already formed and produce fresh loss. For once possible infection must become a secondary consideration. Bimanual compression must be applied immediately as the urgency cannot be greater. Once the hand is introduced it should be kept in the vagina. Insertion, removal, and reintroduction later simply increase the chance of sepsis. Do not rush to stimulants or blood transfusion. Counteract shock with posture and warmth, and replace fluid loss with salines. If additional blood is required it will the better fulfil its function if transferred when the initial shock is over and the patient better fit to face the ordeal.

Often it will be found after a few hours that an astonishing recovery has taken place. This happened in the case I have reported here, and a complete recovery was rapidly made on liver extract, iron and arsenic, generous diet, and good nursing. As can happen, the temperature never rose above the normal in spite of my interference and the grave blood loss. This was contrary to all the rules of the game, but perhaps I should have anticipated this, for the patient did not seem to pay due respect to those rules from the beginning.

### GASTRO-JEJUNO-COLIC FISTULA WITH TERMINAL PERFORATION INTO THE PERITONEAL CAVITY

By H. SEAWARD MORLEY, M.D., M.R.C.P. Lond.

PHYSICIAN TO THE ROYAL WEST SUSSEX HOSPITAL, CHICHESTER;  
CLINICAL ASSISTANT AT UNIVERSITY COLLEGE HOSPITAL,  
LONDON

*With a Note on the Surgical Aspect by*

R. BROOKE, Ph.D., M.S. Lond., F.R.C.S. Eng.

SURGEON TO THE ROYAL WEST SUSSEX HOSPITAL, CHICHESTER

*and on the Pathology by*

C. J. HARWOOD LITTLE, O.B.E., M.B. Leeds

PATHOLOGIST TO THE HOSPITAL

LAST October Drs. Mindline and Rosenheim described in THE LANCET<sup>1</sup> a case of duodenocolic fistula simulating idiopathic steatorrhœa. At that time I had in one of my beds at the Royal West Sussex Hospital a very similar case in which steatorrhœa was also present; and as there were additional points of interest, it seems worth recording. Incidentally it is strongly reminiscent of a case<sup>2</sup> under the care of Dr. F. J. Poynton in University College Hospital in 1930, which I saw as medical registrar.

#### CLINICAL RECORD

The patient was a man, aged 41, a bus conductor, admitted on Sept. 11th, 1935, and referred by Dr. Francis

Leslie of Chichester. He complained of intermittent pain in the umbilical region for the previous six weeks; vomiting about a quarter of an hour after meals, which relieved the pain; and, frequently, a loose action of the bowels soon after a meal "as if the food ran through him." For the same period he had noticed an increasing distension of the abdomen and swelling of the legs, the latter subsiding with recumbency.

*Previous history.*—The man had been first admitted to the Royal West Sussex Hospital under Mr. R. Brooke on August 28th, 1927, complaining of severe pain in the epigastrium a quarter of an hour after meals, relieved by vomiting. Radiography showed a small irritable stomach emptying in four hours with some tenderness over the pyloro-duodenal area. A test-meal showed a marked hyperchlorhydria. The presence of a duodenal ulcer was diagnosed, and as the history was short, the patient young, the stomach rapidly emptying, and the stomach contents very highly acid, the case was thought to be one eminently suitable for medical treatment. Unfortunately, as the man was a bus conductor, his meals were taken at very irregular hours, and he pointed out that it would be impossible for him to diet or to obtain food at evenly spaced intervals. He was therefore informed of the uncertainty of surgical measures, but nevertheless agreed to operation. At operation a medium-sized, indurated ulcer was found at the junction of the first and second parts of the duodenum on the anterior surface, and a posterior gastrojejunostomy was performed. There were no further digestive symptoms for some 2½ years, but the abdominal pain then recurred, coming on 1-2 hours after food, and being relieved by more food or by alkaline powders. Two months before admission in December, 1930, there had been blood-stained vomit and melæna, and the patient had been losing weight. On admission a second operation was performed. The posterior gastrojejunostomy stoma was found to be patent and working well. On the anterior wall of the duodenum, this time at the pylorus, an active indurated ulcer with adhesions was found. At the junction of the first and second parts of the duodenum a white puckered scar of the original ulcer was easily distinguished. A partial gastrectomy was then performed, the end of the stomach was cut off and closed just below the level of the gastro-enterostomy. Recovery was uninterrupted and the patient was able in due course to take a full diet. Before discharge he had several attacks of diarrhœa with yellowish watery stools. The condition cleared up with medical treatment.

*Condition on admission.*—The patient was pale and sallow and looked ill. The abdomen was considerably distended, free fluid was present, and the legs were œdematous. The urine was free from albumin. Having regard to the history and physical signs, I suggested that this was a case of gastrocolic fistula with concurrent œdema, probably of nutritional type, as was suggested by Dr. Poynton in his case in 1930.

*Special investigations.*—A barium meal showed that a partial gastrectomy had been performed and suggested that an enterocolic fistula might be present. A barium enema was then given but this failed to pass upwards further than the middle of the descending colon, the rectum and sigmoid being much ballooned.

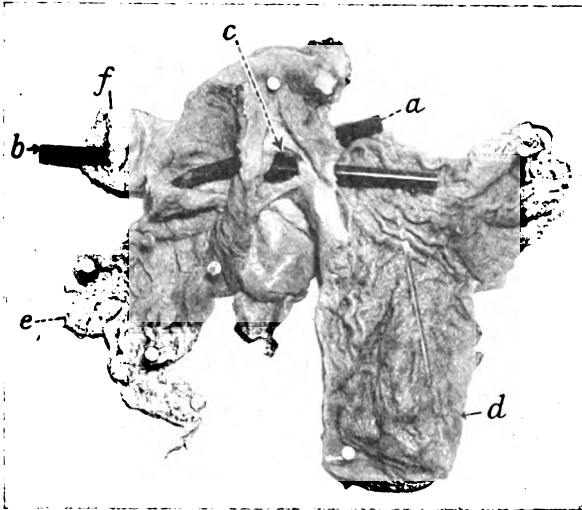
A blood count showed a mild secondary anæmia. The urine contained a few red blood-cells. In the fæces fat was present in excess. The ascitic fluid was clear and, on centrifuging, yielded a few small lymphocytes and large mononuclear cells from the lining of the peritoneum.

*Further progress.*—Vomiting stopped soon after admission until on Sept. 27th the patient vomited some greyish material like soft putty and passed a stool of similar appearance containing an excess of fatty acid crystals. The temperature fluctuated between 98° F. and 101° F. with an occasional rise to 102° F. He was unwilling to undergo an operation and I did not consider that it was justifiable to press for it, as I felt that the chances of survival were slender. On Oct. 18th the man complained of nausea and vomited again. His condition became rapidly worse, the temperature rising to 104° F. and the pulse-rate to 120, and he died next day.

## POST-MORTEM FINDINGS

Dr. E. J. Dennison, the senior house surgeon, performed an autopsy.

The body was much emaciated, with oedema of both feet and ankles, and abdominal enlargement. There was an old operation scar in the upper abdomen. About a pint of straw-coloured fluid was found in the peritoneal cavity, and in the left hypochondrium there was a large indurated adherent mass consisting of stomach, small intestine, and large intestine. There was some muddy black fluid surrounding the indurated mass, which had evidently leaked out from some part of the intestine.



(a) Probe in gastrocolic fistula. (b) Probe in gastrojejunal communication. (c) Site of terminal perforation into peritoneum (cut edges are caused by removal of portion for section). (d) Stomach. (e) Colon. (f) Jejunum.

On further examination an old gastro-enterostomy was found, the suture line having become adherent to and ulcerated through into the transverse colon. This ulceration was evidently of fairly long standing. In addition there was a recent perforation in the same region into the peritoneal cavity. Thus a probe inserted into the stomach could be passed with ease into the jejunum, transverse colon, or peritoneal cavity. The only abnormality in the thorax was an old tuberculous focus in the apex of the right lung, a piece of which was removed for section.

Dr. Little examined the specimens removed. The stomach, colon, and jejunum involved are illustrated in the accompanying Figure. There was a common communicating passage, about 1 in. in diameter, between the stomach, the jejunum, and the colon. At the further edge of the gastro-jejunal communication was a perforation of about a quarter of an inch in width with bile-stained edges.

Sections were made through the gastrojejunal junction and the gastrocolic junction. In the former the mucous membrane of the one passed imperceptibly into that of the other, while the fusion of the underlying muscular layers could only just be made out from the slight irregularity of the muscle bands and the presence of a little fibrous tissue. In the latter a small depressed area of surface necrosis showed where the mucous membrane of stomach and colon met.

In the portion of lung removed were healed and active tubercles.

## SURGICAL ASPECT

The interest in this case from a surgical point of view is that, although it was in every other way suitable for medical treatment, yet the man's occupation as a bus conductor rendered this impossible.

Surgical treatment was therefore undertaken, and for 2½ years he remained symptom-free; the original duodenal ulcer was actually healed and there was no sign of the formation of a gastrojejunal ulcer. When another ulcer did form, it formed at the pylorus and not at the site of the anastomosis. Later, however, when a partial gastrectomy was performed a gastro-jejunal ulcer appeared which ultimately led to the death of the patient. In retrospect there seems to be no doubt that the correct treatment of the condition was medical and not surgical, and that when the patient was first seen he should have been advised to give up his occupation which was obviously unsuitable and in large part the cause of his trouble. Such advice, easy enough to give, would have been difficult to follow during the period of economic depression when the patient first attended hospital.

## REFERENCES

1. Mindline, J., and Rosenheim, M. L.: THE LANCET, 1935 ii., 764.
2. Poynton, F. J., and Macgregor, J. V.: Ibid., 1930, ii., 240.

## BILATERAL HERPES ZOSTER OF THE TRIGEMINAL NERVE

BY R. M. CAMPBELL, M.B. Aberd.

ASSISTANT MEDICAL OFFICER, THE GROVE HOSPITAL (L.C.C.), LONDON, S.W.

BILATERAL involvement of all the divisions of the trigeminal nerve is a sufficiently rare manifestation of herpes zoster to justify the publication of a single case.

The patient was a male, mentally defective child, aged 6 years, to whom diphtheria antitoxin had been administered before admission to hospital because of a profuse mucopurulent nasal discharge of three days' duration. There was no previous illness. On admission the only physical signs of note were a temperature of 102° F., slight faucial congestion, small patches of exudate on the tonsils and uvula, and slight bilateral enlargement of the tonsillar glands. During the night the child had profuse diarrhoea, the stools being green and frequent without visible blood or mucus. On the following morning the temperature subsided by crisis. Cultural examination of the throat and nose failed to confirm the diagnosis of diphtheria.

On the second day, circumscribed raised areas of erythema, each half an inch or more in diameter, were observed on the face. The eruption was strictly symmetrical on the two sides, being distributed on the forehead, nose, cheeks, malar regions, and upper and lower lips. The symmetry of the lesions and their strict localisation to the sensory area of the trigeminal nerve were striking. Small and large vesicles appeared on the erythematous bases by the following morning. At the same time small shotty glands were palpable in the posterior cervical chains. Rupture of the vesicles and crusting were completed by the eighth day. The cornea was not involved, and no lesions were visible in the mouth or fauces. No abnormality was found on general examination of the central nervous system. Scarring following the healing of the herpetic areas was slight, and no sensory or motor impairment of the cranial nerve functions resulted.

Unlike herpes simplex, herpes zoster is rarely bilateral, and it has been estimated that only some 30 instances of this unusual condition have been reported. Among 140 cases of zoster personally observed by Glauberson,<sup>1</sup> only two showed an affection of the same or different segmental areas on the two sides of the body.

Similar examples have been recorded in this country by Fordyce<sup>2</sup> and Fox.<sup>3</sup> Hutton<sup>4</sup> described a case

of bilateral zoster with a concurrent varicelliform eruption. Bilateral facial herpes affecting the pinnæ of the ears and the parotid regions was noted by Burgess.<sup>5</sup> A review of the available literature has resulted in the discovery of one reported case with a bilateral involvement of the whole of the trigeminal nerve areas as in our patient; in a brief annotation Anderson<sup>6</sup> mentions the occurrence of bilateral trigeminal zoster in a woman suffering from a cerebral abscess. In our patient the features are compatible with a primary infection of the Gasserian ganglia

of the trigeminal nerve by the unknown virus of herpes zoster.

I am indebted to Dr. J. S. Anderson, medical superintendent of the Grove Hospital, for permission to publish this case.

## REFERENCES

1. Glauberson, S. A.: *Dermat. Woch.*, 1928, **lxxxvi.**, 141.
2. Fordyce, D.: *Jour. Cutan. Dis.*, 1915, p. 492.
3. Fox, H.: *Ibid.*, 1915, p. 319.
4. Hutton, P. W.: *THE LANCET*, 1935, **ii.**, 302.
5. Burgess, N.: *Brit. Med. Jour.*, 1931, **ii.**, 384.
6. Anderson, J. S.: *Ibid.*, 1931, **ii.**, 592.

## MEDICAL SOCIETIES

## ROYAL SOCIETY OF MEDICINE

## SECTION OF LARYNGOLOGY

At a meeting of this section held on May 1st, with Mr. LIONEL COLLEDGE, the president, in the chair, Dr. G. V. T. BORRIES (Copenhagen) opened a discussion on

**Headache Associated with Disease in the Nose**

He said that according to the text-books the chief causes of such headaches are sinusitis, adenoids and other forms of nasal obstruction, and acute coryza. With modern methods of diagnosis, unsuspected infected sinuses were disclosed more frequently, and, if these had been a cause of headache, a dramatic cure could be effected. This circumstance had served to obscure other causes and had led rhinologists astray. In Dr. Borries's experience the treatment of latent sinusitis did not often result in the cure of headache, and on the other hand other rhinogenous causes of headache were often neglected. A frequent form of headache occurred during and after the common cold following congestion of the middle turbinal. Such a headache might be very severe and prolonged, but could always be cured by simple means, however long it had been present. The question of an allergic cause may arise, but Dr. Borries proposed in this communication to consider only rhinogenous causes excluding sinusitis. In diagnosis the site of the headache was important; the pain was situated about the eye and in the occipital region of the same side. There was also tenderness over the inner palpebral ligament. The headache appeared with coryza; improvement was associated with shrinkage of the middle turbinal and reappeared when this had worn off. There were, however, also less clear-cut cases. Often a diagnosis of hysteria was made which gave satisfaction as confirming the secret beliefs of relatives, but real headache was hardly ever due to hysteria. Treatment was at first conservative, consisting in the dilatation of the middle meatus with cocaine. Dr. Borries quoted cases showing that this alone often succeeded. He used 5 per cent. or 10 per cent. cocaine without adrenaline, and the fact that atropine was frequently beneficial seemed to favour the hyperæmic theory of origin. Where further measures were necessary he advocated partial or total resection of the middle turbinal with submucous resection of the septum where a deflection of the latter was helping to encroach upon the middle meatus. Sometimes a diseased inferior turbinal was keeping up infection and might therefore need either cauterisation or partial reduction. Physical treatment was often required to supplement operative treatment. The occipital myalgia might be analogous to myalgias elsewhere, for example, pleurodynia and sciatica. Dr.

Borries quoted a case where a mastoid operation had twice been performed for myalgia in the muscles of the auricle. The occipital muscles might be a reflexogenic site; in one case pressure on the occipital region relieved the maxillary pain which reappeared on its cessation. Another patient complained of pain in the neck while a middle turbinal was being removed, and pain in the shoulder might accompany maxillary pain. In connexion with the site of the pain it was noteworthy that the area of pain in a sinusitis did not always correspond with the sinus affected. Massage and "shock" therapy could be tried, and a prolonged after-treatment of the myalgia might be necessary. The patients were often susceptible to variations in temperature and must guard against this; measures designed to harden the resistance to weather conditions were useful. Certain patients had a high degree of sensitivity and hyperæsthesia, and cocaine tampons must be cautiously introduced, perhaps preceded by a spray of anæsthetising solution. It might be difficult to draw a sharp line between headache due to sinusitis and that due to other forms of rhinogenous headache. One important condition sometimes associated with headache, namely, conjunctivitis, was occasionally rhinogenous, and cleared up with the treatment of the nasal condition. Dr. Borries wished to emphasise the fact that a headache could be rhinogenous even if rhinoscopy and X rays reveal no obvious abnormality.

Mr. F. J. CLEMINSON (London) said that pain of this sort was very difficult to explain. There are several different types. Radiation from the teeth was a common one, and this might spread from the face and head to the shoulder, and down the arm into the fingers. Sometimes this occurred with an infected sinus, but more often sinus pain was localised. Although pain in the ear was not generally given as a symptom of sinusitis it was occasionally found; a striking case of this sort in a doctor came under the speaker's observation some time ago. Such pain was seldom entirely confined to the ear. It could be understood by studying the connexions of the great superficial petrosal nerve and Arnold's nerve with the sphenopalatine ganglion. Pain down the arm and in the neck might be due to the presence of vagal and sympathetic afferents in the nerve of Wisberg, and might thus be analogous to cardiac referred pain; it must be remembered that the heart was a cervical rather than a thoracic structure. Mr. Cleminson described a case illustrating vacuum pain from an infected maxillary sinus, and another where frontal pain was found to be due to an apical abscess. He had frequently met with occipital pain. Connexions of the fifth cranial nerve in the upper cervical portion of the spinal cord possibly provided the mechanism of production. He felt that myalgia and myositis were not adequate explanations.

Dr. GAVIN YOUNG (Glasgow) said that he would deal only with headache due to chronic nasal disease. There were two reasons why the upper portion of the nose was chiefly responsible: it was narrower and contained narrow channels between the ethmoidal bones, and the sinuses opened into it. Engorgement of the mucous membrane of the middle turbinal might arise from infection or from allergy. High deviation of the septum might be a contributory cause through pressure on the middle turbinal of one side with hypertrophy of the opposite middle turbinal. A form of vacuum headache might be due to this cause. Submucous resection of the septum was the most suitable treatment. For antral or frontal sinus infection, the Caldwell-Luc operation and an external frontal operation were respectively the operations of choice. Allergy accounted for a number of cases, and often no structural deformity or infection could be made out, but congestion could sometimes be provoked by touching an area on the septum or middle turbinal. Polypi rarely caused headache, and that occurring in atrophic rhinitis might be due to the column of cold air constantly impinging on an inflamed surface. Headache associated with adenoidal hypertrophy was a clinical observation dating from Hippocrates, and was possibly due to the narrowed nasal passages. Sudden lancinating pain in the face of psychogenic origin had often occurred in his experience, occasionally with some slight nasal abnormality, but careful questioning served to separate the factors.

Mr. HERBERT TILLEY (London) said that the swelling of the anterior end of the middle turbinal described by Dr. Borries was the first stage of ethmoidal infection. If the patient was seen a year later, the mucosa was found to be wrinkled with perhaps a little crusting, and, later still, it might show small polypoidal granulations or even frank polypi. He believed this condition to be due to a non-suppurative infection of the mucoperiosteum and bone. He showed sections which supported this theory, showing superficial infiltration with organisms of bone taken from the ethmoidal region of patients with headache. The occasional recurrence of headaches after radical operations might be explicable by this theory of infection, and it also emphasised the value of a bacteriological examination of sinus washings.

Miss ROSA FORD (London) discussed the two cases she had shown of headache and retrobulbar neuritis in which she had diagnosed sinusitis (previously unsuspected) on the restriction of the fields of vision. With conservative treatment to promote drainage in the nose she had obtained a permanent cure in both cases.

Dr. F. A. PICKWORTH (Birmingham) showed lantern slides of X rays of the sphenoidal sinuses after lipiodol injection taken before and after the occurrence of headache. Immediately after headache had occurred the mucosa of the sinus had swollen up, especially near the ostium, and the lipiodol was seen to be squeezed into a thin stream. This might also occur elsewhere, and the speaker considered that it was important to take X rays of this type before and immediately after the occurrence of headache.

In reply, Dr. BORRIES said that he believed psychogenic headache to be rare. It occurred chiefly in women, and there might be an endocrinological factor. He pointed out that occipital pain, which he held to be reflex in origin, could be present only

on one side and not on the other, and that it could be relieved by pressure.

Mr. CLEMINSON said that referred pain was generally accompanied by tenderness, and, as a rule in these cases, the occipital region was not tender.

#### SECTION OF OTOLOGY

At a meeting of this section on May 1st, with Mr. HAROLD KISCH, the president, in the chair, a paper on

#### Diagnostic Problems in Orogenous Intracranial Complications

was read by Dr. G. V. T. BORRIES (Copenhagen). He began by speaking of a type of case in which either suddenly or after a spell of Cheyne-Stokes respiration the patient ceased to breathe, and became cyanotic and unconscious. In the absence of active treatment death quickly supervened. At autopsy the lobes of the cerebellum were found to be pressed down in the foramen magnum, the lateral ventricles were dilated, and the brain tissue was oedematous. It was curious that so many text-books of all countries omitted all mention of this complication of otogenic infection. In 1919 Dr. Borries treated a case of the kind in which respiratory paralysis came on suddenly. He at once started artificial respiration, and while his assistant kept this up he himself did a craniotomy on the right side, evacuating a large cerebral abscess. After that, the respiration was restored and continued until next morning, when the patient died. The number of such cases published was 47; in many of them the diagnosis was not made before death, and in only 21 was there an attempt to open the abscess. The suffocation was often interpreted as due to a laryngeal spasm; especially was this so when respiration ceased under narcosis, leading in 7 cases to the performance of tracheotomy. Sometimes it was attributed to the death agony, and hence no operation was undertaken. It should be recognised (1) that sudden cyanosis in an otogenous brain affection meant respiratory paralysis, most often due to a cerebellar abscess; (2) that the treatment consisted in artificial respiration and evacuation of the abscess; and (3) that sudden death in bed in cases of otogenous cerebral lesions was mostly due to respiratory paralysis, which in turn was caused by cerebellar abscess. Bradycardia was a symptom which in this connexion scarcely received any mention in text-books. If a patient with otitis had slowness of pulse it was usually regarded as a sign of increased intracranial pressure. Careful investigation had shown him that a slow pulse was a very common symptom in the serous stage of acute labyrinthitis; collecting the figures of four authorities it was found that 32 of a total of 80 cases showed it. Bradycardia was encountered also in vascularised labyrinthine fistulae, and in association with iridocyclitis. In case of facial paralysis of uncertain origin tetanus was a possible cause; it might originate from middle-ear suppuration without any known trauma.

Turning to the differential diagnosis between brain abscess and meningitis, Dr. Borries said that in 1900 a case was reported in which a man with typical signs of diffuse otogenous leptomeningitis was found to have an uncomplicated abscess of the brain, with no meningitis. This showed that though there might be no visible meningitis, the meninges could nevertheless be inflamed. The question arose whether it was possible clinically to demonstrate

such an abscess. His contention was that the meningitis induced by a brain abscess was sometimes not identical with the ordinary meningitis induced directly by mastoiditis, and could be differentiated clinically. Its special features were its strikingly benign course and its independence of other conditions. In some cases of cerebral abscess the successive specimens of cerebro-spinal fluid became ever clearer, although the abscess was not opened. The explanation seemed to be that the abscess attenuated the virulence of the organisms and toxins passing through it. A non-purulent inflammation of the brain tissue was not to be regarded as a special disease, but merely a preliminary stage of abscess formation.

An important question was: When ought one to attribute mild encephalitic symptoms to a so-called serous or simple encephalitis, and when to a hæmorrhagic encephalitis? It was safe, he thought, to assume that in the severe cases the condition was usually hæmorrhagic, but it was uncertain whether a simple non-hæmorrhagic encephalitis might not also give rise to focal symptoms. Probably both simple and hæmorrhagic encephalitis might produce them, but very pronounced focal symptoms were suggestive of hæmorrhagic encephalitis. Often the symptoms were very slight and not very typical; now and then cases were encountered with indefinite or vague cerebral symptoms and optic neuritis, the spinal fluid was normal, and the patient recovered. His view was that most of those patients had encephalitis. In the more severe and pronounced cases it could generally be said that the symptoms were the same as those of brain abscess. Only when the facts compelled the otologist to adopt a new point of view did he realise that the old nosological entities did not suffice, that there was a missing link which also must be taken into account in clinical work, and that that link was non-suppurative encephalitis. Recognition of that disease he regarded as very important, not only in diagnosis but also in treatment. For example, in a case with hemiplegia and aphasia, if the possibility of a non-purulent encephalitis was not taken into account as a cause of such symptoms, it might be thought that the patient's only chance depended on the finding of an abscess, and this might lead to deeper and repeated punctures being carried out—perhaps with serious results. Its recognition would also modify the prognosis, for experience had shown that in even apparently hopeless cases of encephalitis, with hemiplegia and aphasia, complete recovery might take place. The time had come when otogenous non-purulent encephalitis must be established as a clinical entity.

Mr. ERIC WATSON-WILLIAMS (Bristol) spoke of a case of labyrinthitis under his care, the onset of which was signalled by bradycardia. This sign might be present, too, in acute sinus disease. Among his cases of intracranial suppuration there had been one or two with extreme pulsus paradoxus; in one the pulse varied between 60 and 80 in inspiration and expiration. When nystagmus was noticed after operation the possibility must be remembered that it was really congenital; in which case there would be no vertigo. He thought that the chief point made by Dr. Borries concerned the distinction between brain abscess and meningitis. That was a problem which might arise at any moment, perhaps in the small hours of the morning when laboratory resources were not available. If the patient was in coma and there was no history, one had to rely largely on the clinical signs and the results of lumbar

puncture. When a cerebellar abscess was suspected he always did lumbar puncture with trepidation, postponing it until the patient was on the operating table. In differential diagnosis he laid stress on the chloride content of the fluid; but he had seen several cases of meningitis in which, in early stages, the chloride had not been reduced. By the time a patient presented the text-book clinical picture of meningitis, the opportunity for successful intervention had probably gone by.

Mr. E. D. D. DAVIS said that patients with cerebellar abscess had left hospital and later died suddenly—no signs of abscess having appeared. With abscesses in the brain it was best to defer operation until the pus became localised and the signs were definite. He regarded lumbar puncture as very valuable, and had never known any harm arise from the diagnostic removal of small quantities of fluid. One of the early symptoms of meningitis was severe headache and slight mental change.

Dr. RITCHIE RODGER said that Macewen's remarkably good results in intracranial suppuration had been attributed by others to his having operated on most of his cases at a late stage.

Mr. SYDNEY SCOTT had never seen a case of brain abscess associated with the presence of the tetanus bacillus, but within recent years he had encountered four in which there was anaerobic infection, all of them fatal. He recalled a case in which a woman had a frontal sinus infection, with aphonia and symptoms which led to the suspicion that she had a frontal brain abscess. Sir Percy Sargent, however, preferred to have the frontal sinus operated upon externally first, and that was done, the dura mater not being touched. There were a number of postponements of the larger operation, and eventually the patient made a complete recovery without anything further being done.

Dr. BORRIES, in reply, said that in studying the pulse-rate it was necessary to take a reading at least every hour, so as to detect periods of exceptional slowness. The serous stage of labyrinthitis was a very short one, perhaps not longer than half a day. In purulent labyrinthitis a slow pulse was detectable only in the early stage. In doubtful cases he liked to take two or more specimens of the spinal fluid and correlate the results with the clinical symptoms.

### Hearing Aids

Mr. TERENCE CAWTHORNE read a paper on the prescribing of hearing aids. It was probable, he said, that in the past otologists had given less attention to this part of their work than to any other. A consequence of this neglect was that sufferers had often turned to the makers of advertised apparatus. The provision of an aid was advisable when the hearing defect was such that, despite treatment, normal methods of communication were either impossible or irksome. Correction of the defect presented many problems as yet unsolved, but the invention of the thermionic valve had so increased the amplification of sound that already there had been a great increase in the efficiency of hearing aids, and in the not distant future as good results might be expected from them as were obtained with glasses for defective sight. An essential preliminary was a reasonably exact method of estimating the auditory capacity of the person concerned, both for speech and for the audible range of pure tones. The method should lend itself to accurate reproduction, so that any improvement in the range of hearing could be

measured. In addition to the routine tests with the voice, tuning-forks, or the audiometer, special speech articulation tests—consisting of single syllables chosen to accentuate certain vowels and consonants—were of great value in determining the efficiency of an aid. All patients with pure middle-ear deafness were able to derive benefit from using an aid. In cases where there was less than 50 per cent. of cochlear function, the degree of amplification required of an aid would be such that its intensity would approach the upper threshold of hearing, and the result would be confusion and perhaps discomfort.

The hearing aids themselves could be classed as electrical and non-electrical. The latter included horns, auricles, and speaking-tubes, and their function was to collect and conduct sounds, and occasionally to act as resonators. Their amplifying power was limited, but their attractions included low cost, freedom from sound-distortion and from adventitious sounds, and the fact that no upkeep was necessary.

The electrical aids consisted essentially of a microphone, an amplifying circuit, and a receiver, the first being the most important. In the telephone type a carbon-granule microphone was used, with a small dry cell and amplifier, and though it was difficult to keep this type free from distortion and from adventitious noises, some patients were ready to overlook those disadvantages in view of its portability and relatively low cost. The employment of valves rendered faithful and noiseless amplification possible, and aids embodying them surpassed anything else so far achieved. At the moment their use was limited by their size, and by the initial cost (£12-£25) and cost of upkeep. For individual speech, a speaking-tube or trumpet was usually adequate; for general conversation or for use in church or theatre a valve aid was by far the best. If the aid was to enable the patient to listen to one particular voice, the pitch of that voice must be specially catered for.

## REVIEWS AND NOTICES OF BOOKS

### The Chemistry of Milk

By W. L. DAVIES, Ph.D. Cantab., D.Sc. Wales Research Chemist and Analyst, National Institute for Research in Dairying, Shinfield. London: Chapman and Hall. 1936. Pp. 522. 25s.

DURING the past fifteen or twenty years there has been a great output of published papers on the chemistry and physical chemistry of milk and of milk processing scattered in a variety of scientific journals, agricultural bulletins, trade magazines, and monographs. Of this work some is of fundamental importance including that which has a bearing on human nutrition; some is mainly of agricultural interest and much is of purely commercial significance. The author of the present volume, a well-known authority in the field of dairy research, has undertaken the arduous task of surveying this vast mass of publication, selecting the most significant contributions and bringing the whole within reasonable compass. It seems ungrateful to suggest that while he has done his work of compilation with commendable thoroughness, the process of inspissation has been, in places, too drastic, and so much has been crowded into a paragraph or a section as to destroy clarity.

The book is divided into five sections. In the first the composition of milk is dealt with, particularly the range and causes of variations in chemical composition; recent work on the constituents of milk is then summarised, and the third section is devoted to the physical properties and physical chemistry of milk; the chemistry and chemical technology of milk processing are next considered, whilst the last section provides a useful résumé of published work on the nutritional value of milk constituents and of milk as a whole. In each section Dr. Davies has, in effect, provided a well-documented review of modern work, with here and there a critical assessment of accepted opinion. There are 1400 references, most of them of recent date. Accounts of hitherto unpublished work of the author and of his colleagues at Shinfield are supplied and reference is facilitated by the provision of two indexes, one of subjects and the other of authors.

There are, as might be expected in a volume covering such a vast field, occasional omissions and errors. Thus the important work of Graham and his colleagues on the effect of thyroid feeding and

thyroxine administration on the chemical quality of milk receives no mention, the limits of sensitivity of the phosphatase test for determination of the efficiency of pasteurisation are not given, and the statement is made that casein may be boiled for "a considerable length of time" with 0.1 N alkali without appreciable change.

The present activity in the dairy world, with the growing regard for quality in milk and milk products, and the interest now being taken in the increased consumption of milk in this country make the issue of this book opportune, and it will be welcomed by all those interested in recent advances in knowledge of the chemistry of milk.

### The Medical Treatment of Gallbladder Disease

By MARTIN E. REHFUSS, M.D., Clinical Professor of Medicine at Jefferson Medical College, Philadelphia; and GUY M. NELSON, M.D., Instructor of Medicine at the College. London and Philadelphia: W. B. Saunders Co., Ltd. 1935. Pp. 465. 24s.

In this book the authors have set out to give not only full details of medical treatment of gall-bladder disease, but also a review of the present state of opinion concerning the physiology of the gall-bladder, the metabolism of cholesterol, the genesis of gall-stones, the "infection problem," and other subjects. This is an ambitious undertaking which has not been accomplished with complete success. Of the vast literature on the subject some 500 papers have been selected for inclusion in the bibliography at the end of the book. Unfortunately the authors have exercised little critical faculty in assessing the relative values of these papers; work which most of those in a position to judge regard as misleading is quoted with full approval; in one instance indeed a thesis is based solely on such evidence. We would hesitate to suggest that the omission in places of unpalatable truths which conflict with a theory favoured by the authors is deliberate; but it is certainly likely to mislead readers who are not themselves familiar with the arguments on both sides of controversial questions. Even the sections dealing with treatment, which reflect the outcome of many years of clinical experience, are marred by an attempt to supply a



scientific explanation of observed facts which is not always acceptable. The "low cholesterol diet," for instance, may or may not be essential; it is certainly not essential for the reasons given in its support. In one place we are warned of the danger of using vegetables containing phytosterol, because of what Chauffard said; in another—the bibliography—we find a reference to the author who proved that phytosterol is not absorbed from the intestines.

Yet there can be no doubt that the practical experience reflected in this book, wisely interpreted, will be useful to many. Information on treatments which have been found by experience to benefit patients is always of value. The chief criticism of the methods given in this book is that they err on the side of over-stringency. This is not necessarily a disadvantage; by many patients very exacting instructions about diet, for instance, are welcomed, and most physicians would agree that patients would benefit from a régime such as is here laid down, and might even be saved from the need of an operation. One of the advantages of the book is the admirable detail with which instructions are given; it is by attention to such detail that good results are obtained. We are all apt to forget that what we have learnt after years of study is not by any means as evident to patients. Failure in therapeutics is sometimes the result of telling our patients too little about what they are to do, and too much about the pathology of their condition, which they like to think they understand but almost always misconstrue. In this book, however, the precision of the instructions to be passed on to patients does not seem to be matched by a clear conception of the terminology in use among medical men. To write about "vitiated portal blood," "lithogenesis of the vesicular mucosa," of something being of value "in all sluggish gall-bladder conditions," of "delicate innate forces in the various tissues of the body" helps no one. These are not the phrases used by a scientific physician addressing his fellows. Some of the chapters are excellent, notably that on duodenal intubation, obviously written by one who has had practical experience, and that on jaundice in non-calculous cholecystitis by Dr. A. Cantarow. For English readers the interesting notes on cooking could with advantage have been a little more explicit. A technical term such as "panning" may be full of meaning to an American cook but means little to an English one.

### The Chemical Control of Conception

By J. R. BAKER, M.A., D.Phil., Lecturer in Cytology in the University of Oxford. With a chapter by H. M. CARLETON, M.A., D.Phil., Research Fellow of New College, and Lecturer in Histology, University of Oxford. London: Chapman and Hall. 1935. Pp. 173. 15s.

THIS book gives the results of some eight years' research upon the spermicidal powers of a number of pure chemical substances and of a smaller number of proprietary chemical contraceptives. At intervals during the last five years Dr. Baker has reported his findings in a series of papers, published in the *Journal of Hygiene*, on which we have had occasion to comment, while Dr. Carleton's investigations of the pathological effects of various substances on the mucosæ of the genital tracts of female animals and his experiments on the Gräfenberg ring have been described in the *Journal of Obstetrics and Gynecology*. This book, it should be noted, is not

written for the medical practitioner who wants a straightforward answer to the plain question: What spermicide should I advise my patients to use? It describes the successive stages of the most comprehensive programme of research yet planned with a view to elaborating a chemical spermicide which will prove harmless and yet reliable. This is a field of biological inquiry which has remained almost untouched since the publication in 1907 of the work of Gunther. Dr. Baker's investigations are not yet completed and have not yet revealed an article which fulfils all the requirements. Since the war a steadily increasing interest has been shown in all civilised countries in questions connected with the control of human fertility, and the technical problems of contraception will certainly be studied in all their aspects with growing keenness by a widening circle of investigators. All these will find in Dr. Baker's collected researches a valuable groundwork which they cannot afford to ignore.

### La rate en pathologie sanguine

By ÉMILE HOUCKE, Médecin des Hôpitaux de Lille. Paris: Masson et Cie. 1936. Pp. 154. Fr.45.

THIS small illustrated monograph, one of many of similar type published by Masson in recent years, deals with the pathology of the spleen, and particularly of splenic enlargement, in the diseases which affect the blood-forming organs. The changes in the spleen are broadly considered under four main headings: (1) hæmopoietic reactions, which include myeloid metaplasia in a variety of blood diseases, and the splenic lesion in the leukæmias; (2) splenomegaly with proliferation of the reticulo-endothelial system, in which is included the changes in Hodgkin's disease and the lipoid disturbances of the Gaucher-Pick-Niemann group; (3) reactions following hæmolysis, including acholuric jaundice and Addisonian anæmia; and (4) splenomegaly associated with fibrous and vascular reactions, including the so-called Banti's disease, now more commonly known in this country as hepato-lienal fibrosis. The work here described is founded on observations made in the clinic of Prof. Curtis of Lille (who contributes a preface) during the past ten years, but no statistical records of the numbers treated and practically no clinical details are supplied. Much of the monograph deals with the work of others. There are not many references to foreign literature on the subject. A few German papers are noticed, but there is scarcely any mention of the more important accounts of the varieties of chronic splenomegaly by American, British, and Italian authors. The monograph is, however, useful in so far as it summarises the French outlook and provides a good bibliography of the French literature on the subject.

### Variations in Blood Pressure and Nephritis

*Diagnosis and Treatment.* Third edition. By HERMAN O. MOSENTHAL, M.D., Professor of Medicine and Attending Physician, New York Post-Graduate Medical School and Hospital. London: Humphrey Milford, Oxford University Press. 1936. Pp. 616. 42s.

THIS is a disappointing book. It was apparently planned from the outset with the idea that study of functional pathology (or pathological physiology) is of equal importance to that of morphological pathology. With this conception before him Dr. Mosenthal

has avoided any emphasis of the anatomical changes in the kidneys in Bright's disease and kindred conditions. But there is surely a difference between that wide conception of pathology for which Sir William Gull ably pleaded and the relegation to the dustbin of all the clearer cut distinctions between various types of nephritis which have emerged from the work of modern writers. Are we to revert to some vague general conception of all forms of hypertension, renal œdema, renal failure, and nephritis under the heading "Bright's Disease"? The bad example of the old hæmatologists who took the concept of Addison's anæmia and by remixing it into the general welter of all the grave anæmias arrested the progress of knowledge for decades should not be forgotten. This book has indeed little value for either the student or the graduate. The paragraph on retinitis on page 168 seems altogether inadequate in a section dealing with the prognosis of essential hypertension, and the discussion on the subject on pages 244 and 245 carries the matter but little farther. The sections dealing with œdema are no better. To anyone familiar with modern advances in knowledge about nephritis it must seem amazing that a book which gives a bibliography of 50 to 150 references at the conclusion of each chapter should make no mention of the work of Prof. Govaerts, to give only one example. The sixteenth chapter, which deals with uræmia, whilst endeavouring in an initial section to distinguish between various type of uræmia, fails to give any clear description of the various symptoms which can to-day be exactly ascribed to such different factors as cerebral anæmia, variations in the alkali reserve, calcium deficiency, and urea intoxication. We would, if we could, praise at least the production of this book; but even in this respect it cannot pass muster. There are inexplicable and displeasing variations of the type of paper used: the first 184 pages are grey, the next 350 yellow-white, whilst from page 553-568 we are suddenly faced by eight pages of blue paper.

### Mental Health

By FRANK E. HOWARD, Ph.D., Professor of Education and Psychology; and FREDERICK L. PATRY, M.D., Psychiatrist, State Education Department, University of the State of New York. New York and London: Harper and Brothers. 1935. Pp. 551. 15s.

MENTAL hygiene has suffered a good deal at the hands of friends who claimed too much for it. Such temperate presentations as this may help to restore confidence in its future. The book is based largely on the teaching at the Henry Phipps Psychiatric Clinic at Johns Hopkins Hospital. A preface acknowledging this debt to Prof. Meyer is now a feature of many psychiatric books written in the United States and brings a welcome assurance to the reader that he will not find wild speculations or dogmatic theories, but a well-organised workable approach to the problem of mental health. The adequacy of the general framework of this monograph compensates for an occasional vagueness in expression; in a work not intended for psychiatrists, it is probably wiser to refrain from particularising difficulties and unsolved problems. The emphasis here is on education and on the ways of coping with deviations from normality. One of the authors is an authority on educational psychology and the other a psychiatrist, working principally with children. At the end of each chapter, questions

for discussion offer opportunity for the student to digest what he has read and to apply it to actual problems; there are also valuable lists of papers recommended for further reading. Though somewhat uncritical and rather verbose, the book is as a whole a sensible guide to mental hygiene.

### Practical Clinical Psychiatry

Fourth edition. By EDWARD A. STRECKER, A.M., Sc.D., M.D., Professor of Psychiatry and Chairman of the Department of Psychiatry, School of Medicine, University of Pennsylvania; and FRANKLIN G. EBAUGH, A.B., M.D., Professor of Psychiatry, University of Colorado Medical School. Philadelphia: P. Blakiston's Son and Co. 1935. Pp. 705. \$5.00.

THE new edition of this established text-book has been much enlarged and rewritten. Case records and commentaries on them still make up the bulk of the book, but more space is given to general statements of what is known about each of the reaction-types of psychiatry. A defect in earlier editions is made good by the inclusion of an excellent chapter on the psychopathological problems of childhood by Dr. Leo Kanner. The bibliography of each section is lengthy, and as regards American publications full. The psychobiological point of view is reiterated, so that any student who uses the book is certain to become familiar with the foundation upon which the American school of psychiatry is built. Though of little use as a work of reference, this continues to be an admirable introduction to psychiatry for those who have not yet had the opportunity of working with actual cases under skilled supervision.

### Manipulative Methods in the Treatment of Functional Diseases

By EDWIN L. HOPEWELL-ASH, M.D. Lond., B.S. Lond., Physician-Neurologist to the City of London Red Cross Hospital 1916-18. London: John Bale, Sons and Danielsson Ltd. 1935. Pp. 92. 3s. 6d.

Dr. Hopewell-Ash believes that he has used a manipulative method successfully in the treatment of many functional disorders including melancholia. He claims that there is no organ, no disease, no chemical imbalance which cannot be reached by manipulation or neuromedical treatment which is the application of our knowledge of the reflex effects, through the sympathetic nervous system and endocrine glands, of stimulation of skin areas. Spinal surface manipulation in the manner of Abrams is held to set up reflex responses which ultimately have a tonic therapeutic effect. He does not make clear to the reader how these manipulations are to be carried out, and it still remains to be understood how his method of percussion and massage can produce sympathetic responses capable of permanently breaking up those sympathetic endocrine patterns which have produced the cycle of neurotic symptoms. One might even go further and ask how the complicated submental patterns or complexes which lie at the root of neuroses can equally be resolved by this surface manipulation. Dr. Hopewell-Ash falls back upon the concept of neural energy, but an acceptable neuropsychological explanation of the cures he describes is still to seek.

# THE LANCET

LONDON: SATURDAY, MAY 9, 1936

## EXPANDING PSYCHOTHERAPY

THE Institute of Medical Psychology, which moved only five years ago from its dignified house in Tavistock-square into more commodious premises in Malet-place, is now developing a large extension scheme. A site of 31,400 square feet has been acquired facing Store-street, within a stone's throw of the London School of Hygiene and Tropical Medicine, and on this site it is hoped to build at once a new hostel of 21 beds to take the place of the small in-patients' hostel in Endsleigh-street, the lease of which falls in next year. If all goes well, this will be the first instalment of a scheme for a large educational centre of psychological medicine, to grow up within the shadow of the new central buildings of London University. The extension scheme, which has the blessing of King Edward's Hospital Fund and the interest of the Rockefeller Foundation, will provide equipment for laboratory investigation and research, adequate lecture-rooms, facilities and space for occupational treatment, and the greatly increased number of consulting-rooms in which out-patient and psychotherapist may be brought together without the delay of a long waiting-list. Over 25,000 hours of treatment were given last year; there are nearly 500 patients, adults and children, now under treatment, and the Institute is open from 9 A.M. until 10.30 P.M. And yet it was only possible to open the waiting-list for six weeks in 1935, and the evening waiting-list which had been closed for two years was opened only for three weeks. Both are now closed indefinitely. This is a plain statement of the facts behind a state of affairs which is tragic.

The development of medical psychology in our time has been meteoric and, to paraphrase SCHOPENHAUER'S words, if there were no Tavistock Clinic it would be necessary to invent one. Over 80 medical men and women are working at the Institute and a study of the list of names on pages 2 to 5 of the report suggests that it has included most of the well-known names of those who have devoted their lives to this aspect of medicine. There were not many trained psychologists in London when Dr. CRICHTON-MILLER'S brave scheme first began to take shape, and they were of all grades—Freudian, Jungian, Adlerian, and what not. It was hardly to be expected, or indeed to be desired, that the organisation of the new faculty should follow closely that of the more corporeal form of medical practice. The hospital clinical system can be fairly compared to a herbaceous border, with all the plants of various

shapes and sizes firmly rooted in the soil of pathology, but the Institute more closely resembles the tropical house at Kew where luxuriant growth may be seen at unexpected places and where the brightest flowers spring from stock which has no apparent roots. Few psychologists are pathologically minded, whether by temperament or education, and whatever development may take place there will never be lacking that need for experience in interpretation of pathological findings which is a conspicuous gift of the hospital clinicians of our own time. One of the greatest gains from the new spaciousness should be to give opportunity for work done on pathological lines, as much for the education of the psychologist as for the investigation of the patient. Indeed the development of the educational side is the most hopeful feature of the programme. It is hardly more than a year since the Institute achieved academic status in its recognition by London University for clinical work in the D.P.M. syllabus. The training course for doctors proposing to take up psychotherapy has now been extended from one to two years. And finally the research side of the work has been recognised by the Halley Stewart Trust and the Rockefeller Foundation, both of which have established fellowships at the Institute.

In one other respect the fabric of the Institute differs fundamentally from that of most other medical bodies in this country. During the period of development the Institute was largely under the direction and guidance of an individual mind, and to that fact is due a degree of conscious planning which has delivered the goods although quite alien to any therapeutic system hitherto known. In Dr. REES the founder of the clinic has had a worthy successor. Whether centrifugal direction can safely be maintained is a question which will have to be carefully weighed. The growth of a medical advisory board may indicate that it is likely to give place more and more to the collective responsibility in medical matters which is prevalent elsewhere. But the pioneer work already done by the Institute in its education of social workers, qualified nurses, general practitioners, and would-be psychologists is beyond all praise, and the extension of its usefulness in this direction can have no limit.

## THE LAW OF ABORTION

PROFESSIONAL, even apart from public, interests require the clarification of the law concerning abortion. On this subject the recently issued report<sup>1</sup> of the special committee appointed by the council of the British Medical Association deserves attention. Laws ought to be clear; the law about abortion is obscure. It is not enough to say that in practice the registered medical practitioner is not exposed to prosecution for bona-fide treatment of his patients. Surgeon and physician do not know where they stand. Our judges, who could have given public and authoritative guidance, have added to the confusion. Many distinguished

<sup>1</sup> Brit. Med. Jour., April 25th, Suppl., p. 230.

members of the bench have maintained the traditional legal position that illicit abortion is a grave offence against society as well as, in view of the furtive, unskilled, and insanitary methods of the usual criminal abortionist, a terrible menace to the life and health of the women concerned. Yet one much-respected judge, the late Sir Henry McCardie, seemed often ready to treat an indictment for unlawful abortion as a venial matter hardly distinguishable from birth control and to apply all his judicial authority to hamper the success of a prosecution. Along with this apparent licence to criminal abortionists, there has been an uncomfortable apprehension on the part of the registered practitioner because the law gives him no definite security in the termination of a pregnancy for sound and genuine therapeutic reasons. The profession is aware that bona-fide decisions in the general conduct of medical and surgical practice can lead to exaggerated claims for damages and that, in respect of abortion, criminal prosecution is at any rate a risk. If death follows an operation for the termination of pregnancy, a charge of murder is possible and an inquest may be the opportunity for unwelcome questions and suggestions. Such proceedings may be disastrous to a professional career even if the victim, as the phrase goes, leaves the court without a stain upon his character. The topic of abortion has important religious, economic, and eugenic implications. To the profession it is of immediate personal concern.

The law is to be found in Sections 58 and 59 of the Offences against the Person Act, 1861. There is no need now to go back into the ancient history of ecclesiastical offences. In 1828 Parliament imposed the death penalty for unlawfully and maliciously administering poison or any other noxious thing, or using an instrument or any other means, with intent to procure the miscarriage of a woman quick with child. If the woman was not quick with child, the punishment could be 14 years' transportation and a public whipping. In the general revision of the criminal law in 1861 these provisions were replaced; the unlawful administering of poison or other noxious things, and the unlawful use of instruments or other means, with intent to procure abortion, is now punishable with three years' penal servitude. Commenting on this enactment some years ago,<sup>2</sup> we suggested that, if the statute were nowadays re-enacted, one might expect that an express proviso would be inserted to exempt from criminal liability the fully qualified practitioner who terminated a pregnancy for the bona-fide purpose of preserving the mother from special danger to life or health. The suggestion was justified soon afterwards when the Infant Life (Preservation) Act of 1929, while punishing the wilful destruction of a child capable of being born alive, added a proviso to exempt acts "done in good faith for the purpose only of preserving the life of the mother." It is arguable that this exemption would give like protection against the penalties of the Act of

1861. The professional man is entitled to some closer definition of what is "unlawful" in that Act. If his honest efforts to save the life or health of the mother are (as they surely must be) lawful, those who frame and administer our laws should make the position plain.

Of the moral and religious aspects of the matter there is here no need to speak. Exact statistics of the prevalence and danger of illicit interference with pregnancy may be lacking, but clinical experience in hospitals has its own knowledge of sepsis as a contributory cause of mortality. Public views may vary between that of Tsarist Russia where abortion was punished by solitary confinement and of the Soviet's modern legislation which makes abortion free and permissible in public hospitals while forbidding it to unqualified practitioners. If there is to be any revolutionary change in the law of our own country, feminine opinion, never so well organised or so articulate as to-day, will no doubt be heard. The problem to which we draw attention is a limited one—how is the doctor to be given confidence that the termination of pregnancy on solid bona-fide grounds of therapeutic urgency shall not expose him to the risk of prosecution? Compulsory notification, though it might go far to abolish the grave public dangers of unskilled secret abortion, may be ruled out as impracticable. The confirmation of professional decisions by a second opinion is worth consideration. The recent report of the special committee suggests that a doctor contemplating therapeutic abortion might be obliged to obtain the sanction of a professional colleague of recognised status, on the analogy of "approved" practitioners under the Mental Treatment Act. This specific safeguard should, we think, be thoroughly examined. It would at least enable the doctor to concentrate upon his proper duty to his patient without distracting visions of judges and juries reviewing his decision at the assizes.

## HUMAN ENDURANCE

As a rule human beings employ only a small part of the resources—physical certainly, less obviously mental—which they in fact possess and which can be mobilised for emergency. We live in a state of inhibition or control, a state which is usually identified by the evidence of its removal in so-called superhuman efforts, though exemplified in its extreme or pathological form by the hysteric or the victim of neurosis afflicted with abulia or a sense of chronic fatigue.

In certain circumstances the limits of human endurance appear to be amenable to exact measurement or estimation. Thus, no athlete has as yet succeeded with certainty in running twelve miles within the hour, although a bare half-dozen figure in the records with performances a couple of hundred yards or so short of this distance. In a "go as you please" contest over six days, 624 miles have been covered. Unsited as he is for an amphibian existence, man has swum over 27 hours in a successful crossing of the Channel. Two teams once contested a tug-of-war pull for

<sup>2</sup> THE LANCET, 1927, I., 237.

2 hours 41 minutes. Club-swinging continuously for over 130 hours has on more than one occasion been achieved, and 120 hours' uninterrupted piano-playing appears to be the record for this peculiar attempt at distinction. But the attention is more closely riveted, interest more actively stimulated, by examples of endurance which are outside the sphere of direct measurement: the endurance of cold, of starvation, and of other forms of physical suffering, coupled with extreme anxiety, in shipwrecks, polar expeditions, sieges, and the like. The rescue recently of two of the three men entombed for ten days in a Nova Scotian gold-mine encourages a reference to other, now classical, adventures in an attempt to gain some impression of what men in extremity can endure, to what extent the spark of life can flicker, eventually to kindle once more to a steady flame. Some thirty years ago, after a colliery explosion at Courières in France, rescuers after twenty days of excavation heard the voice of the first survivor, who had taken charge of thirteen others in the darkness and by his courage and example brought them to safety. Five days later, endurance of another kind was exemplified by the exhumation of another survivor who, isolated, had been able to sleep away most of his period of incarceration. Under excitement, again, the organism can perform its physiological functions in a profoundly altered manner, when for weeks and months the drain upon the reserves becomes deeper and deeper. WILLIAM JAMES<sup>1</sup> quotes part of a private letter from Colonel BAIRD SMITH written shortly after six weeks' siege of Delhi in 1857. The gallant officer, to whom the victorious issue was largely due, describes his condition of scurvy, of gangrene of a leg, and of incessant diarrhoea, with complete annihilation of appetite, when for the whole of the siege he lived on brandy and opium. Yet he observes that his sensation of suffering was almost negligible. The excitement of his work was so great that he had never found his intellect clearer nor his nerves stronger. Presumably, as JAMES puts it, Colonel SMITH, having to draw on altogether extraordinary stores of energy, found that brandy and opium were ways of throwing them into gear. With the cessation of the emergency, in a moment all desire for stimulation ceased and a loathing of his late staff of life took possession of him.

The acme of endurance is probably reached at what is for convenience described as early middle age. The veteran in sport often succeeds by virtue of his experience when the superior speed of his more youthful opponent is associated with an impetuosity which leads to an earlier fatigue. "Too old at forty" may be applicable to enterprises in which carelessness is not a liability and speed is essential. But the advantage of the veteran is often attributable to his greater experience; not merely the acquisition of technique or of judgment in employing his physical resources to the best advantage, but a sort of individual cell education automatically acquired as the result

of continued training and automatically utilised. SCOTT'S pathetic cry will be recalled; it was not the older men who failed first, he said—anticipating a criticism that the success of his South Pole Expedition may have been jeopardised by an unwise selection of relatively old leaders. In comparing the sexes, tradition at any rate would assume male superiority; yet the capacity of woman for prolonged endurance of moderate degree is demonstrated in several directions, and she excels man in her ability to maintain prolonged moral excitement as when she takes complete control and support of a poor household—nursing, cooking, cleaning, as well as providing the means for existence by undertaking outside work. It is open to speculation whether crises cannot almost instantaneously awaken processes similar to those reached by yoga-practice only after years of painstaking discipline and training.

### TRAVELLING RESEARCH FELLOWSHIPS

THE decision of the Rockefeller Foundation to abandon the financing of international fellowships in order to concentrate on a more restricted programme for the promotion of medical research was the subject of comment in the report of the Medical Research Council for 1934-35.<sup>1</sup> The Council, who since 1923 had been entrusted with the responsibility of selecting the British Fellows, expressed regret at this change of policy and recalled the success achieved by the 70 men and women who had completed their tenure of these travelling fellowships. An analysis made in 1933 of the positions occupied by them showed that 12 held university chairs, 36 whole-time appointments for higher teaching and research, and a further 16 held part-time appointments of this nature. It would have been most unfortunate if a scheme which had proved so fruitful had been allowed to lapse, especially as the Council now possess the experience, the administrative machinery, and the contacts with centres of recruitment which enables them to choose the most promising candidates. They have therefore been alert to devise a new scheme for the provision of fellowships of a corresponding grade—i.e., with an annual value of approximately £400, besides a grant for travelling and other expenses, and it is now announced that at least eight travelling fellowships will be available for the academic year 1936-37, for which applications must reach the Council by June 1st, 1936. At least three of these (two or more awarded by the Medical Research Council and one by the trustees of the late Lord Leverhulme) will be for the study of any branch of medical science, including clinical medicine and surgery; four will be Dorothy Temple Cross Research Fellowships for the study of tuberculosis; and others, the exact number being unspecified, will be awarded on the recommendation of the Council for the study of psychiatry and neurology, including neurosurgery. The advantage of providing many fellowships on identical terms, and on the basis of a single series of applications, is clear; but potential benefactors should note that the name of any body or person making or leaving a permanent endowment for this purpose, or offering an income at the rate of £500 a year for a specified period would be associated with a fellowship. It would be impossible to find a better way of helping to extend medical knowledge and coöperation.

<sup>1</sup> The Energies of Man.

<sup>1</sup> See THE LANCET, March 14th, 1936, p. 621.

## ANNOTATIONS

## THE ROYAL ACADEMY

THE exhibition of the Royal Academy of Arts, which was opened to the public on Monday last, provides evidence of much contemporary talent. It is of an inclusive character, pictures on the walls representing many and varied directions of thought and fields of accomplishment. This opportunity for eclecticism is given by two things. First, large pictures are not being painted because houses are not being built to hold them, so that canvases measuring 150 ft. square are now rarely submitted, and mainly in response to commissions for the portrayal of national events. Of such we have four illustrations: Mr. Frank Salisbury's "Heart of the Empire," a graphic record of the national jubilee thanksgiving service at St. Paul's Cathedral; two pictures of the lying-in-state in Westminster Hall by respectively Mr. F. E. Beresford and Mr. F. W. Elwell; and a picture of King George's funeral procession. In all of these the artists have been able to render the proper spirit of the occasions. Secondly, artists who by their position within the Academy can exhibit without question of a jury have latterly been unselfish in the exercise of the privilege. The present exhibition has lost the appearance of overcrowding which used to be depressing, while a wider prospect for new talent is offered.

The direct interest of the medical profession in the exhibition is less marked than usual through the practical absence of medical portraits. What there are are worth noting. There is a drawing in chalk by Mrs. Catherine Dodgson of Sir Thomas Barlow, which is an excellent portrait, a characteristic expression of shrewd and courteous attention being well caught. A bust in bronze of Sir Almroth Wright by Mr. Donald Gilbert is an effective piece of work; the presentation is rugged but the suggestion of a commencing smile in a severe face is expressed. Miss Isabella Reid shows a capable portrait of Prof. R. W. Reid. A portrait of Dr. M. K. Martyn by Mr. James Dawson is a particularly pleasing colour arrangement of browns, greens, and grey. There are two subject pictures having relation to the medical life and both are successful pieces of painting, though neither is much what would be expected from the title. Mr. Kynnersley Kirby's "Village Doctor" sits at a desk which may bear medical records, but is chiefly adorned by a large blue jug and a glass. The doctor's face is cheerful, and the flower in his buttonhole emphasises the gay impression, but to look at he is hardly a typical village doctor, and the microscope in the background somehow looks out of place. And if this picture is not what we should expect from the title, still more so is Miss Golden's water-colour, entitled "The Doctor's House," not typical of the subject. Few medical men, we think, can be so charmingly housed. Pathetic interest attaches to the water-colour drawing of Llanthony Abbey by Sir Wilmot Herringham, who died a week before the exhibition was opened. "L'Infirmière," by the late Miss Beatrice How, which has been acquired by the Academy under the terms of the Chantrey bequest, is a charming little picture. In subdued colour and with simple drawing, this tender illustration of hospital nurse and infant is happily indicated. The protective attitude of the nurse and the curiosity of the child—the two prominent emotions that might be expected—are well rendered, without overstress or sentiment.

Turning to the architectural room we have testimony to the brave rebuilding that is now going on, evidenced by drawings of the new department of massage and medical electricity at the London Hospital, of the paying patients' block at University College Hospital, of the new nurses' home at St. Mary's Hospital, and of the nurses' home at the Masonic Hospital in Ravenscourt Park.

A favourable verdict on the exhibition will be generally given. There may be nothing on the walls that arrests the eye by outstanding merit, or that challenges attention by loveliness, by eccentricity, or by appeal to detective ability. There is nothing that will be nicknamed "the picture of the year," but the 168th exhibition of the Royal Academy obtains a special character from the competence and beauty of many of the English landscapes.

## BENIGN LESIONS OF THE BREAST

Dr. Dupuy de Frenelle<sup>1</sup> is a firm advocate of extensive operation for benign tumours of the breast; only by free excision does he consider that he has safeguarded the patient from the danger of cancer. His advice is to excise all chronic breast lesions, because they may be the starting-point of malignant change; to excise freely, because the histological appearance is so often much less benign than the clinical examination had suggested; and, finally, to remove with the affected part of the breast its lymphatic pedicle, because, on occasion, the axillary glands have been shown to contain metastases when no malignant change was found in the breast itself. He condemns the attitude that shelves immediate decision by "watching" the patient in the hope that subsequent development of the breast condition may give further guidance. It is evident that Dr. de Frenelle has no faith in clinical tests as a means of detecting early malignancy. Even if he had, it would not shake him in his belief in extensive operation, for to him every benign lesion is a potential carcinoma. His advocacy of these methods before the Société des Chirurgiens has evidently called forth a good deal of criticism. The attitude of his critics is that the lesion is either benign, in which case operation is out of place, or that it is malignant, and then radical amputation is the proper course. In the main, of course, the discussion centres round the cases of so-called chronic mastitis. It is not the bilateral symmetrical affection of the breasts, involving most of their substance, and described by de Frenelle as being essentially a loss of suppleness, that he is considering, but the breast with a localised area which feels different from the rest of its substance. The sensation to palpation may be of firmness, of numerous little granules, or of surface irregularity. So long as the granules feel as if they can be separated and the firm area seems to spread out evenly under the hand, de Frenelle follows Delbet<sup>2</sup> in regarding the lesion as still innocent. But in the middle there may be a part in which the granules feel confluent, and there is felt an irregular lump which fails to flatten out under the hand. This area, Delbet says, is carcinomatous. Even the simple solitary cyst seems to receive the same rather drastic treatment as the areas of simple mastitis. So long as the excision is drastic enough de Frenelle thinks that its exact nature can be left to the judgment of the individual

<sup>1</sup> *Technique Chirurg.*, April, 1936, p. 81.

<sup>2</sup> Delbet, P., et Mardene: *Les Cancers du Sein*.



surgeon. He is in favour of avoiding disfigurement as far as may be, and he believes that it is possible to remove the whole gland except the nipple by a single curved incision, and still leave the patient without an unsightly deformity. The axillary pedicle is removed in every case. It is perhaps a little difficult to be convinced about the case he quotes of metastases in the axilla with a perfectly innocent appearance in the breast itself. Nothing short of a complete slicing of the whole breast is satisfactory in these cases, and there is no account of such an examination. The reason that de Frenelle was so impressed by this particular case was that he had at first deferred operation because of the negative clinical findings. One of the most anxious decisions that a surgeon has to make is whether or not to operate on a patient who presents herself with an apparently innocent lump in the breast. De Frenelle has certainly simplified matters by his advice to operate every time. Judging by recent discussions he will find many to disagree with him.

### THE BASIS OF FOGGINESS

THE Faraday Society met at Leeds on April 20th to discuss disperse systems in gases, that is to say, the minute liquid drops and solid particles distributed in the atmosphere and resulting in smoke, cloud, or fog. The colour of some of the buildings in that city made it an appropriate locus for the study of dispersed carbon, and in fact Leeds University chemical laboratory is well known throughout the world for the researches of Prof. R. W. Whytlaw-Gray, F.R.S., and his school on artificially produced smokes. The subject attracted authorities from all over Europe to join in a discussion which went on for three days. Prof. Hilding Köhler of Upsala expounded his theories on the Aitken nucleus, the minute association of hygroscopic molecules a few millionths of a centimetre in radius, which serves as a growing point for each of the droplets constituting cloud and fog, in supersaturated air becoming raindrops. In the pure air of the arctic circle, where he has worked, the nucleus is sea-salt. Our readers are mostly more concerned with the less pure air of inhabited regions. Mr. J. H. Coste, formerly chemist-in-chief to the London County Council, described the dispersoids which he and others have found in town and country air. In towns nitrous acid, ammonium salt, and free sulphuric acid may form nuclei, in addition to the sea-salt of pure air. Characteristic are the larger, but still very fine, solid dispersoids which can be concentrated by dust counters such as those of Owens or Whytlaw-Gray and Green, or estimated (in respect of their soot content) in the Owens filter; these include, besides soot, calcium sulphate and carbonate, fine silicious particles and probably other unidentified constituents. Coarser dispersoids are also met with, e.g., pollen, spores of fungi, moulds and ferns, bacteria, silicious matter—both actual sand and spheres of fusible silicates from industrial furnaces—with ash from domestic chimneys. In discussing this paper Sir Robert Robertson referred to researches in the Government laboratory on the combustion products from various heating appliances which included nitrous acid, the presence of which as Aitken nuclei had been demonstrated by Coste and Wright, whilst Dr. R. Meldau of Charlottenburg recalled Ehrenberg's remarkable discovery in the air of Berlin, among many other unexpected substances, of pollen from Australian plants. Prof. J. Firket of Liège set out the circumstances which led to the disaster of December, 1930, in the Meuse

valley, when several hundred inhabitants were attacked with respiratory troubles, 63 of them ending fatally, whilst many head of cattle had to be slaughtered, as the result of an intense and irritant fog lasting some days. The Royal Commission, of which Firket was a member, attributed, on circumstantial evidence, the symptoms to an accumulation of sulphur dioxide and sulphuric acid produced by combustion of fuel in the many factories of the highly industrialised Meuse valley, a finding which Mr. Coste was inclined to agree with, in view of the high concentration of sulphur dioxide found in London air for short periods during the darkest period of the fog of Dec. 23rd, 1935, when very deep stains were obtained in the Owens filter. He and Mr. G. B. Courtier had found sulphuric acid increased in London air during fog. The industrial aspects of disperse systems in air and gases were introduced by Mr. R. Lessing, Ph.D., who referred to the gas-cleaning systems in use at Battersea and Swansea and in prospect at Fulham; Mr. Nonherbel described the I.C.I. plant for removal of smoke and oxides of sulphur from flue gases. A suggestive communication was that of Prof. D. Brunt on the local dissipation of fog for the sake of aviators wishing to land at an aerodrome in foggy weather, and who would be greatly helped if a small area could be rendered fogless for even a very short space of time. The discussion will be reported in full in the transactions of the Faraday Society to appear early in August.

### THE TRAFFIC IN DANGEROUS DRUGS

AT a recent meeting of the Permanent Central Opium Board at Geneva Mr. Lyall, the British representative, was re-elected chairman and Mr. May, the American representative, vice-chairman. The latter was also appointed a member of the supervisory body set up under the Limitation of Manufacture Convention of 1931. It is important that the three organisations established by the League of Nations to deal with different aspects, and from different points of view, with the traffic in narcotic drugs should be kept in close touch. These are the advisory committee on opium which dates from the early days of the League, the Permanent Central Opium Board under the Convention of 1925, and the supervisory body which determines the estimates of the several drugs required by various countries for medicinal purposes. The Board learnt with satisfaction that the Union of Soviet Socialist Republics had ratified the Opium Conventions, and urged those Governments which had not yet adhered to proceed to do so. The Peruvian government had announced its inability to control or supervise the production of coca leaves, but was proceeding to regulate the manufacture of crude cocaine.

Certain discrepancies shown between import and export statistics of dangerous drugs engaged the attention of the Board, notably those of consignments of raw opium from Turkey to Japanese territories. Explanations were also vouchsafed from the Swedish, French, and Bulgarian Governments concerning their manufacture of drugs in excess of the estimates furnished by them for 1934. While the Board feels itself in a position to report to the Council of the League that the amount of drugs now manufactured from both opium and coca leaves for legitimate consumption is lower than the estimates made in 1931, it nevertheless directs attention to the danger arising from the fact that more opium is grown in the world than can be legitimately consumed. Attention is called to the large number of

drug addicts in the United States and Canada, although the control of manufacture is very strict, and the conclusion is drawn that the present system of fighting the illicit traffic is ineffective, fostered as this traffic is by clandestine factories annually producing many tons of the drugs. A conference on its suppression will be held in Geneva on June 8th.

### BRITISH NEUROLOGISTS IN HOLLAND

A MOST successful development of international relations in neurology took place last week-end, when a party of twenty representative neurologists, under the ad hoc presidency of Prof. Edwin Bramwell, visited Holland. A conjoined meeting was held there of the section of neurology of the Royal Society of Medicine and the Amsterdam Society of Neurology. The president of the latter, Dr. de Jong, and the secretary, Dr. Tammemons Bakker, arranged an instructive programme at Prof. Brouwer's clinic within the Wilhelmina-Gasthuis. The Friday morning session was spent in a visit to the wards and laboratories of the neurological department where selected cases were demonstrated. Short papers were read in the afternoon by members of the Dutch society, and in the evening the English visitors were entertained to dinner by private hospitality. Saturday morning was devoted to a visit to the psychiatric clinic of Prof. K. H. Bouman and to demonstrations of experimental psychology (Dr. van der Waals) and of neurophysiology (Dr. de Jong); and visitors were privileged to see Dr. Oljenick, the Amsterdam neurosurgeon, operating upon a case which had been shown the day previous by Prof. Brouwer. A dinner, followed by a reception, was held at the house of Prof. and Mrs. Brouwer in the evening. This valuable and informative combined meeting was concluded on the Sunday by a motor coach tour of the bulb-fields near Haarlem with a visit to a tulip farm.

### HEALTH IN PRISONS

COMPILED in relation to the year 1934, the recently issued annual report<sup>1</sup> of the Commissioners of Prisons has interesting notes on the changes visible in the past 25 years. Cirrhosis of the liver is now less frequent, acute gout in the big toe-joint is seldom seen, delirium tremens is absent, and states of mind attributable to alcoholism (constant causes of admission to the prison hospital in pre-war days) are comparatively unusual to-day. Among young women chlorotic anæmia, formerly common, has almost disappeared, and, thanks to the fashion of wearing the hair short, verminous heads are few. Dr. W. Norwood East, the medical commissioner who marshals these facts, notes on the other hand an apparent increase in minor mental illness, and thinks this is not due merely to the more vigilant recognition of symptoms. Prisoners to-day, he believes, are of a higher standard of intelligence. Harsh punitive measures are no longer employed. Separate confinement has been abolished. There is a weekly news reading, there are debates, lectures, concerts, and library books. Physical training has been introduced in place of the monotonous exercise of walking round in a ring. The close crop ceased in 1922, and soon afterwards shaving in prisons became general, prisoners being allowed to shave themselves or be shaved, and in many cases to have their own safety razors and brushes. The broad arrow has disappeared from convicts' clothing; prisoners who have escaped are no longer obliged to wear parti-

coloured clothes or carry leg chains. And yet, remarks the medical commissioner, prisoners in general are remarkably conservative in their outlook; the old hands prefer the narrow and rigid discipline of former times. The older generation, he says, have fewer interests, fewer requirements, and less need for outer contacts, while the younger generation is less self-reliant, more indulgent in self-pity, and less comfortable under the restrictions of a penal institution or in facing re-entry into civil life. The old heavy sentences are said to have induced insubordination and the assumption of bodily and mental disability. Malingering to-day is thought to be less common than formerly and, when it occurs, to be often the result of self-compassion. The general health in our prisons continues to be good. Five prisons are now equipped for the performance of major surgical operations.

It is a pity that these annual reports of the prison commissioners cannot be more promptly issued. The year 1934 is now ancient history, and the sense of perspective is distorted by references to subsequent events—such as the Money Payments (Justices' Procedure) Act, 1935, which came into force this year.

### EXPERIMENTAL GLOMERULO-NEPHRITIS

FAILURE to reproduce the histological picture in animals has been a baffling feature of research on Bright's disease, and it is a failure that is surprising when we consider the strong evidence that infection causes the disease in man—witness the renal sequelæ of tonsillitis and scarlet fever and the frequent association of diffuse glomerulo-nephritis with sub-acute progressive endocarditis. In these instances the streptococcus is more frequently isolated than other organisms. But the considerable interval that often elapses between the onset of the infection and the onset of the nephritis seems to show that the mechanism is not a perfectly simple one. The theory that the inflammation of the kidneys is an allergic manifestation has been advanced to explain the facts, and has gained support from work during the past three years in Fahr's laboratories in Hamburg where Masugi and others have succeeded in producing a glomerulo-nephritis in rats by injecting into them serum from rabbits treated with a series of injections of a suspension of rat's kidneys. The similarity of this nephritis to Bright's disease in man encouraged Arnott, Kellar, and Matthew to repeat the experiments, and they now report<sup>1</sup> that they have similarly produced a diffuse glomerulo-nephritis in rabbits by injections of serum from ducks subjected to injections of a suspension of rabbit's kidneys. The resemblance, as far as the glomeruli are concerned, was more impressive in the animals which lived longer than a fortnight than in those dying within a few days. The former showed an increase of endothelial nuclei in the tufts, adhesions of the tuft to the wall of Bowman's capsule, and epithelial crescents; these are the diagnostic histological features of Bright's disease in man. It is also of interest that, in the one example in which blood-pressure readings were obtained by the carotid loop method, a sustained rise of about 30 mm. was recorded. A control series of rabbits injected with normal unimmunised duck serum showed no nephritis.

This experimental nephritis, which seems attributable to an intense antigen-antibody reaction in the rabbit, suggests that Bright's disease in man is likewise

<sup>1</sup> H.M. Stationery Office, Cmd. 5153. 2s.

<sup>1</sup> Arnott, W. M., Kellar, R. J., and Matthew, G. D.: *Edin. Med. Jour.*, April, 1936, p. 233.

the result of an intense antigen-antibody reaction in a patient with streptococcal infection. The implications of this preliminary report are so important that those interested in the pathology of Bright's disease will doubtless hope for an opportunity of examining the authors' preparations.

### RECORDS, MERRY AND TRAGICAL

DUKE THESEUS pronounced the story, a dramatic version of which he was afterwards to witness by the famous Bottom troupe, as "merry and tragical" and records of medieval medicine produce just these emotions. While we are filled with admiration for the learning and industry of the authors, their ingenuity in finding reasons for preposterous therapeutics cannot fail to amuse, while it is tragic to observe how many lives could have been saved if credulity had not so often got ahead of reason. The writings of Johannes de Mirfeld, translations from which have just appeared made by Sir Percival Horton-Smith Hartley and Mr. Aldridge,<sup>1</sup> are indeed merry and tragical, and fill a gap in the knowledge of most of us. There is in Norman Moore's "History of St. Bartholomew's Hospital" considerable reference to Mirfeld, showing him to have been a deeply learned man, but the story as presented was imperfect—only a sketch was intended—and it is well that we should have fuller information of the life and works of an important scholar. His two books are entitled the "Breviarium Bartholomei" and the "Florarium Bartholomei," and each proves that their author had read the works of Gaddesden, Galen, Rhazes, and Avicenna, while he knew the precepts of the school of Salerno, where Jewish and Arabian wisdom was blended with classic precept. His biography, as set out by the authors, is very detailed, the result of elaborate research for which they deserve warm credit. The various charters, rolls, and diocesan and parochial records which have been consulted by them must have been difficult to decipher, and when deciphered equally difficult to comprehend exactly, for in many places the sequence had been sadly disturbed in the course of six centuries by the loss of connecting documents. Exactly what standing as doctor or priest Mirfeld had in connexion with St. Bartholomew's is not easy to define. He was a clerk of the Priory of St. Bartholomew's, and although the priory and the hospital were distinct institutions he was evidently in close touch with the medical side, as proved by literary work and by the fact that after ordination as priest he derived his subsistence not from the priory but from the hospital. What comes out, however, from authentic history and from internal evidence is that he was a devout and learned man who had the fine resolve to compile all the medical knowledge of the world up to his date, and to perform the task for the sake of humanity and to the Glory of God—sentiments which he frequently reiterated and whose sincerity his manuscripts prove.

The Breviarium represents the medical learning of the fourteenth century. The work exists in several versions as a manuscript, and if printed in full would cover some 2000 pages of an octavo volume. From this great store the authors have selected for translation the chapter on the signs of fatal illness and

the chapter on phthisis. Their choice was decided because the "De Signis Malis" is the most general essay in the immense treatise and deals with an aspect common to many diseases—namely, death. The chapter "De Ptisi" was chosen because the authors were personally interested in all relating to the disease which, it is suggested, may have contributed to the cause of the death of the Black Prince, Mirfeld's contemporary. Both chapters give us a fine opportunity of comparing the standard of scientific knowledge reached in the Middle Ages with that enjoyed since the discovery by Harvey of the circulation of the blood; indeed long after Harvey had supplied a physiological basis for medicine, practitioners clung to the tenets observed through over 2000 years. Mirfeld made no pretence to originality, and the Breviarium is largely compiled from the works of classical and Arabian medicine. He displays little or no systematic medical knowledge, theories seldom, and is mainly interested in the extraordinary remedies which he puts forward on various authority. The Florarium is a theological work which survives only in imperfect manuscripts, and but one of its 175 chapters deals with physicians and medical treatment. Here Mirfeld is not complimentary to the profession, but, as the authors point out, the chapter indicates such general advice for the maintenance of health as would be given by a physician living at the end of the fourteenth century, while it illustrates the theories on which medical treatment at St. Bartholomew's hospital would have been based up to Mirfeld's day and for some time subsequently. In the Florarium as throughout the Breviarium we have examples of the wild superstitions which led to the employment of complicated remedies for application or digestion in all sorts of conditions, from the obviously fatal to the obviously trivial. We forget the misery that attended such therapeutics in our amused wonder that real learning, of which there was often much, should be blended with such comic credulity. The authors are to be thanked for a very acceptable book.

### RECOVERY AFTER CHILDBIRTH

WRITING in the *Times* of April 27th Dr. Gordon Ward draws attention to the frequent mention in the new Midwives' Bill of ten days as the period that should normally elapse between childbirth and the last visit of the nurse. He goes on to suggest that sanction of the ten-days standard by the Minister of Health will mean that thousands of mothers—tired, undernourished, and suffering from repeated labours—will be led to believe that the eleventh day should find them sufficiently recovered in health to return to their full duties as mother of a family. This protest was repeatedly endorsed in the second-reading debate on the Bill (see p. 1090). The assumption that the midwife's duties are discharged ten days after a normal confinement has for many years been regarded by the medical profession as thoroughly unsound. The responsibility for it rests it seems on the Central Midwives Board, for ten days has always been given in their rules as the statutory nursing period in a so-called normal case. It is natural enough that an administrative body such as the Ministry of Health should follow this lead, on the presumption that the Central Midwives Board would not have made such a ruling without careful consideration. But the result is that an obviously dangerous principle finds expression in the new Bill. As Dr. Gordon Ward says, the one safe standard is the medical standard: the midwife

<sup>1</sup> Johannes de Mirfeld, of St. Bartholomew's, Smithfield. His Life and Works. By Sir Percival Horton-Smith Hartley, C.V.O., M.A., M.D., F.R.C.P., Consulting Physician to St. Bartholomew's Hospital and to the Brompton Hospital; and Harold Richard Aldridge, M.A., Assistant Keeper in the Department of Manuscripts in the British Museum. London: Cambridge University Press. 1936. Pp. 191, 158.

should remain in attendance, and the mother should remain in bed, until she has fully regained her strength—regardless of normality in pulse, temperature, or involution. The time required for recovery will necessarily vary with circumstances, responsibilities, stamina, and general health, and we agree with Dr. Ward that before discharging herself from her case, the midwife should report to a doctor who must assume further responsibility. The introduction of any time-factor into obstetrics, whether for pregnancy or labour, can only be deplorable.

#### MEDICAL INSURANCE AGENCY

THE annual general meeting of the M.I.A. was held on Wednesday of last week when Sir Humphry Rolleston from the chair was able to report continued progress. The agency was established in the interests of medical practitioners to ensure that they received expert advice and assistance in obtaining contracts suited to their own particular needs, and the rebates accruing have resulted since the start of the Agency in the direct saving to members of the medical profession of over £70,000, while through the same period over £40,000 have now been distributed to recognised medical charities.

The charitable grants approved on April 29th were as follows:—

	£	s.	d.
Royal Medical Benevolent Fund—			
Under deed of agreement .. .. .	1260	0	0
For general purposes .. .. .	250	0	0
Special centenary appeal .. .. .	250	0	0
Ladies Guild of the R.M.B.F. .. .. .	620	0	0
Royal Medical Foundation of Epsom College—			
For general benevolent purposes .. .. .	315	0	0
Sherman Bigg Fund—to be used as necessary .. .. .	200	0	0
Grant for special case .. .. .	105	13	3
Girls Education Subcommittee .. .. .	300	0	0
Sir Charles Hastings Fund .. .. .	450	0	0
Royal Home for Incurables, Putney .. .. .	52	10	0
	£3803	3	3

Proposals for insurance to the number of 387 were received during the year, totalling a sum of over £500,000; of these 334, totalling sums assured of £446,947, were completed. During the year 215 policies were negotiated, approximating to £470,000 of maximum "Family Protection" cover, which to date brings the sum so completed to over three million pounds, represented by some 1500 policies. Considerable progress may be noted in the interim report respecting motor-car insurance, and difficult of settlement as many of these cases have been there is evidence of much gratitude from the supporters of the Agency for equitable arrangements. Certain loans have been made for the purchase of medical practices through the medium of the Caledonian Insurance Company, The Clerical Medical and General Life Assurance Society, and the Century Insurance Company, and it is noted that there is a growing tendency for the purchase price of practices to be enhanced, a feature which is particularly conspicuous in the London area. In the balance sheet the audited accounts show increases in the premium income. The whole story is one of progress.

WE regret to record the death of Dr. Th. E. Hess Thaysen of Copenhagen, a physician well known in this country for his original observations on metabolic diseases. He was the first to record, in 1926, the low sugar-tolerance curve of idiopathic steatorrhœa, and his monograph on "Gee's Sygdom, the Cœliac Affection," published in 1931, was a valuable work

which has had interesting repercussions, though his term "non-tropical sprue," for cœliac disease in adults, is not generally accepted. Among his writings many of our readers will most readily recall the paper on "proctalgia fugax" contributed to our columns last August. Subsequent correspondence showed that this condition had often been observed by others, but it had been left to Thaysen, with his clinical insight, to paint the picture and give it a name. The charm of his writing reflected his personality, and many of his English colleagues had reason to think kindly of him.

ON Monday, May 11th, at 8.30 P.M., Sir James Walton will deliver the annual oration of the Medical Society of London. He will speak on carcinoma of the stomach, and the address will be followed by a conversazione.

ON Tuesday, May 19th, at 4.15 P.M., at St. Mary's Hospitals, Manchester, Dr. Walter Schiller, pathologist to the University Frauenklinik in Vienna, will give the Lloyd Roberts lecture on cancer of the uterus. On Wednesday and Friday, May 20th and 22nd, at 4 P.M., he will deliver the Ingleby lectures at the University of Birmingham, when he will speak on granulosa-cell and Brenner tumours of the ovary and on "mesonephroma ovarii."

Sir Herbert Austin has given £250,000 for the extension and further endowment of the Cavendish Laboratory of the University of Cambridge. Lord Rutherford has announced that the first use made of the money will be to build a laboratory for the utilisation of very high voltages in order to carry out experiments on the transmutation of matter by high-speed particles and by radiation. This is the greatest single benefaction the university has ever received, and it is intended as a tribute to the work of J. J. Thomson, Rutherford, and their associates.

THE sixth International Congress of Physical Medicine opens on Tuesday next at the Hotel Great Central, London, under the presidency of Sir Robert Stanton Woods. The proceedings, which will include meetings at the Royal Society of Medicine and the British Institute of Radiology, will be grouped under the headings of kinesitherapy, physical education, hydrotherapy and climatotherapy, electrotherapy, actinotherapy, radiology, and the teaching and organisation of physical medicine in schools and universities. Visits will be paid to hospitals and clinics, and there will be tours in the neighbourhood of London and to spas. Further particulars may be had from the hon. secretary, Dr. Albert Eidinow, 4, Upper Wimpole-street, W.1.

WE regret to learn the death of Mr. David M. Greig, Conservator of the Museum of the Royal College of Surgeons of Edinburgh, which occurred at Edinburgh on May 4th.

Mr. A. J. Melly, F.R.C.S. Edin., who initiated, organised, and led the British Red Cross ambulance unit in Abyssinia, was wounded in the right lung by a revolver shot on the morning of May 3rd, when he stopped his car to pick up a wounded Ethiopian. As we go to press we learn that he died on May 5th at the British Legation at Addis Ababa.

ALBERT DOCK HOSPITAL, LONDON.—A further £30,000 is needed to complete the £75,000 required to rebuild this hospital which will then include one of the best equipped fracture clinics in the United Kingdom.

## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### XCIX.—PROGNOSIS IN ARTHRITIS

(Concluded from p. 1025)

#### Osteo-arthritis

THE classification adopted by the British Medical Association committee divided osteo-arthritis into primary and secondary forms.

*Primary osteo-arthritis*, of which Heberden's nodes furnish a typical example, is due to degenerative changes arising from excessive wear and tear such as may characterise certain occupations; probably deficient blood-supply, the result of arterio-sclerosis, favours such changes; it is insidious in onset and before treatment is sought the joint cartilage may be almost destroyed and extensive osteophyte formation may have taken place. This is very liable to occur in the hip-joint and though the damage cannot be undone careful treatment will prevent the joint from becoming fixed in a bad position. The pain and difficulty of walking leads the patient to sit for long periods and the joint may become fixed in a flexed position; this may be overlooked in its early stages, since it is remarkable how far the hyperextension of the lumbar spine can compensate for flexion of the hip-joint. Radiographic examination is desirable and both hip-joints should be included for the additional strain thrown on the apparently sound side may soon set up arthritis there also. A well-fitting calliper splint is most useful in facilitating exercise, relieving the strain in the sound joint, and often also relieving pain which may otherwise be so severe in the damaged joint as to render walking impossible. A point of much importance in the early recognition of this disease, and thus in improving prognosis by proper treatment, is that at first the pain may be referred often to the knee-joint as in tuberculous disease of the hip in children; it may also be referred to the adductor region or to the area of distribution of the sciatic nerve. Much time may be lost in futile treatment of a painful knee showing no objective signs except perhaps a little crepitus when a radiographic examination of the hip would reveal the true cause of the symptoms. A radiogram may, however, reveal the presence of small osteophytes which are not of importance in themselves, being compensatory to ligamentous strain. They are often seen at the margins of the knee-joint and especially at the upper edge of the patella; but in the absence of evidence of any serious damage to the cartilage they are not of any serious moment from the point of view of prognosis. In the hip, however, similar appearances are of importance owing to the anatomical characters of that joint.

*Secondary osteo-arthritis*, the sequel of gout or of rheumatoid arthritis which has been successfully treated or has burnt itself out, must be recognised as a process of repair, but may call for splinting or other support to control or prevent deformity and thus improve the prognosis and help to make a more active existence possible.

#### PROGNOSIS AS REGARDS MOBILITY

The range of mobility retained by patients with osteo-arthritis will depend on how early treatment is begun. If this has been neglected, restriction of range of movement may result in consequence of contraction of the capsule from peri-articular fibrositis, or from the presence of osteophytes in such a position

as to interfere with normal movement. Bony ankylosis does not occur. The same principles both of prevention and treatment will apply as in rheumatoid arthritis, but the hip-joint is the one which most frequently gives rise to difficulty and restriction of movement. The use of a calliper walking splint hinged at the knee will often relieve pain and if fitted so as to secure a slight degree of extension it will lessen the wear and tear on the articular cartilage and permit of some degree of repair. If there is already some restriction of play in the joint, which is most common in the direction of flexion or adduction, movement under an anæsthetic should be attempted and followed by fitting of a calliper walking splint. In my opinion open operation is rarely justified and only for the relief of severe pain or malposition which cannot otherwise be overcome. Excision of the head of the femur will leave a weak and often useless limb, while a fixed joint, the result of arthrodesis, is a prospect which most patients will prefer to avoid even at the cost of pain.

#### SPONDYLITIS

In this condition it is of the utmost importance to distinguish the two principal forms.

*Ankylosing spondylitis*, which has much in common with rheumatoid arthritis, may speedily, if not recognised, give rise to severe and irreparable crippling; this is the form called "spondylose rhizomelique" by the older writers. It is a disease of young adults, insidious in onset, often with pains in the limbs for months before it becomes obvious that the vertebral column is the real seat of the mischief, and by this time the sacro-iliac joints and the joints between the articular processes of the lumbar vertebrae are often seriously damaged or even ankylosed. In most cases the lumbar spine is first affected, but in a few it begins in the cervical region. Rest and treatment on the lines already indicated will make all the difference to the prognosis both as regards the progress of the disease and the nature and development of deformity. It is of great importance to carry out systematic respiratory exercises as the costovertebral joints are affected early and if care is not taken the thorax quickly becomes a rigid cage. Care must also be taken to prevent or, it may be, to correct any tendency to bad position in the vertebral column in which some degree of ankylosis is practically unavoidable. The hip-joints are usually attacked very early in the course of the disease and may soon be immobilised; the shoulders are affected much later.

The tendency to remission is more marked in ankylosing spondylitis than in other forms of arthritis, which is a fortunate thing, since there is no specific method of treatment known at present, and we can only depend on rest and building up resistance to the invasion, whether it be a streptococcus or a virus or any other cause. If care has been taken to secure a good posture the activity of the patient when the stage of remission is reached is often remarkable, and a degree of movement in the joints is regained which the X ray appearances would lead one to regard as impossible. Care in treatment on the lines already indicated, especially in securing an ample intake of calcium-containing food together with adequate vitamin D, may prevent any recrudescence of symptoms and cure may thus result.

It must be remembered that the latent period may last for years and then the symptoms reappear and extend till the spinal column is a rigid bar, the ribs immovable, and often the shoulders and knees ankylosed. Other joints may be affected, especially the mandibular, so that it becomes impossible to separate the jaws. Even in most advanced cases with complete rigidity of the spine, often in so distorted a shape that the unfortunate patient can neither stand, sit, nor lie in any degree of comfort, compression of the spinal cord or of the spinal nerve-roots is rare.

The second form of spondylitis is *osteo-arthritis of the vertebral column*. It is common in men who have led an active laborious life; in fact, it is rarely that some evidence of the condition is not to be seen in radiograms of working men or women who are getting on in years. It is of importance to remember this, for such appearances, which may cause alarm, are of no serious import. They were recognised by Sir Samuel Wilks who gave the name "the labourer's spine" to the condition. It is characterised by increased stiffness, never going on to ankylosis, though adjacent osteophytes may unite to form bridges between the vertebræ. Pain is not a prominent symptom unless, as sometimes occurs, the nerve-roots are pressed upon by osteophytes in the spinal canal or at the point of emergence from the foramina. The prognosis is, therefore, favourable; life is not threatened and activity not seriously limited, but the working man may be obliged to give up his work because of chronic, though not severe, pain in the back made worse by stooping or lifting. The contrast with ankylosing spondylitis in prognosis is so great that it is of the utmost importance not to confuse the conditions.

### Spa Treatment

Spa treatment is of much assistance in the later stages of rheumatoid and in osteo-arthritis. Specialised methods of applying heat by peat or mud packs combined with hot douching give great relief, while the manipulations which are a feature of the deep pool bath often increase the range of movement surprisingly. Many patients of the poorest classes, for whom the spa hospitals exist, find a course of treatment once or twice a year serves to keep them going in reasonable comfort. In the more acute forms of rheumatoid arthritis the patient is better at home unless the conditions are such that a hospital or clinic at a spa or elsewhere is to be preferred. Among those preferably treated away from home are women who cannot otherwise obtain the rest and freedom from household cares which is essential. The orthodox cure of limited duration with residence in a hotel or lodgings will be of little service in these cases. It is a question of nursing-home or hospital.

The full value of spa treatment will only be obtained if in principle it is continued after the patient has returned home; and he should be instructed how to carry out simple forms of treatment along definite prescribed lines. A relative can often be taught to massage the limbs (with a warning not to rub the joints except in the gentlest manner), to help in carrying out resisted movements and exercises for re-educating muscles, and to use simple forms of heat treatment. Ample information as to suitable spas will be found in the handbook issued by the British Health Resorts Association.

C. W. BUCKLEY, M.D., F.R.C.P.,

Hon. Physician, Devonshire Royal Hospital, Buxton,  
and to the Buxton Clinic for Rheumatic Diseases.

## SPECIAL ARTICLES

### MEDICINE AND THE LAW

#### Delinquency as an Ailment

At the South-Western police-court last month the metropolitan magistrate remanded an accused man for a month in order to obtain a report about him from the Institute for the Scientific Treatment of Delinquency. The magistrate was Mr. Claud Mullins, whose zeal as a reformer of legal procedure has been shown both in his court and in his writings. He is by no means the first member of his body to have recourse to the psychologist; the late William Clarke Hall incurred the ridicule of old-fashioned legal critics for the psychiatric "circus" which was said to attend his court. The step now taken by Mr. Mullins, however, probably indicates that the bench is now prepared to take advantage of modern psychotherapy. The accused man, aged 34, was charged with a serious offence of indecency towards a child. His medical history, as stated to the court by the defending advocate, included sleepy sickness in 1919, cerebral meningitis and double pneumonia in 1922, and a severe scalp wound in 1927; he was said to have been unconscious for months in Martinique when suffering from some obscure form of disease. The police witnesses, who regarded him merely as a pest to the public, outlined his previous convictions and remarked that he seemed always to get into trouble in the month of April. Mr. Mullins pointed out that the man had at first pleaded "not guilty" and had thereby given consider-

able trouble in eliciting the facts; afterwards he pleaded "guilty." The maximum sentence was six months' imprisonment, but this would leave the man at large next April to be again a danger to the public. It was not possible to treat him as "guilty but insane"; the magistrate therefore thought it the best course to send the case for investigation to the institute already mentioned. Needless to say, the magistrate has no power to order a man to be thus dealt with; the man goes to the institute of his own free will. Alteration of the law, to enable persons on remand to be compelled to attend a clinic for examination, has been felt desirable by prison visiting justices and others. Our penal institutions are not adequately equipped to accommodate patients for this purpose.

Psychological examination before sentence is more novel than the psychological treatment in penal establishments which was recommended by the Persistent Offenders Committee some years ago. The recently issued report of the Commissioners of Prisons for the year 1934, referred to specifically on another page, contains a cautious statement by Dr. W. Norwood East on the progress made. This committee considered that a certain amount of persistent crime was due to abnormal mental factors, that the usual punitive and reformatory methods in cases outside the scope of the Lunacy and Mental Deficiency Acts often failed, and that there was reason to think that in selected cases delinquents might be amenable to psychological treatment. Dr. W. H. de B. Hubert was accordingly appointed to Wormwood Scrubs Prison as psychotherapist.



Dr. East observes that, as expected, some prisoners apply for this treatment out of curiosity, others in the hope of preferential conditions while in custody, while others again are genuinely anxious to be relieved from their disability. He adds a warning that a few law-breakers are believed to be exploiting the medical psychologist, attending psychotherapeutic clinics, and equipping themselves in advance with evidence to show that, being under treatment, they are irresponsible or, at any rate, fit subjects for leniency. "It cannot be urged too strongly," Dr. East concludes, "that dishonest intentions on the part of accused persons should be exposed, and unqualified practitioners denied the opportunity of bringing into disrepute a method of treatment which may prove to be of value." When this fraudulent element is eliminated, the community must be patient with the new methods. Quick results must not be overconfidently claimed; care is needed to follow up the released prisoner and to test success over a long period. Ordinary psychological investigation has sufficed to restore normal mentality in many cases of attempted suicide. In other groups of offences prolonged and intensive treatment can secure readjustment. There remains a class of offenders who do not respond at all. The difficulty is to identify the curable, to prove the genuineness of the desire to be rid of the pathological state which is linked with the anti-social conduct, and to establish the successes while taking note of the failures. The legal and judicial attitude towards offenders, and indeed the attitude of the public as a whole, will not be moved by mere enthusiastic insistence that all crime is a disease. It can be demonstrated that some crime at any rate is attributable to neurosis. Progress will be easier when results are at length visible. Dr. East in his recent report says he has no doubt that the professions of law and medicine are drawing nearer in regard to questions of crime and insanity.

#### Criticisms of a Surrey Remand Home

The *Surrey Comet* publishes some disquieting criticisms of a remand home administered by the county council. The complainant is the father of a boy, aged 13, who was remanded in a case where eight lads had been charged with damage to an occupied house. The home, he says, is a gloomy villa with heavily barred windows. It accommodates ten boys in one fair-sized living-room divided by a partition. Their ages range from 9 to 17 years, and they are locked up in these rooms from 7.30 A.M. to 8.30 P.M. every day. The only outdoor exercise allowed is about 30 minutes in the morning and evening in a small yard 10 feet square surrounded by a corrugated iron wall with barbed wire and spikes. There are two bedrooms, six beds in one and four in the other. The toilet arrangements consist of one bath: all ten boys wash in the same water; there are no hand bowls or other utensils. The superintendent, while anxious to do the best he can, has another post as caretaker of an elementary school.

"Remand homes" have taken the place of the "places of detention" provided under Section 108 of the Children Act (now repealed). County councils and county boroughs must provide them, but need not provide additional ones so long as the old places of detention remain suitable for use and are sufficient for the needs of the area. The recent criticisms will no doubt be carefully investigated. Temporary residence under the alleged conditions might well be an unsettling experience for the young.

## UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

### SYPHILIS

UNDER the leadership of Surgeon-General Cumming a very liberal policy has been pursued by the U.S. Public Health Service in its relations with the several State health administrations. Advice and help have been freely granted on request. No attempts at regimentation have been made. When the State and territorial health officers gathered at Washington on April 13th the new surgeon-general, Dr. Thomas Parran, Jun., made it quite clear that this policy will be continued. If, said he, one State finds pellagra its chief problem and wishes to spend three-quarters of its funds fighting pellagra that is perfectly all right with the federal service. Dr. Parran's own conviction that syphilis is a major, perhaps the major, public health problem in this country may have been deduced from the distinguished galaxy of clinicians and epidemiologists who read papers on syphilis on the first day of the conference. Dr. Earle Moore, syphilologist in the Johns Hopkins medical school, emphasised the amount of syphilis that exists in people who are unaware that they may be infected. One man in five, one woman in three acquires the disease without knowing it. Thirteen years ago he showed that 5000 syphilitics passed through Johns Hopkins annually unrecognised. Only in the last six months has his hospital adopted a routine Wassermann test for all patients. If this procedure were adopted by all hospitals in the country 700,000 new cases of syphilis could be discovered annually. If in addition the test were also applied in out-patient departments another million new cases would be discovered. Dr. Moore urged the establishment of free clinics whose presence, far from interfering with private practice, is found, he said, to increase the demand for treatment from the private practitioner.

Dr. Dudley Smith described epidemiological studies made in connexion with the syphilis clinic of the University of Virginia. Questioning of 207 cases had resulted in knowledge of 511 sexual contacts. Elimination of duplicates among these sexual partners reduced the number to 421. Of these 171 were persuaded to attend the clinic. The remainder were advised to consult a physician, with what success is not known. Seventy-four per cent. of the contacts who came to the clinic for examination were found to be infected. From these figures Dr. Smith calculates that each new case of syphilis gives rise to 1.5 new infections which clearly represents an increasing infection-rate. Lantern slides were shown demonstrating how from epidemiological study of the sexual contacts of a single case a small epidemic of syphilis could frequently be uncovered. The physician who makes the inquiry regarding contacts has at the same time a valuable opportunity to emphasise the importance of early and adequate treatment.

Dr. Stokes of Philadelphia spoke both eloquently and wittily of the educational methods available for arousing the interest of the profession and of the public in this subject. Doctors must not resent the acquisition by lay groups of special knowledge in this field. On the other hand, no progress can be made without the whole-hearted co-operation of physicians. The most effective education is learning by doing. Visual memory is more common than auditory memory, and printed propaganda, news stories, and feature stories are more effective than lectures.

Medical students in the University of Pennsylvania are not taught to be experts in dark-field examination or in serology. They are taught to take the specimens for such examinations and to expect that public health agencies will supply the necessary experts.

#### THE SERVICE AND NEW LEGISLATION

Two official dinners were given at the Congress. The first was a farewell dinner to Dr. Hugh Cumming to whom a certificate of life membership in the conference was presented by the dean of State health officers, Dr. Harper of Wisconsin. At this dinner Dr. Parran divulged a secret which had been known to himself only for a short time—namely, that he was a blood relation of Dr. Cumming through their maternal ancestry. On the second night a dinner was given by Miss Roche, assistant Secretary of the Treasury, at which brief speeches were made by Mr. Frank Bane, administrator of the Social Security Act, and by the new surgeon-general on the significance of the new Act. Dr. Parran pointed out very effectively that whereas other features of the Act spent larger quantities of money, and the money was well spent in alleviating the distress of old age, crippling, and unemployment, yet the relatively small amount of money devoted in the Act to public health is the only money that is spent in striking directly at the root of social insecurity and distress.

The two following days, April 15th and 16th, were spent in conference with the officials of the Children's Bureau, Department of Labor, in working out plans for the expenditure of federal subsidy for maternal and child care under the Security Act.

President Roosevelt received the delegates in his office in the White House at noon on April 14th. He spoke to them briefly but with his extraordinary personal charm and with a remarkably keen understanding of their essential problems. It is easy to believe, what his intimates tell us, that the President's most vital interest is the preservation of the nation's resources: vital and natural.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

#### THE PUBLIC HEALTH ESTIMATES

THE debate on the estimates of the Department of Local Government and Public Health was held recently in the Dáil, and the Minister was able to record advances in several lines of public health activity. There is now a whole-time medical officer of health in every county area, and systems of medical inspection of school-children have been widely established. Some 80 per cent. of the school-children come into the ambit of the schemes, although only one-fourth of these children were actually inspected during the year. The infant mortality has shown a decrease in both urban and rural areas. The death-rate among illegitimate infants is still abnormally high, being three and a half times that of legitimate infants. The Minister takes a special interest in housing and he was able to report much work in housing during the year. He stated that the question of more active work against tuberculosis was under consideration. In the debate which arose on the Minister's estimates, attention was mainly focused on the recent circular issued by his Department, in which local authorities were advised that the normal retiring age for their officers should be 65 and in some cases 60. Acting on this advice and

believing it to be mandatory, many local authorities have called on officers over 65 to retire. In reply to criticism in the debate the Minister repeated his assurance that the circular was advisory and not mandatory, and said further that, in his opinion, the local authorities would be acting illegally if they insisted on a general retirement at the age of 65. He also agreed that the case of medical officers required special consideration. The position created by this circular is peculiar and embarrassing. The wording of the circular, rather than its form, appeared to give it a mandatory character. Though the Minister has now declared that this was not his intention it does not appear that he has so far officially drawn the attention of the local authorities to the fact. It is admitted that there is a case to be argued as to the advisability of establishing a retiring age for the officers of local authorities, but if such a step is to be taken the whole system of salaries and pensions must be reconsidered, and the rights of existing officers must be safeguarded. The present position of the Department appears illogical.

#### THE DUBLIN HOSPITAL PROBLEM

The Hospitals Commission in its recent report recommended as its solution of the hospital problem in Dublin the enlargement of some and the amalgamation of others of the existing voluntary hospitals into four large general hospitals which would remain as voluntary hospitals. This solution was recommended by the Commission in opposition to a suggestion that had been made in favour of a large hospital under municipal control. It is understood that strong influences are at work in favour of the latter proposal, and, therefore, the discussion held by the Royal Academy of Medicine of Ireland on May 1st on the Dublin hospital problem was timely. A remarkably strong case for the development of the voluntary hospitals and in favour of the Commission's recommendation was made by several speakers—among others, Prof. Henry Moore, of University College, Profs. T. G. Moorhead and R. J. Rowlette, both of Trinity College, Mr. W. Doolin, and Dr. J. A. Harbison, medical officer of health for County Dublin—and a resolution was unanimously carried to that effect. The final decision rests with the Minister for Local Government and Public Health.

## INSTITUTE OF MEDICAL PSYCHOLOGY

At the annual meeting of the Institute held on Monday in the Wharnclyffe Rooms, London, the report for the year 1935 was presented by the medical director, Dr. J. R. REES, who welcomed the new members of the medical advisory board; their support, he said, would add further to the prestige of the Institute in the medical world. He described an attempt to clear off a long waiting-list by the appointment of four part-time medical officers to treat additional patients. In general hospitals a large proportion of routine clinical work is carried out by newly qualified doctors who give their services in return for the experience they gain, but this practice, he said, cannot be followed in psychotherapy which demands both maturity of outlook and specialist training upon a basis of general medical experience. Hence even the junior members of the Institute's staff are doctors of some seniority. The future efficiency of the Institute lay, he felt sure, in the adequate endowment of a sufficient number of part-time paid appointments to be held by psychotherapists of standing and experience with leisure to devote time to teaching and research. During the year a gratifying number of requests had been

received from other hospitals and clinics for names of psychotherapists trained at the Institute.

The report also contains an account by the newly appointed director of studies, Dr. J. A. HADFIELD, of the educational work done at the Institute. The five weeks' course for general practitioners has been attended by 39 doctors, 14 of whom enrolled for the year's training course designed for those proposing to take up the practice of psychotherapy. The full training course has now been extended to cover two years of study. The educational activities of the Institute are self-supporting. The salient feature of the report is the announcement of the acquisition of a new site for a central hospital and educational centre for psychological medicine, some further notice of which is given on another page.

Sir HENRY BRACKENBURY presided both at the meeting and at the luncheon which followed it, when he asked leave to emphasise one essential point. The Institute, he said, provides collective means for the use of psychotherapy and covers large lumps of ideas and methods. The staff does not confess to any particular school of thought. Prof. Wm. McDougall is a vice-president of the Institute; Dr. Alfred Adler was present both last year and this at their gathering; Prof. C. G. Jung had delivered a course of lectures during the year; and to-day with permission of his hearers he would send a telegram to Sigmund Freud, on the occasion of his 80th birthday, expressing their admiration of his pioneer work.

Sir KINGSLEY WOOD, Minister of Health, who then spoke, welcomed the opportunity of giving some account of the health services of this country as a whole. It was not so long, he said, since people regarded mental patients not as sick but as criminal. Now every year the activities of local authorities were getting more interesting as facilities became available for early treatment as a result of the momentum of the Mental Treatment Act, now five years in force. Last year 30 per cent. of admissions to mental hospitals were, he said, without certificate and he saw the beginning being made to secure preventive treatment. Behind there still lay a large borderland in which the Institute was playing its part. Dr. Halliday's significant figures from Scotland, analysing the 35 per thousand unfit for work, showed that in 30 per cent. of them incapacity was due to some form of mental illness. The larger premises into which the Institute was proposing to expand were a measure of its means and of its optimism. Two aspects of the situation, he thought, demanded special notice: (1) the opportunity offered by the Institute to general practitioners to see the early stages of nervous and mental illness successfully treated; (2) the opportunity for medical officers of mental hospitals to take refresher courses and so to mitigate the isolation of these hospitals. This was in line with the fundamental principle underlying the Medical Treatment Act.

Lord HOLLENDEN, speaking as treasurer of the Institute, sketched the enlargement of its work from the foundation of a clinic in 1920, in a private house in Tavistock-square, for the treatment of those disorders of mind not classed as insanity or mental deficiency. In 1931 the Institute moved into an adapted warehouse in Malet-place, and later became recognised by King Edward VII. Hospital Fund. Starting with 240 patients there were last year 1200, and 500 cases were dealt with a week by 70 doctors. The consultations could not be hurried, for sensitive patients required interviewing in separate rooms with the same doctor in attendance throughout. The continued increase in the work of the Institute was due, he felt sure, to the realisation of practitioners that the early treatment of the mental troubles that baffled them was carried out there with success. But finance was urgent; each interview cost 8s. 3½d., of which the patient's payment covered only a third. He must have the sympathetic understanding on the part of the whole business community whose problems the Institute was helping to solve. A quarter of their children came from L.C.C. sources,

but the L.C.C. gave them no grant. On the new site would be provided first of all a hostel for those who lived too far away to come up regularly for treatment. The site had cost over £68,000, raised partly on mortgage, partly on bank loan guaranteed by nine members of the council of the Institute. The hostel would cost £13,000, and the council would not start building until half of this money was in the bank.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. (retd.) T. Cock to rank of Surg. Capt. (retd.).

Surg. Lt.-Comdr. J. V. Williams to be Surg. Comdr.

Surg. Comdr. R. A. Brown to *President* for three months' course.

Surg. Lt.-Comdrs. M. J. Brosnan to *Pembroke* for R.M. Infirmary, Chatham; and D. C. Drake to *Maine*.

Surg. Comdrs. (D) E. G. Adams to *Victory* for R.N. Hospital, Haslar; J. T. Wood to *Pembroke* for R.N. Hospital, Chatham; and A. D. McHaffie to *Resource*, addl.

Surg. Lt. A. H. O'Malley transferred to *Emergency List*.

Surg. Lts. C. J. Mullen to *Pegasus*; and J. W. Oliver to *Queen Elizabeth*.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lts. C. A. Mather to *Victory* for R.N.B.; and H. R. Vickers to *Drake* for R.N.B.

### ROYAL ARMY MEDICAL CORPS

Lt.-Col. S. S. Dykes retires on ret. pay.

Lt.-Col. R. Gale, D.S.O., h.p. list (late R.A.M.C.), retires on ret. pay on account of ill-health.

Maj. H. B. F. Dixon, M.C., to be Lt.-Col.

Capt. H. N. Walker, h.p. list, is restd. to the estab.

Short Service Commissions: Lt. (on prob.) J. A. Dorran resigns his commission.

Candidates granted short service commissions as lieutenants on probation in the R.A.M.C.: J. Shields, St. Bartholomew's; C. W. Maisey, St. Thomas's; F. T. Moore, St. Bartholomew's; A. T. Marrable, St. Thomas's; R. J. G. Morrison, St. Bartholomew's; W. T. M. Moar, London Hospital; H. R. Simon, Trinity Coll., Dublin; J. A. Hamilton, Trinity Coll., Dublin; C. E. Watson, St. Thomas's; J. A. G. Carmichael, Guy's; W. G. Bateson, Queen's Univ., Belfast; S. E. Osborne, Guy's; E. S. Cooke, R. C. of P. and S., Ireland; A. C. Byles, St. Mary's; E. J. Crowe, R. C. of P. and S., Ireland; V. Bennett, Univ. Coll., Cork; J. W. Orr, Queen's Univ., Belfast; C. McGrath, Univ. Coll., Cork; T. M. W. D'Arcy, Univ. Coll., Dublin; G. N. Barker, St. Thomas's; C. J. O. Kelly, R. C. of P. and S., Ireland; R. A. Toledo, Univ. of Malta; N. C. Lendon, St. Mary's and Camb. Univ.; M. F. Kelleher, Univ. Coll., Cork; K. H. Harper, St. Bartholomew's; F. J. Hebb, Dalhousie Univ.; J. A. MacDougall, Univ. of Manitoba; J. C. A. Marchand, Univ. of Montreal; K. H. Foster, Univ. of Western Ontario; R. A. Hoey, St. Thomas's; J. M. Lynch, Univ. of Montreal; and P. Coleman, Univ. Coll., Cork.

### ARMY DENTAL CORPS

Maj. W. W. Pittuck, ret. pay, relinquishes his appt. under Art. 520 (b), Royal Warrant for Pay and Promotion, 1931.

### TERRITORIAL ARMY

Cpts. G. W. Wigg and E. R. C. Walker to be Maj's.

Lt. R. H. B. McCrae to be Capt.

C. H. G. Price (late Offr. Cadet, Bristol Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

Supernumerary for Service with O.T.C.: Lt. W. S. Harvey (empld. Edinburgh Univ. Contgt. (Med. unit), Sen. Div., O.T.C.) to be Capt.

### ROYAL AIR FORCE

Flying Offr. P. A. Cooper to Aircraft Park, Lahore, India.

### INDIAN MEDICAL SERVICE

Cpts. G. Dockery and J. Quigley to be Maj's.

Lt. S. C. Misra relinquishes his temp. commn.

## CORRESPONDENCE

## FREUD'S EIGHTIETH BIRTHDAY

To the Editor of THE LANCET

SIR,—In the leading article on Freud's eightieth birthday in your issue of May 2nd you say :

"Freud's teachings involved a fundamental change of outlook, for they concern the unconscious motives of behaviour, the recognition of which runs counter to our philosophy and our pride, and to this rather than his insistence upon the importance of sex must be attributed the opposition encountered. This opposition, and the isolation that was forced upon him for years, undoubtedly influenced Freud's attitude to the scientific world."

And again :

"Useful criticism has, indeed, been lacking, for knowledge of the observations upon which the theory is based can only be obtained by making these observations oneself, and most criticism has consisted of a denial of the observations. Hence psycho-analytical doctrine has grown up without that healthy criticism which is both a stimulus and a check to scientific theory."

This is not so. Psychologists and psychiatrists found that Freud's writings contained nothing but assertions without even an attempt of proof, and a neglect, nay a defiance, of scientific method. Freud's writings were, therefore, simply ignored in Germany, *totgeschwiegen*, as Freud calls it. To substantiate these statements of mine is beyond the compass of a letter, but I have done so elsewhere. ("A Critical Examination of Psycho-analysis," London, 1923) and they have never been disproved. All that I have been told is that I have no right to criticise psycho-analysis as long as I have not been psycho-analysed myself, and this is probably what you mean by saying "knowledge of the observations upon which the theory is based can only be obtained by making these observations oneself." Now this is equivalent to saying, if you wish to study the effect of alcohol on a person, it is useless to observe a drunken man, but you can only do so when and whilst you are drunk yourself. A person who is being psycho-analysed is being put through a most intense subtle and refined process of *suggestion*, not for a quarter of an hour, but for hours, days, weeks, months, and sometimes even years. How many men are there that can free themselves from the religious and ethnical bias implanted in them in their youth, where suggestion was causal and discontinuous? A psychologist is as prone to suggestion as a doctor is liable to infection. Therefore, no person is less competent to form or give an unbiased opinion on psycho-analysis than he who has been psycho-analysed. Psychologists do *not* deny the observations and are quite willing to admit all that which psycho-analysts say they observe, but they differ from them in the interpretation of the observed facts.

That some good has come in the wake of psycho-analysis I readily grant: the doctor has ceased to regard the neurotic as a nuisance to be kept quiet during the consultation and to be prevented from talking about himself by keeping a thermometer in his mouth and then dismissing him with a prescription of Pot. Brom. and Tinct. Valerian. He, the doctor, has learned to try and understand his patient and to sympathise with him and readjust and re-educate him. On the other hand the harm psycho-analysis has done to the medical profession has not yet been realised. Promising young men approach the subject without prejudice and without suspicion,

enter the snare by allowing themselves to be psycho-analysed, and are then secure for psycho-analysis for the rest of their lives.

My advice to students is: Study psycho-analytic literature, observe the psycho-analyst at work, as you watch the surgeon doing his operation, but *never allow yourself to be psycho-analysed.*

I am, Sir, yours faithfully,

Shortlands, Kent, May 4th.

A. WOHLGEMUTH.

## VARICOSE VEIN INJECTIONS

To the Editor of THE LANCET

SIR,—I am glad that Dr. McAusland strongly advocates an empty vein technique, but I cannot agree that his methods of carrying it out are as reliable and effective. With regard to his first method, it is not possible to elevate the limb sufficiently because, in the well-elevated position, digital pressure seldom prevents the distal part of the vein emptying by other venous channels before the needle can be introduced, however quickly the patient lies down. In Dr. McAusland's second "dodge," he introduces the needle in the standing position. I am certain that, even in his expert hands, the needle sometimes comes out of the vein, however gently the patient tries to lie down. I notice that he then has to make sure that the needle is in the vein by withdrawing blood. With the described tourniquet technique the vein is frequently so "empty" that it is not possible to withdraw blood after the veins have visibly collapsed.

Although I only briefly referred to the application of firm pressure after the injection, I invariably apply Elastoplast over a considerable area for the reasons Dr. McAusland stated. I am, however, doubtful of the necessity of a pad of wool under the elastoplast.

I am, Sir, yours faithfully,

M. J. BENNETT-JONES.

Gambier-terrace, Liverpool, 1, May 4th.

## TREATMENT OF PHLEBITIS IN VARICOSE VEINS

To the Editor of THE LANCET

SIR,—Mr. R. T. Payne, in his letter of last week, says he feels an unnecessary boggy has been made of the danger of emboli in varicose veins. Though I have been in general practice for only 12 years, I have been present on two occasions when fatal pulmonary emboli have occurred in patients who were receiving treatment for spontaneous phlebitis in varicose veins.—I am, Sir, yours faithfully,

Sheerness, May 3rd.

M. DE LACEY.

## ACUTE FEBRILE ANÆMIA

To the Editor of THE LANCET

SIR,—In his interesting paper on a Case of Acute Febrile Anæmia in your last issue, Dr. P. C. Gibson mentions the term "acute breakdown of the blood," which he thinks was used by me. In reality at the clinical section of the Royal Society of Medicine (meeting of Oct. 9th, 1931) I headed the account of a remarkable case: "An Anæmic Breakdown or Crisis in a Child, not connected with definite Congenital Hæmolytic Jaundice—Rapid Recovery" (*Proceedings*, xxv., p. 9). This was just before I got to know of the observations of Lederer and others on "acute hæmolytic anæmia," and the case was perhaps the first definite example in a child to be

recorded in England. It was certainly one of "break-down," in which anæmia was the chief sign of the breakdown, but surely the term "acute breakdown of the blood" implies hæmoglobinuria as the chief symptom.—I am, Sir, yours faithfully,

London, W., May 4th.

F. PARKES WEBER.

## SEX AND CULTURE

*To the Editor of THE LANCET*

SIR,—In your issue of April 25th you publish from Dr. Rosslyn Earp a letter which may be thought to call for some reply from me. The situation seems to be that an American health periodical has published opinions that have hit Dr. Earp's mind in a place where the resistance to such ideas is great. But I am not concerned with this aspect of the matter so much as with the historical data to which Dr. Earp refers. In my book I classify a number of human societies, first according to the amount of continence, pre-nuptial and post-nuptial, inflicted by the sexual regulations they have chosen to adopt; secondly, according to their cultural behaviour. I define "culture" according to the manner, behaviouristically revealed, in which the members of a society express their attitude towards the external world. Thus I speak of deistic culture, rationalistic culture, &c. People in the deistic state think it right, proper, and necessary to erect buildings in which they try to maintain a right relation with the power (or powers) which, they think, controls the external world. I call these buildings "temples." The evidence is that in the past (1) different types of sexual regulations have always been accompanied by different types of cultural behaviour; (2) the same type of sexual regulations has always been accompanied by the same type of behaviour.

Dr. Earp is right, then, to say (even if he wishes it were not true) that there is a "correlation between temple-building and sexual restraint." But I regard the phrase as misleading; for it may imply that temple-building is the only type of cultural behaviour that is to be correlated in that manner. It would be more correct to say that temple-building is to be correlated with a certain degree of sexual restraint. Dr. Earp's point about Quakers shows that he has not yet been able to study the data closely. As I understand the matter, a Quaker meeting-house would come within the definition I place on "temple." In what he says about the Israelites Dr. Earp shows that he has not yet fully understood the conclusions I felt compelled to draw from the facts. The cultural behaviour of a society, or of any group within it, does not, and I do not think it can, depend on the sexual opportunity it enjoys, but on that enjoyed (or endured) by the two previous generations. Since we do not know the exact chronological position of many Israelite laws (e.g., Deut. xxii.) we cannot use Israelite history as evidence on which to base an induction. All the same, thinking that the minds of some readers would quickly run Israel-wards, I made some suggestions about Israelite history in my book.

Dr. Earp says that I live in a civilised society. Well, I may or may not; I do not know; it depends on what he means by "civilised." A use of this meaningless word takes away any meaning that another of his sentences may appear to possess.

I am, Sir, yours faithfully,

Cambridge House, S.E., April 28th.

J. D. UNWIN.

*To the Editor of THE LANCET*

SIR,—Dr. Earp is confessedly ignorant of the reason why temple-building is evidence of cultural progress. It is well known that the first evidence of any community ceasing to be utterly savage is the paying of post-funeral attention to the dead. Such attention shows that in the community concerned there is some idea of survival after death; the people have opinions about things beyond their immediate experience, and show imagination. Whether the main idea is to sustain the spirit till it can return to reinhabit its body, or to feed and propitiate it lest it exhibit malignancy, the result is substantially the same; there is a cult of the dead established. Temple-building follows closely. The spirit, and other spirits, the gods, are given homes; or places in which it is hoped they will stay. A culture may remain static at this stage; the temples being huts very little better than those of the community. But where the possibilities of a new building material are discovered—stone in Egypt, brick in Mesopotamia, earth faced by stone in Mexico—development is rapid. Permanent structures are provided for permanent requirements, the cult of the dead and the cults of the gods; often the one cult runs into the other, the great dead being deified. These requirements being part of the only permanent burden laid on the community, the temporary abodes of passing men, especially where climatic conditions permit, remain for long of the nature of hutments. Even incarnate gods such as the Egyptian Pharaohs are far more concerned with permanent provision for their post-funeral cults than they are with the lodging of their living bodies. By the time there are permanent temples, there are also permanent priest-hoods, no matter how recruited; and the gods have become localised, with a parallel system of human interest in or ownership of land. Under such circumstances, men, having already provided permanent homes for the deities instead of huts which require constant renewal, find opportunity to discharge the rest of their permanent burden for good and all, by endowment of temples with land in consideration of services to be rendered on behalf of the donors by the priests to the dead or to the gods. Thus corporate communities untouched by death—housed, owning property, and owing service, all in perpetuity—take their rise. The process which seems to have developed independently in Mesopotamia and in Egypt as well as elsewhere in the Near East, was repeated when Europe emerged from the Dark Ages. Our modern corporations are nothing but priesthoods divorced from religious conceptions; much of the business conducted by them first found its birth in the administration of temples and their relations with the secular community. The temples of Babylonia were the first banks of the world; the banking functions of other temples, including that of the Jewish Temple, have been traced. Any business Dr. Earp may transact through his bank or any income he may draw from investments are obtainable owing to a system deriving from the practices he considers "uncivilised."

Dr. Earp infers that there is some sharp differentiation between civilised and uncivilised peoples. But architecture arose from the necessity of providing permanent structures for the service of the cults; sculpture and painting and the manufacture of vessels from their ceremonial requirements; music to time the ritual movements; regularity and rule from the demand for a rite constantly repeated; and writing developed because the canon must not

be changed. All these things were later applied to secular purposes, and found a natural further development. But even before this stage, a culture which possesses all the arts, and deals with every variety of business; a culture which has determined how affairs may be carried on though men die, cannot be denied the hallmarks of civilisation. Modern civilisation shows nothing more and itself arose in precisely the same manner as those which are dead.

I am, Sir, yours faithfully,

Manea, March, Cambs, May 4th, 1936. C. T. NORRIS.

### THE NEW POISONS RULES

To the Editor of THE LANCET

SIR,—It would appear that, already, one of the requirements of the Poisons Rules which came into force to-day is being overlooked, to the inconvenience of both members of the medical profession and manufacturers and dealers. Rule No. 7 (3) (a) requires, *inter alia*, that the purpose for which the poison is required shall be indicated on the (signed) order. It would be to the greater convenience of members of the medical profession and of manufacturers and dealers if this point could be brought specially to the notice of those making out such orders.

We are, Sir, yours faithfully,

THE ASSOCIATION OF BRITISH CHEMICAL MANUFACTURERS.

166, Piccadilly, W., May 1st.

### GASTRIC ACIDITY AND ITS SIGNIFICANCE

To the Editor of THE LANCET

SIR,—May I be allowed to add one more word to the recent discussion in your correspondence columns suscitated by Prof. Apperly's statement that anæmia lowered and abolished gastric acidity, and that in achlorhydric anæmia the ordinary view that the

achlorhydria caused or contributed to the anæmia would sometimes have to be reversed. Dr. Alvarez has suggested (March 28th, p. 741) that severe anæmia accompanied by abnormally high gastric acidity was probably always due to a bleeding ulcer. In a paper on ancylostoma anæmia (THE LANCET, 1934, ii., 299) Prof. A. G. Biggam and I, analysing a series of about 120 cases, stated that gastric juice analysis rarely revealed achlorhydria; in fact it was found in only five cases. The hæmoglobin percentages in these cases were 42, 44, 24, 24, 55, while the average hæmoglobin percentage of the whole series was 27·8, reaching in some cases values as low as 10. In a small number of cases I am following at present the corresponding values of hæmoglobin percentage and gastric acidity are these:—

Red cells in millions	..	0·89	2·4	2·76	1·9	3·7	3·2	2·6	4·0	2·6
Hæmoglobin per cent.	..	15	18	20	25	26	30	40	45	46
Maxim. free acidity c.c.m N/10 HCl		80	10	75	38	53	33	60	75	65
Maximum total acidity	..	110	20	95	54	75	70	96	95	95

It can easily be seen from this series that there is not the least relation between hæmoglobin percentage and gastric acidity in ancylostoma anæmia. Prof. Soliman Azmy Bey and his collaborators (Azmy, S., Gaafar, M., and Noshokaty, H., Jour. Trop. Med. and Hyg., 1934, xxxvii., 311) studying another series of ancylostoma infection also reached the same conclusions, only two cases out of 24 showing achlorhydria.

I am, Sir, yours faithfully,

PAUL GHALIOUNGUI,  
Tutor, Faculty of Medicine, Cairo.

April 25th.

## PUBLIC HEALTH

### Coördination of Hospitals

MANCHESTER

THAT the joint hospitals board set up in Manchester is a practical body and not merely deliberative is shown by the recommendations it has recently made to the city council. The board is composed not only of representatives of the voluntary hospitals in the manner prescribed by Section 13 of the Act of 1929, but also of the city council and the university. It has had before it a memorandum prepared by the medical officer of health (Dr. R. Veitch Clark) on the association between the staffs of voluntary and council general hospitals, of which latter there are three—viz., Crumpsall, Withington, and Booth Hall. At first it had seemed reasonable to link each of these to its nearest voluntary neighbour, but there were certain disadvantages in such an arrangement. The consulting staff of the teaching hospital, the Royal Infirmary, carried—in the public eye at least—a higher status than those in other voluntary hospitals, and their services should be potentially available not merely to the adjacent council hospital. Moreover, the consulting staff of the non-teaching hospitals was not stable, since they naturally tended to move to the infirmary when occasion offered, and their number in any one such hospital might not be sufficient to afford the council a field for selection. The desirable coöperation of hospitals in groups

might be further explored by means of meetings of the medical and surgical staffs convened under the auspices of the board. These the board decided to arrange.

To assist the council in its appointment of consultants the board has suggested that an advisory panel should be recognised by the city council, consisting of the chairman of the public health committee (Councillor Meadowcroft), Councillor Edwards, the chairman of the joint board (Sir Christopher Needham), the chairman of the medical and surgical staff subcommittee (Mr. W. Cobbett), the vice-chancellor of the university (Prof. J. S. B. Stopford), and the medical officer of health. In special branches of medicine it would consult certain nominated advisers. It would submit a short list of applicants to the public health committee. This proposal may not be equally welcome to all sections of the council, but it should relieve them of a troublesome task and improve the selection of professional candidates, at least in the first stage of the process. It will be interesting to see the council's reaction to it.

The board further recommends that a sufficient number of consultants should be appointed, each making two weekly visits to the council hospital to which they are attached, rather than a smaller number visiting thrice weekly. Perhaps the most important suggestion of all is that senior consultants should be appointed to municipal hospitals as directors, in an honorary capacity. They would foster



coöperation between voluntary and council hospitals and the university, guide new developments, and encourage research.

## SCOTLAND

Since the passage of the Act of 1929, the Scottish Department of Health has repeatedly urged local authorities to depart from a parochial outlook in relation to hospital provision and to think rather in terms of regions than areas of local government.<sup>1</sup> In its latest report<sup>2</sup> the department, while mentioning that collaboration has proved difficult to secure and finding a partial explanation in the tendency to mark time till the Committee on Scottish Health Services has reported, does record some advance. In Paisley, for example, the need for a new maternity hospital has been the occasion for a proposal to acquire a site in contiguity with the fever hospital and of sufficient size to meet other hospital needs. The council, at the same time, has approached other authorities and voluntary bodies with the object of exploring a scheme larger than that required by the town itself. The counties of Dumfries, Kirkcudbright, and Wigton apparently appreciate the desirability of forming a joint hospital scheme and have met for its discussion. The department points out that the Dumfries and Galloway Royal Infirmary (a voluntary hospital) would form its natural centre. As the extension of this institution is under consideration by its directors, the moment for coöperation between them and the local authorities seems favourable. A regional system, not only for hospital administration but also for public health purposes, seems to find favour with many Scottish practitioners and, if

<sup>1</sup> THE LANCET, 1935, i., 387.

<sup>2</sup> Seventh Annual Report of the Department of Health for Scotland, 1935. H.M. Stationery Office. Cmd. 5123. 3s. 6d.

the Committee on Scottish Health Services proposes to deal with this idea, its report, which is due at an early date, should be of particular interest.

## INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 25TH, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1896; diphtheria, 892; enteric fever, 30; pneumonia (primary or influenzal), 929; puerperal fever, 48; puerperal pyrexia, 129; cerebrospinal fever, 24; acute poliomyelitis, 6; encephalitis lethargica, 4; dysentery, 24; ophthalmia neonatorum, 97. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 1st was 6303, which included: Scarlet fever, 1007; diphtheria, 889; measles, 3118; whooping-cough, 562; puerperal fever, 13 mothers (plus 9 babies); encephalitis lethargica, 283; poliomyelitis, 5. At St. Margaret's Hospital there were 23 babies (plus 8 mothers) with ophthalmia neonatorum.

*Deaths.*—In 122 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 104 (57) from measles, 6 (0) from scarlet fever, 42 (17) from whooping-cough, 33 (4) from diphtheria, 41 (17) from diarrhoea and enteritis under two years, and 72 (11) from influenza. The figures in parentheses are those for London itself.

Measles remains the fatal infectious malady of the period, the number of deaths for the last eight weeks (working backwards) being 104, 102, 103, 81, 104, 114, 105, 84 for the country as a whole, and 70, 68, 60, 43, 62, 62, 58, 47 for Greater London. Deaths were reported from 31 great towns: Leeds and Liverpool each reported 4, Southampton, Manchester, and Sheffield each 3; no other great town more than 2. Liverpool reported 6 deaths from whooping-cough, Birmingham 5. Deaths from diphtheria were reported from 22 great towns, 3 each from Manchester and Sheffield.

The number of stillbirths notified during the week was 315 (corresponding to a rate of 43 per 1000 total births), including 51 in London.

## PANEL AND CONTRACT PRACTICE

## "No Deposit, No Treatment"

THERE is still, it seems, some misunderstanding about the position of the practitioner when treatment is required by an applicant who produces no medical card or a card which the doctor has been informed is invalid. In the latter event the natural thing is to say: "Oh no, you have been removed from my list as having ceased to be insured; if you want treatment you must pay for it"—and up to a point Clause 7 (2) permits this. The clause safeguards the position both of the doctor and of the applicant; the doctor may demand and accept a reasonable fee provided he gives a receipt on the appropriate form; and the applicant, if he proves eligibility to obtain treatment from the doctor, has the fee refunded to him from the doctor's remuneration. The doctor has in effect drawn part of his remuneration in advance, has treated the applicant as an insured person (except that he must not issue insurance prescriptions until title is proved) and has the patient's name added to his list as from the date on which treatment was first given. If the applicant does not prove his eligibility to obtain treatment the doctor keeps the deposit. Instead of charging a fee the doctor may issue a formal notice of his intention to render an account, and sometimes, especially when the doctor is more or less satisfied of the bona fides of the applicant, this may be preferred to a cash payment.

Suppose, however, the applicant demands treatment but refuses to pay a reasonable sum by way of

deposit. It must be remembered that the clause says that if a person in applying for treatment represents that he is an insured person the practitioner is required to give any necessary treatment, and it might appear therefore that anybody who cares to claim that he is insured may obtain free medical advice merely by refusing to pay a deposit. Some time ago this point arose in connexion with an appeal by a practitioner, and it was then pointed out that the clause also contains the phrase "but the practitioner may demand and accept from the applicant a reasonable fee," and that the clause applies to cases in which there is strong prima-facie ground for thinking that the applicant is not entitled to medical benefit and consequently that the funds at the disposal of the insurance committee for payment to practitioners are not calculated to cover the provision of treatment. Clearly the clause must be read as a whole, and the words quoted above construed as limiting the obligation which in their absence would be an absolute obligation to treat. Hence, in a case where not only is a fee not tendered but liability to pay is expressly repudiated it appears that the obligation to treat does not arise. The clause entitles the practitioner not merely to "accept" a fee but to "demand" one, and the latter word implies that the doctor may make his offer of treatment conditional at any rate on an acceptance of liability. The contrary view would deprive the word "demand" of most, if not all, of its effect.

In the extreme case, then, the practitioner may

quite properly say "no deposit, no treatment" if he wishes.

### Hæmorrhage Following Dental Extractions

An insured person had teeth extracted one afternoon, and during the early evening had to return to the dentist who plugged the gums to arrest hæmorrhage. After she went to bed bleeding recommenced and at 11.30 P.M. the insurance doctor was asked to visit the patient. The doctor replied that dental treatment did not come under the Insurance Act, that the proper course was to get the dentist who caused the bleeding to come and stop it, and that if the dentist had any difficulty the doctor would, at the request and cost of the dentist, come to his aid. The employer called in his own doctor who did what was necessary. The local medical committee took the view that the hæmorrhage was a matter which should have been attended to by the dentist "as dentists are specially qualified to deal with such matters." The insurance committee contended that the service fell within the practitioner's obligations, and with this view the referees agreed.

The question was not whether the service was one which could properly be undertaken "by a general practitioner of ordinary professional competence and skill" (so ran the phrase when the question arose some years ago), but whether it was treatment—that is medical attendance and treatment—within the meaning of the regulations. The referees felt some difficulty even in formulating the view that the

arrest of hæmorrhage from the gums, occurring seven hours after the extraction of teeth, was not medical treatment. If the care of an injury of this nature, admittedly within the competence of the practitioner, was not medical treatment, they were at a loss what meaning to attach to the term. Their report reads as follows:—

The contention of the local medical committee, that it should have been attended to by the dentist as dentists are specially qualified to deal with such matters, is apparently an expression of the view that the dentist would have stopped the hæmorrhage more efficiently. This may, or may not, be so. But the local medical committee can hardly seriously contend that a practitioner is to be excused from rendering a service within his agreement because he is of opinion that some other person would perform the service better. The contention may, however, mean that it was the duty of the dentist to stop the bleeding—though no evidence is offered that the dentist was available for the purpose. On this hypothesis again we fail to see the relevance of this contention. A failure in duty on the part of one person is not an excuse for the failure of another to perform a contract with, and for the benefit of, persons in no way privy to the failure.

The bleeding at 11.30 in the night was a matter calling for the medical treatment which the practitioner was bound to give, and his obligations were in no way affected by the origin of the bleeding.

This ruling is worth calling to mind again now. Although doctors may charge for administering an anæsthetic in connexion with dental extractions they must deal with hæmorrhage as part of their obligations under the terms of service.

## PARLIAMENTARY INTELLIGENCE

### SECOND READING OF THE MIDWIVES BILL

#### Moved by the Minister of Health

ON April 30th, in the House of Commons, Sir KINGSLEY WOOD moved the second reading of the Midwives Bill. He said the main purpose of the Bill was to establish an active service of salaried trained midwives so as to ensure that every expectant mother, whatever her circumstances, would be able to obtain the services of a qualified midwife. The Bill was also designed to raise the status of the midwifery profession by providing adequate salaries and sure prospects to those entering the new service; and also to ensure further facilities for their instruction. The problem was a baffling one. In England and Wales the local authorities in 1926-27 were spending on maternity and child welfare services some £2,000,000 per annum. Last year over £3,000,000. Yet the maternal mortality-rate had not yet been substantially reduced. It affected all classes of the community. It varied from place to place, and they were not yet in a position to speak with certainty and authority as to all its causes.

The position of the midwifery service in this country at the present moment was by no means satisfactory. It had for the most part been a poorly remunerated service, without much status and prospects which were not improving. It was an overcrowded profession. Except for a small minority the practice of the independent midwife did not afford a living wage, and the reasonable livelihood of the few was often obtained only by attendance on an unreasonable number of cases involving much physical and mental strain. There were too many part-timers. (Cheers.) There were also midwives who continued to practise when they were past their work. There were also numbers of unqualified women and there was nothing to prevent them from attending and charging for their attendance as maternity nurses of women in childbirth. Finally, there was a lack of coördination between the work of the independent midwives, excellent though it was, and the health services in many areas.

### SUPERVISING AUTHORITIES

The Bill provided that the organisation of the new service should be entrusted to local authorities who were the local supervising authorities under the Midwives Act. Each supervising authority was required to secure the whole-time employment of a sufficient number of midwives for attendance, not only as midwives, but as maternity nurses in order to meet the needs of the area for domiciliary midwifery and the authority would carry out this duty by making arrangements with voluntary organisations or where necessary by themselves employing midwives. He wished to emphasise that coöperation with the doctors and with voluntary hospitals and agencies was essential to the success of this proposal. Where the supervising authority was not a maternity and child welfare authority coöperation with the work of the antenatal clinics was essential. One of the difficulties in London would be to work out a scheme which would include the service of salaried midwives already provided by a number of voluntary hospitals which took no account of borough boundaries. About 25 per cent. of all confinements in London took place in L.C.C. hospitals at which there were antenatal clinics and where specialists in all branches of maternity work were available. Salaried midwives appointed by the L.C.C. could therefore enlarge their experience by taking duty in hospitals when they were not engaged in domiciliary work.

One of the main principles of the Bill was designed to ensure that efficient voluntary organisations should have a proper and adequate share in locally coördinated schemes and all such organisations which employed salaried midwives must at once be consulted, when the Bill was passed and the proposals had to be put into operation by the local supervising authority as to the arrangements for the new service. The voluntary associations would have the right if they were dissatisfied with any arrangements which were contemplated to make direct representations to the Minister of Health. It would be the duty of the Minister to see that proper agreements were entered

into and proper payments were made so as to secure an adequate service and the extension, wherever desirable and practicable, of their work.

#### SALARIES AND SUPERANNUATION

The local authority would fix the salaries of midwives employed by them and the fees to be charged for their services, and in recovering such fees they would have regard to the financial circumstances in each case. The salaries of the midwives, and fees to be charged in relation to the work of voluntary associations, would be a matter of negotiation between the local authority and the voluntary organisations, but the local authority would be asked to fix their grant to voluntary organisations on a basis which would ensure that the salaries and fees would correspond closely to those adopted by the local authority. A midwife who was practising at the present time could apply for a salaried post, or she could continue in an independent practice if she so cared. On the other hand, if she surrendered her certificate within three years of the coming into operation of the scheme and cared to take this course she would receive compensation equivalent to three times the average of her emoluments for the preceding three years. There were also a number of old or infirm midwives unable to perform satisfactorily their duties, and in these cases the local authority might call upon the midwife to retire, in which case she would receive as compensation a sum equal to five times the net value of her practice during the previous three years. In suitable cases the local authority, instead of paying compensation in a lump sum, would be able to purchase for the midwife an annuity terminable at the age of 70, or at death, if that occurred before she reached that age.

Arrangements were also provided for under the Bill which would enable midwives to keep up to date by attending from time to time post-certificate or refresher courses. The receipt of compensation, or the payment of an annuity provided for in the Bill, would in no way affect the title of a midwife to a contributory pension. He had also taken power in the Bill to deal with the question of unqualified persons. At present any unqualified woman might nurse a woman in confinement if a doctor had been engaged and she worked nominally under his supervision and direction. Such employment was dangerous both to the mothers and to the children. No doctor who worked with an uncertified woman could always be sure that he would be at hand at the critical time, and it was unanimously agreed by the Departmental Committee that the practice of attending a confinement in such circumstances did not conform to a reasonable degree of security, even in normal cases. In the Bill the Minister of Health was empowered, when an adequate salaried midwifery service was in being and not before, in any area or county district to make an Order under which it would be an offence for any person who was neither a midwife nor a registered nurse to receive remuneration for attending as a nurse a woman in childbirth, or at any time during the ten days immediately after the birth.

#### MIDWIFE AND DOCTOR

The Bill did not in any way prejudice the position of medical practitioners, but he thought the general practitioner should benefit considerably when the provisions of Clause 6 became operative as he would always be sure of the assistance of a certificated midwife, whereas at present he had to rely in many cases upon the services of an untrained woman, and in areas where such a course was customary mothers would no doubt continue to engage doctors as now for their confinement, and it was intended that not only the doctor but the mother, wherever practicable, should have a free choice of midwife to act as maternity nurse, and that nothing should be done which would in any way interfere with her preference for a particular doctor.

In bringing forward these proposals, he recognised, the Minister said, that other steps might be necessary.

Hon. Members might remember the statement he made a little while ago in relation to a more special line of attack which was in progress—namely, a series of special investigations that had been undertaken and in a number of administrative areas, primarily those in which the rates of maternal mortality had been persistently above the average for a period of years. Investigations were also being made for the purpose of comparison in some areas comparable in general characteristics with the areas of high maternal mortality, but in which the rates had been relatively low. The aim of these investigations had been, in the first place, to give assistance to the local authorities to devise any immediate practical improvements which might suggest themselves, but also, and more particularly, to see whether they could not obtain any further material which would help them to elucidate the underlying causes of high maternal mortality-rates in general. The result of these investigations would, he hoped, be available at the end of this year. In the meanwhile they would be acting in the best interests of motherhood by proceeding immediately with the proposals in this Bill.

#### Debate on the Motion

Mr. ARTHUR GREENWOOD said he welcomed the Bill for what it was worth. It was nothing more than a slight extension of the existing law making it a little easier for local authorities to carry out the powers which they already possessed. After all the experimentation of past years the time had now arrived not for small piecemeal measures but for a far-flung comprehensive policy and an attack on this problem on a wide front. Maternal mortality was a social problem for which the House of Commons was responsible. The first step, it seemed to him, was to make sure that expectant mothers were properly fed. There ought to be more effective antenatal care, more maternity hospitals within the reach of working-class housewives, and the services of skilled gynaecologists behind the midwife. The Bill provided only a ten days' service. That period had become the practice through poverty, not because of medical knowledge. It was not right to expect a woman who had undergone a trial of that kind to be up and about after ten days and to carry all the responsibilities of the household.

Major HILLS said he would like to see the minimum of ten days' attendance of a midwife raised. He thought they would get more efficient service if they allowed midwifery to be run by the smaller local authorities which complied with the standard laid down by the Local Government Act of 1929. Clause 6 of the Bill abolished the maternity nurse who usurped the midwife's function. If she endangered health she ought to go, but he was doubtful whether they could do without a secondary service. He suggested that they should train a body on the lines of the home helps now working in Birmingham, or of the after-care nurses who had been used with great success in Holland. Would the Minister try to induce the C.M.B. to increase the period of training of midwives to two years? If that could be done they would get a splendid service.

Mr. HOLLAND said what was needed was a complete national maternity scheme including supervisory clinics within easy reach of the mothers' homes, staffed by doctors with special knowledge and experience in obstetrics. There should also be health visitors, improved housing conditions, better nutrition for the mother, and rest hospitals with proper equipment and staffs.

Sir FRANCIS FREMANTLE said that the real object before them was to establish and enlarge and improve both in quantity and quality the profession of midwives. The number of midwives was going to be cut down, probably to half what it was at present, and that half was going to be much more hardily treated from a professional point of view and higher requirements demanded of it. All the speeches had taken it for granted—including that of the Minister—that the flow of recruits would come in, but was that

the case? That was the real problem before them. What were the inducements to young girls of good education and standing to take up the great burden of training for this extraordinarily hard and arduous life with all its difficulties? It was only natural, even if their bent was towards nursing the sick, that they should prefer to go in for general nursing rather than midwifery. The financial scales and conditions of service under the Bill, though better than they had been hitherto, were to his mind quite inadequate to bring in the right kind of persons. Who was to be the right authority to supervise this service? It could not be done by an authority which employed two or three midwives, which had a small rateable value and had no skilled superior officers. He trusted therefore that they would consider in Committee whether it was not better to put this new service under the county councils rather than under smaller authorities. He hoped that regulations would be made in the Bill or afterwards by which complete facilities would be given to midwives to work under all the different organisations and that they would be trained and encouraged to work for the best of their profession, wherever they were and in whatever circumstances. There were nearly 60,000 midwives, and of those 18,000 gave notice of their intention to practise in the year before last, and out of that number only 16,000 practised. What was really wanted—and it was not dealt within the Bill—was some kind of multiplication of the sources of training for those women who wanted to put C.M.B. after their name. This was a most pressing problem both to nursing schools and midwifery schools in London. There should be some kind of intermediate qualification for women who intended to be equipped if necessary for occasional demands made upon them for midwifery or maternity nursing. There was one point in regard to which he could not see how the Bill could be worked. Provision was to be made for entirely whole-time midwives. That would be possible in busy towns, but impossible in country districts, if "whole-time midwives" meant that they were to be midwives and nothing else. It would be impossible, for instance, in the mountain valleys of Wales to arrange a service of full-time midwives. They would have to continue the system of district nurses under the county nursing organisations which had done such valuable work, where there were well-trained midwives, and where by means of timely refresher courses they were kept up to the mark.

Mr. KEELING said he had been asked by the Westminster city council, of which he was a member, to give its views on the Bill; those views were shared by practically all the other metropolitan borough councils. These borough councils regretted they had not been made the authorities for midwives under the Bill. They thought that there were several reasons why they should be preferred to the L.C.C. First, they were already the maternity and child welfare authorities in their areas and were carrying out most of the duties prescribed in the Bill. Secondly, the population of each London borough was larger than the population of a great many provincial county boroughs, all of which were to be the authorities for midwives under the Bill. Finally, and most important, the maternity services in London were far superior to those in the country as a whole. It was true that there were only three metropolitan borough councils which were employing their own midwives, but there was a very good reason for that. Most of the London boroughs found they could provide midwifery service much better by making arrangements with the great London voluntary hospitals whose maternity services were second to none, or with the nursing associations. Under that arrangement the midwife worked with the hospital as a base and the organisation of the hospital was at her back to give her assistance. The Minister had mentioned that 25 per cent. of births in London took place in L.C.C. hospitals; he would point out that another 25 per cent. took place in the voluntary hospitals. Many of the London borough councils

already went much further than this Bill. They subsidised maternity beds in hospitals and arranged for gynaecologists to be available for consultation in serious cases. They also financed bacteriological services. Each of the London borough councils had also one or more maternity centres with which the midwives worked in close association. All these services were available free of charge when necessary. What was required in London was not revolution or reconstruction but development.

Mrs. TATE said it was useless to have better training for midwives if there was not far better training for doctors also.

Mr. FRANKEL thought they ought to ensure by means of some provision in the Bill that this new service would be in the hands of authorities who might be relied upon to take the responsibility for this supremely important work. There should be no farming-out of this responsibility to smaller authorities or to voluntary organisations unless they were of proved capacity. Not only ought there to be salaried midwives, but those midwives ought to have strong medical support. Under the Bill midwives ought to have the power to call in a real expert rather than a general practitioner as was now the case.

Sir GEORGE JONES said he thought the Government were right in the decision that the larger supervising authorities were the best for this purpose. Most people connected with London administration agreed that it was desirable that there should be one authority for London under the Bill. An excellent domiciliary service had been organised by the London voluntary hospitals acting independently of the borough councils, and it would be a calamity if anything were done which would diminish the splendid work which the voluntary hospitals were doing.

Major MILNER said he regretted that the new midwifery service would not be in the real sense a national one. He had hoped that the status of midwives might have been made akin to that of civil servants. In this Bill duties were being imposed on local authorities without the proper financial assistance to carry them out. He strongly supported the plea that the compensation paid to midwives who left either voluntarily or compulsorily should be a national and not a local charge. The services of a midwife should, he thought, be available for at least 14 days instead of 10.

Sir JOHN MELLOR said he felt with many others that there should be included among the authorities who would administer the Bill those county districts which had a maternity and child welfare committee under the Act of 1918, and a whole-time medical officer, and were of sufficient size to conduct the administration.

Mr. DUNN suggested that midwives should in future be given special training in the newer anaesthetic appliances.

Mr. RHYNS DAVIES said that a Bill which merely raised the status of midwives would not avail very much in reducing maternal mortality. The issue was deeper than that. Malnutrition and unemployment must have something to do with the problem. He was satisfied that the measure would provide the country with better nurses.

#### The Parliamentary Secretary's Reply

Mr. SHAKESPEARE said that the Minister had reason for satisfaction at the almost unanimous approval that had been given to the Bill. The term of ten days was fixed by the rules of the Central Midwives Board for midwives acting as such, but there were no rules as to the period for maternity nursing and the Government took a step forward in saying that a midwife acting as a maternity nurse should attend on the mother for at least ten days. If in the circumstances of the case the doctor or the midwife decided that there was need for further attention they could give it. There was considerable opinion among the medical profession that from the point of view of nursing ten days was not enough. If the Central Midwives Board considered changing

the rules with regard to midwives employed as such it would be necessary to change the rule here as regarded the period of attendance of midwives acting as maternity nurses. The Joint Council of Midwifery estimated on certain assumptions that roughly 4500 new salaried midwives would be necessary. Voluntary associations formed in future could be consulted by the supervisory authority and they could come into the scheme. It was certainly hoped that training would be improved. Training places would be reserved for those who intended to practise.

The new expenditure would be calculated in relation to the expenditure incurred in the year ending March 31st, 1936. In the case of direct employment under a supervising authority there would be a unit of cost based on the average net annual cost throughout the country incurred in respect of the employment of a midwife. That unit had not yet been fixed, at the special request of the local authorities who wished to have more information as to what salaries were being paid and what fees were being charged. On the question of the administrative working of the scheme, the Government had come down on the side of the larger authority—the hospitals authority—because that was in line with the whole trend of modern county government. If they entrusted this service to the smaller authority it would be difficult to provide a sufficient number of midwives so that there could be reliefs in case of sickness or holidays. The Minister of Health was always sympathetic in considering an application (under Section 62 of the Local Government Act, 1929) whereby a maternity and child welfare authority employing a whole-time medical officer of health could itself apply to be made a supervising authority. He agreed that there was at present a good deal of overlapping. In future where they had a salaried service under a large supervising authority they would be able to assure a much closer coöperation between the authorities. A midwife in the country would be able to practise nursing and other nursing services. As long as she gave full-time service she could carry on nursing work in the ordinary way when not employed as a midwife.

The Bill was read a second time.

## NOTES ON CURRENT TOPICS

### Supply of Medicines on Sunday

When the Shops (Sunday Trading Restriction) Bill as amended in Standing Committee was considered on report, Mr. WAKEFIELD moved an amendment providing that registered pharmacists employed on Sundays in those shops which had to open for the serving of customers in pursuance of a contract with a national health insurance committee should not be required to receive the compensatory half-holiday, subject to the conditions that the pharmacists must not be employed for more than two hours on the Sunday and have not been employed on the previous Sunday; and that they must receive compensatory time off in the week. He explained that under the contracts which national health insurance societies had with chemists a service must be provided at reasonable hours. Under the regulations a chemist was required to supply with reasonable promptness to any person who presented an order for drugs on a prescription form provided by the committee for the purpose and signed by any practitioner in the medical list of the committee, or his deputy or assistant, such drugs or appliances as were so ordered. The usual times for opening on Sunday were from 5 to 6, or 6.30 to 7.30, or some similar time. The object of the amendment was to ensure that qualified assistants who were employed in this way should receive time off. In the Bill as it stood if a qualified assistant was dispensing for just that one hour, or for half an hour, some of these urgent medicines or drugs it would be necessary for the employer to give him an additional four hours off. It was clear that that would place the chemist, especially a small man in a small town, in an impossible position. He

required his qualified man during the week when business was at its peak and dispensing was most required. This service was not operated for profit; only urgent medicines and goods could be supplied on a Sunday. The amendment had the full approval of the various pharmaceutical interests, that was to say, the insurance committees, the National Pharmaceutical Union, and the Pharmaceutical Society. The Pharmaceutical Society had 22,000 registered pharmacists in membership. It was not proposed that there should be any exemption for any unqualified assistant, or any body other than the registered professional pharmacist.

Mr. LESLIE said he was speaking for the qualified men who were organised in the pharmaceutical section of the Shop Assistants' Union. Speaking from the dispensers' point of view they felt that if they were to give their services on Sunday they should get the time off which was allowed to other assistants. He opposed the amendment, and he hoped that the House would vote for the Bill as it stood.

After further debate, Mr. LLOYD, speaking for the Home Office, said that the amendment applied only to those chemists' shops which had to be open on Sunday under contract, to qualified assistants, and to those who were employed for not more than two hours on alternate Sundays. After consultation with the Ministry of Health the Home Office thought that the amendment should be accepted, in view of its extremely limited character.

The amendment was carried by 120 votes to 61.

### The Public Health Bill

In the House of Commons on May 4th the following members were appointed to form a Select Committee of seven to join with the Committee appointed by the House of Lords to consider the Public Health Bill: Sir Francis Acland, Sir Francis Fremantle, Mr. Leach, Major Milner, Mr. Shakespeare, and Mr. H. G. Williams.

The Royal Pension Fund for Nurses Bill (which has passed through the House of Lords) was read the third time and passed without amendment.

## HOUSE OF COMMONS

WEDNESDAY, APRIL 29TH

### Medical Service in West Africa

Dr. LEECH asked the Secretary of State for the Colonies whether he was aware that the conditions of service and rates of pay of the West African section of the colonial medical service had recently been revised; that this revision had caused such dissatisfaction as to compel the Nigerian section to memorialise his department; and what action he proposed to take in the matter.—Mr. THOMAS replied: The answer to the first part of the question is in the affirmative. I have recently received, through the Governor of Nigeria, a memorial from the members of the colonial medical service serving in Nigeria, which is receiving consideration.

THURSDAY, APRIL 30TH

### Juvenile Trainees and Malnutrition

Mr. GEORGE HALL asked the Minister of Labour the result of his inquiries into the malnutrition existing amongst trainees attending juvenile instruction centres; and whether he was now prepared to recommend that local authorities be empowered to supply meals as well as milk in such cases.—Mr. ERNEST BROWN replied: In reply to a question by the hon. Member on Feb. 27th I said that I was making inquiries into the adequacy of the existing arrangements for the provision of milk in the junior instruction centres in the county of Glamorgan. An inquiry into this question has been made in collaboration with the President of the Board of Education, and I am satisfied that the arrangements for the provision of milk as medical treatment are adequate. I am now extending the inquiry to other areas. As the hon. Member is aware, local education authorities have no power to



provide ordinary meals in junior instruction centres, and the decision not to seek such power was in accordance with the recommendation of the National Advisory Council for Juvenile Employment. I propose, however, at an early date to ask the council to review the operation of the system of authorised courses and the question of providing meals in centres will no doubt be considered by them.

Mr. HALL: Is the right hon. gentleman aware that milk has been supplied to the trainees attending the centres for some time, and notwithstanding that 57 per cent. of them have been certified to be suffering from malnutrition? Is not the matter sufficiently serious for the right hon. gentleman to complete negotiations to provide meals as well as milk?—Mr. BROWN: I have no powers, but I propose with these facts in mind to ask the advisory committee to go into the matter at an early date.

#### Pollution of Water-supply in Lancashire

Sir ROBERT YOUNG asked the Minister of Health whether he had received any report of the bad conditions of the Golborne, Lancashire, water-supply; whether he was aware that the water services were practically choked with manganese dioxide, and that the supply of drinking water was often dirty; and whether he would take steps to remedy this matter in the interests of public health.—Sir KINGSLEY WOOD replied: I have received a communication, which refers to pollution by manganese dioxide, from the Golborne Urban District Council. I am communicating with the authorities concerned.

#### Registration of Births: Mother's Age

Mr. RANKIN asked the Minister of Health whether, in order to measure correctly the fertility of the population, he would arrange for the records of the Registrar-General in future to show the age of the mother at the birth of each child, as was recorded in nearly every other country, and whereby alone a proper diagnosis of the situation could be made.—Sir KINGSLEY WOOD replied: It has for some time been the intention to make this alteration in the birth registers on the first suitable occasion, having regard to the complicated administrative adjustments and preparations involved, and steps are now being taken to make the change.

#### Maternity Treatment: Liverpool Minnitt Apparatus

Mr. RANKIN asked the Minister of Health if he would state in which hospitals operated by local authorities the Liverpool Minnitt apparatus was available in respect of maternity cases.—Sir KINGSLEY WOOD replied: I regret that this information is not available.

#### Accredited Milk Licences

Mr. ASSHETON asked the Minister of Health (1) if he was aware that injustice was being done to many farmers owing to the lack of uniformity of standard of farm buildings required by different county councils as a condition of the grant of an accredited milk licence; and if he would investigate this matter; and (2) if he could explain why there were 2092 farmers in Cheshire licensed for accredited milk production, whereas there were only 447 in Lancashire and 427 in the West Riding of Yorkshire; and to what extent this was due to the lack of uniformity in the standard of farm buildings required as a condition of the grant of an accredited milk licence.—Sir KINGSLEY WOOD replied: I am aware that there is said to be a lack of uniformity between the requirements of certain county councils for the granting of Grade A milk producers' licences which are necessary before the producers are included in the list of accredited producers kept by the Milk Marketing Board. I do not consider it practicable to lay down a detailed code, but in a recent circular I have drawn the attention of local authorities to the principles by which they should be guided. I have offered to give the authorities such assistance as I can with due regard to the exercise of my jurisdiction in the matter of appeals upon individual cases.

#### Anti-tetanus Serum

Mr. ROSTRON DUCKWORTH asked the Minister of Health whether any local authorities provided centres at which

anti-tetanus serum was readily obtainable by medical practitioners; and whether, if such a policy met with the approval of his department, he would advise local authorities not making such provision to do so.—Sir KINGSLEY WOOD replied: I am not aware that any local authorities have provided centres for this purpose, but in one or two cases sanction has been given by my department under Section 133 of the Public Health Act, 1875, empowering an authority to provide temporary supplies of the serum for the poorer inhabitants of their district. As regards the last part of the question, I am advised that the serum is readily obtainable through ordinary trade channels, and that if it were stocked generally by local authorities only a very small proportion of their stocks would be likely to be used and the greater part would become inert and be wasted.

#### Silicosis Certificates in South Wales

Mr. JAMES GRIFFITHS asked the Home Secretary the number of applications for certificates from among the South Wales miners made to the Medical Board under the Various Industries (Silicosis) Schemes, and the number who were granted and refused certificates each year from 1931 to date.—Sir JOHN SIMON replied: The following table gives the information asked for on applications dealt with by the Silicosis Medical Board from South Wales miners or their dependants so far as it is available:—

	Death certificates.		Disablement or suspension certificates.	
	Granted.	Refused.	Granted.	Refused.
1931 (1st June) to 1933 (December) ..	69	•	329	•
1934 .. .. .	33	20	186	124
1935 .. .. .	45	16	192	137

\* Separate figures for South Wales are not available. For the whole coal-mining industry the refusals during the period referred to were 21 and 169 respectively, and the certificates granted 92 and 370.

#### Health Insurance: Regional Medical Service

Mr. GRAHAM WHITE asked the Minister of Health the number of insured persons, men and women, respectively submitted during 1935 to regional medical officers for incapacity references; and the results of their submissions.—Sir KINGSLEY WOOD replied: The particulars of incapacity references of insured persons to regional medical officers in England and Wales in 1935 are as set out below:—

	Men.	Women.
Total references dealt with .. .. .	178,917	297,921
Persons examined .. .. .	97,055	154,139
Persons found on examination to be incapable of work .. .. .	75,668	104,353
Persons found on examination to be not incapable of work .. .. .	21,387	49,786
Persons whose incapacity was accepted, so that examination was not necessary .. .. .	8,850	13,628
Persons not attending for examination although fit to do so (ordinarily these persons had been declared by their doctors to have become fit for work) .. .. .	73,012	130,154

#### Cost of Drugs and Medicines in Lancashire

Mr. RHYS DAVIES asked the Minister of Health whether he was aware that the drug and medicine costs covering the insured population under the care of the Lancashire insurance committee had increased, and that the average cost per insured person had increased from 19'30d. in 1916 to 41'21d. in 1934; and what steps, if any, his department was taking to stop this increase without at the same time depriving the insured population of necessities in this connexion.—Sir KINGSLEY WOOD replied: I am aware of the increase in the cost of drugs for insured persons which has occurred in Lancashire in common with other areas. As regards the second part of the question, action is taken under Article 42 of the Medical



Benefit Consolidated Regulations, 1928, which provides machinery for dealing with cases where the cost is in excess of what is reasonably necessary for the adequate treatment of the patients.

MONDAY, MAY 4TH

### Shropshire Quarry Workers and Silicosis

Mr. ARTHUR DUCKWORTH asked the Secretary for Mines whether he was satisfied that every possible precaution had now been taken to safeguard the barytes mines and quarry workers in the Pontesbury and Minsterley districts of Shropshire from the dangers of silicosis; and whether he was satisfied that the precautions were being duly enforced by His Majesty's inspectors of mines and were proving effective.—Captain CROOKSHANK replied: Following investigations by H.M. Inspectors of Mines, the best available precautions have been adopted at the barytes workings in this district and I hope that experience will show them to be effective. Necessarily the effective

application of the day-to-day precautions which are prescribed is largely in the hands of the management and the workmen themselves, but the inspectors also give the matter close attention whenever they visit the workings.

### Ventilation of the House of Commons

Mr. DAY asked the First Commissioner of Works whether his attention had been called to the system of air cooling and air conditioning installed in many large public buildings abroad; and if he would call for a report from his experts as to whether this system, if installed in the House of Commons, would improve the ventilation during the summer months.—Mr. ORMSBY-GORE replied: Yes, Sir. Investigations are being carried out by my engineers in collaboration with the Department of Scientific and Industrial Research, the Medical Research Council, and the Government Chemist, but the question is one of great difficulty on account of the age and character of the building.

## MEDICAL NEWS

### University of Oxford

On April 30th the degree of B.M. was conferred on C. D. Coode, R. A. Irving, and V. H. Yates.

On Tuesday last the regius professor of medicine introduced a statute to set up an institute of experimental psychology. Its establishment has been made possible by an anonymous gift of £10,000 and by the allocation of £500 from the Rockefeller trustees, together with £150 for the next five years. The first director will be Dr. William Brown.

Dr. Brown, who in 1921 succeeded Prof. William Macdougall as Wilde reader in mental philosophy, was born in 1881, and was educated at Collyer's School, Horsham, and at Christ Church. After a distinguished undergraduate career he became assistant master at Bradfield College and at St. Paul's School, meanwhile holding the John Locke scholarship at Oxford. In 1908 he was appointed head of the psychological department at King's College, and in 1914, having qualified in medicine from King's College Hospital, he was made reader in psychology in the University of London. Joining the Royal Army Medical Corps he acted as neurologist to the Fourth and Fifth Armies, B.E.F., from 1916, and in 1918 was given charge of the Craiglockhart War Hospital for Neuroasthenic Officers at Edinburgh. Later he joined the staff of Bethlem Hospital, and the neurological department at King's College Hospital, where he was appointed psychotherapist in 1925. Dr. Brown is a D.Sc. of London University, where he was Carpenter medallist in 1911, and he was elected F.R.C.P. Lond. in 1930. He has been sectional president of the British Association, and Terry lecturer at Yale, and is the author of well-known books on psychological subjects.

### University of Cambridge

On May 2nd the following degrees were conferred:—

M.D.—Sagarajasekaran Tyagaraja and John Gray.  
M.Chir.—R. V. Payne.  
M.B., B.Chir.—J. S. Richardson and J. R. Rosa.  
M.B.—M. K. Martyn.  
B.Chir.—Fenton Braithwaite.

\* By proxy.

Dr. M. T. Greig has been appointed university demonstrator in the department of anatomy for three years. Sir Walter Langdon-Brown, who retired from the regius professorship of physic in October, has been re-elected a fellow of Corpus Christi College.

Dr. J. S. Mitchell has been elected into a fellowship at St. John's College.

### Royal College of Physicians of London

At a meeting of the college held on April 30th, with Lord Dawson, the president, in the chair, the following members were elected fellows:—

Frederick William Price, M.D. Edin. (London); Harold Campbell Parsons, M.D. Toronto (Toronto); James Clark, M.D. Aberd. (Sheffield); Otto May, M.D. Camb. (London); Henry Charles Gustave Semon, M.D. Oxon. (London); Harold Black, M.D. Belf. (Birmingham); Henry Owen West, M.D. Lond. (London); Eric Wordley, M.D. Camb. (Plymouth); Dorothy Christian Hare, M.D. Lond. (London); Charles Brehmer Heald, M.D. Camb. (London); Arthur Hillyard Holmes, M.D. Manch. (Manchester); Charles Titterton Maitland, M.D. Lond. (London); Brevet-Col. Robert Cecil Priest, M.D. Camb. (R.A.M.C., Egypt); Lawrence Paul Garrod, M.D. Camb. (London); Kenneth Harry Tallerman, M.D. Camb. (London); Redvers Nowell Ironside, M.B. Aberd. (London); Reginald Cyril Lightwood, M.D. Lond. (London); Lieut.-Col. Ambuj Nath Bose, M.B. Calcutta (I.M.S.); William Innes Gerrard, M.D. Aberd. (Hong-Kong); Ernest Bulmer, M.D. Edin. (Birmingham); John Thornton Ingram, M.D. Lond.

(Leeds); Philip Montagu D'Arcy Hart, M.D. Camb. (London); Eric Alfred Blake Pritchard, M.D. Camb. (London); Major Sohan Lal Bhatia, M.D. Camb. (I.M.S. Bombay); Joseph Tegar Lewis, M.D. Belf. (Belfast); Charles Paton Blacker, M.D. Oxon. (London); Edwin Charles Warner, M.D. Lond. (London); John Greenwood Wilson, M.D. Lond. (Cardiff); William Hofmeyr Craib, M.D. Camb. (Johannesburg); Charles Bruce Perry, M.D. Bristol (Bristol); Eric Newmarch Allott, M.B. Oxon. (London); Hector Kenneth Goadby, M.D. Camb. (London); Leonard Findlay, M.D. Glasg. (London); John Gordon Thomson, M.B. Edin. (London); Derek Ernest Denny-Brown, M.B. N.Z. (London); and under Bye-law XXXVIII. (b), Sir Frederick Grant Banting, M.B. Kingston (Toronto); Henry Havelock Ellis, L.S.A. (London); and Robert Thomson Leiper, M.D. Glasg. (London).

The following were admitted members of the college:—

Douglas Anderson, M.B. Sydney; Charles Gaffney Baker, M.B. Lond.; Bawa Ishar Singh Bhalla, M.B. Punjab; Edward Eric Keith Bottomley, M.B. Melb.; Surg.-Lieut. Comdr. Thomas Latimer Cleave, L.R.C.P. Lond.; Maurice Coke, L.R.C.P. Lond.; Arthur Claud Ely Cole, M.B. Camb.; Joseph Doupe, M.D. Manitoab; John Ewart Edson, M.B. Sheff.; Thomas Russell Cumming Fraser, M.B. N.Z.; Rupert Montgomery Gordon, M.D. Dubl.; Isaac Henry Gosset, B.M. Oxon., L.R.C.P. Lond.; Cedric Culy Harvey, M.B. Lond., L.R.C.P. Lond.; Robert Roger Henderson, M.B. Lond.; David Elvet Vaughan Jones, M.D. Lond.; Harold Witcomb Everley Jones, M.B. Lond.; Brian McArdle, M.B. Lond.; Laurence Cleveland Martin, M.B. Camb.; Ivy May Massick, M.B. Punjab; Kenneth Sibley May, M.D. Lond.; Maurice Henry Pappworth, M.B. Liverp.; Clifford Gregory Parsons, M.B. Camb.; John Erskine Grayhurst Pearson, M.B. Oxon.; David Shaw, M.D. Lond.; William Fletcher Shaw, M.D. Manch.; Roy McKenzie Stewart, M.D. Edin.; Tryambak Hari Tulpule, M.B. Bombay; and John Michael Vaizey, M.B. Camb.

Licences to practise were conferred upon 171 candidates (156 men and 15 women) who have passed the final examination of the Conjoint Board and have complied with the by-laws of the college. The following are the names and the medical schools of the successful candidates:—

Subrahmanyam Alankaram, Madras and West Lond.; G. A. Armstrong, Westminster; J. D. F. Armstrong, St. Mary's; G. H. Baines, Camb. and St. Thos.; H. C. W. Baker, Liverp.; D. R. Balcombe-Brown, Oxon. and St. Thos.; S. Ball, Liverp.; J. M. Barnes, Camb. and Sheff.; G. S. Barradell-Smith, Middlesex; R. H. Barrett, St. Bart.'s; E. A. Beet, Middlesex; E. D. Belbin, Sheff.; A. M. Best, King's Coll.; J. F. Bostock, St. Bart.'s; C. M. Bowker, St. George's; J. D. Bradley-Watson and R. F. Braithwaite, St. Bart.'s; R. H. W. Britton, St. Thos.; J. M. Brown, Guy's; J. W. F. Brown, St. Thos.; I. S. Buchanan, Westminster; S. C. Buck, Camb. and Lond.; G. D. Channell, Guy's; S. H. C. Clarke, St. Bart.'s; J. W. Clegg, Guy's; J. C. Coates, Leeds; B. Cohen, Middlesex; J. O. Collin, Camb. and Westminster; Ellen M. T. Colls, Royal Free; J. O. Creighton, St. Thos.; J. W. Crofton, Camb. and St. Thos.; Nuala F. T. Crowley, Royal Free; S. Curwen, Middlesex; B. K. Das Gupta, Calcutta and West Lond.; S. K. Das Gupta, Calcutta and Lond.; H. K. Dastur, St. Bart.'s; L. E. C. Davies, Oxon. and St. George's; W. H. Davies, Cardiff; F. C. Deller, Liverp.; Hilda S. F. de Peyer, King's Coll.; P. A. Diemer, St. Mary's; H. G. Dowler, Camb. and Middlesex; T. P. Eddy, Oxon. and Middlesex; P. Emmerson, Durh.; C. H. C. Ferguson, Camb. and St. Thos.; J. P. Fox, Westminster; W. G. France, Leeds; Joan R. Franklin, Royal Free; O. M. Galal, Cairo and Birm.; R. E. Gibson, St. Bart.'s; D. L. H. Goddard and P. W. D. Goddard, St. Thos.; J. B. H. Green, Oxon. and St. Thos.; Eileen P. Gretton-Watson, Camb. and King's Coll.; J. A. T. Griffiths, Guy's; A. B. Hamer, Manch.; M. S. B. A. Hamid, Singapore; K. H. Harper, St. Bart.'s; E. W. Hart, Camb. and Middlesex; G. A. Hart, St. Thos.; L. Heasman and L. Henig, St. Bart.'s; G. E. Hesketh, Liverp.; J. F. Heslop, Manch.; M. C. B. Heyns, Cape and Univ. Coll.; J. D. N. Hill, St. Thos.; W. A. T. Hill,

Liverp.; R. A. Hoey, St. Thos.; L. R. Holt, Middlesex; A. C. Houghton, Birm.; O. Hughes, Guy's; K. F. Hulbert and G. A. Jackson, Middlesex; T. G. S. James, Camb. and King's Coll.; J. A. R. Johnson, Birm.; P. P. Jonescu, Jassy and St. Bart.'s; W. H. Jopling, St. Bart.'s; H. Josephs, King's Coll. and Westminster; L. B. Joshi, Bombay and Birm.; M. A. Kader, Leeds; L. U. Kamm, Guy's; D. D. Keall, Camb. and St. Thos.; R. G. M. Keeling, Camb. and St. Mary's; W. W. B. Kelly-Wiseman, Middlesex; D. Kendall, Oxon. and St. Thos.; B. S. Kent, Middlesex; W. E. Kershaw, Manch.; D. N. Leiberman, Leeds; S. A. H. Lesser, Camb. and St. Bart.'s; D. G. Lewis, Camb. and St. Thos.; S. W. Longthorne, King's Coll. and Charing Cross; A. A. Lovell, Cardiff and Birm.; C. R. Lowe, Birm.; G. Lowe, Liverp.; D. H. G. MacQuaide, St. Thos.; E. B. P. Madden, Charing Cross; J. A. Mansi, St. Bart.'s; M. S. Marks, Glasg. and Prince of Wales Hosp.; K. H. A. Marshall, Oxon. and St. Mary's; J. Mason, Cardiff and Middlesex; L. A. B. Matthews, Calcutta and St. Mary's; W. V. Maughan, Middlesex; N. E. Mawby, Liverp.; H. K. Meller, Camb. and Middlesex; G. D. N. Milne, Guy's; J. S. Minett, Camb. and St. George's; D. C. Moore, Manch. and Liverp.; J. T. Murray-Aynsley, Camb. and St. Thos.; Alice L. Musgrave, Royal Free; R. T. K. Nayar, Madras; Lucy M. B. Nelson, Royal Free; J. H. L. Newnham, Lond.; W. S. A. Onkes, Leeds; K. J. O'Connor, Manch. and West. Lond.; Sushila N. Paranjpe, Royal Free; J. W. Parks, St. Bart.'s; B. G. Parsons-Smith, and W. J. E. Phillips, Camb. and St. George's; J. W. Pierce, St. Thos.; G. C. L. Pile, Camb. and Middlesex; F. E. Pitt-Payne, Guy's; Faith C. Poles, Univ. Coll.; E. D. Pond, Charing Cross; Lena F. G. Priestman, Royal Free; J. M. Ranking, Camb. and St. Thos.; E. W. Rees, St. Thos.; A. Reeves, Leeds; A. H. M. Richards, Oxon. and St. Thos.; Gwen Richards, Royal Free; Lily Rivlin, Univ. Coll.; J. L. D. Roberts, St. Bart.'s; W. W. Roberts, Sheff.; S. Rosof, St. Mary's; G. R. Royston and D. M. Samuel, St. Bart.'s; S. H. Samuel, Leeds; J. W. R. Sarkies, St. Thos.; M. Schalat, Lond.; G. E. B. Scott, Univ. Coll.; Mary Scott, Royal Free; D. R. Seaton, Camb. and Leeds; R. G. Silver, Oxon. and Middlesex; M. R. Singh, Madras and Middlesex; C. H. Smith, Madras and West Lond.; G. C. Smith, Camb. and St. Thos.; H. P. R. Smith, Camb. and Lond.; J. I. M. Smith, King's Coll. and North Staffs. Inf.; Edith M. Spencer, Univ. Coll.; A. H. M.-K. Tabatabai, Birm.; A. K. Talwalkar, Bombay; G. K. Taylor, Lond.; R. D. Teare, St. George's; O. H. J. M. Telling, Oxon. and Leeds; S. F. Thomas, Lond.; R. M. Thornton, St. Thos.; P. H. Tooley, Lond.; R. F. Townsend, King's Coll. and Westminster; E. G. Tuckwell, Oxon. and St. Bart.'s; T. A. Turnbull, Guy's; J. R. T. Turner, Camb. and St. George's; G. A. van Someren, Middlesex; G. G. Waldin, St. Bart.'s; C. P. Warren, Lond.; H. Weiner, and A. M. Williams, St. Bart.'s; H. T. H. Wilson, Camb. and Middlesex; J. R. Wilson, King's Coll.; P. R. Wilson, Camb. and Lond.; A. W. Wragg, and P. J. M. Wright, St. Thos.; and C. A. Young, St. Mary's.

The following diplomas were conferred, jointly with the Royal College of Surgeons:—

*D.T.M. & H.*—J. K. Adranvala, H. A. Al-Farouki, A. G. W. Branch, E. J. Bury, R. Calderwood, G. J. Carr, B. K. P. Choudhury, R. L. Crook, J. G. Dickson, R. C. Dolly, E. Farrell, E. A. Fernando, W. A. Fitzherbert, H. C. Foster, A. F. Fowler, R. R. Gharekhan, D. A. B. Hopkin, S. H. O. Jones, O. Khairat, A. G. Kulkarni, E. A. Lawrence, G. K. Lim, J. B. Lobo, G. W. McAleer, J. S. McGregor, Oonunniamma Matthai, H. Most, K. C. Priddy, E. G. Pyne, S. Rajendram, M. S. Rao, J. D. Reid, W. H. Schokman, P. B. E. Senewiratne, M. J. Shah, Violet R. Sharp, D. A. Smith, D. S. Smith, J. R. C. Spicer, M. Theodoulou, V. Thorne-Thorne, S. R. Verma, Tatjana von Haebler, and E. L. Wickremeratno.

*D.O.M.S.*—F. Badrock, P. N. Chaudhuri, J. E. Clark, T. K. Clifford, S. P. Divatia, G. B. Ebbage, W. H. V. D. Ferdinands, F. Heckford, T. J. Howell, H. A. Ibrahim, F. J. Jensen, A. de B. Joyce, J. Mazell, B. F. Moore, S. Nath, T. Nath, G. Pollock, E. P. Tulloh, N. Wren, and E. C. Zorab.

*D.C.H.*—Cecile H. D. Asher, L. I. S. Campbell, E. H. Capel, M. Carr, Anne A. Craig, R. H. Fish, Margaret L. Foxwell, S. C. Gawne, Constance M. Hall, Irene M. Holoran, A. H. Khan, H. L. Lee, B. F. Longbotham, W. H. Patterson, Margaret R. Price, C. K. Rowan-Legge, W. I. D. Scott, J. M. Watt, and R. A. Wilson.

Lord Dawson was re-elected as representative of the college on the governing body of the British Postgraduate Medical School. Sir Bernard Spilsbury will deliver the Croonian lectures on the Doctrine of Inflammation at 5 o'clock at the college on May 19th, 21st, and 26th.

#### Notification of Manganese Poisoning

The Home Secretary proposes, after the expiration of forty days from May 4th, to make an order requiring that all cases of manganese poisoning occurring in factories or workshops shall be reported to inspectors of factories and certifying surgeons.

#### Industrial Health Education Society

The annual meeting of this society will be held on Wednesday next, May 13th, at 5 p.m., at 29, Portman-square, London, W.C., on the invitation of Lord Luke (the chairman) and Lady Luke. Sir Kingsley Wood, M.P., Minister of Health, and Mr. George Hicks, M.P., will be among the speakers. The hon. secretary is Dr. G. Clark Trotter, and the office is at Tavistock House North, Tavistock-square, W.C. 1.

#### Medical Research Council Travelling Fellowships

The Council invite applications for the following travelling fellowships for the academic year 1936-37:—

(1) In *Medical Science (including Clinical Medicine and Surgery)*.—Two or more fellowships to be awarded by the Council, and one Leverhulme fellowship, to be awarded on the nomination of the Council.

(2) In *Tuberculosis*.—Dorothy Temple Cross research fellowships (up to four).

(3) In *Psychiatry and Neurology (including Neurosurgery)*.

Candidates who are eligible under the second and third heads will as a rule not be considered under the first head. Completed applications must be lodged by June 1st, 1936. The awards will be made to suitably qualified British subjects of either sex, who have had some training in research work in the medical sciences and are likely to profit by a period of work at a university or other approved centre in another country before taking up positions for higher teaching or research in the United Kingdom. Fellowships under the first and second heads will each carry a stipend of £400 with an expenses allowance in addition. Fellowships under the third head are subject to different regulations but are of approximately equivalent total value. Inquiries for further information and forms of application should state the type of fellowship sought, and should be addressed to the secretary, Medical Research Council, 38, Old Queen-street, Westminster, London, S.W. 1.

#### London Hospital Medical College

Sir William Bragg, O.M., president of the Royal Society will distribute prizes to successful students at this school on Friday, June 26th, at 3 p.m.

#### Glasgow University Club, London

This club will dine at the Trocadero Restaurant, Piccadilly, W., on Friday, May 29th, at 7.15 for 7.30 p.m., when Mr. Ramsay MacDonald will take the chair. Any Glasgow University men who, though not members of the club, desire to attend are asked to communicate with the honorary secretaries, 62, Harley House, London, N.W. 1.

#### Invalid Children's Aid Association

The annual meeting of this association will be held at Norfolk House, 31, St. James's-square, London, S.W., at 3 p.m. on Tuesday next, May 12th. The Archbishop of Westminster will preside and the speakers will include Sir Kingsley Wood, Minister of Health, Sir Maurice Cassidy, and Mr. H. S. Souttar.

#### West Kent Medico-Chirurgical Society

The annual dinner of this society will be held at Chiesman Restaurant, Lewisham, S.E., on Thursday, May 14th, at 7.30 for 8 p.m. Dr. J. R. Wylie, the president, will be in the chair. The hon. secretary of the society is Dr. C. J. B. Buchan, 267, Baring-road, Grove Park, London, S.E. 12.

#### British Red Cross Society

Red Cross Day will be held on the anniversary of Florence Nightingale's birthday, Tuesday, May 12th, when funds will be collected in aid of the work of the British Red Cross Society. This includes the maintenance of ambulances and first-aid stations, clinics for rheumatism and orthopaedic clinics, an organisation for blood transfusion, and dispensaries for hop-pickers and herring-fishers, while the society is also taking part in plans to mitigate the consequences of air raids, and has sent two units to Abyssinia for the relief of Ethiopian sick and disabled.

#### Vanishing Fauna of Africa

In a lecture delivered at King's College last Monday under the auspices of the University of London Animal Welfare Society Dr. A. H. B. Kirkman spoke of the rapid extermination of the African fauna and the failure of the Colonial Office to establish sanctuaries or national parks. The Kruger National Park of South Africa and the Parc National Albert of the Congo were the only reserves that could not be abolished by a stroke of the pen. The London Convention of 1933, though nominally operative, would have no pronounced results for a long time to come.

## OBITUARY

**ALBERT CARLESS, C.B.E., M.S. Lond.,  
F.R.C.S. Eng.**

THE death occurred suddenly at Worthing on April 27th of Mr. Albert Carless, consulting surgeon to King's College Hospital and known by name to the whole medical world through the famous manual of surgery, colloquially known as "Rose and Carless."

Albert Carless, who was born at Richmond in 1863, received his early education at King's College School and joined the medical school at King's College Hospital in 1881. He was a successful student, winning medals and scholarships, among others the Warneford and Leathes prize, and graduated as

M.B. Lond. with honours in 1886, as B.S. in 1887, and in the following year as M.S., taking also the diploma of F.R.C.S. Eng. He held the house appointments at King's College Hospital, having the distinction of dressing for Lister, was appointed surgical registrar, and duly became assistant surgeon to the hospital and teacher of clinical and operative surgery. In 1898 he became full surgeon to the hospital and in that year appeared the first edition of the



MR. CARLESS

[Photograph by Elliott and Fry]

famous "Manual of Surgery" of which he was the joint author with the late William Rose. Prof. Rose's share in the production was that of supervision; the work was entirely written by Carless and was the outcome of his splendid teaching classes. It was translated into Hungarian, Chinese, and Arabic, and American editions were also published.

Mr. C. P. G. Wakeley writes: "As a teacher, Carless was a stimulating and fluent exponent of the art of surgery, and probably no one had a bigger class following him round the wards of the old King's College Hospital, in Lincoln's Inn Fields. In fact, some dressers frequently complained that they rarely could get near the patient when Carless was doing a teaching round, for often he had some sixty to eighty fellowship students accompanying him round the wards. These men were drawn from the other London hospitals and from the Dominions. Carless had that adaptability for teaching which made him outstanding, for it did not matter whether the patient was a vague abdominal case with few symptoms, or a classical example of a cancer, he made it interesting and could teach for an hour or more in that lucid and compelling manner, which, for many a student, facilitated his passing the higher examinations in surgery.

The 'Manual of Surgery,' which Carless wrote and published in 1898, was in reality a combination of the notes which he had made during his coaching and teaching of advanced surgical students. Prof. Rose's name was added to the volume rather as an appreciation by Carless of what he had received

from one of his earlier teachers." But the senior to whom Carless owed most was Lister, to whom when on the hospital staff he acted as assistant surgeon. Thus he had seen the whole antiseptic technique develop. As a surgeon he was careful, thoughtful, and a rapid operator, being able to put into practice the results of his own orderly demonstrations to many mixed classes. He was devoted to King's College Hospital to which he always gave unstintingly the major portion of his time, but he was on the staff also of the Seamen's Hospital at Greenwich and of several other institutions, and wherever he worked his outstanding characteristics of clinical skill and thoughtfulness for the patient were manifest.

During the war Carless served first with the rank of major as surgeon to the London Hospital, Territorial, 1914-16; later he became consulting surgeon to the Eastern Command, and at the close of hostilities he was promoted to the rank of colonel and received the C.B.E. Throughout the period of the war he held the position of professor of surgery in King's College, a position in which he had succeeded Sir Watson Cheyne in 1902. He resigned from the honorary staff of King's College Hospital in 1919, and was appointed consulting surgeon. There can be no doubt that these strenuous duties, coupled with the loss of two sons in the war, were the factors responsible for his early retirement from the staff.

From an early period in his professional life Carless had been deeply interested in religious and social work, and when he retired from King's College Hospital several years before his time on the staff was completed it was due to a desire to devote himself to philanthropic aims. He was medical director of Dr. Barnardo's Homes, in which capacity he travelled round the world more than once and visited most countries. There can be no doubt that the good influence which he imparted was tremendously appreciated by that ever-growing institution. After devoting himself for some five years to this and similar labour, he retired to Crieff, where he made his Scottish home. He has left behind him a great reputation as teacher, surgeon, and philanthropist; throughout his busy and varied life he was consistent in his obedience to deep religious convictions and in his desire to ameliorate human troubles.

**CECIL JOHN ROGERSON, M.C., M.B. Lond.**

Dr. Cecil John Rogerson, who died recently at the untimely age of 49, had a fine career. His parents lived in Lewes, where he spent his boyhood, and he received his general education at Brighton. He went to University College Hospital, graduated as M.B., B.S. in 1909, and then served the resident appointments at the Leicester Royal Infirmary. On the outbreak of war he joined up immediately and distinguished himself for his courage and devotion to duty. He was awarded the Military Cross for attending the wounded under fire and reached the rank of lieutenant-colonel, R.A.M.C. He had a narrow escape of being killed on Armistice Day, for just before eleven o'clock a German shell exploded by his side and killed several who were standing near him. After the war he was appointed to the Kent and Canterbury Hospital as physician and became recognised also as a skilful anaesthetist. In general practice, where he was the partner of Dr. H. O. Preston, he was highly successful. Though privately rather a difficult man to approach, being reticent

and reserved, in his 16 years in Canterbury as a general practitioner he was a complete success. He was able and conscientious, popular with his patients, and regarded with particular affection by many. He was a good obstetrician and gynaecologist with a special affection for children, which his little patients returned. He was a physically delicate man, and broke down in health some two years ago, but seemed to have made a good recovery. A few weeks before his death he failed again and entered a sanatorium where his condition gave rise to anxiety, but the end was unexpected. Rogerson was an enthusiastic sportsman, had been a useful bowler as a member of the local cricket club, and played golf and tennis with equal keenness. He was unmarried.

#### ALFRED ERNEST PAYNE, M.B. Lond.

Dr. Alfred Ernest Payne, who died on April 7th, was born in Leicester, received his general education at Wyggeston School, Leicester, and his medical training at St. Mary's Hospital. He was a successful student, entered St. Mary's as a natural science scholar, gained prizes in several preliminary subjects, and became prosector of anatomy in the school. He graduated as M.B. Lond. in 1898 and was for a time assistant demonstrator of anatomy at St. Mary's Hospital. After short service with a steamship company he started general practice in Leicester, but during the war he developed an interest in radiology, derived from his skilled practice of photography, and he was attached to the 5th Northern General Hospital as radiologist. After the war he did not return to general practice but specialised in radiology and in this capacity won high repute in and beyond his locality. He became radiologist to the Leicester Pensions Hospital and Institute of Diseases of the Skin, and to the Loughborough General Hospital, and at the time of his death was honorary consulting radiologist and director of the department at Leicester Royal Infirmary. He had been a vice-president of the special section of the Royal Society of Medicine, and in 1921 was president of the Leicester Medical Society. He married Lillie, daughter of Dr. C. A. Schneider, and was 60 years old at the time of his death.

#### J. G. CATTANACH, M.D., F.R.C.P. Edin.

The death occurred in Edinburgh on April 28th of Dr. J. G. Cattanach at the age of 84; he had been for many years closely associated with the medical life of Edinburgh. He graduated with distinction at Edinburgh University in 1893 and was an original life member of the Students' Union. He was a resident at the Royal Infirmary and was a fellow and president of the Royal Medical Society. He became a fellow of the Royal College of Physicians, Edinburgh, in 1898, and was for a time assistant physician to the Deaconess Hospital. He was appointed assistant to the professor of medicine in Edinburgh University, a post which he held for many years, and in that capacity his genial personality is well-remembered by many graduates.

Dr. Cattanach was a man of many interests. In his younger days he was a keen sportsman, an enthusiastic golfer and angler, and a fine shot. He had, moreover, an extensive knowledge of Scottish life and letters. He was proud of belonging to a Highland family, and took a pride in the fact that at one time he had been a piper in the London Scottish. He was a prominent member of the Scottish Arts Club, the Pen and Pencil Club, and of the Monks of St. Giles. He served with the rank

of Captain in the R.A.M.C. (Territorials), and was a justice of the peace. He is survived by two daughters.

## Medical Diary

### SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**  
**TUESDAY, May 12th.**  
*Therapeutics and Pharmacology.* 5 P.M. Annual General Meeting. Prof. J. H. Gaddum: Estimation of Histamine in Blood. Mr. R. Wein: Effect of Diet on Resistance to Drugs.  
*Psychiatry.* 8.30 P.M. Annual General Meeting. Dr. E. Guttman: Psychiatric Observations in Arterial Hypertension. Dr. R. F. Barbour: Bromide Intoxication. Dr. W. Mayer-Gross: Optic Impairment in Constructional Apraxia.
- WEDNESDAY.**  
*Surgery: Subsection of Proctology.* 5 P.M. Annual General Meeting. Dr. R. Bensaude, Dr. Marshall Findlay, Dr. P. H. Manson-Bahr, and Mr. J. P. Lockhart-Mummery: The Aetiology and Treatment of Fibrous Stricture of the Rectum (including Lymphogranuloma Inguinale).
- FRIDAY.**  
*Obstetrics and Gynaecology.* 8 P.M. Annual General Meeting. Mr. Frederick Roques, Mr. Arnold Walker, Dr. A. J. Wrigley, Dr. Herbert R. Spencer, and Mr. James Wyatt: That Induction of Premature Labour should not Play any Part in the Treatment of Pelvic Contraction or Disproportion in Primigravidae. Mr. Everard Williams, Dr. G. W. Theobald, Mr. Hastings Ince will also speak.  
*Radiology.* 7 P.M. Annual General Meeting.
- SATURDAY.**  
*History of Medicine.* Meeting at Bath. 2.45 P.M. Demonstration of Bathing Establishments. 9.30 P.M., Dr. F. G. Thomson: Some Early Physicians at Bath and the Times they Lived in.
- SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.**  
**FRIDAY, May 15th.—5 P.M., Prof. W. W. Jameson and Prof. R. M. F. Picken: Post-graduate Teaching in Public Health.**
- SOUTH-WEST LONDON MEDICAL SOCIETY.**  
**WEDNESDAY, May 13th.—9 P.M. (Bolingbroke Hospital, Wandsworth Common, S.W.), Mr. H. Samuelli and Dr. C. O. Hawthorne: Voluntary Euthanasia.**
- MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.**  
**MONDAY, May 11th.—8 P.M., Annual General Meeting. 8.30 P.M., Sir James Walton: Carcinoma of the Stomach. (Annual Oration.) A Conversazione will follow.**
- HARVEIAN SOCIETY OF LONDON.**  
**THURSDAY, May 14th.—8.30 P.M. (Manson House, 26, Portland-place, W.), Dr. Basil Parsons-Smith: Angina Pectoris.**
- SOCIETY OF RADIOTHERAPISTS.**  
**FRIDAY, May 15th.—4.30 P.M. (11, Chandos-street, W.), Mr. G. F. Stebbing and Miss Margaret Tod: Technique and Results of the Radiation Treatment of Carcinoma of the Rectum.**
- NORTH-WEST LONDON MEDICAL SOCIETY.**  
**TUESDAY, May 12th.—9 P.M. (Stroud Laboratories, National Cancer Research Fund, The Ridgeway, Mill Hill, N.W.), Dr. W. E. Gye: Recent Advances in Cancer Research.**
- PADDINGTON MEDICAL SOCIETY.**  
**TUESDAY, May 12th.—9 P.M. (St. Mary's Hospital, W.), Dr. James Menzell: Diagnosis and Treatment of some Common Conditions for which Manipulative Treatment is Required.**
- TUBERCULOSIS ASSOCIATION.**  
**FRIDAY, May 15th.—5.15 P.M. (Manson House, 26, Portland-place, W.), Sir Leonard Rogers, Dr. Andrew Morland, and Dr. Basil Price: Climate and its Relationship to Tuberculosis. 8.15 P.M., Mr. J. E. H. Roberts and Dr. F. G. Chandler: Recent Advances in Thoracoscopy and Adhesion Section.**
- BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.**  
**THURSDAY, May 14th.—6.30 P.M., Annual General Meeting. FRIDAY.—11 A.M., Visit to the Radium Institute, 16, Riding House-street, W. 5 P.M., Case Demonstration and Discussion.**
- MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.**  
**THURSDAY, May 14th.—8.30 P.M. (11, Chandos-street, W.), Dr. Emmanuel Miller: The Limits of Psychopathology.**
- ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.**  
**WEDNESDAY, May 13th, and THURSDAY.—Meeting at Glasgow. On Thursday, at 2.30 P.M., Symposium on Somnifaine.**
- LECTURES, ADDRESSES, DEMONSTRATIONS, &c.**
- UNIVERSITY OF LONDON.**  
**TUESDAY, May 12th, WEDNESDAY, and THURSDAY.—5.30 P.M. (17, Bloomsbury-square, W.C.), Prof. Arthur Stoll (Basle): Cardiac Glucosides.**  
**FRIDAY.—5 P.M. (King's College, Strand, W.C.), Prof. Henri Fredericq (Liège): The Laws of Excitation of the Autonomic Nervous Systems.**

**INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE.**  
TUESDAY, May 12th, to SATURDAY, at the Hotel Great Central, Marylebone-road, N.W., and elsewhere.

**BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.**  
MONDAY, May 11th.—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Dr. Wilfred Shaw: Irregular Uterine Hæmorrhage.  
TUESDAY.—2 P.M., Prof. E. H. Kettle: Pathological Demonstration. 3 P.M., Mr. Earl King, Ph.D.: Phosphatase as a Test of Hepatic Function.  
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).  
THURSDAY.—2.30 P.M., Dr. W. S. C. Copeman: Arthritis. 2.30 P.M., Sir Henry Gauvain: Surgical Tuberculosis. 3 P.M., Operative Obstetrics.  
FRIDAY.—2.15 P.M., Dr. A. A. Davis: Gynæcological Pathology.  
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetric and gynecological clinics or operations, refresher course for general practitioners.

**FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**  
MONDAY, May 11th, to SUNDAY, May 17th.—BROMPTON HOSPITAL, S.W. All-day course in thoracic surgery.—ST. JOHN'S HOSPITAL, Lisle-street, W.C. Afternoon course in dermatology.—MAUDSLEY HOSPITAL, Denmark-hill, S.E. Afternoon course in psychological medicine.—CANCER HOSPITAL, S.W. Sat. and Sun., course in general surgery.—Courses are open only to Members of the Fellowship.

**LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.**  
MONDAY, May 11th.—5 P.M., Dr. W. N. Goldsmith: Acneiform Eruptions.  
TUESDAY.—5 P.M., Dr. H. C. G. Semon: Diseases of the Buccal Mucous Membrane.  
THURSDAY.—5 P.M., Dr. A. C. Roxburgh: Eczema.  
FRIDAY.—5 P.M., Dr. W. Griffith: Bullous Eruptions.

**HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.**  
WEDNESDAY, May 13th.—2 P.M., Sir Lancelot Barrington-Ward: Hirschsprung's Disease. 3 P.M., Lecture—Dr. W. W. Payne: Food Values: Normal and Special Diets.  
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

**UNIVERSITY OF BIRMINGHAM.**  
TUESDAY, May 12th.—3.30 P.M. (General Hospital), Mr. B. T. Rose: Principles and Practice of Radio-surgery.  
THURSDAY.—4 P.M. (Medical Faculty Buildings), Prof. W. W. C. Topley, F.R.S.: The Practical Application of Antigen-Antibody Mechanisms in Diagnosis, Prophylaxis and Treatment. (William Withering Lecture).  
FRIDAY.—3.30 P.M. (Queen's Hospital), Dr. E. Baylis Ash: Psoriasis and Seborrhœa.

**MANCHESTER ROYAL INFIRMARY.**  
TUESDAY, May 12th.—4.15 P.M., Mr. E. D. Telford: Occlusive Disease of Peripheral Arteries.  
FRIDAY.—4.15 P.M., Mr. A. H. Southam: Demonstration of Surgical Cases.

**GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.**  
WEDNESDAY, May 13th.—4.15 P.M. (Victoria Infirmary), Dr. W. Herbert Brown: Occupational Dermatoses.

## Vacancies

For further information refer to the advertisement columns

**Accrington, Victoria Hospital.**—H.S. £150.  
**Barnsley, Beckett Hospital and Dispensary.**—Cas. O. and H.P. £250 and £200 respectively.  
**Belfast, Forster Green Hospital, Fortbreda.**—H.P. At rate of £150.  
**Birkenhead Education Committee.**—Asst. School M.O. £500.  
**Birmingham, Selly Oak Hospital.**—Temp. Res. Pathologist. 9 guineas weekly.  
**Bradford Royal Infirmary.**—H.P. At rate of £135.  
**Burton-on-Trent, Ereby Hall Orthopedic Hospital.**—Locum Res. Asst. M.O. At rate of £350.  
**Burton-on-Trent General Infirmary.**—H.P. and Cas. O. £150.  
**Cambridge, Addenbrooke's Hospital.**—Res. Surg. O. £225. Also H.P. At rate of £130.  
**Canterbury, Kent and Canterbury Hospital.**—Hon. Physician.  
**Cardiff, King Edward VII. Welsh National Memorial Association.**—Asst. Res. M.O. for Glan Ely Tuber. Hospital. £200.  
**Carshalton, Beadlington and Wallington Hospital.**—Three Hon. M.O.'s.  
**Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.**—Third Res. H.S. At rate of £75.  
**City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.**—Med. Reg.  
**Coventry and Warwickshire Hospital.**—Hon. Ophth. Surgeon.  
**Delamere, Cheshire, Crossley Sanatorium.**—Med. Supt. £650.  
**Derbyshire County Council.**—Asst. Maternity and Child Welfare M.O. £600.  
**Doncaster Royal Infirmary.**—H.S. £175.  
**Dreadnought Hospital, Greenwich, S.E.**—Receiving Room Officer. At rate of £200.  
**Durham County Council Education Department.**—Asst. School M.O. £500.  
**East Ham County Borough.**—Locum Tenens. £10 10s. weekly.  
**Epsom County Hospital.**—Res. Asst. M.O. At rate of £375.  
**Evelina Hospital for Sick Children, Southwark-street, S.E.**—H.P. At rate of £120.  
**Exeter, Devon Mental Hospital, Exminster.**—Jun. Asst. M.O. £350.  
**Fareham, Hants, Knowle Mental Hospital.**—Deputy Med. Supt. £700.  
**Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W.**—Res. H.S. At rate of £150.  
**Guildford, Royal Surrey County Hospital.**—H.S. £150.  
**Hallifax Royal Infirmary.**—Third H.S. At rate of £150.  
**Holl, Norfolk, Kelling Sanatorium.**—Second Asst. Res. M.O. £350.  
**Hospital for Sick Children, Great Ormond-street, W.C.**—Res. H.P. and Res. H.S. Each at rate of £100.  
**Huddersfield Royal Infirmary.**—Res. Surg. O. £225—£250. Cas. O. £200. H.P. and Res. Anæsthetist. Also H.S. Each at rate of £150.  
**Hull Royal Infirmary.**—H.S. to Ophth. and Ear, Nose, and Throat Dept. At rate of £150. Also H.S. to Sutton Branch Hospital. At rate of £160.  
**Ipswich, East Suffolk and Ipswich Hospital.**—Orthopedic Surgeon. £500.  
**Islington Metropolitan Borough.**—Asst. M.O.H. £700.  
**Isolation Hospital, Muswell Hill, N.**—Res. M.O. £500.  
**Kettering and District General Hospital.**—Second Res. M.O. £125.  
**Kingston District Hospital.**—Res. Asst. M.O. At rate of £375.  
**Leeds General Infirmary.**—Reg. to Orthopedic Dept. £400.  
**Lincoln, Burton-road Hospital.**—Asst. M.O.H. £600.  
**Liverpool City.**—Temp. Jun. Asst. Bacteriologist. £400.  
**Liverpool, Fazakerly Sanatorium.**—Res. Asst. M.O. £200.  
**Liverpool Hahnemann Hospital.**—Hon. Asst. Ophth. S.  
**Liverpool University.**—Lecturer in Dept. of Bacteriology and Lecturer in Physiology. Each £600—£700. Also two Demonstrators. Each £300.  
**Llanclly and District Hospital.**—H.S. £150.  
**London Child Guidance Clinic, 1, Canonbury-place, N.**—Three Fellowships in Psychiatry. Each £300.  
**London County Council.**—Asst. M.O., Grade I. £350. Asst. M.O.'s, Grade II. Each £250. H.P. At rate of £120. Temp. Asst. M.O., Grade I. At rate of £350. Visiting M.O. £200. Also Temp. Dist. M.O. At rate of £150.  
**Macclesfield General Infirmary.**—Sen. H.S. At rate of £180.  
**Manchester, Ancoats Hospital.**—Combined H.S. (Aural) and H.P. Post. At rate of £100.  
**Manchester City.**—Vacancies on Consultant Medical, Surgical, &c. Staffs of Municipal Hospitals. £125—£400.  
**Manchester, Duchess of York Hospital for Babies.**—Med. Reg. £50.  
**Manchester Royal Children's Hospital, Pendlebury.**—Res. H.S. At rate of £100.  
**Manchester Royal Infirmary.**—Hon. Asst. Surgeon.  
**Manchester and Salford Hospital for Skin Diseases.**—Two Asst. M.O.'s. Each £100.  
**Miller General Hospital, Greenwich-road, S.E.**—Res. Surg. O. and Reg. £250. Cas. O. At rate of £150. Also two H.P.'s and H.S. Each at rate of £100.  
**Newcastle-upon-Tyne Hospital for Sick Children.**—Asst. Hon. Physician to Skin Dept.  
**Newport, Mon, Royal Gwent Hospital.**—H.S. and Asst. Cas. O. At rate of £135.  
**North Riding of Yorkshire C.C.**—County M.O.H. and School M.O. £1200.  
**Norwich, Norfolk and Norwich Hospital.**—H.S. to Spec. Depts. £120.  
**Nottingham Children's Hospital.**—Res. H.P. At rate of £150.  
**Oxford, The Warnford.**—Jun. Asst. M.O. £350.  
**Oxford, Wingfield-Morris Orthopedic Hospital, Headington.**—Lord Nuffield Scholarship in Orthopedic Surgery. £200.  
**Plymouth, Prince of Wales's Hospital, Greenbank-road.**—Res. Surg. O. At rate of £225.  
**Poplar Hospital for Accidents, East India Dock-road, E.**—Second Res. Officer. £175.  
**Preston and County of Lancaster Royal Infirmary.**—H.S. £150.  
**Princess Beatrice Hospital, Earl's Court, S.W.**—Res. M.O. At rate of £150.  
**Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.**—Res. M.O. for Isolation Hospital. At rate of £200. Res. Anæsthetist. At rate of £100. Res. Anæsthetist and Dist. Res. M.O. At rate of £90. Also Asst. Res. M.O. At rate of £80.  
**Raivenstall, Lancs, Moorlands Public Assistance Institution.**—Visiting Obstetrician. £100 and 3 gns. per session.  
**Redhill, Royal Earlswood Institution.**—Jun. Asst. M.O. At rate of £250.  
**Rochester, St. Bartholomew's Hospital.**—Res. Surg. O. At rate of £225.  
**Romford, Oldchurch Hospital.**—Asst. Res. Radiologist. £250.  
**Royal Cancer Hospital, Fulham-road, S.W.**—H.S. At rate of £100.  
**Royal Naval Medical Service.**—M.O.'s.  
**Royal Northern Hospital, Holloway, N.**—H.P. At rate of £70.  
**Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.**—H.P. At rate of £100.  
**St. John's Hospital, Lewisham, S.E.**—Hon. Ophth. Reg.  
**Seamen's Hospital Society, Greenwich.**—H.S. for Tilbury Hospital. At rate of £140.  
**Sheffield, Jessop Hospital for Women.**—Res. M.O. Also H.S. At rate of £150 and £100.  
**Sheffield Royal Infirmary.**—Ophth. H.S. At rate of £120.  
**Smethwick County Borough.**—Asst. M.O.H. and Asst. School M.O. £350.  
**Southeast-on-Sea General Hospital.**—H.S. for Spec. Depts. At rate of £100.  
**South Eastern Hospital for Children, Sydenham, S.E.**—Hon. Cons. Surgeon. Also Jun. Res. M.O. At rate of £100.  
**Stafford, Prestwood Sanatorium.**—Jun. Asst. M.O. £250.  
**Stockport Infirmary.**—H.S. and Cas. O. £150.  
**Taunton and Somerset Hospital.**—Sen. House M.O. At rate of £150.  
**Twickenham, St. John's Hospital.**—Hon. Cons. Physician.  
**University College Hospital, Gower-street, W.C.**—Hon. Asst. Surgeon.  
**Walsall County Borough.**—Asst. M.O.H. £350.



**Warwickshire and Coventry Mental Hospital.**—Med. Supt. £1200.  
**Wembley U.D.C.**—M.O.H. £1000.  
**West Bromwich, Hallam Hospital.**—Two H.P.'s and H.S. Each at rate of £200.  
**West London Hospital, Hammersmith, W.**—Res. Anaesthetist. At rate of £100.  
**Willesden General Hospital, Harlesden-road, N.W.**—Hon. Clin. Assts. for Out-patients' Dept.  
**Wolverhampton Royal Hospital.**—H.P. At rate of £125. Also H.S. At rate of £100.  
**Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.**—Hon. Asst. Obstet. Surgeon. Also two H.S.'s. Each at rate of £100.  
**Worthing Borough.**—Asst. M.O.H. £500.  
**York City.**—Asst. M.O.H. At rate of £350.  
**Zelland County.**—County M.O.H. £700.  
 The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Brecon (Brecknock) and Hoylake (Cheshire).

**TREVOR, DAVID, M.S. Lond., F.R.C.S. Eng.,** Hon. Assistant Orthopaedic Surgeon at the Royal Waterloo Hospital, London.  
**URQUHART, JAMES, M.B. Edin., D.P.H.,** Assistant Tuberculosis Officer at Winter-street Hospital, Sheffield.  
**Hampstead General and North-West London Hospital.**—The following appointments are announced:—  
**KREMER, MICHAEL, M.D., M.R.C.P. Lond.,** Physician to Out-patients;  
**PRYDE, N. W., M.B. N.Z.,** House Surgeon to a Surgical Unit; and  
**DAVIES, D. W., M.R.C.S. Eng.,** Casualty Medical Officer.  
 Certifying Surgeons under the Factory and Workshop Acts:  
**Dr. V. WILKINSON, M.C.** (Croydon District, Surrey);  
**Dr. W. B. BALLENDEN** (Pontesbury District, Salop);  
 and **Dr. T. MORGAN** (Swanscombe District, Kent).

## Births, Marriages, and Deaths

### BIRTHS

**CHITNIS.**—On May 1st, at Welbeck-street, W., the wife of Dr. C. N. Chitnis, of a son.  
**MATTHEWS.**—On April 27th, at Cowfold, Sussex, the wife of Dr. T. E. Matthews, of a daughter.  
**SLEIGH.**—On May 1st, at Dedham, Colchester, the wife of Dr. Graham Sleigh, of a daughter.

### MARRIAGES

**CLARKE—BLUNT.**—On April 20th, at Alexandria, Egypt, Major Ailwyn Clarke, M.C., R.A.M.C., to Cicely Blunt, second daughter of Mr. and Mrs. Graham Blunt of Streatham.  
**GARDNER—NIXON.**—On April 29th, at St. Mary-le-Tower Church, Ipswich, Surg. Lt.-Com. (D.) Andrew Allen Gardner, to Mary Barron, daughter of the late Mr. J. C. Nixon and of Mrs. Nixon of Ipswich.

### DEATHS

**BENNETT.**—On April 20th, at Westergate, Sussex, Cecil Bennett, M.R.C.S. Eng., Medical Superintendent, General Hospital, Shanghai.  
**BRASH.**—On April 29th, John Bardsley, M.R.C.S., L.R.C.P., of Handsworth, Birmingham.  
**BROWN.**—On May 1st, at Harrogate, James William Henry Brown, M.R.C.S. Eng., L.R.C.P. Edin., formerly of Holbeck and Roundhay, in his 77th year.  
**BURNETT.**—On April 25th, at Westcliff, John Duncan Burnett, M.B. Aberd., of Southchurch, Essex, and formerly of Watford, Hertfordshire.  
**COOKE.**—On May 4th, at Wootton, Isle of Wight, Reginald Torriano Cooke, M.R.C.S. Eng.  
**GODSON.**—On May 2nd, at Gatley, Ches., John Herbert Godson, M.B. Camb., D.P.H.  
**GRANGE.**—On April 29th, at Bournemouth, Wm. D'Oyly Grange, M.D. Edin., formerly of Moffat and Harrogate, aged 83.  
**JACKSON.**—On April 26th, suddenly, at Esher, John William Jackson, M.B. Glasg., late of Shanghai.  
**PATON.**—On April 29th, at Rugeley, Staffs, Benjamin Lewis Paton, O.B.E., M.D. Edin., aged 75.  
**WAIT.**—On April 26th, at Carlisle, John Alfred Wait, M.B. Camb., Lieut.-Col., T.D. (Retd.), Tyne mouth R.G.A.  
*N.B.—A fee of 1s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

## Appointments

**CLARK, E. B., M.B. Edin.,** has been appointed Medical Registrar to the Out-patient Department of Manchester Royal Infirmary.  
**CLAYE, A. M., M.D. Leeds, F.R.C.S. Eng.,** Hon. Surgeon to the Hospital for Women at Leeds.  
**CURRIE, D. W., M.D., Ch.M. Leeds, M.C.O.G.,** Hon. Obstetric Surgeon to the Leeds Maternity Hospital.  
**FOX, P. P., M.B. Liverp., D.P.H.,** Medical Officer of Health, School Medical Officer, and Port Medical Officer for Harwich.  
**GUTHRIE, SYLVIA K., M.D. Manch., M.R.C.P. Lond.,** Hon. Visiting Physician to the Duchess of York Hospital for Babies, Manchester.  
**HENDERSON, STANLEY, M.B. Liverp., M.C.O.G.,** Resident Obstetric Officer at Hope Hospital, Salford.  
**HERRON, R. A. C., M.B. Belf.,** Second Assistant Resident Medical Officer at the Southlands Hospital, Shoreham-by-Sea.  
**HISLOP, J. C., M.B. Edin.,** Senior Resident Medical Officer at the King Edward Memorial Hospital, Ealing.  
**JOHNSON, J. S., M.B. Durh., D.P.M.,** First Assistant Medical Officer at Durham County Mental Hospital, Winterton.  
**KELLY, G. C., M.D. Aberd., D.P.H.,** Senior Assistant Medical Officer of Health for Birmingham.  
**LIPSCHITZ, W., M.D. Freiburg, L.R.C.P. Edin.,** Assistant Medical Superintendent at the Royal Sea-Bathing Hospital, Margate.  
**MORGAN, VERNON, M.R.C.S. Eng.,** Hon. Anaesthetist to the Princess Beatrice Hospital, London.  
**NEWMAN, J. L., M.D. Camb., M.R.C.P. Lond., D.P.H.,** Assistant County Medical Officer of Health for West Sussex and Medical Officer of Health for the Midhurst Rural District.  
**OZANNE, R. C., M.B. Oxon.,** Hon. Physician to the Harrogate and District General Hospital.  
**PHELAN, KIERAN, M.B. Irel.,** Assistant Port Medical Officer of Health for Harwich.  
**SHARPEY-SCHAFFER, E. P., M.B. Camb., M.R.C.P. Lond.,** Resident Medical Officer at the National Hospital for Diseases of the Heart.  
**SHEPHERD, C. E. A., M.R.C.S. Eng., D.P.M.,** Medical Superintendent at the Kent County Mental Hospital, Chatham.  
**SMITHERS, DAVID, M.D. Camb.,** Out-patient Medical Officer at the National Hospital for Diseases of the Heart.

### Royal Institution

The annual meeting of the Royal Institution of Great Britain was held on May 1st. The report of the visitors, which was received and adopted, referred to the improved attendance at lectures, and stated that the recent Christmas juvenile lectures on photography had an average audience of over 500, while a Friday evening discourse by Sir James Jeans was attended by 640 people, the largest audience seen in the institution for many years. The legacy of Mr. Harry Brown, of Sergeant's Inn, is expected to amount to between £25,000 and £30,000, and to invest this money and provide for future expansion of research the managers have purchased the freehold of 19, Albemarle-street, immediately adjoining the premises of the institution. The reconstruction of the principal library is to be finished by the summer, and a large new research laboratory is being provided as a part of the scheme. By the issue of Volume VII. and a separate index the publication of Faraday's diary has been completed.

The officers for the ensuing year will be Lord Eustace Percy (president), Sir Robert Robertson (treasurer), and Major C. E. S. Phillips (secretary). The managers include Sir James Crichton-Browne, F.R.S., and Mr. V. Warren Low, and the visitors Prof. H. H. Hartridge, F.R.S.

### Beet Sugar Effluent

Speaking on May 4th before the London section of the Society of Chemical Industry, Mr. A. Parker, D.Sc., described the work of the Water Pollution Research

Board in the provision of cleaner rivers. The work of the Board, he said, had definitely shown that millions of gallons of water used by a beet sugar factory which were previously wasted can be saved and re-used after treatment by a simple and practical process, while, if it is necessary to discharge the water into a stream, it can be purified and pollution avoided by percolating filters. This was important, for the waste water from a single factory may be equivalent in its polluting character to crude domestic sewage from a town with a population of about 300,000 people. If the waste waters from all the beet sugar factories in this country were discharged into streams they would cause as much pollution as the sewage from a population of four or five million people.

### Fellowship of Medicine and Post-Graduate Medical Association

The following all-day courses will take place during May: thoracic surgery at the Brompton Hospital (May 11th to 16th); urology at St. Peter's Hospital (May 18th to 30th, men only); proctology at the Gordon Hospital (May 25th to 30th); an afternoon course in venereal disease will also be held at the London Lock Hospital (May 25th to June 20th); and a week-end course in general surgery at the Cancer Hospital (May 16th and 17th). Courses are open only to members and associates of the Fellowship, and further information may be had from the secretary of the Fellowship, 1, Wimpole-street, London, W.1.



ADDRESSES AND ORIGINAL ARTICLES

CARCINOMA OF THE STOMACH\*

By Sir James Walton, K.C.V.O., M.S., B.Sc. Lond.,  
F.R.C.S. Eng.

SURGEON TO THE LONDON HOSPITAL

IN giving this oration I have thought it best to limit my remarks to the results of my own experience, which at least has the merit that it is based upon thirty-five years' work. Not all would accept the wisdom of such a method, but would rather agree with the preacher who in the Book of Ecclesiastes says: "I looked on all the works that my hands had wrought and on the labour I had laboured to do and behold all was vanity and vexation of spirit, and there was no profit under the sun." For my own part I prefer to follow the lead of one who, considered a pagan, is responsible for some of the finest Christian teaching, one of whom the Emperor Antonius stated that "he thanked the gods that he could collect from his writings the wherewithal to conduct life with honour to himself and advantage to his country." I refer to Epictetus who in his Enchiridion pointed out that "every art is wearisome in the learning of it,—yet things that are made by the arts immediately declare their uses and in most of them there is something which is attractive and pleasing." In my own work I have been fortunate enough in finding much that has been attractive and pleasing.

It has been wisely said that "to travel hopefully is better than to arrive and the greatest happiness is in labour," and the older members of this society will I know join me in saying that the only constant and certain happiness in life, the only happiness that lies in a man's own hands and which is not destroyed by untoward circumstances beyond his control, lies in his labour. I am venturesome enough to hope that, although I can produce nothing new, the work which has given me so much pleasure may be of some interest to others.

Of the many branches of abdominal surgery I have felt that a consideration of carcinoma of the stomach would be the most appropriate, for this disease is one upon which the attention of the whole medical world is centred, and it has only been by the slow aggregation of small details in diagnosis and treatment that we are able to say to-day that although the outlook is still bad it is no longer hopeless, as was supposed a few years ago.

Frequency

Carcinoma of the stomach is undoubtedly a common disease and forms a high proportion of all gastric lesions; but I am doubtful if its frequency is increasing. The number of cases of carcinoma, of all peptic ulcers, and of ulcers of the body of the stomach that have occurred in my own practice yearly from 1913-35 are shown in Fig. 1, and it is noticeable that there has been no appreciable rise in the number of carcinomata in the last seven years. The curves for carcinoma and for ulcers of the body run nearly parallel. To a lesser degree they are simulated by the curve for all ulcers. The annual variation in the numbers of peptic ulcers is probably due to changes in the method of treatment. The popularity of surgical treatment reached its peak in 1930, since

when the numbers have fallen; but it is a remarkable fact that the curve for carcinoma shows a similar rise and fall. Does this mean that more cases of carcinoma are overlooked to-day and are treated as ulcers, or are more ulcers cured medically and so do not progress to carcinoma?

Another important fact that is made evident is that of all gastric operations between one in three and one in five is performed for carcinoma.

Age and Sex

Generally speaking carcinoma is a disease of middle age, the greater number appearing between the ages of fifty and sixty. In aged people it becomes, like carcinoma elsewhere, relatively rare. The late Sir Jonathan Hutchinson used to say that elderly people were beyond the carcinoma age, but it must be remembered that very aged people form but a small proportion of the total population, and before such a belief can be held it would be necessary to know what proportion the cases of carcinoma formed of the total numbers of that age. The age-frequency in my own series is shown in Fig. 2, where it is compared with the curves of frequency of ulcers of the lesser curve and of all ulcers of the stomach. The apex occurs a decade later than that of ulcers either of the lesser curve or of all ulcers, which is reached between forty and fifty. Not only are the curves very similar but as many as 5 cases of carcinoma occurred before the age of thirty.

The sex-distribution is more equal than that of most peptic ulcers (Table I.). The total number of

TABLE I.—Sex-incidence

	Totals.	Males.	Females.	% Males.
Duodenal ulcers ..	1017	847	170	83.3
All ulcers .. ..	1888	1447	441	76.5
Lesser curve ulcers ..	646	483	163	74.5
Carcinoma .. ..	461	317	144	68.7
Hour-glass stomach ..	89	1	88	1.1

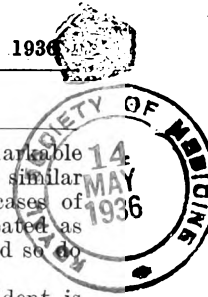
all chronic ulcers was 1888, of which 1447 were in males. But since duodenal and gastrojejunal ulcers never become carcinomatous it is of more importance to study the sex relationship only in the lesser-curve ulcers. These were 735 in number, of which 484 were males. It is however an interesting fact that the lesser-curve ulcers which are associated with an hour-glass constriction only occur in women and apparently never become carcinomatous. They seem to be a class of lesion distinct from the ordinary peptic ulcer. There were 89 such cases, and if they are eliminated there are remaining 483 males and 163 females. These figures I regard as important, for it is still often stated that ulcers of the body of the stomach are commoner in females than in males, whereas in my experience the reverse has always been true.

Among patients with duodenal ulcers the predominance of males is more marked, there being in my own series 1017, of whom 847 were males. In carcinoma, on the other hand, of 461 cases only 317 were males.

Pathological Varieties

Carcinoma of the stomach is usually primary, although it may occasionally be due to spread from some neighbouring viscus. When primary it may

\* The annual oration for 1936, delivered before the Medical Society of London on May 11th.



arise in a healthy stomach, or in one which is the seat of some previous lesion. The two common pre-existing lesions are adenomata and chronic peptic ulceration.

CARCINOMA SECONDARY TO ADENOMATA

Adenomata of the stomach are but rarely seen surgically. In my own series of over 2500 operations upon the stomach there have only been 6 cases. Even post-mortem statistics show that they are relatively rare lesions, Stewart finding only 56 examples in 12,800 autopsies. Like papillomata of the colon they are prone to become carcinomatous, 28 per cent. of Stewart's 56 cases showing this change. Of 322 of his cases of carcinomata 4.7 per cent. were associated with adenomata. McRoberts found that four out of five cases and Benedict seven out of seventeen cases treated surgically showed carcinomatous changes. The large papillomata which, situated near the pylorus, may initiate an intussusception are especially likely to be carcinomatous. A rare change is the condition known as polyadenomata or polyposis of the stomach which may consist of multiple discrete predunculated tumours, or form confluent masses showing as well demarcated plaques. Brun and Pearl were able to collect only 84 reported cases. This condition, regarded by many as the result of chronic gastritis, is also prone to become carcinomatous, four out of fourteen cases collected by Mills showing this change. In the condition which I have previously described as massive carcinoma of the greater curvature there is a probable but less clearly defined relation to adenomata. On clinical examination a mass is felt in the epigastrium which is so large that surgical intervention may be regarded as hopeless. At operation however the tumour which arises about the middle of the greater curvature is freely movable in spite of its size and of the fact that the gastrocolic omentum may be in part involved. Metastases are usually limited to the glands along the greater curve in the immediate vicinity of the growth and a

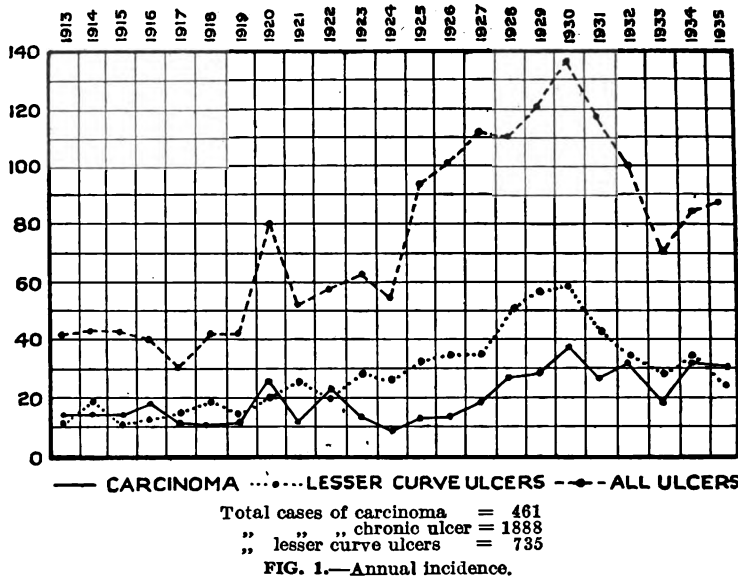


FIG. 1.—Annual incidence.

partial gastrectomy is usually possible. It is such cases that warn us never to refuse operative relief solely on account of the size of the tumour. They are relatively rare, there being only 11 examples in my series of 458 cases. The stomach shows a large fungating and often partly necrotic mass spreading into the stomach from the greater curve. In spite of its size the prognosis is relatively good. The rarity of this variety, its slow onset, the large mass with but few secondaries, the unusual site of origin and the tendency to necrosis and hæmorrhage and its relatively benign nature all suggest that it has arisen from an adenoma.

CARCINOMA SECONDARY TO PEPTIC ULCERATION

A relationship between chronic peptic ulceration and carcinoma has long been suspected, but an almost acrimonious discussion has arisen as to its frequency, the figures varying from 71 per cent. of carcinoma arising in ulcer as given by Wilson and McCarty to the complete absence of such a relationship as claimed by MacLean. To-day the figures of Stewart are generally accepted. He concluded that 9.5 per cent. of cases of chronic ulcer become carcinomatous and 17 per cent. of cases of carcinoma originate in a chronic ulcer. Clinical criteria are notoriously unreliable, although Hurst has produced evidence to show that the presence of a high acidity is suggestive that the carcinoma originated in an ulcer. In my own series I have only included those cases:—

1. Having a history of many years' standing in which the early symptoms were periodic;
2. Having a relatively high test-meal acidity;
3. Showing a condition at operation suggestive of a chronic ulcer; or
4. Showing pathological evidence of an old chronic ulcer.

Forty-four of the cases filled these requirements—that is, approximately 10 per cent—which is rather less than Stewart's figures, but it of course does not include the inoperable cases which were not investigated pathologically. It is important to appreciate this possibility, and if the symptoms are suggestive of such a change a partial gastrectomy should always be performed. There were 8 such cases in my own series,

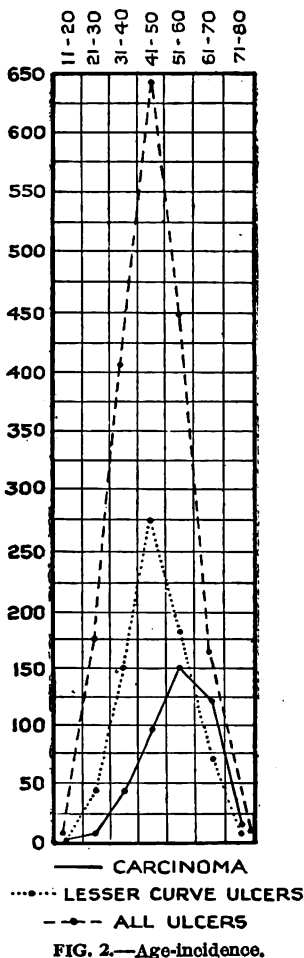


FIG. 2.—Age-incidence.

carcinoma being discovered only after microscopic examination. The history of carcinoma in its early stages may also closely resemble that of chronic ulcer, so that an even higher percentage of the cases diagnosed clinically as chronic ulceration become malignant.

In a previous communication I discussed the frequency with which carcinoma arises after palliative operations for ulcer. The cases were found to fall into three groups. In the first a gastro-enterostomy is performed for an ulcer so large and so adherent that a radical operation is considered inadvisable. Symptoms of carcinoma soon follow, and it is almost certain that this lesion was present at the first operation. In the second group a gastro-enterostomy is performed for an ulcer at the pylorus or in the duodenum, and after a considerable period a carcinoma appears in the body of the stomach remote from the old ulcer. It is a new and distinct lesion. The third group consists of those cases in which the carcinoma is found in the area of the stomach in which the ulcer was situated, and although it may arise many years afterwards probably originates in the scar of the old ulcer. In my own series of 1888 operations for peptic ulcers there were 16 examples of subsequent carcinoma and 2 other cases where the first operation for peptic ulcer had been performed by another surgeon, making 18 in all for investigation (Table II.). Of these, four belong to the first group

TABLE II.—*Carcinoma in Scar of Healed Ulcer*

—	Cases.	Years.
I. Shortly after ..	4	—
II. Remote from ulcer ..	6	4, 7, 12, 15, 17, and 25
III. Later in scar ..	8	2, 4, 4, 5, 6, 6, 15, and 21

and six belong to the second group, occurring 4, 7, 12, 15, 17, and 25 years respectively after the primary lesion. Eight belong to the last group, and it is in these alone that it can be suggested that the carcinoma arose in the scar of the ulcer.

An interesting question is whether the acidity decreases with the onset of carcinoma. Dr. Hurst has always failed to find such a change. I had believed it probable, and this present series appears to support my views, for in 10 of them a test-meal had been done previous to the operation for ulceration and again when the patient was admitted with carcinoma. The test-meal before the first operation showed on the average a free HCl of 0.15 and a total acidity of 55. At the time of the second operation for carcinoma 8 showed a complete absence and 2 a reduction of free HCl. In all of these cases however a gastro-enterostomy had been performed, and the reduction might have been dependent upon this step rather than upon the carcinomatous change.

Carcinomata of this nature will present the pathological characters of an ulcer with a varying degree of visible carcinomatous change. In early cases the diagnosis of carcinoma may only be possible on microscopic examination, while in the later stages the mass of growth may be so extensive that it is impossible to determine with the naked eye whether the ulcer is primary or secondary. Microscopic examination will nevertheless often reveal characters of the original ulcer. As Newcomb points out, the most important of these are complete destruction of the muscle in the floor of the ulcer; a large area of dense fibrous and granulation tissue, also in the floor; the presence of endarteritis and thrombo-

phlebitis in the vessels around, and fusion or close approximation of the muscularis mucosæ and the muscle at the margin of, the ulcer.

#### PRIMARY CARCINOMATA

About 80 per cent. of all cases are usually regarded as primary—that is, as arising from no known cause and not being secondary to any antecedent lesion in the stomach. Hurst however has produced considerable evidence that this form of carcinoma is dependent upon chronic gastritis. He believes that the achlorhydria is caused by the gastritis and is not due to the growth. He found that in almost every case of undoubted ulcer-cancer free HCl was present, but when there was no evidence of a previous ulcer acid was usually absent even in the very early stages of the disease. He states that carcinoma never develops in a healthy stomach, but if a patient with a constitutional predisposition to carcinoma also has achlorhydria and gastritis he will probably develop carcinoma, and that the early recognition and treatment of the gastritis will diminish the frequency of carcinoma. His work is very suggestive but if true would indicate that ulcer is a more common cause of carcinoma than is usually believed. In my own series about 35 per cent. showed a high acidity, whereas only 10 per cent. fulfilled my criteria.

Many different types of growth are seen which are in the main dependent upon the amount of reactionary fibrosis, the following forms being usually recognised.

1. *Atrophic scirrhus, or leather-bottle stomach.*—This is a rare change, there being only 8 examples in my series. It is characterised by a dense fibrous thickening, occasionally limited to the pyloric portion, more commonly involving the whole wall of the viscus but being sharply limited at the pylorus. The stomach is shrunken and the wall thickened and rigid. The fibrosis is so extensive that it has often been regarded as inflammatory or syphilitic, and the condition described as *linitis plastica*. In my own cases the mucosa has never been ulcerated. The neighbouring glands may be enlarged and hard, but those remote are rarely affected, and as a rule there is no evidence of secondary deposits in other viscera. Microscopic examination reveals extreme fibrosis, but the London Hospital cases have all contained carcinoma cells although often widely scattered. This variety appears to correspond with atrophic scirrhus of the breast.

2. *Scirrhus carcinoma.*—The fibrosis with this variety is less extensive. Most commonly found at the pylorus it generally forms a hard irregular thickening of the wall with stenosis of the canal. The peritoneal surface is nodular and thickened with infiltrated lymphatics often running over its surface to the neighbouring glands. On section the wall is much infiltrated, the mucosa usually showing a flattened area of ulceration with raised nodular edges. Although the primary growth may be small, secondary deposits are common in the glands and metastases may be widespread in other viscera.

3. *Medullary carcinoma.*—In this variety the amount of fibrosis is relatively slight. The affected portion of the stomach is much thickened, forming a firm solid tumour with a nodular irregular peritoneal surface, from which infiltrated lymphatics may run to the considerably enlarged glands. On section the walls are widely infiltrated with growth which also forms a large mass projecting into the stomach. It may be nodular with small necrotic areas or deeply ulcerated, in which case the edges

of the ulcer are raised, irregular, and necrotic. This variety is most common on the lesser curve but may be seen at the cardia and pylorus.

4. *Diffuse carcinoma*.—Very rarely there may be a widespread infiltration of the mucosa of the stomach with nodular masses of growth which are especially marked in the apices of the rugæ. The substance of the stomach wall may show slight infiltration, but the dense thickening seen in the leather-bottle stomach is absent. There are usually widespread secondaries, especially in the bones, and the condition may be associated with a profound myelopathic anaemia.

These varying forms appear to be dependent upon the amount of reactionary and protective fibrosis, but the appearance is of no prognostic value. A small pyloric scirrhus may be seen with extensive metastases or recurrence may take place shortly after removal. On the other hand a medullary growth may be so extensive that excision is performed more as a palliative measure but the patient remains free for many years.

A rare form occurring in about 5 per cent. of the total is colloid carcinoma in which the growth is made up of semitranslucent globules of colloid material. Although usually spoken of as a colloid degeneration the cells are highly malignant and there is often widespread infiltration of the walls and extensive involvement of the lymph glands, the cells in all areas showing the characteristic colloid change.

5. *Squamous carcinoma*.—It is probable that this variety always commences in the lower end of the œsophagus. At times however it forms a soft villous and ulcerated mass which spreads down the lesser curve without obstructing the œsophagus, and thus appears to be gastric in origin. The true nature of the condition may then only be determinable on microscopic section.

#### SARCOMA OF THE STOMACH

Gastric sarcoma often gives a history identical with carcinoma, and its nature may remain uncertain until microscopic sections are examined. It is a rare lesion, there being only 3 examples in my series. Of the different forms the round-celled and sometimes the lymphosarcoma give the closest resemblance to carcinomata. These may form large sessile masses three or four inches in diameter which only spread a short distance into the stomach so that a firm flat plaque may be formed. It may be ulcerated in the centre but rarely to the same degree as a carcinoma. The substance of the growth is firm and white and widely invades the stomach wall, but in the lumen appears to be sharply limited. On the peritoneal surface small raised nodular masses of growth may be seen.

#### Methods of Spread

Carcinoma usually originates in the lesser curve or pylorus, and infiltrates the wall more widely than is apparent to the naked eye. The lesser curve is however relatively short, so that any form of partial gastrectomy has to be more limited than would be considered wise with carcinoma elsewhere, and for this reason the recurrence rate is high. Fortunately the duodenum shows nearly as remarkable an immunity to the spread of carcinoma as it does to the presence of a primary growth, and hence section of the duodenum is usually simple. Occasionally small nodules of growth may be seen in the first half inch of the duodenum, but it is nearly always possible to get beyond them.

The arrangement of the lymphatic fields and the path of the lymphatic flow are so well known that it is unnecessary to describe them. In practice the two areas of involvement which may make resection difficult or impossible are the retropyloric glands and those of the lesser curve. Sometimes one of the retropyloric glands is extensively involved and may be adherent to the neck of the pancreas; great care must then be taken in determining the extent of the disease, for it is an easy matter to divide the neck of the pancreas in the belief that an enlarged gland is being dissected from it. In the lesser curve glands the disease spreads up towards the œsophagus and then down to the glands around the cœliac axis, extensive metastases in the latter situation being a frequent cause of inoperability. Even if these glands appear to be unaffected they should always be removed, and in the last few years it has been my invariable custom to divide the coronary artery close to its origin from the cœliac axis and to remove all the glands that are around it, a step which I believe has done much to improve the ultimate prognosis.

Spread to the peritoneum, and through it to the pelvis and ovaries, must always be looked for. Multiple hard secondary deposits in the great omentum or in the parietal peritoneum may be found with relatively small and otherwise easily removable growths, and the same is true of the pelvis or ovaries where large masses of growth forming the so-called Krukenburg tumour may occasionally be seen.

The frequency of secondary deposits in the liver is uncertain and erratic. A huge mass of growth may be found in the stomach with the liver quite unaffected, while a small primary growth may be seen with the liver full of large secondary masses.

Direct spread to other viscera is generally seen only in the late stages, but the pancreas is commonly involved in those cases which have followed an ulcer which has become adherent to the pancreas.

#### Symptoms

Even with the improvements in diagnosis brought about by the use of radiography and test-meals, only a relatively small number of cases are diagnosed sufficiently early to allow a radical operation. It is true that a large number of patients first seek advice when the condition is already inoperable, but there are still many who are treated for a benign lesion until the disease is far advanced. It cannot be too strongly impressed upon the physician and patient alike that the onset of persistent dyspepsia in one over the age of forty must be regarded as due to carcinoma until the contrary can be proved.

When the growth gives rise to obstruction the symptoms of obstruction always mask those of the growth. If situated at the cardia the lesion is gener-

TABLE III.—*Clinical Types*

Cardiac obstruction ..	34	Insidious onset ..	174
Pyloric ..	181	After ulcer ...	44
Sudden onset ..	28		461

ally diagnosed correctly, for it is universally recognised that steadily increasing difficulty in swallowing is most commonly due to carcinoma. These cases however, in the present state of œsophageal surgery, are the ones which are the least amenable to treatment. Fortunately they only form a small proportion of the total. In my series there were only 34 (Table III.).

It is when situated at the pylorus that the presence of carcinoma is likely to be overlooked, for stenosis

in this position may be caused by a peptic ulcer or an extragastric lesion. The short and steadily progressive history is the factor of chief import, and time must never be wasted by treating such a case with stomach washes. This is now rarely done, for it is realised that the presence of obstruction is one of the chief indications for operation even with a benign lesion. The increase of pain after the ingestion of food and its relief after the large vomits suggest a peptic ulcer, whilst the fact that even an obstruction due to a peptic ulcer will abolish the periodicity and cause loss of appetite and wasting may erroneously suggest carcinoma. This variety is relatively common, there being in my series 181 cases with some pyloric obstruction.

The position and the frequent scirrhus nature of this type of growth makes it the most favourable for operation. Nevertheless many have been watched so long that a radical removal is impossible. The important points in the diagnosis are the short and progressive history; the constant discomfort, which may be associated with real pain from gastric peristalsis; the presence of characteristic obstructive vomiting; the early loss of appetite, with decreased acidity; the evidence of a dilated stomach shown either by the presence of splashing, of a palpably contracted stomach, or of visible peristalsis; and the demonstration of a hard irregular tumour in the region of the pylorus.

With such symptoms the diagnosis of a mechanical obstruction is certain and the presence of carcinoma most probable. Operation should be advocated without delay. Radiography may confirm the diagnosis, but if the obstruction is complete may fail to distinguish a carcinoma from a benign lesion.

It is in lesions of the body of the stomach that the diagnosis is often so uncertain. As Lord Moynihan pointed out these cases may be classified into three groups: those appearing with a sudden onset, those with a slow, insidious onset, and those following an ulcer. In the first group the patient may have had a slight degree of dyspepsia which has not necessitated his seeking advice, or he may indeed have been quite unaware of any gastric trouble. The onset may be with sudden severe pain, often dating back to a definite meal. From the time of the onset the pain remains constant and is usually severe so that advice is generally sought within a few weeks, but even then the condition may be inoperable. In others the first symptom may be a severe hæmorrhage or more rarely still a perforation. The danger lies in the fact that the severity of the pain or of the hæmorrhage suggests a chronic ulcer rather than a growth, and much valuable time may be lost in giving medical treatment. This variety is relatively rare, there being only 28 in my series.

The most common form, and indeed the typical variety, is that with a slow and insidious onset, 174 cases in my series falling into this group. In the early stages the patient may only complain of loss of energy with no gastric symptoms, although if questioned he will admit to a diminished appetite. The symptoms are a steadily progressive discomfort with fullness which rarely amounts to severe pain in the epigastrium. It is constant throughout the day, although often increased by food. There may be the eructation of foul gas or of small quantities of foul and bitter fluid, and at times true vomiting. As time progresses the patient becomes depressed and anæmic and there is loss of weight. There may be visible loss of blood either in the vomit or in the stools, but if this be absent occult blood is usually found. A tumour may or may not be palpable;

even in advanced cases it may not be felt if high up on the lesser curve and under the costal margin. The test-meal usually shows a complete absence of free HCl and a low total acidity. The X ray findings are usually characteristic, there being a well-marked filling defect, a large and irregular ulcer, or an area of loss of peristalsis. The whole course of the disease as a rule only extends over a few months but is steadily progressive, although cases are seen where the history seems to extend back for a year or more. It is in this group that advice is often sought too late, or if sought early so much time is spent in investigation that when the diagnosis is certain treatment is impossible.

In my own series 44 cases were accepted as being secondary to a chronic ulcer. The carcinomatous change is suggested by definite alterations in the symptoms. They become much more constant, the characteristic periodicity being lost so that the last attack appears to be much longer. The pain becomes more constant throughout the day, although it usually becomes less severe. The appetite begins to fail, and this although the test-meal may show a relatively high acidity such as is found with the ulcer. Vomiting may cease to give relief to the pain. It is true that similar changes may occur with other complications of a chronic ulcer, but they are always suggestive and are not only an indication for surgical interference but for the performance of a partial gastrectomy even if at operation the lesion appears to be benign.

#### Treatment

The only treatment which to-day appears to offer any hope is surgical, but in my own series a radical operation was possible in only 173 of the 461 cases. Of these, 6 were treated by complete gastrectomy, an operation which is as a rule possible only in the leather-bottle type of stomach; and this leaves 167 cases of partial gastrectomy—that is, 36 per cent. of the total. In spite of the fact that so many patients do not seek advice until the condition is inoperable I cannot help but feel that these figures could be improved. A full investigation of all patients developing dyspepsia after middle age should be carried out, and unless a growth can be definitely eliminated an operation should be considered. In advanced cases operation should not be lightly refused, for not only may a large tumour be capable of removal but the patient may have a good chance of remaining free from recurrence. It is my own practice only to refuse operation if there is definite evidence of secondary deposits. Even if the disease be inoperable it is often a great solace to the relatives to know that an

TABLE IV.—Operability Rate

Period.	Total.	Removable.	Percentage.
1913-19 ..	92	26	27.9
1920-27 ..	139	49	35.2
1928-35 ..	230	101	43.9

operation was undertaken and the patient given every chance of relief. In this respect it is very hopeful to find that in my own series the operability rate has steadily improved. In the years 1913-19 there were 92 cases, 26 of which were operable—that is, 27.9 per cent. In the period 1920-27 there were 139 cases with 49 removals—that is, 35.2 per cent.—and in the last period, 1928-35, 230 cases, of which 101, or 43.9 per cent., were removable (Table IV.).

At operation a rapid survey must be made to determine the extent of the primary growth and of the lymphatic involvement and the omentum, peritoneum, and liver must be examined for secondary deposits. If the growth is operable, as wide a partial gastrectomy as possible should be performed. The limited area is that of the lesser curve, so that the line of resection must lie close to the œsophagus, about seven-eighths of the total area of the stomach being removed. The lymphatic glands of both curvatures are included, but it is not necessary to remove the whole of the great omentum unless the peritoneum be relatively widely involved. Care must be taken, in removing the glands around the pylorus, to see that all are removed and to make sure that if adherent to the pancreas this latter structure is not endangered. The duodenum is divided about one inch beyond the pylorus and the distal end closed and invaginated. The stomach is turned over to the left, thus giving free access to its posterior surface.

A step which I regard as important and which I have carried out in all my later cases is the removal of the glands around the cœliac axis. The coronary artery is identified at its origin, the lymph glands are stripped up towards the stomach, and the artery divided at its origin from the cœliac axis. The commonest site of recurrence is in these glands and a wide removal of them gives the patient a better chance of subsequent cure. The method of anastomosis is of little import. I still have a preference for the original Polya method where the jejunum is brought up through the mesocolon and united to the stump of the stomach with the afferent loop at the lesser curve, but care must be taken to leave a sufficient loop so that there is no tension upon the junction. If however there be any indication the jejunum may be united with the afferent loop to the greater curve or it may be brought in front of the colon and united with the afferent loop either to the greater (Moynihan method) or to the lesser curve (Balfour method). At one time I was very hopeful that the implantation of radium around the cœliac axis and the head of the pancreas would lessen the danger of recurrence, and use was made of it in 18 cases in 1928-30. It was found that there was a considerably greater risk of a duodenal fistula. The total mortality was approximately the same (i.e., 28 per cent.). Three of the cases treated in 1930 are alive and well to-day; that represents a percentage no better than by operation alone.

**Results of Treatment**

When a large series of cases is investigated the results are very disappointing. This is in part due to the fact that the symptoms are so indefinite in the early stages that surgical advice is not sought until too late and in part to anatomical considerations. The growth soon spreads beyond the area that is removable, and even if limited the surgeon has to be content with excising an area of healthy tissue much less than would satisfy him in removing a carcinoma elsewhere. For these reasons only a small proportion of the cases operated upon can be subjected to resection, and even in such cases the recurrence rate is likely to be high. In order to improve the patient's chances the surgeon is tempted—and indeed it is his duty with so dread a disease—to carry out a resection wherever possible. The operation is therefore always extensive and severe, and often has to be performed upon patients who are weak and debilitated from prolonged pain, loss of appetite, vomiting, and loss of blood. To a certain

extent these risks can be decreased by a preliminary blood transfusion and careful preparation. But even when all precautions are taken the conscientious surgeon is bound to have a much higher mortality with a partial gastrectomy performed for a carcinoma than for a similar operation for a chronic ulcer. Because of these difficulties the results in the earlier series were so poor that many physicians did not consider operation justifiable, and there are even a few to-day who still hold this view. In the later series however the results have improved considerably, so that there is now a danger that too optimistic a view may be taken. I have personally issued a warning of this, and lately several carefully prepared and valuable lists of statistics of the end-results have been published. It is remarkable that the majority of these, although originating in widely separated areas of the world, show a close similarity (Table V.). The greater number have found that in

TABLE V.—Reported Cases

Author.	Operated cases.	Radical operations.	Mortality.	Alive.	Years.					
					10	5	4	3	2	1
Lahey (Boston).	195	25.7 %	34 %	11	..	2	1	1	1	6
Lewisohn (New York).	265	93 (35 %)	33 %	..	3	7	..	..	..	..
De Beule (Belgium).	258	197 (76 %)	63 31 %	..	1	3	1	..	..	..
Rossi (Milan).	200	83 (41.5 %)	33 %	..	..	6	..	..	2	..
Persson.	1150	361 (31 %)	28 %	..	18		..	..	..	..
Gordon-Taylor.	..	108	30 %	..	1	8	52 % if no glands.			
Balfour.	..	45-50 %	10 %	..	20 % of all.		19 % if glands.			

only about 30 per cent. of the cases is resection possible and that the operation shows a mortality of approximately 30 per cent. Moreover only a few of the survivors were well 5-10 years after operation. An outstanding exception to these figures is the report of Balfour of the Mayo Clinic who found that 40-50 per cent. of a large series were operable and the mortality was only 10 per cent., about 20 per cent. of all cases remaining well and free from disease 5-10 years later.

Disappointing though most of these figures may be they prove beyond all doubt that a certain number of patients are cured by operation, and that therefore in the present state of our knowledge where there is no alternative treatment operation should be advised wherever possible. In my own series the most helpful and encouraging points have been that although the total resection rate has been only 36 per cent. there has been a steady improvement when the figures are considered in three seven-year periods (Table IV.) and that a definite proportion have lived sufficiently long for operation to be considered a cure. The mortality-rate of those patients subjected to resection is lamentably high and if anything tends to increase (Table VI.). I have however previously pointed out that as the surgeon's experience increases his mortality-rate tends to rise, for not only are a larger proportion of difficult cases and bad operative risks handed over to him but with an otherwise fatal disease he will attempt to save more and more patients as his dexterity increases. The operative mortality in this series was 28 per



cent., but it is of interest as showing the bad operative risks of these patients as a class, to appreciate that there were 86 patients in whom gastro-enterostomy was alone possible and among them the mortality was even higher, being 32.5 per cent. Of the 167 patients treated by resection 28 are alive and well to-day, but there were 2 others who were apparently

TABLE VI.—Operative Results

—	All operations.	Radical operations.	Deaths.	Relieved.	Alive and well to-day.	P.G.E.	Deaths.
All cases.	461	167 (36%)	48 (28%)	34	28	86	28 (32.5%)
Operated 5 years or more.	324	116 (35.8%)	31 (26.7%)	..	20	60	19 (31.6%)

cured, one dying of pneumonia four years after operation and one of nephritis two years after, both showing no evidence of carcinoma at the time of their death. There were also 4 cases in which the operation was well worth while, 2 showing no signs of recurrence until eight years, and 2 none until four years, after operation. On the other hand, of the patients alive and well to-day some have lived for too short a period to be considered as cured, those alive and well at varying time periods after operation being shown in Table VII. In order to overcome to some

TABLE VII.—Length of Survival of Cases Alive

Years.	Number of cases.	Years.	Number of cases.	Years.	Number of cases.
19	1	7	1	2	4
17	1	6	3	1	3
15	1	5	7	Total	28
14	1	4	1		
10	1	3	4		

measure the fallacy of these figures I have considered in a separate group the patients operated upon not later than 1930, and the results are shown in Tables VI. and VIII. A consideration of these tables seems

TABLE VIII.—Late Results

—	Total.	Relieved.	Alive and well.	% of operative recoveries.	% of resections.	% of all cases.
All cases.	461	34 ..	28	28 23.5	20 16.7	7.3 6
Operated 5 years or more.	324	..	20	23.5	17.2	6.1

to show that a cure may be looked for in 6 per cent. of all cases that come to operation, in about 16.5 per cent. of those in whom a resection is possible, and in about 23.5 per cent. of those who survive the resection.

These figures are poor, but at least they encourage us to work for better results and to advise operation wherever possible. If we have yet far to travel we may certainly travel hopefully.

REFERENCES

Benedict, E. B., and Allen, A. W. : Adenomatous Polypi of the Stomach, Surg., Gyn., and Obst., 1934, lviii., 79.  
 Brun, H., and Pearl, F. : Diffuse Gastric Polyposis, &c., Ibid., 1926, xliii., 559.

(Continued at foot of next column)

HYPERTENSION PRODUCED WITH BENZEDRINE

ITS PSYCHOLOGICAL ACCOMPANIMENTS

By S. A. PEOPLES, M.D.\*

AND

E. GUTTMANN, M.D. Munich †

(From the Maudsley Hospital, London)

THE fluctuations of blood pressure which accompany normal mental phenomena have been much investigated. A close connexion between blood pressure and emotions has been demonstrated here, which might be expected also to be found in the case of morbid states, especially the affective type. By the study of such physical relationship in mental illness one might hope to arrive at objective symptoms of such "functional" disorders, which are otherwise diagnosed mainly on the basis of subjective psychological phenomena. Furthermore, the reciprocal relation between emotions and their bodily concomitants suggests the possibility of a therapeutic approach from the physical side.

Pathological changes of the blood pressure are in the province of the physician rather than of the psychiatrist. The clear distinction between hypertension, as a disease sui generis, and arterio-sclerosis (of which an increased blood pressure may be a symptom) has stimulated interest in the pathology of blood pressure, and has attracted the attention not only of neurologists but of psychiatrists as well. E. Krapf has recently published a monograph on the mental disorders that occur in patients with arterial hypertension. The analysis of a large clinical material leads him to conclude that the lability of the blood pressure or its actual fluctuations play a far more important rôle in the pathogenesis of psychoses than one had previously supposed. He points out that some syndromes of different aetiology are similar or even identical, and he thinks that this may be due to the fact that fluctuations of the blood pressure are a link in the causation or perhaps supply a final

(Continued from previous column)

De Beule, F. : Ce que l'on peut attendre de la Chirurgie dans le cancer des voies digestives, Rev. belge. de sci. méd., 1931, iii., 232.  
 Eusterman, G. B., and Balfour, D. C. : The Stomach and Duodenum, Philadelphia and London, 1936.  
 Gordon-Taylor, G. : Surgical Treatment of Cancer of the Stomach, Med. Press and Circ., 1935, cxcl., 5034.  
 Hurst, A. F. : Clinical Importance of Achlorhydria, Brit. Med. Jour., 1934, ii., 665.  
 Hurst, A. F. : Precursors of Carcinoma of the Stomach, THE LANCET, 1929, ii., 1023.  
 Hurst, A. F. : Unity of Gastric Disorders, Brit. Med. Jour., 1933, ii., 89.  
 Lahey, F. H. : Cancer of the Stomach, New Eng. Jour. Med., 1935, ccxii., 863.  
 Lewishohn, R., and Maye, S. : Five-year Cures of Cancer of the Stomach, Surg., Gyn., and Obst., 1935, l., 467.  
 McRoberts, J. W. : Proc. Staff Meet. Mayo Clin., 1933, viii., 685.  
 Mills, G. P. : Multiple Polypi of the Stomach, Brit. Jour. Surg., 1922, x., 226.  
 Newcomb, W. D. : Relationship between Peptic Ulceration and Gastric Carcinoma, Ibid., 1932, xx., 279.  
 Persson, M. : Final Results of Gastric Resections for Cancer, Ann. of Surg., 1927, lxxxvi., 321.  
 Rossi, F. : Study of Cases Treated at Milan, 1919-27, Clin. Chir., 1930, vi., 1207.  
 Stewart, M. J. : Precancerous Lesions of the Alimentary Tract, THE LANCET, 1931, ii., 670.  
 Stewart, M. J. : General Relationship of Gastric Carcinoma to Ulceration, Brit. Med. Jour., 1925, ii., 882.  
 Walton, J. : Failures of Gastric Surgery, THE LANCET, 1934, i., 893.

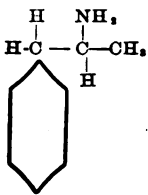
\* With the support of the British Commonwealth Fund.  
 † " " " " Rockefeller Foundation.

common pathway. His interesting theory seemed to offer a useful basis for experiment.

THE PRESENT OBSERVATIONS

These experiments were designed to answer the following question: What mental changes will take place in normal or mentally abnormal persons when their blood pressure is artificially altered?

Psychological experiments in man, especially with drugs, are always difficult to interpret, since so many individual factors must be considered; a discussion of these problems is to be found in a paper by Guttman and Maclay, who were faced with the same difficulty in experiments with mescaline. We are therefore giving here only preliminary report on some effects of Benzedrine, leaving their interpretation to a later publication in which our blood-pressure studies, including these experiments, will be more fully reported. Benzedrine is  $\beta$ -phenyl-iso-propylamine, which is similar in chemical structure to ephedrine and adrenaline. It was synthesised by Gordon Alles who with his collaborators first described its physiological action. All that is known of its action in man may be found summarised in a paper by Prinzmetal and Bloomberg on the Use of Benzedrine for the Treatment of Narcolepsy.



We made our experiments on 25 persons, all of them having two or more different doses. The drug was given orally in doses between 10 and 80 mg., in the form of 10 mg. tablets. In each subject the normal daily fluctuation of blood pressure was recorded, and the mental state was carefully considered. Each of the blood-pressure readings, mentioned below, was the lowest of a series of four readings taken at 5-minute intervals.

Among this group of 25 persons there were only 2 who did not show any reaction to the doses used. The lowest dose to which anyone reacted appreciably was 20 mg.; 22 of the patients reacted to 30 mg.

As benzedrine apparently is an adrenergic drug, its effect on the vegetative nervous system was of particular interest. On certain parts of the vegetative nervous system this was unexpectedly slight: there was no blushing or pallor and no alteration of the size of pupil, gastro-intestinal motility, perspiration, or genito-urinary function. In 7 cases series of blood-sugar readings were made during the experiment; there was no fluctuation beyond the normal limits. Respiration was unaffected. In some cases the appetite was less during the action of the drug, and about a quarter of the subjects reported dryness of the mouth.

The alterations in blood pressure were used as an index of the course and intensity of the intoxication. The latent period after the oral administration of the drug generally lay between 45 minutes and two hours. Once the action on the blood pressure had become apparent, the maximum point was reached in about an hour. The decrease was gradual; the normal pressure was reached between two and five hours after the peak, according to the dose given. In some cases, owing to external circumstances, the end-effects could not be recorded. The blood pressure always became normal within 24 hours after the administration of the drug. The intensity of the reaction apparently depends on several factors, the most important of which was the amount of the drug administered.

Thus in a typical case:—

Mr. B.—Normal pressure .. .. .	126/75
After 20 mg. .. .. .	138/88
" 40 " .. .. .	148/88

Another important factor is the constitution of the subject. As far as our general impression goes, persons with low and labile pressure reacted more than those with higher and more stable pressures. The pressure changes were chiefly systolic, the diastolic showing little or no increase, so that there was an increase of the pulse pressure. A typical reaction was, e.g. :—

Mr. C.—Initial pressure .. .. .	100/74
Maximum " .. .. .	142/84

In most cases the change of blood pressure was accompanied by an increase of the pulse-rate which was, however, not strictly proportional, as shown in the following examples:—

	Initial value.	Maximum value.
Miss N. .. B.P. 114/76. Pulse 72	B.P. 134/82. Pulse 84	
Mr. L. .. " 116/68. " 84	" 144/78. " 120	

The acceleration of the pulse usually lasted longer than the increase of the blood pressure.

As regards sleep, Alles and Prinzmetal have already observed that benzedrine will awaken experimental animals from anaesthesia and produce insomnia in man. Therefore Prinzmetal and Bloomberg introduced it into the therapy of narcolepsy. We confirmed their observation with regard to insomnia. The majority of our subjects complained of a disturbance of sleep on the night after the experiment. They found difficulty in going to sleep and woke much earlier than usual. It is interesting to note, with regard to the mode of action of the drug, that there is sometimes a discrepancy between the effect on pressure and on sleep. Three cases with marked rise of blood pressure had no insomnia, and three others slept badly and had marked psychic symptoms, although they had little or no rise of blood pressure.

EFFECTS ON THE MIND

Our results with the drug in the mental field were unexpected, considering that it so closely resembles

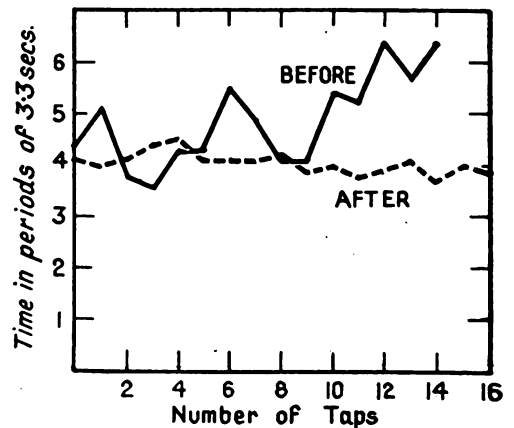


FIG. 1.—Tapping test. Normal control. Time-intervals between taps before and after 0.04 g. benzedrine.

adrenaline which produces anxiety. It is necessary, however, in this connexion to bear in mind that it also resembles ephedrine chemically, and Dr. Mapother has observed some diminution of depressive symptoms or some mild euphoria after the administration of ephedrine, given for asthma (personal communica-

tion). The systematic investigation of the psychic effect of vegetative drugs is only in its infancy (see Lindemann's valuable contribution).

The first psychic symptom which struck us was the talkativeness of our subjects. Almost everybody showed an increased tendency to talk, but the effect was most striking in depressive patients; they overcame their retardation, and several of them talked spontaneously to other people for the first time since their admission. This improvement was also visible in the patients' movements. Some of the normal subjects showed a motor restlessness. The most interesting feature was a change of mood, experienced

common type of reaction. As regards individual differences it may be mentioned in this paper only that some persons exhibited changes of mood of the kind described, although they were reluctant to admit them. The converse of this was seen in a girl—depersonalisation and anxiety state—who was the only person whose reaction reminded one of an adrenaline effect; she felt giddy, cold, shivering, and weak, yet in spite of that she felt a mild elation and noticed that she was less concerned about her worries.

To demonstrate some features of the complex mental changes we used a few simple tests—e.g., we gave the patients Kraepelin's continuous addition test before and during the intoxication and in some cases we made control experiments at various times. Sixteen cases were tested in this way; nine of them showed an increase in the number of additions far beyond the probable error and the normal increase by practice. The rest had only slight increases or none.

Also in simple tests for estimating time some changes were demonstrable. The subjects were asked to repeat several times a time-interval, tapped out from them once, and their tapping was recorded on a kymograph. Where changes occurred they always pointed in the same direction: under the effect of the drug the intervals tapped became relatively shorter compared with the tapping under normal condition, either before or a day after the administration of the drug. (If one arranges the times of the single intervals in a curve, as in Figs. 1 and 2, the drug-curve is always turned clockwise away from the normal curve.)

#### CONCLUSION

This drug is certainly effective and a promising therapeutic ally, but one cannot make use of it until it is known whether permanent administration produces anything like adaptation, habituation, or even addiction. It also will have to be observed whether and how far the disturbance of sleep and appetite interfere with the therapeutic effect. The lines of further inquiry have been the change of tolerance, the reactions of depressions of different kind to the medication, and the effect of the drug on other psychopathological phenomena. These will be the subject of a further publication.

We wish to acknowledge our gratitude to Dr. E. Mapother for his kind permission to use the clinical material of the Maudsley Hospital and to Dr. F. Golla for putting at our disposal the facilities of the Central Pathological Laboratory. We also wish to thank Dr. G. Alles for the generous supply of the drug and for his many useful suggestions.

#### REFERENCES

- Alles, G.: Comparative Physiological Actions of the di-B-Phenylisopropylamines. I. Pressor Effect, *Z. Pharmacol. and Exper. Therap.*, 1933, *xlvii*, 339.  
 Alles, G., and Prinzmetal, M.: The Comparative Physiological Actions of the di-B-Phenylisopropylamines. II. Bronchial Effect, *Ibid.*, 1933, *xlviii*, 161.  
 Guttmann, E., and Maclay, W. S.: Mescaline and Depersonalization, *Jour. Neurol. and Psychopath.*, 1936, *lcviii*, 193.  
 Krapp, E.: *Die Seelenstörungen der Blutdruck-Kranken.*, Leipzig and Vienna, 1936.  
 Lindemann, E.: The Psychopathological Effect of Drugs Affecting the Vegetative System, *Amer. Jour. Psychiat.*, 1934-35, *xci*, 933.  
 Prinzmetal, M., and Bloomberg, W.: Use of Benzedrine in the Treatment of Narcolepsy, *Jour. Amer. Med. Assoc.*, 1935, *cv*, 2051.

QUEEN'S HOSPITAL FOR CHILDREN, HACKNEY.—The Duke of York presided over the annual court of governors of this hospital on April 29th. Over £16,000 towards the £30,000 needed for the first stage of the development programme has now been received and work on a new out-patient department is to begin immediately.

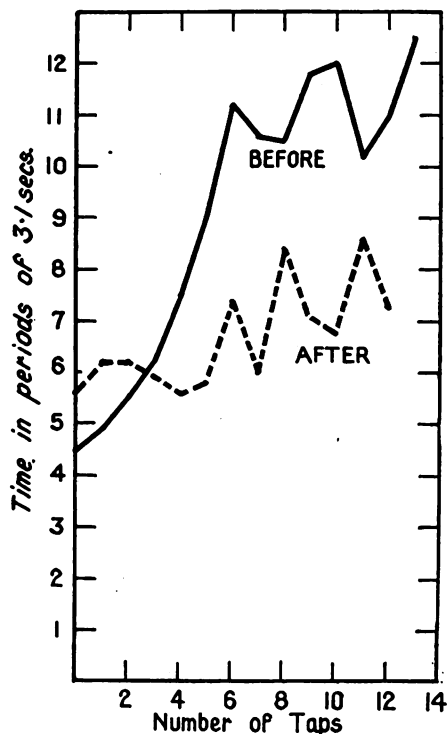


FIG. 2.—Results of same test in a depressed patient. Before and after 0.03 g. benzedrine.

in nearly every case. In no instance was anxiety produced or a depression deepened. The change was generally in the direction of euphoria. We shall give some examples of the subjective experience without attempting a detailed analysis of the underlying psychopathology.

One of our normal subjects said that she felt extremely elated, that she had no worries. She felt that the lectures she listened to were extremely lucid and interesting. She also reported an unusual self-confidence. She felt physically equal to any task. Another subject, a mildly depressed patient, stated that she felt full of energy and confidence, that she could think clearly and had no worries. She called herself "an exulted being." Another patient (depression with mild paranoid features) at first said he felt as if he were drunk. As this passed off, everything seemed brighter and more interesting. He felt relaxed and not restless as he was at other times. He ceased to have difficulty in concentration, so that he was now able to read a newspaper again; his worries had gone for the time being, he felt quite happy, realising that his previous paranoid ideas were unfounded.

These few examples may suffice to illustrate the

## PUERPERAL SURGICAL SCARLET FEVER

By A. H. G. BURTON, M.D., M.R.C.P. Lond.,  
D.P.H., D.P.M.

MEDICAL OFFICER OF HEALTH, ILFORD, AND MEDICAL SUPER-  
INTENDENT OF ILFORD ISOLATION HOSPITAL AND  
SANATORIUM; AND

J. H. WEIR, M.D., B.Hy. Durh., D.P.H.

ASSISTANT M.O.H., ILFORD, AND RESIDENT MEDICAL OFFICER TO  
THE ISOLATION HOSPITAL AND SANATORIUM

DESPITE the universal recognition of scarlet fever occurring in the puerperium, no clear conception of its pathogenesis or of its relation to ordinary scarlatina has yet been enunciated. THE LANCET, in a leading article in 1922, stated that the relation between puerperal sepsis and scarlet fever in the puerperium was not fully cleared up, although much attention had been given to it. The article criticised the contention that when puerperal sepsis and scarlet fever were concurrent they were in fact distinct and separate infections.

The earliest recorded observations on the subject appear to be those of Hamilton (1470), Welsh (1635), and Ludwig (1758), all of whom described conditions which were probably puerperal scarlet fever. After that there is nothing of note until classical accounts of the disease were given by Malfatti (1799) and Senn (1826) with whose observations most clinicians of the nineteenth century were in agreement and from whose findings two schools of thought emanated. The one held that the condition was a coincidental and concurrent simple scarlet fever complicating the puerperium, while the other maintained that the malady was a scarlatiniform erythema and merely a symptom of puerperal infection. These ideas found acceptance by many observers in the present century; for instance, Byers<sup>1</sup> notes that two types of scarlatiniform rashes may be encountered—mild and severe—but maintains that *true* scarlatina is rarely seen during the puerperium. In his opinion so-called puerperal scarlatina is practically always a form of septic infection with a rash only resembling the eruption seen in true scarlatina. Other writers, Thorp,<sup>2</sup> Cozzolino,<sup>3</sup> and Robinson,<sup>4</sup> on the contrary, record cases of definite scarlatina in the puerperium which were followed by simple scarlatina in other members of the same households, many being in newly born infants.

Delorme<sup>5</sup> holds a similar opinion in regard to the two varieties of puerperal scarlatina, and in support of his views cites certain peculiar features such as the absence of sore-throat, associated with little or no uterine infection in certain cases. De Lavergne and Fruhinsholz<sup>6</sup> conclude that there may be a specific puerperal scarlet fever different from the true scarlet fever that may also complicate the puerperium. They point out that certain cases of puerperal scarlet fever appear to have their path of infection by way of the genital tract and that these are notable for the absence of the typical buccopharyngeal picture of scarlet fever, in which it is admitted that the principal mode of infection is by droplets. Devraigne<sup>7</sup> agrees with their opinions and offers the so-called "phenomenon of Cantacuzène" as a possible hypothetical explanation. It is suggested that scarlatina is due to the combined action of a streptococcus in the cervix, an attendant supplying an ultravirus.

Baize and Mayer,<sup>8</sup> basing their observations on six cases in the Maternity Hospital at Lariboisière, find that the disease tends particularly to affect primiparæ,

especially on the third to fifth day after delivery. In most cases, they state, the source of infection cannot be discovered and the symptoms differ but slightly from those of ordinary scarlet fever. Most of their cases were also associated with signs of puerperal sepsis. The patients were transferred to the Hôpital Claude Bernard and the death-rate is not recorded.

Probably the most authoritative study on the subject in recent years is that of Lemierre and Bernard,<sup>9</sup> who base their conclusions on a critical examination and survey of 23 cases treated in the Hôpital Claude Bernard. They note: (1) the rarity of scarlet fever in pregnancy and after abortion, as opposed to its relative frequency in the puerperium, whether after a normal or an instrumental delivery; (2) the incubation period, 2-5 days after confinement, and therefore comparable to ordinary scarlet fever; (3) the abrupt onset characterised by pyrexia, malaise, vomiting, sore-throat, and headache, atypical cases presenting symptoms no more diverse than the varieties commonly encountered in ordinary scarlet fever; (4) the physical signs—eruption, "streptococcal tongue," facies, throat lesion—followed by a convalescence pursuing the same course and marked by the same complications as typical scarlet fever; (5) a positive Schultz-Charlton reaction whenever it was possible to perform the test in the early stages of the rash; (6) the similar results given by laboratory investigation of the bacteriology, hæmatology, and biochemistry of the two conditions, hæmolytic streptococci being found in the local lesions or in septic complications; and (7) a death-rate of approximately 15 per cent. They conclude that non-*puerperal* scarlatina and *puerperal* scarlatina are identical.

Of the 23 cases, however, there were only 14 in which the illness began within the normal incubation period of scarlet fever; the onset of some was as late as the nineteenth or twenty-third day and they cannot therefore be regarded as ordinary cases of "puerperal" scarlet fever, even if they were preceded by signs of puerperal sepsis.

It is clear that puerperal scarlet fever may be due to a specific infection either immediately before the confinement, or at the time of the confinement, or during the puerperium. The death-rate of scarlet fever following puerperal sepsis must not be therefore compared with the death-rate of scarlet fever arising from a specific infection at the confinement. Of the 12 patients in this latter group 3 died, 3 gave a positive blood culture for hæmolytic streptococci (of these 2 died), and several showed signs of puerperal sepsis; one infant died of septicæmia, another of erysipelas, and a third was born dead. Considering therefore only these 12 patients, the maternal mortality was 25 per cent. and the infantile mortality the same—a sufficient indication of the gravity of puerperal scarlet fever.

Warembourg and Demarez<sup>10</sup> give the following characteristics of puerperal scarlet fever: (1) it occurs in epidemics coincident with those of puerperal sepsis; (2) it is exceptional in pregnancy or after an abortion, but most frequent in the puerperium 2-5 days after the confinement; (3) there are rarely signs of infection in the genital organs; (4) it leads to death in a large proportion of cases. They consider that the infective organisms usually enter through the genital organs and only rarely through the nasopharynx.

The close connexion between scarlet fever and puerperal fever is shown by certain cases in a private nursing-home in Ilford.

On Oct. 8th, 1935, a patient with puerperal fever was removed to the London Hospital, where hæmolytic streptococci were found in her cervix. A throat swab was not taken.

On Oct. 14th a second case of puerperal fever was notified which was removed to the isolation block at Queen Charlotte's Hospital, where she died of general peritonitis. Hæmolytic streptococci were not found in a swab from the throat of the patient, but some of the same type as in the first case were cultured from her cervix. It was stated that the hæmolytic streptococci were not of the ordinary scarlatinal type but fell within an unusual group not generally accepted as causing scarlet fever, although the patient had a well-marked rash, peeling of the skin, &c., before she died.

On Oct. 18th the child of the keeper of the nursing-home was notified as suffering from scarlet fever.

The mode of infection in puerperal scarlet fever has been little studied. Okell<sup>11</sup> concludes that there are two conditions coming under this title—an ordinary scarlet fever due to primary faucial infection, and a primary infection of the uterus itself by a streptococcus of high toxigenic power. This would explain the varying death-rates given by various observers.

We would suggest that the second class of cases mentioned by Okell should be regarded as essentially a surgical scarlet fever with the local lesion in the genital tract, taking the form of either a streptococcal endometritis or, more probably, a streptococcal cervicitis. From this focus of infection streptococcal toxins are liberated into the general circulation and produce the characteristic picture of scarlatina, just as in ordinary scarlet fever they are evolved from the local throat lesion, or in common surgical scarlet fever from an infected wound. It may also be recalled that the injection of Dick toxin in active immunisation occasionally produces a "miniature scarlet fever," shown by malaise, sore-throat, vomiting, and a generalised rash. Locally the streptococcus produces the usual effects of puerperal sepsis.

The following is a typical case of surgical scarlet fever admitted to the Ilford Isolation Hospital on Oct. 31st, 1935.

Male, aged 4. Septic focus over tubercle of left tibia, followed three days later by sore-throat and malaise; next day he had headache and he vomited several times; two days later he developed a typical scarlatinal rash. Admitted to hospital on second day of rash. Examination showed intense generalised scarlatinal rash, the throat injected, oedematous, and exudate on the right tonsil. Faint circumoral pallor present. Septic focus on left leg at site mentioned, with free purulent discharge. Treatment: Scarlatinal antitoxin 18 c.cm. intramuscularly. Bacteriology: Throat swab; no streptococci present in cultures. Swab from septic focus on leg; hæmolytic streptococcus present in cultures, inagglutinable with type sera. Progress: Uninterrupted recovery; Dick test positive on eleventh day after serum; passively immunised with 5.0 c.cm. of scarlatinal antitoxin. Discharged Nov. 30th.

#### AN ACCOUNT OF THREE CASES

Three patients with puerperal pyrexia, all of which proved to have scarlet fever, were admitted to the Ilford Isolation Hospital in the autumn of 1935. The following is a summary of them.

**CASE 1.**—Aged 29; 3-para. Normal delivery of full-time child Sept. 24th, 1935. Small perineal tear repaired with one suture. Normal puerperium until Sept. 26th, when she complained of general malaise, headache, and dry throat. Slight rigor, Sept. 27th, followed by the appearance of a generalised scarlatinal rash.

*On admission* on Sept. 28th her general condition was good. There was a generalised scarlatinal eruption, injection of fauces; tongue thickly coated, becoming

subsequently typically "strawberry." The uterus was rather bulky; no tenderness or swelling indicative of local inflammatory condition; lochia normal and not offensive. One perineal suture in situ showing superficial sepsis. Diagnosis: Puerperal scarlatina.

*Bacteriological findings:* Throat swab: *Streptococcus viridans*, no evidence of *S. hæmolyticus*. Swab from cervix showed *S. hæmolyticus*, inagglutinable with the usual scarlet fever type sera. Treatment: Sept. 28th, scarlatinal antitoxin 20 c.cm. and 30 c.cm. intramuscularly. Sept. 29th, scarlatinal antitoxin 30 c.cm. intramuscularly. Progress: After a preliminary fall in temperature on Sept. 28th and an evening rise on the 29th, the temperature finally fell to normal 12 hours after the third dose of intramuscular serum. Since then recovery was uneventful and no further treatment was necessary beyond the removal of the perineal suture and the insertion of antiseptic pessaries. She showed, however, a typical scarlet fever desquamation.

**CASE 2.**—Aged 28; 2-para. Normal delivery of full-term child on Oct. 8th, 1935, by the same doctor as in Case 1. Episiotomy performed and repaired by one perineal suture. Some difficulty in micturition was experienced for four days after confinement. On the 14th she complained of headache and generalised scarlatinal rash appeared.

*On admission* on the 14th her general condition was good. There was a generalised scarlatinal eruption, injection of fauces and bright punctate rash on palate; tongue furred, subsequently becoming typically "strawberry"; no abdominal abnormality. The uterus was midway between umbilicus and symphysis; lochia profuse but normal and inoffensive; one perineal suture in situ. *Diagnosis:* Puerperal scarlatina. *Bacteriology:* Cervical swab: hæmolytic streptococci on culture, inagglutinable with type sera. Throat swab: no evidence of hæmolytic streptococci on culture. Treatment: Oct. 14th: scarlatinal antitoxin 48 c.cm. intramuscularly. Progress: Eight hours after the administration of the serum the temperature fell to normal, and by the next day the rash had almost disappeared. The patient felt greatly improved and stated that she was well enough to get up. She continued to improve until Oct. 18th when some hypogastric pain and tenderness were manifested. On examination the uterus was found to be half-way between the umbilicus and the symphysis, the left broad ligament structures to be enlarged and tender, and the lochia profuse but otherwise apparently normal and inoffensive. Following hot douches and the local application of heat the condition resolved in about 14 days, leaving no trace of broad ligament thickening or uterine enlargement. The patient desquamated in a typical manner.

**CASE 3.**—Aged 30; primipara. Instrumental delivery of full-term living male child on Oct. 18th by the same doctor as Cases 1 and 2. Perineum torn; two sutures inserted. Rise of temperature on the 20th, accompanied by slight headache, sore-throat, and malaise. Appearance of scarlatinal rash on the 21st.

*On admission*, on the same day, there was a generalised scarlatinal rash (intensity ++++) most marked on abdomen; throat markedly injected but no oedema; exudate on right tonsil; tongue white "strawberry." Punctate rash on palate. The uterus was four fingers-breadth above the symphysis pubis; lochia not offensive; cervix oedematous and badly lacerated without any extensive tearing. *Diagnosis:* Puerperal scarlatina. Treatment: Three intramuscular injections of scarlatinal antitoxin were given: 48 c.cm. on Oct. 21st, 30 c.cm. on the 22nd, and 48 c.cm. on the 23rd. *Bacteriology:* On Oct. 21st and again on the 30th cultures from throat swabs showed no evidence of hæmolytic streptococci. A cervical swab taken on Oct. 21st showed hæmolytic streptococci on cultures, inagglutinable with type sera. Progress: The temperature fell on the third day after admission and remained normal until the ninth day when it rose to 100.8° F., thereafter remaining intermittent for the next nine days. During this time the patient had a very severe attack of serum rash which doubtless was the cause of the pyrexia. Since then the temperature remained afebrile. The uterine condition rapidly cleared up and, although the

lochia became purulent and a small rectovaginal fistula caused some trouble, the whole local lesion had cleared up by the end of the fourth week. The convalescence was otherwise uneventful although accompanied by a very extensive, coarse desquamation.

The salient point in this series is that while each patient developed the typical syndrome of scarlet fever—including a well-marked faucial lesion, strawberry tongue, and brilliant rash followed by widespread desquamation—no hæmolytic streptococci were cultured from faucial swabs, yet in each case hæmolytic streptococci were demonstrable in plate cultures of cervical swabs. The three cases mentioned occurred in the practice of one medical practitioner in whom repeated throat and nose swabbing failed to demonstrate the presence of hæmolytic streptococci. It appears therefore that in these cases the local lesion and probable point of entrance of infection was the uterine cervix. The general manifestations—rash, toxæmia, &c.—arose from the absorption of toxin from the cervix, as also did the oral and faucial lesion noticed in all cases. In other words, the evolution of physical signs was similar to the process involved in surgical scarlet fever or in the "scarlatinoid syndrome" which may occur during active immunisation with Dick toxin. It will be further noted that all the cases quoted ran the usual course of ordinary scarlet fever both in the acute and convalescent stage.

Treatment by serotherapy in each instance was attended by most gratifying results; certainly none suffered as a consequence, and no serious complications developed. Having regard to the severity of the acute stages encountered it appears that definite credit must be attached to the serum administration. It seems extremely problematical whether such a response would have followed treatment without the use of antitoxin. The absence of mortality is striking when contrasted with the figures quoted by Benthin<sup>12</sup>—viz., those of Gahet (8.7 per cent.), Schmidt (12 per cent.), Posch (16 per cent.), Olshausen (48 per cent.).

This view does not accord with that expressed by Benson and Rankin,<sup>13</sup> and Colebrook<sup>14</sup>; both agree that serum is of little avail in puerperal sepsis, and the latter maintains that in many instances it is actually harmful. On the other hand, Selwood Lindsay<sup>15</sup> found that definite benefit accrued when serum was given at an early stage in adequate doses; it is well to note this analogy.

For this reason we feel that the use of scarlatinal antitoxin should not be abandoned in the treatment of puerperal sepsis, that it is most emphatically indicated in puerperal scarlatina, and that many other non-eruptive cases of puerperal streptococcal infection may derive some benefit from its early administration.

#### SUMMARY AND CONCLUSIONS

(1) The three cases of puerperal scarlet fever described were all in the practice of one medical man. None showed hæmolytic streptococci in the throat, but all showed them in the cervix; the organisms were all inagglutinable with the ordinary scarlet fever type sera.

(2) The nose and throat of the doctor concerned and of those in attendance, who were different in each case, were negative for hæmolytic streptococci, indicating that the disease was not a droplet infection.

(3) It is suggested that these cases of puerperal scarlet fever, in which the organism is located in the cervix and not the throat, are properly described

as *puerperal surgical scarlet fever*, and the prognosis is probably quite different from those in which the organism is found in the throat.

(4) Puerperal fever without a rash, when due to a hæmolytic streptococcus, does not differ from puerperal surgical scarlet fever except in some cases, in the type of organisms, and in others, in the susceptibility of the patient.

(5) Definite benefit accrued in each case from the administration of scarlet fever antitoxin. Although they do not admit of definite proof, we believe that the results would not have been so favourable had the cases been treated by any means other than serotherapy.

(6) Despite recently adduced evidence to the contrary, we are of the opinion that all such cases—and many others of puerperal sepsis, even when no scarlatinal rash is manifested—would be benefited by the early administration of an adequate amount of scarlet fever antitoxin.

#### REFERENCES

1. Byers, Sir J.: *THE LANCET*, 1912, ii., 532.
2. Thorp, E.: *Ibid.*, 1922, ii., 660.
3. Cozzolino: *Pediatrics*, June 1st, 1922.
4. Robinson, J. H.: *THE LANCET*, 1922, i., 371.
5. Delorme, J.: *Thèse de Paris*, 1930, No. 44.
6. de Lavergne, V., and Fruhinsholz, A.: *Gynéc. et Obstet.*, 1928, xviii., 1498.
7. Devraigne, M. L.: *Revue méd. franç.*, 1930, xi., 593.
8. Baize, P., and Mayer, M.: *Presse médicale*, 1929, xxxvii., 1007.
9. Lénierre, A., and Bernard, J.: *Bull. et mém. Soc. méd. d. hóp. de Paris*, 1934, i., 160.
10. Warembourg and Demarez: *Paris méd.*, 1935, i., 124.
11. Okell, C. C.: *THE LANCET*, 1932, i., 872.
12. Benthin, W.: *Deut. med. Woch.*, 1928, liv., 727.
13. Benson, W. T., and Rankin, A. L. K.: *THE LANCET*, 1933, i., 848.
14. Colebrook, L.: *Ibid.*, 1935, ii., 1433.
15. Lindsay, H. F. S.: *Brit. Med. Jour.*, 1935, ii., 6.

### THE TREATMENT OF VESICOVAGINAL FISTULA WITH SPECIAL REFERENCE TO IMPLANTATION OF THE URETERS

BY G. STEWART WOODMAN, M.B. Durh.,  
F.R.C.S. Edin.

LATE PROFESSOR OF CLINICAL SURGERY, BAGHDAD

THIS article consists of a summary of work carried out under conditions which for many reasons, chiefly the lack of a trained nursing staff, would nowhere be regarded as satisfactory. The series covers two periods as shown in the Table. (In 1922 and 1923 my duties were in a male hospital only.) A number of cases operated on during the three years 1925-27 have not been included as I have been unable, owing to administrative difficulties, to trace their records.

Year.	Cases.	Methods of treatment.			
		Suture.	Deaths.	Implanta- tion.	Deaths.
1921 and 1924	11	4 (6)	0	7 (12)	1
1928-33 ..	43	28 (30)	0	15 (25)	4
Total ..	54	32 (36)	—	22 (37)	5

The figures in parentheses indicate the actual number of operations.

*Causation.*—The patients were all Arabs (Muslim, Jew, or Christian), and only one of them was literate. The fistula was always the result of difficult labour,



often under tribal conditions and always in the absence of any medical aid. There were two exceptions: in the first a large calculus had perforated the vaginal and vesical walls, and the second followed the removal of the cervix uteri and the application of radium after a vaginal hysterectomy, both of which operations were performed in another country.

*Associated injuries.*—The commonest were perineal lacerations and all degrees of vaginal scarring—a "sump" between a posterior cicatrix and the cervix was noted in four cases. Two women had a recto-vaginal fistula as well, and in three a urethrovaginal fistula was also present. All gave a history of a stormy puerperium and the majority had phosphatic vaginal incrustations and vulval ulceration, often severe.

*Fistula.*—The duration of the longest fistula was two years, of the shortest six weeks. The opening was always partly in the midline, indicating its site of origin. Its size varied from that of a small date-stone to a gap admitting four fingers in which most of the vesical mucous membrane was either prolapsed or visible. With little or no vaginal scarring its long axis was parallel with that of the vagina; with gross scarring the opening was largely transverse. The ultimate shape appears to depend on the pull of the cicatricial tissue, and the size seems, at any rate in part, directly proportional to the period during which the presenting part remains impacted. In a patient who had been five days in labour the anterior lip of the cervix had also sloughed.

*Suture per vaginam.*—This operation was performed in 32 cases. It has been my experience that, so long as the internal vesical sphincter is not involved in the fistula, and even in the presence of the grossest vaginal cicatrices with retraction and fixation of the anterior and occasionally the posterior vaginal wall also, it is possible to close the opening by a relatively simple vaginal operation. In 1921, before appreciating this fact, attempts at vaginal repair failed in two cases because the sphincter involvement had not been noted. The chief essentials are generous excision of scar tissue, adequate but not excessive mobilisation, and careful paring of the vesical and vaginal edges of the fistula, combined with *accurate suture without tension*. Two rows of interrupted No. 0 Kalmerid catgut sutures are placed, one in the submucous and one in the muscle coat of the bladder. A third layer approximates the vaginal mucous membrane as far as possible at right angles to the line of the vesical layers. The vagina is lightly packed with gauze wrung out of equal parts of acriflavine and paraffin, and the bladder is drained by catheter (except when the patient pulls it out). Gauze and catheter are changed daily, and the latter is dispensed with after the seventh day.

In no case without sphincteric involvement has the vaginal operation failed. In two women a second operation was required to close a small leak at a lateral angle of a transverse fistula. In the presence of a transverse fistula with much scarring, suture of the angles of the wound, where a leak is most likely to occur, requires much care and thoroughness in a confined space. In these two cases the leak was due, I feel sure, to inadequate excision of scar tissue, although in both a great deal was removed. The maintenance of the patient in the best position for the surgeon is much aided by placing a large sandbag under the buttocks and by employing a modified Trendelenburg position with shoulder supports. Prof. Grey Turner tells me he finds the prone position with a pelvic support a great help, as it allows the

surgeon to view and work in the operation area from above instead of from below. I have no experience of suturing the bladder mucous membrane from a suprapubic wound as is, I understand, done by some. In straightforward cases it seems an unnecessary procedure which should be reserved for unusually difficult cases where at operation it is not found possible satisfactorily to close the fistula from below.

#### IMPLANTATION OF THE URETERS INTO THE RECTOSIGMOID

In this group there were 22 patients, in all of whom the fistula involved the internal vesical sphincter.

(A) *Stiles's operation* (18 cases).—I am much indebted to Prof. Grey Turner who in 1921 so kindly put me in touch with Stiles's original paper<sup>1</sup> written in respect of ectopia vesicæ, to the treatment of which he himself has made such notable contributions.<sup>2</sup> Except in one of the cases complicated by rectovaginal fistula, the ureters were implanted at intervals of 2-3 weeks through paramedian incisions. A remarkable feature has been the almost complete absence of adhesions, the presence of which might have been expected in patients with such histories—a tribute to the possibly insufficiently recognised powers of the peritoneum.

In the early operations the right ureter was first implanted because, owing to its greater distance from the bowel, it is the more difficult to implant in good alignment. In these the peritoneal incision to expose the ureter was made directly over it; later this incision was made parallel and just lateral to the right border of the bowel with curved upper and lower ends. By turning outwards the resulting peritoneal flap, the isolation of the ureter with its vessels intact and its implantation in good alignment was made easier. It was also found that a low implantation of the right ureter left ample room for the subsequent implantation of its fellow. In the sixth case after isolation and division of the right ureter, there was doubt of the adequacy of the blood-supply of its lower end,  $\frac{3}{4}$  in. of which was therefore excised and a higher implantation effected. In a later patient a similar condition was similarly treated. These experiences and the fact that the blood-vessels of the left ureter, owing to its greater proximity to the bowel, are in less danger, led me to continue to implant the right ureter first. Mayo's catgut guide has not been used. In one case only, where a firm adhesion necessitated a higher implantation of the left ureter than usual, have adhesions in any way impeded the second transplantation. A recent interesting note on technique by Everidge,<sup>3</sup> who refers to Nitch's work,<sup>4</sup> has afforded me the pleasure of reading the latter's views. He also advocates excision of any terminal portion of ureter of doubtful vitality and a higher implantation, as was done in my two patients. In a two-stage operation he recommends implantation of the left ureter first and gives reasons for this preference. His main one—a tendency of the pelvic colon to form an adherent sheet over the implanted right ureter—I have not encountered.

In the first of the two cases complicated by a recto-vaginal fistula (the second is reported below) an inguinal colostomy was prepared, and after implanting both ureters through a midline incision by Stiles's method at one sitting a large tube was sutured into the rectum in an endeavour to deflect the urine from the recto-vaginal fistula. The colostomy was opened after 24 hours. The tube was only partially successful and the recto-vaginal fistula was completely closed after two attempts. The artificial anus was then closed.

Here Coffey's catheters would have been of great value, but neither they nor sufficiently fine tubing were available. Despite their absence, it would I feel have been preferable after making a colostomy, first to close the rectovaginal fistula and drain the bladder by a tube of suitable size sutured into the vesicovaginal fistula to prevent leakage, and after a suitable interval to implant the ureters.

Of these 18 patients three died, one from peritonitis due to sloughing of the ureter following an attempt to close a ureteric fistula, the result of an unsuccessful implantation performed during my absence on leave, and one from pneumonia on the sixth post-operative day. In the latter there was no evidence of abdominal trouble but a post-mortem was not obtained. The third death took place on the tenth day and at post-mortem acute pyelonephritis was present in both kidneys.

(B) *Coffey's No. 2 (catheter) technique*<sup>5</sup> (1 case).—Both ureters were implanted at one operation, as Coffey recommends when catheters are used.<sup>6</sup> A block in the left catheter on the second day was cleared; ureterostomy for a further blockage on the fourth day did not save the patient.

(C) *Coffey's No. 3 (transfixion suture) technique*<sup>7</sup> (3 cases).—One patient died of shock 24 hours after operation, a result, I think, partly due to the use of spinal anaesthesia in a debilitated person. In the next patient the ureters were implanted at twenty days' interval, and the third refused a second operation after a successful implantation of her right ureter. The general condition of the patients operated on by this method was in marked contrast to that of those in which Stiles's technique was used. Restlessness, elevation of temperature, lumbar pain—frequently severe—and drowsiness were all noted before the establishment of the recto-ureteral fistula and their convalescence was more protracted.

Under the conditions referred to at the beginning of this paper the use of Coffey's catheter method was perhaps not justified. The few cases in which his transfixion suture was used do not permit of its comparison with Stiles's method, which, apart from my greater familiarity with it, I prefer on account of its greater simplicity and the appreciably shorter time it occupies.

#### DRAINAGE: ANÆSTHESIA

Drainage was only twice employed in the whole series—in the fatal case of ureteral fistula and once when at the second implantation the suture line was considered unsatisfactory and a piece of omentum was sown over it. The latter case did well. When Coffey's methods were used drainage was not employed as he recommends, though his is a very different type of case in which the possibility of infection seems to be much greater. The peritoneal incision made to isolate the ureter has always been closed. Great difficulty has been experienced in persuading the patient to remain in hospital for a period sufficient to cover both operations. Four women refused a second operation after the right ureter had been successfully implanted. It is difficult to convince an illiterate patient that she is really half cured; she notices only the persistence of the vaginal discharge of urine, not its diminution in volume, and her wish to be cured is overcome by the call of the desert and her desire to escape from the strange and, to her, uncongenial hospital atmosphere.

*Anæsthesia.*—Chloroform was used for the first 12 operations, intrathecal Tutocaine for 19, and intrathecal Percaine for 23. I prefer the latter which, in 20 c.cm. ampoules of a 1/1500 solution,

permits of accurate dosage. In the Royal Hospital, Baghdad, spinal anaesthesia has been employed for most abdominal operations for the past ten years, and I am satisfied that under local conditions it is the method of choice, both for vaginal suture and for implantation of the ureter.

#### RESULTS

Illiterate patients largely nomadic in habits and drawn from a vast area have made a follow-up practically impossible. Two patients have, however, been traced and each presents features of interest.

CASE 1.—Aged 15. Admitted to the Royal Hospital on May 12th, 1929, with a large vesicovaginal fistula admitting three fingers and involving the internal vesical sphincter, the result of difficult labour six weeks previously. The right ureter was implanted on May 15th and the left ureter on May 31st. After a straightforward recovery she left hospital on June 17th and was advised to report should she again become pregnant. She returned on May 9th, 1931, in labour with the fetal head arrested on the perineum. A healthy 6½ lb. boy was easily delivered with forceps. She stated that before the advent of pregnancy her bowels were opened 3-4 times daily and only rarely at night, and during pregnancy 5-6 times daily and generally once at night. Her general condition was good and the abdominal scars were sound. The old fistula admitted the tip of the index-finger into a contracted smooth-walled bladder. A radiographic estimate of renal function was postponed and she left hospital on May 19th after a normal puerperium. Later through the courtesy of the Brigadier commanding the Iraq Levies she was traced and brought down from the Kurdish mountains. Excretion urography with Uroselectan on Dec. 17th, 1931, showed a moderately large right-sided hydronephrosis with marked dilatation of the right ureter, but with no apparent abnormality in either the left kidney or ureter. She appeared to be in excellent health, and her only complaint was that she had been brought to hospital when she considered she was quite well. The right kidney was palpable but not tender. Sigmoidoscopy was refused and blood was not obtained for urea estimation. She again returned in January, 1935, pregnant for the third time (second post-implantation pregnancy), and came under the care of my colleague, Prof. D. A. D. Kennedy, at whose kind invitation I was present when on Jan. 13th he performed Cesarean section (the patient was in labour) and divided the Fallopian tubes. Inspection of the ureters showed the right ureter considerably dilated and three times as large as the left, which was much thickened and about twice its normal diameter. Her general appearance belied the previously known condition of her right kidney which was not noticeably more enlarged and not tender. On Feb. 4th uroselectan showed a slight increase in the dilatation of the right kidney. The left kidney was again reported normal. The old fistula showed no change. Sigmoidoscopy was again refused and after an uneventful recovery she left hospital on Feb. 5th.

CASE 2.—A 3-para, aged 24, was admitted on Sept. 3rd, 1929, with a vesicovaginal fistula involving the proximal urethra and admitting four fingers. The bladder was almost inverted, its mucous membrane in contact with a posterior vaginal wall covered in phosphatic deposit and much scarred. After treatment the right ureter was implanted on Sept. 21st and the left ureter on Nov. 27th. The persistence of a small amount of urinary discharge from the vagina led to its re-examination, which showed a small rectovaginal fistula about three inches above the torn perineum. No faecal matter escaped by that route, and as it was still unhealed on Jan. 12th an unsuccessful attempt was made to suture it. The patient left hospital to earn the family living as her husband was blind. She was next seen on June 17th, 1934, five years later, as an in-patient in a medical ward. She stated she had remained fairly well for four years; menstruation, previously regular, had ceased one year ago. Febrile attacks with shivering and left lumbar pain, occasionally severe, had been noticed, but recently these had ceased. For several

months there had been some faecal matter in the vaginal discharge. Her general condition was very poor; pulse-rate, 110; temperature, 99°-100° F. There was oedema of the feet but no ascites. Chronic bronchitis with much mucopurulent sputum was present. The rectovaginal fistula admitted the tip of the index-finger. Intravenous urography showed a faint definition of the calices of the right kidney and a complete absence of secretion on the left side. The blood-urea was 0.68 mg. per 100 c.c.m. After a blood transfusion of 150 c.c.m. the temperature rose to 105° F. but settled two days later, when a blood count showed: red cells, 1,400,000; hæmoglobin, 25 per cent.; colour-index, 0.89; leucocytes, 6900 (polymorphs 85 per cent., lymphocytes 12 per cent., mononuclears 2 per cent., eosinophils 1 per cent., basophils nil). The left kidney was removed on July 2nd under combined local and general anaesthesia. It was small and consisted largely of fibro-fatty tissue with no obvious cortex. The ureter was much thickened but only slightly if at all dilated. The patient stood the operation remarkably well, and her general condition on July 6th when I proceeded on leave was hopeful. Later she gradually went downhill and died on August 12th. Post mortem the right kidney was larger than normal. The capsule stripped easily, and a few small cysts were seen on the subcapsular surface, particularly over the lower pole. On section the whole organ was paler than normal, the cortex was diminished, and the cut surface presented multiple small cysts containing clear fluid. The calices showed a mild degree of hydronephrosis. There was no definite indication of inflammatory change and neither abscesses nor infarcts were present. The ureter showed a constriction about three inches above its implanted end. Above this site and below it as far as the implantation which merged insensibly into the bowel it was dilated to about thrice its normal diameter. A probe passed freely from the kidney pelvis to the bowel and in the reverse direction. Unfortunately portions were not removed for microscopy, and as the specimen was placed in Kaiserling's solution it has not been possible to study the microscopical appearances.

I am indebted to Dr. A. C. Norman, director of the X Ray Institute, Baghdad, for his assistance, and to the Director-General of Health in Iraq for permission to publish this article.

## REFERENCES

1. Stiles, H. J.: *Surg., Gyn., and Obst.*, 1911, xiii., 127.
2. Turner, G. Grey: *Brit. Jour. Surg.*, 1929, xvii., 114.
3. Everidge, J.: *THE LANCET*, 1934, ii., 483.
4. Nitch, C. A. R.: *Proc. Roy. Soc. Med.*, 1932, xxv., 1413.
5. Coffey, R. C.: *Surg., Gyn., and Obst.*, 1927, xlv., 816.
6. " " : *Brit. Jour. Urol.*, 1931, iii., 353.
7. " " : *Jour. Amer. Med. Assoc.*, 1930, xciv., 1748.

### THE SIGNIFICANCE IN CERTAIN CASES OF SYSTEMATISED INTERLOBULAR (PORTAL) INFILTRATION OF THE LIVER WITH LYMPHOCYTE-LIKE CELLS

By F. PARKES WEBER, M.D. Camb., F.R.C.P. Lond.  
SENIOR PHYSICIAN TO THE GERMAN HOSPITAL; AND  
A. SCHÜLTER, M.D. Münster i. W.  
HOUSE PHYSICIAN TO THE HOSPITAL

In cases where the clinical diagnosis (with or without the help of blood counts) has been some form of mycosis fungoides, Hodgkin's disease, lymphosarcomatosis or lymphadenosis, the post-mortem discovery (by microscopical examination) of a systematised interlobular infiltration of the liver with lymphocyte-like cells is generally accepted as signifying (or confirming) the leukæmic nature of the disease—i.e., that it was a kind of (generally aleukæmic) lymphadenosis.

One of us (F. P. W.) remembers as far back as 1894 a peculiar-looking man, aged 73, whose whole skin was infiltrated, notably the face, giving him a leonine appearance. The case had been regarded as one of mycosis fungoides, but no blood counts were made and the microscopical examination of the liver after death showed a systematised infiltration with lymphocyte-like cells. This almost conclusively pointed to a leukæmic nature of the disease; in other words, it proved that the case was one of (probably aleukæmic) lymphadenosis with predominant infiltration of the skin, as in the rare cases to which Kaposi long ago gave the name "lymphodermia perniciosa."

But nowadays we believe that in cases of aleukæmic lymphadenosis showing systematised interlobular (portal) infiltration of the liver at the post-mortem examination, the blood picture during life has demonstrated an absolute excess of lymphocytes in the differential counts of white cells. In this connexion the following recent case is of interest.

The patient, then aged 57, was first seen at the German Hospital in the latter half of 1934. He was losing weight and had enlargement of lymph glands in both groins, especially the left groin, and both axillæ; a slightly enlarged lymph gland was likewise felt under the lower jaw on the right side. An axillary gland excised in September, 1934, for "biopsy" purposes, was found to be diffusely infiltrated with lymphocyte-like cells; but on the whole, considering the absence of any characteristic change in the blood counts, the case was supposed to be most probably one of Hodgkin's disease (lymphogranulomatosis). The spleen could be felt. Otherwise no evidence of disease could be detected by ordinary examination and no mediastinal mass was seen in a radiogram of the thorax. The blood-serum gave negative Wassermann and Meinicke reactions. He was treated and kept under observation at the Radium Institute under Dr. Durden Smith, to whom we are also indebted for many blood counts. Small doses of Arsacetin by the mouth had been given in the German Hospital.

At first his general health remained good, but in September, 1935, he suffered from hæmaturia and pain in the left loin, and in October received radium treatment for a large mass (retroperitoneal?) in the upper left part of the abdomen. He lost ground, and in January, 1936, he looked pale and weak and had enlarged lymphatic glands on both sides of the neck, as well as in the axillæ and groins. A mass developed in the upper part of the mediastinum, for which he again received radium treatment. In January and February, 1936, he passed two little calculi in the urine. One of them was chemically analysed by Dr. M. M. O. Dannehl and found to be a pure uric acid calculus without inorganic constituents.

In February a slightly sanguineous serous effusion in the right pleura had to be tapped three times. He died on March 3rd, 1936. The patient had had practically no fever, but the pulse had been very frequent and the respiration somewhat increased during the last two weeks of his life.

*Necropsy.*—Generalised enlargement of the lymph glands: axillary, inguinal, cervical, para-aortic, mesenteric, and especially the mediastinal and hilus glands in the thorax. Erosion of the sternum by softened enlarged mediastinal glands. Liver (weight 800 grammes): chronic passive congestion; minute white nodules below the capsule and in its substance. Spleen (300 g.): enlarged and soft; no white nodules characteristic of Hodgkin's disease. The right kidney (enlarged, 225 g.) and the left kidney (160 g.) both contain calculi in pelvis and calices. The heart (353 g.) is of flabby consistence and anæmic. Emphysema and oedema of the lungs and bilateral hydrothorax. Retroperitoneal tumour-like mass in the neighbourhood of the left kidney. The bone-marrow from the shaft of the right femur is red.

*Microscopic examination.*—Diffuse infiltration of lymph glands with lymphocyte-like cells; outline of germ centres not entirely obliterated. The bone-marrow from the shaft of the femur shows much irregular infiltration with

similar cells. The retroperitoneal mass consists chiefly of similar cells; it encloses at one part a nerve ganglion. The liver shows a systematised infiltration of the interlobular spaces with lymphocyte-like cells, at parts forming small tumour-like areas. There is some infiltration of the pulp of the spleen. No definite infiltration is found in the sections of the kidney.

Prof. H. M. Turnbull, who examined the microscopical sections, has kindly furnished us with the following report:—

The infiltration consists of lymphocytes, and not of small cells of other kinds, for instance, medulloblasts. It is not a sarcoma of undifferentiated cells of the retroperitoneal tissues.

I can find no area with the characteristic reaction of Hodgkin's lymphogranuloma. Further, the Malpighian bodies in the spleen are not appreciably enlarged, but there is considerable lymphocytic infiltration of the pulp. The affection of the pulp rather than the Malpighian bodies definitely excludes Hodgkin's disease, even of the so-called sarcomatous type.

The differential diagnosis lies, therefore, between lymphosarcomatosis and lymphadenoid leukaemia. The nodular infiltration of the marrow favours lymphosarcomatosis rather than lymphadenoid leukaemia. On the other hand lymphosarcomatosis usually affects and enlarges the Malpighian bodies of the spleen and leaves the pulp intact. The infiltration of the pulp of the spleen is, however, not so great as in typical lymphadenoid leukaemia, in which the whole pattern, including the Malpighian bodies, is obliterated by lymphocytic infiltration. Further, although there appears to be an increase in the number of lymphocytes in the blood-vessels, this is insignificant in comparison with what is characteristic of lymphadenoid leukaemia; and lymphadenoid leukaemia may be found in the later stages of lymphosarcoma. I think, therefore, that this is an example of lymphosarcomatosis, of a type which is less closely allied to Hodgkin's disease than that in which the Malpighian bodies of the spleen are affected.

There is a myeloid transformation of the spleen, and a considerable number of normoblasts in the hepatic sinusoids. The myeloid transformation of the spleen is doubtless due to the lymphocytic infiltration of the bone-marrow.

The general distribution of the lymphocytic infiltration, in particular the involvement of the portal systems of the liver, points to a general hyperplasia of lymphadenoid tissue rather than an infiltration with secondary growth.

Date.	Hemoglobin (per cent.).	Erythrocytes in millions per c.m.m.	Colour-index.	Leucocytes per c.m.m.	Eosinophils.	Myelocytes.	Metamyelocytes.	Polymorphonuclear neutrophils.	Lymphocytes.	Monocytes.
1934.										
July 10	95	5.500	0.9	14,300	0	0	0	76	14	10
Sep. 7	86	4.620	0.93	11,300	1	0	4	75	16	4
Oct. 8 <sup>1</sup>	99	4.620	1.0	16,200	1.5	2	0	57	39	0.5
Nov. 12 <sup>1</sup>	100	5.664	1.13	10,920	1	0	0	61	38	0
1935.										
Jan. 10 <sup>2</sup>	100	—	—	9,000	0	0	0	64	36	0
Apr. 18 <sup>2</sup>	100	4.792	0.9	17,680	3	0	0	37	60	0
May 15 <sup>2</sup>	100	4.672	0.9	23,840	0	0	0	23	75	2
Sep. 25 <sup>2</sup>	78	4.600	0.85	14,000	2	0	0	78	15	5
Oct. 8 <sup>2</sup>	74	3.984	1.0	9,640	0	0	0	52	45	3
Oct. 25 <sup>4</sup>	77	4.040	0.9	7,160	0	0	0	80	17	3
1936.										
Jan. 2 <sup>1</sup>	65	4.000	0.8	6,700	2	0	2	60	25	11
Jan. 22 <sup>1</sup>	70	4.080	0.9	11,280	0	0	0	80	17	3
Jan. 29 <sup>1</sup>	60	4.280	0.7	6,850	0	0	0	76	18	6
Feb. 18 <sup>1</sup>	69	4.520	0.75	7,550	0	0	1	67	28	4
Feb. 27 <sup>1</sup>	71	4.100	0.9	16,500	0	0	1	82	15	2

<sup>1</sup> The red cells had a fairly normal appearance, but on Jan. 2nd and Feb. 18th, 1936, anisocytosis was specially noted, and on the latter date one nucleated red cell (normoblast) was likewise seen.

<sup>2</sup> Counted at Radium Institute.

<sup>3</sup> At Radium Institute before treatment.

<sup>4</sup> At Radium Institute after treatment.

To this report we add a Table of the blood counts that were taken during the life of the patient. Some of them (especially that of May 15th, 1935), together with the systematised infiltration of the liver found by microscopical examination after the patient's death, seem to suggest that the lymphosarcomatosis was verging on a generalised condition of aleukæmic lymphadenosis.

We have to thank Dr. Durden Smith for his reports from the Radium Institute, and Prof. H. M. Turnbull for his histological summary.

### INTERMITTENT DIARRHŒA ASSOCIATED WITH BACILLUS ASIATICUS

BY GERALD SLOT, M.D., M.R.C.P. Lond., D.P.H.

SENIOR PHYSICIAN TO THE ROYAL WATERLOO HOSPITAL, LONDON; CONSULTING PHYSICIAN, LONDON COUNTY COUNCIL; AND

DOUGLAS BLOMFIELD, M.B. Lond.

HOUSE PHYSICIAN AT THE HOSPITAL

Two cases coming under this heading have lately been seen in the Royal Waterloo Hospital.

CASE 1.—A healthy girl of 18 was admitted for investigation. In infancy and early childhood she had had only measles, pertussis, and chicken-pox, and no infective diarrhœa. At the age of 12 she had a sudden attack of rather prolonged diarrhœa, resulting in general weakness, but without vomiting. The attack subsided, but was soon followed by others. Usually starting at the beginning of the day, they lasted not more than a week, after which the bowel function was normal. Periods of freedom gradually became longer, and she was often free for 2-3 months. But ordinary palliative treatment was of only temporary avail, and did not prevent recurrence. Puberty was passed through normally.

She first came to the hospital in April, 1935, complaining of attacks of sharp pain in the right iliac fossa, which was attributed to a calculus in the right ureter, which had passed naturally. At this time she thought fit to describe her bowel function as normal. At the beginning of this year she had her worst attack of diarrhœa. This, as usual, started suddenly in the morning; she had eight stools within the first hour, and surmises she had about 20 stools that day. They were looser than usual, but otherwise did not appear abnormal. There was some urgency of defecation. She had nausea but no vomiting, and no blood or slime was passed. The attack subsided fairly quickly, but left the patient weak. She was seen on Jan. 28th, 1936, two days after the onset, and was admitted for investigation. She had discovered that attacks commonly followed ingestion of eggs and fruit, or much meat.

She was an apparently healthy girl and apyrexial. Pulse-rate 86. There was no diarrhœa on admission. The only positive abnormal finding was caries of some teeth. Stools during this non-diarrhœal period appeared to be normal in formation and colour, and the average number without aperients was one per day. There was no pain on movement of the bowels. The abdomen showed no distension, tenderness, or rigidity. The spleen was not enlarged. Rectal examination revealed nothing unusual. Culture of the stools in this non-diarrhœal stage, reported by Dr. F. A. Knott, showed normal *Bacillus coli* and enterococci, and also numerous non-lactose-fermenters, whose sugar reactions coincided with those of *B. asiaticus*. The patient's blood agglutinated this organism up to 1-100, with no agglutination to T.A.B. groups.

While in hospital she was treated with a light non-residue diet, and acidophilus milk half a pint a day. Saloi was given in 5-grain doses twice daily. There was no recurrence of diarrhœa; she was discharged free of all symptoms and is being kept under observation.

CASE 2.—A boy, aged 5 years, was treated for rickets at the age of 2 as an out-patient, since when, his mother said, he had not been the same child. Nine months ago he had a sudden attack of diarrhœa, passing 6-7 loose,

green, slimy stools a day, without any other symptoms. The diarrhoea moderated after a few days to 4-5 loose normal motions a day. He was treated for three months by a practitioner without improvement, and eventually returned to hospital when faecal incontinence began at night. The stools were apparently so loose that they escaped in his sleep without the child being aware of it. No worms had been noticed. He had been incontinent of urine since the age of one year. Recently the motions had diminished in number—2-4 per diem. The mother stated that these were not abnormal except in their looseness. It had been noticed that fruit was especially liable to increase the diarrhoea. Tonsillectomy had been performed a fortnight before admission. The father is a sergeant, who had served in Gibraltar; there is otherwise nothing in the family history. The child was admitted for investigation.

He was a thin, though healthy boy. Weight 2 st. 8 lb. Multiple boils were present on the right side of the head, and the scalp was infected with nits and pediculi. During the first week he had 2-3 loose stools per day, and once had incontinence of faeces. There was also enuresis. Bacteriological examination of the stools by Dr. Knott on Jan. 10th, 1936, showed *B. coli* and enterococci, and numerous colonies of non-lactose-fermenting organisms, giving the reactions of *B. asiaticus*. On Dr. Knott's suggestion he was treated with acidophilus milk, but it was difficult to get him to take it. Pneumonia developed in February, 1936, and though the child was constipated during the infection, when the attack subsided, as it did by crisis six days later, he had 4-5 stools per day. He was put on acidophilus milk again—half a pint per day—on Feb. 4th, and on this date Dr. Knott reported that *B. asiaticus* was still present. The number of stools began to decrease rapidly at the end of the first week, and since then the child has had only a single normal stool each day. A few phlyctenules appeared in both eyes on

Feb. 14th but rapidly disappeared. The Mantoux reaction was positive. Since recovery from the pneumonia the child has rapidly improved in physical condition, and on Feb. 21st Dr. Knott reported that all cultures contained *B. coli* and enterococci only; no non-lactose-fermenters were present.

Infection with *B. asiaticus* is described<sup>1</sup> as beginning with malaise, headache, and rise of temperature of half a degree. The stools are usually solid, though dysenteric symptoms, with mucus and blood, occasionally mark the onset. Emaciation is common, while the "typhoid condition" is seldom met; the spleen is not always enlarged. This is an account of the acute condition. The cases we describe, however, seem to be of a chronic type, and the high agglutination titre in Case 1 suggested a chronic infection. Such a condition must be uncommon, for we have been able to trace no other account of it. There was no similar illness in either of the patient's families. The interest of the cases lies in the fact that *B. asiaticus*, a member of the parenteric group, apparently gives rise to chronic intractable diarrhoea, both in adults and children. The diagnosis can be made only by bacteriological examination, confirmed by serological examination. In both our patients treatment with non-residue diet and acidophilus emulsion seemed to have an almost immediate effect.

We would like to express our indebtedness to Dr. J. O'Reilly for details of the second case and to Dr. Knott for much help in the bacteriology of these cases.

<sup>1</sup> Khaled, Z.: Jour. of Hyg., 1922-23, xxi., 362.

## MEDICAL SOCIETIES

### MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY

At a meeting of this society held on May 7th the chair was taken by the president, Dr. BEVAN BROWN, who introduced Dr. Alfred Adler and commented on the increasing importance of the subject of individual psychology. Dr. ADLER spoke on the

#### Psychological Approach

When, he said, in the 'seventies of last century Wundt had established his chair of psychology at the University of Leipzig he had been asked if such a chair could not be established in every university. He had answered "No because each psychologist has his own psychology." The position was much the same to-day and Dr. Adler himself preferred an eclectic view. Some took the introspective course, others studied life situations, and yet others considered instincts or drives or other unconscious contents. To Dr. Adler the inside was part of the whole and the whole was greater than its parts; he had tried to understand how an individual reacted and what were the outside problems to which he related himself. In early childhood, when the child had to use his inherited abilities to solve the problems set in front of him, he developed a certain style of life and thereafter he always brought those same melodies or motifs into all life's situations. The method of approach to the life style was much like that of a detective; the psychologist had to study how the patient listened, talked, smiled, or sat down, his conscious acts and aims, and his relations with outside persons and problems. Every child built

his style according to his opinion of how to be successful when confronted with problems, but different people put different interpretations upon the word "success." It was essential to show that the motif was present in every phase, even perhaps in trance, before recognising it as the life style.

The three great problems of life were social relations, occupation, and love; these three contained all others and were unavoidable. They demanded for their solution a certain degree of social interest, which arose primarily from inherited qualities. Nevertheless, the inherited capacity for social interest must be trained, cultivated, and made alive. A man might be unable to solve the problem of friendship because he was not sufficiently interested in friends. He might then become afraid of people, afraid of life, feeling as if he were in a hostile country, and develop an anxiety neurosis. At the first interview the individual psychologist inquired about early home circumstances and about the origin of the present complaint. No symptoms would originate unless a patient was confronted by a social problem for which he was not prepared. A point in childhood could always be found at which the development and cultivation of social interest was blocked; it might be an apparently trifling one but it affected the life style. The personality must then be explained to the patient, and he must be shown how and why, at every point in his life, he had taken a mistaken direction. He must be given a chance to prepare better, and to increase his social interests. Neurotic people wanted to believe that life had something to give them, that the mountain would come to them and not they to the mountain. The individual psychologist ascertained the position of the child in the family and his earliest recollections. Much of

the relation of the patient towards his parents and towards life could be deduced from his earliest recollection. The same melody could also be recognised in dreams. The psychologist who understood his patient could guess what dreams he would have. The trained worker could find the life style in a quarter of an hour, but this was not to say that the patient had also realised it in that time. The treatment put him in a new situation and thrust him forward to face a problem which had already frightened and shocked him. He was not in love with his illness, but it gave him an alibi or excuse for his failure in life.

After a large number of questions had been asked

and answered, Dr. H. O. WOODCOCK expressed the thanks of the meeting to Dr. Adler and said that what Dr. Adler had done for individual psychology most of all was to live it. He did not criticise other schools; his unremitting energy was extraordinary, and he had real social feeling. Individual psychology, though not a substitute for religion, could, if its principles were generally adopted, banish both crime and international strife.

Dr. ADLER, in reply, reminded his hearers that individual psychology imposed on everyone who was interested in it an obligation to do something about it and not to expect, like pampered children, that others would do the work.

## REVIEWS AND NOTICES OF BOOKS

### Detachment of the Retina

*Operative Technique in Treatment.* By J. COLE MARSHALL, M.D., F.R.C.S., Senior Surgeon, Western Ophthalmic Hospital, London. London: Humphrey Milford, Oxford University Press. 1936. Pp. 80. 7s. 6d.

SINCE the theory and treatment of detached retina was put on a firm basis by the late Prof. Gonin a multitude of articles have been published dealing with isolated parts of the problem but until now no adequate account has appeared of the best contemporary methods of diagnosis and treatment. Mr. Cole Marshall has filled this gap in his book with considerable success. Most recent advances in technique have been devised by surgeons practising on the continent of Europe, and as the author has made it his business to become personally acquainted with their clinics, and indeed has dedicated his book to his colleagues abroad, it contains just that information which less mobile ophthalmic surgeons in this country are likely to require. The essential point in diagnosis is always the location of the hole or tear and the corresponding point on the sclera where the instrument chosen to effect its obliteration has to be applied. The most modern methods of doing this are described, and the author's own chart for comparing the various diameters of the globe with the insertion of the external eye muscles is reproduced.

In discussing the various types of operation employed, Mr. Cole Marshall tries to give credit to the merits of each. Although Gonin's original method of thermo-puncture has been practically given up in England, he thinks it may come into use again in certain cases. When it is possible to localise the tear with exactitude the method has the great merit of simplicity and, according to Gonin's own account, the only times when he had trouble was when the cautery was held in too long after the perforation of the sclerotic.

Since 1930 many alternative methods have been employed, the principal ones being associated with the names of Neve of Utrecht, Larsson of Stockholm, and Safar of Vienna. They are all methods of causing coagulation of the choroidal and retinal tissues at or near the site of the tear or hole, generally combined with small punctures to evacuate the subretinal fluid. This last is the method which Mr. Cole Marshall himself has consistently used at the Western Ophthalmic Hospital for the last four years, and a detailed description of the operation will be found in this book. It must be remembered that the introduction of this method of treating

retinal detachment is still recent and that the evolution of the operation is as yet incomplete. To those engaged in the process of perfecting it Mr. Cole Marshall's book will assuredly bring encouragement and stimulation.

### Pollen Grains

*Their Structure, Identification, and Significance in Science and Medicine.* By R. P. WODEHOUSE, Ph.D., Scientific Director of the Hayfever Laboratory, Arlington Chemical Company, Yonkers, New York. London: McGraw-Hill Publishing Company. 1936. Pp. 574. 36s.

THE first part of this monograph traces the development of knowledge of the physiology and morphology of pollen grains from the hand pollination of the date-palm in 885 B.C. to the gradual accumulation of information which has resulted from the researches of the last 150 years. After the historical section come examples of the application of this pollen knowledge—notably in the diagnosis and treatment of the pollen fevers and in a method of botanical and geological research, of which an account is contributed by Prof. Gunnar Erdtman of Stockholm. The largest portion of the book, almost two-thirds of it, is devoted to the description and classification of pollen grains and the methods of recognising them. Dr. Wodehouse points out that this account is very incomplete and that his main object is to furnish a reliable introduction to a complex subject.

The hay-fever chapter, which for medical readers is the slice of ham in a rather thick sandwich, is not entirely convincing. Dr. Wodehouse's idea of treatment is first to take a pollen census, so that "the exact species of pollen which affects the sufferer can be discovered by the hayfever specialist by the skin reactions." The pollen is caught for this census on glycerinated surfaces (in the manner devised by Blackley and described in his famous monograph published in 1873), and a sample census taken at Yonkers in 1933 is given us. It is only, of course, the wind-distributed pollen which gets caught, and the great bulk of this comes in the first half of the year from trees—chiefly the birch and oak; in fact "at the time of the oak-pollen maxima the atmosphere is actually hazy with oak-pollen." The second largest pollen group comes from the wind-pollinated compositæ in the autumn, and here, as is natural, ambrosia-pollen (the American "rag-weed") makes by far the biggest showing. Then, less than either the trees or the compositæ, the grasses make their mark on the chart at midsummer. What Dr. Wodehouse calls rather confusingly "tree-pollen hayfever"



produces only trivial symptoms in America as in England; it is the grass-pollen at midsummer that causes true hay-fever in both countries. The big splash of ambrosia-pollen on the Yonkers chart marks the duration of the autumn pollen-fever well known to be prevalent in North America. Happily this ghastly weed does not grow on our side of the Atlantic, therefore our autumn "hay-fever"—derived from Michaelmas daisies and such-like of the compositæ—is almost as insignificant an affair compared with our true hay-fever in June as is our tree-pollen fever in the spring.

In discussing his graph, Dr. Wodehouse draws attention to the fact that Timothy grass "in spite of the great emphasis that has been laid on it in most hayfever literature" stands only fourth among the grasses for Yonkers. The point is immaterial because Timothy grass was selected 25 years ago for hay-fever work, not so much because it might possibly stand first in any pollen census, but because it was in many respects the most convenient grass to work with, and was found to be antigenically identical with hundreds of other English grass-pollens, and presumably with grass-pollens all over the world.

A special feature of the book, which is beautifully got up, is its illustration by the fine free-hand drawings made by Dr. Wodehouse of the grains and of their special diagnostic features. This part of the work is admirably done and should be of the greatest help to those wishing for any reason, botanical or medical, to make a pollen census.

### Traité d'embryologie des vertébrés

By A. BRACHET, Professor in the University of Brussels. Second edition, revised and completed by A. DALCQ and P. GÉRARD, Professors in the University of Brussels. Paris: Masson et Cie. 1935. Pp. 690. Fr.130.

THE first edition of this book appeared in 1921. Albert Brachet had begun work on the second edition in 1930 when his death left the reissue of his book—which had become recognised as a classic—to be completed by two of his former colleagues in the University of Brussels. Much research has been done in embryology in the last fifteen years, especially on the experimental side, and the appearance of the second edition of this work has been awaited impatiently: its wide field and its erudition make it a medium suited to reflect with discrimination the new lights which have been appearing on every side of the older embryology.

In the early parts of the book, penned by Brachet himself, there is good evidence that the new conceptions arrived at through experimental embryology were well received. He saw crystallised the forces of embryogenesis, and recognised the relations to these of principal and subordinate organisers. One gets the idea that the cell, as such, has receded from a foremost position in his mind, and that if he had lived he might have become a definite supporter of the "Einheitstheorie" or of some such biological conception. Profs. Dalcq and Gérard have done well the difficult task of completing the work. There has been some shifting of chapters, with introduction of new headings and new material, but the general planning remains unaltered. The chapter dealing with primary and secondary gonocytes, and the associated theories, provides an excellent summary of recent views; additional matter has been inserted here dealing with the placenta and foetal membranes.

Of more general and fundamental matters, the

consideration of Vogt's experiments on amphibian eggs and of the streaming phenomena of their protoplasm, and the accounts of experimental work on the organism as a whole and of the accepted positions of preformed areas, are all of first-rate importance. The same may be said of the description of Conklin's work on the prochordates, which shows them to resemble closely the developing amphioxus. In this connexion it is of interest to notice that the writers define gastrulation as the "ensemble" of processes leading to the formation of an archenteric cavity and the putting in position of the formative material of the principal organs. This is a decided advance on the usual physical conception of gastrulation, one which would seem to follow on the recognition of the streaming movements of protoplasm and the changes in the areas of preformation.

We welcome cordially this excellent book.

### Sacrifice to Attis

*A Study of Sex and Civilisation.* By WILLIAM A. BREND, M.A. Camb., M.D., B.Sc. Lond., Lecturer on Forensic Medicine, Charing Cross Hospital. London: William Heinemann Ltd. 1936. Pp. 350. 10s. 6d.

Dr. Brend writes emphatically on the relations between sex problems and the development of civilisation, a particular motive inspiring him being the decrease in the birth-rate of our country. This decrease is viewed by some with satisfaction, having the terrors of overcrowding and unemployment in their minds; others prophesy our subsidence from the category of first-class nations, as a result of the failure of man-power; a third section of thinkers inquires what of that, seeing in imperial expansion, with its implications, a threat to individual happiness. Clear thinking is necessary to understand the arguments behind these views and to such meditations this outspoken book will contribute. It is thoroughly revolutionary and will thus give offence in some quarters through the criticisms of Christianity and the attribution to Christian teaching of misery due to the biblical conceptions of sex, and the precepts of the saints and early fathers. The author analyses the references to sex in the Gospels and discusses the psychology of the great apostle to the heathen, finding that it was particularly St. Paul who gave to Christianity an anti-sex bias, though similar doctrines were inculcated by the Greek philosophers, Buddha, and that curious Jewish sect the Essenes, pious communists who repudiated sexual union save when contracted for the sake of posterity. Dr. Brend employs the same frankness in dealing with the developments exemplified to-day in communism and fascism; and with the social codes in various countries appertaining to marriage, abortion, prostitution, and the publication of obscene writing, and he ends with a plea for freedom of thought upon these subjects. "The proposals in this book," he says, "involve setting up a standard of conduct based upon knowledge and truth, and not upon revealed guidance or sectional interests. They would take man as he is and fit a moral code to him, instead of torturing him to comply with a predetermined ethic." This is a fine ideal, and Dr. Brend is eloquent in his views for its attainment.

The title of the book refers to a custom in the worship of the Phrygian god Attis. Here castration was undertaken by the priests who were vowed to celibacy, the ritual forming an extreme example of sex repression.

### Surgical Emergencies in Children

By H. C. EDWARDS, M.S. Lond., F.R.C.S. Eng., Surgeon and Lecturer in Surgery, King's College Hospital. London: Baillière, Tindall and Cox. 1936. Pp. 274. 12s. 6d.

It is difficult to know what kind of reader Mr. Edwards had in mind when he wrote this little book. The specialist may find it is too small to cover such a large field and the general practitioner may regret that there is not more emphasis on diagnosis and less on treatment. It is a fact that some conditions which were previously looked upon as emergencies are nowadays treated more conservatively, a preliminary period of rest and inquiry being often considered advisable. Thus it is with empyema and perhaps even with osteomyelitis. Hæmorrhage and respiratory obstruction remain two grave events calling for immediate action; Mr. Geoffrey Bateman considers these separately in a chapter of 50 pages contributed to this book. General anæsthesia and modern basal anæsthetics are discussed by Dr. Vernon Hall who preserves a nicely balanced judgment.

The rest Mr. Edwards has written himself and it is his own opinions which he sets out. These do not always conform with the practice of most modern surgeons—for example, the "copious wet dressings" advised for compound fractures and the advocacy of open operation on all fractures of the humerus with musculo-spiral paralysis. He favours Winnett-Orr's method of vaseline packs and plaster-of-Paris in osteomyelitis; there is no reference to the important work of the late Clarence Starr which has largely influenced recent views of this condition. The urinary tract deserves better notice than it can receive in six pages, but even in this short space room might have been found for mention of calculus and paraphimosis.

The largest section is devoted to the abdomen and this is certainly the best part of a work which attempts to cover a very large subject in small compass. Here Mr. Edwards succeeds in giving a clear picture and clear advice on a difficult topic. It is almost impossible for a book like this to be completely successful, but few important surgical emergencies are ignored and the study of this book should give confidence to the inexperienced young surgeon likely to be called on for night work. It is written in a pleasant style and is easy to read. Miss Barclay-Smith's drawings are an attractive feature.

### Quarterly Journal of Medicine

THE April issue (Vol. V., No. 18) contains the following papers: R. Ewart Jones and D. Leyton Woodhouse (Birmingham) have examined 450 sera by the modified vanadate serum malignancy test (Bendien-Lowe). The 296 patients tested had a variety of malignant tumours and other pathological conditions. In 75 per cent. of the cases the test gave results corresponding with clinical observations and 4 cases are quoted where results agreed with post-mortem or operation findings where the clinical evidence had been contrary. Jones and Woodhouse discuss fully the cases in which it seems to have failed, and they also include a preliminary report on the results of the test in animals bearing experimentally induced neoplasms.—Investigating the production of the cerebro-spinal fluid, Henry Cohen (Liverpool) has studied the comparative values in blood and cerebro-spinal fluid of sugar, non-protein nitrogen, and inorganic phosphorus; he finds no relationship between these values, even when all known disturbing factors have been eliminated. He discusses his findings in relation

to the physicochemical and secretory theories of the formation of C.S.F. and indicates further lines of approach.—The same writer, together with Julius Libman, has inquired into two aspects of hyperglycæmia. An attempt was made to obtain hyperglycæmia over so long a period that its effect on the C.S.F. sugar could be noted, and this was achieved by combined administration of glucose orally and Infundin subcutaneously; infundin alone had no effect. They were able to show significant rises in C.S.F. sugar in sustained hyperglycæmia, thus proving incorrect the theory that the choroid plexus prevents the passage of glucose. There were signs, however, of a "threshold" effect.—These workers also showed that the glucose content of the C.S.F. after withdrawal from the body remained unaltered for an indefinite period provided it was sterile.

F. T. Nattrass and S. F. Evans (Newcastle) give an account of the production of pyrexia by means of short radio waves and demonstrate its advantages over other methods in that the pyrexia can be controlled and regulated. They discuss the development of electrical methods, describe an apparatus, and give details of the technique. The therapeutic use of short radio waves is illustrated by observations on cases of various kinds.—The value of quinidine in restoring normal rhythm in the presence of auricular fibrillation is well established, and there is fairly general agreement about the type of case in which it is useful. Maurice Campbell and F. W. Gordon (London) have made a detailed study of quinidine therapy and find that given a careful selection of suitable patients it is effective and often lasting in its effects. They have followed up a series of patients and estimate the duration of normal rhythm in different types of case. They report their experience with 91 patients during 1929-34, including a group with goitre.—Eleanor Badenoch and Noah Morris (Glasgow) have studied carbohydrate metabolism in cases of coeliac disease. They found a very flat blood-sugar curve during the active stage of the disease and considered this to be due to carbohydrate fermentation. They then investigated the possible connexion between the anterior pituitary and coeliac disease, since it had been suggested that the anterior pituitary hormone plays an important part in the regulation of sugar metabolism. They found that injection of anterior pituitary extract into patients with coeliac disease raised the level of the fasting blood-sugar and led to a slight improvement in the percentage absorption of fat.

S. L. Langley, W. Mackay, and L. Stent (Salford) have studied pneumonia with special reference to agglutinins. They find that these are recognisable in the blood-serum of the patient during the course of lobar pneumonia, where the infection is due to Type 1 or 2 organisms, and that their appearance is closely connected with recovery since they are absent in the majority of fatal cases. They also establish several other observations important from the point of view of treatment which if confirmed might, they think, be of more general application.—L. S. P. Davidson and J. Smith (Aberdeen) have made a clinical, chemical, and bacteriological study of 40 cases of Weil's disease among fish-workers in Aberdeen. They give proof of the occupational nature of the disease and its association with an industry housed in a particular area of the city, and they establish the connexion between the carriers (infected rats) and the sufferers (infected fish-workers) through contaminated water and slime. The prophylactic value of hypochlorite solution in spirochaetal disinfectants is examined.

EAST SURREY HOSPITAL, REDHILL.—Subscribers are badly needed at this hospital as the total deficit on the year was £713. About £7000 has been received towards the £11,000 required to erect a new nurses' home. Building will probably begin in June, and it is hoped that the new home will be ready in the spring of next year as the chairman declared the old one could no longer be tolerated.

# THE LANCET

LONDON: SATURDAY, MAY 16, 1936

## POISONS AND THE PRESCRIBER

THE first day of May was an important date for all who are concerned in the distribution of poison; on that day came into operation the rules made in pursuance of the Pharmacy and Poisons Act, 1933, and these rules affect the conduct of every type of person who is identified in any way with transactions in substances which are poisons within the meaning of the Act. Of course the pharmacist is chiefly concerned in carrying out these new regulations, but in a lesser, but by no means small, degree the medical practitioner, the hospital, the dentist, and the veterinary surgeon come within their scope and will be compelled to use new methods in buying poisons and in prescribing them. They will have to take pains to learn which substances are poisons, and even to be sure about that will need considerable care. There were drugs which on April 30th could be bought and even sold with the same freedom as milk and eggs, and on the next day the traffic in them became as circumscribed as is the traffic in the deadliest poisons known to mankind. Take one instance, to wit amidopyrin; for years past this substance has been an ingredient of proprietary articles advertised in the press as vitalising forces which make the old young, grey hair black, and pale cheeks red. As from May 1st amidopyrin will still have the same properties as it always had, for no poisons law can alter them, but the searcher after eternal youth will have to see a doctor about it. For amidopyrin, whether by itself or mixed in other substances may be sold by retail only on a written prescription. In this way will come to fruition the kind of patient research, always going on, which discovers substances as good as amidopyrin but without its drawbacks. And what has been said of the restriction to the sale of amidopyrin applies equally to barbituric acid, dinitrophenols, phenyl and salicyl cinchoninic acids, sulphonal, and any preparation containing them.

Poisons law is extremely intricate; it was so before the Act of 1933, and since that came into force it has become much more so. The intricacies are laid bare in Mr. LINSTEAD'S guide<sup>1</sup> written at the request of the Pharmaceutical Society of Great Britain, of which he is secretary. Two pages of this book are filled with the titles of statutes,

statutory rules and orders which bear directly upon the sale of poisons in this country; 30 items in all, from which it will be seen how necessary it is for someone in authority to simplify the law to the non-legal mind so that the letter of it may be observed. The new rules, as they apply to medical practitioners, are explained by Mr. LINSTEAD in clear terms, and notes are added for the guidance of those who prescribe or dispense medicines or do both. There are, first, certain poisons which can be sold only on a medical prescription and it is provided that the prescriber in such cases must enter on the prescription (1) his signature, (2) the date, (3) his address, (4) the patient's name and address, (5) an indication of the total amount of medicine, and (6) the dose. These requirements entail no departure from custom, but they now become enforceable in the case of certain drugs and the onus is on the dispenser to satisfy himself that the prescription is in the correct form. Further, the prescription may be dispensed once only, unless the prescriber has ordered otherwise, either on the prescription the number of times it is to be repeated or with no indication of the number of times. In the latter case the prescription is valid for an indefinite number of repetitions.

The rules as they apply to the obtaining of supplies by medical practitioners of substances which contain poisons included in the First Schedule require that a written order be signed by the practitioner, unless he attends at the premises of the supplier and signs the Poisons Register; there are no formalities to be complied with by a practitioner wishing to obtain substances which contain poisons which are not included in the First Schedule. There is a provision by which a practitioner may obtain substances in the First Schedule in an emergency, without sending a written order, if he gives an undertaking that he will furnish a written order within the next 24 hours. The seller must be "reasonably satisfied" that an emergency prevents the purchaser from furnishing the order or attending at his premises and signing the Register, and should the practitioner fail to supply a signed order he would be guilty of an offence against the Act. The conditions which apply to medical practitioners who supply medicines to their patients contain no provisions which make it necessary to keep a record of a medicine unless it is a substance included in the First Schedule. It is essential, however, for all medicines containing poisons supplied by a medical practitioner to bear a label on which appear his name and address. Further, if the medicine is an embrocation, liniment, lotion, antiseptic, disinfectant in liquid form, or other medicine for external application, it must, if there is poison in it, be in a container labelled with the name of the article—e.g., "The Embrocation," "The Liniment," with the addition of the words "For External Use Only." The only requirement about storage of poisons which applies to the premises of a medical practitioner is that the container must be impervious to the poison and sufficiently stout to prevent leakage arising from

<sup>1</sup> Poisons Law: A Guide to the Provisions of the Pharmacy and Poisons Acts, 1852 to 1933, and the Dangerous Drugs Acts, 1920 to 1932, for the use of pharmacists and others concerned in transactions in drugs and poisons. By H. N. Linstead, Secretary, Pharmaceutical Society of Great Britain. London: The Pharmaceutical Press. Pp. 444. 5s.

the ordinary risks of handling. It must not be assumed that Mr. LINSTAD's brief references to the new Poisons Rules as they affect medical practitioners will, valuable as they are, enable them to be sure they do not unwittingly commit a technical offence of some kind. The schedules of poisons under the new Act occupy ten pages of small type, while the list of poisons and substances to which special restrictions apply contains the names of some 1250 articles. It is only by patient observance of the art of literary condensation that Mr. LINSTAD has been able to limit himself to 444 pages. But no doctor can assimilate this compendious study without realising where he stands.

### SCARLET FEVER AND THE PUERPERIUM

SINCE the eighteenth century the attention of physicians and epidemiologists has been turned from time to time to the resemblances and the differences among those diseases which we now recognise as due to the hæmolytic streptococci—notably scarlet fever, septic sore-throat, puerperal fever, and erysipelas. At one time it would be the clinical peculiarities of this class of disease upon which discussion was focused; at another it would be their similarities and overlappings, clinical and epidemiological. At long intervals similar views have recurred in a striking manner: thus in maintaining the essential identity of septic sore-throat with scarlet fever, F. G. HOBSON has lately been expressing views<sup>1</sup> almost identical with those of WITHERING a century and a half ago. In our present issue Drs. BURTON and WEIR give an interesting account of another of the interrelationships of streptococcal disease. They describe three cases in which a scarlet fever rash developed in the puerperium and the uterus was infected with hæmolytic streptococci, the throat being apparently free from infection.

Modern study has done much to simplify the outlook on aberrant cases of streptococcal disease such as these. The scheme put forward by OKELL<sup>2</sup> in his Milroy lectures of 1932 seems to explain most if not all of the clinical and immunological entities of streptococcal origin occurring in the puerperium. OKELL recognises the following categories: (1) Faucial infection with rash—i.e., ordinary scarlet fever but occurring in the puerperium. (2) Uterine infection with a streptococcus of high toxigenic power in a Dick-positive woman, the throat being free from infection; this is manifested in a rash, complicated in some cases by the septic accidents which are only too common when a hæmolytic streptococcus invades the uterus. (3) Uterine infection in either a Dick-positive or a Dick-negative woman with a streptococcus of sufficient pyogenic and invasive power, but of low toxigenic power; the result here is a puerperal fever without rash. The same clinical picture is produced if the uterus of a Dick-negative woman is infected with a hæmolytic streptococcus which would be able to produce the picture given

under (2) if the woman were Dick-positive. One of these conditions may be combined with another and all may at times merge into the full picture of a septicæmia. BURTON and WEIR suggest that their three cases—which would be classified under (2) in the scheme given above—should be called puerperal surgical scarlet fever. The term seems hardly to be a happy one, though it emphasises the extrafaucial origin of the condition. There is nothing particularly surgical about many at least of such cases, and we immediately meet with difficulties if we imagine a woman suffering from scarlet fever of uterine origin transmitting her infection to the uterus of a Dick-negative ward-mate. There would be no rash in this second case and to call it scarlet fever at all would be to belie its description. Further instances could be brought forward to suggest that the study of streptococcal diseases is still suffering from a superabundance of names inherited from a time when a clinical analysis of the various conditions was alone possible. Many of these names have still a clinical usefulness, but they should not be allowed to obscure the essential unity of the diseases due to the hæmolytic streptococci, nor to discourage the observer from a deeper analysis of the pathogenesis of every case of such disease that he encounters.

As BURTON and WEIR point out, the prognosis of the scarlatinal syndromes of the puerperium is probably much influenced by the site of the infection, being best, no doubt, where there is a faucial infection only. It has long been recognised that under certain circumstances scarlet fever, or rather exposure to scarlatinal infection, may be a fatal complication of the puerperium, and outbreaks of severe and fatal puerperal fever have been recorded as starting in this way. That cases in which the prime focus of the infection is in the uterus may rapidly become septicæmic can be readily understood; and it is harder perhaps to understand how such a dangerous invader can enter the uterus and produce no worse effects than a relatively benign local disease with erythrogenic toxæmia, as in the cases BURTON and WEIR record. These occurred in the practice of one medical man between Sept. 24th and Oct. 18th, 1935, and had in all probability a common source of infection. That the infecting strain of streptococcus had high erythrogenic in-vivo toxigenicity and low pyogenic and invasive power may be deduced from the relatively benign course of the resulting disease from which all the patients recovered. An interesting feature of the cases is that faucial infection was a physical sign in all, though infection of the fauces was absent. It is well known that sore-throat may develop in children who have been given a sufficient dose of sterile scarlet fever toxin, and we must perhaps look upon the sore-throat of scarlet fever as of composite origin—as due not only to septic inflammation but also to the hyperæmia produced by the erythrogenic toxin. In studying aberrant types of scarlatinal disease it is important to remember that the presence of some degree of throat affection does not necessarily mean that the

<sup>1</sup> Hobson, F. G.: THE LANCET, Feb 22nd, p. 417.

<sup>2</sup> Okell, C. C.: Ibid., 1932, i., 867.

source of infection is in the throat. Many of such cases cannot be referred to their proper category without careful bacteriological examination.

## TUBERCLE AND SEGREGATION

It is not easy now to realise that tuberculosis has been dealt with seriously as a public health problem only since the turn of the century. It was at the British Congress of July, 1901, that ROBERT KOCH said: "The fact that tuberculosis is a preventable disease ought to have become clear as soon as the tubercle bacillus was discovered." And this pregnant remark of KOCH's led King EDWARD VII. to ask the historic question: "If preventable, why not prevented?" which fastened on the public conscience. In the same address<sup>1</sup> KOCH pointed to the danger of infection in small and overcrowded dwellings, and, since housing reform must take time, urged the removal of infective patients from them. The founding of special hospitals for consumptives he described as the most important measure in the combating of tuberculosis, and he pointed to the excellent example then already set in this country. We should not forget the service to the community long rendered by such friendly homes for the dying as Friedenheim (now St. Columba's) and St. Luke's, Bayswater. This fundamental message was overshadowed at the time by KOCH's avowal that he doubted the susceptibility of man to bovine tubercle; and it took his hearers long to discover the profound truth in the paradox. Five years later in his Nobel lecture KOCH again insisted<sup>2</sup> that the better provision for patients in the last stage of pulmonary phthisis has contributed more than anything else to the declining death-rate from tubercle. At that time, he said, more was being done in that direction than was generally supposed. In Berlin, for instance, during the decade 1895-1905 more than 40 per cent. of the cases of pulmonary phthisis died in hospitals, and although he did not underrate the value of the sanatorium in the restitution of the individual to a measure (at all events) of earning capacity, he pointed out that this restitution was no gain from the prophylactic standpoint. In this country A. NEWSHOLME has always stressed the same need insisting<sup>3</sup> that "institutional segregation, notably of advanced cases, is the most powerful single means available for controlling phthisis."

Notification was a necessary preliminary to action directed to prevent the spread of the disease. In the early days of the century a system of voluntary notification of pulmonary tuberculosis was sanctioned for particular areas. In 1908 compulsory notification of pulmonary tuberculosis was applied to patients treated under the poor-law; in 1911 compulsory notification was extended to patients treated by voluntary hospitals and similar institutions, and at the end of that year to the whole community. Finally in 1912 all forms of tuberculosis were made compulsorily

notifiable. During this period boards of guardians were encouraged to treat cases of pulmonary tuberculosis in their hospitals rather than to maintain them in their own homes, with the result that by 1911 some 9000 beds in poor-law hospitals were occupied by tuberculous patients. Public health authorities in whose areas notification was in operation developed a system of visiting and supervising notified cases living at home with a view to taking such steps and providing such facilities as would minimise the risk of the spread of infection. A number of public health authorities also made hospital provision to this end, while some of the more active authorities developed arrangements to provide for the treatment of patients with a view to their recovery. In 1912 too the first National Insurance Act came into operation which provided for the treatment of tuberculous patients of all types on a wide scale. The Inter-departmental Committee set up to advise on the application of this Act recommended the provision for adults suffering from pulmonary tuberculosis of one sanatorium and one hospital bed for every 5000 persons in the population, the hospital beds being intended mainly for advanced cases. Although no public authority dealing with tuberculosis has been given the power to require a tuberculous patient to enter or to remain in a hospital or sanatorium, much has been done by persuasion and by making the hospitals and their routine reasonably attractive. At the present time about one-third of the patients who die annually from pulmonary tuberculosis die in the residential institutions of public authorities. A number of authorities during the past six or eight years have developed a home isolation method of dealing with infective patients living in unsatisfactory home conditions. Under this system the patient and his family are provided with a cottage or small house which is sufficiently large to enable the patient to have a bedroom to himself. Financial assistance is usually given in respect of the rent and in return the tenant has to agree to certain conditions such as that the patient shall occupy a bedroom to himself, that no lodgers shall be taken, that the home conditions shall be systematically supervised by the authorities' nurse, and that the contacts shall be examined by the tuberculosis officer whenever he considers this to be desirable. The data are not yet sufficient to prove the value of this method statistically, but there is little doubt that the system is of definite service in minimising the spread of infection and in improving the health of the contacts.

This has been achieved without compulsory segregation such as was brought into operation in Norway in 1902 or in Thüringen two years ago. By the Public Health Act of 1925, however, any public health authority outside London was given power to apply to a court of summary jurisdiction for an order for the compulsory removal to hospital of a person suffering from pulmonary tuberculosis who is in an infectious state. London boroughs were able to obtain the same power, if they desired it, under a special Act in the following year; and Hackney promptly availed itself

<sup>1</sup> THE LANCET, 1901, ii., 187.

<sup>2</sup> Ibid., 1906, i., 1449.

<sup>3</sup> Trans. Epidem. Soc., 1905-06, xxv., 111.

of this power. The court in any case has to be satisfied not only that the patient is in an infectious state, but that his lodging or accommodation is such that proper precautions against the spread of infection cannot be taken or are not being taken, that serious risk of infection is thereby caused to other persons, and that a suitable institution is available for the reception of the patient. The order may be made for not longer than three months in the first instance, but may be renewed for a period not longer than three months. The

cost of the patient's maintenance must be borne by the authority applying for the order, and the authority may contribute or may be ordered by the court to contribute towards the maintenance of dependants. In practice it has rarely been found necessary to use this power. In cases of wilful neglect to take precautions the threat that an application for an order for compulsory removal will be made has nearly always proved sufficient to induce the patient to comply with the requirements.

## ANNOTATIONS

### NEW FELLOWS OF THE ROYAL SOCIETY

In previous years the names of the 17 men recommended by the council of the Royal Society for election at the next annual meeting were announced in February or March. This year it is not until the new Fellows have actually become entitled to add to their names the letters which spell recognition of scientific achievement that we are privileged to congratulate them. There are only two doctors in the list: E. H. Kettle, professor of pathology in the University of London at the British Postgraduate Medical School and consulting pathologist to St. Bartholomew's Hospital; and E. B. Verney, Sheild reader in pharmacology at the University of Cambridge, formerly professor of pharmacology at University College, London. Prof. Kettle has carried out researches on cancer, tubercle, and inflammatory reactions, and in recent years has been engaged in experimental work on the pneumoconioses and their relation to infection. Prof. Verney has studied experimentally the action of blood flow, nervous influences, and drugs on the secretion of urine, and has proved the continual control of kidney activity by the secretions of the pituitary gland. Among the other new Fellows there are two whose work is closely associated with medical problems: Lancelot Hogben, who holds the chair of social biology at the London School of Economics, has made substantial contributions to comparative physiology and to genetics; his work in experimental zoology has been chiefly concerned with the mechanism of colour change in amphibia and with the effect of hormones on the pigmentary effector system and the reproductive cycle of vertebrates. F. J. W. Roughton, lecturer in physiology at Cambridge, has worked mainly on the chemistry of respiration. He has developed methods for measuring the velocity of rapid chemical reactions, has applied them to reactions of physiological importance, and has calculated the speeds of such processes *in vivo*.

The other fellowships are distributed, as usual, over a wide range of scientific activity. A. C. Aitken is lecturer in mathematical statistics and actuarial mathematics at Edinburgh; J. D. Cockroft is demonstrator in physics at Cambridge; H. J. Fleure is professor of geography and anthropology at Manchester; C. Forster-Cooper is director of the University Museum of Zoology at Cambridge; and Sir Alexander Gibb is a consulting engineer who has contributed much to hydro-electrical developments in many countries. H. L. Guy is chief engineer in the mechanical engineering department of Metropolitan Vickers; H. G. A. Hickling is professor of geology at Armstrong College, Newcastle-upon-Tyne; and J. Kenyon is head of the chemistry department

at Battersea Polytechnic. N. F. Mott holds the chair of theoretical physics at Bristol, and R. G. W. Norrish a lectureship in physical chemistry at Cambridge. H. H. Plaskett is Savilian professor of astronomy at Oxford, E. F. Relf is superintendent of the aerodynamics department of the National Physical Laboratory, and Birbal Sahni is professor of botany at Lucknow.

### THE HEART IN HYPERPIESIA

IN a note on the cardiac complications of hypertension, Dr. Paul D. White,<sup>1</sup> assistant professor of medicine at Harvard, reviews 1249 cases which have come under his observation during a period of 15 years. In almost all of these the patients had essential hypertension (hyperpiesia) of several years' standing. Sixty-eight per cent. were between the ages of 50 and 70, the sex-incidence was almost equal, and the majority showed cardiac enlargement. Angina pectoris was seen in 329 (i.e., 26 per cent.) of whom 182 were men and 147 women. Coronary thrombosis occurred in 99 cases (8 per cent.) and the symptoms of congestive heart failure of greater or less severity brought 308 (25 per cent.) to the doctor. Rheumatic heart disease was present in 43 cases of which 23 showed mitral stenosis. Cardiovascular syphilis was noted in only 10 and thyrotoxicosis in 6. Aortic regurgitation without stenosis was found in 52 cases; aortic stenosis in 33. Dissecting aortic aneurysms were discovered at autopsy in 2 cases. Auricular fibrillation had developed in 170 cases, and in 55 of these was of the paroxysmal type; true paroxysmal tachycardia with regular rhythm occurred in 58. Electrocardiograms demonstrated auriculo-ventricular block in 34 cases and interventricular block in 43. Analysis of the cause of death in 100 consecutive cases (65 male, 35 female) revealed that 95 died "cardiovascular-renal" deaths; in the vast majority of these there was a cardiac catastrophe of one sort or another, and only 6 died from apoplexy, 5 from uræmia, and 5 from infections. As regards age, 42 died between the ages of sixty and seventy, 26 between seventy and eighty, and 2 over eighty. Dr. White, who takes a grave view of hypertensive heart disease, points out that 72 per cent. of his patients died before the age of seventy. A more cheerful reading of the facts would be that 70 per cent. of them attained the seventh decade. He also urges more intensive research into the aetiology and therapeutics of hyperpiesia, and while agreeing with him we should remember that the expectation of life in proved cases of essential hypertension does not fall much below the normal figure, that the condition is extremely common, and that many hypertensives doubtless live to ripe ages and die with their hyper-

<sup>1</sup> New Eng. Jour. Med., April 9th, 1936, p. 719.



tension undiagnosed. Even so, routine sphygmomanometry can do nothing but good provided we are careful not to make our patients "blood-pressure minded" to the point of neurosis.

**APPARENT TRANSFORMATION OF A VIRUS**

VERY interesting relationships have lately been demonstrated between two viruses which attack rabbits in America. Both of them produce tumour-like lesions and have been considered as forming a possible link between the viruses which produce tumours and those of other groups. The virus of infectious myxoma, known for nearly forty years, causes a highly infectious, almost uniformly fatal disease in domestic rabbits, characterised by inflammation of mucous membranes and the formation of myxomatous masses in the skin and elsewhere. The other virus, that of infectious fibroma, occurs in North America among wild cottontail rabbits, members of a different genus from the domestic rabbit; it produces fibromatous nodules at the site of inoculation in either cottontails or tame rabbits, and is not infectious under ordinary laboratory conditions. Andrewes and Shope<sup>1</sup> have lately described a "mutant" of this fibroma virus which gives rise to inflammatory instead of tumour-like lesions, but is still not infectious. This "mutant" has appeared rather suddenly in the course of serial passages through tame rabbits, while virus carried through other series has retained its original characters.

Shope showed in 1932 that the myxoma and fibroma viruses were immunologically related, and this relationship forms the subject of several recent papers.<sup>2-4</sup> It has been found that the myxoma virus, contrary to previous belief, will infect cottontail rabbits, but that it produces in them only a localised lesion at the site of inoculation, recalling the infectious fibroma rather than the myxoma picture. Such cottontails are subsequently found to be immune to both viruses. After serial passage through cottontails, the myxoma virus fully retains its power to produce a generalised fatal disease in tame rabbits. When fibroma virus is injected into domestic rabbits, the tumour-like growths regress in course of time. If myxoma virus is now inoculated into these animals, they are found to be partly resistant and the virus produces as a rule only localised lesions as it does in the cottontail. It will nevertheless multiply and can be propagated serially in such rabbits. These facts may be briefly set forth as follows:—

virus is antigenically the more complex. Following up this clue, Berry and Dedrick<sup>5</sup> carried out experiments, based on the work of F. Griffith, on transformation of one type of pneumococcus into another. It will be recalled that Griffith in 1928 degraded type-specific pneumococci to the rough form and was then able by inoculating them into mice along with killed virulent pneumococci of another type to cause them to develop into the smooth virulent form of that other type. The same result was later obtained in vitro by Dawson and Sia (1931) and Alloway (1932). Berry and Dedrick similarly heated myxoma virus to a temperature of 60° or 75° C.—the last figure being well above its thermal death-point—and inoculated it into rabbits along with living fibroma virus. They report that in each of eight experiments rabbits receiving the mixture died of myxoma; typical myxoma virus was recovered from them, and the disease proved infectious by contact. Though only a preliminary report is as yet available, it seems that the experiments have been adequately controlled. The authors suggest that there is something in the myxomatous material which lends virulence to the fibroma virus, and, further, that this something is propagated along with the virus in future generations; in other words, the fibroma virus is transformed into myxoma virus. Other possible explanations will have to be sought, but the line of approach may well, as Berry and Dedrick suggest, prove useful in exploring other virus relationships.

It is a strange fact that tame rabbits, which are derived from the European wild rabbit, should be naturally attacked by myxoma virus only in America, where they are not native. The facts now coming to light concerning the relationships between myxoma and fibroma viruses afford a likely clue to the origin of the former. Further study of this problem may even open up the whole question of the evolution of viruses and the origin of apparently new ones.

**ST. GEORGE'S HOSPITAL**

St. George's Hospital has from its earliest days had an association with the Royal Family; indeed this has been continuous since 1734, when Frederick Prince of Wales became the first president. To-day that precedent is carried on by the Duke of Kent, who at the last annual Court of Governors alluded to the eight generations of his family "who have maintained their close interest in the hospital erected almost at their doorstep." The Duke spoke with appreciation of the preliminary work which has been done for the rebuilding fund, and hopefully of all that which is still to be accomplished. His remarks went home so well that at the close of the meeting one of his audience handed in his cheque for a thousand pounds, and within a day or two this was followed by one for fifteen hundred. A million pounds, which the hospital must raise, is a formidable sum, but repeated donations of this kind which have flowed in steadily since the appeal began are putting heart into those whose business it is to collect the money as the great deficit is slowly but surely worn down. An immediate need is two thousand pounds for an up-to-date X ray apparatus which has recently been installed but is still unpaid for, and for this purpose a great boxing tournament has been arranged. A dinner dance under the patronage of the Duke and Duchess of Kent demands patronage, while a race meeting at Northolt represents another activity of the appeal fund committee. It is not always that a hospital

	Normal cottontail rabbit.	Normal domestic rabbit.	Myxoma-immune cottontail.	Fibroma-immune domestic rabbit.
Myxoma virus.	Local myxoma or fibroma nodule.	Fatal disease.	Nil.	Local fibroma or myxoma nodule.
Fibroma virus.	Local fibroma.	Local fibroma.	Nil.	Nil.

Sera from myxoma-immune rabbits contain antibodies which neutralise both viruses; those from fibroma-immunes inactivate fibroma virus, but are less active<sup>4</sup> or inactive<sup>2</sup> against myxoma. It seems possible therefore that the more virulent myxoma

<sup>1</sup> Andrewes, C. H.: Jour. Exp. Med., 1936, lxiil., 157; Shope, R. E.: Ibid., p. 173; Andrewes and Shope: Ibid., p. 179.

<sup>2</sup> Shope: Ibid., 1936, lxiil., 33 and 43.

<sup>3</sup> Hyde, K.: Amer. Jour. Hyg., 1936, xxlii., 278.

<sup>4</sup> Berry, G. P., and Lichty, J. A.: Jour. of Bact., 1936, xxxi., 49.

<sup>5</sup> Berry and Dedrick, H. M.: Ibid., 1936, xxxi., 50.

can capture a millionaire philanthropist ready to donate a large sum and until that happy day arrives for St. George's its supporters are relying on repeated efforts to secure many smaller contributions. The day may arrive soon or may be delayed, but until it comes endeavour must be constant, and all must wish it success and help towards the great achievement.

### POLLEN STATISTICS

A most fascinating account of a laborious method of investigation has been contributed by Prof. Gunnar Erdtman, of Stockholm, to a work on Pollen Grains reviewed on another page. He describes how by making borings to various depths in the peat bogs it is possible to reclaim and recognise the various pollen grains, and thus try to make some estimate of what plants, and in particular what trees, were growing in the various localities hundreds or even thousands of years ago. The method has its difficulties, as Dr. Erdtman is careful to point out: pollen may fly for hundreds of miles (e.g., from Canada to Greenland) and thus be caught in bogs remote from the vegetation which has produced it; the various pollens are produced in very different quantities by different plants, will fly very different distances, and, if they get on to a bog, are preserved in it to a varying extent. Again the finding of pollen to-day does not necessarily tally with the presence or absence of corresponding trees or plants; thus there is really no "pine-time" occurring in Alberta at the present day, though the pollen findings in Alberta bogs would certainly suggest the contrary. Still, to detect errors goes a long way to overcoming them, and Prof. Erdtman is convinced that his pollen statistics, if calculated from a great number of localities in different countries and then compared with each other, could yield results that would at least show the lines along which further research could profitably be conducted. It seems to us a little doubtful whether the labour involved in such investigations would prove to have been well directed.

### MORE PEP WANTED

THE Royal Society of Medicine has reached a stage at which everyone speaks well of it, including the Minister of Health. At the biennial dinner last week, reported on another page, Sir Kingsley Wood revelled in the fact that the society had nothing to do with medical politics, and he could therefore himself enjoy a night out. More than that, it provides the Minister with standards on which to model his work. It was left to the retiring president to find the only fault with the society's present conduct. Dr. Hutchison spoke of the three functions it had to perform—to supply the apparatus of knowledge, to provide for the interchange and diffusion of knowledge, and to promote good fellowship. All these functions he had found efficiently fulfilled. One thing however was lacking: there were many sections and they were well attended, but, he said, the discussions are too polite; and turning to the Minister he obtained his assent that unparliamentary language is at times a useful tonic. The fact is that at a certain stage of specialisation gatherings are apt to lose vivacity, so learned are the participants who attend the meeting with their case made out and the intention to let off what they have to say without reference to what has been said or what will be said. There is perhaps inevitably in such discussions a lack of the freshness met with at a rotary club meeting in which each member represents some different outlook on life and manners, or in a

society at which many different groups of medical practice are represented. Happily it is not the case that medical politics are rigidly excluded from all sections of the society, although this weakness may be attended with a sense of shame, for the press and even the medical press has several times been excluded on such occasions. But this may be going rather further than Dr. Hutchison intended, for he went on to quote an old Latin tag which says that "in order to speak the truth it is not necessary to pull a long face," and to welcome the increasing use of the society's house as a club and the increasing frivolity of the receptions held there. Perhaps what is most wanted is the ability for the introducer of a discussion not merely to read his paper, but, as Dr. Bruce Low suggested a year or two ago, to render and perform his contribution just as an actor performs a part or a musician renders a piece of music. It is not enough to garner his observations or to marshal the emergent facts; he must present them in a way to elicit discussion and even, as Dr. Hutchison suggested, to provoke retort.

### A CLEARING HOUSE FOR HUMAN GENETICS

FOR the last four years there has been a branch in this country of the International Human Heredity Committee founded by the International Federation of Eugenic Organisations. This has recently been enlarged as the British National Human Heredity Council and, in collaboration with the Galton Laboratory, aims at setting up a clearing house for material on human genetics. The council consists of a number of geneticists and leading medical men, with Prof. R. Ruggles Gates, F.R.S., as chairman, Sir Laurence Halsey as treasurer, Mr. J. A. Fraser Roberts, D.Sc., as hon. scientific secretary, and Mrs. C. B. S. Hodson as hon. general secretary. The direction of the work is to be in the hands of a small executive committee. The council, we understand, would be grateful to receive, from institutions and individuals, well-authenticated data on the transmission of human traits—e.g., family histories or pedigrees, twin studies, and statistical researches. Authors of published work may have collected a number of pedigrees which they have been unable to reproduce in detail. Such records by inclusion in the clearing house would be preserved. Anyone who wishes to have a copy of the standard international pedigree symbols may obtain one from the office at 115, Gower-street, London, W.C.1.

### THE ORIGIN OF CHILBLAINS

THE conception of chilblains as a manifestation of tuberculosis, or at least of the activities of the tubercle bacillus, is by no means new. Its latest exponent is Dr. Jeanne Stephani-Cherbuliez, of Geneva, and her thesis, published in *Revue de la Tuberculose* for March, is the outcome of thirteen years' observation. As she points out, Darier in the 1918 edition of his "Précis de Dermatologie" adumbrated the possibility of chilblains being some day recognised as a manifestation of attenuated tuberculosis, in the same class with the tuberculides. Calmette also suspected a causal connexion between the tubercle bacillus and chilblains. The author of the paper has dispensed with laboratory methods of research and has not even made systematic use of any tuberculin test. Instead, she has studied the incidence and severity of chilblains in various groups classified according as their constituent members were healthy or suffered from, or gave a family history of, tuberculosis. Of 350 persons examined, 250 were tuber-

oulous and 100 were healthy. In addition, there was a separate group of 15 patients subject to ulcerating chilblains. It was found that while chilblains were much commoner among the offspring of healthy parents than among the offspring of tuberculous parents, their course was more benign in the latter—a difference which Stephani-Cherbuliez compares with the observation that tuberculosis developing in previously healthy stock is liable to run a comparatively violent course. Chilblains, she argues, are an allergic response to the tubercle bacillus which itself may not be present in the chilblain but in some other part of the body where it may even play the part allotted to it by the Germans in their conception of the *Primärkomplex*. If this were so, chilblains might come to be regarded as a valuable warning—i.e., as evidence of tuberculous activities which demand that precautions should be taken by the patient lest worse befall him. But while none will deny that chilblains and tuberculosis are often associated, it will take much new evidence to persuade us that the association is essential.

#### SYMPATHETIC OPHTHALMIA AS A SEASONAL AFFECTION

No important advance has been made for many years in explaining the pathology of sympathetic ophthalmia. Our Budapest correspondent tells us of an elaborate study made by Dr. Bela Waldmann which was recently awarded the prize of the Oradea Medical Society. Dr. Waldmann believes that sympathetic ophthalmia depends upon some toxic agent conveyed to the eyeball from an accessory nasal sinus, and thence to the second eye via either the optic or the ciliary nerve. His belief is founded on the fact that out of 69 cases of which he has personal knowledge 53 started during what he terms the influenza months (October to April), while during the summer months (May to September) less than a quarter started. To test his theory from further statistics he sent inquiry forms to various eye clinics (in Baltimore, Berlin, Budapest, Ghizeh, London, Madras, Manchester, Munich, Stockholm, and Vienna), and by this means obtained answers respecting 124 additional cases and these told the same story. Three-quarters of the cases began during the cold half of the year and only one-quarter during the warm. In Prof. Meller's clinic in Vienna the ratio was 7 : 1. On the strength of these data Dr. Waldmann feels justified in asserting that sympathetic ophthalmia is a seasonal affection. This is a new observation and, whether or not his suggestion as to the channel of infection should ultimately prove to be justified, it is one that should not be lost sight of.

#### THE RELATIONS OF THE ŒSOPHAGUS

SURROUNDED by translucent lung tissue, the heart and aortic arch are favourably placed for radiographical inspection. But the posterior surface of the heart and the descending aorta, because of their proximity to the spinal column, are not always readily visualised. The Œsophagus, in traversing the thorax, is closely applied to the back of the heart, the aorta, and the tracheo-bronchial tree, so that its course is easily influenced by changes in cardiovascular structure. When filled with a suitable emulsion of barium, the Œsophagus serves as a valuable radiological landmark in the chest. Kreuzfuchs (1921) made use of the barium-filled Œsophagus in measuring the diameter of the aortic arch. Gäbert (1924) studied the displacement of the Œsophagus caused by enlargement of the left auricle, thus extend-

ing the anatomical investigations of Kovács and Stoerk (1910). Renander (1926), Biedermann (1931), and others noted the characteristic Œsophagogram associated with a right-sided aortic arch, a congenital anomaly which occasionally causes dysphagia. Parkinson and Bedford described in our own columns (1931, ii., 337) the middle Œsophageal impression, due to the left bronchus and indirectly to the right pulmonary artery, and discussed its clinical significance in relation to cardiovascular disease. A further valuable contribution to our knowledge of the Œsophagus in relation to the heart and aorta has been made by Dr. William Evans, in a report<sup>1</sup> issued by the Medical Research Council. Dr. Evans has made an extensive study of the normal Œsophagogram in healthy subjects, confirming his interpretations of the various impressions by anatomical dissection. He establishes four normal Œsophageal impressions made, from above down, by the aortic arch, the left bronchus, the left auricle, and the descending aorta. Each of these is described first as seen in healthy subjects, then as modified by different pathological changes in the heart and aorta. A large series of radiograms is given, each with its anatomical interpretation, illustrating in turn the different forms of Œsophagogram found in health and in cardiovascular disease. Dr. Evans's monograph, which combines with his own investigations a survey of previous work on the subject, should lead to a better appreciation of the importance of the visualised Œsophagus in relation to the heart.

#### THE BRITISH HEALTH RESORTS

THE waning popularity of the continental health resorts and the renewed vigour of their British rivals is referred to in the report on page 1137 of the conference of the British Health Resorts Association at Woodhall Spa. In his foreword to the Association's Handbook for 1936,<sup>2</sup> Sir Kingsley Wood writes: "It is true to say that the benefits which British Health Resorts can offer in a great variety of cases are not known or used to the extent they deserve. Modern research has done much to explore and explain the relation of environment to health, and to add to our knowledge of the precise importance of factors like climate, air, and medicinal waters in the treatment and prevention of disease. But this increased knowledge cannot have its full effect unless it reaches the public. It is the object of the British Health Resorts Association to ensure that it shall. The task which the Association has undertaken is threefold; to bring before the public the claims of British spas and watering places to possess curative resources in no way inferior to continental health resorts; to offer to the medical profession and its clients expert advice on the natural conditions most favourable to the successful treatment of the maladies with which they are concerned; and to inform them where these conditions may be found in this country." The handbook, now in its fourth edition as a separate work, ably serves all these purposes. Considerable changes have been made in the new and enlarged edition, which will increase its usefulness both to the general public and to the medical profession. The information about the British wintering places has been augmented by detailed meteorological reports on the climate during each of the winter months; these are in

<sup>1</sup> Spec. Rep. Ser. No. 208, pp. 93, 2s. 6d.

<sup>2</sup> British Health Resorts: Spa, Seaside, Inland. Official Handbook of the British Health Resorts Association. Edited for the Association by A. Fortescue Fox, M.D., F.R.C.P. London: J. & A. Churchill, Ltd. 1936. 1s.

addition to the readings hitherto given for the whole winter. These should help the physician to decide what resorts might help each individual patient who is likely to benefit from a change of climate. The 179 coastal resorts have been alphabetically arranged in one section and the maps and descriptions of the different climatic regions are grouped together in another. A third group includes all the recognised British spas, and, finally, an account of the waters and climates of Australia and of the West Indies has been added to the section on the British Commonwealth overseas. Each account of the spas and resorts is illustrated; the place itself, its climate and attractions are fully described, and indications for residence at it are given. The Association this month is beginning a systematic investigation of the claims of some of the more important resorts by means of a series of visits conducted by a sub-committee. This will supplement the more general information obtained in the conferences that have been held throughout the country during the past few years, and the further data obtained should in due course add to the value of what is already an excellent work of reference.

### THE TOXÆMIC ELEMENT IN INTESTINAL STRANGULATION

COLLAPSE and death following intestinal strangulation have been variously attributed to loss of fluid from the general circulation, to loss of chlorides, to nervous stimuli, and to toxæmia. It is only on strangulation of a long loop that there is likely to be much loss of fluid, and Mr. G. C. Knight and Dr. David Slome<sup>1</sup> have now come to the conclusion that toxæmia is alone of importance. Their experiments appear to show that the toxin is generated in the wall of the bowel, and is a product of degeneration of the tissues—due to the anoxæmia that follows interference with the local circulation—rather than of bacterial activity. The specific effect by which Knight and Slome were able to recognise the presence of the toxin in body fluids and extracts is a depressor action on the blood pressure. Their experiments included attempts to measure the fluid loss from a strangulated loop and by peritoneal exudation around it. In one of these, a cross-circulation experiment, an animal was made to bear all the fluid loss by connecting its carotid artery to the mesenteric artery of the strangulated gut of a second animal. Whereas the strangulation had a profound effect on the latter, which died rapidly, the blood pressure of the animal supplying the blood was steadily maintained. The method of strangulation was by ligation of the superior mesenteric vein. Another type of experiment was designed to make the normal animal bear the toxæmia. Here a loop of bowel 17 cm. long was strangulated; when it was black it was enclosed in a rubber bag, and at the end of 16½ hours this contained 45 c.cm. of fluid. The fluid, together with the black loop of bowel, was then placed inside the peritoneal cavity of a normal animal, the abdominal cavities of the two animals being sutured together. The normal animal died, in circulatory collapse, within 3½ hours, although it had lost no fluid, while the strangulated animal died a little later, 20½ hours after the strangulation. The presence of depressor substances in the venous blood was demonstrated by cannulation of the superior mesenteric vein in cases of superior mesenteric strangulation, the blood being collected and injected intravenously into normal animals; a depressor action was obtained within an

hour of the strangulation. It was also proved that the depressor substance could be absorbed through the peritoneum when both venous and lymphatic channels were compressed—the most likely channel of absorption, probably, in strangulation in human beings. The contribution that distension of the gut wall makes to the collapse of the patient is probably very important, but its significance is not quite clear. It may be largely a nervous effect, though Knight and Slome incline to think that this is itself a result of further production and absorption of depressor substance.

### PHYSICAL MEDICINE

IN the art gallery of the Guildhall on Tuesday evening the City of London offered its inimitable hospitality to the delegates of the Sixth International Congress of Physical Medicine, in session this week in London. Captain G. S. Elliston, M.P., speaking on behalf of the public health committee of the City, toasted the Congress and recalled how careful the City of London had been, for 500 years or more, through the charters granted to the Barbers and Apothecaries Companies, in the protection of its citizens from the rashness of presumptuous empirics and ignorant and inexpert men; and he gave a particularly kind word to the latter society in maintaining a register of biophysical assistants qualified to dispense physical medicine on the prescription of doctors. Four delegates responded to the toast. Sir Robert Woods, president of the congress, insisted that for the first time preventive medicine had appeared on its programme in the shape of a section devoted to physical education. Sir Leonard Hill, a vice-president, claimed that 80 per cent. of patients who come for help to insurance practitioners have nothing the matter with them that is not amenable to physical medicine, and he asked the universities to found chairs in this branch of medicine, and the City to finance a National Institute of Physical Medicine. Prof. I. Gunzburg, of Antwerp, set out with eloquence the decadence of medicine and surgery as we know them and their replacement by physical methods which would constitute the medicine of the future. Finally, Dr. Richard Kovacs, of New York, speaking with facility in four languages, expressed satisfaction that the congress was meeting in London, for, said he, the real progress of science lies in individual liberty. The Lord Mayor, whose traditional part in all good health work was eulogised by Sir Henry Gauvain, after welcoming the delegates, put to them the searching question what was the present need for more radium, in view of his responsibility for some worthy object for the King George V. Memorial Fund. Earlier on the Tuesday the congress had met in common session, some account of which is given on another page, to resolve itself later in the week into seven separate sections, each with its own programme. The attendance is remarkable testimony to the hold which this new branch of medicine has on the minds of medical pioneers in all countries.

Dr. John Smith Fraser, who had for 15 years been surgeon to the Royal Infirmary, Edinburgh, and lecturer on diseases of the ear, nose, and throat, died in Edinburgh on Monday last.

On May 19th, 21st, and 26th Sir Bernard Spilsbury will deliver the Croonian lectures of the Royal College of Physicians of London, on the doctrine of inflammation. The lectures will take place at the College, Pall Mall East, S.W., at 5 p.m., and members of the profession will be admitted on presentation of their card.

<sup>1</sup>Brit. Jour. Surg., April, 1936, p. 820.

## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### C.—PROGNOSIS OF PSYCHOLOGICAL DISTURBANCES IN CHILDHOOD AND ADOLESCENCE

PSYCHOLOGICAL disturbances in the young may be manifest in a wide variety of symptoms. We are dealing not with diseases as a rule but with personalities in the making. Symptoms are usually evidence of disturbance of development rather than of distortion of established function. It follows that on the whole a favourable outcome is to be anticipated provided gross mistakes in treatment are avoided; for at this stage there is an opportunity to undo faulty tendencies with much less labour in retracing the line of development than is required in the treatment of psychopathological conditions in adults.

A considerable proportion of symptoms in childhood and adolescence can be considered as reactions to situations. In children the situations are often still present or at least recent; a large number of them have not become internalised or introjected. Hence what might be called environmental manipulation is far more often successful than it is in adults, just as it is much more practicable. It is easier and less costly, to take an extreme example, to change a child's school than to change in any worth-while fashion his job in after-life. Moreover, the people surrounding the child are much more amenable to education about him than are the persons in the vicinity of an adult. For the child allowances are more willingly made. Pedagogy is recognised, dimly perhaps, as a branch of science which anyone may have to practise and yet about which anyone may receive instruction without loss of dignity. In adult patients, on the other hand, personal feelings are even more involved than they are in one's relationships to children, and the weapons of prestige and affection are much less readily available in consequence.

This reciprocal plasticity both of patient and environment must clearly be an important factor in prognosis. But in so far as the environment enters into the causation of these psychological disorders of childhood it becomes itself an important factor to be weighed in giving a prognostic opinion. Moreover a child's environment is apt even more than an adult's to be a continuing cause of symptoms. In adult conditions, we hear much more of precipitating causes than of continuing ones, partly because in adults we are much more apt to think of diseases than of reactions. In children the continuing rather than the merely precipitating aspects of the environment are impressed on us very strongly, and never more strongly than when we watch the results of complete avulsion of the child from his surroundings: symptoms of a type that in an adult would be regarded as ominously chronic may in a child subside almost in a night and remain away indefinitely.

It is possible that some "symptoms," so-called, are simply normal developmental stages, in the sense that every child develops some degree of them at some time or other in the course of its natural growth. This for example may be true of obsessions and compulsions. Thinking of that order is normal at some stage: and only when it is especially prominent or lingers over-long can it properly be regarded as pathological, like a thyroglossal cyst.

It must also be remembered that when we speak of "symptoms" in childhood we are often misusing the word. Symptoms are by definition what the patient complains of, but in children they are much more often what the adult complains of as appearing in the child.

Self-rectification has also to be taken into account in assessing results: especially when claims are made for the superiority of one method of treatment over another. It appears to take a great deal to disturb a child psychologically in a permanent fashion; and although we must regard the old comforting assurance that "he will grow out of it" as thoroughly feeble in its motive (as it is so often a confession of ignorance about therapy) there is no doubt that children do have a very distinct tendency to "grow out of" their psychological difficulties. At any rate that is the impression which anyone must receive who studies psychological disturbances in children.

In an attempt to obtain a more precise impression an attempt was made some years ago in connexion with the Child Guidance Clinic at Guy's Hospital to find what was the apparent recovery-rate from psychological disturbances in children which had not been treated. This was undertaken with the hope of getting a control group for the results obtained in the clinic. Miss McFie found the results shown in the Table. Her figures give the number of

*School-children showing various types of difficulty classified according to result of school handling. (McFie.)*

School.	Personality deviation.			Behaviour disorders.			Habit disorders.			Scholastic difficulties.		
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
A ..	3	15	14	—	10	16	—	13	24	1	3	6
B ..	1	2	8	—	1	6	—	1	18	—	1	4
C ..	—	6	6	—	3	—	—	1	25	—	—	3
D ..	—	24	8	—	9	3	—	12	3	—	4	2
E ..	1	6	13	1	4	8	1	11	22	—	1	—
F ..	—	6	7	—	2	4	—	1	4	—	—	1
H ..	—	12	16	—	5	10	—	6	12	—	2	4
Total	5	71	72	1	34	47	1	45	108	1	11	20

X = Difficulty cleared up completely. Y = Difficulty cleared up partially. Z = Difficulty persisted.

Owing to the fact that some of the children presented more than one type of difficulty, an addition of the totals gives 416, while the actual number of children concerned is 322.

recoveries estimated by head mistresses and head teachers in children who while under their care exhibited symptoms of a nervous type. This, which might be regarded as a spontaneous recovery-rate, seems to be comparatively low compared with what would have been expected. The method of collecting the figures while it was the best that could be devised at the time, and was very conscientiously carried out, contained considerable possibility of error; but these are the only figures available to us of the spontaneous recovery-rate in the types of disorder now under consideration. They form at least an interesting contrast to what we have to state as the results of treated cases.

The problem which confronts us at the outset in making any prognostic generalisation on this topic is that of classification. There is no very widely

accepted simple classification but there are close resemblances between the different classifications in use. We have sought to put the classification upon as logical a basis as possible by compiling a list of symptoms in our series of patients. To give the experience with individual symptoms however would be of little value, as their meaning depends so much on their setting among other symptoms and indeed on their setting in the total problem. We have therefore used the list as a basis for subdivision, enumerating various symptoms under one of several headings into which they seemed to fall logically. One has to realise that when we speak of psychological disorders we have to include not only conditions which appear to have their origin at the psychological level, but others which may only have their expression there and which actually originate at a lower level, for example at the vegetative level. Thus it appears that some night-terrors at least are of metabolic rather than of psychological origin.

The classification which appears to us to be of the most practical utility is the one which, with some modifications, has been used at Guy's Hospital for a number of years. It includes the types of reaction met with also in adults, but adds other types of disorder which come specially to notice in childhood. This classification is as follows:—

1. *Disturbances arising at the vegetative level*—i.e., of a psychological symptomatic description but not accounted for by pre-existing psychological conditions. For example, disturbances in the functions of eating, sleeping, and excretion—e.g., night-terrors, groaning in sleep, restlessness, some cases of walking and talking in sleep, and some of enuresis.

2. *Habit disorders*—nail biting, thumb sucking, hair pulling, nose pulling.

3. *Behaviour disorders* (this refers to social behaviour of the purposive kind. Fidgetiness is therefore not included). This includes stealing, lying, truancy, wandering, sex misbehaviour, masturbation, disobedience, obstinacy, destructiveness, spitefulness, temper tantrums, crying spells, threats of suicide, swearing, refusal to eat, refusal to speak, refusal to go to school, dermatitis artefacta. The reason for including dermatitis in children is that in our experience it is a conscious purposive act (although of course the real factors may be unconscious).

4. *Personality traits*.—These are defined as habitual attitudes in a social respect, and include shyness, sensitiveness, sulkiness, a-socialness, greediness, irritability, petulance, excitability, timidity, and the opposites to some of these; aggressiveness for example, rebelliousness, and its opposite (easily dominated), over-meticulousness, dreaminess. It has to be pointed out that behaviour if continued long enough becomes ingrained as a habit and ceases to be consciously purposive. It then ranks as a personality trait, and there is therefore apt to be a transitional state between these last two categories.

5. *Scholastic difficulties* other than those due to generalised mental defect—e.g., reading disability. This category therefore includes backwardness in school arising from environmental handicap or intrinsic localised handicap such as word blindness and word deafness.

6. *Psychoneurotic anxiety states*.

7. *Hysteria*.

8. *Obsessive compulsive states*.

9. *Epilepsy*.

10. *Mental defect*.

11. *Schizophrenic psychoses*.

12. *Affective psychoses*.

13. *Tics* which cannot be placed in any of the above categories.

14. *Stammer* in cases which cannot be listed under any of the above categories.

#### SYMPTOMS TWO YEARS AFTER TREATMENT

The incidence and ultimate fate of individual symptoms of these types were studied in a series of

80 cases which were followed up after a period of two years by personal visits from the social worker. It was found that improvement or actual recovery was the rule for all groups, not excluding even the mentally defective. In nearly all individual symptoms failure to improve was very exceptional. This is not to be attributed merely to maturation, as might be expected in the mental defectives for example, but to many other factors of which treatment is sometimes one. The total number of patients is much too small for reliable statistical treatment of syndromes or individual symptoms, but they serve to strengthen the general impression that the following statements are true.

*Scholastic difficulties* other than those due to defect of general intelligence, such as backwardness from difficulties over a special subject like arithmetic, or to faulty methods of teaching, or to some source of unhappiness at school, commonly disappear when accurately diagnosed and adequately treated, especially by coaching. This is perhaps the most favourable of the individual groups of symptoms and the results here alone would justify the assertion that a clinic for child guidance is an essential part of any educational system.

*Behaviour disorders* also commonly have a favourable outcome. Of 64 instances of symptoms falling under this head 31 were recorded as well two years later, 26 as improved or much improved, and only 7 as in statu quo. Of this type of symptom wandering and truancy are in our experience probably the most difficult to abolish, at least in a city population of the poorer class and where a residential school régime cannot be provided. Stealing in a similar population can be stopped in a considerable proportion of cases but not in all. Provision of suitable residential arrangements, especially in an atmosphere where much attention was paid to character training, would in our opinion considerably increase the effectiveness of treatment. Cases of behaviour disorder, so grave as to suggest a diagnosis of moral imbecility in an older terminology, commonly clear up surprisingly well if properly handled. Naturally the prognosis of an item of behaviour must be considered both in relation to personality and to environment. If wandering or a peculiarly persistent refusal to go to school are the expressions of an early schizophrenic psychosis the prognosis is of course that of the latter. The more the behaviour can be shown to be the outcome of environmental factors, including in that term the play of affection or the reverse around the child, the better the prognosis.

*Personality traits* are by definition more difficult to modify than difficulties of behaviour. These are both more habitual and less tangible than the latter. A-social characteristics are among the most frequent and the most difficult to influence. Such characteristics are so common in the anamnesis of adult psychoneurotics and psychotics that the reflection is obvious that a successful attack in childhood on them might do something to limit the incidence of adult breakdowns. Timidity and its variants are on the other hand among the most readily influenced, and so are temper tantrums. Obstinacy or stubbornness occupies a middle position in probable outcome and our impression is that negativistic traits rank next to a-social ones in their value as warning signals of a subsequent adolescent or adult breakdown. Persistent cruelty in spite of environmental manipulation is also a bad omen.

Of the *vegetative disturbances* those of sleep are commonly much improved or cured. Sleep-walking



is in our belief not by any means always psychologically determined. It may be due to physiological instability of the nervous system and occasionally perhaps to epilepsy. Disorders in this group commonly subside when the general health is satisfactory, but in addition glucose at bedtime, bromide sometimes, and occasionally Luminal, are effective. Enuresis is a problem in itself and is included in this group only when it has existed since infancy and when it seems uninfluenced to any extent by psychological factors or when none of these are discoverable. Nevertheless it has, on the whole, ultimately a favourable prognosis whatever category it belongs to. The "physiological" type, as we call it, according to the definition we have given, commonly clears up about puberty; and comparatively few cases of whatever origin persist into late adolescence. We have seen every sort of remedy cure enuresis and in individual cases have seen everything fail.

Our experience of the *psychoneurotic disturbances* of childhood is on the whole a favourable one. We refer of course to clinical pictures which are dominated by psychoneurotic symptoms and not so much to minor childish phobias such as fears of the dark. We have been surprised to find how readily psychoneurotic conditions in children subside on a mere change of environment: how they may stay away so long as the environment remains suitable; and how, if properly handled, they need not necessarily relapse on the return to the family. This is of theoretical significance when we consider the Freudian theories of the origin of such conditions. It is our impression that such symptoms tend to disappear also with a non-interpretative play technique.

*Psychoses*, although rare in young children, are occasionally met with in them and may be of the affective type. For schizophrenic conditions occurring in young children the outlook is usually although not invariably poor. It is however worth emphasizing that for schizophrenic psychoses occurring in adolescence the proportion of recoveries is much higher than is usually realised. For example, in 72 cases occurring between 14-17 Ssucharewa (1932) recorded that 72 per cent. had more or less complete remissions, and of 27 cases followed up five years later 52 per cent. had no subsequent attacks, while the remainder of the 27 cases had further attacks with ultimate complete deterioration. Among the manic-depressive psychotics recovery probably takes place in the majority, though they remain liable to subsequent attacks. Of four young psychotic children seen as out-patients at Guy's Hospital in the last few years, one of an affective and two of a schizophrenic type have deteriorated, and another (schizophrenic) has made a great improvement.

We have placed *stammer* in a special category because we are not satisfied that it can properly be regarded as hysterical in a high proportion of cases. Such data as have come to our knowledge suggest that about two-thirds of cases in childhood recover by late adolescence, but in those cases in which stammering persists until 17 or 18 it is apt not to be cured by any methods whatsoever, although it may be considerably improved. Nevertheless the fact that stammering in middle life is rare suggests that here again a spontaneous factor is at work for ultimate recovery.

#### CONCLUSION

The factors that influence recovery or improvement are many; and it is difficult to ascertain with any degree of precision to what factor recovery is to be attributed; but a list would include: talks with a

psychiatrist and talks with a social worker (the talks may be with the parents as well as with the child); various kinds of environmental manipulation, such as foster homes, residential schools, change of school, change of work, going to work for the first time, going up to senior school, removal of the home to another district; medical measures of the more ordinary kind, such as medicine and rest; and finally, the mere lapse of time which implies maturation or perhaps emancipation from earlier problems.

R. D. GILLESPIE, M.D., F.R.C.P., D.P.M.  
Physician and Lecturer in Psychological  
Medicine to Guy's Hospital.

R. A. Q. LAY, M.B. Lond.  
Sir Alfred Fripp Memorial Research Fellow  
in Child Psychology at the Hospital.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. J. E. Clark to *Malabar* for Bermuda Dockyard.

Surg. Lt.-Comdrs. J. A. Cusack and V. F. Walsh to rank of Surg. Comdr.

Surg. Lt.-Comdr. A. L. Moorby to *Pembroke* for R.N.B.  
Surg. Lt. L. G. Yendoll to *Drake* for R.N.B.

S. J. Atkinson, H. B. Watson, and E. C. Janet, as Surg. Lts. (D), for short service and appointed to *Victory* for R.N. Hospital, Haslar.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. R. R. B. Roberts to *Drake* for R.N.B.

Surg. Lt.-Comdr. (D) E. D. Collins to *Victory* for R.N.B.  
Surg. Lt. R. D. Jenkins to *Ramillies*.

### ROYAL ARMY MEDICAL CORPS

Short Service Commissions: The undermentioned Lts. to be Capts.: P. L. E. Wood, P. R. Wheatley, A. C. Cox, J. J. Groome, J. S. Kelleher, C. Ryan, W. B. Hamilton, D. S. Cochran, T. P. O'Brien, M. A. Flaherty, E. J. Pryn, and J. P. Weir.

The undermentioned Lts. (on prob.) (vide THE LANCET, May 9th, 1936) are sec'd.: S. E. Osborne, V. Bennett, G. N. Barker, and R. A. Hoey.

### ARMY DENTAL CORPS

Capt. W. B. Purnell to be Maj.

Short Service Commissions: T. A. Smitham to be Lt. (on prob.).

### TERRITORIAL ARMY

Cpts. N. H. Watson and N. Harkness resign their commissions.

Lt. R. D. Forsyth to be Capt.

### ROYAL AIR FORCE

Wing Comdr. C. P. Barber to No. 6 Flying Training School, Netheravon, for duty as Medical Officer.

F. L. Whitehead is granted a short service commission as a Flying Officer.

*Dental Branch*.—Flying Offrs. I. St. C. Alderdice to No. 1 School of Technical Training (Apprentices), Halton; O. F. Brown, J. H. G. Fensom, R. A. Pepper to Home Aircraft Depot, Henlow; S. Hill to R.A.F. Depot, Uxbridge; and W. A. H. Smith to R.A.F. Station, Manston.

### RESERVE OF AIR FORCE OFFICERS

*Special Reserve*.—A. C. Fraser is granted a commission as Flying Officer.

### INDIAN MEDICAL SERVICE

The names of the undermentioned have been brought to notice by the Commander-in-Chief in India, for distinguished services rendered in connexion with the Mohmand operations N.W. Frontier August to October, 1935: Lt.-Col. H. B. Scott, O.B.E., Capt. F. J. Doherty, D.S.O., Lt.-Col. R. K. Mallam, R.A.M.C., Maj. C. A. Slaughter, R.A.M.C., and Maj. M. P. Power, O.B.E., M.C., R.A.M.C.

Lt. J. M. F. Byrnes relinquishes his prob. appt.

## SPECIAL ARTICLES

## RELATIVE VALUE OF RAW AND HEATED MILK IN NUTRITION

BY ELFREIDA C. V. MATTICK, M.Sc., Ph.D. Bristol  
AND

J. GOLDING, D.S.O., F.I.C.

(From the National Institute for Research in Dairying,  
the University, Reading)

In a previous paper on the relative value of raw and heated milk in nutrition,<sup>1</sup> long-continued feeding experiments with rats in which different types of milk were used was described. It was shown that in the first experiment while a fourth generation receiving raw milk were weaned successfully, only dead pups were born to the second generation on "fresh" sterilised milk, and no second generation were weaned on "kept" sterilised milk.

In that paper we said: "It is proposed to keep some members of this fourth generation in an endeavour to determine the number of successive generations which can be raised on this particular diet." We now give the history of these subsequent generations.

## RESULTS OF THE INVESTIGATION

The technique used and the source of the milk remained unchanged. All the results given here are from a first and single mating only, in each generation. Except in the early stages when suitable weights were considered, mating was entirely "random" within the possibilities of cross-mating. If it had been possible to keep all the rats which were weaned and to carry out successive matings it is possible that our efforts would have been more successful; on several occasions families were weaned from later but not from a first mating. It must be remembered that the diet was at no time considered to be ideal.

The number of pups born and weaned in successive generations are shown in Table I. For the sake of

comparison the results of "fresh" and "kept" sterilised milk are included.

The results with "sterilised" milk, both "fresh" and "kept," have been discussed<sup>1</sup> and hardly need further comment. Those with raw milk present various interesting features. The does of the first, second, and third generations all produced litters at a first mating; in the later generations one or more in each case failed to produce litters. These failures in production were not, however, increasingly numerous in successive generations. In the seventh generation, one doe of four did not become pregnant, but the remaining three produced nineteen pups (litters of four, seven, and eight). None of these were weaned, for the does failed to lactate. It is this failure to lactate which seems to be the limiting factor in this type of experiment, and it is noticeable that this is present throughout the experiment and may be due to inadequacy of the diet or to some unknown factor which is found to affect does in many similar experiments.

A comparison of the rate of growth and average weight at similar age of the members of successive generations is shown in Figs. 1 and 2 and in Table II.

From Table II. it is seen that at 120 days the average weights of the first generations (litter brothers and sisters) on each type of milk are somewhat similar; the "kept" sterilised bucks and the "fresh" sterilised does having respectively the highest and lowest values. No second generation was weaned on "kept" sterilised milk while the second on "fresh" sterilised were quite abnormally small and light (photograph given in earlier paper).<sup>1</sup> The numbers in these groups are so small that the results might quite reasonably be regarded as insignificant except for the fact that the original rats in each group were litter brothers and sisters selected from two litters only. No further comparison between groups can be made. A quite definite falling off in weight of animals of the same age on raw milk is shown in subsequent generations compared with the first and second, but again it is interesting to note that this is not progressive, the average weight of the fourth to the seventh generations of bucks being con-

TABLE I.—RESULTS OF MATING IN SUCCESSIVE GENERATIONS

Generation.	RAW.					" FRESH " STERILISED.					" KEPT " STERILISED.				
	No. of does and age at mating, in days.	No. of litters seen.	No. of pups seen.	No. of litters from which pups weaned.	No. of pups weaned.	No. of does and age at mating, in days.	No. of litters seen.	No. of pups seen.	No. of litters from which pups weaned.	No. of pups weaned.	No. of does and age at mating, in days.	No. of litters seen.	No. of pups seen.	No. of litters from which pups weaned.	No. of pups weaned.
I.	<sup>2</sup> 125-137	2	17	1	4	<sup>2</sup> 125-137	2	10	1	5	<sup>2</sup> 125-137	1	2	0	0
II.	<sup>3</sup> 139	3	22	2	17	<sup>2</sup> 133	1	7	0	0					
III.	<sup>6</sup> 226-231	6	45	3	20										
IV.	<sup>9</sup> 133-137 163-166	6	38	3	17										
V.	<sup>9</sup> 121-126 165	7	40	2	10										
VI.	<sup>4</sup> 138-240	1	7	1	6										
VII.	<sup>4</sup> 163	3	19	0	0										

siderably higher and of the does either identical or slightly better than those of the third generation.

These results are clearly indicated in Figs. 1 and 2, which show the average growth curves for bucks and does respectively in each successive generation until the time of mating.

The significance of these differences between the average weight of the animals in the different groups and in different generations of the same group was found by comparing each with twice its standard error.\* When a difference is greater than twice its standard error, we may regard the measurements as evidence of a real distinction between the two quantities whose difference is in question.

In groups where the numbers are less than ten, a correction established by "Student,"<sup>2</sup> but in the form adopted by Jeffreys<sup>3</sup> was introduced. This makes the comparisons considerably more stringent than they would otherwise be. The results of the statistical calculations show that the average weights of bucks and does in the three groups receiving raw, "fresh" sterilised, and "kept" sterilised milk were not significantly different in the first generation.

Differences between the second generation does on raw and "fresh" sterilised milk, and the first

from the tails and a hæmocytometer was used. The hæmogoblin was estimated by the acid hæmatin method using a Klett colorimeter. The blood of rats aged 110-117 days which had been kept on the

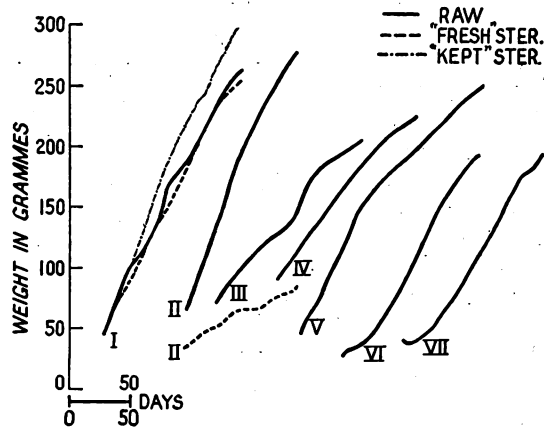


FIG. 1.—Rate of growth in successive generations. First experiment. All bucks.

TABLE II.—Average Weight in Successive Generations Calculated for all animals at 120 days

Generation.	RAW.				"FRESH" STERILISED.				"KEPT" STERILISED.			
	No.	No.	A.w. ♂	A.w. ♀	No.	No.	A.w. ♂	A.w. ♀	No.	No.	A.w. ♂	A.w. ♀
I.	2	2	234	171	2	2	232	155	2†	2	257	173
II.	1	3	246	161	2*	2	76	70				
III.	4	6	130	121								
IV.	8	9	158	122								
V.	7	9	175	128								
VI.	6	4	171	128								
VII.	1	4	168	121								

\* No third generation weaned. † No second generation weaned; one of these two does died at 126 days.

A.w. ♂ ♀ = average weight in grammes of bucks and does respectively.

and second generation bucks and does on "fresh" sterilised milk are very significant. There is no significant difference between the average weights of successive generations from the third to the seventh in either bucks or does on raw milk.

The reason for the falling off in weight in the third generation and subsequent stabilising is not known, but recorded data show that it is not apparently due to inbreeding, age of rats, or time of year at mating. It may be significant that the second generation rats were bred from does whose parents had been raised on a stock diet, and it is possible that the benefits of this original stock diet were not lost until after the second generation, while from the third onward the rats had become accustomed to this insufficient diet of biscuit and milk. Failures in lactation were found in the first generation.

**Red cells and hæmogoblin blood content.**—Towards the end of this experiment some estimations of the number of red cells and hæmogoblin content of the blood of stock (11 bucks) and experimental (5 bucks, 5 does) rats were made. The samples were taken

milk and biscuit diet showed a statistically significant higher number of red blood-cells, and lower hæmogoblin content, indicating a tendency to anæmia which, however, disappeared with increasing age. On the other hand, the animals on stock diet showed lower values of statistical significance—of both red cells and hæmogoblin as they became older. At 358-386 days there were no statistically significant differences in either red cells or hæmogoblin in the blood of the experimental and stock rats examined.

**Bone analysis.**—Analyses of the leg bones of six rats of the second generation were carried out. These were one buck and two does from the raw and two bucks and one doe from the sterilised milk group. The age of all the rats was between 473 and 486 days. Statistical calculation of the results showed that the ash and calcium contents of the

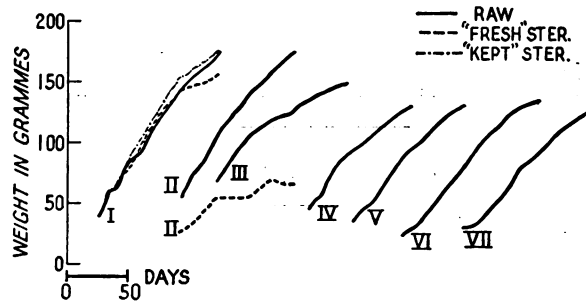


FIG. 2.—Rate of growth in successive generations. First experiment. All does.

bones of the raw milk fed rats were slightly but definitely greater than in those receiving sterilised milk. The differences in the phosphorus content were not significant.

Results of the analyses of the leg bones of a seventh generation doe (aged 516 days) showed that after four years' feeding of successive generations on a diet of raw milk and flour and water biscuit there was no diminution in the ash, calcium, and phosphorus content of the bones.

**Condition of teeth.**—It is interesting to note that at an age of 477 and 516 days respectively, no dental lesions could be found in a seventh generation buck

\* The standard error of the difference between two quantities is the square root of the sum of the squares of individual standard errors of the two quantities.

and only doubtful earliest signs of carious lesions in a doe of the seventh generation on raw milk. Examination of the teeth of these rats was very kindly made for us by Dr. Evelyn Sprawson of the London Hospital dental school.

#### CONCLUSIONS

(1) Rats from the same litters placed at weaning on diets of biscuit made from flour and water only and of (a) raw, (b) freshly sterilised, and (c) kept sterilised milk, show marked differences during a long-continued experiment.

(2) No second generation was weaned from the group receiving "kept" sterilised milk. No third generation was weaned from the group receiving "fresh" sterilised milk. Second, third, fourth, fifth, sixth, and seventh generations were weaned from first matings only of successive generations in the raw milk group.

(3) Although the rats originally placed on these diets at weaning from stock (called first generation) showed no significant differences in average weight at time of mating, the second generation does on fresh sterilised milk were significantly lower in weight than the original rats receiving either raw or sterilised milk.

(4) After the third generation no significant differences in the average weights of either bucks or does were found in successive generations on raw milk.

(5) The possibility of anæmia in the younger rats on the experimental diet is shown by a consideration of the statistical significance of the differences in the average red cell count and hæmoglobin content of such rats compared with those on a stock diet of similar age—such differences are no longer significant in the case of older rats.

(6) Analysis of bones of rats of the second generation on raw and fresh sterilised milk show that the bones of the former contain slightly more ash and calcium than those in the latter group.

(7) No dental lesions could be found in a buck and only doubtful signs in the teeth of one doe of the seventh generation on raw milk.

#### REFERENCES

1. Mattick and Golding: THE LANCET, 1931, i., 662.
2. "Student": Biometrika, 1908, vi., 1.
3. Jeffreys, S. H.: Proc. Roy. Soc. A., 1932, cxxxviii., 48

## ROYAL SOCIETY OF MEDICINE

THE biennial dinner of the society was held on May 9th, at the May Fair Hotel, London, when about 180 fellows and guests sat down. The president, Dr. Robert Hutchison, was in the chair, and after the loyal toasts "The Royal Society of Medicine" was proposed by the Minister of Health, Sir KINGSLEY WOOD, who remarked that he was to enjoy a night out as the society had, he understood, nothing to do with medical politics. It was born, he was told, in a tavern in 1805 under the name of the Medical and Chirurgical Society for the purpose of conversation on professional subjects, for the reception of communications, and for the formation of a library. Since that time its numbers had increased until to-day it was housed in a magnificent building in Wimpole-street with a Royal Charter, a roll of over 5000 fellows, and twenty-four sections dealing with all branches of medicine. The printed "Proceedings" acted as the ambassador of the society all over the

world to report advances and progress in medical knowledge. It was, he said, one of the aims of the Ministry of Health to secure unity and coöperation in health and medical administration, to prevent overlapping and waste of effort, and so to secure the exertion of maximum effect. Between 1846 and 1902 many other medical societies were formed for the advancement of special studies, all doing excellent work within their own spheres. Owing to rivalry and lack of coördination, however, progress was not as marked as it should have been and it was a happy thing when the amalgamation of seventeen of these societies ensured the success of what became the Royal Society of Medicine. He congratulated the society on its financial stability and increasing membership, due in large measure to the loyal service of the late Sir John MacAlister and of Mr. Geoffrey Edwards. The Ministry of Health was primarily concerned with the prevention of disease and it was becoming more difficult to draw the line where prevention ended and treatment began. This society provided the Minister with standards on which to model and keep bright his work. He coupled with the toast the name of Dr. Robert Hutchison, equally distinguished as physician, medical historian, wit, and expert on nutrition.

Dr. ROBERT HUTCHISON, in reply, spoke of the loss sustained by the society in the death of their patron, King George V. They hoped that Royal patronage would again be extended to them by King Edward. In thanking the Minister of Health for his presence he spoke of the pleasure felt by the society of putting before the Ministry the knowledge and experience of the many great men contained in its ranks, for the society knew no politics, medical or other. Their only regret was that they were not consulted oftener. The society, he went on, had three functions to perform: it had to supply the apparatus of knowledge; to provide for the interchange and diffusion of knowledge; and to promote good fellowship amongst its members and the profession at large. It was his belief that these three functions were efficiently fulfilled. The library, he was told, ranked fourth among the great medical libraries of the world; its maintenance was regarded as a first charge on income. Men in the remoter parts of the Empire had said how helpful the library service was to them. The sectional meetings were well attended, but he felt himself that the discussions were too polite; a little unparliamentary language at times would be a useful tonic. A tavern was, he thought, a good place to be born in, for it at least ensured that the society was imbued with the spirit of sociability. There was no reason for a learned society to be solemn or pompous in its lighter moments and under the inspiration of the present secretary the society's house was becoming more of a club and their receptions more frivolous—e.g., a recent study of the embryology of Mickey Mouse. Financially they were doing well; the budget had been balanced with a substantial surplus. They had done that off their own bats, they had robbed no hen-roosts. He felt it a great honour to be president of the society, and a great responsibility, although fortunately that responsibility was shared, and he would be wanting in gratitude if he did not acknowledge the constant help received from the honorary officers and from the permanent staff.

The toast of "The Guests" was proposed by Mr. ERIC PEARCE GOULD, who paid a very pretty compliment to their rôle at a medical dinner in pandering to doctors' natural delight in gluttony. When we

dine alone in our own homes, he said, a simple meal is all we allow ourselves; but once introduce a guest to the table and up go the calories and out go the vitamins. He extended a warm welcome to several guests, little known to fellows, yet who contributed largely to the stability of the society: Sir Alfred Lewis, financial adviser, Mr. J. H. C. Burton, bank manager, Mr. J. W. Pepper, solicitor, and Mr. G. G. Turner, representing the auditors. He coupled with the toast the name of Mr. Guedalla who had for many years sublimated his ego in a series of fascinating historical studies. Medical literature could be made more palatable and more easily digested if something of his grace and wit were interwoven with fact and figure.

Mr. PHILIP GUEDALLA thanked the society for its lavish entertainment and for its continued interest in their health. His own presence there was due, he supposed, to the society's determination that there should be one specimen of the patient class, in the same spirit in which the ancients enlivened themselves by the presence of one mummy. Patients had feelings too, feelings of gratitude, though not always feelings of respect, "for you cannot do much about a common cold; but it is to you that we go when we are in real trouble—I do not know why." In final reply to the toast, Mr. Guedalla said: I would say that your calling and my calling both depend on the free use of their minds by free men and women, which is something which has disappeared from the more backward parts of the world. If we did not remember it no one would.

## SCOTLAND

(FROM OUR OWN CORRESPONDENT)

### SURGEONS IN EDINBURGH

THE Association of Surgeons, which held a successful meeting in Edinburgh last week, last met in Edinburgh 15 years ago when Sir Harold Stiles was president. On the present occasion Sir David Wilkie presided and there were over two hundred surgeons present. On the mornings of Thursday and Friday, discussions were held on the treatment of fracture of the neck of the femur, and on the treatment of bleeding peptic ulcer. Operations were demonstrated in the afternoons, and an excellent pathological demonstration was arranged. On Friday evening the members dined together in the upper library hall of the University. On Saturday morning several short communications were given, mainly on experimental studies. The weather was good and many of the members found time to play golf.

### CHRONIC PROGRESSIVE HYDROCEPHALUS

At a meeting of the Medico-Chirurgical Society of Edinburgh held last week, Mr. N. M. Dott and Dr. Ernst Levin presented a paper on chronic progressive hydrocephalus. They included in this group of cases those in which there is progressive and excessive accumulation of cerebro-spinal fluid with increasing intracranial pressure which are caused by an inflammatory process. They have experience of 60 of these cases and find that their incidence as compared with cases of brain tumour is in the proportion of one to ten. They emphasised the importance of these cases, and find that the result of surgical treatment is usually good. They classified the cases on an anatomical basis according to the situation at which the circulation of the cerebro-spinal fluid was princi-

pally interfered with. They divided them into three main groups: (a) chronic diffuse meningitis, (b) chronic adhesive meningitis, and (c) chronic plastic ependymitis. The first group is sometimes termed chronic serous meningitis. There are no visible adhesions and the obstruction is over the convex surface of the hemispheres and interferes with the absorption of the cerebro-spinal fluid into the blood. Diagnosis is made by ventriculography which shows no distension of the ventricles but great distension of the subarachnoid space over the hemispheres. Bitemporal decompression usually gives good results in these cases. The second group of adhesive meningitis may be subdivided also on an anatomical basis, according to the site of the obstruction which may be in the sulci of the brain or in the cisterns. An encysted form of this disease may produce symptoms and signs identical with those of brain tumour, and such cases can be cured by removing the outer wall of the cyst. The type of case in which the peri-pontine adhesions occur causes huge distension of the cisterna magna and is the most unsatisfactory form to treat by operation. In the perimedullary type the adhesions prevent the cerebro-spinal fluid from escaping freely from the fourth ventricle and this type can usually be well relieved by operation. Cases of plastic ependymitis are rare, but may cause narrowing of parts of the ventricular system. Obstruction of the aqueduct of Sylvius may be caused in this way and treatment may be attempted by draining the third ventricle into the chiasmatal cistern. When one foramen of Monro is obstructed in this way the condition can be successfully relieved by making an opening in the septum lucidum. Mr. Dott has operated on two such cases of unilateral hydrocephalus. The results obtained from the whole group show about 70 per cent. cured, 10 per cent. recovered with more or less disability, 5 per cent. operative deaths, and 15 per cent. of the cases have subsequently died from progression of the disease.

### THE LATE DR. JAMES SWANSON

The death occurred on April 27th, in a nursing-home in Glasgow, of Dr. James Swanson. Dr. Swanson three years ago was knocked down by a motor-car which mounted the pavement, and he had never fully recovered from the serious injuries which he then received. He had been connected with medical education in Glasgow for nearly half a century. He graduated in arts at Glasgow University in 1881, and at first was a student of divinity, but after taking some instruction in medicine with a view to foreign mission work, he became so much attracted to medicine that he decided to qualify for that profession. He graduated M.B., C.M. in 1890, and obtained the fellowship of the Royal Faculty of Physicians and Surgeons of Glasgow in 1896. In his early days he conducted tutorial classes for medical students, and later was appointed professor of biology at St. Mungo's College, Glasgow, a position which he held for many years. He was a lecturer in botany at Glasgow University, and was the author of several books on botany. He was at one time an officer in the Territorials, and the company he commanded in the H.L.I. won the Ambulance Challenge Shield in London, and held it for several years. Dr. Swanson, who was himself a good horseman, was keenly interested in athletics of all kinds, and was president of the Glasgow Health Culture Society. He is survived by his wife, and a son and daughter. His son, Dr. George Swanson, is on the surgical staff of the Glasgow Royal Infirmary.

## PARIS

(FROM OUR OWN CORRESPONDENT)

## QUIS CUSTODIET IPSOS CUSTODES ?

The council of the Confédération des Syndicats Médicaux Français has recently issued a circular addressed to the heads of faculties of medicine and of scientific medical associations. It is pointed out in this circular that many and lively complaints have been made to the council on account of the repeated appearance in lay publications of scientific articles calculated to be interpreted as personal advertisements of their authors. No one would object, the circular proceeds, if the contributors to these freely illustrated publications were to confine their literary activities to always needed advice about prophylaxis and hygiene. The matter is quite different in connexion with articles dealing with treatment and showing temperature curves and so forth. The public who read such articles may have a keen appetite for them, but are unqualified to be discriminating in their judgment, and are apt to assume that the advice given is necessarily the best even though it may not coincide with that given by a general practitioner in charge of a case. "Further, allow us, with all the deference and respect we owe our masters, to point out that great prudence should be exercised in collaboration of this kind, when one has the honour to preside over the scientific and moral education of students, and to be, on many occasions, the valued councillors of general practitioners." It is to be hoped that the leaders of the medical profession, who have incurred this reprimand from the rank and file, will accept it in a contrite spirit.

## IS BACTERIOLOGICAL WARFARE POSSIBLE ?

The *Sicèle Médical* for April 1st gives prominence to a paper, published in Morocco, by Major Velu, bacteriologist and head of the Army Veterinary Service in Morocco. As well as being a distinguished bacteriologist and veterinary surgeon, Major Velu is a potential author of thrillers. The picture he paints of the next great war is credible as well as lurid. A few weeks before the outbreak of hostilities, which begin suddenly and without a warning of particularly strained political international relations, the enemy's agents create numerous centres of cattle plague in the country. The outbreak of this disease is followed by that of psittacosis, introduced by the surreptitious importation of infected parrots. Artificially introduced dysentery and typhoid fever follow suit. Then there is human plague, tularæmia, &c. When peace comes to be signed and the casualties are totted up, it is found that those due to artificially induced infections are numerically much inferior to those due to wounds and chemical warfare; for it will be established that the artificially induced infections sooner or later petered out of themselves. But this does not mean that bacteriological warfare is an ineffective weapon. Far from it. Major Velu anticipates as a reaction to bacterial warfare a state of confusion and panic dramatically destructive of its victims' morale. He pictures veterinary surgeons being called back from the front to attend to alleged outbreaks of disease in the interior, and the Pasteur Institute frantically switching off from one infectious disease to another as each outbreak in turn makes new demands for large supplies of serums and vaccines. "Certainly, bacteriological warfare is possible. Therefore it will take place."

## THE LITIGIOUS PATIENT

A recent lawsuit in Paris has centred about the Aschheim-Zondek pregnancy reaction. The plaintiff, a Madame Lévy, consulted in 1931 a medical practitioner who diagnosed fibroids of the uterus. A surgeon, Dr. de Martel, undertook to operate on her on Nov. 24th of that year. Laparotomy having been performed, he did not proceed to amputation of the uterus, for its appearance and consistency raised doubts in his mind as to the possibility of pregnancy. In January, 1932, the Aschheim-Zondek reaction was tested for the first time and proved to be negative. Seventeen months after the first laparotomy, Madame Lévy found herself again on the operating table, and this time the operator removed her tumour. This operation was perfectly successful. But Madame Lévy felt that it would have been superfluous had the first operator not made the mistake of suspecting pregnancy. He ought, she was convinced, to have made use of the Aschheim-Zondek reaction and acted according to its findings. The court thought otherwise, holding that, at the end of 1931, the reliability of this reaction had not yet been statistically and irrefutably established. Costs were given against Madame Lévy whose loss of this suit should have an inhibitory effect on other potential litigants.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

## THE PROBLEM OF TUBERCULOSIS

In the recent debate in the Dáil on the estimates of the Minister for Local Government and Public Health, attention was drawn by some deputies to the lack of progress in recent years in dealing with tuberculosis. In his reply the Minister gave information as to certain discussions which have been taking place between the officers of his Department and the Hospitals Commission on the treatment of tuberculosis. He only claimed to give a rough outline of what was in mind, and stated that plans had not been worked out in detail. He added that the present announcement might be useful from the point of view of eliciting criticism. From this point of view it might have been more useful if he had made the statement at the opening of the debate instead of at the close. The following are the main points of the plan under discussion: A person who was suspected, or suspected himself, of having tuberculous disease should visit a central or branch tuberculosis dispensary. After investigation the medical officer should classify the patient as (a) early or moderately advanced pulmonary tuberculosis capable of cure or improvement; (b) surgical tuberculosis of similar class; (c) observation case; (d) advanced or chronic case for which no improvement could be expected; (e) non-tuberculous. Cases classified as (a) or (c) would be referred to a chest hospital for thorough investigation and observation, and for surgical treatment in suitable cases. Patients would subsequently be drafted either to a central sanatorium where modern treatment would be available, or to a local tuberculosis institution for advanced and chronic cases. Cases requiring major surgical operation would be transferred as occasion arose to the chest hospital. Class (b) would be mainly dealt with at an orthopædic centre, which would be associated with an orthopædic school or



instructional centre. Minor cases might be dealt with at a county hospital. The present sanatoriums would provide accommodation for advanced and chronic cases. The units required for the scheme would be: (1) for each county and other district a central and branch dispensaries; (2) a central chest hospital in Dublin, and a wing or block in regional hospitals so located as to serve groups of counties; (3) central sanatoriums for groups of counties, equipped so as to provide the most modern and efficient treatment; (4) a central orthopædic centre or group of coördinated institutions to deal with surgical cases; (5) hospitals for advanced cases.

It is satisfactory that the Department is considering the problem in a broad way. The Minister suggested that to carry out the scheme legislation will probably be necessary. This will no doubt give the profession time to consider the matter and to offer what helpful criticism it finds proper. Care must be taken that tuberculous patients are not so exclusively segregated in special institutions as to interfere with medical education.

## WOODHALL SPA

### CONFERENCE OF THE BRITISH HEALTH RESORTS ASSOCIATION

"AN Englishman's morality is bounded on one side by the English Channel." This was quoted at the conference of the British Health Resorts Association held at Woodhall Spa on May 8th-10th. The speaker, Sir WALTER LANGDON-BROWN, said that in one particular the Englishman was persistently unmoral, for he still preferred to cross the water to visit his health resorts. The present time, however, is an opportune one, on account of the continent's unrest, for the British resorts once more to present their claims to the public.

Woodhall Spa thirty years ago enjoyed a certain reputation as a gynæcological spa, but since the late war it has sunk into comparative obscurity. Through the generosity and inspiration of Sir Archibald and Lady Weigall, the spa has been developed and the conference marked its recognition once again as a competent health resort. The waters are obtained from a coal shaft sunk at the beginning of the last century, and a new bath establishment was opened last year by Princess Marie Louise. The Weigall Clinic is equipped with the latest electrical apparatus, which, with the general regimen, the packs of local fango, and the social and natural amenities, has brought the spa into a position rivalling that of the better known but less accessible continental resorts.

The delegates to the conference were received by Sir ARCHIBALD WEIGALL, his daughter, the Viscountess CURZON, and the local authorities. At the first session, with Mr. WILLOUGHBY SMITH, in the chair, the subject was

#### The Spa Treatment of Gynæcological Conditions

Dr. J. BRIGHT BANISTER (London), opening the discussion, said that the Victorian obstetric physician would often recommend treatment at various spas and several notable authorities had included a list of suitable resorts in their publications. The evolution of the surgical gynæcologist had led to these methods being considered old fashioned and most of the patients came to be regarded as fit subjects for the scalpel. Many well-known text-books to-day did not mention this form of therapy. In spite of

this surgical bias, however, there were still people who would not be operated upon, and even gynæcologists who disliked operating, so that spa methods had not died out; but most of those for whom it was recommended had been sent to Kreuznach or other continental centres. Woodhall Spa had always been closely associated with the treatment of certain gynæcological disorders and the British Health Resorts Association, which had done so much to make known the possibilities of our own spas, might therefore reasonably attempt to raise it to the high place to which it was entitled. Referring to the indications, Dr. Banister said that subinvolution following miscarriage or childbirth was a condition that could be very definitely relieved by a stay in the spa. The douches would relieve the local hyperæmia and congestion, and the absorption of inflammatory products, while the regular régime of spa life would also be helpful. It was, however, essential to investigate thoroughly every case of bleeding before assuming that congestion was the cause. Spa treatment might also be adopted in chronic and subacute pelvic inflammation. It was often surprising how functional recovery could take place after purely conservative methods of treatment in cases that at the outset seemed doomed to operation. Chronic cervicitis and endometritis might also benefit and good results might be obtained in certain cases of sterility. They had to remember, therefore, that spa treatment and all that it implied was a very wide therapeutic measure. With the wider outlook now adopted by students of gynæcology its usefulness should be more generally recognised and, as there was evidence that the waters of Woodhall were particularly suitable for the relief of pelvic inflammation, he hoped for a return of its old prosperity. Many might in the future bless this spa for giving relief from their suffering and a way of escape from a surgical operation.

Dr. LEONARD BOYS (Woodhall) said that the Woodhall Spa waters were hypertonic saline and contained in addition appreciable quantities of iodide and bromide, as well as a large amount of calcium; magnesium salts to the extent of grs. 44 to the gallon were also present. The waters had been used in the treatment of certain gynæcological conditions for many years, and it was Dr. C. J. Williams who had first used them according to the Kreuznach system with such favourable results as to arouse appreciative enthusiasm for this "cure" in the minds of many of the leading gynæcologists in London, Edinburgh, and the provinces. The treatment at Woodhall consisted of giving baths at a more or less neutral temperature for from 15-45 minutes and, at the same time, a vaginal douche of the waters at 104° F., which in successive baths was increased to 118° F. The douche might be strengthened by the addition of motherlye, the concentrated waters. Alternatively, the douche was given with the pelvis and lower abdomen surrounded by fango compresses made from the local deposits. The bath had a sedative effect on the nervous system and stimulated metabolism. It improved the circulation of the pelvis, stimulated the uterine muscle to contract, and hastened the absorption of inflammatory products and thickenings. The douches thoroughly cleansed the vagina and external os. Among the conditions successfully treated were pelvic cellulitis, salpingo-oöphoritis, subinvolution, leucorrhœa, menorrhagia, fibroids, sterility due to congestion, vaginitis, and the mild prolapse due to lack of tone of the pelvic organs and supports. Many a patient exhausted by hæmorrhage, perhaps toxic

from constipation owing to pressure in the lower bowel, could be prepared for later operation by a course of spa treatment. In those also for whom an operation might be a very grave risk the "cure" offered an alternative. Finally, Dr. Boys described cases of pelvic inflammation, subinvolution, and sterility that had benefited from a course at Woodhall.

Prof. BECKWITH WHITEHOUSE (Birmingham) discussed the general value of spa treatment in relation to female pelvic ailments and the special advantages offered by Woodhall Spa. He said that to the older school of gynaecologists the advantages of Woodhall Spa were well known, and that in those days spa treatment was accorded an important place in the therapeutics of female pelvic ailments. It was opportune that the experience of the past should not be lost in the flood of new methods and new remedies, which often had not had the advantage of extended trial. On the continent spas had occupied a very definite place in the therapeutic armamentarium for a number of years. There on their very doorstep they had available natural resources equal to anything that Europe could offer; and yet they as a profession were neglecting many of those opportunities. The activities of many organs, and certainly of the pelvic organs, were dependent upon the correct and balanced interrelation of various hormones. Excessive strain upon the sympathetic and parasympathetic nervous systems, from over-work, worry, or errors in diet found its reward in hormonal and metabolic disorders such as thyrotoxicosis, amenorrhœa, and what the American called vagotonia and sympathicotonia. The syndrome that Crile termed "New York disease" was by no means uncommon in this country and most gynaecologists were familiar with the patient with symptoms and signs of lack of nutrition, cold extremities, exaggerated knee-jerks, &c., who often came complaining of amenorrhœa, insomnia, or anæmia. This modern product—the result of post-war civilisation and the counterpart of the "chlorosis" of the Victorian epoch—was the very type that must derive benefit from the British spas. There was no necessity for her to go to the continent. Indeed, in many cases the excitement and life associated with the majority of continental resorts was the reverse of helpful. The waters of Woodhall were remarkable in that they contained two elements of special therapeutic value to the gynaecologist, iodine and bromine. Modern research had shown the importance of iodine in the female for the proper function of the thyroid gland, and for the normal activities of the sex organs. Woodhall, therefore, was par excellence the ideal spa for the successful treatment and convalescence of patients showing signs of endocrine imbalance, for amenorrhœa, and oligomenorrhœa associated with defective ovulation, for sterility and, during the early stages of pregnancy, for women who had a tendency to habitual abortion. He himself knew of women suffering from uterine fibroids, in whom for various reasons surgical treatment had been inadvisable, who had been sent to Woodhall with benefit. The constitutional effect of increased iodine intake was often only shown after prolonged treatment; it was therefore necessary to ensure a constant supply to the patient, but this could only be done by bottling and efficient distribution. He concluded with an appreciation of the medical centre that he regarded as *the* gynaecological spa of Great Britain.

Sir EWEN MACLEAN (Cardiff) thought that to describe spa treatment as a way of escape from surgery would create a misunderstanding that would

be fatal to the good opinion of the profession. The remote results of sepsis—a subject fully discussed at Melbourne last year—were, he considered, the most suitable for this type of therapy. Ten years ago these prevalent and persistent inflammatory conditions were operated upon and this often led to such serious complications as fæcal fistula or to permanent invalidism, and Arthur Curtis of Chicago was to be thanked for showing how these patients could benefit from ambulatory treatment. In the spa proper and intelligent supervision was necessary to note the progress and to guard against complications. Woodhall Spa could rejoice in its reputation for treating these conditions.

Dr. F. HOWARD HUMPHRIS (London) thought that it was radium emanation that led to the good results in the spa treatment of chronic pelvic pain and of sterility. He felt that the temptation for the public to choose continental resorts was very great because they were as a rule very well advertised and subsidised.

Dr. MURIEL KEYES (Harrogate) believed that gynaecology was slowly recovering from an attack of surgical fever and that conservative therapy was again coming into its own in this country and in America. Patients were still liable however to be classed as neurotic or doomed to operation. Because every means of continental treatment was now available in Great Britain she felt that the average woman's conscience would at last allow her to undergo a less expensive "cure" at home. She was sure that to remove sepsis before cervical operations a careful toilet such as that given in the spa was essential.

Dr. W. EDGEcombe (Harrogate) was disappointed in the present attitude of benevolent toleration; it was damning the spas with faint praise. The lack of conviction came from a lack of personal knowledge and there was a crying want for the confidence that had been accorded to the continental spas.

Mr. L. C. RIVETT (London) said he had been struck by the need for spreading the knowledge of spa treatment. He felt that increased hospital accommodation would do much; his own outpatient clinic had many that would be suitable subjects; records could be kept and results of the work published.

Dr. Boys replied that Woodhall Spa had 30 hospital beds and to demonstrate the effects of its treatment he would welcome patients from London.

Dr. F. A. BEARN (London) thought that to bottle spa water was damaging to a spa's reputation if it failed to repeat the effects of its source.

Dr. C. W. BUCKLEY (Buxton) thought it was the radio-active substances that lost their effect on bottling or evaporation, and though the habit of drinking more water was always good, the effects depended on the composition of the water.

In the afternoon session the subject of

#### Food at the Health Resort

was discussed. Lieut.-Colonel Sir ARCHIBALD WEIGALL was in the chair. He said that the attention given to the diet of animals in veterinary research was lacking in the study of human nutrition. In health resorts, he felt, the chief difficulty was to cater for both the healthy and the invalid at the same time and in the same establishment. He thought that a special self-contained clinic with the waters, subsidiary treatment, and facilities for special diets housed in a single building was essential.

Prof. E. C. DODDS (London) thought the important

indication for spa treatment was the need for a general toning up of health. Though it was usual, particularly at continental spas, to combine dietetic with physical treatment, and though the two forms of treatment might be complementary, they could never replace each other; in the treatment of obesity no amount of physical treatment with baths or electricity would reduce a patient's weight unless the diet was very carefully revised. This applied equally well to all conditions for which spa treatment was employed—to metabolic disorders such as gout, to glycosuria in its various forms and, possibly, rheumatoid arthritis also required careful control of food and drink. Treatment could be applied both to the bodily intake and to the output. The latter, however, was not successful because the hardest exercise used only a little of the energy provided by a large diet. The intake could only be decreased by relative starvation, but this need not be unpleasant. In the foreign spas an Englishman would submit to a diet that he would consider intolerable at home, and it was difficult to understand why medical advice should command more obedience when given in broken English. On the continent also the amusements and dietary of the whole spa were subservient to its specialty. It was able to provide attractive food with a low energy value and it insisted on a disciplined life. It was still necessary, he said, to educate the British public in this matter, for it was useless to have efficient spa treatment in the clinics when the attractive hotels tempted the patient to continue his evil habits. Treatment had also to be continued, to a lesser extent, on returning home. The weight of the human body could be reduced to any degree compatible with life by adjusting the intake of food to the output of energy. When this fundamental fact was grasped it stood to reason that at the spas there was a sure method of reducing peoples' weight, but they could not do it without an adequate attention to the diet. He sincerely hoped that the Association would devote its time and thought to this problem, as he was certain that it was one of fundamental importance to the British spas.

Prof. V. H. MOTTRAM (London) spoke as an educationist. Dietetics, he said, was a new subject in Great Britain that had only recently shown signs of coming into its own. He agreed with Stefansson, the Arctic explorer, when he said that there was no field of human endeavour in which prejudices and custom took the place of sound thinking and rational experiment so much as in dietetics. Prof. Mottram had found that visits to hotels had left him replete with too much and too attractive food. The problem was one of balance, for the present emphasis was on protein and fat to the exclusion of carbohydrate, which led to a deficiency of vitamin C. He agreed with Prof. Dodds that it was difficult to "slim" in an ordinary hotel to-day; to the diabetic a holiday became a torture and to the nephritic a danger. He thought a dietitian was essential to a health resort; in coöperation with the physician on the one hand and the cook on the other, she could translate prescriptions into an attractive but effective diet. It would probably be worth while to let the public in the health resorts know that the food they consumed had not only been cooked by a first-class chef but that it had received the benediction of a first-class dietitian.

Mr. MORTON CHANCE (Harrogate) spoke from the point of view of a hotel caterer. He said that he had noticed that the patient who most rigidly obeyed the physician's advice was the one who recovered the

soonest. In each British resort were to be found hotels that would pay strict attention to the prescribed diets. A spa hydro was not a place of gloom and misery; as a rule it was more comfortable and cheerful than the ordinary hotels.

Dr. H. H. SANGUINETTI (London) deplored the average practitioner's ignorance of dietetics. He thought that a few standard diets to suit the various diseases were necessary though commercially difficult.

Lady HONYWOOD said she had found that the visitors were never satisfied with the prescribed diet and were always ordering extra dishes. She thought that exercise was an essential adjunct.

Dr. E. V. WORTHINGTON (Llandrindod Wells) said that there were three ways of giving a diet. The first was the continental method of having a single standard diet in all the hotels; the second was to have, as at Harrogate, a few standard diets that could be prescribed; and the last was the prohibition of certain foods, leaving the patient to choose the rest. A good physician, however, should be able to prescribe a diet to suit individual needs. He thought that the chief difficulty was lack of coöperation in the hotels; it was essential that they should prohibit clandestine "extras" that had not been prescribed by the physician.

Dr. EDGECOMBE said that he found both a single universal diet and prescriptions for individual diets to be impracticable. At Harrogate there were six simple standard diets—high calorie (3-4000 C.); low calorie (less than 1200 C.); low protein and high vitamin; reduced carbohydrate, quantitative or qualitative; high fat; and lacto-vegetarian. To these diets additions could easily be made. He thought that the psychological effect of a prescription was very great and the scheme had been an unqualified success.

Sir ARCHIBALD WEIGALL said that the large "luxury" hotels that did not coöperate were those that attracted the wealthy patient who as a rule went abroad for treatment; the attractive food and the amusements of the healthy visitors proved too tempting. He was sure that it was bad to combine luxury and a strict diet in one place.

Dr. BUCKLEY spoke of the value of vitamin C, especially in treating rheumatism. Veterinary experiments had shown that degenerative changes such as osteo-arthritis were commonest in horses suffering from a vitamin-C deficiency. Over-eating added to the trouble by increasing the weight. The addition of plenty of raw fruit and vegetable to the hotel diet would be invaluable.

In reply to a question by Prof. Beckwith Whitehouse, Prof. MOTTRAM said that present researches were showing that canning and cooking did not destroy all the vitamin C. The addition of alkalis would of course destroy it rapidly.

Dr. J. W. MCNEE (London) said that he always asked five questions about a spa before recommending it. What were its general amenities? What was the standing of its physicians? What discipline was required of the patients? How carefully would the diet be controlled? What arrangements were there for special investigations and treatment? He was certain that the British spas ought to specialise more and that a single clinic should contain all that was needed. He thought that it was almost impossible to accommodate both sick and healthy in one place.

Sir WALTER LANGDON-BROWN (London) believed that the Englishman's liking for foreign resorts was due to the greater expense and the better discipline. He felt that the difficulty was not merely one of the

diet—some were born to be fat—but he agreed with the importance of having dietitians in a resort. They would be valuable in varying the diet prescribed by the physicians. He prophesied that trained dietitians would be attached to chemists' shops to interpret prescriptions in the same way as the pharmacist.

Mr. GODFREY MOWATT said that in travelling abroad he found that the British spas would extend their foreign clientele if the patients could find someone to advise them in their own language. A list of available medical linguists should be valuable in every resort. He thought that the choice of a resort was generally a matter of habit and custom that was very difficult to break.

Dr. A. R. NELIGAN said that at Droitwich a prescription was made for the diet of each patient, a typed copy of which was given to the hotel caterer. The scheme was ideal but difficult in practice. The average chronic rheumatic who visited the spa was middle aged and over-weight. A well-balanced modified diet was therefore given, with a note explaining the subject to the patient and with instructions for use in the kitchen.

Dr. S. MONCKTON COPEMAN (London) said that vegetables were very badly prepared in this country. The addition of sodium bicarbonate to preserve the colour destroyed vitamin C and it was not generally known that a little brown sugar was a harmless substitute that had the same cosmetic effect. Experiments by the Ministry of Health had shown the great value of watercress. It provided the vitamins in high concentration, it was cheap and pleasant, and it was grown under carefully supervised conditions. It had also the advantage that it had a low calorific value. Children receiving it had thrived in a way only equalled by the group that had milk added to the diet.

Sir JOHN ATKINS (London) said that he had found it very difficult to persuade patients not to go abroad for spa treatment; tradition was partly to blame, but they also felt that there was nothing good to be had at home and that the great change would be beneficial. He felt that there was a weak link in the prescription of diets—their interpretation by the hotel—and a trained dietitian would remove this. Patients returning from a foreign spa had a comprehensive dossier of their whole treatment, progress, and results, with which the occasional curt note from the British spa physician compared very unfavourably, especially in the patient's eyes. There ought therefore to be a closer relationship between the spa physician and the private practitioner.

### Hospitality

The delegates were entertained in the evening to a banquet in the Petwood Hotel, formerly the home of Sir Archibald Weigall, who presided. In proposing the health of the Association he said that though the English produced the most skilled artisans in the world, they had never been successful purveyors of health. Abroad the Briton would loaf and laugh, at home he could only work and worry. This country, however, was unrivalled in its possibilities and in the variety of its climate. He thought that the local authorities could do much by removing petty and irritating restrictions. Lord Meston, president of the Association, replied. He voiced the regrets of the guests at Lady Weigall's indisposition, caused in part by her energy and self-sacrifice in the interests of Woodhall. The Association was to inaugurate at the conference a visitation of expert delegates to all the recognised spas, in order to check and verify their information and to coördinate their function.

Sir Ewen Maclean proposed the toast of Woodhall Spa and said the neglect of British resorts was due to the unsound practice of the lay public who preferred patent medicines, which they swallowed with the blatant advertisements, to a simple but sound prescription. The spas should aim at pleasing the pit and the dress circle as well as the stalls and the boxes. Mr. G. B. Barton, chairman of the Woodhall Spa Advancement Association, replied. Dr. Leonard Boys proposed the health of the guests, giving a summary of the spa's history and vicissitudes, and the Rt. Rev. The Lord Bishop of Lincoln replied.

On the last morning of the conference the delegates made a tour of the Tennyson country.

## MEDICINE AND THE LAW

### Trade Marks for Chemical Preparations

THE medical profession has a strong interest in eliminating confusion from the names of chemical preparations. It is understood that a dispute has arisen over the application of Oxo Ltd. to register the word "Thyroxoid" as a trade mark in the medicinal class. Chemical manufacturers of thyroid preparations, including thyroxine, are said to be opposing the application. They will probably argue that, if "Thyroxoid" is to be used for a thyroid preparation, it is a descriptive word and therefore inadmissible for registration; on the other hand, if "Thyroxoid" is to be used as the name of some preparation unconnected with thyroid products, then it is misleading and deceptive. The applicants are understood to be already the proprietors of the word "Oxoid" as a trade mark: they now seek to prefix the syllable "Thyr-": it remains to be seen whether the existing right to two syllables will justify the addition of a third syllable in front of them.

Some of the decisions of the courts are difficult to follow. The law used to admit to registration "fancy words not in common use." In the Bovril case, decided in this connexion in 1896, there was much discussion of "obviously meaningless as applied to the article in question" and "obviously non-descriptive." Lindley, L. J., held that "Bovril" was not a descriptive word, notwithstanding the association of "bov-" and ox. In 1904 the Court of Appeal even held that "Tabloid" was not a descriptive word, in spite of doubts by Lord Justice Stirling: or rather it held that when the word "tabloid" was registered in 1884, it was a distinctive fancy word not in common use. One hardly envies the judges the task of deciding these conundrums. Does "Colleen," as a name for a stove, induce the belief that the stove is of Irish origin? Is "Egall" too near an existing registered trade mark "Egrol" as a name for custard powder? Does the word "Sandovy" deceive if used for goods not consisting of real sardines? Is "Nuvola" (a medicated food) too near to "Nujol" (a medicine)? These are some of the questions which have required judicial answer. Whatever the legal principle, doctors, being humanly prone to the use of abbreviations, may easily fall into error if the only difference between the names of two products is that one word ends in "-oid" and the other in "-ine." There is seldom in these disputes any suggestion of fraud. Section 11 of the 1905 Act says a trade mark is not to be registered "if calculated to deceive." Industrial firms go as far as they can to get themselves the most alluring trade names with the maximum permissible of attractive association. The courts have to say how far they can go.

## CORRESPONDENCE

## TUBERCULOUS CERVICAL GLANDS

*To the Editor of THE LANCET*

SIR,—It was with some surprise and disappointment that I read in your issue of April 25th (p. 946) Dr. Brian Thompson's universal condemnation of excision in the treatment of tuberculous cervical lymphadenitis. I have always felt that the formation of a sinus in this condition, in any but exceptional cases, should be considered as a failure in treatment; it has been my experience that excision in cases with localised disease, which has advanced to caseation or suppuration, is followed by highly satisfactory results, which can be termed cures. It is, however, essential at operation to excise completely all tuberculous tissue, often a tedious and meticulous procedure, which is, however, rewarded by the fact that there is neither sinus formation nor local recurrence—results which appear to have been only too common in the cases which Dr. Thompson has observed, and which have determined his rejection of this form of treatment.

I am, Sir, yours faithfully,

London, W., May 7th. VERNON C. THOMPSON.

## ENCEPHALITIS LETHARGICA AND THE LAW

*To the Editor of THE LANCET*

SIR,—Recently at the Leeds Assizes a man of the name of Turner, who, according to the evidence of the police surgeon, had a history of sleepy sickness, was sentenced to two years' hard labour for assaulting four small boys by caning them. He had previously twice been convicted of similar offences, and said in his evidence, "I know it is wrong but I cannot help it."

Some years ago I published in your columns the case of an ex-Service man who was sent first to prison and later, for a subsequent offence, to a criminal lunatic asylum for assault, and at his post-mortem examination, following suicide, a piece of shrapnel was found in his brain. Later I happened to be attending the Norwich Assizes when I was asked if I would give expert evidence in a case of a sexual offence. I did so—the case was one of fetishism—and after laying my views before the court, to which judge, jury, and bar listened with interested attention, the man was acquitted. Counsel assured me that if chance had not taken me into the court for another case the accused would certainly have been convicted.

Surely the time has come, and indeed is long overdue, when the law should be altered so that persons suffering from morbid mental conditions, the result of illness, accident, or heredity, should be treated as irresponsible mental cases rather than as responsible criminals—even though they may not have any obvious delusions.

The bench, the bar, solicitors, and juries are quite naturally ignorant of morbid psychology and it appears to be a grave miscarriage of justice, for which legislators rather than lawyers are responsible, that morbid mental states should be punishable by law. Judges in their proper disgust at the acts committed, and in ignorance of the irresponsibility of the unfortunate victim of brain damage, too often permit themselves to express opinions which to those who have medical knowledge appear to be not only unjust but vindictive. The medical history of every case that suggests the possibility of a mental kink

should be gone into most carefully and the accused should be given the benefit of the opinion of a medical expert, while the police surgeon's evidence, though doubtless given in all good faith, should not be accepted as final.

I have drawn the attention of the Home Secretary to Turner's case.

I am, Sir, yours faithfully,

Harley-street, W., May 10th. H. WANSEY BAYLY.

## TREATMENT OF MAMMARY ABSCESS

*To the Editor of THE LANCET*

SIR,—Reading in your issue of Feb. 22nd (p. 440) of Messrs. Battle and Bailey's dissatisfaction with the results of incision and drainage in mammary abscess, I should like to tell you something of my own experience. As a student I saw mammary abscess treated with incision; after pressing out the pus, we put in a tampon of vioform gauze, renewed every day until the wound healed. The treatment was very painful but the result was good. As a young practitioner I treated mammary abscess with incision, insertion of a tampon of gauze, saturated with Goulard's lotion or alcohol, covered with Billroth batist, the tampon being renewed every day. The treatment was painful but the result was good. Not content with this, I tried a stock vaccine known as Propidon, giving three injections of 5 c.cm. at an interval of two to three days. After each injection the woman has a rigor and the temperature rises to 104° F. Sometimes this drastic treatment leads to cure; but it may be necessary to open the abscess. More recently I have been in the habit of applying an ice bag for about five days while the patient rests in bed, followed, if this does not suffice, with local application of 10 per cent. iodine pot. iod. ointment and hot poulticing. When the presence of pus is certain I make an incision 3 cm. long, put in a pair of forceps and after pus is evacuated place in the cavity a tampon of gauze saturated with common cod-liver oil, covered with Billroth batist, leaving this for four days, when the woman is cured. During this period the temperature remains normal, there is no pain, sometimes a disagreeable odour—but that is no matter. The method is easy, safe, and quick. All my recent cases have done well.

I am, Sir, yours faithfully,

Nijmegen, April 28th. H. FEIKEMA.

## MENTAL SICKNESS AND CERTIFICATION

*To the Editor of THE LANCET*

SIR,—The account given in THE LANCET of May 9th of the new hostel to deal with mental sickness which is to be built in association with the Institute of Medical Psychology will be welcomed by all who are familiar with the pressing need for such facilities of treatment in London, and indeed throughout the country. At the same time it compels attention to the unsatisfactory state of the law in relation to mental patients, and of the difficult position in which the Board of Control is likely to be placed when such special hospitals are established.

As the law now stands, patients who are considered to be certifiably of unsound mind must not be kept for treatment except in a place licensed or approved by the Board of Control and subject to visitation by the Commissioners. This introduces

complications into the question of treatment such as the new hospital may wish to avoid, and brings into relief the old but increasingly important problem of the stigma of certification. It is the opinion of most doctors experienced in mental illnesses that a change in the law on this subject is urgently required. A great opportunity was lost in the Mental Treatment Act, 1930, and the present time would seem to be a very suitable occasion for a reconsideration of the legal aspect of this form of illness so that the law can be made helpful and not an obstruction in the treatment of these distressing cases.

I am, Sir, yours faithfully,

Wimpole-street, W., May 9th. FREDERICK DILLON.

**BLOOD COUNTS IN TUBERCULOSIS**

To the Editor of THE LANCET

SIR,—In view of the increasing interest that is being taken in blood counts in tuberculosis, I have carried out the following experiments. Blood was taken from a freely flowing stab wound of the ear in three cases, two tuberculous patients and one normal person. Blood films were prepared and stained by Jenner's method. The films were then sent to 11 competent authorities who were asked to do a differential count on each of the three slides (one from each case) sent to them. The results are tabulated below:—

SLIDE 1

Polymorphs.	S. Lymphs.	Monocytes.	Eosinophils.	Others.	Polymorphs.	S. Lymphs.	Monocytes.	Eosinophils.	Others.
53.3	22.3	23.3	1.1	0	62.0	29.0	4.5	4.0	0.5
43.0	29.5	25.0	3.0	0.5	61.0	28.0	9.0	2.0	0
32.0	12.0	40.0	1.0	0	72.0	15.0	10.0	2.0	1.0
64.0	25.5	5.0	4.5	1.0	60.0	27.0	9.0	4.0	0
67.0	20.4	6.5	4.5	1.3	65.0	20.0	9.0	5.0	1.0
62.0	19.0	14.0	5.0	0					

SLIDE 2

Polymorphs.	Lymphocytes.	Monocytes.	Eosinophils.	Others.	Polymorphs.	Lymphocytes.	Monocytes.	Eosinophils.	Others.
74.0	7.3	11.0	7.7	0	68.0	10.0	10.5	11.5	0
68.5	14.0	10.0	7.5	0	72.0	11.0	8.0	9.0	0
67.0	9.0	13.0	11.0	0					
76.5	10.0	6.5	7.0	0	68.0	19.0	4.0	9.0	0
59.0	13.0	12.6	15.3	0	70.0	9.5	12.5	7.0	1.0
69.0	4.0	16.0	11.0	0					

SLIDE 3

37.5	52.9	3.6	3.6	2.4	38.0	55.0	3.5	2.5	1.0
43.5	45.0	6.0	4.5	1.0	48.0	46.0	3.0	3.0	0
50.0	36.0	12.0	1.0	1.0					
48.5	47.0	2.0	1.5	1.0	51.0	43.0	3.0	3.0	0
48.4	45.6	3.0	2.6	0.4	30.5	65.0	2.0	1.5	1.0
45.0	38.0	15.0	2.0	0					

It was thought that the surprising variation in the counts might be due to—

- (1) The collection of the blood by stab puncture.
- (2) The fact that the counts were made on different films by each pathologist.

I therefore made a film from blood taken from one patient by venepuncture, and sent this one slide

round to the various hæmatologists and asked for a differential count again. The result was as follows:—

Polymorphs.	Lymphocytes.	Monocytes.	Eosinophils.	Others.	Polymorphs.	Lymphocytes.	Monocytes.	Eosinophils.	Others.
63.3	27.6	8.0	0.6	0.3	75.0	20.0	5.0	—	0.0
66.5	22.5	8.5	2.0	0.0	65.5	27.0	6.5	0.5	1.0
66.0	23.0	9.0	2.0	0.0	65.0	27.0	5.0	3.0	0.0
70.0	20.6	5.2	3.2	1.0	65.0	30.0	4.0	1.0	0.0
67.0	21.0	10.0	2.0	0.0					

It will be seen that reasonable uniformity was now obtained although there was still a greater variation than one would have thought possible.

The experiment seems to show that blood films made from the same drop of blood taken from the ear or finger by the stab method can give very variable results even when counted by authorities who are frequently making reports on blood films. The method therefore appears to be unreliable, particularly in tuberculosis where serial hæmograms are desired for their prognostic value. The experiment further suggests that, if comparable results are to be obtained, the blood must be collected by venepuncture, but even with this method care must be taken not to lay too great stress on the count, as seen by the variation obtained when the same slide was counted by different observers.

These facts are probably well known to pathologists, but I feel sure that a number of clinicians will be interested in these tables and the conclusions they indicate.

I am, Sir, yours faithfully,

FREDERICK HEAF.

Colindale Hospital, Hendon, N.W., May 7th.

**ETHER CONVULSIONS**

To the Editor of THE LANCET

SIR,—Having read the article by Dr. Woolmer and Dr. Taylor on Late Ether Convulsions in THE LANCET of May 2nd, I feel that the following case may be of interest. It happened to be treated successfully with Evipan sodium before reading the article.

A well-developed man, aged 20, was admitted to the Leicester Royal Infirmary on May 6th suffering from acute appendicitis, with a history of abdominal pain and vomiting for three days. Before operation his temperature was 101.4° F., pulse 120, respiration 22. Atropine gr. 1/100 was given before operation; nitrous oxide, oxygen, and ether (4 oz.) was administered by the McKesson apparatus, using a carbon-dioxide absorber. A perforated gangrenous appendix was removed; the abdomen contained a large quantity of pus. When the operation was almost completed and the anaesthesia had been in progress for about thirty minutes, the patient began to have short clonic convulsions and was cyanosed during each attack. In the intervals between the fits his colour returned to normal. Ten minutes later the convulsions became tonic and continuous, and the patient remained cyanosed in spite of the administration of oxygen with carbon dioxide. The convulsions became extremely violent, and it was only with great difficulty that the patient could be kept on the table. The administration of chloroform was quite ineffectual in controlling the condition. With some difficulty the arm was held still and evipan sodium injected slowly intravenously. By the time 4 c.cm. had been given the convulsions ceased and the patient relaxed. Oxygen was given by the McKesson mask, and the colour improved. The pulse was poor in volume, but 1.7 c.cm. of Coramine intravenously acted quickly, and the operation was finished in a few minutes.



In this case as in most of the other recorded cases of late ether convulsions there was much sepsis, a high degree of pyrexia, and (I may add) a thunderstorm was in progress at the time of the operation. The convulsions did not recur and up to the present the patient is making a good recovery. His past history was healthy, and there was no family history of epilepsy or of fits.

I am, Sir, yours faithfully,

JAMES S. MARR,

Resident Anaesthetist, Leicester Royal Infirmary.  
May 10th.

### UNDULANT FEVER

To the Editor of THE LANCET

SIR,—In your issue of Dec. 28th, 1935, you were good enough to publish a paper on undulant fever which I read before the Nottingham Medico-Chirurgical Society on Nov. 6th. My attention has been called to a small but important error in this paper and I shall be much obliged if you will give me the opportunity of correcting this. Fig. 2 showed in diagrammatic form the frequency of the commonest 21 symptoms in a series of 200 cases, but in the legend beneath the Figure I referred in error to 300 instead of 200 cases, thus showing a greatly reduced incidence of all these symptoms. I have now analysed the first 300 cases in my records for which I have obtained the signs and symptoms, and the following Table giving their frequency may be of interest to some of your readers:—

Sweating .. .. .	195	Abdominal pain .. .. .	33
Malaise and fatigue .. .. .	180	"    tenderness .. .. .	31
Headache .. .. .	158	Depression .. .. .	30
Anorexia .. .. .	130	Arthritis and arthralgia .. .. .	29
Pain (not in joints, head, or abdomen) .. .. .	126	Rash .. .. .	27
Constipation .. .. .	124	Diarrhoea .. .. .	25
Rigors .. .. .	80	Insomnia .. .. .	25
Enlarged spleen .. .. .	55	Epistaxis .. .. .	21
Cough .. .. .	49	Visual disturbances .. .. .	20
Sore-throat .. .. .	47	Vomiting .. .. .	15
		Nausea .. .. .	13

I am, Sir, yours faithfully,

WELDON DALRYMPLE-CHAMPNEYS.

Ministry of Health, Whitehall, S.W., May 7th.

### ACUTE FEBRILE ANÆMIA

To the Editor of THE LANCET

SIR,—I must offer sincere apologies to Dr. Parkes Weber for quoting a misquotation of his words. I think the expression "acute breakdown of the blood" is quite a useful one. It is more elegant than "erythronoclastic anæmia," a term also used in this connexion. I do not see why an acute breakdown of the erythron should necessarily be associated with hæmoglobinuria. I have never seen a satisfactory explanation of the relationship of hæmolysis to anæmia. It cannot be that they are two manifestations of one process. I am not sufficiently familiar with cases of acholuric jaundice or paroxysmal hæmoglobinuria to quote them, with confidence, as examples of conditions in which hæmolysis is out of proportion to the anæmia, but the case that I described in my paper, which included every feature of the Lederer type of anæmia except hæmolysis, suggests that two processes are concerned in the production of acute hæmolytic anæmia, one of which, hæmolysis, is a concomitant rather than an essential feature. The fact that, in my case, ventriculin seemed to exert its specific effect suggests that it was the make-up of the cells that was at fault rather than their breakdown.—I am, Sir, yours faithfully,

Torquay, May 10th.

PAUL GIBSON.

### RADIOLOGY IN THE CURRICULUM

To the Editor of THE LANCET

SIR,—In the account in THE LANCET of May 2nd (p. 1027) of the report of the Royal Society of Medicine Subcommittee on the teaching of radiology in medical schools, I see no reference to the teaching of this subject in Sheffield. I beg to point out that our regulations insist that before a student can enter for his final examination he must have attended "for three months a course in radiology." We have had on the University staff since 1924 a lecturer in radiology who is honorary radiologist to one of our general hospitals, and even before that date instruction was given by clinical teachers. The course includes lectures and demonstrations in the radiological department. Radiological anatomy is also taught in the department of anatomy during the preclinical period.—I am, Sir, yours faithfully,

G. A. CLARK,

Dean of the Faculty of Medicine, University of Sheffield.

May 11th.

### "A DOUBTFUL CASE OF TYPHUS FEVER"

To the Editor of THE LANCET

SIR,—With reference to the case shortly reported in your issue of Oct. 12th, 1935 (p. 864) and my comment which appeared on March 7th (p. 570), I wish to say that I have now received information from an entirely trustworthy source showing that this case was in fact bacteriologically proven enteric fever. Subsequent tests (not published) demonstrated a high and rising titre to *Bacillus typhosus* (both H and O strains) which, taken with a positive stool culture and absence of all response with Malayan *proteus* strains (Weil-Felix tests), left the matter in no doubt whatever. The diagnosis of sporadic cases of "endemic" typhus occasionally gives us trouble in the East, and that such cases are apt to be overlooked is my excuse for my perhaps too hasty comment on the too brief report which you published.

I am, Sir, yours faithfully,

Hankow, April 17th.

A. H. SKINNER.

### THE FREUDIAN CONFESSIOAL

To the Editor of THE LANCET

SIR,—In view of Dr. Freud's recent anniversary the following quotation from a sermon of St. Gregory the Great, the first Benedictine Pope (590–604) is not without interest: "Quid est ergo peccatorum confessio, nisi quaedam vulnere ruptio? Quia peccati virus salubriter aperitur in confessione, quod pestifere latebat in mente.—Et confitendo peccata quid aliud agimus, nisi malum quod in nobis latebat, aperimus." (Hom. 40 in Evang.)

I am, Sir, yours faithfully,

Dom FRANCIS IZARD, O.S.B., M.R.C.S., L.R.C.P.  
Quarr Abbey, Ryde, Isle of Wight, May 10th.

ROYAL CANCER HOSPITAL.—The annual accounts of this hospital show a deficit of £29,476 on the ordinary account and £5242 on the research account. Annual subscriptions amount to only £4000 and a sum of £60,000 has to be collected to pay expenses, exclusive of research. At the annual meeting held on May 8th, Mr. Cecil Rowntree, the senior surgeon, said that owing to the expensive apparatus presented by Sir Herbert Austin, and the five-gramme radium bomb which was being installed, they had the prospect of being able to effect cures in cases which a few years ago they would have been afraid to attempt.

## OBITUARY

**HAROLD BATTY SHAW, M.D., F.R.C.P. Lond.,  
F.R.C.S. Eng.**

Dr. Harold Batty Shaw, who died on Saturday last at Littlehampton suddenly, held a leading position in London for many years as a consultant physician.

The third son of the late Mr. Edward Walker Shaw of Bradford, he received his education as a boy in New South Wales but came later to the Yorkshire College, Leeds, and then entered University College, London, as a scholar. He gained many honours as a student, among others the Tuke medal and the Erichsen prize, and graduated as M.B., B.S. Lond. in 1895, taking the scholarship and gold medal



DR. BATTY SHAW

[Photograph by Elliott &amp; Fry

in the B.S. examination. In 1897 he was Atkinson-Morley surgical scholar. He proceeded to the M.D. degree, taking also the diploma of F.R.C.S. Eng., and held the interne appointments at University College hospital. He became demonstrator of anatomy in the school, and resident medical officer to the hospital, and was elected in 1900 assistant physician to the hospital and later assistant physician to the Brompton Consumption Hospital.

At the Royal College of Physicians of London he was elected F.R.C.P. in 1905, delivered the Goulstonian lectures in the following year, and was an examiner for several years in medicine at the Conjoint Board. He served also as examiner in medicine at Oxford. Elected physician to University College hospital, he was lecturer on clinical medicine and therapeutics in the school, where he also served as dean.

Batty Shaw showed an original bent for surgery, as is indicated by his scholastic record, but he served as house physician to Sidney Ringer and was imbued with that great physician's love of research. In those days it fell to the lot of the resident medical officers of the hospital to perform the post mortems and conduct other investigations in clinical pathology needed by the staff. In these directions Shaw worked assiduously, and early in his career made a mark with contributions to the professional journals over a wide range of subjects. He wrote on acute leukaemia, then a rare subject in medical literature, in collaboration with Rose Bradford, and on erythromelalgia and certain developments of diphtheria. He contributed the articles on food poisoning and pulmonary hypertrophic osteo-arthritis to Allbutt and Rolleston's "System of Medicine," and in the pages of the *British Medical Journal* summarised the evidence for and against the use of tuberculin as a specific cure. He wrote also a book on organotherapy as early as 1905, which formed a good summary of the work done up to that date with regard to the physiology of the ductless glands and the use of

organic preparations. In opening important and in many directions new ground, he wrote with great fairness as can now be seen, though at the time he appeared to be merely cautious. He allowed the facts as he recorded them to speak for themselves and showed little dogmatism in speaking of the value of organotherapeutics in various diseases. Readers at the time may have felt that they wanted more guidance, but we can see to-day many things which might have been put in through superficial deductions, and would later have been corrected. A similar attitude of caution marked his learned Goulstonian lectures upon the relations of auto-intoxication to the disturbances of blood pressure. The lectures were based largely on personal observations on the use of the sphygmomanometer, and his aim was to present elaborate physiological processes in a way that would serve practical medicine. In his book, "Hyperpiesia and Hyperpiesis," published in 1922, Batty Shaw showed his independence of thought and critical spirit while giving the results of exact clinical information controlled by post-mortem examination. The work was essentially the record of one man's experiences, and singleness of vision was not complicated by the numerous and conflicting observations and opinions of other workers in this field of medicine.

Dr. Charles Bolton writes: "He was a man of quite extraordinary energy and enthusiasm, which characterised all his activities not only in the various aspects of his work, but in everything that he undertook. The same qualities have been displayed at all stages of his career from a student to the end of his life, for he has died in harness—a death he would have chosen; and one might have foretold that his end would be sudden and whilst he was actively engaged in work. His selection of his life's work was characteristic. Having decided, under Ringer's influence, to take up medicine rather than surgery he was ever afterwards an indefatigable worker and his endeavour was from start to finish to give the best of which he was capable to the hospital to which he was a physician, and to his profession. He succeeded well in this endeavour, which he carried out with great industry and honesty, and he merited the warm esteem of all. He took infinite pains in his teaching without any thought whatever of trouble; but he did more than this for the students, for his example exerted an influence for good in all respects; and when he resigned from the hospital they felt that they had lost not only a very popular teacher and sound general clinician, but a very real friend. A man of this striking personality and breezy activity could not avoid now and again making a hasty judgment and perhaps raising the dust about his ears; but such was his good nature and his prompt acknowledgment of an error that it soon ended amicably with pleasant chaff. When University College was taken over by the London University, it was necessary to build a medical school for the hospital. Funds were not available wherewith to carry out this project, and it stands entirely to the credit of Shaw that, through his influence, Sir Donald Currie presented the money to build the school."

At the time of his death Dr. Batty Shaw was consulting physician to University College hospital and the Brompton Hospital. He married Agnes, daughter of the late Rev. Patrick Watson, who survives him with a daughter and son.

**ARTHUR EASTWOOD, M.A. Oxon., M.A. Camb.,  
M.D. Lond.**

ON Tuesday, May 5th, after a few hours' illness, Arthur Eastwood died in his sixty-ninth year. Manchester born, he was one of the brilliant group who studied fifty years ago at the famous grammar school of his native city, among them our present Lord Chief Justice. After greats in philosophy at Oxford, Eastwood's career might have taken almost any of the channels which a profound scholarship and an innate lucidity of thought laid open to him. To those who knew him in his prime it often seemed that an academic chair or the higher branches of the law would have been the proper setting for his acute intellect and grasp of detail. It is rare for such a training to turn a man to medicine but, when it does, we have such a man as Eastwood was. To Michael Foster, primarily, this turning was due, for it was Foster's philosophic outlook on the institutes of medicine, as physiology was once so happily entitled in the Scottish schools, that led Eastwood to Cambridge and an unceasing devotion to science as applied to the study of human disease. On completing his clinical studies at St. Bartholomew's Hospital, he graduated in 1901 M.B. of London University, and in the following year M.D. with a thesis on the malignant tumours originating from adrenal remnants. It was this, no doubt, which led the Royal Commission on Tuberculosis to call upon Eastwood when in January, 1903, they felt the need of a first-class histologist to study the tissue reactions in their experimental material. For nearly seven years he worked in the "Royalcot" Laboratory, built for him at Stansted, Essex, making up with Cobbett and the brothers Griffith the team of investigators which did so much to render the Commission's Report a monument to British scientific thoroughness and a quarry from which have been dug most of the foundation-stones of later work on the bacteriology of tuberculosis.

When in 1909 the Commission came to an end, there remained some outstanding questions still to answer, notably on the part played by bovine tuberculosis in the causation of tuberculous infection in children and on the degree of infection with tubercle bacilli of the meat of tuberculous pigs. Eastwood was appointed on Newsholme's advice to deal with these questions, was given the post of Inspector to the Local Government Board, and called upon to found the Board's pathological laboratory. This he did, and to his guiding hand is owed much of what credit has accrued to the laboratory—later the laboratory of the Ministry of Health—during the subsequent 23 years in which he was its head. One of the earliest tasks of the new laboratory was to investigate the outbreak of rat plague in East Anglia in 1911; Eastwood's report (with F. Griffith) will remain a graphic picture of one of the most curious manifestations of that mysterious pestilence, bubonic plague. But it hardly reveals the power of organisation and of dealing with local difficulties, human and material, which Eastwood had to display. Few men could have gained, as he did, enthusiastic co-operation, alike from the village constable, the farm labourer and the country squire.

On the outbreak of war in 1914 the Laboratory tackled the problem of epidemic cerebro-spinal fever which Newsholme's epidemiological flair foresaw as the necessary consequence of the mass congestion of army life. Eastwood's report on the meningococcus carrier problem with its insistence on the extraordinary proportion of carriers among "non-contacts,"

though it clashed with previous conceptions and was not immediately acknowledged as the true picture, became the basis of administration for civilian health authorities in this disease.

In later years Eastwood's philosophical bent was manifested in a long series of articles in the *Journal of Hygiene* on immunological problems. It was a disappointment to him to find how little interest the post-Ehrlich generation of pathologists took, and how small their effort was, in attempts to synthesise and establish a co-ordinating hypothesis for the ever-increasing body of observations on immunity in its widest sense. Some, at least, of Eastwood's hypotheses will inevitably be recalled with admiration when the day comes for immunity to yield up its final secrets. He had hoped, in the leisure of his retirement which began three years ago, to express his views in a conspectus of immunology in general and it is to be hoped that enough of this had been achieved to permit of its publication, at least in skeleton form.

Not the least important of Eastwood's activities during his long official life was the giving of advice on bacteriological questions to the administrative staff at the Local Government Board and Ministry of Health. Whether in consultation or by official minute, his replies were always models of clarity; his caution was equalled only by the firmness with which he would maintain and express an opinion which he felt was just. No doubt to the eager reformer and innovator he might appear cold and unresponsive; he was, in fact, by nature reserved and even perhaps intolerant of what he regarded as ill-founded enthusiasm. But to Eastwood thought must be grounded on strict logic and an opinion once formed, on the full consideration which no one knew better than he how to give, was almost sacred and certainly not lightly to be challenged.

He had little liking for even semi-public appearances. Though one of the founder-members of the Pathological Society of Great Britain and Ireland, he rarely attended its meetings and scarcely ever spoke. At one time he regularly reviewed scientific publications for the *British Medical Journal*; his style was unmistakable; it was, in fact, a common remark that Eastwood's account of a scientific paper was not only much shorter but much better than the original. His familiarity with the literature, especially that of immunology, was probably unequalled, and in that field his surviving colleagues will miss his aid perhaps more than in any other.

His private life was simple, almost austere. Left a widower when quite a young man, he did not remarry. He had few interests outside his work, though to the end his leisure hours went to the tending of his garden in which he knew almost intimately each plant and flower. To the few who knew him well, he would give freely out of his store of memories of academic and official life and to them his death has come as a divorce from exceptional intellectual richness and urbanity.

W. McD. S.

**DAVID MIDDLETON GREIG, M.B., F.R.C.S.,  
F.R.S. Edin.**

WE announced last week the death of Mr. David Greig, who for the last 15 years had been conservator of the museum of the Royal College of Surgeons, Edinburgh. He received his medical education at the University of Edinburgh where he graduated in medicine in 1885, taking also the diploma of F.R.C.S. Edin. He practised at first as assistant

to his father in Dundee and then filled for a time an appointment to the James Murray Royal Asylum, Perth, and then became medical superintendent of the Baldovan Asylum for Imbecile Children. Later he decided to practise in surgery and became demonstrator of anatomy and lecturer on clinical surgery at University College, Dundee, and assistant surgeon to the Dundee Royal Infirmary. But he preserved his interest in psychiatry, and his investigations into the material collected at Baldovan definitely advanced knowledge of certain problems of mental deficiency.

The outbreak of the South African War found Greig an officer in the Forfar volunteer artillery. He served in the R.A.M.C. throughout the war with the rank of major and received a medal and two clasps. At the close of the war he became full surgeon to the Dundee Royal Infirmary and acted as examiner in surgery at the University of St. Andrews, while he also made interesting surgical communications to the *Edinburgh Medical Journal*. While still actively engaged in surgical work, he retired from practice to devote himself to studies of a more purely scientific nature. Fifteen years ago he was appointed curator of the museum of the Royal College of Surgeons of Edinburgh and his work in that capacity has greatly added to the value to the profession of the material stored in the museum. His name in recent years has been chiefly associated with researches into the pathology of diseases of bone, and his recent publication on the "Surgical Pathology of Bone" was the fruit of extensive observation and study. Both the Universities of Edinburgh and St. Andrews conferred on him the honorary degree of Doctor of Laws in recognition of the value of his work.

**ANDRÉ JOHN MELLY, M.C., M.B. Oxon.,  
F.R.C.S. Edin.**

THE tragic death of Dr. Melly in the British Legation at Addis Ababa on Tuesday, May 5th, has awakened feelings of the deepest regret. The tragedy occurred as a result of a wound sustained during the riots following the fall of the city.

André John Mesnard was born in Liverpool in 1899, the younger son of the late Col. Hugh Melly, and was educated at Marlborough. On leaving school he entered the Royal Artillery as a subaltern, served in France during the war, and was awarded the M.C. On demobilisation he went up to University College, Oxford, where he studied medicine. He completed his medical training at St. Bartholomew's Hospital, and graduated in 1929 as M.B., B.Ch. Oxon. He served as house surgeon at St. Bartholomew's Hospital and at the Hampstead General Hospital, and having visited Canada and the United States, held for a time the post of surgical instructor at Michigan University Hospital.

Melly had for many years manifested his ardent religious convictions, and while an undergraduate at Oxford he used to preach at the Martyrs' Memorial on Sundays. A deep interest in missionary work came natural to him, and when some two years ago he heard that there was an opening in Abyssinia for these efforts he made two visits to the country. He interviewed the Emperor and as a result gained his support and that of his advisers for the establishment of a medical mission in Ethiopia, but by that time the political situation put an arrest to any such project. But he learned of the need of the Ethiopian Government for a Red Cross service, and returned to London to obtain backing for the project. It was entirely owing to Melly's enthusiasm that the

Abyssinian Red Cross ambulance was initiated. He left for Abyssinia in November last as head of the first unit of the British Ambulance Service, accompanied by five doctors, an armed guard consisting of 12 ex-privates of the King's African Rifles and a few other men, one of whom was a Canadian and



Mr. Melly on service in Abyssinia

one a Dane. They took with them tents to be used for the conduct of operations specially designed so that they could be erected and dismantled in the briefest possible time, and from the time of their arrival in Ethiopia he and those serving with him in the unit went in grave risk of death. Melly himself had many escapes, his camp being bombed in January and again in March. On the latter occasion, which occurred at Quoram, there were in the ward-tents many serious cases and Melly himself was operating when the Italian planes began dropping bombs. Several of the tents were destroyed and unfortunate inmates killed. Melly himself had no doubt that the bombing of the tent was intentional inasmuch as the camp was indicated by an enormous red cross. He received a fatal wound during the riot of drunken looters which occurred in Addis Ababa on the Sunday following the departure of the Emperor. His car was attempting the rescue of a wounded Abyssinian when he was shot through the lung and died 48 hours afterwards.

From personal notes of Melly's career received here we may select the following:—

G. F. R. S. writes: "It was entirely owing to Melly's enthusiasm that the Red Cross Ambulance Unit was initiated though, with characteristic modesty, he kept in the background, but it is safe to say that if it had not been for the work done by him and his sister, this unit would never have taken the field. Although John Melly had this serious side to his character, he was brimful of fun and joie de vivre. To know him was to love him, and it is sad to think that we shall not hear again the infectious laughter which characterised his gay and gallant spirit. His elder brother was killed at Beaumont Hamel in 1916."

Another personal tribute is as follows: "Dr. A. J. M. Melly, known to everyone as John Melly, was an outstanding personality. He was striking in every way, his appearance, his behaviour, his charm

of manner, and his ideals; and even as an undergraduate it was obvious that he would not run in any of the ordinary paths of medicine. In appearance he was good to look upon, striding along 'beautifully' dressed, hat in hand and above all his open ever-cheerful face. But there was another side to his appearance which many may not have seen—in the boxing ring, where he was a first-rate performer, his wonderful physique, perfectly controlled, was a sight not easily forgotten. His cheerful enthusiasm was remarkable at all times. When out in Abyssinia on an occasion previous to the Italo-Abyssinian war he developed a neuritis which was followed by a paralysis completely incapacitating his hand. Though the prospect of recovery seemed far from good, his cheerfulness and spontaneous gaiety which had always drawn to him a host of friends remained unchanged. The unexpected occurred—the paralysed muscles began to move the day before an operation had been planned for exposure of the nerve, and this was followed by a full return of function. He then threw himself into the hard work of making preparations for taking out the first Red Cross unit to Ethiopia. Truly of John Melly it may be said that 'A merry heart maketh a cheerful countenance.' His laughter was so typical and infectious that to those who knew him it will ever continue in their ears reminding them of a remarkable Christian English gentleman."

#### PROF. J. G. CATTANACH

Dr. Robt. Hutchison sends the following appreciation:

"Dr. Cattanach occupied a unique position in the medical world of Edinburgh for he might have been described as a 'character.' He began the study of medicine rather late in life, his earlier years having been spent in business in London, but in spite of this initial handicap he became an accomplished clinician with a very sound judgment in diagnosis; being entirely devoid of worldly ambition, however, and having many other interests, he never reached the professional success to which his abilities entitled him. None the less, he had a position and a success all his own. His genial personality and his wide interests in literature, art, and sport won for him a

host of friends and all who knew him loved him. He was very widely read and had a most retentive memory and being also gifted with the graces both of wit and humour, was a delightful companion, and never more so than on a fishing or golfing holiday. Throughout his long life he retained his keen enjoyment of the human comedy and was the guide, counsellor, and friend of any who were in trouble, and especially of the young. Although much crippled by gout in his later life he never gave in, and only last year set off alone on a trip to Palestine. He went down in the end with his flag flying and has left to his many friends the memory of perhaps the most kindly and lovable human being they ever knew."

Dr. JOHN WILLIAM JACKSON, who died recently at Esher, was a native of Glasgow and graduated at the university as M.B., C.M. in 1895. He was for a time resident physician at the Royal Infirmary, Glasgow. He then went to China and was in practice there when the war broke out. He took a commission in the R.A.M.C. and was stationed at Malta, but at the direction of the Foreign Office returned to Shanghai where he later became surgeon to the Imperial Maritime Customs, acting also as Admiralty surgeon and agent with quarters in Shanghai. He was during this period of invaluable assistance to the China Inland Mission, and on his return to England and private practice in London he kept up his interest in the mission and gave valuable voluntary help at a nursing-home in London connected with it. He was a sound practitioner and philanthropic man.

FREDERICK PERCY ROSE, L.M.S.S.A., who recently died from heart failure, had been a medical practitioner in St. Ives, Huntingdonshire, for more than 30 years. The son of the British Consul at San Remo, he was born in Italy where he spent his childhood. He received his medical education at the London Hospital and went into practice at St. Ives where he succeeded to and enlarged an old practice. He served on the St. Ives town council and was mayor of the borough in 1929 and took a keen interest in public affairs throughout a busy life.

## PANEL AND CONTRACT PRACTICE

### Sickness in Scotland

THE continued gradual recovery in employment since the depression of 1931 is reflected in the increase of contribution receipts for insurance purposes shown in the recent report of the Scottish Department of Health. These in 1935 were 6 per cent. greater than in 1934, 8.6 per cent. greater than in 1933, and 12.7 per cent. greater than in 1932. At the same time the incidence of incapacitating sickness is rising among the insured population of Scotland. The fifth of a series of annual surveys, which will shortly be available, shows substantial increases for 1934-35 compared with 1933-34 in both (a) the number of individual cases of incapacity completed during the year, and (b) the aggregate number of days of incapacity relating to these cases. Compared with 1932-33, however, there is a decrease under (a), coupled, however, with an increase under (b). The increase over 1933-34 is mainly attributed to the influenza epidemic in the spring of 1935 which accounted for the entire increase in the total number of cases, and for nearly half of the total increase in the aggregate duration of incapacity. The epidemic had two exceptional features: in the first place its

virulence was greatest in the normally very healthy rural areas from Kincardine round the Moray Firth to Caithness; in the second place, after the passing of the epidemic, the sickness-rate remained relatively high, whereas as a rule an epidemic is followed by a period of relatively low sickness. There was some increase also in a number of other diseases, particularly bronchitis and subacute rheumatism; an upward tendency has been noted during the past four years in diseases of the ear, myocarditis, diseases of arteries, mastitis, boils and ulcers, muscular rheumatism and lumbago, brachial neuritis, and nervous debility. The number of insured persons incapable of work throughout the whole of the year has shown a steady increase from year to year. The figures are: 1931-32, 22,287 cases; 1932-33, 26,059 cases; 1933-34, 27,224 cases; 1934-35, 29,504 cases.

### Prescribing for Insured Persons

The same report contains an interesting excursus on the use of drugs. Although drugs are potent weapons against disease when administered under skilled direction, they do not, it is suggested, as a rule alone constitute treatment. No amount of

medication, for example, can cure dyspeptic disorders where the causal element is an unremedied violation of the fundamental dietary laws. There is reason for concern at the widespread incidence of peptic ulcer and of those minor gastric disorders which form the early stages of this condition, but there is ample evidence, especially in industrial areas, that the public place too much reliance upon medication for the cure of such disorders and pay too little regard to the counsels of their medical advisers as to discipline of diet and of habits. In the Department's view there is an urgent need for further education of the public in these matters, and they feel that the family physician, by the exercise of his professional authority and prestige, can do much to inculcate the paramount importance of proper dietary, habits, and hygiene, not only from the point of view of maintaining health but as an integral part of curative treatment.

During the year ended Sept. 30th, 1935, the average cost per insured person in Scotland of drugs and appliances was 24.20 pence. This compares with 23 pence in the previous year. As in previous years, great variations existed as between different areas and between doctors' costs within an area. On the recommendation of local panel committees, three doctors were surcharged during the year for excessive prescribing, the surcharges aggregating £45 5s. The

Department seeks to restrain the tendency towards unnecessarily expensive and excessive prescribing, and note with satisfaction that the principles and rules for economical prescribing recently laid down by the International Labour Office are substantially on the lines that have been in operation in Scotland for many years.

The question whether certain specified vitamin concentrates are drugs for the purposes of medical benefit was referred to the advisory committee, which advised that (a) vitamin concentrates must be considered as drugs for the purposes of medical benefit in cases presenting evidence of definite diseases due to vitamin lack, but such cases are rare among adults in this country; (b) unless there is evidence of definite disease due to vitamin lack, vitamin concentrates must be considered as food substitutes rather than drugs, and their cost should not form a charge on N.H.I. funds; and (c) as a general rule a vitamin concentrate should not be used unless there is definite evidence that its vitamin content has been accurately estimated and is clearly stated in recognised units. The committee points out that vitamin concentrates are commonly prescribed in cases of ill-defined ill-health, whereas if there is a vitamin deficiency in such cases, the natural and most satisfactory method of increasing the vitamin supply is to improve the dietary.

## PUBLIC HEALTH

### Some Problems of Midwifery

At the annual meeting on May 6th of the National Birthday Trust Fund report was made on Mrs. Baldwin's appeal for an investigation into the question of an analgesic for use in confinements not attended by a doctor. The inquiry by the British College of Obstetricians and Gynaecologists, which was the result of this appeal, made it clear that, while analgesia is not harmful to either mother or infant, the College could not give unqualified approval to the administration of chloroform capsules by midwives. The College did however regard gas-and-air administration by the Minnitt apparatus as a safe and satisfactory method, the drawback being that the apparatus is expensive and the gas costly. The report of the Fund notes that efforts are being made to meet this criticism by producing a cheaper and more portable machine. The price of the Minnitt machine used in the tests, viz., £16 16s., should be within the means of small hospitals, as it is suitable not only for maternity work, but also for minor operations and painful dressings. The cost per case of gas as worked out by the Wellhouse Hospital is 2s., the British Hospital for Mothers and Babies at Woolwich reports the outlay as 2s. or under, and in general the cost does not seem to have exceeded 3s.-4s. a case. The British Oxygen Company is now supplying nitrous oxide at 5s. per hundred gallons for individual orders and at a cheaper rate for hospitals and institutions.

Two other investigations have been financed by the Fund. The first of these was to determine the influence of malnutrition on childbirth. The average maternal death-rate in the Rhondda urban district and the Llantrisant and Llantwit Fardre rural district for eleven years up to 1933 was 6.2. In 1934 the figure rose to 11.3 with a total rate from all causes of 14.5 in spite of an improved medical service established that year. In 1935 an experimental distribution of free foodstuffs in the shape of Blandox, Ovaltine, and Marmite was provided over a period

of three months to necessitous expectant mothers. The maternal death-rate fell to 3.9, or a total death-rate from all causes of 4.8. Impressed by these figures the Fund approached the Commissioner for Special Areas for a grant to enable the scheme to be extended. A gift of £2500 from the Marquess of Bute has provided for a continuance and extension of the work in S. Wales, and a grant of £3000 from the Commission for Special Areas has been allocated for similar distribution of foodstuffs in South Shields, Sunderland, Gateshead, Merthyr Tydfil, and the scheduled areas of Monmouthshire. At the suggestion of the Ministry of Health more milk food is to be given. The second investigation was made with the assistance of the M.O.H. for the Rhondda Valley to determine the value of an efficient non-poisonous antiseptic. For the two years 1934-35 midwives in the valley were given a free supply of Dettol disinfectant. The incidence of sepsis in 1935 was 1.06 per cent. in cases in which this disinfectant was used, compared with 3.17 when it was not used.

### INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED  
MAY 2ND, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 3 (Brighton 2, Hove 1); scarlet fever, 2028; diphtheria, 911; enteric fever, 22; pneumonia (primary or influenzal), 941; puerperal fever, 35; puerperal pyrexia, 129; cerebro-spinal fever, 22; acute poliomyelitis, 1; acute poliomyelitis, 1; encephalitis lethargica, 5; continued fever, 1 (Battersea); dysentery, 14; ophthalmia neonatorum, 98. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 8th was 6128, which included: Scarlet fever, 1021; diphtheria, 874; measles, 2933; whooping-cough, 557; puerperal fever, 19 mothers (plus 14 babies); encephalitis lethargica, 283; poliomyelitis, 4. At St. Margaret's Hospital there were 25 babies (plus 10 mothers) with ophthalmia neonatorum.

(Continued at foot of next page)



## PARLIAMENTARY INTELLIGENCE

### SILICOSIS IN SOUTH WALES

LAST week in the House of Commons several exchanges betrayed the deep interest felt in the occurrence of silicosis among the miners of South Wales. Mr. JAMES GRIFFITHS asked the Secretary for Mines whether he was aware that since 1931 the Silicosis Medical Board had issued certificates of disablement or suspension to 709 miners from the South Wales coalfield, and that in the same period the deaths of 147 miners were certified to have been due to silicosis; and, in view of the spread of this disease among the miners in South Wales, what steps he proposed to take to enforce measures to prevent the contraction of the disease by the workmen employed in the mines. Dr. BURGIN, Parliamentary Secretary to the Board of Trade, replied: My hon. friend is kept fully informed of the mine and quarry cases which are dealt with by the Silicosis Medical Boards in all parts of the country and the information is used as a guide for preventive action. The gravity of the figures for South Wales has been fully appreciated, and in reply to a question on Feb. 13th my hon. friend indicated the measures which have been taken and are still in active progress both to extend the use of preventive methods already available and to develop new and improved measures.

Mr. GRIFFITHS: Will the hon. Member make sure that the men's representatives, who have a wide experience in this matter, are consulted? My information is that no representative of the Department has had a single consultation with the representatives of the men.

Viscountess ASTOR: Will the Parliamentary Secretary inform the House that he is doing all he can in this matter? The question has been before the House for 17 years and so far the numbers are going up instead of down.

Dr. BURGIN: The House will probably like to see the matter dealt with more fully by reading the evidence tendered to the Royal Commission by the Mines Department which is now published on pages 13 and 14 of the Report of the Royal Commission of Feb. 10th last.

Mr. E. J. WILLIAMS: Will the Department in conjunction with the Home Office see that a new Order is issued speedily so that the men may have compensation in the meanwhile?

No further answer was given.

Mr. GRIFFITHS then asked the Home Secretary whether he was aware that out of 691 applications made by miners from South Wales to the Silicosis Medical Board for certificates of disablement or suspensions during 1934 and 1935, no fewer than 311 of these applications were refused such certificates, notwithstanding that each of these workmen had been certified by their panel doctors and by the regional medical officer of the Ministry of Health to be suffering from silicosis or anthracosis; and what steps he proposed to take to so amend the provisions of the various Industries (Silicosis) Orders, 1931 to 1934, as to make it possible for these workmen to claim compensation for the disablement which arose

*(Continued from previous page)*

*Deaths.*—In 122 great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 83 (38) from measles, 8 (3) from scarlet fever, 32 (9) from whooping-cough, 31 (5) from diphtheria, 42 (17) from diarrhoea and enteritis under two years, and 64 (11) from influenza. The figures in parentheses are those for London itself.

Measles is now probably on the wane, the number of deaths for the last eight weeks (working backwards) being 83, 104, 102, 103, 81, 104, 114, 105 for the country as a whole, and 55, 70, 68, 60, 43, 62, 62, 58 for Greater London. Deaths from diphtheria were reported from 17 great towns, 4 each from Hull and Manchester. Portsmouth, Sunderland, and Leicester each had 1 death from enteric fever.

The number of stillbirths notified during the week was 258 (corresponding to a rate of 36 per 1000 total births), including 45 in London.

from and was caused by the inhalation of coal and stone dust in the course of their employment. Mr. GEOFFREY LLOYD replied: I am aware that there have lately been a considerable number of cases of miners suffering from lung troubles which the expert Medical Board could not find to be silicosis. It is impossible, in the present state of knowledge, to tell whether or how far they may have been due to employment, but the matter is being investigated by the Industrial Pulmonary Diseases Committee of the Medical Research Council. Consideration of further action must await results of such research. I should add that under the arrangements made with the Ministry of Health, the Regional Medical Officer does not diagnose and certify silicosis but merely conducts a preliminary examination to ascertain whether there is reasonable cause to support the presence of the disease.

Mr. GRIFFITHS: Seeing that the Ministry of Health doctor is satisfied that these men's illnesses are affected by their employment will the Minister see that the scheme is so widened as to bring these men within the compensation law, in view of the fact that they have been certified by the Ministry of Health doctor.—Mr. LLOYD: I do not know whether the hon. Member appreciates the fact that the regional medical officers' function is to certify only when there is cause to suspect silicosis. The Home Secretary's powers are limited under the Act to making schemes for silicosis.

Mr. GRIFFITHS: I appreciate that, but does the hon. Member appreciate the fact that 311 suspected cases turned down in three years is alarming and calls for a widening of the scheme.—Mr. LLOYD: That is why the medical aspect of this matter, which must be settled before we proceed further, must be investigated.

Mr. PALING: The Medical Board have been inquiring into this matter for a long time. Can the Minister say how soon they are likely to report.—Mr. LLOYD: I cannot say how long they have been inquiring, but it is very difficult research and will take some time.

Mr. ROWSON: Can the Minister say how many of the cases turned down have been diagnosed as tuberculosis cases.—Mr. LLOYD: Not without notice.

Mr. LEACH: In view of the Minister's own statement as to the restricted powers of the Home Office will he not ask his Departmental chief to promote legislation to remedy it.—Mr. LLOYD: Before that question can arise the medical aspect of this matter must be settled beyond reasonable doubts.

### NOTES ON CURRENT TOPICS

#### Debate on the Midwives Bill

Speaking late in the debate on the second reading of the Midwives Bill on April 30th, Captain G. S. ELLISTON expressed surprise that general approval had been given by previous speakers to the view that county councils were the proper authorities to be entrusted with the powers under the Bill. It was, he said, a significant fact that, with a few understandable exceptions, all the representative public health organisations contended that where the local supervising authority is not responsible for administration under the Maternity and Child Welfare Act of 1918, the local authority which was administering that Act should also be responsible for the service of midwives provided under this Bill. In other words, they urged that this midwifery service should be an integral part of the maternity and child welfare schemes. The principle involved, he remarked, seemed to have been recognised in the new Public Health Bill. That Bill expressly authorised the Minister to transfer functions to the welfare authority if such transfer would conduce to the more efficient administration in the district of functions relating to public health. It could be argued that such provisions would justify the Minister in placing midwives under the maternity and child welfare authorities. The reasons for this claim were obvious. The health visitors of the maternity and child welfare

authority were able to give the health department early information of pregnancy. It was the health departments which provided antenatal care in clinics, consulting medical services for difficult cases and under the puerperal fever regulations, and those ancillary services, so important in maternity work, such as the provision of milk and meals for necessitous mothers.

The Bill is still under discussion in committee.

#### Voluntary Hospitals (Paying Patients) Bill

In the House of Commons on May 8th when this Bill was being considered on report Sir A. WILSON moved an amendment providing that hospitals under the Bill should not only have to go to the Charity Commissioners in connexion with schemes but also obtain the consent of the Ministry of Health. There was, he said, a steady growth throughout England and Wales of paying patients wards. The pressure on hospitals to make both ends meet by taking in paying patients was increasing, and the Bill was an attempt to make it easier for them to do so in competition with State hospitals. The time had come when the Ministry ought to decide, after full consideration, whether *paying* patients of a particular type should be concentrated in a particular hospital, or whether there should be redistribution of responsibilities.—Mr. GLEDHILL seconded the amendment, and Sir P. HARRIS agreed that the Ministry of Health or the local authorities should be brought in in some way or another.—Mr. STOREY said that under the Bill there was a general safeguard that the available facilities for ordinary patients should not be diminished, and the amendment was withdrawn.

A further amendment by Sir A. WILSON to give county or borough councils some say before the Charity Commissioners exercised their statutory duty in sanctioning a scheme was negatived by 75 votes to 68.

The report stage being concluded, on the motion for the third reading of the Bill, Mr. STOREY said that the measure was promoted by King Edward's Hospital Fund and by the British Hospitals Association to enable hospitals with trust deeds settled long ago to meet the modern demand for pay beds in which those who could afford to pay a moderate charge might receive the benefit of those modern methods of diagnosis and treatment which could not be undertaken without the specialist skill and staff of a general hospital, or could only be undertaken elsewhere at very great expense, if at all. Voluntary hospitals with modern trust deeds could and should provide for all who needed hospital treatment, whatever their capacity to pay. As in the past, their first duty should be to treat free of cost all cases of the sick poor, but after that, they should provide for those persons who could afford the charges which were made elsewhere, and who, but for the provision of paying beds, would have to be treated in the ordinary ward. They should also provide for the other classes who could afford to pay charges proportionate to their means and who could not obtain the treatment they needed anywhere except in a general hospital. But there were many hospitals with ancient trust deeds which could not legally make such provision even with money specially collected or given for the purpose, and when on occasion they had to give treatment which could not be given elsewhere they could not legally charge for that treatment, even though the recipient might be able and willing to pay. Such a state of affairs was not fair to the hospital or to the people of the district served by the hospital. This Bill therefore gave to the Charity Commissioners the power to remove such anomalies by allowing hospitals to provide pay beds provided this was not done to the detriment of their first duty, treatment of the sick poor. No hon. Member need have any fear that in voting for the Bill he would endanger the treatment of the sick poor.

Mr. MATHERS said he hoped that the passage of this Bill for England and Wales would not make the

Government consider that they had any right to proceed with a similar measure for the voluntary hospitals of Scotland.

Sir ALAN ANDERSON said the voluntary hospitals were created, and they all existed primarily to serve the sick poor for whom they had done enormous work; and they had further work to do in seeking out causes of disease and promoting health. But the provision of health was getting more and more expensive, and without help from all the patients the hospitals would have broken down. In his view, and in the view of those who gave up their lives to organising this great charity, it would assist the hospitals to help the sick poor if this Bill was passed.

The Bill was read the third time by 153 votes to 19.

#### Employment of Women and Young Persons

On May 12th the House of Commons considered the Employment of Women and Young Persons Bill, as amended in Standing Committee, on the Report.

Mr. R. J. DAVIES moved a new clause, providing that an advisory committee of eight persons, representing equally the interests of employers and workpeople, should be appointed by the Home Secretary whose duty should be to advise the Home Secretary generally as to the operation of the Bill and in particular as to any complaints which might be received regarding the operation of any authorisation under the Bill. He said that large numbers of employers and workers disliked the two-shift system.

Sir JOHN SIMON opposed the amendment. He said that if there were a complaint which would justify forthwith the cancellation by the Home Secretary of the authority he had given, the clause would prevent him from dealing at once with such a complaint and he would have to allow an admitted evil to go on until he could call the statutory committee together to advise him. It would be better to have such a committee set up with a much more flexible constitution than even the most carefully drafted clause could devise. It would be most unwise to try to define this committee in these set terms at present.

Dr. HOWITT said that the Departmental Committee of which he was a member were in favour of setting up a committee to advise the Home Office, and he for some time could not understand why provision for such a committee could not be inserted in the Bill. It was perfectly obvious that the composition of the advisory committee as suggested in the amendment would not do, and that the Home Secretary should have power to vary its composition in order to deal with different matters as they might crop up. Hon. Members wanted, as he did, to safeguard the workers and to make a success of the double shift system. He had never heard of any deleterious effects on the health of persons who worked under the double shift system. Indeed, by granting such a system they would make it much more certain that good conditions did prevail. He hoped that the amendment would not be pressed, because it was not in the interests of the workers.

The amendment was negatived. The Report stage was concluded and the Bill was read the third time.

#### Vivisection of Dogs

In the House of Commons on Tuesday, May 12th, Sir ROBERT GOWER presented a Bill to prohibit the vivisection of dogs. The Bill was read a first time.

### HOUSE OF COMMONS

WEDNESDAY, MAY 6TH

#### Midwives Bill for Scotland

Mr. MATHERS asked the Secretary of State for Scotland in view of the introduction of the Midwives Bill for England and Wales whether it was his intention to promote legislation for the purpose of reducing the maternal mortality-rate in Scotland; and, if so, when.—Colonel COLVILLE, Under-Secretary of State for Scotland, replied: Yes, Sir.

My right hon. friend hopes to be able to make a statement on this subject at an early date.

#### Dust in Card-rooms

Mr. SUTCLIFFE asked the Home Secretary if he could now make any statement regarding the question of dust in card-rooms in the cotton industry.—Mr. GEOFFREY LLOYD replied: I received a deputation last week from the Amalgamated Association of Card, Blowing, and Ring Room Operatives who were asked in the first instance to send certain further information which would help my right hon. friend in considering the next step. I cannot say more at the moment.

THURSDAY, MAY 7TH

#### Delinquents and Psychological Treatment

Mr. BENSON asked the Home Secretary whether he was yet in a position to make any report upon the work of the psychiatrist appointed to deal with delinquents.—Mr. GEOFFREY LLOYD replied: As is indicated in the recently published report of the Prison Commissioners, this work is still in an experimental stage, and the material obtained will require careful analysis before any conclusions can usefully be formulated. It will not, therefore, be possible to issue any report for some time to come.

#### Local Authorities and Veterinary Surgeons

Mr. SERVINGTON SAVERY asked the Minister of Health how many whole-time veterinary surgeons had been appointed by county and county borough councils during the last 12 months; and whether he was willing to recommend that such councils should, as far as possible, utilise the services of veterinary surgeons who were practising in their districts.—Sir KINGSLEY WOOD replied: I regret that I am unable to give the information asked for in the first part of the question. As regards the second part, my hon. friend is no doubt aware that the Cattle Diseases Committee of the Economic Advisory Council recommended that local authorities should appoint whole-time veterinary officers wherever this is practicable, and I do not think therefore I should be justified in taking the course suggested.

#### Rural Sewage Disposal Schemes

Sir RALPH GLYN asked the Minister of Health whether there was any prospect of the Government, in continuation of the policy of giving assistance for the proper provision of water-supply in rural areas, contemplating the allocation of money towards sewerage and sewage disposal schemes under similar safeguards as were agreed in the case of water-supply, in order to assist rural district councils and county councils who now had power to contribute, but had not adequate funds to carry out thoroughly comprehensive schemes.—Sir KINGSLEY WOOD replied: No proposal on these lines is at present in contemplation.

#### Health Insurance and Ophthalmic Benefit

Mr. DAY asked the Minister of Health whether he would state the total amount spent by approved societies and branches on ophthalmic benefit, showing the amount separately that was spent on the provision of glasses for the two years ended to the last convenient date.—Sir KINGSLEY WOOD replied: The expenditure in England and Wales on ophthalmic benefit, which includes payment towards the provision of glasses as well as ophthalmic treatment, was £355,000 in the year 1934 and £360,000 in the year 1935. Separate figures are not available of the sums expended in the provision of glasses.

MONDAY, MAY 11TH

#### League and Nutrition Problems

Mr. MATHERS asked the Under-Secretary of State for India whether he was aware of the investigations by the League of Nations into problems of nutrition and the recommendation of the mixed committee that national committees should be set up to make national investigations; that the conference on rural hygiene in the Far East and the Congress of the Far Eastern Association of Tropical Medicine proposed in their next sessions to consider nutrition in Asia and the Far East; and whether he was taking steps to investigate the standard of nutrition of the Indian people and how to improve it.—Mr.

BUTLER replied: I am aware of the facts stated by the hon. Member in the first and second parts of the question. The question of nutrition is and has been for some years engaging the attention of the Government of India; and nutritional surveys in selected areas are now being carried out under the auspices of the Indian Research Fund Association, which is financed by the Government of India.

#### The Pollution of Water-supplies

Mr. SHORT asked the Minister of Agriculture (1) whether he was aware of the pollution of rivers by the waste water of sugar beet factories; whether the Water Pollution Research Board had discovered any simple and practical process by which these waste waters could be purified; and, if so, if he would call the attention of sugar beet factories to this fact, with a view to the discontinuance of such pollution; and (2) whether he was aware of the constant pollution of inland waterways by the effluents from dairies and factories manufacturing milk products; whether the Water Pollution Research Board had discovered processes by which these effluents could be purified, and, if so, whether he would call the attention of such factories to these processes in the interests of anglers and the preservation of cleanliness and the purity of our water-supplies.—Mr. ELLIOT replied: The Ministry has no powers in regard to the prevention and control of river pollution, which is a matter primarily for the local sanitation authorities or fishery boards. I am aware, however, that pollution does occur in some cases. As regards sugar beet, the Water Pollution Research Board advised in 1931 that the problem of pollution by sugar beet factories could be largely, and in many cases completely, solved by modifications in the factory processes and by simple methods of treatment of the waste waters so that the waters could be re-used in the factory. These conclusions were communicated to the industry, and I understand that a number of factories have taken effective steps to prevent pollution. The British Sugar Corporation, which will take over control of the beet sugar factories if Parliament approves the proposals in the Sugar Industry (Reorganisation) Bill, may be expected to give careful attention to this problem. As regards dairy and milk product factories, I understand that the Water Pollution Research Board has for some months been conducting experiments on effluent treatment with the financial co-operation of the industry. I have every hope that these experiments, with the progress of which the industry is being kept in close touch, will lead in the near future to useful practical results.

#### Milk (Special Designations) Order

Sir CECIL HANBURY asked the Minister of Health whether, in view of the wide differences in the way in which the Accredited Herd Scheme was being administered by the licensing authorities, he would issue instructions designed to secure uniformity in the administration of the new Milk (Special Designations) Order by county and county borough councils.—Mr. SHAKESPEARE replied: I would draw my hon. friend's attention to the answer given on this subject on April 30th. In the circular mentioned in that answer attention is drawn to the principles by which local authorities should be guided in granting licences.

TUESDAY, MAY 12TH

#### Standard of Overcrowding

Mr. JOEL asked the Minister of Health whether any complaints had been received from local authorities that the standard of overcrowding under the Housing Act of 1935 was too low; and, if so, if he would state the towns from which these complaints came.—Mr. SHAKESPEARE replied: My right hon. friend is aware that in some quarters the standard is regarded as low but, as my hon. friend knows, the standard is a penal standard and is therefore of necessity lower than, for example, the standard of accommodation adopted by local authorities for rehousing purposes. My right hon. friend is unable to trace any official representations from local authorities on the subject.

THE Home Secretary has appointed Dr. George Hugh Culverwell, O.B.E., D.P.H., to be an inspector for the purpose of the Cruelty to Animals Act, 1876.

## INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE

At the opening session of this congress on May 12th, with Prof. I. GUNZBURG (Antwerp), president of the international committee of the congress, in the chair, Prof. W. T. ASTBURY (Leeds) spoke on

### New Ideas from X Ray Analysis of the Molecular Structure and Properties of Proteins

He said that proteins were generally considered to be extremely complex, and indeed were probably the basis of life itself. By means of X ray diffraction analysis some knowledge of their structure was being obtained. He hoped that in time their structure would be as well understood as that of, say, sodium chloride. According to the classical view, the proteins consisted of condensations of twenty or more amino acids, the peptide groups being joined one to another to form a long chain. The side chains were thought to determine the specific nature of the protein. This comparatively simple structure was found on X ray analysis to occur in the simplest fibres such as those of silk—where the long molecules lie extended along the fibres and give a characteristic X ray photograph. Another type of X ray picture was given by hair, wool, horn, whale bone, nails, and other keratinoid epidermal structures in their normal condition; but mathematical analyses of this picture showed that the chain of the molecule was folded. If, however, a hair was stretched the X ray picture characteristic of silk was obtained, and the molecules could again be shown to be straight. Presumably the remarkable elasticity of hair and other proteins depended therefore on the straightening and folding of the molecular structure. Normal hair could also be made to contract by various means such as by exposure to X rays and steam. This was known as super contraction and was of particular interest. Muscle-fibres at rest gave an X ray photo almost indistinguishable from that of normal hair; muscle protein could also be made to undergo stretching and super contraction. Most of the experimental work had been performed on dead material, but recent work on living tissue provided confirmatory evidence, and there was reason to believe that the super contraction of hair was analogous to the changes of contracting muscle. The remarkably long range of elasticity of many biological structures turned out then to be a property of the protein molecule itself, which was thus eminently fitted for the purposes of movement, growth, and enzymotic activity. Crystalline proteins such as pepsin and insulin were definitely globular and not arranged in long chains, but many such proteins could now be converted into the long chain form and made into fibres.

In the afternoon Sir ROBERT STANTON WOODS, president of the congress, took the chair and Lord DAWSON OF PENN spoke on

### Physical Education

The Golden Age of Greece, he said, stood forth in history with ideals of education which gave equal prominence to the training of body and mind for the production of whole men, both strong and beautiful, and it was a matter for wonderment that its bequest to all ages of a culture beyond compare should have faded away and lain dormant. It was only at the beginning of the nineteenth century that Denmark had led the modern world by making physical education an essential part of the curriculum in its national schools. Soon after, Ling persuaded the Swedish

Government to establish the Central Institute in Stockholm of which he was appointed director in 1813. From these beginnings physical education had extended to various countries, but was slow to gain foothold in Great Britain with its traditional love of games and sports. Not until 1909 was physical education established on the time-table of all elementary schools in this country. The next milestone, said Lord Dawson, was the "primitive gymnastics" movement in Denmark, founded by Niels Bukh. This was a revolt against the Ling system which had come to be regarded as formal, static, and sombre. With a basis of fundamental gymnastics Bukh used games and folk dancing to teach balance and grace of movement. Miss Margaret Morris, in this country, had thought along similar lines and secured like results. She regarded the training of lungs, abdomen, and feet as the first essential.

Although in practice often overlapping, physical education, games and sports, and recreational physical training served distinctive purposes. Physical education belonged to school hours and required a trained instructor; games were part of recreation and were directed mainly by the pupils. Proficiency in games was compatible and often existed with defects of frame or function. Such defects might be improved by physical education, the neglect of which might become a progressive handicap to the child. Some games, unless correlated with physical education, were liable to overstrain their votaries and impair health later in life. On the other hand, physical education could not replace sports and games. The rivalry of games, quickening the mind and body, the team spirit, the responsibility of leadership, and the joy of effort could not be derived from physical exercises; physical education therefore made use of games even in school hours whenever possible. This last idea found its expression in recreational physical training, which was valuable in giving health and fitness to those at work and especially to those between 14 and 18 years of age.

In Lord Dawson's view physical training was a growing necessity. In days past when life was less protected and there were no organised measures like insurance and social services, natural selection operated more effectively and the unfit were prone to be extinguished. With the growth of the human conscience the unfit were being preserved. Doubtless that was right, but it was the more necessary to build up the fit. We had therefore to look after nutrition and the training of the body as well as that of the mind for health and efficiency. Modern industrialism, the sedentary life imposed on many people, and specialisation necessitated the provision of opportunities for exercise of the body as a whole; these changes of social and economic life had come to stay. Lord Dawson quoted some examples of great improvement in physique brought about in short periods by physical education. There was now a strong effort being made in this country to save men from the weakening of physique apt to result from unemployment. An increase in training colleges for teachers was urgently needed. The women's training colleges in this country had for some years been ahead of those for men.

A teacher of physical education could with advantage also be trained in education of the mind. Such a combination secured a wider outlook, and further, a teacher equipped to educate the mind was still in the flowing tide of his career at an age when the teacher of physical education was on the ebb.

The doctor should collaborate in physical education and periodic surveys by him might assist detection of early divergencies from normal development. The movement towards a complete system of physical education was going on apace in this country and had been helped in no small measure by the investigation and report by the British Medical Association.

Sir LEONARD HILL, speaking on the

### Hygiene of Sport

said that skilled movement was the basis of man's mental equipment; yet some 70 per cent. of the

British youth between the ages of 14 and 18 did not participate adequately in physical training. The examination system was the means of promoting boys to universities without due consideration of their physique. It was not wise to spend millions on equipment for national defence and neglect the very basis of physical fitness. Sir Leonard spoke of the fine physique which was resulting from widespread physical training in Germany. In every part of London there should be flood-lit sports grounds and swimming baths, the former arranged not for holding competitive sport, but for the exercise of the citizens in their leisure hours.

## MEDICAL NEWS

### University of Oxford

Dr. B. D. Pullinger has been appointed university lecturer and demonstrator in pathology and Dr. S. Zuckerman university lecturer and demonstrator in human anatomy.

During the visit of the British Medical Association to Oxford in July, the honorary degree of D.Sc. will be conferred on Sir George Newman, Sir Cuthbert Wallace, P.R.C.S., Sir Henry Dale, F.R.S., Sir Walter Langdon-Brown, Dr. Robert Hutchison, and Prof. Charles Singer.

The next dean's dinner will be held in the Chantecler Restaurant, Frith-street, London, W., at 7.30 p.m. on Thursday, May 28th. Oxford medical students who wish to attend should communicate with the dean of the medical school at his office at the University Museum before May 25th.

### Royal College of Surgeons of England

At the recent primary examination for the fellowship the following candidates were successful:—

D. J. Anderson, Sydney; P. B. Banaji, St. Bart.'s and Middlesex; V. H. Barnett, Univ. Coll. and Middlesex; C. H. Bliss, St. Thos., St. Bart.'s, and Middlesex; G. W. Blomfield, Leeds, Univ. Coll. and Middlesex; A. F. Bryson, Camb., Lond., and Univ. Coll.; A. S. Bullough, Manch. and Middlesex; H. W. Burge, King's Coll.; R. C. F. Catterall, Camb., Univ. Coll. and Middlesex; L. Chanock, Aberd. and Edin.; R. Cox, Univ. Coll., King's Coll., and Westminster; S. K. Datta, Calcutta and Univ. Coll.; J. R. Dawson, Adelaide, Otago, Univ. Coll., and Middlesex; J. A. Dhacka, Bombay and Univ. Coll.; A. T. Doss, Cairo and Middlesex; D. M. Douglas, St. Andrews and Univ. Coll.; T. K. Elliott, St. Mary's; M. Fahmy, Cairo, Middlesex, and St. Bart.'s; C. M. Gardner, McGill, Univ. Coll., and Middlesex; D. W. C. Gawne, Camb. and St. Bart.'s; H. M. Goldberg, Univ. Coll.; J. C. Goligher, Edin. and Middlesex; J. H. Gould, St. Bart.'s and St. Thos.; K. I. Graham, Melbourne and Middlesex; Phyllis N. Green, Roy. Free; H. W. Hall, Univ. Coll.; R. A. Hall, Leeds; J. Hanekom, Cape Town and Middlesex; G. O. Jelly, Oxon and Guy's; C. D. P. Jones, Univ. Coll.; R. H. Karmarkar, Bombay, Univ. Coll., and Middlesex; F. R. Kilpatrick, Cape Town and Guy's; J. B. Kinmonth, St. Thos.; Dorothy M. S. Knott, Roy. Free; R. S. Lawrie, Middlesex; W. S. Lewin, Univ. Coll.; H. F. Lunn, Guy's; J. D. Macleod, Univ. Coll., St. Thos., and Middlesex; S. C. Mehta, Ahmedabad and Lond.; W. G. Q. Mills, Camb., St. Mary's and Middlesex; A. K. Monro, Camb. and Lond.; J. B. Morrow, Belfast and Middlesex; J. A. Moyses, Manitoba; R. S. Murley, St. Bart.'s; S. K. Nag, Calcutta and Univ. Coll.; C. D. Needham, Middlesex; G. E. Nevill, Dublin; J. Patrick, Edin. and Sheff.; G. H. Pearce, Univ. Coll.; A. Rafta, Cairo and King's Coll.; B. N. B. Rao, Bombay and Middlesex; G. C. D. Roberts, Camb., St. Thos., and Middlesex; H. J. Ross, Aberd., Middlesex, and Univ. Coll.; E. P. Row, Sydney and St. Mary's; T. R. Sarjeant, Toronto and Univ. Coll.; G. C. Sawyer, Guy's; J. C. Scott, Toronto and Oxon; W. N. Searle, Otago, Univ. Coll., and Middlesex; L. M. Snaith, Durham; K. W. Starr, Sydney and Univ. Coll.; A. S. Till, Camb. and Middlesex; W. H. D. Trubshaw, St. Bart.'s and Middlesex; A. J. Wilson, Camb. and St. Thos.; and M. M. Wilson, Camb. and Lond.

### Royal College of Physicians of Edinburgh

At a meeting of the College, held on May 5th, with Dr. W. T. Ritchie, the president, in the chair, Dr. Thomas Carlyle Mitchell (London) and Dr. John James Black Martin (Dorchester) were elected fellows. The Lister fellowship was awarded to Lieut.-Colonel W. F. Harvey, I.M.S.

### University of Sheffield

Mr. Glyn Davies, registrar at the Jessop Hospital for Women, has been appointed lecturer in obstetrics and gynaecology, and Dr. J. C. Paisley, junior assistant bacteriologist.

Sir Bruce Bruce-Porter has been appointed Deputy-Lieutenant for the County of London.

### West London Medico-Chirurgical Society

On Thursday, June 4th, at 8.30 p.m., Prof. William Wright will deliver the Cavendish lecture of this society at the Kensington Town Hall. He will speak on the Princes in the Tower. The annual conversazione and medical and surgical exhibition will follow the lecture.

### Lebanon Hospital for Mental Diseases

The thirty-seventh annual meeting of this hospital will be held at Friends House, Euston-road, London, N.W., on Monday, May 18th, at 3.15 p.m., when Sir Hubert Bond, senior commissioner of the Board of Control, will be in the chair. The speakers will include Dr. E. W. G. Masterman.

### A Medical Research Fellowship

Applications are invited by the council of the Royal Society for the E. Alan Johnston and Lawrence research fellowship, which is tenable in any hospital or medical school in the British Isles. The stipend is £700 a year and the appointment will be for two years in the first instance and may be renewed up to five years. Further information may be had from the assistant secretary of the society, Burlington House, London, W.

### Glasgow Post-Graduate Medical Association

A general medical and surgical course will be held by this association during the last two weeks of August and the first two weeks of September at the Western Infirmary, the Royal Infirmary, and the special hospitals of the city. A number of clinical assistantships will also be available to graduates who wish to make a detailed study of one of the specialties. Further information may be had from the secretary of the association, The University, Glasgow.

### Conference on Fever Therapy

As already announced, the first International Conference on Fever Therapy is to be held at Columbia University, New York, from Sept. 29th to Oct. 3rd, under the chairmanship of Baron Henri de Rothschild. The subjects to be discussed will include physiological and pathological changes in fever; and the use of fever therapy for gonorrhoea in the male and female, gonococcal and non-specific arthritis, syphilis in its various stages, neurological conditions, and skin diseases. Further information about the meeting may be had from Dr. William Bierman, 471, Park-avenue, New York, U.S.A.

### Socialist Medical Association

The sixth annual general meeting of this association is to be held at the Royal Hotel, Woburn-place, London, W.C.1, on Sunday, May 24th, commencing at 11 a.m., when the report of the executive committee will be presented and its recommendations for drastic alteration in the constitution of the association. Notice has been given of motions to approve the legalisation of voluntary sterilisation and the principle of voluntary euthanasia, and to discuss the attitude of the association to war. At 5 p.m. Col. A. H. Proctor, M.D., I.M.S. (retd.), dean of the British Postgraduate Medical School, will lecture on State Hospitals and Medical Education.



Dr. Peter McRitchie, a well-known medical practitioner in the Swansea district, died on the day of his son's funeral. The son, a student at Aberystwith College, had died in a sanatorium and on the morning chosen for his funeral his father died from heart failure in his sleep. Father and son were buried in the same grave.

#### Hospital Furniture Display

A special display of hospital furniture is being held on the ground floor of British Industries House. More than thirty firms which specialise in furniture and other domestic equipment for hospitals, such as chinaware and cutlery, are taking part, and the exhibition will be open until May 23rd.

#### The Synthesis of New Radio-active Elements

An address on this subject will be given by Prof. and Madame Joliot-Curie at the Wigmore Hall, Wigmore-street, London, W.1, on June 5th at 5 p.m., under the auspices of the Medical Association of the International Clinic. Lord Lytton will preside.

#### Medical Prayer Union

The annual medical missionary breakfast of this union will be held at the refectory, University College, Gower-street, London, W.C., on Wednesday, May 27th, at 8 a.m. The chair will be taken by Mr. W. McAdam Eccles, and an address will be given by Dr. Mary Watson, of the Church Missionary Society, South China. Those wishing to attend should notify the secretary, Dr. Tom Jays, at Livingstone College, Leyton, E.10.

#### Royal Society of Medicine

Applications are invited by this society for the Nichols fellowship which is offered for research relating to the discovery of the causes and the prevention of death in childbirth from septicemia. The fellowship is tenable for two years and applications should be sent to the secretary of the society, 1, Wimpole-street, W.1, not later than Oct. 1st.

#### East London Child Guidance Clinic

On Wednesday, May 27th, at 3 p.m., at Jews' Free School, Bell-lane, Bishopsgate, E., Prof. Alfred Adler will give a demonstration clinic on cases of child neurosis and behaviour disorder.

#### Brighton and Slum Clearance

At Brighton on April 8th Sir Kingsley Wood, the Minister of Health, opened a new health clinic, and homes for aged people and houses for dispossessed slum tenants on the Manor Farm estate. He said he had ample evidence that Brighton was determined to be in the forefront of the continued campaign for better health, better conditions, and particularly for better homes. Sir Herbert Carden, a member of the local corporation, said Brighton had had some of the filthiest slums in England, but the worst had disappeared, and in another year practically all of them would have vanished. Warm tributes were paid to the work of Dr. Duncan Forbes as medical officer of health.

#### Fellowship of Medicine and Post-Graduate Medical Association

Arrangements for June include a course in gynaecology at the Chelsea Hospital for Women (June 8th to 20th); and clinical and pathological demonstrations and lectures for M.R.C.P. candidates at the National Temperance Hospital on Tuesday and Thursday evenings at 8 p.m. (June 9th to 25th); and lectures on chest and heart diseases at the Victoria Park Hospital on Wednesday and Friday evenings at 6 p.m. (June 17th to July 10th); on chest diseases at the Brompton Hospital on two afternoons weekly at 5 p.m. (June 15th to July 11th); and an afternoon course on neurology and psychotherapy at the West End Hospital (June 8th to July 4th). Week-end courses in June will be given on general medicine at the Prince of Wales's Hospital (June 6th and 7th); in obstetrics at the City of London Maternity Hospital (June 13th and 14th); in fevers at the Park Hospital (June 20th and 21st); and in general surgery at the Prince of Wales's Hospital (June 27th and 28th). Courses are open only to members and associates of the Fellowship, and further information may be had from the secretary of the Fellowship, 1, Wimpole-street, London, W.1.

#### Chelsea Hospital for Women

In 1934 this institution had an excess of income over expenditure of £1804; but last year there was an excess of expenditure over income of £2226.

#### Crewe Memorial Hospital

Lady Somervell has opened the new women's ward at this hospital and named it the Jubilee ward. The hospital is about forty years old.

#### City of London Hospital for Diseases of the Chest

The overdraft of this hospital is £5373, and additional funds are needed for extensions which will include surgical wards.

#### West End Hospital for Nervous Diseases

At the annual general meeting of this institution, held on April 30th, it was stated that a deep X ray therapy apparatus, which would cost about £1200, was urgently needed.

#### Caterham Hospital

Sir Bernard Greenwell has given five acres of land for a new hospital at Caterham. The present hospital has served the district for more than sixty years but the limit of expansion on the present site has now been reached.

#### Royal Eye Hospital, Southwark

Earl Beatty presided at the annual meeting of this hospital when it was announced that the foundation-stone of the new building will not be laid until £80,000 has been raised towards the necessary £200,000. During 1935 28,820 new out-patients attended the hospital.

#### Durham County Hospital

All sections of the community have combined to support this hospital and it is in a stronger financial position than it has been for some years. The excess of income over expenditure last year was £3424, which went to reduce the deficit account to £10,768.

#### Medical Motorists

Under the auspices of the Union Internationale des Automobile-Clubs Médicaux a congress of medical motorists will be held in Paris from June 14th to 17th. The subjects to be considered include road accidents, assistance on the road, and the psychological examination of drivers. The president is Dr. G. A. Prins, of Utrecht, and the secretary-general may be addressed at 89, Boulevard Magenta, Paris X.

#### Royal Medical Benevolent Fund

At a recent meeting of the committee of this fund 14 new applicants were assisted and 25 grants were renewed to beneficiaries. In all £918 was voted. The following particulars of a few cases helped indicate the kind of work undertaken:

Widow aged 79, of M.D. who died in 1886 aged 36. Under the will of her husband the applicant received £144 per annum from a trust fund. Both the executors appointed to administer the trust have died and it no longer exists. A nephew made up the deficiency till September, 1935, when he was unable to continue. Since then friends and neighbours have given charitable help and the Freemasons a gift of £10 10s. Fund gave immediate help of £3 and a yearly allowance of £36. The applicant will apply for the old age pension of £26, thus making her total income £62.

L.R.C.P., aged 61, suffering from cancer of the rectum. His savings are exhausted. Fund made a grant of £40.

Widow aged 66, of L.R.C.P. who died 1933 aged 65, is in receipt of a small allowance from the parish council. Her son, who is a medical student, was unable to pay his examination fee and hospital work fees. Fund has paid the fees and the examination has been passed satisfactorily.

This is the centenary year of the fund and a special appeal is being made for new subscribers to raise the annual income by subscriptions and donations to £20,000. From the present income of £14,000 allowances of £40 and £26 are made to medical practitioners and their dependents respectively. The increased income would enable the committee to raise these allowances to £52 and £36. An appeal is also being made this year for special donations to create a fund from which larger grants can be voted to very urgent and distressing cases, and which may be used to help with the training of the widows and orphan sons and daughters of medical practitioners to enable them to be self-supporting. Cheques should be made payable to the hon. treasurer of the fund, 11, Chandos-street, London, W.1.



## Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

### SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**  
**TUESDAY, May 19th.**  
*Special Meeting of Fellows, 5 P.M.* Nomination of Officers and Council for 1936-37. 5.30 P.M. Ballot for Election to the Fellowship.
- THURSDAY.**  
*Dermatology, 4 P.M.* Annual General Meeting. Dr. Svend Lomholt (Copenhagen): Alpha and Beta Rays in Skin Therapy. Dr. Ramel (Switzerland): Neuro-pathic Eczema.  
*Neurology, 8.30 P.M.* Annual General Meeting. Pathological Specimens of Neurological Interest will be Shown.
- FRIDAY.**  
*Disease in Children, 5 P.M.* (Cases at 4.30 P.M.) Annual General Meeting. Mr. Denis Browne: Congenital Deformities of Mechanical Origin.  
*Epidemiology and State Medicine, 8.30 P.M.* Annual General Meeting. Dr. E. W. Goodall: Fracastor as an Epidemiologist.  
*Physical Medicine, 5.45 P.M.* Annual General Meeting at the Wharnclyffe Rooms, Great Central Hotel, N.W.
- SATURDAY.**  
*Orthopaedics, Meeting at Nottingham, 12.45 P.M.* Demonstration of Clinical Cases and Inspection at Harlow Wood Orthopaedic Hospital.
- CHELSEA CLINICAL SOCIETY.**  
**TUESDAY, May 19th (8.30 P.M. Hotel Rembrandt, Thurloe-place, S.W.), Mr. C. Lambrinudi: Backache.**
- SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.**  
*Fever Hospital Medical Services Group.*  
**FRIDAY, May 22nd.—4 P.M., Dr. Robert Forbes: Medical-legal Problems in Hospital Practice.**
- ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.**  
**THURSDAY, May 21st.—8.15 P.M., Dr. N. Hamilton Fairley and Dr. Colin Ross: Intestinal Absorption in the Steatorrhœas. Prof. L. G. Parsons will also speak.**
- LECTURES ADDRESSES, DEMONSTRATIONS, &c.**
- ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W. 1**  
**TUESDAY, May 19th, and THURSDAY—5 P.M., Sir Bernard Spilbury: Doctrine of Inflammation. (Croonian lectures.)**
- UNIVERSITY OF LONDON.**  
**MONDAY, May 18th, and TUESDAY.—5.30 P.M.** (University College medical school, University-street, W.C.), Mr. H. M. Traquair: Perimetry.  
**THURSDAY.—5.15 P.M.** (University College Hospital medical school, University-street, W.C.), Prof. Charles Singer: The History of the Theory of Infection. 5.30 P.M. (University College, Gower-street, W.C.), Dr. Alfred Adler: Some Recent Developments in Individual Psychology.
- BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.**  
**MONDAY, May 18th.—2.15 P.M., Dr. Duncan White: Radiological Demonstration, 3.30 P.M., Mr. V. B. Green-Armytage: Sterility.**  
**TUESDAY.—2 P.M., Prof. E. H. Kettle, F.R.S.: Pathological Demonstration, 3 P.M., Dr. A. A. Miles: Aspects of Blood Culture.**  
**WEDNESDAY.—Noon, clinical and pathological conference (medical), 2.30 P.M., clinical and pathological conference (surgical).**  
**THURSDAY.—2.30 P.M., Sir Henry Gauvain: Surgical Tuberculosis, 3 P.M., Dr. R. A. Young: Non-tuberculous Pulmonary Diseases. Dr. Chassar Moir: Operative Obstetrics.**  
**FRIDAY.—2.15 P.M., Dr. A. A. Davis: Gynaecological Pathology.**  
 Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetric and gynaecological clinics or operations.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**  
**MONDAY, May 18th, to SATURDAY, May 23rd.—St. JOHN'S HOSPITAL, Lisle-street, W.C. Afternoon course in dermatology.—MAUDSLEY HOSPITAL, Denmark Hill, S.E. Afternoon course in psychological medicine.—St. PETER'S HOSPITAL, Henrietta-street, W.C. All-day advanced course in urology.—Courses are open only to members of the fellowship.**
- HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.**  
**WEDNESDAY, May 20th.—2 P.M., Dr. Wilfred Pearson: Indigestion in Older Children, 3 P.M., Dr. W. W. Payne: Deficiency Diseases.**  
 Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.
- UNIVERSITY OF BIRMINGHAM.**  
**TUESDAY, May 19th.—3.30 P.M. (Children's Hospital), Dr. J. M. Smellie: Gastro-interitis in Infancy.**

- WEDNESDAY and FRIDAY.—4 P.M. (Medical Lecture Theatre, Edmund-street Buildings), Dr. Walter Schiller: Ovarian Tumours. (Ingleby lectures.)**
- THURSDAY.—4 P.M. (Medical Faculty Buildings), Mr. Hartley, D.Sc.: The Standardisation of Immunological Reagents. (William Withering lecture.)**
- MANCHESTER ROYAL INFIRMARY.**  
**FRIDAY, May 22nd.—4.15 P.M., Dr. Norman Kletz: Demonstration of Medical Cases.**
- ST. MARY'S HOSPITALS, Whitworth-street West, Manchester.**  
**TUESDAY, May 19th.—4.15 P.M., Dr. Walter Schiller: Cancer of the Uterus. (Lloyd Roberts lecture.)**
- ANCOATS HOSPITAL, Manchester.**  
**THURSDAY, May 21st.—4.15 P.M., Dr. W. J. S. Reid: Psychopathology.**
- GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.**  
**WEDNESDAY, May 20th.—4.15 P.M. (Royal Infirmary), Dr. J. A. C. Macewen: Gastric Cases.**

## Vacancies

For further information refer to the advertisement columns

- Accrington, Victoria Hospital.—H.S. £150.**  
**All Saints' Hospital, Austral-street, West-square, S.E.—Res. H.S. At rate of £100-£150.**  
**Ashford Hospital, Kent.—Res. M.O. £150.**  
**Barnsley, Beckett Hospital and Dispensary.—Cas. O. and H.P. £250 and £200 respectively.**  
**Birmingham, Erdington House.—Asst. M.O. £650.**  
**Bolton Royal Infirmary.—H.P. £200. Also two H.S.'s. Each £125.**  
**Bolton, Townleys Hospital, Farnworth.—Asst. M.O. £225.**  
**Bradford Royal Infirmary.—H.P. At rate of £135.**  
**Brighton, New Sussex Hospital for Women, Windlesham-road.—H.P. and H.S. Each £100.**  
**Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.**  
**Burton-on-Trent, Brelby Hall Orthopaedic Hospital.—Locum Res. Asst. M.O. At rate of £350.**  
**Burton-on-Trent General Infirmary.—H.P. and Cas. O. £150.**  
**Cambridge, Addenbrooke's Hospital.—Res. Surg. O. £225.**  
**Cardiff, Llandough Hospital.—Jun. Res. M.O. At rate of £100.**  
**Cardiff Royal Infirmary.—Gynaecological H.S. At rate of £50.**  
**Charing Cross Hospital, Strand, W.C.—Part-time Med. Reg. At rate of £50.**  
**Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.**  
**City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Surg. and Med. Regs. £225 and £175 respectively. Also H.P. At rate of £100.**  
**Coventry, Gulsom-road Municipal Hospital.—Second Asst. Res. M.O. £250.**  
**Coventry and Warwickshire Hospital.—Hon. Ophth. Surgeon. Also Res. H.S. £125.**  
**Delamere, Cheshire, Crossley Sanatorium.—Med. Supt. £650.**  
**Derbyshire County Council.—Asst. Maternity and Child Welfare M.O. £600.**  
**Doncaster Royal Infirmary.—H.S. £175.**  
**Dreadnought Hospital, Greenwich, S.E.—Receiving Room Officer. At rate of £200.**  
**Durham County Council Education Department.—Asst. School M.O. £500.**  
**Ealing, King Edward Memorial Hospital.—Sen. and Jun. Res. M.O.'s. At rate of £200 and £150 respectively.**  
**East Ham Memorial Hospital, Shrewsbury-road, E.—H.S. to Spec. Depts. and Cas. O. At rate of £120.**  
**East Lophian Sanatorium.—Second Jun. Res. M.O. At rate of £175.**  
**Evelina Hospital for Sick Children, Southwark-street, S.E.—H.P. At rate of £120.**  
**Exeter, Devon Mental Hospital, Exminster.—Jun. Asst. M.O. £350.**  
**Hackney Metropolitan Borough Council.—Public Vaccinator.**  
**Halifax Royal Infirmary.—Third H.S. At rate of £150.**  
**Hartlepool Hospital.—Second H.S. At rate of £150.**  
**Herefordshire County Council.—Asst. M.O. £500.**  
**Holt, Norfolk, Kelling Sanatorium.—Second Asst. Res. M.O. £350.**  
**Hospital for Sick Children, Great Ormond-street, W.C.—Res. H.P. and Res. H.S. Each at rate of £100.**  
**Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.**  
**Huddersfield Royal Infirmary.—Res. Surg. O. £225-250. Also H.S., H.P., and Res. Anaesthetist. Each at rate of £150.**  
**Hull Royal Infirmary.—H.S. to Ophth. and Ear, Nose, and Throat Dept. At rate of £150. Also H.S. to Sutton Branch Hospital. At rate of £160.**  
**Ipswich, East Suffolk and Ipswich Hospital.—H.S. £144.**  
**Isleworth, West Middlesex County Hospital.—Asst. M.O. £400.**  
**Kidderminster and District General Hospital.—H.S. £150.**  
**Lancashire County Council.—Asst. County M.O.'s. Each £800.**  
**Leicester City.—Asst. School M.O. £500.**  
**Leicester City Mental Hospital, Humberstone.—Third Asst. Res. M.O. £350.**  
**Lincoln, Burton-road Hospital.—Asst. M.O.H. £600.**  
**Liverpool City.—Asst. Venereal Diseases M.O. £400.**  
**Liverpool Hahnemann Hospital.—Hon. Asst. Ophth. S.**  
**Liverpool University.—Lecturer in Physiology. £600-£700. Also two Demonstrators. Each £300.**  
**Llanely and District Hospital.—H.S. £150.**  
**London County Council.—Asst. M.O.'s. Each £470. Asst. M.O., Grade I. £350. Asst. M.O.'s, Grade II. Each £250. H.P. At rate of £120. Temp. Asst. M.O., Grade I. At rate of £350. Visiting M.O. £200. Also Temp. Dist. M.O. At rate of £150.**

*London Hospital, E.*—Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.  
*Manchester, Ancoats Hospital.*—H.S. At rate of £100.  
*Manchester and Salford Hospital for Skin Diseases.*—Two Asst. M.O.'s. Each £100.  
*Manchester Royal Children's Hospital, Pendlebury.*—Res. Surg. O. At rate of £125. Also Res. H.S. At rate of £100.  
*Manchester, Withington Hospital and Institution.*—Asst. M.O. (Grade 2), 2 Asst. M.O.'s (Grade 3). At rate of £250 and £200 respectively.  
*Middlesex Hospital, W.*—Part-time Dental Registrar. At rate of £150.  
*Miller General Hospital, Greenwich-road, S.E.*—Res. Surg. O. and Reg. £250. Cas. O. At rate of £150. Also two H.P.'s and H.S. Each at rate of £100.  
*Mount Vernon Hospital, Northwood.*—H.S. At rate of £150.  
*Newcastle-upon-Tyne Hospital for Sick Children.*—Asst. Hon. Physician to Skin Dept.  
*Newcastle-upon-Tyne, Royal Victoria Infirmary.*—Jun. Surg. Reg. £150.  
*Norwich, Norfolk and Norwich Hospital.*—Cas. O. Also H.S. to Spec. Depts. Each £120.  
*Nottingham Children's Hospital.*—Res. H.P. At rate of £150.  
*Nottingham General Hospital.*—H.S. At rate of £150.  
*Nottingham General Hospital, Gregory Boulevard Branch.*—Res. Surgeon. £250.  
*Oldham, Boundary Park Municipal Hospital.*—Res. M.O. £350.  
*Oxford, The Warneford.*—Jun. Asst. M.O. £350.  
*Plymouth, Prince of Wales's Hospital, Greenbank-road.*—Res. Surg. O. At rate of £225. Also H.S., Res. Anaesthetist, and H.S. to Spec. Depts. Each at rate of £120.  
*Poplar Hospital for Accidents, East India Dock-road, E.*—Second Res. Officer. £175.  
*Princess Beatrice Hospital, Earl's Court, S.W.*—Res. M.O. At rate of £150. Also Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.  
*Queen's Hospital for Children, Hackney-road, E.*—Psychiatrist.  
*Queen Mary's Hospital for the East End, Stratford, E.*—Hon. Asst. Surgeon, Res. M.O., and two Cas. and Out-patient Officers. Each at rate of £150. Also H.P.'s, H.S.'s, and Res. Anaesthetist. Each at rate of £120.  
*Radium Beam Therapy Research, &c., 16, Riding House-street, W.*—Asst. M.O. At rate of £250.  
*Royal Cancer Hospital, Fulham-road, S.W.*—H.S. At rate of £100.  
*Royal Free Hospital and London (R.F.H.) School of Medicine for Women, W.C.*—Res. Asst. Pathologist. At rate of £150.  
*Royal Naval Medical Service.*—M.O.'s.  
*Royal Northern Hospital, Holloway, N.*—Hon. Radiologist.  
*Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.*—H.S. At rate of £100.  
*Royal Westminster Ophthalmic Hospital, Broad-street, Holborn, W.C.*—Cruise Clin. Res. Scholarship. £100.  
*St. Mary's Hospital, W.*—Jun. Asst. Radiologist. £75.  
*Salvation Army Mothers' Hospital, Lower Clapton-road, E.*—Jun. Res. M.O. At rate of £80.  
*Seamen's Hospital Society, Greenwich.*—H.S. for Tilbury Hospital. At rate of £140.  
*Sheffield, Jessop Hospital for Women.*—Res. M.O. Also H.S. At rate of £150 and £100.  
*Sheffield Royal Infirmary.*—Ophth. H.S. At rate of £120.  
*Sheffield University.*—Demonstrator in Anatomy. £300.  
*Smethwick County Borough.*—Asst. M.O.H. and Asst. School M.O. £350.  
*South Eastern Hospital for Children, Sydenham, S.E.*—Hon. Cons. Surgeon. Also Jun. Res. M.O. At rate of £100.  
*South London Hospital for Women, Clapham Common, S.W.*—H.P. and two H.S.'s. Each at rate of £100.  
*Stoke-on-Trent, North Staffordshire Royal Infirmary.*—H.S. £150.  
*Taunton and Somerset Hospital.*—Sen. House M.O. At rate of £150.  
*University of London, King's College, Strand, W.C.*—Asst. Lecturer and Research Worker. £300.  
*Walsall County Borough.*—Asst. M.O.H. £350.  
*West Bromwich, Hallam Hospital.*—Two H.P.'s and H.S. Each at rate of £200.  
*West London Hospital, Hammersmith-road, W.*—Res. Asst. Surgeon. £200. Also Res. Anaesthetist. At rate of £100.  
*West Malling, Kent, Leybourne Grange Colony for Mental Defectives.*—Asst. Res. M.O. £350.  
*Wickford, Esser, Runwell Hospital.*—H.P. At rate of £150.  
*Wilkesden General Hospital, Harlesden-road, N.W.*—Hon. Clin. Assts. for Out-patients' Dept.  
*Winchester, Royal Hampshire County Hospital.*—H.S. At rate of £125.  
*Windsor, King Edward VII. Hospital.*—Cas. H.S. At rate of £100.  
*Woking and District Victoria Hospital.*—Res. M.O. At rate of £120.  
*Wolverhampton Royal Hospital.*—H.P. Also H.S. At rate of £125 and £100 respectively.  
*Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.*—Hon. Asst. Obstet. Surgeon. Also two H.S.'s. Each at rate of £100.  
*Worksop, Victoria Hospital.*—Sen. and Jun. Residents. £150 and £120 respectively.  
*Zelland County.*—County M.O.H. £700.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Bromyard (Hereford) and Exeter (Devon).

## Appointments

APPLEBEE, MOYA, M.B. Belf., D.P.H., has been appointed Hon. Assistant Physician to the Devonshire Royal Hospital, Buxton.

BATTEN, GRACE, B.M. Oxon., D.M.R.E., Research Assistant to the William Morris Research Fellow at Mount Vernon Hospital.  
 BELL, A. C. H., M.B. Lond., F.R.C.S. Eng., Hon. Gynecologist to the Edenbridge and District War Memorial Hospital.  
 BROWN, BESSIE, M.D. Leeds, Resident Surgical Officer at the Leeds Maternity Hospital.  
 EWING, J. B., M.D., F.R.C.S. Edin., Resident Medical and Surgical Officer and Registrar at Wigan Infirmary.  
 GATES, E. A., M.D., M.R.C.P. Lond., Hon. Physician to the Italian Hospital, London.  
 GOODGER, JOAN, M.R.C.S. Eng., D.P.H., Assistant Medical Officer for Kensington.  
 GREEN-ARMITAGE, V. B., M.D. Brist., F.R.C.P. Lond., Hon. Gynecologist to the Italian Hospital, London.  
 HOWARD, STANFORD, B.M. Oxon., F.R.C.S. Eng., Hon. Assistant Surgeon to the Poplar Hospital for Accidents.  
 KEDDIE, J. T. C., M.B. Manch., D.P.H., Medical Officer of Health for Oldham.  
 LYNCH, C. F., M.B. Belf., D.P.H., Assistant Medical Officer of Health for Manchester.  
 MARINKOVITCH, R., M.D. Leeds, Venereal Diseases Medical Officer for Salford.  
 PETHER, G. C., M.D., M.R.C.P. Lond., Hon. Assistant Physician to the Devonshire Royal Hospital, Buxton.  
 REID, ANNA M. M., M.B. Edin., D.P.H., Assistant County Medical Officer for the County of Northumberland.  
 SIMPSON, W., M.D. Glasg., First Assistant Medical Officer at Barnsley Municipal General Hospital.  
 SPINK, M. S., M.D. Camb., Resident Medical Officer at the City General Hospital, Leicester.  
 WEBSTER, R. C., M.B. Irel., Assistant Medical Officer at the Venereal Diseases Treatment Centre, Salford.  
 King Edward VII. Welsh National Memorial Association.—The following appointments are announced:—  
 THOMAS, D. M. E., M.R.C.S. Eng., Assistant Tuberculosis Medical Officer;  
 MEWTON, J. L., M.B. Liverp., F.R.C.S. Edin., Resident Medical Officer;  
 MORRIS, G. J., M.R.C.S., Assistant Resident Medical Officer.  
 Certifying Surgeon under the Factory and Workshop Acts: Dr. D. C. PIM, M.C. (Calvert District, Bucks).  
 Medical Referee under the Workmen's Compensation Act, 1925: T. L. CLARK, M.D., F.R.C.S., of Halifax, for the Halifax County Court District (Circuit No. 12).

## Births, Marriages, and Deaths

### BIRTHS

BARBOR.—On May 7th, the wife of Dr. Ronald Barbor, of Hoddesdon, Herts, of a son.  
 BROMLEY.—On May 2nd, at Bury St. Edmunds, the wife of James Wilfred Bromley, M.B. Camb., of a daughter.  
 CAMERON.—On May 3rd, at a nursing-home, Aberdeen, the wife of Dr. T. W. F. Cameron, of Chatham, of a son.  
 GOSSIP.—On May 4th, at Sutherland-avenue, W., the wife of Dr. James Gossip, of Warwick-avenue, W., of a daughter.  
 HOPE.—On May 4th, the wife of Dr. J. P. Hope, Sheffield, of a son.  
 PIMBLETT.—On May 2nd, at a nursing-home, Lincoln, the wife of Flight-Lieut. H. C. S. Pimblett, M.D., R.A.F., of a son.  
 POST.—On May 3rd, at Devonshire-place, the wife of Dr. H. W. A. Post, of a daughter.  
 SIMPSON.—On May 4th, at Kensington Park-road, W., the wife of Reginald Hugh Simpson, M.D., F.R.C.P. Lond., of a son.

### MARRIAGES

MCPHERSON—SUTHERLAND.—On April 30th, Alexander Roberts McPherson, M.B. Edin., to Agnes Sutherland of Gilwern, Abergavenny.  
 TYRRELL—STENNING.—On April 25th, at St. Andrew's Church, Holborn, Timothy Martin Tyrrell, F.R.C.S. Eng., to Beryl Mary Gwendoline, daughter of Mr. A. E. Stenning of Philbeach-gardens, S.W.

### DEATHS

COHEN.—On May 4th, at the London Hospital, Dr. Alan E. Cohen, youngest son of Mr. M. E. Cohen, Didsbury, Manchester.  
 COOKE.—On May 4th, at Woodlands, Wootton, I.W., Reginald T. Cooke, M.R.C.S. Eng., aged 60.  
 FRASER.—On May 11th, at Melville-street, Edinburgh, John Smith Fraser, M.B., F.R.C.S. Edin.  
 HAINES.—On April 15th, at Longford, Tasmania, Hugh G. Haines, F.R.C.S. Edin., son of the late Lieut.-Colonel Gregory Haines and the Hon. Mrs. Haines, aged 82.  
 LEICESTER.—On May 3rd, George Frederick Leicester, M.B. Edin., of Castlemain-avenue, Bournemouth.  
 LINEHAN.—On April 12th, 1936 (Easter Sunday), at a private nursing-home, Dublin, Bridget Linehan, M.B. N.U.I., D.P.M. R.C.S.I., late A.M.O. County Mental Hospital, Lancaster, and Millstreet, Co. Cork, Ireland, R.I.P.  
 SHAW.—On May 9th, at his home, Littlehampton, Harold Batty Shaw, M.D., F.R.C.P. Lond., F.R.C.S. Eng., late physician to University College Hospital, London.  
 SLADE.—On May 3rd, at a nursing-home in London, John Godfrey Slade, M.D. Camb., aged 59.  
 WYLLYS.—On May 11th, at Great Yarmouth, Henry John Mackesou Wyllys, F.R.C.S. Edin.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

## NOTES, COMMENTS, AND ABSTRACTS

## PHARMACY JARS

By C. J. S. THOMPSON, M.B.E.

HON. CURATOR, HISTORICAL COLLECTION OF MUSEUM, ROYAL COLLEGE OF SURGEONS OF ENGLAND

THE study of the pottery used in pharmacies in various European countries, from the Middle Ages to the eighteenth century, is one of considerable interest to those engaged in the practice of medicine. Many of the specimens still existing are very valuable not only for their artistic beauty but also for their inscribed labels which throw a light on the history of medication. Dioscorides (A.D. 40-90) is the first to tell us something about the storage of drugs in the early Christian era. He says that "for liquid medicines containers of silver, glass or horn should be used, also of earthenware that is not porous," and we still have numerous specimens of the clay vessels employed for the purpose in Greek and Roman times.

But the beauty and interest of the vessels used in pharmacy really dates from the introduction of enamelled pottery into Europe after the invasion of Spain by the Moors. The oldest centre for making Moorish faience was at Malaga, when as early as 1350 it is recorded that "its beautiful golden pottery was exported to the most distant countries." This Hispano-moresque pottery is a distinct class and is decorated with Moorish designs painted in metallic lustre produced by means of copper. The Italians adopted the brilliant prismatic hues of the Moors whose pottery excited their admiration, and soon they produced results which surpassed those achieved

by their instructors. The industry spread to Majorca, and Majolica, the ancient Tuscan name for the island, became the general designation for the early Italian pottery.

It is impossible in the space of a short article to give more than an outline of the development of Italian majolica between the fourteenth and the eighteenth centuries, or an indication of its great artistic beauty and importance; but the chief shapes of the vessels used for drugs and their preparations can be indicated. The commonest shape of the jars used for solids is the albarello. It is cylindrical in form with slightly concave sides, and varies in height from four to sixteen inches. The tops in early times were covered with bladder or parchment and, before labels were employed, were distinguished by armorial designs or strips of metal bearing the name of the contents, attached by a wire. For liquids, the ewer was used with a spout for pouring and a handle. The tops were covered in the same way until metal lids came to be employed.

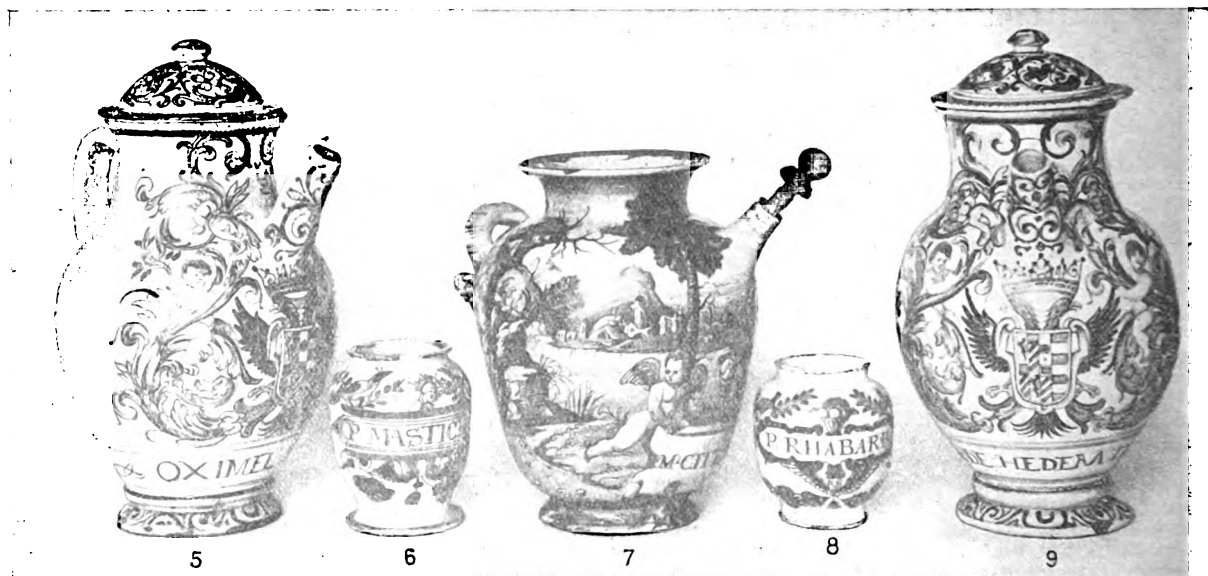
Even before glaze was used, there was a pottery where pharmacy jars were fashioned at Oviedo in the fourteenth century and another at Pesaro is recorded in 1300. What is called the first period of Majolica began before 1500, when Faenza became famous for its productions. Dated specimens are known from 1500, and two fine examples, here reproduced from the collection of Sir StClair Thomson, are worthy of note for their characteristic decoration. One is painted with the portrait of a man wearing a crown and is inscribed "Villa Nova," while the other bears the head of a woman in profile. Two specimens of Castel Durante in the collection are dated 1569. They are remarkable for their fine

## PHARMACY JARS FROM THE COLLECTION OF SIR STCLAIR THOMSON



1 and 4. A pair of Faenza drug jars. XVI. century.  
2 and 3. A pair of Castel Durante in polychrome. Dated 1569. Label Lead Ointment.

## EWERS AND JARS FROM THE SAME COLLECTION



5. Pharmacy Ewer. Castelli. XVII. century. Label Oxymel of Squills.
6. Drug Jar. English Delft. XVII. century. Label Pill Mastic.
7. Pharmacy Ewer with stopper. Urbino. XVI. century.
8. Drug Jar. English Delft. XVII. century. Label Pill Rhubarb.
9. Pharmacy Ewer. Castelli. XVII. century. Label Syrup of Ground Ivy.

decoration in polychrome: green, blue, and yellow.

What may be termed the second period of majolica dates from about 1500, when the famous pottery of Urbino was founded. For colour and artistic beauty the pharmacy jars of Urbino are unsurpassed. Great artists such as Battista Franco and Raffaele del Colle were employed to carry out the designs in which figures, armorini, and landscapes formed part in brilliant colouring, a rich yellow, blue, and green being predominant. A famous set of pharmacy jars were made at Urbino to the order of the Duke of Guidobaldo for the pharmacy attached to his palace, which had the distinction of being the costliest pharmacy vases in the world. It is said that Queen Christina of Sweden, offered for them their weight in gold, as did also Louis XIV. The Grand Duke of Florence wanted to exchange them for silver vases of equal size, but Guidobaldo would not be tempted to part with them. On his death his heir presented them to the shrine of Our Lady at Loreto. Sir StClair has a beautiful example of Urbino in his collection. It is a pharmacy ewer painted with scenes and figures, carried out in brilliant colouring, and is specially interesting on account of having the original wooden stopper for insertion in the spout.

In the sixteenth century many other cities in Italy became famous for their pottery, most of which may be recognised from their distinctive designs and colourings. Among those celebrated was Castel Durante which dates from 1361. Its characteristic decoration consists of coats of arms, armorini and garlands, or patterns of a geometrical type, trophies, grotesques and medallions, many of which were the work of Sebastian di Marforio. Another early pottery was that of Deruta, which was famous for its yellow lustre edged with blue, and equally beautiful were the products of Gubbio, mainly the work of Maestro Georgio, which was noted for its peculiar ruby lustre and later for its shades of blue. Sienna must also be mentioned with its characteristic colourings of dark blue, brown, and black, and pharmacy jars from its pottery are extant dating from 1501.

Other famous potteries were carried on at Caffagiola which belonged to the Medici princes, Venice,

Florence, Treviso, Montelupo, and Castelli, the last named being remarkable for its beautifully executed landscapes and figures, some fine examples of which are in Sir StClair's collection. Caltagirone, the capital of Sicilian majolica, with its florid rich colouring of blended reds, blues, and yellows, is easily recognisable, as also the pottery of Savona notable for its varied shades of blue and artistic decoration. For the purpose of study and comparison many beautiful specimens of Italian majolica may be seen in the British and Victoria and Albert Museums, and also in the Wallace Collection at Hertford House.

In Sir StClair's collection are also many fine examples of pharmacy jars of Dutch and London Delft which it is not the object of this article to describe.

## TIMELY ISSUE OF GADD'S SYNOPSIS

THE issue of the thirteenth edition of Gadd's Synopsis of the British Pharmacopœia, 1932 (London: Baillière, Tindall and Cox, pp. 200, 3s.), coincides with the appearance of the new Poisons List and Rules, and the opportunity has been taken of incorporating a synopsis of them. In the table of chemicals, drugs, and preparations of the B.P., 1932, the statutory poisons are assigned to their respective parts of the Poisons List and Schedule 1 poisons are indicated. A note is also made of drugs and preparations, falling within Schedule 4, which can be supplied on prescription only. This table provides a ready means of reference to all official substances and preparations. The utmost care has been taken in its compilation, and it is remarkably free from typographical errors. Fifty-four pages are devoted to a summary of the Poisons Laws and the Dangerous Drugs Act and Regulations. This could be improved by the insertion of such common names as novocain, benzocain, &c., as examples of substances of the aminobenzoic ester series, synthalin as typifying the guanidines, and so forth. A few minor errors are noticeable; phenetidylphenacetin is spelt wrong on p. 154. The synopsis presents a concise account of the subject and should prove valuable to practitioners who wish to discover their obligations under these Acts and Rules.

### "LACK OF HINGHAM"—A COUNTRY PRACTITIONER OF VICTORIAN DAYS

THE death of Dr. Thomas Lambert Lack, a widely known Norfolk practitioner, which occurred recently in his ninety-fourth year, suggests to one who knew him, and knew intimately all the district where he worked, a retrospect; the way in which a country practice in a sparsely populated county was conducted between early Victorian days and the end of the nineteenth century was well illustrated by the life of this nonagenarian. "I remember," writes our correspondent, "the daily routine of the country doctor's life from the 'seventies onwards, that is, not only before the coming of motor-driven vehicles, but before many of the fundamental discoveries in medicine of the last century, and before the general revision of local government, which set a pattern to country practice; and this in its turn has been fundamentally changed from the old shape by the coming of motor traffic.

"Lack of Hingham"—in Norfolk always so styled—was an excellent exponent of the country practice of his time. He was born in Norfolk in the little town of Swaffham, and received his early education at the local grammar school. He became a student at King's College Hospital and qualified some 70 years ago, in accordance with universal practice, as M.R.C.S. Eng., L.S.A. After the usual period as an assistant he moved to the neighbouring town of Hingham, and for over 60 years carried on there a large general practice. He was a sound doctor, the part-time medical officer of health of the district, and general adviser on sanitation of the neighbourhood, and became, which must have been useful to the community, a justice of the peace for the county. My own father, who was 30 years Lack's senior, was also a country practitioner in the vicinity, and the daily round was similar in each case. Norfolk, still a typically agricultural country, was more strictly so 70 years ago, and the medical man had a very hard and responsible life in dividing up the 16 hours or so of his working day between parish and club work and the claims of a private practice. A successful practitioner like Lack had an assistant resident in the house or the surgery-dispensary adjoining, and his day ran like this. He rose early and the first part of the morning would be occupied in supervising or helping his assistant in dispensing. Then morning work in the surgery would cover the range of an out-patient casualty department. There was treatment of minor ills, injuries and ambulatory cases generally, diagnosis of medical cases, with a sharp eye for infectious disorders, and there would be frequent tooth extraction. Much of the details fell upon the assistant, and assistants themselves were divided into two classes, though their intent may have been to belong to the first class only. All were serving by apprenticeship the first period of their medical curriculum; while learning to dispense and conduct minor surgery they obtained from their principal a knowledge of anatomy, physiology, and therapeutics, and the elements of book-keeping. Some of them went on to a medical school and became duly qualified; others remained as unqualified assistants, finding the range of knowledge which they were able to acquire commanded a satisfactory payment while they served under qualified men. In the period of which I write many of these men were doing valuable work and filling a definite place in the pattern of practice, but abuses followed which need not be detailed and which ended in the abolition of the unqualified assistant.

As soon after 10 as duties in the surgery allowed, the doctor would be in the saddle or the gig, making rounds, visiting private homes, and, where the practice was extensive, calling at local centres either for messages or to deposit medicines for distribution in the villages. Luncheon or midday dinner the doctor obtained at the hour when the round was finished, rather than at any specified time; after which, in the afternoon, the proceedings of the

morning were repeated through another area of the practice. The end of the second round was the fluctuating time for the evening meal, and then there remained for the doctor, with the help of his assistant, to make a record of visits paid and cases to be noted, to write up his books, and to arrange the programme for the next day. Also some of the medicines which had been found necessary during the rounds had to be dispensed, and these were great days for the pill, potion, and plaster. Norfolk was sparsely populated and serious cases, medical or surgical, among rich or poor, had for the most part to be treated in their own homes. Only in exceptional instances could resort be had to a hospital and the methods of transport were exceedingly difficult, while their arrangement fell upon the doctor. No emphasis need be laid on the difference of the responsibilities of those days and the situations that arise since the arrival of motor traffic and the multiplication of cottage hospitals. But the doctor had more leisure than such a day as I have described would seem to offer. It is true that often he took no regular holiday, and certainly did not conceive the idea of being, through a period of weeks, away from his practice save on account of illness. But breaks would occur in the drudgery, society was more informal, and the doctor had many chances of indulging a love of sport. Many supported the local cricket-club, to some there fell the chance of a day with the hounds, while many country doctors shot over a large area with the land-owners and farmers of the neighbourhood. Lack was a keen and good shot and pursued his favourite sport when chance offered until late in life.

Our correspondent's picture has been drawn before, but it will bear the repetition. The class to which Lack belonged and which indeed he ornamented, is gone, but such a man's life-work was based on the same qualities which his analogue to-day, with his high equipment and advanced methods of transport, brings to bear in the conduct of practice.

### HOSPITAL LIBRARIANS

LESS than three years ago the librarians voluntarily engaged in distributing books to patients in English hospitals decided that it was necessary for the advancement of their work to form themselves into a Guild. The organisation attracted attention in foreign countries with the result that the membership includes a number of nationalities. France has recently formed a National Hospital Library Committee under whose auspices the second annual meeting of the Guild was held in Paris during the week-end from May 9th-11th.

The Duc de Broglie, as president of the French committee, supported by General Weygand, greeted the gathering at the opening session on Saturday when Dr. René Sand presented the annual report and welcomed the Guild as an accession to the social services connected with hospitals which have developed since the war. After a discussion upon the recruitment and training of hospital librarians opened by Mrs. Roberts, the honorary secretary of the Guild, M. Henriot, the inspector of the municipal libraries in Paris, gave an account of the collaboration of the library organisation with the public assistance authorities in establishing this service. The hospitals are supplied from one centre. The only exception is the new Hôpital Beaujon which has its own library provided with the assistance of a generous bequest. In the afternoon the visitors had an opportunity to see the fine new building which is described as a Gallicised adaptation of American hospital architecture. Among the special features in the care of the patients which especially demonstrate thoughtful consideration are the entirely separate admission of night emergencies so as not to disturb other patients and the allocation of a separate ward to mothers, whose babies are stillborn, whereby they do not have a reminder of their disappointment through association with mothers with babies. On Sunday morning Madame Getting, the president of the hospital social service, welcomed the visitors at the



Hôpital de la Pitié which contains the central library for many hospitals on the analogy of other necessities such as food-supplies which are distributed from a centre. Madame Houel, who acted as honorary secretary of the conference and has the direction of the distribution of the books, explained the arrangements made, through a committee who read all the books, for providing for the various requirements according to sex or the nature of their illness. The features of the organisation are that it is under the direction of a professional librarian, and that the library has been established with new books instead of being dependent upon the goodwill of donors of secondhand books as is usually the case in England.

Mr. C. E. A. Bedwell, chairman of the English Guild, opened the proceedings on Monday morning under the chairmanship of M. Chenevier, secretary-general of the Public Assistance, with a description of the relations in England between the hospital and library authorities. Voluntary hospitals as well as municipal hospitals, especially in London, are supplied by the voluntary organisation of the Red Cross, while some municipal libraries are supplying voluntary hospitals as well as municipal hospitals. The conference also considered the development of the Guild. It decided to enlarge the international council and to encourage the formation of national committees to be welded into an international federation.

The English visitors were particularly impressed by, and grateful for, the cordiality of their welcome. The whole gathering was a great encouragement to those who believe that books and the reading of them, if adequately organised, can make a real contribution to the progress of patients in general and mental hospitals. Much interest was shown in the *Book Trolley*, the quarterly organ of the Guild as well as a pamphlet, "How to Run a Hospital Library," which are both published from the headquarters of the British Red Cross Library at 48, Queen's-gardens, London. It remains only for the hospital and library authorities, encouraged by the members of the medical profession who appreciate the value of this work for their patients, to give such support to the Guild that it may be enabled to maintain the reputation of English hospitals in this branch of hospital activity.

#### INVALID CHILDREN'S AID ASSOCIATION

At the annual meeting of this association, held in London on Tuesday, with the Archbishop of Westminster in the chair, Sir Maurice Cassidy said that some 12,000 people in this country died every year from rheumatic heart disease—a disease which he believed would, before very long, prove to be preventable. The majority of those who died had been cardiac cripples for many years, and a large number died in childhood. In 1934 there had been more than 2000 children in special schools of the London County Council suffering from heart disease, and something like two-thirds of all victims of acute rheumatism died before the age of 50. Any scheme for tackling the rheumatic problem should have certain features: (1) rheumatism should be made notifiable; (2) research into the factors aggravating and predisposing to it should be encouraged; (3) treatment should be secured for all children suffering from the disease. It was vital that such children should be put to rest for at least three months under ideal hygienic conditions, this treatment to be followed by a long period of convalescence. The I.C.A.A. had special homes for children in both stages.

Sir Kingsley Wood spoke of the importance of environment. The good work done in a home or hospital was often largely undone if a child had to go back to overcrowded or unhealthy living conditions. As Minister of Health he appreciated all that municipalities were doing in the field of public health, but he could not overlook the great pioneer work of voluntary associations.

A resolution, pledging those present to obtain the necessary financial support for the work of the association, was formally proposed by Dr. J. Fawcett and seconded by Miss Helen Simpson. She had

referred to THE LANCET of 1828, and compared the torture meted out to Lord Byron in the unsuccessful attempt to cure him of crippledness in childhood with the skilled and kindly treatment available for the poorest man's child to-day. The I.C.A.A. was constantly interfering with the course of history by changing the outlook of crippled children. Many were cured, and those who could not be cured were helped to get work they could do. Miss Yvonne Arnaud added a moving plea for financial help, and votes of thanks were proposed and seconded by Mr. H. S. Souttar and Sir John Broadbent.

#### NEW PREPARATIONS

**MANDELIX** (Elixir of Ammonium Mandelate, B.D.H.).—In THE LANCET of April 4th, 1936 (p. 769), H. E. Holling and R. Platt reported favourably on the treatment of urinary infections (pyelitis) with ammonium mandelate. This was prepared by the British Drug Houses Ltd. (London, N.1) in the hope that its use would obviate the necessity of giving ammonium chloride, which many patients find nauseous, whenever mandelic acid treatment is required. The elixir tried by Holling and Platt contained the equivalent of grs. 30 (2.0 g.) of mandelic acid per fluid ounce; but the preparation now marketed under the name of Mandelix contains in 2 fluid drachms the equivalent of the full therapeutic dose (3.0 g.) of mandelic acid. It is issued either separately or as part of an outfit embodying all that is necessary for a week's treatment. This includes 28 doses, a dozen capsules of ammonium chloride (for supplementary use if required), and equipment for determining the pH of the urine.

**CANNED PINEAPPLE JUICE, "DOLE" BRAND.**—This is the natural (unsweetened) juice of ripe Hawaiian pineapples and has been approved by the Committee on Foods of the American Medical Association. It is expressed from the shredded fruit, heated to 60°C., and centrifuged to remove suspended matter; it is then placed in cans which are sealed under "vacuum," heated in a cooker at 88°C. for less than ten minutes, and promptly cooled. According to the manufacturers the nutritional value of the raw pineapple is almost unimpaired by these processes. The vitamin-C content is slightly reduced but the juice remains, according to published investigations, a good source of vitamins A, B<sub>1</sub>, and C, and also contains B<sub>2</sub>. Among the advantages claimed for its use are that it raises the alkaline reserve of the blood plasma, increases renal elimination of waste products (urea), and stimulates the digestion of proteins in the stomach. Apart from these or other qualities it is an attractive addition to the diet, especially of children. The distributors are J. K. Husband and Co., Ltd., 10 Eastcheap, E.C.3.

THE May issue of the *Prescriber* is devoted to endocrinology, being the sixteenth annual issue on this subject. Each chapter treats of a ductless gland, and after a brief statement on its functions reviews the published advances of the past year. The journal is published from 65, Castle-street, Edinburgh 2.

**A POCKET TRANSILLUMINOSCOPE.**—Dr. M. E. El-Ibiary, writing from Ancylostoma and Bilharzia Hospital, No. 20, Cairo, refers to the "pocket transilluminoscope" described by Mr. Hamilton Bailey in THE LANCET of April 18th and informs us that two years ago he gave an account of a somewhat simpler instrument serving the same purpose which he named the "transoscope" (*Proc. Clin. Soc., Kasr-el-Ainy Hosp.*, 1934, vol. ii., No. 1.)

**A NEW SCREW-CAP.**—The United Glass Bottle Manufacturers, Ltd., have produced a double-shell metal cap for bottles and pots. This cap has all the advantages of the ordinary screw-cap, but by the use of two layers the outside presents a smooth, unbroken surface. This not only improves the appearance but also enhances the value of the receptacle, because the side of the cap ordinarily occupied by the thread of the screw is smooth and available for labels or designs. Any required lining can be fitted.



## ADDRESSES AND ORIGINAL ARTICLES

THE BIOCHEMICAL LESION IN  
VITAMIN B<sub>1</sub> DEFICIENCYAPPLICATION OF MODERN BIOCHEMICAL  
ANALYSIS IN ITS DIAGNOSIS \*

BY RUDOLPH A. PETERS, M.C., M.D., F.R.S.

WHITLEY PROFESSOR OF BIOCHEMISTRY IN THE  
UNIVERSITY OF OXFORD

WE are so accustomed to the detailed analysis upon the fixed tissue which is made possible by refined histological methods that we do not readily adjust to the idea that a new type of analysis is being steadily perfected by modern biochemical research. So far as the separation of one cell from another is concerned and the elucidation of differences in its pathological state, modern biochemistry is still very crude. We cannot work upon much less than 50 mg. of wet tissue, but we can obtain information from this of changes too subtle to be revealed upon the fixed histological specimen, changes in the behaviour of essential enzyme systems present. It really constitutes a new approach to pathological analysis, and has been exemplified in part by the work of Warburg,<sup>1</sup> Dickens,<sup>2</sup> and colleagues upon glycolysis and the cancer cell.

B<sub>1</sub>-DEFICIENCY IN THE PIGEON

An object of the present paper is to present an outline of one analysis of this type which is now in progress in the biochemistry department at Oxford. Our work had its origin in the wish to improve the pigeon test for vitamin B<sub>1</sub>. Anyone who has fed pigeons upon B<sub>1</sub>-deficient diets (such as polished rice) soon knows that there are two fairly well-marked different states produced, the acute and the chronic. The chronic are characterised by varying degrees of wing and leg weakness and spasticity; they often take a long time to cure upon accepted sources of vitamin B<sub>1</sub>; in young birds leg weakness may take a month of such treatment to effect a cure. In these it is easy to imagine the existence of a true polyneuritis, though it is doubtful whether it has been proved (Woollard,<sup>3</sup> Prickett<sup>4</sup>).

The acute symptoms are quite different from the chronic; they clear up with the greatest rapidity if vitamin B<sub>1</sub> is given, in under an hour when injected under the skull.<sup>5</sup> There is no evidence of histological change, nor could this be expected. Pigeons with these acute symptoms have been much described. It suffices to note here that they usually show opisthotonus, but more rarely forward symptoms, "emprosthotonus."<sup>6</sup> The bird either remains with the back of the head nearly touching the back, or exercises cartwheel convulsions. Previous to this the bird sees badly and does not respond when the finger is placed close to the eye. Exercise, noises, and strong light excite and exaggerate the symptoms; rest in the dark makes them quiescent. In the terminal stages there are usually failures of temperature regulation. Much work had been done upon this condition previous to the start of our own, about 1927, without the emergence of any definite conclusion as to their origin. It was the conviction that the secret of the condition lay in the brain rather than elsewhere that led naturally to the development of the following story.

\* The substance of a lecture delivered at the National Hospital, Queen-square.  
5882

Our first observations (Kinnersley and Peters<sup>7</sup>) were made by older biochemical methods, analysis of fixed tissues. Brains taken with a special T-shaped guillotine were plunged into liquid air within ten seconds of death. Speed is essential if the biochemical state of brain at death is required; about one minute suffices for the post-mortem conversion of the sugar present in a brain at death into lactic acid.<sup>8</sup> We concluded from this early work that there was more lactic acid than normal present at death in the brains of birds showing the acute symptoms, and that this increase took place especially and first in the optic lobes and lower parts of the brain. No changes could be detected in the cerebellum. The increased lactic acid had two possible origins, either from the blood or from local changes in the tissues. Increases of lactic acid in the blood of three avitaminous pigeons had been previously described by Collazo and Morelli.<sup>9</sup> We argued that the lactic acid change was local because of its uneven distribution and its failure to keep step with blood lactic acid. As a matter of fact there seems to be a difficulty in removing lactic acid in other parts of the body in the B<sub>1</sub>-deficient organism. The Japanese workers Hayasaka and Inawashiro<sup>10</sup> found that lactic acid disappeared more slowly from the blood in beri-beri patients after exercise, and R. B. Fisher<sup>11</sup> showed in Oxford that in the deficient pigeon after exercise lactic acid disappeared more slowly from the heart and muscles.

## ABNORMALITIES IN TISSUE RESPIRATION

With these abnormalities in the brain as a guide, the enzyme systems were next analysed by more modern methods. It will be realised now that tissue systems can be studied after removal from the body in various states of organisation. The most organised of such systems is the slice of tissue (Warburg), and the least the isolated single enzyme. The one chosen for study will depend upon the aim and upon local conditions. Owing to the nature of our material, pigeon's brain, we have found it best to work with brain tissue teased with a blunt bone spatula. It is well known that tissue preparations of this type take up more oxygen in presence of certain substances such as glucose than when studied alone. Study of the behaviour of such tissue systems in vitro in glucose and other solutions is now generally believed by biochemists to be of value in interpreting the biochemistry of such tissues in the body. The phenomena are not too artificial to be of value.

Accordingly we studied the oxygen uptake of the brain tissue in Barcroft microrespirometers with and without addition of glucose. This had been done before without paying attention to the parts of the brain, and without addition of this substrate.<sup>12</sup> It must be realised that the tissue must be fresh for this purpose. Freezing or leaving the tissue to stand inactivates the subsequent tissue respiration in vitro. With 100 mg. of brain and 3 c.cm. of Ringer phosphate solution, no certain difference between the respiration of normal and avitaminous pigeon's brain has been observed (Gavrilescu and Peters<sup>13</sup>). But with glucose present, there was no doubt that the respiration was lowered and, as in the case of the lactate accumulations, especially in the lower parts of the brain. Cured birds showed an increase. As we know now, the same phenomenon is found in vitro with lactate (CH<sub>3</sub>.CHOH.COOH) and pyruvate (CH<sub>3</sub>.CO.COOH), both of which substrates

must be regarded as lying within the field of intermediary carbohydrate metabolism. With Meiklejohn and Passmore<sup>14</sup> we became quite certain that the lowered oxygen uptake was specific for the lowered vitamin B<sub>1</sub> and was not due to the accompanying general inanition. The birds dosed with vitamin B<sub>1</sub> alone in water and not allowed to feed showed the improved brain condition.<sup>15</sup>

Summarising the evidence up to this point, we see that there are two differences found in these brains, both more marked in the lower parts, (a) increased lactate and (b) diminished tissue respiration in glucose or lactate solution.

CATALYTIC ACTION OF THE VITAMIN

So far the experiments did not decide absolutely whether the vitamin itself was missing from the tissue. It was natural to try the effect of adding vitamin B<sub>1</sub> in the early experiments with the concentrates and in the later with the pure crystalline vitamin B<sub>1</sub> which became available.<sup>16</sup>† We had the good fortune to find that the addition of vitamin B<sub>1</sub> largely restored the oxygen uptake in vitro. Moreover, there was a regular relation between the effect of vitamin on O<sub>2</sub> uptake and the amount of vitamin added up to a certain maximum amount. To make this precise, with the amount of tissue and solution used, as little as 1/10,000 mg. has a perceptible effect and 1/500 mg. is maximal in action. The vitamin is definitely a catalyst; with small amounts much more oxygen is taken up than would be required to oxidise the vitamin B<sub>1</sub> added; further an increase of the vitamin to 1/5 mg. (100 times) produces no further increase in O<sub>2</sub> uptake.<sup>17</sup> Fig. 1 shows the effect of vitamin in increasing the oxygen uptake over an hour period of respiration in the presence of pyruvate from a recent experiment.<sup>18</sup> The action

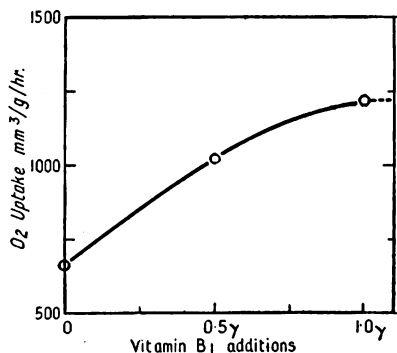


FIG. 1.—Illustrates increases in oxygen uptake in vitro of avitaminous pigeon's brain tissue due to addition of increasing amounts of crystalline vitamin B<sub>1</sub> (hydrochloride). Period 1-2 hours from beginning of experiment. Medium Ringer phosphate containing pyruvate.

is so regular that it can be used as a test for estimating the vitamin.<sup>16</sup> A very important point is that there is practically no effect of the vitamin upon the normal brain. To the above points (a) and (b) we can now add (c) that the lowered oxygen uptake in glucose, lactate, and pyruvate media was

† See note upon Chemistry of vitamin B<sub>1</sub> at end.

This work will not be clear to those unacquainted with the biochemical field without a slight digression. As a result of much labour, biochemists have produced a scheme for the coordination of certain essential features in tissue respiration, which probably represents a fairly close approximation to the facts. Oxygen is picked up from the blood (or elsewhere) by the cell by one enzyme system (known as the Warburg system) and passed by means of an inter-

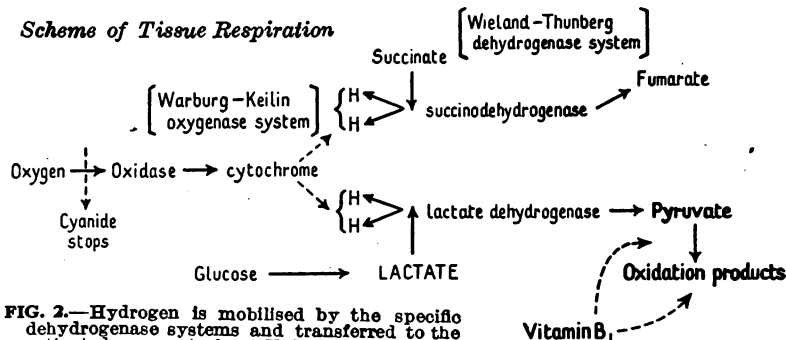


FIG. 2.—Hydrogen is mobilised by the specific dehydrogenase systems and transferred to the activated oxygen to form H<sub>2</sub>O<sub>2</sub>.

mediary carrier (Keilin's cytochrome) to the specific enzyme systems which activate lactate or other substances. Keilin's cytochrome (and probably the Warburg enzyme) are both porphyrin compounds allied to the blood-pigment.<sup>19</sup> Diagrammatically it is as in Fig. 2.

It should be emphasised that these are not mere paper schemes; the various factors have been isolated and can be made to work artificially by putting them together in vitro. It will be noted that KCN and narcotics interrupt the activity of the system at different sites. KCN for instance will inhibit the O<sub>2</sub> uptake for both the succinoxidase system and the lactate system. Succinate is a 4-carbon compound (COOH.CH<sub>2</sub>.CH<sub>2</sub>.COOH) present in the body in small amounts. The enzyme which oxidises it to fumaric acid (COOH.CH=CH.COOH) is widely distributed in brain and other tissues. Its importance as a test lies in the fact that it does not belong to the carbohydrate intermediary series of substances. Hence it forms a useful test in this connexion as to where the vitamin is acting, whether upon the oxidase or upon some specific dehydrogenase system. In strong contrast to the results with lactate, pyruvate, and glucose, we found no difference at all between the behaviour of normal and avitaminous brain tissues when succinate was used as the substrate.<sup>14</sup> Hence we can say definitely that B<sub>1</sub>-deficiency is affecting the sugar metabolism at some point related to the 3-carbon stage. Another fact in support of the carbohydrate concern of this vitamin is to be seen in observations on the respiratory quotient of the isolated tissue. Sinclair found that addition of vitamin B<sub>1</sub> raised this nearer to the true value for carbohydrate, upon average from 0.68 to 0.86.<sup>20</sup> I should add here that though most of our work has been done with phosphate solutions, the phenomena occur also in the more physiological bicarbonate media.

FURTHER OBSERVATIONS ON ITS ACTION

The facts so far considered really give substance to the two old theories of the action of vitamin B<sub>1</sub>: (1) that it was especially concerned with carbohydrate metabolism,<sup>21</sup> and (2) that it was connected with tissue respiration.<sup>22</sup> We can now decide that both views are correct; it is a catalyst needed for the

oxidative removal of one of the lower degradation products of carbohydrate metabolism.

Continuance of the work soon gave proof that the vitamin was not a lactate oxidase co-enzyme. The first shock arose from the work by Meiklejohn<sup>23</sup> in which he estimated the lactic acid removed by the respiring brain systems with and without vitamin. In spite of the increased oxygen uptake when vitamin was added, there was no increase in the lactic acid which disappeared. Hence B<sub>1</sub> was not directly increasing the removal of lactic acid. We therefore inspected the system more closely, and we found that the vitamin effect could be increased by warming the tissue during preparation and that addition of pyrophosphate also improved it. About the same time that this work with Sinclair<sup>24</sup> was proceeding Embden and Meyerhof<sup>25</sup> with their colleagues produced their new scheme for the stages of degradation of sugar in muscle, in which the energy of the sugar is made available by a rather detailed series of successive phosphorylations, and in which stress was laid upon the importance of pyruvic acid as a precursor of lactic acid. Long known in yeast fermentation, the significance of pyruvic acid was now raised for the animal. In the Embden-Meyerhof experiments the pyruvic acid was detected by the use of poisons; to this extent it could still be argued that its presence was an artefact. Qualitative tests for pyruvate (Simon and Piaux) are simple, a modified Rothera with more nitroprusside and strong ammonia, a blue-green colour indicates the presence of pyruvic acid. The pyruvate reaction is given strongly by the brain which has respired in lactate without addition of vitamin and is reduced by adding vitamin. It is not given by the normal brain unless this has been poisoned with iodoacetic acid. The metabolism of pyruvate in vitro was studied with Thompson<sup>26</sup> quantitatively and the following things established about it:

(1) It was never present with the normal respiring brain in appreciable amount.

(2) It was formed from lactate with avitaminous brain in vitro in absence but not in presence of vitamin.

(3) Vitamin caused the disappearance of added pyruvate.

(4) The ratio  $\frac{\text{extra oxygen taken up}}{\text{pyruvic acid disappearing}}$  with addition of vitamin was variable but for pyruvate had average 450 mm.<sup>3</sup>/mg.

(5) Practically no pyruvate was present in avitaminous brain at death.

We concluded that the vitamin was definitely concerned with the removal of pyruvate, but not directly. The experiments clinched the importance of pyruvic acid as an intermediary metabolite. In recent unpublished experiments with K. G. McGowan, the ratio  $\frac{O_2}{\text{pyruvic acid}}$  has been more accurately determined upon normal brain for pyruvate and oxygen uptake. It indicates roughly the same value (435 mm.<sup>3</sup>/mg.) as for the extra pyruvate disappearing, and that most of the pyruvate is actually burnt. Hence the vitamin must be concerned with this in the normal brain.

The next step in this work was to look for pyruvate elsewhere. Thompson found it in the blood of the avitaminous bird. The accompanying Table shows the values obtained by Thompson and Johnson<sup>27</sup> for the pyruvate in the blood of avitaminous pigeons and also rats at a similar stage of vitamin-B<sub>1</sub> deficiency. The increase is definite and there is a reduction upon cure of the animal. The pyruvate has been identified by the best chemical methods by Johnson.<sup>28</sup> It may be mentioned that an investigation with O'Brien has been conducted upon the

rats' brain<sup>28</sup>; the same abnormalities were found as in the pigeon but they were more difficult to demonstrate, and there was no evidence of localisation in the lower parts. It is really fortunate that circumstances compelled us to use the bird's brain for these studies, as the phenomena seem to be exaggerated in the pigeon as compared with the rat.

In the human, the presence of pyruvate in the blood in ordinary diseased conditions has not been

Table showing mg. Pyruvic Acid\* per 100 g. Blood

	Normal.	Avit.	Cured.
Pigeon .. ..	3.96	11.31	5.29
Rat.. ..	4.22	9.39	—

\* Estimated as bisulphite-binding substance. About 2.8 mg. is not actually pyruvic acid, so that the actual increase of pyruvic acid is larger than the figures indicate.

found by Johnson, Meiklejohn, Passmore, and Thompson<sup>30</sup>; in contrast to this a fascinating preliminary note by Platt and Lu<sup>31</sup> draws attention to the presence of pyruvate in the blood and c.s.f. of beri-beri patients in the Orient!

#### WHAT HAS BEEN LEARNT

We may now take stock of the position. A purely in-vitro research with brain tissue of the bird was started in the first instance to improve the test for vitamin B<sub>1</sub> and later extended to elucidate the enzyme with which the vitamin co-operated. It has not only helped to settle these problems but it has proved the existence of pyruvate in normal metabolism. It has also shown that an in-vitro research upon brain tissue which takes advantage of the in-vitro labours of biochemists, can be applied to in-vivo events. This is an important step in this field. It is further encouraging that the work has led to the detection of pyruvate in the blood of beri-beri patients, which may well prove diagnostic. Surely we could not have a better instance of the ultimately practical value of a purely academic research.

*Further intimate analysis of the condition.*—The finding that pyrophosphate improves the respiration in presence of vitamin B<sub>1</sub>, taken in relation to the work of Meyerhof and Lohmann, suggests that it improves the synthesis of adenosine triphosphate in the tissue; a direct test of this point with Sinclair gave a negative answer. At first there seemed to be no experimental support for the view that lactate was converted into pyruvate, which was then oxidised with the co-operation of vitamin B<sub>1</sub>. Both iodoacetic acid and fluoride were found by Peters, Rydin, and Thompson<sup>32</sup> to eliminate the vitamin effect, though the former inhibited pyruvate appearance and the latter increased it, with lactate as substrate. Upon this they put forward the view that vitamin B<sub>1</sub> in presence of pyrophosphate led to the formation of some substance (unknown) which then interacted with the lactate pyruvate system, to produce an increase in oxygen uptake. In more recent unpublished work,<sup>13</sup> the experimental evidence against the view that lactate is directly oxidised to pyruvate, which then interacts with vitamin B<sub>1</sub>, has been to some extent reduced, so that it is possible that this is the course of events, lactate (with pyrophosphate) → pyruvate, the latter being directly oxidised in presence of vitamin B<sub>1</sub>. Vitamin B<sub>1</sub> does not catalyse the interaction of pyruvate and α-glycerophosphate, a reaction which does not occur in brain,<sup>33</sup> nor does it act as catalyst in vacuo in the presence of methylene-blue (Rydin).

This finding of pyruvic acid is not the only instance of discovery of an intermediary carbohydrate metabolite in vitamin-B deficiency. In children, Geiger and Rosenberg<sup>34</sup> have described the appearance of methyl glyoxal, which is stated to clear up when giving vitamin-B concentrates. There has also been the claim that in animals methyl glyoxal will appear in vitamin-B deficiency.<sup>34</sup> In the case of the pigeon

where we seem to have a fairly pure vitamin-B<sub>1</sub> deficiency in the brain, there is no evidence at all that methyl glyoxal is present in the animals during these symptoms.<sup>13, 29</sup> It is still possible that the methyl glyoxal may arise as a result of some entity of the vitamin-B complex other than vitamin B<sub>1</sub>.

To return now to the *acute symptoms* themselves, we have been able to relate these definitely to biochemical changes in the brain; there is evidence that they are initially located in the optic lobes and lower parts of the brain. No biochemical change has so far been demonstrated in the cerebellum. Two views can be taken as to their origin: (1) they are due to toxic products, of which the only ones at present known are lactate and pyruvate; or (2) they are the result of the deficiency of the factor only. Both these views have been much debated. The question of some general intestinal toxæmia seems now eliminated. After the discovery of the lactate accumulations we inclined to the toxic view, lactate in excess being considered to be toxic<sup>7</sup>; but we ourselves and others<sup>36</sup> have not been successful in inducing symptoms by injections of lactate. There is therefore not much actual support for the toxicity of the lactate increases; in any case it is a normal metabolite. In the case of pyruvate the amounts present in the blood are very small, and there is not evidence of increased pyruvate in the brain at death. Hence experimental support for the idea of toxicity even by the accumulation of a normal metabolite in the brain-cells is non-existent. This leaves open the second view (2) the purely deficiency view. Upon this the absence of an important factor in the development of energy from carbohydrates would be sufficient to stop the normal functioning of some groups of nerve-cells. Those which normally had most work to do might be expected to run out of their supply of the catalyst vitamin B<sub>1</sub> sooner than others. In other words, interrupt the normal metabolism of glucose at any stage, and brain-cells do not function properly. As has been pointed out elsewhere,<sup>5</sup> several circumstances may lead to the development of these symptoms in pigeons, most of which can be considered to be interference with some stage of the sugar metabolism; we may mention asphyxia, insulin overdose, cyanide poisoning, and anaesthetics such as chloroform. This is particularly interesting in view of a rather similar analysis to the above which was carried out independently and at the same time by Quastel and colleagues<sup>37</sup> upon the action of narcotics. They found that narcotics influenced the lactate oxidations far more than the succinate. As a result of interference with the metabolism of the cell, we get failure of function. It is not necessary to invoke the idea of a toxic agent as such unless this view was extended to include H<sub>2</sub>O in the wrong place in a cell!

The prolonged nature of the *chronic symptoms* and the length of time needed for cure suggest some more extensive cell change. In the valuable work by Prickett<sup>4</sup> there are described lesions in the CNS. in rats due to vitamin-B<sub>1</sub> deficiency, or rather it would be more correct to say due to the heat labile entities of the vitamin-B complex, since the symptoms correspond more nearly to the B<sub>6</sub> rats. The lesions were disseminated foci of hæmorrhage or intense congestion of one or both sides, involving the nucleus of Deiters, the chief vestibular nucleus of Bechterew and nucleus solitarius, in approximately three-quarters of the animals. No changes in the peripheral nervous system could be satisfactorily correlated with the B deficiency. In spastic beri-beri in pigeons, disseminated foci of hæmorrhage were

found in pons, medulla, or cerebellum, and to a lesser extent in optic lobes and cerebral hemispheres. Such hæmorrhages have been observed in this laboratory. In the animals with chronic symptoms, Rydin has found evidence of vitamin-B<sub>1</sub> deficiency in the cerebral hemispheres with little change in the rest of the brain.

In conclusion it may be said that it is realised that the present studies are fragmentary and defective in several important respects, but there is no doubt as to the emphasis which they throw upon the importance of biochemistry in the central nervous system; it can reasonably be claimed that they are sufficiently promising to justify further studies upon these lines.

#### SUMMARY

New methods of biochemical enzyme analysis have been applied by workers in the Department of Biochemistry, Oxford, to the problem of the origin of acute opisthotonus symptoms in pigeons suffering from vitamin-B<sub>1</sub> deficiency. There is found to be a defect in the power of oxidising certain carbohydrate intermediates in the central nervous system (especially in the lower parts of the brain); the most important substances concerned specifically with the avitaminosis are lactic CH<sub>3</sub>CHOH.COOH and pyruvic acids; of these the "biochemical lesion" is most closely related to the oxidation of pyruvic acid (CH<sub>3</sub>COCOOH). Addition of minute amounts of crystalline vitamin B<sub>1</sub> in vitro to the avitaminous (not normal) brain tissue restores the diminished tissue respiration. This is not only the first clear instance of the experimental realisation of an in-vitro action of a vitamin, but it constitutes a useful method of assaying vitamin B<sub>1</sub>. This vitamin is a catalyst used by the tissue at some stage in the combustion of carbohydrate. Defect in this stage within the central nervous system will lead readily to convulsions. The researches decide that two prominent theories of the action of vitamin B<sub>1</sub> were both partly true. Both avitaminous pigeon and rat brain (but not normal) produce pyruvate in vitro; the presence of added vitamin B<sub>1</sub> removes this pyruvate. The blood of these animals with vitamin-B<sub>1</sub> deficiency has present pyruvic acid in relatively large amount, which disappears upon dosing with vitamin. In China, pyruvate has also been detected in the blood of beri-beri patients; so that there is a direct connexion between the animal and human conditions. These observations emphasise the importance of biochemical studies in relation to the central nervous system.

*Note upon chemistry of vitamin B<sub>1</sub>.*—This compound has now been isolated from yeast and rice polishings in crystalline form as the hydrochloride in several laboratories; the crystals are either thin plates or needles. It contains sulphur and has the formula



and according to the latest suggestions is a pyrimidine-thiazole compound. The thiazole nucleus has the skeleton—



The compound will cure pigeons in a daily dose of 2.0γ (0.002 mg.) which also constitutes the international vitamin B<sub>1</sub> unit. It is precipitable in very dilute solution by phosphotungstic acid, and gives a specific diazo test under special conditions. For references to literature see (38).

#### REFERENCES

1. Warburg, O.: *Metabolism of Tumours*, London, 1930.
2. Dickens, F., and Simer, F.: *Biochem. Jour.*, 1930, **xxiv.**, 905.
3. Woollard, H. H.: *Jour. of Anat.*, 1927, **lxi.**, 283.
4. Prickett, C. O.: *Amer. Jour. Physiol.*, 1934, **cvil.**, 459.

(References continued at foot of next page)

## ANÆMIA IN PREGNANCY

BY JOHN A. BOYCOTT, B.M. Oxon.

ASSISTANT IN THE PATHOLOGICAL DEPARTMENT AND HON.  
ASSISTANT IN THE OBSTETRIC UNIT, UNIVERSITY  
COLLEGE HOSPITAL, LONDON

THESE observations are based on the examination of 222 unselected patients attending the antenatal clinic at University College Hospital, the object of the inquiry being—

1. To investigate the frequency and degree of anæmia at this clinic.
2. To define the hæmatological characters of this anæmia.

All the patients were pregnant. None were seen before the third month of pregnancy; the majority were first seen during the fifth month. The patients were seen at irregular intervals, generally three or four times, and in some cases once or twice also in the puerperium. The period of pregnancy was calculated from the date of delivery, allowance being made for pre- and post-maturity.

A small proportion of the subjects were very poor, and a few had family incomes in the neighbourhood of £5 a week; the majority were of an intermediate status. No obvious connexion between the incidence of anæmia and social status, parity or age could be traced but the numbers involved were small.

## Methods

Hæmoglobin estimations were made with the Haldane hæmoglobinometer standardised at an oxygen capacity of 18.5 c.cm. per cent., equivalent to 13.8 g. of hæmoglobin. Red cells were counted by dilution with normal saline in a Bürker chamber. This was done as a routine only when the hæmoglobin level was below 80 per cent. Cell diameters were measured by the Price-Jones method. The films were fixed and stained in Jenner and counterstained with 0.5 per cent. aqueous eosin. Reticulocytes were counted by a wet method.<sup>1</sup> Test-meals were not done in many cases; the technique described by Strauss and Castle<sup>2</sup> was used.

## Criteria of Anæmia

The mean normal hæmoglobin of healthy non-pregnant women (100 cases) was found by Price-Jones<sup>3</sup> to be 98% on the Haldane scale; by the + and - 3 × the standard deviation rule he calculated a possible normal range of 85%-111%, and found an observed range of 90%-110%. Davidson<sup>4</sup> takes the normal for women as 98% (Haldane) ± 10%, i.e., 88%-108%. Other figures are difficult to compare exactly because other methods of determination have been used; in all cases quoted I have converted them to the Haldane equivalent. Osgood and Haskins<sup>5</sup> found 99.5%, Wintrobe<sup>6</sup> 99.7%, Jenkins and Don<sup>7</sup> 100%, Jerlov<sup>8</sup> 99.8%, all mean values for healthy women based on fifty or more observations. In most cases the observed range was more extensive than that found by Price-Jones.

In view of these findings I have thought it reasonable to regard those cases with Hb. > 80% as not grossly abnormal. The remainder will be labelled "anæmic" with the important exception of those in Table II. (v. seq.).

## Incidence of Anæmia Among Pregnant Subjects

Of my 222 cases 172 (78%) always had Hb. > 80%, 50 (22%) had Hb. < 80% on at least one occasion, and 25 (11%) had Hb. < 70%.

From a large group in Aberdeen Davidson<sup>4</sup> obtained the following figures:—

—	Ages.	No.	Percentage of women with—					Mean Hb.
			Hb. 90% +	80-89%	< 80%	< 70%	< 60%	
Pregnant women	15-44	819	12.5	38	49.5	17.5	5.5	78.1%
Parous women*	15-44	603	36	31	33	16	10	81.3%

\* Not pregnant.

The difference in mean Hb. between parous and pregnant women in the same age-group is not

## PROF. PETERS: REFERENCES—(continued from previous page)

5. Peters, R. A.: Harben Lectures, Jour. State Med., 1929, vols. xxvii. and xxviii.
6. McCarrison, R.: Studies in Deficiency Diseases, London, 1921.
7. Kinnersley, H. W., and Peters, R. A.: Biochem. Jour., 1929, xxiii., 1126; 1930, xxiv., 711.
8. For earlier work on lactic acid in brain see Holmes, E. G.: Brit. Med. Jour., 1929, ii., 861.
9. Collazo, J. A., and Morelli, E.: Jour. de physiol. et de path. gén., 1925, xxiv., 77.
10. Inawashiro, R., and Hayastaka, E.: Tokohu Jour. Exp. Med., 1928, xii., 1.
11. Fisher, R. B.: Biochem. Jour., 1931, xxv., 1410.
12. Abderhalden, E., and Vlaspoulos, V.: Pflügers Arch., 1931, cxxvi., 808. For reference see Rydin, H.: Inaug. Dissert., Uppsala, 1935.
13. Gavrilescu, N., and Peters, R. A.: Biochem. Jour., 1931, xxv., 1317.
14. Gavrilescu, N., Meiklejohn, A. P., Passmore, R., and Peters, R. A.: Proc. Roy. Soc. B., 1932, cx., 431.
15. Meiklejohn, A. P., Passmore, R., and Peters, R. A.: Ibid., 1932, cx., 391.
16. Passmore, R., Peters, R. A., and Sinclair, H. M.: Biochem. Jour., 1933, xxvii., 842.
17. Kinnersley, H. W., and Peters, R. A.: Unpublished results.
18. Peters, R. A.: Unpublished experiments.
19. Keilin, D.: Bull. Soc. Chem. Biol., 1936, xviii., 114 (lecture). See also Ogston, F., and Green, D. E.: Biochem. Jour., 1935, xxix., 1983.
20. Sinclair, H. M.: Biochem. Jour., 1933, xxvii., 1927.
21. Braddon, W. G., and Cooper, E. A.: Jour. of Hyg., 1914, xiv., 331. Funk, C.: Zeits. f. physiol. Chem., 1914, lxxxix., 378. Randoïn, L., and Simonnet, H.: Compt. rend. de l'Acad. des Sci., 1923, clxxvii., 903.
22. Hess, W. R.: Zeits. f. physiol. Chem., 1921, cxvii., 287. Abderhalden, E., and Werthelmer, E.: Pflügers Arch., 1920, clxxxv., 141. See also critical work of Drummond, J. C., and Marrian, G. F.: Biochem. Jour., 1926, xx., 1229.
23. Meiklejohn, A. P.: Biochem. Jour., 1933, xxvii., 1315.
24. Peters, R. A., and Sinclair, H. M.: Ibid., 1933, xxvii., 1677 and 1910.
25. Embden-Meyerhof Scheme. See Meyerhof, O., and Kiessling, W.: Biochem. Zeits., 1933, ccxiv., 40. Meyerhof, O., and Lomann, K.: Ibid., 1934, ccxxiii., 60.
26. Peters, R. A., and Thompson, R. H. S.: Biochem. Jour., 1934, xxviii., 916.
27. Thompson, R. H. S., and Johnson, R. E.: Ibid., 1935, xxix., 694.
28. O'Brien, J. R., and Peters, R. A.: Jour. of Physiol., 1935, lxxxv., 454.
29. Johnson, R. E.: Biochem. Jour., 1936, xxx., 30.
30. Johnson, R. E., Meiklejohn, A. P., Passmore, R., and Thompson, R. H. S.: Ibid., 1935, xxix., 2506.
31. Platt, B. S., and Lu, G. D.: Proc. Physiol. Soc., 3rd Gen. Congress, Chinese Med. Assoc., 1935.
32. Peters, R. A., Rydin, H., and Thompson, R. H. S.: Biochem. Jour., 1935, xxix., 63.
33. Johnson, R. E.: Ibid., 1936, xxx., 33. Ashford, C. A., and Dixon, K. C.: Ibid., 1933, xxix., 157.
34. Geiger, A., and Rosenberg, A.: Klin. Woch., 1933, xii., 1258.
35. Vogt-Møller, P.: Biochem. Jour., 1931, xxv., 418.
36. Birch, T. W., and Harris, L. J.: Ibid., 1934, xxviii., 602.
37. See recent review by Quastel, J. H.: Proc. Roy. Soc. Med., 1936, xxix., 200.
38. Kinnersley, H. W., O'Brien, J. R., and Peters, R. A.: Biochem. Jour., 1933, xxvii., 232, and 1935, xxix., 701 and 2369.

significant. Both categories show a higher incidence of anæmia than the nulliparæ and parous women aged 45 + which he examined in the same period.

Mackay<sup>9</sup> examined two groups: mothers (not pregnant) bringing children to hospital, and pregnant girls in a home. Of the latter 56% had Hb. 70-84% and 4.5% Hb. < 70%. Davies and Shelley<sup>10</sup> examined fifty patients in a London antenatal clinic. Of these six became anæmic; no definition of anæmia is given but the hæmoglobin range of these was 41-68%. The remainder showed an average fall of 8% in the hæmoglobin during pregnancy which was not considered significant. Davidson, Mackay and Davies and Shelley all used the standard Haldane hæmoglobinometer.

There are several other series of observations on the occurrence of anæmia in pregnancy in which the method of hæmoglobin estimation makes comparison more difficult. Balfour and Drury<sup>11</sup> examined 311 pregnant women in Durham and Tyneside with a Dare hæmoglobinometer calibrated in Haldane equivalents. 14.5% had Hb. < 80% and 7.4% Hb < 70%. Galloway<sup>12</sup> found that, of 222 pregnant patients, 65% gave hæmoglobin readings less than 65% on the Sahli scale, equivalent to 81% (Haldane) if the Sahli instrument is standardised at 17.3 g.%. Lyon<sup>13</sup> examined 177 patients at term by Sahli's method and found them to range from 50-95%

(= 62-118%, Haldane). About an equal proportion (32%) of these and a control group of gynæcological patients had Hb. < 88% (Haldane). Bland, Goldstein and First<sup>14</sup> examined 1000 pregnant women with a Dare instrument. As no standardisation of the hæmoglobinometer is given comparison is impossible, but the findings appear to be of the same order as those of Lyon.

Richter et al.<sup>17</sup> examined 99 white and coloured patients with a Sahli hæmoglobinometer calibrated at 14.8 g.% = 100%. Many were of poor social standing, with dietary insufficiency and focal sepsis the rule. 78% had Hb. < 75% (Haldane). Harvey<sup>18</sup> found a mean hæmoglobin of 64.5% for 100 women in labour, using a Sahli instrument calibrated at 21.3 g.% = 100%. This is equivalent to 99% on the Haldane scale. Adair<sup>21</sup> reports that, of 1176 new patients admitted to an antenatal clinic, 23% had less than 10 g.% hæmoglobin (approximately 72% on the Haldane scale). Mussey<sup>16</sup> found that of 82 patients all showed a fall in hæmoglobin values during pregnancy but only 16 were to be regarded as "anæmic." The figures of Galloway, Lyon, Bland, Richter, Harvey, Adair, and Mussey are all derived from the U.S.A. Adamson and Smith<sup>23</sup> in Canada found that 20% of 116 normal pregnant women had Hb. < 74% (Haldane.) McGeorge<sup>24</sup> in New Zealand, out of 100 consecutive cases at an

TABLE I.—Incidence of Anæmia in Pregnancy

Author.	Type of hæmoglobinometer.	Material.	Hæmoglobin.	Percentage of patients.
Price-Jones.	Ha.	100 normal young women, not pregnant.	Mean .. .. 98 ± 3σ = 85-111 ± 2σ = 89-107 Observed range 90-110 Normal mean.. 98 ± 10 = 88-108	— — — —
Davidson.	Ha.	603 parous (under 45 years). 50 nulliparæ. 319 pregnant.	Mean 81.3%  89.7% 78.1%	Hb. < 80% 33 Hb. < 70% 16 Hb. < 40% 3  16 49.5      6 17.5      0 0.5
Mackay.	Ha.	209 not pregnant. 109 pregnant.	Mean 87.2% (range 48%-106%) Mean 83.5% (range 58%-120%)	Hb. 70-84% 29 Hb. < 70% 3 4.5
Davies and Shelley.	Ha.	51 ..	—	Hb. < 70% (lowest Hb. 41%). 12
Boycott.	Ha.	222 ..	87.8	Hb. < 80% 22 Hb. < 70% 11 (lowest Hb. 48%).
Richter.	Sa <sub>1</sub> .	99 ..	—	Hb. 75-86% 17 Hb. 64-75% 51 Hb. < 64% 27
Jerlov.	Au.	1143 ..	Normal mean for non-pregnant 100% (range 92%-109%)	Hb. < 76% 26
Adair.	Q.	1176 ..	—	Hb. < 72% 23
Esch.	Sa <sub>1</sub> .	700 ..	Range 56%-112%	Hb. 75-80% 15 Hb. 69-74% 5 Hb. < 69% 3
Adamson and Smith.	Sa <sub>1</sub> .	200 ..	—	Hb. 75-87% 50 Hb. 62-74% 20
Lyon.	Sa <sub>2</sub> .	177 ..	—	Hb. < 88% 32.2
Galloway.	Sa <sub>1</sub> .	222 ..	—	Hb. < 82% 65
McGeorge.	He.	100 .. 95 not pregnant.	Mean 100% (range 80%-110%)	Hb. < 75% 16 Hb. < 60% 2 (lowest Hb. 39%).
Balfour and Drury.	Da.	311 pregnant.	Mean 86.74%	Hb. < 80% 14.5 Hb. < 70% 7.4 Hb. < 40% 1.0

Type of Hamoglobinometer

Au. = Autenrieth Hb. 70% = Hb. 76% Haldane.  
Ha. = Haldane standardised at 13.8 g.%.  
Sa<sub>1</sub>. = Sahli: the figures given are approximate Haldane equivalents.  
Sa<sub>2</sub>. = Sahli: Correction in these cases is doubtful since no standard is mentioned.

Q. = Method unknown: expressed in g. % and corrected to Haldane equivalent.  
He. = Helligen: expressed in Haldane equivalents.  
Da. = Dare: calibrated in Haldane equivalents.



antenatal clinic found 16 with Hb. < 75% and 2 with Hb. < 60% (Haldane).

Jerlov<sup>8</sup> in Denmark, using an Autenrieth hæmoglobinometer, examined 1143 pregnant women of whom 74.1% had Hb. > 76%; of the remainder 2.7% had Hb. 43-54%, 13.9% Hb. 55-65%, and the rest Hb. 66-76% (Haldane equivalents). Gram,<sup>15</sup> also in Denmark, examined a short series of pregnant women, some of whose hæmoglobin values fell 20% below the normal which he had established for healthy women.

Schultz<sup>20</sup> found only 3% of anæmic patients among 567 examined; he believed these to have been anæmic before pregnancy. Esch<sup>22</sup> examined 700 women in pregnancy, of whom 500 were primiparæ and 200 multiparæ. The estimations were made with a standardised Sahli hæmoglobinometer. The range of values was 56-112% (Haldane) and the majority lay between 75% and 93%. Brindeau and Theodorides<sup>19</sup> found a mean hæmoglobin of 13.58 g. % (98% Haldane) in 30 normal pregnant women, with a tendency for the values to be lower than in normal women. These authors worked in France, and Esch and Schultz in Germany.

The sum of experience seems to be that the average level of hæmoglobin is lower among pregnant than among non-pregnant women. Individual patients may show a small decrease in hæmoglobin values in pregnancy with recovery about the time of delivery. Different authors, however, give very different figures for the occurrence of anæmia of more than a slight degree in pregnancy (Table I.). This is well shown in the figures from this country. Davidson in Aberdeen found a considerably higher number of anæmic patients than were found by Davies and Shelley, or myself in London, or by Balfour and Drury in Durham and Tyneside. Mackay's figures show an even lower incidence than the other London observations but, as the subjects were living in an institution, are hardly comparable with those derived from hospital clinics. Some of the American and continental figures seem to indicate a greater prevalence of anæmia in pregnancy than in England, but the comparison must not be pressed too far on account of the different methods employed. Richter's figures from U.S.A. show a considerably higher incidence than those of any other author. The possible factors which may explain these differences will be discussed later.

**Hæmatological Characters of the Anæmia**

Of the 222 cases observed at University College Hospital, fifty (22%) were found to have Hb. < 80% on at least one attendance at the clinic. From these we may exclude for the time fourteen who had either associated disease or a history of hæmorrhage; eleven had Hb. < 70%. They will be discussed later. Of the remaining thirty-six, ten (two of which had Hb. < 70%) were not fully examined and will not be dealt with further. The rest were divided into two groups, those with colour indices 0.91-1.07, the limits of normality described by Price-Jones,<sup>3</sup> and those with colour indices less than 0.91 (Tables II. and III.). No case was found with a colour-index greater than 1.07.

It will be seen that, of the thirteen cases whose colour-indices lie within normal limits (Table II.), none shows a hæmoglobin level below 67%, and several have values below 80% on one occasion only. The colour-indices vary from 0.91 to 1.05. The mean diameters are always within normal limits; one case (1278) shows a rather high mean diameter

which was maintained in two post-partum estimations (not shown). The variability is in all cases within normal range but rather higher than the mean established by Price-Jones.<sup>25</sup> The reticulocytes were never found to be increased. Except for the low hæmoglobin level and corresponding fall

TABLE II.—Thirteen Cases having Colour-indices 0.91-1.07

10 never showed Hb. < 70%.  
3 showed Hb. < 70% on at least one occasion.  
Lowest recorded value of Hb. = 67%.  
No case showed more than 5% hypochromic cells.  
The percentage of reticulocytes was never found to be raised above normal.

Case.	Duration of pregnancy in weeks.	Hb.	C.I.	M.D. microns.	v. per cent.	Case.	Duration of pregnancy in weeks.	Hb.	C.I.	
1220	30	72%	..	..	..	1296	27	89%	..	
	33	67%	1.0	..	..		31	78%	..	
	37	70%	0.93	7.134	6.2		36	78%	0.91	
1257	13	89%	..	..	..	1316	18	78%	..	
	17	84%	..	..	..		32	86%	1.03	
	30	74%	1.0	7.187	6.8	1360	25	94%	..	
	36	76%	0.94	..	..		31	80%	..	
1264	23	77%	..	..	..	1421	32	88%	..	
	27	78%	0.97	..	..		36	74%	1.01	
	36	78%	..	..	..		1445	30	68%	..
	37	78%	1.02	..	..	38		74%	0.93	
	38	80%	..	..	..	1554	35	72%	..	
1276	21	77%	..	..	..		38	70%	1.0	
	25	85%	..	..	..		1556	28	78%	..
	34	82%	1.01	..	..			29	76%	..
	36	82%	0.97	..	..		35	76%	0.95	
38	88%	..	..	..	1278	32	79%	..		
1278	34	68%	1.05	7.578		6.12	34	68%	1.05	
	38	76%	0.98	..		..	1294	25	103%	..
	1294	29	88%	..		..		..	29	88%
31		86%	..	..	..	31		86%	..	
32		78%	..	..	..	32		78%	..	
39	88%	0.98	7.389	6.6	39	88%	0.98			

Normal M.D. = 7.202µ ± 0.172µ ; normal variability = 6.326 ± 0.331 per cent (Price-Jones<sup>25</sup>).  
M.D. (mean diameter) and v. (variability); nil in Cases 1296 to 1556.

in the red cell count there is no ground for considering these cases abnormal hæmatologically. There is no observed constant direction of change in the hæmoglobin level to correspond with the stage of pregnancy, as is seen when all the normal cases in the series are examined together (v. seq.) but the numbers concerned are small.

In contrast to these cases the thirteen with low colour-indices present abnormal features (Table III.). The hæmoglobin levels are lower; the red cell count is often low but never to an extent to correspond with the hæmoglobin level. The colour-indices vary from 0.89 to 0.6. The mean diameters are below the normal mean in all cases. Many of them fall within normal limits but they bear, usually, a fairly close relation to the hæmoglobin level. This is well illustrated by Case 1358, where the progressive fall in hæmoglobin 90%-80%-70% is accompanied by a fall in the mean diameter 7.223 µ-6.881 µ-6.613 µ. One case (1333) shows no change in mean diameter. The variability is usually increased, but does not appear to run so closely parallel with the hæmoglobin level as does the mean diameter (e.g., 1358 shows a slight decrease in variability as the mean diameter falls). Hypochromic cells are numerous in the more severely anæmic cases and appear to occur in an inverse ratio to the hæmoglobin level. I am not convinced that the technique of staining for these

cells is satisfactory for differential counting, since different results could be obtained in different parts of the same blood film. The reticulocytes were never increased except when iron treatment was given. In all these particulars the blood films are indis-

TABLE III

13 cases having C.I. < 0.9.  
4 never showed Hb. < 70%.  
9 showed Hb. < 70% on at least one attendance.  
5 " " Hb. < 60% " " "  
Lowest recorded value, Hb. 48%. " " "

Case.	Duration of pregnancy in weeks.	Hb.	C.I.	M.D. microns.	v. per cent.	Hypo-chromic cells per cent.	Reticulo-cytes per cent.
1221	19	78%					
	23	70%	0.73	6.868	8.2	24	< 0.2
	27	68%					
	30	68%	0.72				
	33	62%	0.73				
	39	60%	0.71	6.323	9.1	29	< 0.2
1248	29	74%					
	31	69%	0.83	6.735	7.3	17	
	36	68%					
	38	68%					
1272	30	53%	0.62				
	32	52%	0.58	6.388	8.9	43	
	36	48%	0.54				2.2
	37	58%	0.62				3.8
		38	60%	0.62			
1293	18	85%					
	28	80%					
	33	70%	0.85				
	35	76%	0.89	6.776	7.1	2	
	36	70%	0.88				
1333	25	78%		7.145	7.2		
	32	76%	0.85				
	38	72%	0.8	7.195	6.9	2	
1358	16	90%		7.223	6.5	1	
	28	80%		6.831	6.8	12	
	34	70%	0.7	6.613	6.5	16	
	35	72%	0.74				
1362	24	62%					
	38	66%	0.78	6.627	8.8	20	
1373	29	68%		6.464	8.0	42	
	35	58%					
	39	62%	0.6	6.489	8.8	24	
1401	18	66%					
	33	50%	0.7	6.274	8.2	25	
1413	19	70%	0.84				
	31	66%	0.84				
	34	62%	0.77	6.770	8.0	15	
	38	64%	0.78				
1444	18	100%					
	27	84%					
	32	78%					
	36	76%	0.89	6.786	7.2	< 1	
1500	26	50%					
	37	52%	0.67				
	39	56%	0.69	6.759	9.8	34	
263 735	24	56%					
	26	52%	0.6				
	30	52%	0.63				
	37	52%	0.63	6.723	12.1	21	3.6
	39	56%	0.67				

tinguishable from those from cases of Witts's hypochromic anæmia. Price-Jones<sup>28</sup> quotes the figures of eight cases of Witts's anæmia before and after treatment, which are of the same order as those observed by me. In neither Witts' anæmia nor this hypochromic anæmia of pregnancy is there spontaneous remission, but both diseases appear to respond to adequate iron treatment—e.g., Case 1272. It is not however suggested that the diseases are identical except as regards the blood picture produced and the response to treatment. Several of the cases which have been excluded as having some

complicating feature have blood pictures of this type.

In Price-Jones's figures for Witts's anæmia and in my series (Table III.) there is a tendency for the mean diameter to be low and the percentage of hypochromic cells to be high with a low level of hæmoglobin. In my figures this is confirmed by significant coefficients of correlation between hæmoglobin and mean diameter ( $r = +0.735, \pm 0.109$ ), and hæmoglobin and the number of hypochromic cells ( $r = -0.704, \pm 0.122$ ). No correlation was found between hæmoglobin and variability. In pernicious anæmia Price-Jones found a significant correlation between hæmoglobin and variability but none between hæmoglobin and mean diameter.

It was thought worth while to examine some of each class in the first week of the puerperium. Those of normal colour-index showed a tendency to improve spontaneously while the others showed no change. Since the blood losses at delivery are approximate estimations, it is improbable that observations at this time are of value unless a large number of cases are examined. An attempt was made to examine the patients and their children between six and nine months after delivery to detect any cases of the anæmia occurring in the children of anæmic mothers (Strauss<sup>29</sup>). This appeared to be a possible way of separating a nutritional iron deficiency in the mother from other conditions causing a low hæmoglobin level. No case of such anæmia could be found among those examined (about half those written for), but the majority of the children of those severely anæmic had been artificially fed and were attending welfare centres.

In comparing these two classes (with normal and subnormal colour-indices) there were noticeable clinical distinctions. Those of normal colour-index were apparently healthy women, who made no complaint of the subjective features of anæmia, breathlessness, faintness, or "palpitations." The majority of the second class were in poor general health; symptoms of anæmia were common. The obstetric histories of neither group were obviously worse than those of the 172 cases classed as normal, but two cases with subnormal colour-indices had severe postpartum hæmorrhages. Except in two cases (both in the second group) the family income of these cases was up to the general standard, and (with these two exceptions) the patients appeared to have adequate diets. Nevertheless the difficulties in assessing the actual diet of out-patients are too great to make any conclusion on this ground of value. Fractional test-meals, when performed, did not show any difference between the two groups; hypochlorhydria or achlorhydria, even after histamine, was found in all cases.

From this evidence it has been assumed that two conditions may be distinguished, a true anæmia, and lowering of the hæmoglobin level probably due to dilution of the blood. In future the thirteen cases in Table II. will not be referred to as "anæmic." That the blood volume is increased in pregnancy is an old observation, but much of the early evidence is conflicting. Recently Dieckmann and Wegner<sup>29</sup> have reviewed the evidence and find that the majority of observations show an average increase in blood volume in pregnant women of 10–20%. Their own experiments were made by the dye method of Keith and Rowntree<sup>30</sup>; this is probably less accurate than the carbon monoxide method but has an advantage peculiar to these observations that the placenta is impermeable to the dye employed. They found an

TABLE IV.—*Hæmoglobin Level in 152 Normal Pregnant Patients: 419 Observations*

Duration of pregnancy in weeks ..	12-15	16-19	20-21	22-23	24-25	26-27	28-29	30-31	32-33	34-35	36-37	38-39
Number of observations .. ..	12	22	26	20	22	27	37	38	56	36	54	69
Mean hæmoglobin % .. ..	100.8	96.8	96.6	95.3	95.3	91.4	89.6	88.9	88.5	87.6	88.6	91.9
Lowest Hb. % .. ..	90	84	78	78	82	78	74	72	68	68	70	70
Highest Hb. % .. ..	110	114	114	102	112	110	110	104	114	112	106	116
Standard error .. ..	1.82	1.55	1.82	1.31	1.57	1.52	1.18	1.08	0.99	1.48	1.15	1.16

Whereas no two adjoining columns show significant differences, there is a statistical difference between the highest and lowest means—e.g., 22-23 and 32-33 weeks.

average increase in blood volume of 23%, beginning in the first three months of pregnancy and continuing to term. The increase was mostly in the plasma volume. A notable feature of their results is the inconsistency of the increase, some cases showing none or even a decrease. Richter<sup>17</sup> examined the blood volume (by a dye method), red cell count and hæmoglobin in fourteen cases before and after delivery. There was fairly close inverse correlation between blood volume and hæmoglobin. Schultz<sup>20</sup> considered that 50% of the patients he examined in pregnancy showed a dilution of the blood and only 3% were truly anæmic.

Some fall in the hæmoglobin level in normal pregnancy has been reported by many authors (Gram,<sup>15</sup> Einar Rud,<sup>31</sup> Kerwin and Collins,<sup>32</sup> Suwa,<sup>33</sup> Nalle,<sup>34</sup> McGeorge,<sup>24</sup> Davies and Shelley<sup>10</sup>). This has usually been described as the "physiological" anæmia of pregnancy in distinction to the severer grades of anæmia which cause symptoms. Kühnel<sup>35</sup> examined fifteen women at fortnightly intervals from the second month of pregnancy, and found a progressive fall, of hæmoglobin and cells equally, until the thirty-second week, when a slight rise occurred. Shortly before delivery there was a fall in the hæmoglobin only. Mussey<sup>18</sup> found that of 82 pregnant patients, 71% showed an equal reduction of red cells and hæmoglobin, while the colour-index of the rest fell to some extent. Both these observations support the idea of hydræmia as the cause of the physiological anæmia of pregnancy. Jerlov's findings,<sup>8</sup> that, of 141 untreated patients, 64% showed a fall of hæmoglobin in pregnancy, 19% showed no change and 17% a rise, agree with the observation that the increase of blood volume is inconsistent. If this fall in hæmoglobin is due to hydræmia, treatment with iron should have no effect and recovery should be spontaneous. Of 50 cases, Bland and Goldstein<sup>52</sup> report spontaneous return of the hæmoglobin to normal after delivery in all but four. Richter<sup>17</sup> found little difference between cases treated with iron and liver and those untreated, but the former showed a quicker post-partum recovery. Jerlov<sup>8</sup> however reports that 90% of women treated with iron during pregnancy show a slight rise in hæmoglobin: the hæmoglobin levels do not return to normal. The incidence of anæmia in his series was high (Table I.) and it is reasonable to suppose that iron deficiency was common in the group he examined. Irving<sup>36</sup> showed that there is a demonstrable improvement in red cells and hæmoglobin in eighteen pregnant women treated with iron and copper compared with forty-three untreated cases. No attempt was made by this author to distinguish those cases which responded to treatment from those who showed no change, and the improvement is an average one. It seems probable that iron shortage is not uncommon in a slight degree (v. seq.) but that the main cause of the fall

of hæmoglobin, apart from frank anæmia, is a dilution of the blood.

#### SUMMARY

Twenty-six cases having Hb. < 80% were examined in detail; their histories and present states gave ground for supposing that the low level of hæmoglobin was due to pregnancy alone. It was found that they were equally divided into those with normal and those with subnormal colour-indices. These two classes could also be distinguished on clinical and hæmatological grounds. There is evidence to show that there is an inconsistent increase in the plasma volume in pregnancy causing a dilution of the red cells, and it has been suggested that the existence of the group with low hæmoglobin figures and normal colour-indices is explicable on this basis. On the grounds of hæmatological resemblances and satisfactory response to iron treatment the group with low colour-indices have been assigned to the class of anæmia due to iron deficiency. The two groups are not mutually exclusive.

#### Normal Hæmoglobin Level in Pregnancy

Although it is impossible to exclude a slight degree of iron deficiency, if this really exists in some patients, it has been thought worth while to construct Table IV. from the hæmoglobin figures of those cases whose histories were accurately known, who had no complicating disease and whose colour-indices lay within normal limits. It will be seen that the mean hæmoglobin level for each fortnight forms a fairly regular curve, reaching a minimum at 34-35 weeks and rising slightly before delivery. The variability in any fortnight is large, and examination of the data of individual cases shows that many maintained a constantly high level throughout pregnancy. Such a variation between individual cases was a feature of Wiekmann and Degner's blood volume estimations.

#### Nature of the Anæmia

Strauss<sup>37</sup> makes a clear distinction between hydræmia and hypochromic anæmia occurring in pregnancy, and reserves the name "physiological" anæmia of pregnancy for the former. The hypochromic anæmia of pregnancy he regards as an iron-deficiency anæmia arising either from deficient diet or from deficient gastric secretion. To either of these must be added the drain of the foetal demands for iron. Of the cases which he examined, those whose gastric secretion was normal had a diet deficient in animal protein and green vegetables. It is at present uncertain if the cause of this anæmia is a true deficiency of iron or a failure, perhaps due to defective acid secretion, to utilise iron except in large doses. The latter appears more probable. I use the words "iron deficiency" without prejudice. The foetus is born with five times the iron content of the adult per unit body-weight and receives no appreciable amount from the milk. Strauss<sup>28</sup> has

shown that there is a correlation between maternal hæmoglobin in pregnancy and the infant's hæmoglobin some months later—i.e., when the iron store of the infant is reaching exhaustion. This agrees well with Mackay's findings in nutritional anæmia in infants.<sup>38</sup> Both maternal and infantile anæmias respond to adequate iron treatment.

Table III. shows thirteen cases of anæmia which must be regarded as of this type. Where these cases have been treated there has been a response to iron. An attempt to find nutritional anæmia in the children failed (*v. ante*). The hæmatological similarity to Witts's hypochromic anæmia gives confirmatory evidence of a similar essential ætiology, iron deficiency.

Schultz<sup>20</sup> and Mussey<sup>16</sup> suggest that anæmia exists before pregnancy in these cases. This is a possibility hard to disprove. Each patient was closely questioned and, where the answers suggested a pre-existing anæmia, was excluded from this series. Five cases were rejected for this reason. It is possible that iron deficiency in pregnancy is more common than the number of anæmic patients in this series would suggest. Such a case as 1296 (Table II.), where the colour-index is at the lowest level of normality, may well be a case of combined hydræmia and anæmia. Cases 1444, 1413, and 1293 (Table III.) are probably examples of a relatively slight iron deficiency. The existence of such cases would help to explain the beneficial effect of iron treatment in unselected cases (Richter, Jerlov, Irving, *v. ante*).

The fourteen cases in which there is reasonable ground for recognising a cause of anæmia other than pregnancy may be divided as follows :

1. Five which had (or were reasonably suspected of having) anæmia prior to pregnancy ; four had Hb. < 70%. Of these, one showed the signs of Witts's hypochromic anæmia ; a recent examination of the patient after intensive iron treatment showed considerable improvement in the anæmia and disappearance of the "spoon nails." One was a case of myxœdema.
2. Three had hæmorrhage during or immediately before pregnancy. All had Hb. < 70%.
3. Three had pyelitis. Only one had Hb. < 70%.
4. Three had heart disease with histories of recurrent attacks of failure. Two (733, 1247) had been anæmic in previous pregnancies. All had Hb. < 70%.

Of those with pre-existing anæmia or a history of hæmorrhage all were of the iron-deficiency type except one. In cases of pyelitis it was very noticeable how quickly the hæmoglobin fell with the onset of fever. The three cases of severe heart disease met with among 222 patients all came into this group. If this is more than a chance occurrence it is difficult to explain ; possibly atrophic changes occur in the gastric mucosa consequent on prolonged congestion. The proportion of poor general health and bad obstetric histories among this group of "complicated anæmia" was remarkably high. No case of the macrocytic anæmia of pregnancy was met with in this series. It does not seem to be related in any way to the hypochromic form.

#### SUMMARY

Twenty-seven cases of anæmia are discussed. Thirteen of these have been ascribed to iron deficiency, due to the demands of the fœtus in combination with either dietary insufficiency or defective utilisation of iron. The remainder occurred in patients who had some complicating disease ; the majority of these were of the hypochromic type.

#### Factors Contributory to Anæmia

Of 222 patients 27 were found to be anæmic, of whom 13 may reasonably be supposed to have

developed anæmia as the direct result of pregnancy. Comparing the anæmic and non-anæmic groups there did not appear to be any connexion between anæmia and toxæmia or any other complication of pregnancy beyond those mentioned above. The numbers of these are too small to be anything but suggestive. Gram<sup>15</sup> found no hæmatological abnormality in 3 cases of eclampsia. O'Sullivan<sup>39</sup> found that 15 of 19 patients with albuminuria and 21 of 32 with pyelitis suffered from hypochromic anæmia in pregnancy ; iron treatment raised the hæmoglobin level and improved the albuminuria. Steiglitz<sup>40</sup> found that the presence of renal or cardiovascular disease hindered the treatment of anæmia in pregnancy. Moore<sup>41</sup> found nephritic patients to show a lower hæmoglobin level than normal pregnant patients. Richter<sup>17</sup> attributes the high incidence of anæmia in pregnancy in a mixed group of whites and negroes to, among other things, the prevalence of focal sepsis. That such diseases concurrent with pregnancy should cause or exaggerate anæmia fits in with clinical experience in non-pregnant patients. Iron treatment in such cases is often unsatisfactory until the primary disease is controlled.

Other possible factors are social status, age, and parity. As has been stated no correlation could be found between these factors and anæmia in this series. However, the high incidence of anæmia in Aberdeen (Davidson, Table I.) as compared with that found by Davies and Shelley and myself in London suggests that the first may influence the occurrence of anæmia. Davidson<sup>4</sup> describes his subjects as "a cross-section of the poorest classes" ; many did not present themselves on account of symptoms of ill-health. He states that a large number came from families in which the wage-earner was unemployed. The class of patient at the Royal Free Hospital (Davies and Shelley) is probably of the same nature as that I have examined, in which unemployment, although not unknown, is relatively uncommon. I am informed by those who have experience of Aberdeen and this part of London that there is a real difference in the class of patient attending antenatal clinics in the two areas. Balfour and Drury<sup>11</sup> compared the number of cases of anæmia in pregnancy among the wives of employed and unemployed workers attending antenatal clinics in County Durham and on Tyneside. No patient was admitted to the employed group whose weekly family income did not amount to 10s. or more per head, or to the unemployed group whose income was more than 8s. per head. They found that, of a total of 311 patients, divided about equally between the two groups, 11.2% of the former and 16.4% of the latter had Hb. < 70% (Haldane). The numbers examined were small, and the figures would be more striking if they showed a higher incidence of anæmia than those derived from the apparently better-to-do working-class population in London. The authors consider that many of the most undernourished cases were too feeble to attend the clinic. Although the family income was always recorded in my series, no correlation between this and the incidence of anæmia was apparent. Harvey<sup>42</sup> from the study of 100 pregnant women in the U.S.A. came to the conclusion that social status (and parity) had no effect on the incidence of anæmia. If social status is to have effect it will most probably do so through the patients' diet. Davidson<sup>4</sup> has shown that the population which he studied is on the border-line of iron starvation, and Strauss<sup>37</sup> that the absence of animal protein and vegetables from the diet is

conducive to anæmia in pregnancy. Data however are lacking for the proof that a barely sufficient diet will, in more than a minority of cases, produce anæmia, even under the strain on the hæmatopoietic system caused by pregnancy. Although, as has been shown, hydræmia may produce a pseudo-anæmia in pregnancy, this does not seem to invalidate the comparison of the incidence of anæmia in different groups. There is, of course, a possibility that there are unrecognised factors influencing the increase in blood volume (Green-Armytage<sup>42</sup>).

Age is recognised as a dangerous factor in obstetric risks as a whole (Robinson,<sup>43</sup> Douglas and McKinlay<sup>44</sup>), but it is difficult in a small series to separate it from multiparity. Since the majority of cases of anæmia in pregnancy are due to an iron deficiency, it is reasonable to suppose that repeated pregnancies would be a drain on the iron stores of the body. 13.5% of the subjects in this series were in their fifth or later pregnancy. Of the normals 13% and of the anæmic 16% came into this category, findings which cannot be considered significant. Davies and Shelley<sup>10</sup> found that a large proportion of women anæmic in the puerperium had born upwards of seven children. Kerwin and Collins<sup>32</sup> also found a greater tendency to anæmia in old multiparæ than in the remainder of their patients. Davidson<sup>4</sup> regards menstruation and repeated pregnancies as a potential source of anæmia. Douglas and McKinlay,<sup>44</sup> from the study of maternal deaths, state that the liability to death from "severe anæmia" (usually apparently of the macrocytic type, v. seq.) increases with age and parity. Moreover a large number of pregnancies is traditionally associated with the type of subject likely to suffer from poor circumstances and a deficient diet. Nalle<sup>34</sup> makes the interesting observation that, at the same period of pregnancy, there is a close correspondence in the hæmoglobin level in successive pregnancies.

#### SUMMARY

Although the numbers in this series are too small to establish the pre-eminence of any factors as a cause of anæmia in pregnancy, the evidence goes to show that diseases which cause anæmia in the normal subject also predispose to anæmia in pregnancy. Although the data are suggestive, it is not proved that social status, age, or parity affect the incidence of anæmia.

#### Effect of Anæmia on Pregnancy

Mackay<sup>9</sup> has suggested that anæmia may be a predisposing factor in maternal infection on the analogy of the greater susceptibility to infection of anæmic infants. Four cases of puerperal morbidity occurred in my series with no fatality; two were among the anæmic and two among the normal cases. Two of the anæmic cases in Table III. (263/35 and 1272) had severe postpartum hæmorrhage, but apart from these the obstetric histories of the 13 cases were uneventful. The 14 cases of "complicated anæmia" showed an unduly high incidence of obstetric catastrophes, but it would not be just to attribute these to the anæmia alone. It seems probable that anæmia does not become dangerous in pregnancy (apart from the tendency to anæmia in the child) until a hæmoglobin level is reached, lower than is common in this country. Evans<sup>45</sup> reports that no case of "severe anæmia" occurred in 4083 consecutive patients at Queen Charlotte's Hospital in 1926-27. Balfour<sup>46</sup> quotes one case in 12,000 deliveries at the Rotunda Hospital (1921-23), one case at Queen Charlotte's Hospital in 1800 (1923), and

no cases at the Simpson Memorial Hospital, Edinburgh, in 1600 (1923). Douglas and McKinlay<sup>44</sup> classified 19 of 2527 maternal deaths in Scotland (1928-32) as due to severe anæmia. Most of these were known to have been of the pernicious type and deaths from "secondary anæmia" were classed under the primary condition. The macrocytic anæmia of pregnancy and pernicious anæmia occurring in pregnancy have deserved, at any rate before the introduction of liver treatment, a poor prognosis (Osler<sup>47</sup>) but these diseases are evidently rare in temperate climates (Whitby<sup>48</sup>). The tropical macrocytic anæmia is apparently responsible for a very high maternal and fetal mortality (Balfour,<sup>46</sup> McSwiney<sup>49</sup>). McSwiney says that it is unusual for a pregnancy to proceed to term and stillbirths are common. King<sup>50</sup> considers that the anæmia alone is the cause of the frequency of abortion and premature labour in patients suffering from hookworm disease. Wickramasuriya<sup>51</sup> in discussing the effect of hookworm infection on pregnancy says that where the hæmoglobin is less than 30 per cent. obstetric shock and postpartum hæmorrhage are frequent, the degree of shock depending on the degree of anæmia. I have seen no case in this series with less than Hb. 48%, but recently have had the opportunity of examining a pregnant patient with Hb. 30% and an anæmia of the hypochromic type, who subsequently had an uneventful labour and puerperium. Where obstetric disasters have occurred in this series poor general health has usually been a more prominent feature than anæmia. Reviewing the evidence it appears that anæmia of a hypochromic type, likely to be dangerous per se, is uncommon in this country (Table I.).

#### Conclusions

1. 22 per cent. of the patients attending the University College Hospital antenatal clinic had less than 80 per cent. hæmoglobin (Haldane). This incidence is compared with that recorded from other sources. It is of the same order as that observed elsewhere in England and rather less than in Aberdeen.

2. The common anæmia of pregnancy in this country is of the hypochromic type and would appear to be due to iron deficiency.

3. Increase of blood volume may cause an apparent anæmia in pregnancy by reason of the temporary fall in hæmoglobin and red cells. Such a condition may be distinguished from a true anæmia by the blood picture, but may coexist with a true anæmia.

4. Anæmia is probably not a serious risk in pregnancy in this country.

5. The effect of intercurrent disease, social status, age, and parity on the causation of anæmia is discussed.

6. The common anæmia of pregnancy responds well to adequate iron treatment unless there is complicating disease.

My thanks are due to Prof. F. J. Browne for the opportunity to investigate his cases and to Mr. J. G. H. Ince for his assistance with clinical details.

#### REFERENCES.

1. Nicholson, D.: *Laboratory Medicine*, 2nd ed., London, 1934, p. 156.
2. Strauss, M. B., and Castle, W. B.: *Amer. Jour. Med. Sci.*, 1933, *clxxxiv.*, 655.
3. Price-Jones, C.: *Jour. Path. and Bact.*, 1931, *xxxiv.*, 779.
4. Davidson, S.: *Brit. Med. Jour.*, 1935, *ii.*, 195.
5. Osgood, E. E., and Haskins, H. D.: *Arch. Intern. Med.*, 1927, *xxxix.*, 643.
6. Wintrobe, M. M.: *Ibid.*, 1930, *xlv.*, 287.
7. Jenkins, C. E., and Don, C. S. D.: *Jour. Hyg.*, 1933, *xxxiii.*, 36.

(Continued at foot of next page)

## ACUTE SUPPURATIVE THYROIDITIS

By ROBERT COOPE, M.D., B.Sc. Liverp.,  
M.R.C.P. Lond.

HON. ASSISTANT PHYSICIAN, LIVERPOOL ROYAL INFIRMARY;  
VISITING PHYSICIAN, MILL-ROAD INFIRMARY, LIVERPOOL;  
HON. PHYSICIAN, LIVERPOOL HOSPITAL FOR CONSUMPTION  
AND DISEASES OF THE CHEST; AND

L. FINDLAY, M.D. Liverp.

MEDICAL SUPERINTENDENT, MILL ROAD INFIRMARY,  
LIVERPOOL

ACUTE thyroiditis is rare. Hagenbuch in 1921 found only 43 cases in nearly 46,000 surgical and medical admissions at the Basle Clinic over a period of ten years. Joll (1931) has seen only 2 cases in a series of over 2000 patients admitted to hospital with goitre. Acute non-suppurative inflammation of the thyroid may resolve after about seven to ten days; rarely it may progress to abscess formation. In the Lahey Clinic (Clute and Smith, 1927) only 1 case of frank suppurative thyroiditis was encountered in a series of nearly 1200 cases of thyroid disease, and out of 3000 operations on the thyroid, only 3 were for thyroiditis followed by abscess. Robertson in 1911, reporting 3 cases of his own of acute inflammation of the gland, collected a further 93 from the literature; in the few instances where thyroiditis had developed as a complication of either pneumonia or of puerperal fever, he noted that suppuration invariably followed.

The inflammation may arise by direct infection (Lambert Rogers has reported an instance of abscess following a penetrating wound of the thyroid); the infection may spread from structures near by, though the fascial architecture in the neck, with the fusion of the superficial and pretracheal layers of the deep fascia to form a tough capsule to the thyroid, discourages such invasion; or the infection may be carried by the blood stream.

A distinction has been made between inflammation arising in a normal thyroid gland and that developing in a goitrous (usually adenomatous) gland, the latter condition being termed "strumitis." There seems to be little point in this difference of terminology, though some authors think that an already diseased gland is much more liable to infection. Among

Robertson's collection of 96 cases, goitre was already present in 31; and out of 67 cases of acute thyroiditis studied by Burhans (1928), adenomatous goitre was already present in 24. Moreover, an annotation in THE LANCET (1927) suggests that abscess formation is much more liable to follow acute thyroiditis in a goitrous than in a normal gland.

The most common pathway of infection is by the blood stream, either in association with generalised infections such as pneumonia, typhoid fever, influenza, puerperal fever, and various streptococcal infections; or by metastatic spread from alveolar abscess (Thorburn), tonsillitis, nasal sinusitis, gonorrhoea (Pic, Delore, and Paufigue), or urinary tract infection (Salleras and Colodrero). Crotti in 1918 said of Koher, who was the first to appreciate the usual origin of the condition:

"In the far-sightedness of his genius, although at the time he did not have bacteriology to support his theoretical views, he claimed that every acute thyroiditis or strumitis was due to metastasis of an infectious agent located somewhere in the organism, or originating from the intestinal canal. Later bacteriological findings proved the correctness of such views."

Several cases of acute suppurative thyroiditis following pneumonia have already been reported. Of Robertson's 96 cases already referred to, 6 occurred as a complication of pneumonia; bacteriological examination was made, however, in only 7 of the whole series, in 4 of which pneumococci were isolated from the pus of the thyroid abscess. Of Burhan's 67 cases of acute thyroiditis, 9 followed pneumonia; of Hagenbuch's 43 cases, 9 followed pneumonia. Eberts, Fitzgerald, and Silver in 1929 described a case of pneumococcal suppurative thyroiditis in a man of fifty who had pneumonia four weeks previously. Lanzani and Docimo also report instances.

We bring forward a case which illustrates neatly the mode of infection via the blood stream. The patient was admitted to Mill Road Infirmary on the first day of her acute illness, suffering from a Type II. pneumococcal pneumonia. Type II. pneumococci were isolated from the blood. Desperately ill, the patient was treated with serum and she recovered from the pneumonia; an acute thyroiditis developed five or six days after the onset of the pneumonia, progressing to abscess formation. The abscess was

## DR. JOHN BOYCOTT: REFERENCES—(continued from previous page)

8. Jerlov, E.: Act. obst. et gyn. scand., 1927, viii., 356.
9. Mackay, H. M. M.: THE LANCET, 1935, i., 1431.
10. Davies, D. T., and Shelley, U.: Ibid., 1934, ii., 1094.
11. Balfour, M., and Drury, J.: Motherhood in Special Areas of Durham and Tyneside, London, 1935, p. 25.
12. Galloway, C. E.: Jour. Amer. Med. Assoc., 1929, xciii., 1695.
13. Lyon, E. C.: Ibid., 1929, xciii., 11.
14. Bland, P. B., Goldstein, L., and First, A.: Surg., Gyn., and Obst., 1930, i., 954.
15. Gram, H. C.: Ugesk. for Laeger, 1920, lxxxii., 1609.
16. Mussey, R. D., Watkins, C. H., and Kihroc, J. C.: Amer. Jour. Obst. and Gyn., 1932, xxiv., 179.
17. Richter, O., Meyer, A. E., and Bennett, J. P.: Ibid., 1934, xxviii., 543.
18. Harvey, H. E.: Ibid., 1931, xxi., 476.
19. Brindeau, A., and Theodorides, P.: Anémie au cours de la grossesse, Paris, 1935, p. 64.
20. Schultz, W.: Münch. med. Woch., 1933, lxxx., 679.
21. Adair, F. L.: Quoted by Dieckmann and Wegner, v. seq. (ref. 29).
22. Esch, P.: Deut. med. Woch., 1932, lii., 1077.
23. Adamson, J. D., and Smith, F. H.: Canad. Med. Assoc. Jour., 1932, xxvi., 669.
24. McGeorge, M.: Brit. Emp. Jour. Obst. and Gyn., 1935, xlii., 1027.
25. Price-Jones, C.: Red Blood Cell Diameters, London, 1933, p. 31.
26. Price-Jones C.: Jour. Path. and Bact., 1932, xxxv., 759.
27. " Ibid., 1929, xxxii., 479.
28. Strauss, M. B.: Jour. Clin. Invest., 1933, xii., 345.
29. Dieckmann, W. J., and Wegner, C. R.: Arch. Intern. Med., 1934, liii., 71.
30. Keith, N. M., Rowntree, L. G., and Geraghty, J. T.: Ibid., 1915, xvi., 547.
31. Rud, E.: Quoted by Brindeau and Theodorides, loc. cit. (ref. 19), p. 59.
32. Kerwin, W., and Collins, L. L.: Amer. Jour. Med. Sci., 1926, clxxii., 548.
33. Suwa, Y.: Jap. Jour. Obst. and Gyn., 1930, xliii., 73.
34. Nalle, B. C.: South. Med. Jour., 1930, xxiii., 490.
35. Kühnel, P.: Zeit. f. Geburt. u. Gyn., 1927, xc., 511.
36. Irving, F. R.: Amer. Jour. Obst. and Gyn., 1935, xxxix., 850.
37. Strauss, M. B.: Jour. Amer. Med. Assoc., 1934, cii., 281.
38. Mackay, H. M. M.: Med. Research Coun., Rep. No. 157, London, 1931.
39. O'Sullivan, J. V.: THE LANCET, 1932, ii., 1326.
40. Stieglitz, E. J.: Amer. Jour. Obst. and Gyn., 1931, xxi., 35.
41. Moore, J. H.: Ibid., 1930, xx., 254.
42. Green-Armytage, V. B.: THE LANCET, 1935, i., 1253.
43. Robinson, A. L.: Brit. Med. Jour., 1930, ii., 47.
44. Douglas, C. A., and McKinlay, P. L.: Report on Maternal Mortality in Scotland, Edinburgh, 1935, p. 8.
45. Evans, W.: THE LANCET, 1929, i., 14.
46. Balfour, M.: Ind. Med. Gaz., 1927, lxii., 489.
47. Osler, W.: Brit. Med. Jour., 1919, i., 1.
48. Whitby, L. E. H.: Brit. Emp. Jour. Obst., and Gyn., 1932, xxxix., 267.
49. McSwiney, S. A.: Ind. Med. Gaz., 1927, lxii., 487.
50. King, E. L.: Amer. Jour. Obst. and Gyn., 1929, xxviii., 569.
51. Wickramasuriya, G. A.: Brit. Emp. Jour. Obst. and Gyn., 1935, xlii., 217.
52. Bland, P. B., and Goldstein, L.: Jour. Amer. Med. Assoc., 1929, xciii., 582.
53. Strauss, M. B., and Castle, W. B.: Amer. Jour. Med. Sci., 1933, clxxxv., 539.



eventually incised, Type II. pneumococci were grown from the pus, and the patient slowly recovered.

Miss A, a nurse aged 53, was admitted to Mill Road Infirmary on Nov. 9th, 1935. She had been aware of an adenomatous swelling of the thyroid for at least eleven years, and eight years previously, owing to symptoms of pressure on the trachea and œsophagus, the right lateral lobe and the isthmus had been enucleated at operation.

The morning of the day of her admission to hospital, she had felt an acute pain at the base of the right lung, aggravated by deep breathing; she vomited twice; she had a short painful cough, dyspnoea, and some cyanosis. The temperature was 103° F., there were signs of early consolidation at the base of the right lung, and rhonchi were heard over both lungs. She looked desperately ill and "toxic," and she was immediately given 20,000 units of Type I. pneumococcal serum and 20,000 units of Type II. serum. Meanwhile 10 c.cm. of blood was taken for culture, and after 36 hours Type II. pneumococci were isolated by Dr. H. A. Osborn. The morning after admission the same dose of mixed serum was repeated, and the general condition improved a little. On the third day there was herpes of the lips, blood-stained sputum was coughed up, and a film taken by the portable X ray unit confirmed the presence of a right basal pneumonia. It also showed a shadow filling the superior mediastinum, and pushing the trachea over to the right—a retrosternal prolongation of the adenomatous thyroid swelling. For a day or two the temperature hovered between 98° and 100° F., and the patient seemed much better. On the fifth day, however, the temperature rose again to 101° F. and then to 102° F. The following day she complained of pain over the upper part of the chest in front, and the cyanosis increased; only the front of the chest was examined, rhonchi and coarse moist sounds being heard over both lungs.

The outlook appeared so grave that a note was made about her testamentary capacity. Atropine and oxygen were given, and a further 20,000 units of Type II. pneumococcal serum were injected intravenously. While the serum made no difference to the temperature, the general condition improved slightly. The next morning she complained of severe pain over the left side of the neck, brushing her hand continuously and distressfully across the front of the neck. Extension of the neck made the pain worse, and she kept her head bent forward on the chest. She felt a "choky feeling," but could swallow fluids reasonably well. The dyspnoea was still severe. Now there was some dilatation of the superficial veins over the neck, and the thyroid swelling was larger. It was difficult to detect any movement of the gland with swallowing. The next day it was larger still, with obvious redness of the skin over it. Her condition, however, was better, and after consultation with Mr. S. V. Unsworth, the visiting surgeon, it was decided to wait to see if fluctuation developed. During the next ten days she slowly improved; Mr. Unsworth then aspirated about 30 c.cm. of green pus from the now fluctuating thyroid abscess. This pus contained Type II. pneumococci. Two days later Mr. Unsworth incised the abscess transversely and released a copious discharge of pus, leaving in a small rubber drain. The temperature began to subside and she made slow progress to recovery. She was eventually discharged from hospital on Jan. 29th, 1936; a radiogram of the chest then revealed complete resolution of the basal pneumonia and the marked displacement of trachea and œsophagus to the right side by the substernal thyroid mass.

Seen again on Feb. 24th she was well, save for obvious symptoms of pressure on the trachea and œsophagus. In view of the recent inflammatory reaction and scarring which must have taken place around the thyroid, it is not considered advisable at present to attempt the difficult task of operative removal of the substernal mass.

In the early stages of inflammation of the thyroid the process is confined within the tough capsule of the gland, and any fluctuation in or even enlargement of the thyroid is difficult to detect because of the overlying muscles and fascial layers. It is clear,

therefore, that pain is likely to be an early symptom before there is any obvious inflammatory swelling. If the inflammation extends to the fascial layers, adhesions may form and tie down the gland so that it cannot move normally with the movements of swallowing. Moreover, extension of the neck will cause compression of the inflamed gland by the fasciæ and muscles and increase the pain. As the inflammation progresses, the enlargement of the gland may produce pressure on the trachea and œsophagus, resulting in dyspnoea, perhaps a hard, dry, irritating cough, and dysphagia. The spread of œdema to the larynx may give hoarseness; the overlying skin may eventually become a little œdematous, the superficial veins dilated, and finally redness of the skin may indicate the underlying inflammation. Occasionally the abscess may burst into the trachea, and pus and blood be coughed up. Obvious fluctuation in the neck is a late sign. Rarely the symptoms of toxic goitre may supervene. Once the inflammation has extended outside the thyroid capsule, there is danger of the formation of a deep cervical abscess, with extension downwards to the mediastinum.

#### SUMMARY

A case is described of acute suppurative thyroiditis in a woman of fifty-three who had had a long-standing adenomatous goitre; it developed some five or six days after the onset of a Type II. pneumococcal pneumonia; Type II. pneumococci were isolated from the blood. Type II. pneumococci were grown from the pus obtained from the thyroid abscess.

#### REFERENCES

- Burbans, E. C.: *Surg. Gyn., and Obst.*, 1928, *xlvii.*, 478.  
 Clute, H. M., and Smith, L. W.: *Ibid.*, 1927, *xliv.*, 23.  
 Crofti, A.: *Thyroid and Thyimus*, Philadelphia, 1918, p. 93.  
 Dooino, L.: *Arch. ital. di Chir.*, 1930, *xxvii.*, 627.  
 Eberts, Fitzgerald, and Silver: *Surgical Diseases of the Thyroid Gland*, Philadelphia, 1929, p. 205.  
 Hagenbuch, M.: *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1921, *xxxiii.*, 181.  
 Joll, C. A.: *Diseases of the Thyroid Gland*, London, 1931, p. 77.  
 THE LANCET, Annotation, 1927, *i.*, 243.  
 Lanzani, V.: *Rass. internaz. di Clin. e Terap.*, 1934, *xv.*, 1033.  
 Pic, Dolore, and Paigne: *Lyon méd.*, 1928, *cxliii.*, 399.  
 Robertson, W. S.: *THE LANCET*, 1911, *i.*, 930.  
 Rogers, L.: *Ibid.*, 1927, *i.*, 868.  
 Salleras, J., and Alvarez Colodrero, N.: *Semana méd.*, 1927, *ii.*, 1491.  
 Thorburn, I. B.: *Brit. Med. Jour.*, 1934, *i.*, 428.

## THE INTRAVENOUS ROUTE

### A NEW METHOD AND APPARATUS

BY C. G. K. THOMPSON, M.B. Edin.

ASSISTANT MEDICAL OFFICER, THE BROOK HOSPITAL, WOOLWICH

In children intravenous medication always presents a problem, chiefly owing to their restlessness and fear. The repeated wriggings and twistings of the arm during injection dislodge the needle from the vein, and an annoying hæmatoma may result. There is a great temptation to hurry, but this is to be strongly resisted if undue risks of shock are to be avoided. I have therefore evolved a method to satisfy the following five essentials: (1) it is the least disturbing to the child; (2) it provides the easiest access to the vein; (3) it does not tire the operator; (4) it allows the fluid to be injected at a constant blood-heat; and (5) it is the least liable to be interfered with by the restlessness of the patient. The whole difficulty is in the apparatus in contact with the patient's arm. The aim is to get rid of as much weight as possible, but the 20 c.cm., or occasionally

50 c.cm., syringe hitherto in general use had to be detached from the needle in the vein, refilled, and reconnected. The weight of these syringes is considerable when filled, and the slightest movement of the patient's arm is enough to dislodge the needle from the vein. The operator's hand also adds tenfold to the inertia of the syringe, which is already rendered more unwieldy by having its piston fully withdrawn. The ideal, therefore, would be to have only the needle and no syringe in contact with the arm. This unfortunately is not always practicable, and I compromise by using a very small syringe, which acts only as a means of holding the needle while puncturing a vein and as a window to show the blood coming back through the needle. It was introduced to me by Dr. H. S. Banks, medical superintendent of the Park Hospital, Hither Green, and is known as the B. D. Kaufman Luer syringe.<sup>1</sup> Although the same size as a 1 c.cm. Record syringe, it differs in that the body has an extra nozzle or adapter fused to its side about  $\frac{3}{4}$  in. from the needle nozzle. When the piston is drawn back it uncovers this second nozzle and thereby acts as a valve. The piston is chained to the body of the syringe, and this prevents withdrawal of more than an inch altogether. The whole syringe is very light and easy to manipulate, being long enough to control the direction of the needle while entering a vein; special needles with a Luer base and a medium acute bevel are used.

As this apparatus has been chiefly used for administering large intravenous doses of diphtheria anti-toxin and of dextrose, it will be assumed that the patient is suffering from the toxic type of faucial diphtheria.

Besides the Kaufman syringe, the apparatus is composed of a 100 c.cm. Pyrex all-glass syringe to act as a reservoir, two pieces of  $\frac{3}{16}$  in. rubber tubing, and a glass insert. The serum is placed in a water-bath at about 110° F. One piece of the rubber tubing 3 in. long is slipped over the nozzle of the 100 c.cm. syringe, which has been previously oiled with liquid paraffin and sterilised by dry heat. An adapter is connected to the distal end of the rubber tube and inserted into a cannula. The ampoules should now be opened. Before drawing up the serum, 10 c.cm. of air is drawn into the syringe first, and when the last ampoule has been emptied another 10 c.cm. of air is allowed to enter, with the nozzle held vertically. The rubber tube is removed and replaced by the other piece, which is about 15 in. long and has the glass insert at one end; the short piece is used to connect the side nozzle of the Kaufman syringe to the glass insert (Fig. 1).

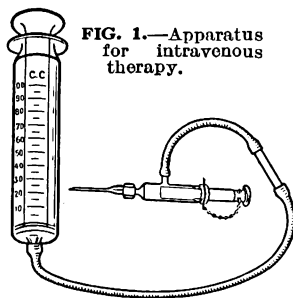


FIG. 1.—Apparatus for intravenous therapy.

One hand holding the big syringe vertically, piston-head up, the other takes hold of the small syringe in such a way that its piston is fully drawn back, when it will be noticed that the serum, by the weight of the piston in the big syringe, will pass down the tube through the glass insert and up into the small syringe. To avoid bubbles of air during the injection, syringes are alternately raised and lowered. When all the air has been

expelled from the tube, the serum is allowed to enter the small syringe until a bubble of air, the size of a small pea, lies near the needle base; this is gently expelled by pushing the small piston, which by this action should have just, and no more, closed the aperture of the side nozzle, cutting off the supply. The 20 c.cm. of air is left

in the big syringe to act as a cushion between the piston and the serum, and so that the last drop of serum can be expelled from the tubing, which holds about 7 c.cm. The apparatus is now ready for use. On entering a vein the intravenous back pressure is transmitted to the piston of the small syringe, which moves back uncovering the side nozzle, and the serum starts to flow into the vein. Meanwhile the big syringe is held up by a nurse so that the delivery tube rests in a kidney dish of water at 110° F., and until the operator has fixed the small syringe to the forearm with two pieces of strapping—one over the needle butt, and the other over the body of the syringe immediately behind the side nozzle. The operator can now take the big syringe and control the rate of injection, the temperature of the serum being kept constant by having the delivery tube in the water-bath.

If the small syringe is securely fixed to the arm it will not be dislodged by sudden movements, and forcible restraint of the child is not necessary, but merely limitation of the range of movement. So unaware is the child of any discomfort that he often goes off to sleep and is only aroused by the removal of the plaster after the injection is completed.

This apparatus was used over three hundred times in the Brook Hospital last year to give injections of serum and glucose in amounts varying from 50 c.cm. to 100 c.cm. and alarming symptoms were never encountered. I attribute this mainly to the freedom from anxiety and apprehension about the needle coming out, which enables one to slow down the rate of injection with impunity.

#### A Calorifier

The usual method of keeping blood or other fluid for transfusion at proper temperature requires considerable and unceasing work for the assistant. However often the water-bath for the reservoir is changed, there is always some variation in temperature. A water-bath for 500 c.cm. of saline or blood must be kept at 130° F. for the patient to receive it at 100°–101° F. The heat loss is increased in the gravity-flow method because about four feet of rubber tubing is used. With regulated pressure flow it is less, owing to the smaller amount of tubing, but the constant attention needed makes the method a complicated one. On the other hand, the gravity feed requires no attention and the transfusion can be prolonged to diminish the risk of shock; there is however the one drawback, of temperature regulation, and I have attempted to lessen this by devising a calorifier.

It consists of a vacuum flask, a spiral piece of  $\frac{3}{16}$  in. bore pyrex glass tubing, a thermometer, and two pieces of ordinary glass tubing fitted to the rubber bung of the flask, as shown in Fig. 2. The spiral alone forms part of the conduit to the vein, and must therefore be boiled before use. To avoid breakage it is made inseparable from the bung. The spiral is made of glass to enable one to see if it is clean, and also to be sure of eliminating bubbles of air. The vacuum flask gets rid of the main cause of heat loss, but there is still some loss owing to the absorption

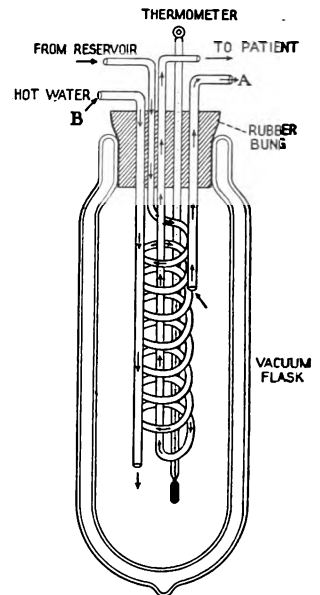


FIG. 2.—The calorifier.

<sup>1</sup> British agent, C. F. Thackray, 252, Regent-street, London, W.1.

of heat by the fluid passing through; to compensate this the other two tubes are fitted (Fig. 2). Tube A is connected to the suction end of a Higginson syringe, and B by rubber tubing to a convenient source of hot water at about 180° F. As soon as the temperature drops 5° from 110° F. on the calorifier thermometer, a light squeeze of the Higginson bulb will suck some of the cool water out from the top of the flask, at the same time drawing in hot water at the bottom to replace it. When the blood or saline is flowing at the rate of 90 drops a minute, the temperature in the flask drops at the rate of 1/2° F. a minute, so that, roughly, the temperature will have to be adjusted every ten minutes. Further, by connecting the calorifier in the circuit as near to the needle as possible, the radiation from the rubber tubing can be made negligible: the length need not be more than 24 in. The apparatus may be hung near the patient, or laid on the bed.

The calorifier has been used frequently, and found to work perfectly with the minimum of trouble and attention. The apparatus has been made for me by Messrs. Down Bros., London.

### PROGNOSIS OF RESECTION IN CARCINOMA OF THE STOMACH

BY WILLY ANSCHÜTZ, M.D.

PROFESSOR OF SURGERY AND DIRECTOR OF THE SURGICAL CLINIC IN THE UNIVERSITY OF KIEL

#### (1) CAN GASTRIC CARCINOMA BE DIAGNOSED EARLY ?

WHEN a patient comes to his doctor on account of gastric symptoms and has a carcinoma in the stomach it is our experience, and that of very many radiologists, that the carcinoma can be shown with almost absolute certainty by X rays. At all events, the X ray picture is not a normal one. Further, in our experience 94 per cent. of gastric carcinomas have occult blood in the stool. Even the smallest carcinomas are already ulcerated and, in consequence of the angioplastic reaction of the tissue, continually excrete blood. Carcinomas the size of a lentil (Versè, Konjetzny) have been found already ulcerated. *A normal radiogram and the absence of occult blood make the presence of a carcinoma improbable in the highest degree.* Then we do no diagnostic laparotomy. From the accompanying Table may be seen precisely what in the clinic here is regarded as the indication for intervention.

#### Scheme to Illustrate the Indication for Intervention

—	Occult blood.	Radiogram.	Probability of carcinoma.	Treatment indicated
1	Pos.	Typical filling defect.	Very probable.	Immediate operation.
2	Pos.	Uncertain.	Doubtful.	Diagnostic laparotomy.
3	Pos.	Normal.	Very improbable.	Keep under observation.
4	Neg.	Normal.	None.	—
5	Neg.	Uncertain.	Improbable.	Consider diagnostic laparotomy.
6	Neg.	Pathological.	Almost to be excluded.	„

In order to test the trustworthiness of this method of diagnosis I have re-examined, after a period of 2 to 15 years, all the gastric cases in which the diagnosis was not made certain by an operation. These are cases which were discharged unoperated with the diagnosis gastritis, adhesions, simple ulcer, suspicion of ulcer, ectasia, ptosis, and so forth. In a total of 375 such cases only 4 have been discovered in which what was certainly a carcinoma developed later. Reinvestigation of these cases has however shown

that in all four of them the radiogram was not quite normal or was not sufficiently exact, for in two cases the fundus in which carcinoma later developed had not been examined. I am convinced that a gastric carcinoma, even when it gives rise only to general symptoms such as pallor, wasting, or debility, can be diagnosed.

#### (2) ARE THE SO-CALLED EARLY DIAGNOSES ALSO EARLY IN THE SENSE OF TUMOUR GROWTH ?

That is difficult to say; for it is not a question of the size of the carcinoma but of the reaction of the body to it whether the carcinoma gives rise to metastases early or not. In regard to the duration of the symptoms and the possibility of resection, for over thirty years I have repeatedly found the following almost paradoxical relation—and this is true not only for the material of the Kiel clinic but also of that at Breslau and Heidelberg. As a rule the relation has been much as follows:—

#### Relation of Duration to Operability

Out of 1000 cases with duration of symptoms in months } ..	3	6	12	More than 12.
The tumour was capable of removal in.. ..	27	29	28	30 per cent.

That is to say, the duration of the symptoms before operation plays no perceptible rôle in the possibility of removal of the tumour and therefore of cure. Even when the cases are arranged according to the site of the tumour (pylorus or fundus) the operability does not alter in relation to the duration of symptoms. Probably a still better proportion of operability and operative results would be obtained if it were possible to resect earlier in the cases with longer anamnesis, but even that is not certain. I return to this point when I speak of the later outcome of resection.

#### (3) DOES EARLY DIAGNOSIS ENSURE THE HOPE OF RECOVERY ?

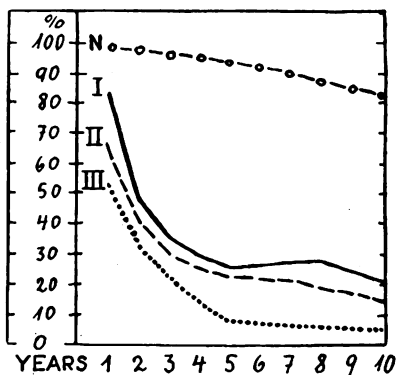
The answer to this, which is the main question, may be deduced from what I have already said. The question can, I think, only be answered with a conditional Yes. The problem of the cure of carcinoma lies on the biological side. If the carcinomas are divided into three groups, as shown in the Figure, the astonishing fact comes to light that the very small and easily operable carcinomas, in which when the operation is finished the surgeon is satisfied that a good result will follow, do not actually do better than the big adherent carcinomas in which operation is difficult. Naturally the immediate operative mortality of the first group (small tumour: no adhesions) is much smaller, latterly only 15 per cent., than that of the second group (large tumour: dense adhesions) where it is 30 per cent.; but once the operation is over the two groups have about the same prospect of cure—the second group indeed somewhat better! It almost seems as if the carcinoma which has called forth a severe local reaction and has invaded neighbouring tissues is less dangerous than the small non-adherent growth which gives rise early to distant metastases.

The mortality of the resection itself depends entirely on its extent and on the patient's general condition. In my clinic the total mortality has not fallen materially in recent years because we have continually widened the indication for resection. The proportion of resections has risen from 26 per cent.

in 1908 to 58 per cent. in 1933. Of the 183 cases in Group I. 18 per cent. died; of the 102 cases in Group II., 37 per cent. died, or, including stomach-colon resections, 44 per cent.; of the 145 cases in Group III., in which carcinomatous glands or metastases in omentum and peritoneum were left behind, 31 per cent. The considerable increase in these merely palliative resections continually prevents any fall in mortality. Besides that we have continually pushed up the age limit of operation. In the last five years 44 per cent. of our patients were over 60 years old, against 26 per cent. earlier. Under such circumstances it can hardly be expected that the general mortality of the resections should drop very much. With carcinoma before him the surgeon must resect whenever he can. That is shown by the figures of survival after palliative resection (Group III.).

Gastro-entrostomy we hesitate to do for gastric carcinoma. The average length of life after operation in 190 cases averaged six months. Only 6 undoubted cases of carcinoma survived more than a year. After palliative resection, on the other hand, 50 per cent. of the patients survived a year, 30 per cent. two years, and 20 per cent. three years. In considering the duration of the results in general and in the separate groups (see Figure) it must be borne in mind that

*Years of Life in Patients with Gastric Carcinoma Who Have Survived Resection*



GROUP I. (149 cases).—Uncomplicated cases with no adhesions: regional glands: regarded at operation as favourable.

GROUP II. (64 cases).—Severe cases: carcinoma firmly adherent: less favourable cases.

GROUP III. (99 cases).—Palliative resection: glands or metastases or carcinomatous tissue left behind: unfavourable cases.

Group III. shows in the first three years considerably more deaths than the other two groups. From then on the survival curves approach each other and from the fifth year on run almost parallel to the normal survival curve (N) for that age.

in a large number of the cases the patients are elderly folk. For comparison we have drawn in the normal survival curve (N) for the fifty-fourth year of age which corresponds to the average age of our resection cases (the expectation of life for each year can be obtained from the life assurance societies). From this it appears that five years after the operation the survival curve of the resections runs parallel with the average curve at that age. After five years there are 14 per cent. and after ten years 11 per cent. of cures, but on the other hand a certain number of cases relapse still later or a new carcinoma appears in the large intestine. I must emphasise that all the

surviving resection cases have been followed up. We were under the impression that the more freely growing carcinomas occurring with special frequency on the greater curvature did better than those infiltrating the pylorus and smaller curvature, but even with the latter we can record results lasting ten years or more.

#### CONCLUSION

All in all, gastric resection must be recommended urgently in carcinoma, and the operation done as early as possible, even at advanced age. The prospects of cure are in fact materially better in the older patients than in the younger. Of those under 40 years 5 per cent. survived five years or more; of the 40-60 year old group 18 per cent.; over 60 years 28 per cent. The percentage of operable and of surviving cases among the total number of gastric carcinomas is certainly not large, but there remain quite a number of cases. In my clinic we have to do more radical operations for gastric carcinoma than for carcinoma of the breast. Attention should not be directed so much to the hopeless cases which are not to be cured by resection as to the considerable number in which resection can be done with prospect of survival for long years.

## Clinical and Laboratory Notes

### TUBERCULOSIS TREATED WITH MERTHIOLATE

BY D. P. LAMBERT, M.D. Edin., D.T.M. & H.  
CAPTAIN, INDIAN MEDICAL SERVICE

In the Medical Research Council's annual report for 1933-34 (p. 61) it is stated that "the synthetic antiseptic known as 'merthiolate' has been found to be particularly effective" in killing the tubercle bacillus, with very slight effects on its antigenic properties. There is no suggestion in the report that it has any specific action on *B. tuberculosis*, and I certainly am making no such claim. The makers, Eli Lilly and Co., describe the drug as "sodium ethyl mercurithio-salicylate," and present it in a 1/1000 solution. In a healthy male volunteer, weighing 11 stones, ten intravenous injections of 10 c.cm. on alternate days produced no toxic effects and the drug was then used in hospital.

CASE 1.—Female, Mohammedan, aged 19. Was admitted for tuberculosis of the metatarsal bones with sinus formation, but was found to have extensive tuberculosis of both lungs. The sputum contained tubercle bacilli and the temperature swung daily from about 97° to 102° F. Malaria was excluded. The patient was treated on general lines for ten days with no improvement. On the eleventh day 5 c.cm. of merthiolate was given intravenously, followed by a like dose on alternate days up to six injections. The patient then discharged herself. After the second injection the temperature showed an unusual reaction, becoming stabilised round 100° with a daily range of not more than 2.5°. There were still tubercle bacilli in the sputum and the physical signs were unchanged.

CASE 2.—Male, Hindu, aged 33. Admitted for left-sided pleurisy with effusion of two months' duration. The effusion reached almost to the clavicle and was causing great distress, which the aspiration of four pints of fluid relieved. But absorption of the remaining fluid was slow and was not accompanied by reduction of the temperature which ranged from 99° to 102° F. Tubercle bacilli were absent on repeated examinations, and after six weeks injections of merthiolate were started, with

5 c.cm. intravenously on alternate days. After the second injection the temperature became normal, and it was still normal when the patient left hospital on the following morning.

**CASE 3.**—Male, Hindu, aged 37. Admitted for bilateral pulmonary tuberculosis, with extensive cavitation, and intestinal tuberculosis. Tubercle bacilli were plentiful in the sputum, and the patient was very wasted. His temperature swung irregularly from 97° to 101° F. with peaks up to 103° occasionally. Merthiolate injections, 5 c.cm. intravenously on alternate days, were started on the seventh day. Four were given without the slightest effect, and the patient then died.

**CASE 4.**—Male, Hindu, aged 22. Admitted with a psoas abscess, for which he refused aspiration or any other active treatment. He refused to remain recumbent or wear a plaster. His night temperature was raised to 99° or 100° F., the morning temperature being normal or sub-normal. Ten days after admission merthiolate injections (5 c.cm. intravenously on alternate days) were begun. From the third injection onwards the temperature remained normal, but after the fourth the patient discharged himself.

**CASE 5.**—Male, Mohammedan, aged 33. Admitted with bilateral pulmonary tuberculosis. Tubercle bacilli were found in the sputum, and there was a medium-sized cavity at the right apex. The temperature swung irregularly from about 99° to 103° F. Merthiolate injections (5 c.cm. intravenously on alternate days) were started on the seventh day, and continued till seven had been given, when the patient left hospital. After the third injection the temperature became stabilised round 101° F., the daily swing not exceeding 2.5°. Tubercle bacilli were still present the day before he left hospital.

**CASE 6.**—Male, Mohammedan, aged 13. Admitted with a cold abscess of the back, apparently arising from the ninth right rib. The abscess was aspirated and ordinary general treatment was carried out. The temperature ranged from normal to about 101° F., and despite repeated careful examinations no other cause than the rib tuberculosis could be discovered for it. The cold abscess responded well to aspiration, but the temperature remained high till the fifth week when injections of merthiolate (3.5 c.cm. intravenously on alternate days) were started. Seven injections were given, after which the patient's father removed him. In this case the temperature became normal after the third injection, but next day it rose again, remaining high for two days. Thereafter it remained normal. Seen again five weeks later this patient was apparently quite well, and had no fever.

**CASE 7.**—Male, Mohammedan, aged 25. Admitted with active bilateral pulmonary tuberculosis. There was no evidence of cavitation, but tubercle bacilli were present in the sputum. His temperature was 97°–102° F. On the eighth day injections of merthiolate were started. After the second injection the temperature was normal, but it continued to swing irregularly over about 2° round the normal line till he left hospital. By this time he had gained weight and said he was somewhat better.

**CASE 8.**—Male, Mohammedan, aged 36. Admitted for bilateral pulmonary tuberculosis, with a large cavity on the right side. The sputum contained many tubercle bacilli. The temperature swung from 97° to 103° F. On the third day 4 c.cm. of merthiolate was injected intravenously, and on alternate days doses increasing by 1 c.cm. at each injection were given till a dose of 8 c.cm. was reached. Supplies of the drug then became exhausted. After the third injection the temperature never rose above 101° F., but no improvement in the general condition took place. The patient discharged himself two days after the drug was stopped.

No toxic effects were seen in any case. All except Case 3, in which the patient was probably beyond human aid, showed reduction or stabilisation of the temperature after the exhibition of the drug, and in Case 7 there was also a gain in weight and subjective improvement. It remains to be decided whether the action of the drug (if any) on tuberculosis is merely

due to the antipyretic properties of its salicylate component. The best means of giving the drug and the optimum dose also need to be determined. Accurate controlled work is not possible in an Indian district hospital, and I hope that someone more fortunately placed will continue the investigation.

I am indebted to the inspector-general of civil hospitals, United Provinces, for permission to record these observations.

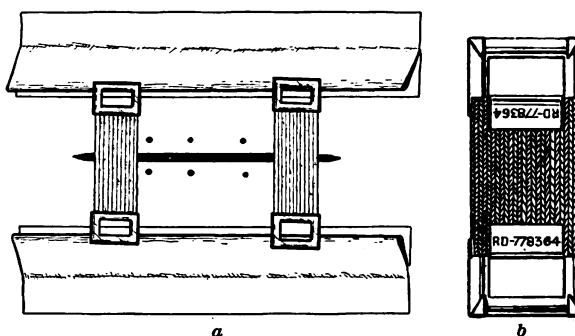
Saharanpur, U.P.

## A RAPID METHOD OF DRESSING INCISIONS

BY KENNETH MCFADYEAN, M.R.C.S. Eng.

THE device to be described is a firm but comfortable dressing that allows easy and painless access to closed operation wounds. The necessary materials, Elastoplast bandage and Rasco lightning bandage fasteners, are in common use.

First, cut two strips of 2 in. elastoplast bandage, each 2 in. longer than the incision to be covered. Lay one length adhesive side uppermost and cover  $\frac{1}{2}$  in. of its width with the protective supplied. Then



(a) The Elastoplast strips and the bandage fasteners. The dressing has been omitted for clearness. (b) The Rasco fastener.

fold the strip in half throughout its length and press the uncovered opposing surfaces firmly together. Finally remove the protective, separating the two non-adherent  $\frac{1}{2}$  in. faces and open them out at right angles to the remaining double thickness of bandage. Repeat this with the second length of bandage.

Now place one of these strips on each side of the incision, leaving  $\frac{1}{2}$  in. between the inner edge of each strip and the margin of the stitches or clips. Having applied iodine or other medicament to the closed incision, cover it throughout its length and 1 in. further at either end with a thick layer of sterilised gauze. This may now be held firmly in place by attaching two, three, or more rapid bandage fasteners to the free edges of the upstanding portions of the elastoplast strips. The whole dressing maintains apposition of the wound edges and relieves tension. The measurements given may, of course, be varied to suit individual cases.

Herne Hill.

UNIVERSITY COLLEGE HOSPITAL.—The authorities of this hospital are protesting against the proposal of the London Passenger Transport Board to convert Francis-street, University-street, and Huntley-street into a turning circle for the new trolleybus service down Tottenham Court-road. It is pointed out that an alternative turning circle could be provided via Euston-road and George-street or on the other side of Tottenham court-road.

## MEDICAL SOCIETIES

## ROYAL SOCIETY OF MEDICINE

SECTION OF OBSTETRICS AND  
GYNÆCOLOGY

At a meeting of this section held on May 15th, Dr. J. S. FAIRBAIRN presiding, a discussion took place on

## Induction of Premature Labour

Mr. A. J. WRIGLEY opened the discussion by proposing a motion that induction of premature labour should not play any part in the treatment of pelvic contraction or disproportion in primigravida.

## THE DANGERS OF INDUCTION

He started by recalling a conversation with a medical colleague who asked whether one could assess the fit of an infant's head into the pelvis and thus know when to induce labour. Mr. Wrigley's answer was that no one was capable of assessing this fit, or misfit, and even if it could be done it would serve no practical purpose, as one could not forecast the efficiency of the uterine contractions, the factor upon which ultimate success or failure depended. Few would advise induction of labour before about the thirty-sixth week of pregnancy, and if the disproportion was obvious before that date, most would agree that the choice, for the sake of both mother and child, would be delivery by Caesarean section. Was it possible to estimate exactly the dimensions either of the birth canal or of the size of the foetal skull? Could these two estimates if made be properly compared, and, if so, would such comparison be of advantage to mother or child? He thought the best purpose would be served if the debate were to revolve around the question whether we were satisfied with the results of our teaching or our individual efforts. During the last few years perhaps tens of thousands of unnecessary inductions had been performed, largely because the medical attendant had been led to believe that it was safer for the mother, and better practice in doubtful cases. Even in the teaching hospitals there was a great variation in the proportion of cases which were thought to need such treatment. In 1933, of 1070 booked cases in Birmingham Maternity Hospital, induction of premature labour for disproportion was regarded as necessary in 152, or 15 per cent.; in a further 28 (2.7 per cent.) booked cases, delivery by Caesarean section was necessitated by disproportion. On the other hand, in the Croydon maternity service during 1934-35 about 2500 were under care, and induction of premature labour was performed only twice, both cases being multipara. Caesarean section was done ten times (0.4 per cent.) in the same circumstances. These figures showed a very great divergence of opinion as to indications for induction in primigravida for disproportion.

Mr. Wrigley next sought to show that such wholesale interference was accompanied by a considerable risk and loss of life. The infant mortality in cases of induction of premature labour in primigravida in five years at St. Thomas's was 16.5 per cent., and at the General Lying-in Hospital, York-road, 17.5 per cent.; patients in those institutions were drawn from the same districts of London. At King's College Hospital figures showed that induction of premature labour by surgical means in primigravida resulted in a stillbirth-rate of 20.8 per cent. With

regard to maternal risks, F. J. Browne found that out of 173 deaths in nine maternity hospitals—all staffed by experts—5 per cent. followed directly on induction. In J. H. Peel's recently published series of cases 45 per cent. showed definite evidence of uterine infection after delivery. There was also a risk of severe haemorrhage, due to separation of the placenta. Moreover, after surgical induction the action of the uterus in labour was inadequate, and the complications of inertia were to be feared. Peel showed that induction of premature labour increased the forceps rate threefold. Mr. Wrigley held strongly that the surgical induction of premature labour in primigravida was unjustifiable, and that it was not possible to estimate the fit of a foetal head into the pelvis. Better results were obtainable by other means.

Mr. FREDERICK ROQUES spoke of the "other means" mentioned by Mr. Wrigley. Caesarean section was admittedly called for in dwarfs, rachitics, and women with grossly malformed pelvis. In others, except very rarely, it was impossible to foretell, early in pregnancy, whether disproportion would become evident by term. At about the thirty-sixth week a clinical examination should be made to determine the presentation of the foetus. This discussion would be confined to the cases in which there was presentation of the vertex. The relation of the head to the pelvis should first be determined; it would either be (1) engaged, (2) engaging, or (3) floating. By *engaged* was meant that the greatest diameter of the head had passed through the pelvic brim, so that it was firmly fixed and less than half the head could be palpated abdominally. Normal labour could be anticipated when it was found that the head was engaged at this stage, for contraction of the bony outlet was not, in his experience, found apart from contraction in the other pelvic planes. Neither Mr. Wrigley nor the speaker believed that it was possible accurately to measure the outlet, and even if it were the clinical position would remain unaltered, because the head diameters could not be measured. By an *engaging* head was meant one lying low in the uterine cavity with limited mobility on abdominal palpation, though its widest part was not yet past the brim; more than half the head could be palpated abdominally. In such cases further descent with engagement could be expected during the ensuing period before term. A head *floating* above the brim could be palpated abdominally over practically the whole of its surface. An attempt should be made, by the Munro Kerr or a similar method, to determine whether the head could be caused to enter the pelvic brim. If not, the patient should be treated expectantly, except in the presence of gross pelvic malformation or complicating factors, when Caesarean section should be advised. If the head could be pushed in or if overlap was absent, another examination should be made a week or two later; and a similar policy should be pursued if the clinical information elicited was uncertain owing to the tone of the muscles of the abdominal wall, obesity, or the patient's resistance to examination. Anaesthesia would overcome these interferences, but should not be employed at the thirty-sixth week. Mr. Roques would therefore say that all cases except those with gross pelvic malformation or complication at the thirty-sixth week should be treated expectantly, and re-examined at a time nearer to term.

The methods of investigation available were:



(1) X rays, (2) clinical methods, including examination under anæsthesia. The first of these could be of great value if done by expert radiologists working with the best apparatus. As a result of those two methods of investigation a case fell into one of the two groups mentioned; that in which the disproportion was pronounced, and that in which disproportion was either absent or slight. The great majority of cases belonged to the latter group, and should be submitted to a trial labour. Some might argue that an almost exclusively expectant policy amounted to a confession of ignorance on the part of its protagonists, but he affirmed that no obstetrician could accurately foretell before labour commenced how a case would progress during labour.

Mr. ARNOLD WALKER said that it was unwise to induce premature labour with a view to avoiding mechanical trouble in primiparæ, because of the frequency with which induced labour was complicated by inertia, and the proportion of cases in which the child died. His experience was at the Willesden Maternity Hospital, where the patients were a representative lot, embracing those coming into an expanding industrial district from all parts of the kingdom; those of whom he spoke were under his personal care, a fact favourable to accurate analysis. In 1447 primiparæ there were only 18 (or 1 per cent.) in which the child failed to work its own way out. Cæsarean section was done 13 times, and all the mothers and babies did well. In only 9 of the 13 was the operation done because natural delivery at the time was not likely to result in the birth of a live child. In 6 the size and shape of the pelvis was the only indication for operation. The number of patients in his series who were not allowed to go into labour spontaneously was 6; those in whom the labour was terminated by Cæsarean section because it was feared a live baby would not be delivered numbered only 3. With regard to the meaning of the term "trial labour," his conception was not that of a battle between the fetal skull and the bony pelvis in which it was hoped that the skull would be defeated before the uterus gave up its efforts; he and his colleagues regarded it as the provision of an opportunity for a deflexed head or a conical uterine segment to right itself, and for the increased tension on the ligaments to pull down the uterus and its contents. When time had been given for readjustment the position could be reviewed afresh.

#### IN FAVOUR OF INDUCTION

Dr. HERBERT SPENCER, who opened against the motion, reminded members that five years ago when the section debated this subject there was a general acknowledgment by the participants—including Mr. Wrigley—of the value of the induction of premature labour for minor degrees of pelvic contraction or disproportion. At that date only one hospital (London Hospital) had ceased to practise induction. Though the present discussion was restricted to primiparæ, Dr. Spencer saw no reason for the limitation. The value of induction could only be estimated if full particulars of alternative methods of treatment—i.e., trial labour, forceps, Cæsarean section, craniotomy—were given, with the total deaths of mothers and children. Dr. Spencer's own use of forceps had been conservative since, 46 years ago, he learned that all the children delivered by forceps who died showed meningeal or cerebral hemorrhage. He gave the following particulars of induction and other methods of treatment during the last five years of his service in University College Hospital—

namely, 1920 to 1924. Induction for contracted pelvis ( $3\frac{1}{4}$  to  $3\frac{1}{2}$  true conjugate) was carried out in 85 primiparæ and 128 pluriparæ, 1 mother and 25 children dying. Cæsarean section for contracted pelvis was carried out in 56 cases with no maternal mortality; 2 children died. Craniotomy (3 for dead children, 2 for hydrocephalus) was carried out in 5 cases, with no maternal mortality. One maternal death from sepsis after induction was the only fatality in a consecutive series of 427 cases at the hospital, showing a mortality-rate of 2.3 per thousand, while the foetal death-rate was just under 12 per cent. Of the 85 primiparæ of this series, 10 children died, or 11.7 per cent. Only full details of all the cases treated by individual obstetricians would enable a due estimate to be arrived at as to the value of induction in the treatment of contracted pelvis. Induction had the great advantage over alternative methods that it usually did no harm to the mothers; indeed, the harm was less than in a natural labour. His opinion, therefore, was that in the treatment of cases of minor contraction or disproportion, induction should play a large part, Cæsarean section and forceps delivery a small part, and craniotomy (except for dead, damaged, or hydrocephalic children) no part whatever.

Mr. JAMES WYATT said that he and those who thought with him were only out to induce labour in a patient with a small pelvis if it seemed unlikely that the head would pass through. In a trial labour the patient was allowed to have a reasonably long second stage, in order to ascertain whether the head would go through; if it did not, Cæsarean section was performed. In all labours there were two variable factors: the strength and frequency of the pains and the size of the foetus. With regard to the idea that the pains after induction of labour were poor, much depended on the means adopted to induce labour; the pains were just as poor in patients who entered labour naturally, especially if the head was high up. Frequently the fetuses of primigravidae weighed  $8\frac{1}{2}$  to 9 lb. Risks to the infant were increased by a prolonged labour. Some of the cases after a long second stage in a trial labour would have to have a Cæsarean section, an operation which, in Mr. Wyatt's view, was carried out too often and with too little weighing of consequences, both immediate and remote. If there was a demand for so-called trial labour it should be in a second labour, when certain factors were already known. The maternal passages had already been dilated by the first infant, so the amount of force necessary to overcome resistance for subsequent ones was lessened. He felt that the anti-induction school had arisen because Cæsarean section had been treated too lightly. In one large provincial hospital Cæsarean section was performed 158 times in 2401 cases. If induction had been carried out he thought a large proportion of those babies would have been alive, and the uterus would have borne no scar.

#### GENERAL DISCUSSION

Dr. EVERARD WILLIAMS based his contribution on cases under his care at Charing Cross Hospital and at the Ilford Borough Obstetric Hospital. In the antenatal examination of an expectant mother, the general inspection of her bodily frame would indicate to which type she belonged, whether of the asthenic type with a flattening of the brim of the pelvis, or the sthenic type, in which the pelvis as a whole approximated to the male configuration. Foetal deflection was physiological until the forces

of labour set in to promote flexion. He regarded disproportion at the brim as the rarest, not the commonest, cause of the floating head. In 3714 deliveries at Charing Cross Hospital there were 187 surgical inductions for disproportion, 17 (9 per cent.) fetal deaths, and 1 maternal death (due to pulmonary embolism). At Ilford in 4301 deliveries there were 200 surgical inductions, 21 fetal deaths (10.5 per cent.), and no maternal deaths. The Ilford figures showed the maternal morbidity in the cases of surgical induction to be lower than that for the whole series of over 4000 births; this surely suggested that surgical induction, if properly carried out, was a safe procedure. The fascial supports of the pelvic organs arose from the white line of the pubes and the bone about the ischial spine. The extensive trauma inflicted on them, causing retroversions and prolapses, supported the view that it was not in the region of the brim, but in that of the cavity and outlet of the pelvis that disproportion really existed.

Mr. S. GORDON LUKER said that the general indications for the induction of premature labour were a slight or moderate degree of contracted pelvis in which the true conjugate was estimated to be not less than  $3\frac{1}{2}$  in. The fœtus should be not more than four weeks premature, as its chances of survival before this time were not sufficiently favourable. If the patient was examined at frequent intervals towards the end of her pregnancy the correct time for induction could be arrived at. The examination should include the umbilical girth of the mother, the height of the fundus uteri, and a thorough palpation to judge of the size of the fœtus. If the fœtal head could not quite be pushed into the brim of the pelvis by abdominal examination, the bi-manual method must be used, if necessary under anaesthesia. Induction was free from risk, in his view, if carried out in a proper manner. The aseptic ritual must never be relaxed. Owing to the softness of the fœtal head, forceps must not be used if that could be avoided; as the fœtus would not be as strong as a full-time child a prolonged or deep chloroform anaesthesia must not be given. He gave particulars of 110 cases under the care of Dr. J. C. Norman and himself, in which 3 infants were stillborn, and 1 died on the seventh day after delivery (less than 4 per cent.). His conclusion was that induction of premature labour was a most valuable procedure in many cases, preferable to a test labour. The increasing demand for analgesics, especially among educated women, militated against test labours, and so the alternative of Cæsarean section was carried out. The latter was a major operation, not so safe as labour after induction by bougies. The fertility following Cæsarean section was considerably diminished and moreover a subsequent pregnancy involved the risk of rupture of the uterine scar which occurred in 4 per cent. of cases.

Dr. J. C. NORMAN, speaking as a general practitioner, was still an enthusiast about induction of labour. In several cases known to him Cæsarean section had prevented women from having any more children. He had carried out premature induction not only in institutions but also in private, and as he had had no bad results he felt justified in regarding it as a safe procedure.

Mr. G. W. THEOBALD said that one of the things which had emerged from the discussion was that the particular method was of less importance than the man behind the method. Another feature was the revolt against Cæsarean section, an attitude with which he cordially agreed. He quoted with approval Fitz-

Gibbon's view that to speak of "trial labour" before the membranes had ruptured was a contradiction in terms. There was no antithesis between trial labour and induction of labour. If one wished to prevent forceps delivery and a long labour one must start at the beginning of the first stage of labour, and not concentrate on the second stage; valuable drugs for this purpose were quinine, morphine, and hyoscine.

Prof. MUNRO KERR remarked that in no other country could such a discussion as this take place, since in no other country was it thought advisable to induce labour in cases of contracted pelvis in primiparæ. It was impossible in borderline cases at the thirty-sixth week to tell whether the fœtal head would or would not go through. Adjustments might take place during the last period which completely altered the relative sizes of head and pelvis. A point not referred to in text-books was that when the examiner grasped the fœtal head above the pelvis, the patient lying flat on her back, he was apt to tilt it either forward or backward, and so to produce either anterior or posterior parietal obliquity. One could not possibly tell beforehand how the head would mould in labour, nor what would be the strength of the uterine contractions. Prognostication was only safe after labour had commenced. Obviously, therefore, in primiparæ the only reasonable course was to allow the patient to go into labour. At that stage, however, he contended that he could ascertain, within 10 per cent. of error, whether a particular head would go through. The sooner the induction method in primiparæ was banished the better.

Mr. HASTINGS INCE spoke of a series of 9762 deliveries at University College Hospital, in which there were 144 surgical inductions for contracted pelvis or disproportion. The gross fœtal mortality-rate was 11.4 per thousand. In one-third of the cases forceps had been used. His conclusion was that induction of premature labour had a place in obstetrics. Every subsequent pregnancy of a woman must be regarded afresh.

Mr. ALECK BOURNE said he had not carried out induction of labour since, in 1924, Whitridge Williams said he never did it. In the present discussion too much stress had been laid on the factors of the size and weight of the baby. Induction was done in order to obtain a smaller head; measurements showed that the reduction of the presenting head obtained by inducing at 36 weeks was not more than one-third of an inch; and he doubted whether it was worth while to interfere with pregnancy and induce labour for that small reduction. The serious argument against induction in disproportion was that the second stage of labour was too easy; too much stress was usually laid on mechanics. The quality of the contractions might change a case, and he agreed that one could not always predict the quality of pains. Induction of labour was dangerous; it was the chief aetiological factor in inertia. The mortality of inertia lasting more than 48 hours was 10 per cent., and in 28 per cent. of cases induction played a part in its aetiology.

Mr. A. L. GUNN spoke of his work at Croydon, where he handled 1300 cases a year. All who brought forward series of cases should state whether or not they were selected. In 2100 deliveries surgical induction was carried out in 2, both in multigravidæ. In 1103 second pregnancies surgical induction was not done at all. Cæsarean section for disproportion had been done in 5 cases and no craniotomies had been done.

Mr. W. R. WINTERTON spoke of 44 cases at the

Middlesex Hospital in ten years in which surgical induction for disproportion was carried out. The average length of the first stage of labour was 28 hours. There were 38 per cent. of primary inertias, and 22 per cent. lasted more than 48 hours. The forceps rate was 18 per cent.; in 15 per cent. of cases sepsis occurred, half of them following forceps delivery. There were 6 stillbirths, one of them macerated. Half of the cases were delivered by forceps.

Dame LOUISE MCILROY said that she had largely given up induction of labour, not because results were bad, but because the results which followed the policy of leaving the patients alone were as good, if not better. She did not see the need for so much criticism of trial labour, since every labour was, in a sense, a trial. One of the reasons why she had discontinued induction of labour was that having introduced a foreign body into the uterus, one had shot one's bolt. It was bad practice to use forceps thereafter; there was the added risk of sepsis, and Cæsarean section was out of the question. She did not think enough stress had been laid on the ligaments. What mattered was the "give" of the pelvis, combined with the relaxation of the soft parts, and the contractions of the uterus. Treatment preliminary to labour was useful. In the last week of pregnancy grs. 15 of chloral every night made a vast difference in the character of the labour; as also did sitz baths.

Dr. DOROTHY LOGAN commented on the different standard conjugates found in different parts of the country, and hence the fallacy of conclusions based upon an idea of a standard normal conjugate everywhere.

Mr. WILLIAM GILLIATT ranged himself on the side of the supporters of the motion. Since the beginning of January, 1932, he had not done induction of labour in primigravidae. The change in method of treatment was forced upon the staff at King's College Hospital by the unsatisfactory results to mother and child which followed induction of labour. He and his colleagues there allowed all cases to have a trial labour on the lines suggested by Mr. Theobald; no so-called trial labour was such until the membranes had ruptured. There could be no regret at the change, as in the last five years their figures had been far better.

The openers briefly replied, and the vote on the motion resulted in 40 supporting it, and 18 opponents.

## TUBERCULOSIS ASSOCIATION

At a meeting of this association, held in London on May 15th, a discussion on

### Climate and Its Relationship to Tuberculosis

was opened by Sir LEONARD ROGERS. The immense importance of tuberculosis as a cause of illness and mortality in India was not, he said, yet sufficiently realised. Post-mortem examination showed that the type of disease was often that of chronic fibroid phthisis, healed pulmonary, and even intestinal tubercle being also frequently met with; all this indicated long tuberculation of the Indian races. As 15·8 per cent. of the deaths occurred before the age of 21, nearly all in adolescents, with another 36 per cent. in the third decade the type corresponded with that of Brownlee's "young adult" group which had been recently shown to be the type most influenced by climatic conditions. There was a good deal of evidence to show that damp hot climates are harmful

to tuberculous patients. It was essential, however, when studying the influence of any climatic factor, to deal with strictly comparable populations, such as rural ones living under the same conditions, or with very large and well-populated areas with widely varying climatic conditions, such as India furnished. The scanty evidence on the effect of soil and geological formation appeared to suggest that living on damp soils predisposed to increased phthisis. Any beneficial effects of high altitudes were in all probability due to such factors as lowered temperature, lessened rainfall and humidity, long hours of sunshine, and sheltered position, and not to any virtue in high altitudes in themselves. The late W. Gordon had shown that rainfall, apart from direct rain-bearing winds, had no close relationship to the incidence of phthisis in Devonshire. In India the speaker had found a very close general relationship between a high annual humidity and a high incidence of tuberculosis. In a few cases, however, notably in Assam, the tubercle rate was low, while the rainfall was heavy and the humidity high. Here another factor was involved—namely, the remarkable degree to which the province was sheltered from strong winds. Sir Leonard showed a number of maps marking the distribution of tuberculosis in relation to rainfall, humidity, and rain-bearing winds, illustrating his general conclusion, which the work of others in Europe and America had confirmed, that the climatic factors favouring high tuberculosis incidence were considerable rainfall accompanied by strong rain-bearing winds carrying a high degree of absolute humidity to the affected areas. Those affected with or predisposed towards tuberculosis should, when possible, seek a dry, sunny, cool place with fairly low rainfall and little wind, and protection from the directions from which the main rains came. A point of interest was that maps of the distribution of pneumonia in relation to climate in India, which Sir Leonard had prepared, showed precisely the opposite incidence to that of tuberculosis—namely, very high prevalence in the winter months in the North-West Frontier Province, Sind, and Gujerat, with a dry cold climate, the maximum diurnal variation of temperature of over 30° F., and winter absolute humidity of under 0·3; and the lowest rates in Madras and Lower Burma with the opposite climate in all respects.

Dr. ANDREW MORLAND said that variations in the tuberculosis mortality-rates in different parts of the world had very little connexion with the question of climate, owing to the fact that so many other factors were involved. It was important to keep constantly in mind the dictum of the late Dr. Huggard of Davos: "Whether a climate is bracing or relaxing depends mainly on the patient's power of response; for metabolism to be increased the digestive organs must be in good enough order to respond to a demand for increased activity of function." Although there were other important factors, such as the amount of sunshine, climatic treatment depended in the main on putting the patient in an environment which either stimulated or retarded his metabolism. The metabolic rate was increased by such factors as low temperature, wind, and dryness of the air, this last acting by facilitating evaporation not only from the surface of the body, but also from the lungs. But the fresh-air treatment of tuberculosis had suffered from excessive enthusiasm, and some of its advocates had gone too far in exposing to bitterly cold weather patients whose metabolism could not respond to such a strong stimulus either because they had been too much weakened by disease, or

because they were wrongly constituted for such rigorous treatment. The thick-set, or pyknic, type of person would as a rule be able to respond to a bracing climate in a way that the asthenic type could not do. After giving a short regional survey of various countries in different parts of the world the speaker went on to discuss the question of high altitudes in more detail. The special characteristics of such a climate were, that it was cool and dry, with low barometric pressure and high intensity of light, with a considerably greater proportion of ultra-violet rays. The low barometric pressure was a great stimulus to metabolism. Even at 5000 ft. the basal metabolic rate was increased about 20 per cent. To counteract the shortage of oxygen in the air, the red corpuscles increased in number, contraction of the spleen being the first mechanism called into play, which was followed by increased activity of the bone-marrow. The effect of altitude on the nervous system was of great importance. In general, highly nervous people did not stand altitude well, and tachycardia and insomnia were frequent complaints. Sufficient attention had not, he thought, been called to the fact that people who at first derived benefit from altitude sometimes got stale later on and needed a change. Speaking generally, in the majority of cases it probably made little difference whether the patient was treated in Great Britain or in the Alps, provided that he went to a good sanatorium where the discipline was strict. Early cases, especially when there were active symptoms, were, he considered, best treated at a low or moderate altitude where their metabolism would not be excessively stimulated. Afterwards a change to a higher altitude might often be an advantage.

Dr. G. B. PRICE said that the advantages to be derived from residence in sanatoria at high altitudes—over 4000 ft.—were undeniable, but they had to be balanced against certain disadvantages, such as increased expense, unfamiliar and often monotonous diet, lack of restrictions which might allow a patient to follow his own bent in appetite and indulgence, and the necessity for “declimatisation” on returning to English conditions. Moreover, the valuable physical and psychological effect of the pure stimulating air and increased sunshine was not necessarily accompanied by a corresponding improvement in the foci of disease. Alpine treatment could not provide a short cut to a cure, nor could even the most ideal climate replace the ordinary methods of treatment. Marine climates in tropical and subtropical areas also had their drawbacks. During the war Dr. Price had charge of a large hospital in Malta situated on the highest point of the island, where 300 beds were occupied by early tuberculous cases, mainly of those invalided from Salonica. Most of these cases did well only up to a certain point, after which it was highly desirable to get them back to England. For the bronchitic type of tuberculosis, as with bronchitis, emphysema and its complications, a low altitude, humid climate free from dust and a more or less uniform temperature, summer and winter, were assets of great importance, leading to improvement when ordinary measures were unavailing.

Dr. A. SANDISON said that the experience of the Ministry of Pensions, over an average of 20 years, in the treatment abroad (Switzerland and the Riviera) of over 300 tuberculous officers and nurses was instructive. The cases could be classified in three groups: (1) from 1919–1922, when the cases had not been subject to any special process of selection for such treatment; (2) 1922–1925, when, following on a survey by the Ministry of all the cases then

abroad in Switzerland and the Riviera, the Ministry increased its control and a much more careful selection was made of cases likely to benefit from such treatment; (3) 1925 and onwards, following on a second survey, when the control was further tightened up, and responsibility for such treatment only accepted by the Ministry when it appeared likely that the resulting benefit to the patient could not be obtained by treatment in this country. A research was now being made into the results obtained in these three periods, the groups being further subdivided according to their clinical types and to the locality in which the treatment was given—Switzerland, the Riviera, or both these. The clinical types were: (1) those patients in whom tubercle bacilli had at some time been found; (2) those with negative sputum in whom a clinical diagnosis of tuberculosis had been made; and (3) those whose pulmonary condition was primarily one of bronchitis or emphysema, with no definite evidence of tubercle. The investigation being still uncompleted, no final conclusions had yet been arrived at.

## ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

THE main discussion at the quarterly meeting of the Association, which took place at the Royal Mental Hospital, Glasgow, on May 13th and 14th, under the presidency of Dr. REGINALD WORTH, was on the subject of

### Somnifaine Therapy

Dr. A. MACNIVEN (Glasgow) discussed the clinical aspect. He said that as long ago as 1870 such drugs as ether, chloroform, alcohol, and certain derivatives of opium were used for the purpose of producing prolonged periods of unconsciousness in the treatment of mental disease. The first use of somnifaine to this end was by Klaesi in 1922, when he treated 24 patients suffering from dementia præcox in this way, and obtained definite improvement in many. Negativistic patients became much less resistant, and tube-feeding could be replaced by normal meals; moreover, some mute patients became fairly talkative. In this country the first trial was that by Dawson and Barkas at the Maudsley Hospital in 1926; they came to the conclusion that it was a dangerous treatment, entailing serious risk of death from cardiac failure. Certain other workers reported a high mortality from the method. Ström-Olsen evolved a method of combating by glucose and insulin the toxic symptoms produced by prolonged administration of somnifaine, especially the ketosis. He found that by giving glucose and insulin during the treatment, such symptoms as diminished glucose tolerance, tachycardia, circulatory collapse, suppression of urine, albuminuria, and certain disturbance of coördination were largely eliminated. In 15 patients who received glucose and insulin the dangerous symptoms disappeared in 48 hours or less; in 17 cases in which glucose and insulin were given throughout treatment, no serious complications occurred. Ström-Olsen and Muriel McCowan obtained very good results by treating 107 cases in this way, particularly cases of manic-depressive psychoses. In 49 cases in the schizophrenic group, 8 per cent. recovered, 38½ per cent. improved, and 53 per cent. were unchanged. In Dr. MacNiven's cases the somnifaine was injected intramuscularly in doses of 2 c.cm.; the degree of narcosis aimed at was that approximating to natural sleep; it was not difficult to

arouse patients sufficiently for purposes of feeding and excretion. The treatment was continued for ten to fourteen days.

**Complications.**—One woman died from pneumonia contracted on the first day of the treatment; it would be difficult to blame the somnifaine. In three cases there were symptoms of cerebral irritation, with some rise of temperature; in one of them there was probably calcium deficiency, for when she was given calcium by the mouth the symptoms completely subsided. In one male patient the temperature rose to 104° F. on the fourth day of treatment. He had marked leucopenia, and though the treatment was at once stopped, the narcosis lasted two more days. The treatment was not resumed. In three cases there were indications of circulatory failure. In only one case were there renal complications, the urinary output being dangerously low on the fifth day. With alkalis the renal symptoms disappeared, and the somnifaine treatment was resumed. In eight cases catheterisation was needed at some time. So far, in the Royal Mental Hospital, Glasgow, 20 men and 20 women had been submitted to the treatment; 25 of them were suffering from manic-depressive psychosis. In 5 of the cases recovery was definitely attributable to the treatment; 10 were permanently improved, 15 temporarily so, while 10 were unchanged by the treatment.

Dr. J. MACDONALD (Glasgow) dealt with the psychological aspects of the treatment. In view of the number of drugs which had been employed for inducing narcosis he considered that in seeking an explanation of the results obtained other factors than biochemical ones had to be taken into account. A rational explanation, he submitted, could be based on the psychological and physiological laws of habit and resistance. Prolonged sleep interfered with or inhibited for the time being habitual modes of thought and action, resistance to which in the normal wakeful state had been either weak or futile. This enforced period of quiescence enabled the patient to acquire new habits of thought and action, or rendered possible the better use of ideas already acquired. This change was likely to be especially pronounced in the schizophrenic. If at the right time the patient's interest could be aroused, and healthy thoughts encouraged, the physician could make good use of all the methods at his disposal.

Mr. J. H. QUASTEL, D.Sc. (Cardiff), dealt with the physiological and biochemical aspects. He said it would be a pity if such research as this were to be abandoned because of the considerable toxicity apparently associated with it; it was desirable to obtain some idea of how narcotics worked, while efforts were being made to reduce toxicity. It was necessary to realise that the main substance burned by the brain was glucose; the dominant form of metabolism in the central nervous system was associated with the breakdown of glucose and lactic acid. This could be proved by experiments on the living animal, or with brain tissue *in vitro*. It was scarcely possible to work on human brain, owing to the difficulty of obtaining it fresh enough. Glucose and lactic acid were necessary for the functioning of the nervous system, and it was those substances whose metabolism was inhibited by the narcotics. Ether in sufficient concentration to effect narcosis inhibited the oxygenation by the brain of sugar, but as the effect of ether was cumulative, and was not easily reversible, this was not a good substance to use in treatment. Glucose and insulin were useful because they combated the toxic effects of narcotics in

organs where the carbohydrate metabolism depended greatly on the glycogen-glucose metabolism.

Dr. W. M. FORD ROBERTSON (Glasgow) said that as early as 1882 Gessinger sought to allay the excitement and restlessness of his psychotic patients by prolonged ether and alcohol narcosis. Of the numerous types of insanity which had been subjected to prolonged narcosis, the acute forms, such as mania and the manic phase of the cyclic psychosis, were the most successful. The patient suffering from tetanus, who because of sepsis was in extremis, did not respond to the anæsthetic or narcotic, his nervous system and somatic functions being at a low ebb; and this might be the case, too, with many schizophrenics. In mania, deep narcosis if given at once acted mainly in the true phylactic sense. He thought protein shock might have a place in the therapeutic scheme if carefully controlled by observation on bone-marrow activity; he urged all workers in this field to follow closely the advances being made in the knowledge of brain metabolism.

Dr. P. K. MCCOWAN (Cardiff) said he had given 300 treatments of prolonged narcosis, 200 with glucose and insulin, without a death. He emphasised the importance of carrying out the treatment in a dark, single room; this gave results with smaller dosage than when the patient was exposed to noises and distractions which militated against both narcosis and natural sleep. If acetone in the urine was found to be increasing, the treatment was stopped. As the mental disorders from which the patients were suffering were not in themselves lethal, there was no justification in submitting them to a treatment which carried the possibility of death. For this reason it was imperative to carry out frequent urinary and other clinical investigations during the treatment. He had found that in a quiet and darkened room more than two doses of 4 c.cm. each were seldom required to induce narcosis to the point at which the patient could be roused for the usual physiological functions.

## SOCIETY OF RADIOTHERAPISTS OF GREAT BRITAIN AND IRELAND

A MEETING of this society was held in the rooms of the Medical Society of London on May 15th, Mr. G. B. STEBBING, the president, being in the chair, when a discussion took place on the technique and results of

### Radiation Treatment of Carcinoma of the Rectum

Miss M. C. TOD (Edinburgh) said that the treatment of carcinoma of the rectum presented so many difficulties that no one could approach the subject with confidence. Before the position of radiation therapy could be assessed it was necessary to consider the possibility of cure by surgery and she had therefore prepared a short review of the literature published during the last five years. It was clear that no really satisfactory solution to the problem had been found. There were three main operative procedures, the perineal excision, the abdomino-perineal excision associated with the name of Miles, and the perineo-abdominal excision practised at the Mayo Clinic. Radiation therapy included the insertion of intracavitary radium, combinations of surgery with implantation, and combinations of X rays and surgery or X rays and radium. None of these methods produced very good results. Coffey claimed 60 per cent. successes but could only treat half his

patients. T. E. Jones had 52 per cent. of operated cases alive after five years, and Lockhart Mummery gave about the same figures. As to radiation statistics G. E. Binkley, of the Memorial Hospital, New York, gave full treatment to 25 out of 238 patients seen and 13 of these survived over five years. The latest report of the Radium Commission recorded 15 out of 107 alive over three years. Miss Tod showed a table giving the results in all cases admitted to the Royal Infirmary, Edinburgh, over the last four years. Although these were fairly recent, it was already obvious that the survival-rate was not likely to exceed 10 per cent., a figure borne out by a report from the hospitals of Boston, U.S.A., giving an absolute survival-rate of 8 per cent. Miss Tod submitted that the Edinburgh figures provided a fair average for any general hospital, and claimed that the necessity for further investigation and trial of radiation methods was established.

The PRESIDENT said that he was fortunate in having experience of a large number of cases. He still believed that the genuinely operable case should be treated by excision, but if this was contra-indicated by the general condition, and in more advanced cases, the results recently obtained from thorough radiation therapy were distinctly encouraging. He gave a full course of X radiation including a perineal field; the patient sat on a chair fixed above the aperture of the tube with an applicator in such a position that careful compression allowed the growth to be brought considerably nearer the skin surface. He regarded as the main essentials for success (1) the arrangement of all his applicators as near the growth as possible, and (2) the very careful aiming of the beam. External

radiation was supplemented by intracavitary radium in a special applicator designed to hold the radium at a fixed distance from the mucous membrane. It was in his opinion always advisable to perform a colostomy in advance. The patient was much more comfortable during treatment, and even if the disease was eradicated a fibrous stricture remained and the artificial anus was inevitable.

Dr. N. S. FINZI (London) gave particulars of five patients treated by him with intracavitary radium who had survived for long periods, one for over 20 years. He believed that the possibility of such results should stimulate further inquiry.

Dr. J. T. REARDEN (Manchester) described the technique employed at the Holt Radium Institute which consisted now of the implantation of long needles (13 cm.) round the rectum to include the largest possible volume of tissue. At the same time intracavitary radium either in the special applicator or in sorbo rubber was inserted. The needles were left in position for 6-7 days, the applicator for about half that time. The treatment was now given on two occasions. The results though inconclusive were encouraging.

Dr. FRANGCON ROBERTS (Cambridge) described his method of external radiation which makes the greatest possible use of the surface skin and so obtains a high dose at the tumour.

Mr. B. W. WINDEYER (London) said that he had tried interstitial radium as a palliative measure and the results obtained had been surprisingly good. It was now his intention to attempt a combined treatment on a series of cases, a course in which the discussion had encouraged him to continue.

## REVIEWS AND NOTICES OF BOOKS

### Peroneal Type of Progressive Muscular Atrophy

By JULIA BELL, M.A., M.R.C.P. Being Part 2 of Vol. IV. of the "Treasury of Human Inheritance." London: Cambridge University Press. 1935. Pp. 140. 12s. 6d.

THIS able monograph fully justifies the title of the series under which it is published, being certainly a treasury of knowledge and research. One is tempted in contemplating the miserable stories of hereditary disease retailed in successive volumes to suggest that the tragedy and not the treasury of human inheritance would seem a name more fitting for the series as a whole. Dr. Bell has made a comprehensive and critical summary of observations on the peroneal type of progressive muscular atrophy with special emphasis on its ætiology and inheritance. From her data it appears that the tendency to transmit this congenitally installed defect is strong and equal in parents of either sex; 50 per cent. of children, one of whose parents is affected, can be expected to develop this disorder, although suppression of the disease is less rare than is that of some other diseases of the same genetic type. Sporadic cases provide a much smaller proportion of the whole than in glaucoma, glioma retinae or paralysis agitans, but larger than in Huntington's chorea. One interesting observation, not readily explicable, suggests that it may prove possible to predict which of the children who carry this inheritance will develop the actual manifestations of the disease, by testing their ability to taste phenyl-thiocarbamide; the inference is that the symptoms will appear only in those who are non-

tasters. It is curious that inheritance in this condition implies not merely liability to the disease, but liability to show the earliest symptoms at just the same age, to present the same typical or atypical distribution in exactly the same sequence, and to develop the same uncommon complications. The data concerning age and nature of onset, symptomatology, duration, complications, and pathology are all discussed. No unexpected observations seem to have emerged and the picture of the disease remains that which has hitherto been accepted.

### Lobar Pneumonia and Serum Therapy

By FREDERICK T. LORD, M.D., Clinical Professor of Medicine, Emeritus, Harvard Medical School; and RODERICK HEFFRON, M.D., Field Director, Pneumonia Study and Service, Massachusetts Department of Public Health. New York: The Commonwealth Fund; London: Humphrey Milford, Oxford University Press. 1936. Pp. 91. 4s. 6d.

THIS is the first of three projected publications arising out of the study of pneumonia, originated by Dr. G. H. Bigelow and financed by the Commonwealth Fund, in the State of Massachusetts. It deals with the general principles of serum therapy in lobar pneumonia. Methods of pneumococcus typing, the selection of suitable cases for specific treatment, dosage and administration of serum, the reactions which may occur, and the ultimate results and benefits of serum therapy are discussed fairly and clearly.

If the risks of serum reactions are stressed unduly, it is probably because the authors feel that in a



crusade for the wider use of a new therapeutic measure every care must be taken to avoid accidents which might bring it into disrepute. The mortality-rates for lobar pneumonia are higher in America than in this country and rather larger doses of serum are recommended than are used here, but the results from serum therapy in the two countries are quite comparable. Practitioners who are interested in this addition to our therapeutic armamentarium should read this monograph in conjunction with the report on the subject to the Therapeutic Trials Committee of the Medical Research Council (see THE LANCET, 1934, i., 290).

### Mechanics of Normal and Pathological Locomotion in Man

By ARTHUR STEINDLER, M.D., F.A.C.S., Professor of Orthopædic Surgery, State University of Iowa. London: Baillière, Tindall and Cox. 1935. Pp. 424. 36s.

THIS careful analysis of the mechanics of gait is based on a wide study of the literature and of researches all over the world, as well as on Prof. Steindler's own investigations on a vast mass of clinical material during his long professional career. The book has thirty chapters, of which the first four and the last are devoted to general mechanical principles; one chapter is devoted to the mechanics and pathology of bone, and five to the mechanics and pathology of muscle, including fatigue. Then the human machine is discussed in anatomical order, beginning with the trunk (spine, pelvis, thorax, abdomen) and travelling down the lower limb from the hip to the foot, and down the upper limb from the shoulder to the fingers, while the final chapters are devoted to a summary of the gait, both normal and pathological. A good bibliography is appended to the chapters. It is pleasing to find stress laid on a matter often overlooked by teachers and gymnasts: the amount of work involved in "standing at ease." This work is assessed as demanding 12 per cent. over the basal metabolic rate. The important part played by the abdominal muscles in maintaining the posture of the spine, and that of the intrinsic muscles of the hand in its activity is also emphasised. In an interesting discussion on deformities due to muscle-contractions the author points out that three groups of causes give diverse effects: (1) shrinkage from *fibrosis* of the muscle gives the greatest deformity, and is most noticeable when one stretches the damaged muscle; (2) *spastic* shortening is greatest when the muscle is at its least length; once the muscle has been pulled out, the spasm disappears (e.g. the tendo Achillis relaxes in full dorsiflexion); (3) shortening of a muscle, whose antagonist is paralysed, is never extreme. These are points of great importance when treatment is under discussion, but are frequently overlooked. There is also a valuable analysis of the different types of function of the human arm—e.g., as a flail in some sports, such as golf; as a fixed rod, straight for pushing, locked in flexion for some phases of boxing; and as a tensile spring for hanging from a trapeze.

The book is well illustrated and some good photos of the range of the human spine in different planes are reproduced; this range is actually much less than it appears to be in the living form, where limb movements supplement and appear to magnify the movements. Generous acknowledgment is given to the work of Goldthwait on the function of human posture, but the photos of good posture would not satisfy that pioneer. Prof. Steindler gives an interest-

ing study of phylogenetic changes on the centre of gravity, and of the anatomy and pathology of the spinal column. One is glad to find in the pages of such a master in the treatment of scoliosis a warning against the insidious and almost inevitable development of paralytic scoliosis and a statement that almost the only prophylaxis is to develop the reserve forces of the musculature, especially by respiratory exercises and care of the abdominal muscles.

This book should be studied in detail by every surgeon whose work is with bones and joints; while practitioners in every branch of medicine will find it worth while to consider thoughtfully the conclusions which the author brings forward at the end of each chapter. Intelligent appreciation of the physical and mathematical data on which Dr. Steindler bases this study may be a strain upon those whose first professional examination is a matter of ancient history, but most will be willing to trust the word of an expert and will not attempt to follow or confirm his calculations.

### Woman

By HERMANN HEINRICH PLOSS, MAX BARTELS, and PAUL BARTELS. English edition by ERIC JOHN DINGWALL. Vols. III. London: William Heinemann (Medical Books) Ltd. 1935. Pp. 2018. 8 guineas the set.

THESE three large volumes contain the first English translation of a work which has been well known in Germany and elsewhere for years and has passed through many editions. Originally conceived by Hermann Heinrich Ploss some fifty years back, the last issue appeared about nine or ten years ago, and it is a translation by Dr. Dingwall of this edition which has now appeared in English.

In these volumes, which are profusely illustrated, it is claimed that at least most of the activities of woman are shown, to some extent, as they appear throughout the world. In the first volume the female organism is considered in her anthropological, psychological, and æsthetic aspects, including the conscious cultivation of beauty and the attitude towards women found in folklore and traditional religion. After this comes the description of the female genitalia, external and internal, and then consideration of women's social life and status and spheres in the ancient and modern world, with the influences of religion on these matters. This is followed by a discussion of the girl before puberty, prenatal, during childhood, and reaching maturity; anthropological and ethnological considerations of menstruation go with this, including the study of "puberty rites" and popular superstition on the subject. It is evident, without giving lists of the subjects in the other volumes, that the work has been planned on broad lines.

In the second volume an interesting and important section is that which deals with prostitution and with brothels. This section seems to bear the editorial imprint, and leaves a more connected impression on the reader's mind than the greater part of the book, in which all kinds of observations appear to be thrown together in a somewhat haphazard way. It is of interest to learn that Joanna I. of Naples founded a brothel with intention to benefit her people, and established laws for its proper government, one of which provided for a weekly examination of its inmates by a surgeon, with segregation when necessary. The variations in the social status of women among different peoples is discussed at considerable length. This is only one of many matters in these

volumes which have interest apart from anthropology. For example, women suckle their children up to the age of 12 or 14 among the North American Indians and the Esquimaux, while in upper Bavaria, as Waldeyer pointed out 30 years ago, this female function is despised; Toldt related this attitude in many parts of the Tyrol to the wearing of stiff clothing which made suckling difficult. In many races confinement seems to be commonly without help, and usually easy. More difficult birth is probably commoner where there is racial mixture, especially when the father comes from a larger stock; definite expert information is wanting, however, on this matter. The post-partum uterus is "put into place" in various ways; the Tanganyika woman is stuffed with goat's flesh till she can swallow no more, combining an unusually full meal with downward pressure on the uterus. The duration of the puerperium varies remarkably, without any evident association with races or peoples. The suggestions that it varies with the period of lochial discharge, or with the falling off of the cord, are not convincing. Little seems to be known about the matter, which may be connected with ideas of "uncleanness." Scattered through the volumes is an enormous amount of data which gives the impression of having been accumulated rather than assimilated. An anthropologist or ethnologist who wants to know something about woman's ways in any place will find in this book whatever may be known on the matter; what value he may attribute to it and what use he may make of it is in his own hands. He will find here many statements made by one authority and flatly contradicted by another—but to that he is probably not unaccustomed. Perhaps the greatest fault of this work is the fundamental one that it has been written throughout from the standpoint of a man who tends to see woman's activity against his own background. Albrecht's dicta on the female skull, for example, are informed by the male sense only, and there are many other and more important aspects of women's functions, perceptions, ideas, and standards which are clearly not understood by the other sex. The differences of structure are dealt with adequately enough; a just appreciation of differences of outlook and their significance for the development of the human race is perhaps necessarily lacking.

### The Individual Criminal

*Studies in the Psychogenetics of Crime.* Vol. I. Cases 1-5. By BEN KARPMAN, M.D., Professor of Psychiatry, Howard University, Washington. Washington: Nervous and Mental Disease Publishing Co. 1935. Pp. 317. \$4.50.

ANY empirical attack upon the problem of criminal psychology is welcome. Prof. Karpman has aimed at producing such a study, as the outcome of years of work among prisoners. In an earlier volume he published detailed case-studies, for which he here supplies the interpretation. He is dissatisfied with the descriptive psychiatric approach to criminal behaviour, and, on the other hand, he finds that the psycho-analytic method has failed to contribute significantly to the solution of the problem because of fallacious assumptions as to the mechanisms at work. He takes each of his five cases in turn, formulates the situation and the psychogenesis, and reviews the diagnostic aspects. Appended to three of the records are the professional comments of Mr. William Brandon, himself a patient in the Criminal Department of St. Elizabeth's Hospital: they are obviously based on

first-hand knowledge of the underworld and add to the value of the book. The psychiatric explanations which Dr. Karpman offers are debatable, but are carefully reasoned and based on an adequate psychiatric experience. His unbiased approach to the problem of therapy is plain in the essay with which the book ends: here he points out the difficulties which imprisonment puts in the way of effective individual treatment. These obstacles have apparently been more stubborn than English experience might lead one to expect: the difference probably depends to a considerable extent on the inveteracy of the criminal behaviour under consideration. It would be unsafe to generalise from Dr. Karpman's misgivings, though his main standpoint about punitive measures is no doubt valid. This well-documented and reasoned study of a few cases is a useful complement to the larger statistical surveys which are valuable in criminology.

### Essentials of Psychopathology

By GEORGE W. HENRY, M.D., Associate Professor of Psychiatry, Cornell University Medical School, N.Y. London: Baillière, Tindall and Cox. 1935. Pp. 312. 18s.

Dr. Henry seems to have aimed less at presenting psychopathology as a whole than at introducing the reader to some of its important problems, explaining to him what are the dynamic formulations of human psychology now in use, and telling him how to collect and evaluate the facts of a psychiatric case. The book is elementary and clear, though difficulties are not glossed over. There is much illustrative clinical material, which will no doubt be useful to those who have no psychiatric experience of their own to draw upon. Through these clinical records and the account of his own researches in psychiatry, the author's personal interests are made manifest to the reader and stimulate his interest. The first third of the book deals with such physiological and biological matters as heredity, constitution, cerebral function, and the vegetative and toxic factors in mental illness; the last third is concerned in detail with clinical methods of examination and description; and in the middle of the book—which should be the meat of the sandwich—comes the psychopathology proper. It is not however a meat sandwich, but one which contains paste of rather indefinite flavour—a vague account of the integration of personality, mental dynamics, and the maladjustments of childhood.

### Marriage in My Time

By MARIE C. STOPES, D.Sc., Ph.D. London: Rich and Cowan Ltd. 1935. Pp. 247. 6s.

THIS volume appears in a series which deals with contemporary institutions and activities which are in a state of transition. The author sees in marriage to-day "a flux of conflicting needs, customs and mores and from that flux the conscious evolution of something nobler and higher than humanity has yet experienced." According to Mrs. Stopes the Victorian outlook on marriage was influenced by the Pauline and Augustinian morality, which was primarily based on a false cosmogony arising from the belief that, in view of the imminence of the second coming and the end of the world, marriage was likely to be a hindrance rather than a help to Christians. The book is written with the author's well-known vigour and clarity of style. It contains little that will be of direct utility to medical readers, but most people will find the arguments interesting.

especially in the two chapters which deal with the author's activities in connexion with what she calls the marriage tax and the woman's right to retain her maiden name.

### Clinical Miscellany

Vol. II. By F. F. HARRISON, C. C. MCCOY, M. A. McIVER, G. M. MACKENZIE, M. F. MURRAY, R. M. PIKE, J. H. POWERS, D. K. SCHEIDELL, and R. C. TANZER. The Mary Imogene Bassett Hospital, Cooperstown, New York. Springfield, Illinois, and Baltimore, Maryland: Charles C. Thomas; London: Baillière, Tindall and Cox. 1935. Pp. 218. 13s. 6d.

THIS miscellany gives an account of certain more or less rare clinical conditions correlating as completely as possible the clinical and laboratory findings in each case. There are nine contributors. Dr. John H. Powers, in collaboration with Dr. Dorothy K. Scheidell, writes on cholecystitis in childhood and, with Dr. F. F. Harrison, on primary carcinoma of the Fallopian tube. He also writes on decubitus ulcers and idiopathic urethral stricture. Dr. Harrison contributes a paper on post-vaccinal polyneuritis, and another, with Dr. M. F. Murray, on anterior poliomyelitis. Other subjects dealt with by Dr. Murray are juvenile acrodynia, fatal hæmorrhage from an eroded vessel in scarlet fever, and apparent cure of mediastinal Hodgkin's disease. He also reports, with Dr. Monroe A. McIver, three cases of congenital anomaly of the intestine. Dr. McIver also writes on intussusception and carcinoma of the vulva, Dr. C. C. McCoy on undulant fever complicated by hepatic cirrhosis, and on *Staphylococcus aureus* bacteriæmia possibly associated with undulant fever. Dr. R. C. Tanzer reports cases of bacteriæmia arising from hand infection, and Dr. G. M. Mackenzie writes on various rare blood conditions. In the chapter on blood cultures he has collaborated with Dr. R. M. Pike. The cases are thoroughly and carefully worked out and followed up. A bibliography is appended to each chapter and an index to the book.

### Incompatibilities in Prescriptions

Sixth edition. By EDSSEL A. RUDDIMAN, Ph.M., M.D., Research Chemist with the Ford Motor Co., Dearborn, Mich.; and ADLEY B. NICHOLS, Ph.D., B.Sc., Assistant Professor in Operative Pharmacy, Philadelphia College of Pharmacy and Science. New York: John Wiley and Sons Inc.; London: Chapman and Hall Ltd. 1936. Pp. 337. 13s. 6d.

THE primary object of this book is to provide a compact source of information for pharmacists and to present to the physician data pertinent to the success of the prescriptions he writes. It is divided into two parts. Part I. considers the substances in alphabetical order and every conceivable incompatibility appears to be formulated. From the prescriber's point of view the book would be much improved if stress were laid on those incompatibilities which are likely to occur in actual practice. Interesting information is given on the decomposition of aspirin in mixtures containing potassium citrate, a combination which occurs in mist. acid. acetylsal. of the National Formulary. Hydrolysis to an extent of 10 per cent. occurs in one day, 50 per cent. in a week, and practically all the aspirin is decomposed within three weeks. The inclusion of acriflavine, anæsthesin, calcium gluconate, ephedrine, thiosinamine, and thyroxin shows that the revision has brought the book well up to date. The decomposition of soluble phenobarbitone in aqueous solution is considered,

and the influence of temperature on the rate of decomposition is noted.

Part II. consists of typical examples of prescriptions containing incompatibles. Some of these are much too complicated to afford much help to the prescriber. A number of the substances included, although widely prescribed in America, are rarely encountered in this country. The table of solubilities and the index of incompatibilities and prescriptions enhance the value of the book. On the whole the book has much to recommend it, being one of the most comprehensive treatises on the subject of incompatibilities but it will be more useful to the pharmaceutical student than to anyone else.

### The 1935 Year Book of Surgery

*General Surgery.* Edited by EVARIS A. GRAHAM, A.B., M.D., Professor of Surgery, Washington University School of Medicine; Surgeon-in-Chief of the Barnes Hospital and of the Children's Hospital, St. Louis. Chicago: The Year Book Publishers; London: H. K. Lewis and Co., Ltd. 1936. Pp. 838. 12s. 6d.

THIS useful review of surgery during the past year maintains the high standard set by its predecessors. The matter has been well selected and well arranged, and nothing of importance that has occurred has been omitted. These year books are almost indispensable to any actively practising surgeon, even to those who think they have kept well abreast of current literature. Those who examine one of them, notably this one, will almost certainly find papers which have escaped their vigilance. Even if their reading has indeed been exhaustive as far as the year's advances are concerned, they will still be glad to have a convenient summary of original work which they have previously noticed, or to be reminded of communications which they have forgotten.

### Life and Works of Charles Barrett Lockwood

By ERIC C. O. JEWESBURY, M.A., B.M. Oxon. London: H. K. Lewis and Co., Ltd. 1936. Pp. 103. 3s. 6d.

THE major part of Dr. Jewesbury's book was published during the past year in the *St. Bartholomew's Hospital Journal* and many may have read there the biographical notes on an exceptional man. In the medical school of St. Bartholomew's Hospital Lockwood commanded notice from many points of view. One heard him described now as anatomist, now as a pioneer of aseptic surgery, and now as an adventurous sailer of small boats; as a coiner of epigrams, and a wonderful teacher he claimed attention. Dr. Jewesbury points shrewdly to the qualities which lay behind this varied display—qualities which themselves never varied. Lockwood was always inquisitive for knowledge, untiring in the search for it, rigidly accurate, and quite adventurous; yet he was a simple man. Absorbed in his work, no man here was ever more zealous for perfection; but he equally rejoiced in play, as any will recognise who read the journal entitled "Swin, Swale, and Swatchway" kept by himself and his intimate friend Lewis Jones, as a record of experiences round the mouth of the Thames in a little sailing boat. Lockwood has been dead more than 20 years, but those who knew him are bound to remember him, and those who did not know him should learn something of him. Dr. Jewesbury has done well to republish his chapters in the *St. Bartholomew's Hospital Journal*, which form the Wix prize essay.

### Researches Published from the Wards and Laboratories of the London Hospital during 1935

London: H. K. Lewis and Co., Ltd. 7s. 6d.

THIS collection of 28 publications from the London Hospital covers an unusually wide range in subject-matter. S. P. Bedson has demonstrated the value of the complement-fixation test in the clinical diagnosis of psittacosis, while J. O. W. Bland has succeeded in obtaining, with the late R. G. Canti, a cinematographic record of the life cycle of this virus—thus confirming his earlier work with Bedson in which the existence of this cycle was first described. Some further observations upon anti-cancer sera are made by T. Lumsden and his co-workers. The unreliability of the Schubert-Dannmeyer test for cancer is demonstrated by E. R. Holiday and F. Campbell Smith. The two contributions to hæmatology in this volume are of a fundamental character: in the first E. R. Holiday, Phyllis Tookey Kerridge, and F. Campbell Smith criticise the hæmoglobinometers in common use and report the results of their investigation of the photo-electric hæmoglobinometer favoured in the Hale Clinical Laboratory; in the second C. Price-Jones, Janet Vaughan, and Helen Goddard have established and confirmed a number of hæmatological standards for health. A. C. Crooke and Dorothy Russell have shown, by differential cell counts, a marked decrease in the numerical proportions of basophil cells in the anterior lobe of the pituitary in a series of cases of Addison's disease. In another paper, which was the subject of a leading article in THE LANCET, A. C. Crooke describes a peculiar hyaline change in the basophil cells in cases exhibiting the syndrome known as "pituitary basophilism." Dorothy Russell and C. Donald have directed attention to a malformation of the hind brain in a series of cases of spina bifida and have shown how this may be the mechanical cause of internal hydrocephalus. M. A. Abbasy, L. J. Harris, S. N. Ray, and J. R. Marrack have investigated the response in adults and children to measured doses of vitamin C and have shown how urinary analysis indicates the level of intake over long periods. R. S. Aitken and C. Wilson have been unable to confirm Bohn's claim that a pressor substance can be demonstrated in the ultra-filtrates from the plasma of patients suffering from Volhard's "pale" hypertension.

On the clinical side a comprehensive review by R. A. Brews of 72 cases of hydatidiform mole and 16 cases of chorion-epithelioma leads to the conclusion that conservative treatment is rewarded by a very low rate of mortality. The value of the Aschheim-Zondek and Friedman tests is discussed. Clinical studies of actinomycosis in childhood by R. W. B. Ellis, of occupational argyria by J. M. Harker and D. Hunter, and of dyschondroplasia and other bone diseases by D. Hunter are noteworthy contributions.

## LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY

### ANNUAL GENERAL MEETING

THE annual general meeting of the society was held at Victory House, Leicester-square, W.C., on May 6th.

Sir CUTHBERT WALLACE, the president, in putting the resolution for the adoption of the annual report, said that he had presided before as the merest tyro, deputising for Sir John Rose Bradford, when he knew little about the work, but that during the last twelve months he had attended committees fairly often, and from the experience gained he had come to feel that professional life is very precarious. "A man does as well as he can," he said, "and acts the

best he knows how, and yet he gets into trouble somehow or other. It has been a revelation to me what pitfalls there are in general practice and indeed in every kind of practice. I can give the society a warm testimonial as to the tremendous amount of work it does and the collective wisdom of its council and committees. Sitting at their meetings my head has sometimes buzzed with the detail, but it seemed to produce no like effect on the heads of more accustomed members." The professional man must, he said, safeguard himself and join a society like this directly after qualification, instead of waiting as so many do for the trouble to materialise, and he was glad to know that many public bodies are insisting upon the medical members of their staff joining one of the societies in order to protect themselves.

Commenting upon the successful work of the society, he said "We have 898 new members, and the total number on our books at the end of the year was 14,455. Judging by the number of applications for advice and assistance we have had during the year (1401), 10 per cent. of our members have got into trouble of some sort. If we take the same proportion of those present at this meeting it means that four or five of us will encounter trouble before this year is out. That is an argument often heard in cancer campaigns—one in seven of those present will get cancer. Here it is one in ten who will have occasion to seek the assistance of the society.

"Another thing which interests me as a surgeon is the eternal question of swabs left in after operation. It does not appear to matter what precautions are taken, whether the surgeon counts them himself, has nurses to count them, or trusts to luck, the time will come when there will be a suspicion that a swab has been left in. On two occasions it happened that nurses reported to me that there was a swab missing, but in both cases the swab was found with very little difficulty."

Sir Cuthbert Wallace urged the necessity of the members in difficulty consulting the society at the outset, delay or attempts to help themselves were often unfortunate. He moved the reception and adoption of the annual report, statement of accounts, and balance sheet, and the resolution was carried unanimously.

On the motion of Dr. W. J. O'DONOVAN, seconded by Mr. G. F. STEBBING, Sir Cuthbert Wallace was unanimously re-elected president. The re-election of the existing vice-presidents and officers followed, when Dr. P. B. SPURGIN said that the hardest worked officer of the society was the secretary, Dr. Fegen, in saying which he was not disparaging others. They had, he said, a secretary who for many years had devoted great interest and skill to this work. He heartily proposed Dr. Fegen's re-election.—Dr. HUGH WOODS, in seconding, said that there could be no better proof of Dr. Fegen's good work than the way the society had continued to progress steadily and regularly, and the resolution was carried unanimously.

Dr. ROBERT HUTCHISON proposed a vote of thanks to the solicitors, Messrs. Le Brasseur and Oakley, who were, in legal matters, the brains of the society. For the special knowledge which they brought to bear upon the society's affairs he held that they deserved hearty thanks.—Dr. STEBBING, in seconding the resolution, expressed his admiration of this legal work and the resolution was carried by acclamation.

A vote of thanks was accorded to the president for his conduct of the chair.

# THE LANCET

LONDON: SATURDAY, MAY 23, 1936

## THE SCOPE OF NATURAL SELECTION

DARWIN'S main thesis in the "Origin of Species" was that the great majority of live organisms born into the world failed to reach maturity, that the progeny of an animal or plant vary spontaneously among themselves, that those which are better fitted to meet the changes and chances of life would be more likely to reproduce themselves, and that these favourable variations, if heritable, would be perpetuated and those which were unfavourable would be eliminated. His clear statement of these necessary consequences of the facts won immediate consent, and the world in general agreed, and still agrees, that they had here a tolerably rational explanation of the adaptation of live things to their surroundings. But his further suggestion that this process of "accidental" variation and consequent selection would account not only for the separation and segregation of the very obvious units known as species but for the whole of the evolutionary process was from the first looked upon with some suspicion, and biologists became more and more uneasy not about the fact of natural selection but about the variations which are its raw material and about its consequences. Thus the symposium on the subject opened last week at the Royal Society by Prof. D. M. S. WATSON led to an interesting survey of current opinion.

In thinking of spontaneous variation DARWIN had in mind mostly the small, even tiny, differences which can be seen in any brood, and he thought that these might be progressively accentuated by repeated selection to almost any degree; he knew of the occurrence of the much larger and more dramatic changes, in his day called "sports," but deliberately excluded them from his argument though he thought later on that he might have done well to give them more consideration. The experimental evidence obtained since is against his idea that small fluctuations can give such large effects as he required, though it is of course still possible that a different answer would emerge sub specie æternitatis. And there seems now to be general agreement (Prof. E. W. MACBRIDE strongly dissenting) that the sudden changes described by DE VRIES as mutations of which the precise mode of inheritance was revealed by MENDEL are the only variations which can be considered effective in evolution. Some mutations involve large changes in structure and appearance, and it was through these that their occurrence was first discovered, but there is no reason to doubt that similar capers among the chromosomes may give rise to morphological changes of any degree, and also to variations which are perceptible only by examining function. Prof. N. TIMOFEEFF-

RESSORSKY had found that small physiological mutations demonstrable by measuring viability under conditions of overcrowding were quite common in wild populations of *Drosophila*, much more common in fact than those involving gross changes in structure, which meets the difficulty made at one time that mutations were too infrequent to be of much evolutionary significance. Most mutations are not adaptive, and as Prof. R. R. GATES emphasised, have a lethal rather than a survival tendency and, acting on such material, natural selection really acts, as Prof. J. B. S. HALDANE pointed out, in keeping a species constant and preventing wild animals and plants running riot as protected dogs and cabbages do. But the occasional favourable mutation will in the same way be favoured, though considering the intimate adaptation of organism to environment such must presumably be quite uncommon.

Other points of importance were brought forward mostly by the botanists. DARWIN looked for characters of survival value chiefly in adult animals and plants, and some of his followers went to rather extravagant lengths in finding meanings and virtues in all the odds and ends of manifest structure. They did not realise that most selection takes place in the early stages, in the young seedlings of plants as Prof. E. J. SALISBURY'S observations showed—that is long before the characteristic features of the adult have appeared. The intensity of this infantile mortality must vary so largely with the number of young produced that its significance is perhaps different in different instances. In a uniform environment animals and plants maintain their numbers roughly constant from year to year, and selection in the foxglove where one individual produces half a million seeds must be quantitatively and perhaps qualitatively different from selection in bats where two yield one young one per annum. When and how the elimination of superfluous young takes place is a matter on which much more information is needed; that elimination is selective follows a priori from its occurrence, but of what quality is being selected we are almost entirely ignorant. These are points which are fundamental to the Darwinian argument, and it is singular that so few attempts have been made to discover what *does* happen compared with the immense amount of work which has been put into the investigation of the possibilities. Prof. SALISBURY also laid stress on the overwhelming influence of competition in plant communities, and Dr. W. B. TURRILL pointed out that a change of environment might produce as large an alteration in a plant as a change of gene.

Of the reality of natural selection in eliminating the individuals which try to transgress the bounds of their adaptability (as Mr. C. DIVER put it) no one expressed any doubt, and those who, like Prof. WATSON, were dubious about its selective effect seemed to overlook the plain fact that if a harmful agent kills half a population the dead must be those which are more susceptible to the agent and the survivors those which are more resistant. The agent ceases to be selective only

if it kills all or none. Of the relation of natural selection to evolution there was much less certainty. Unfortunately none of the speakers represented the orthogenetic view, advocated particularly by the mammalian palaeontologists, that evolution is a pre-ordained development with a purposive end. And no one but Prof. MACBRIDE put in a word for LAMARCK and the inheritance of acquired habits, the evidence for which is now definite and considerable. Perhaps the truth is that evolution has been achieved in a variety of ways or by combinations of different modes. Mutations, for instance, have appeared up to the present to occur at random or at the most by some system inherent in the organism concerned. It would be distinctly helpful if they could be shown to have some relation to the environment as is suggested by the observation that the typhoid bacillus will ferment lactose if it lives in its presence long enough. A learned bacteriologist might indeed have been included with advantage in the panel at the meeting.

### OPERATION FOR CANCER OF THE STOMACH

CANCER of the stomach is one of the most insidious and most fatal forms of cancer. In the past the outlook has been so serious that by some physicians surgery has been held to be inadvisable. Of 149 consecutive cases of carcinoma of the stomach admitted to St. Thomas's Hospital during the 13 years 1920-32, Sir CUTHBERT WALLACE, or a member of his firm, regarded<sup>1</sup> 122 as unfit for excision (their average survival was 3.3 months); of the 27 in whom gastrectomy was performed the average survival was 12.3 months, but 4 lived more than three years and 1 more than six. Their results were displayed in an admirably graphic way which deserves imitation. Bad though the outlook is, there is now, as Sir JAMES WALTON pointed out in an oration before the Medical Society of London which we published last week, no reason to speak of it as hopeless. He has operated upon 461 patients with carcinoma of the stomach and has made a number of original observations. Of the rarer forms, that growing at the greater curvature presents points of interest. Inasmuch as at first it causes no alteration in digestion and does not lead to obstruction at the pylorus, it is commonly of large size when first seen by a surgeon, sometimes immense. Yet this large fungating, frequently necrotic mass may be removed with good result, for the metastases are usually limited to the glands of the greater curvature. In cancer of the stomach operation should never be decided against because of the size of a palpable tumour. WALTON's figures for the incidence of carcinoma in chronic gastric ulcers agree with those of W. D. NEWCOMB, that is 10 per cent. of cancers originate in a gastric ulcer; eight of his cases apparently arose in the scar of a gastric ulcer after gastro-jejunostomy had been performed. The St. Thomas's surgeons regarded the shortness of history of gastric symptoms in almost all their

cases as a strong argument against carcinoma commonly starting in a chronic ulcer.

The silent nature of the disease makes its early recognition difficult or impossible. WALTON found only 36 per cent. of his cases had been diagnosed sufficiently early to allow a radical operation—and this in spite of improved radiography. He added that he could not but feel that the figures for operability could be improved. But how? His answer is by operating upon all patients developing dyspepsia after middle age unless a growth can be definitely eliminated by X ray examination and test-meals. But even this plan would not gather in, at an early stage, those patients in whom a cancer has been growing for some time, either with no symptoms at all or with symptoms so vague that they pass almost unnoticed. When the diagnosis has been established, WALTON's practice is only to refuse operation if there is definitely evidence of secondary deposits. He finds it possible to remove an increasing number of growths; and this is a hopeful sign although as the range of operability is increased the primary mortality does not tend to shrink. It is 28 per cent. Nor are the late results of resection good. Of 324 patients who were operated upon more than five years ago, only 20 are still alive, although single patients have survived for 19, 17, 15, 14, 10, and 7 years. One of his observations is of fundamental importance from the surgical point of view. The experience of these 461 cases has shown that no reliable deductions as to the future course of the case can be drawn from the appearance of the growth or of its disposition or situation. Small tumours apparently favourably situated for radical removal may, after resection, be followed by the rapid formation of metastases and lead to early death, whereas large masses removable only with difficulty and some hazard may be followed by years of health. This same fact is brought out by Prof. W. ANSCHÜTZ of Kiel in a communication published on p. 1175 of our present issue. The phenomenon is by no means peculiar to cancer in the stomach; it is characteristic of cancer in almost any part of the body. The outlook after operation depends more upon the defence of the organism to malignant growth than upon any other factor. This is the experience of all who have had much experience in cancer work. For early diagnosis ANSCHÜTZ lays great weight upon the X ray findings and the presence of blood in the fæces; a normal radiogram and the absence of occult blood, he says, make the presence of a carcinoma improbable in the highest degree. At the University surgical clinic in Kiel the normal operation for carcinoma of the stomach is resection, which is done even in the presence of irremovable glands or other metastases. The results from gastro-jejunostomy have been so disappointing that this procedure has been almost given up. Resection is done at the earliest possible stage and even in old people. The primary mortality is as high as that reported by WALTON, but the results are striking, and sometimes unexpected, as the graph illustrating the article shows.

<sup>1</sup> THE LANCET, Prognosis Series No. 50, 1935, 1., 1059.



## INDUCTION OF PREMATURE LABOUR

OF the three great divisions of clinical practice, gynaecology is the last to be chastened into the humility which breeds conservatism. First in medicine, towards the end of last century, and then in surgery, pride in ability to modify processes of disease and repair, or to hasten resolution, has given place to a critical attitude towards active treatment. The tendency is to require more than an impression of the efficacy of any drastic form of intervention. The demand is now for evidence (1) that patients treated otherwise or not treated at all do less well, and (2) that the harm, immediate or remote, which may result from activity is less to be feared than the outcome of expectant treatment. This more scientific attitude has led not to the abandonment of procedures favoured in the past but to restriction in their application: blood-letting is still the practice in selected cases, for example, and large portions of a colon, when clearly diseased, are removed with benefit to the patient. The discussion at the British Congress of Obstetrics and Gynaecology held last month<sup>1</sup> showed that except in malignant disease hysterectomy and oöphorectomy are now falling into disfavour, and that increasing importance is being attached to the conservation of even small portions of gland tissue. Obstetrics is also coming into line, in so far as the popularity of Cæsarean section is waning. But there is one form of intervention which has been more common of recent times in Great Britain than in other countries, following the attention paid to antenatal supervision. A chief aim of such supervision has been the detection well in advance of conditions likely to lead to difficult labour, and in many patients referred from the clinic to the family doctor or to a hospital at the thirty-sixth week with a tentative diagnosis of disproportion, premature labour has been induced for fear of obstructed delivery.

The detection of disproportion, and the management of cases in which it was supposed to be present, have long been regarded by the profession and public as one of the triumphs of antenatal work. It will come as a shock to many people therefore to learn that the benefits of this apparently sound principle should even be regarded as doubtful, let alone condemned. It is particularly noteworthy that at the debate reported on p. 1178 of this issue the motion that the surgical induction of premature labour should play no part in the treatment of pelvic contraction or disproportion in primigravidaë was proposed and supported by three of the younger men in obstetrics, and that a large section of those present voted with them. It will be recalled that Mr. J. H. PEEL recently published in our columns<sup>2</sup> an account of a hundred consecutive cases in which induction had been performed for disproportion in primigravidaë. These results were bad; there was a high maternal morbidity and a fetal mortality of over twenty, and Mr. PEEL emphasised, what few have realised

hitherto, the high incidence of uterine inertia that follows surgical induction, bringing other dangers in its train. Those who supported the motion last Friday argued on similar lines, and some depressing figures from the practices of the speakers or from hospital statistics were quoted. Even those whose faith in figures is small will have been impressed by the disturbing facts recorded. A point of particular interest emerged in the wide variation in the percentage of labours induced for disproportion at the different schools throughout the country. In one centre the inductions for this cause reached 15 per cent., in contrast to the practice, say, at Willesden and Croydon where among some thousands of cases not one premature labour was induced for disproportion. The medical officers in charge of the centres at these two places were able to show very satisfactory figures as regards maternal morbidity and foetal mortality, and also, what is of the utmost importance, extremely low figures for Cæsarean section. It might be argued that the incidence of contracted pelvis varies in different parts of the country; it seems to be common in Glasgow and Lancashire and rare in London. But Mr. ARNOLD WALKER pointed out that during the last few years the patients under his care at Willesden were drawn from all the depressed areas of the British Isles, and he therefore regards them as representative of the population as a whole.

Those who defend the premature termination of pregnancy fear that failure to induce will lead to an increase in foetal mortality and in Cæsarean section and craniotomy; but the figures supplied by several speakers should allay these fears. Indeed it was shown that the number of Cæsarean sections in any particular institution seems to vary directly with the number of inductions: the apparent paradox may be resolved by considering the proverbial danger of looking for trouble. An argument put forward on behalf of the radical policy—induction when in doubt—is that to "wait and see" leads to great difficulties in general practice. On the other side it might be said that the latter course would relieve the general practitioner of the responsibility of making the difficult decision whether to induce. By waiting until near the expected date he will find that most cases of apparent disproportion make normal progress as the foetus increases in size. In other words, the alarming non-engagement of the foetal head has not been due to a real misfit. Where this does not happen, that is, when in the last weeks of pregnancy there is still doubt whether a living child will pass through the canal, the case should be handed over to an experienced obstetrician.

Whether the obstetric pendulum has now swung too far in the conservative direction must remain in doubt for a few years. It is, however, certain that if "meddlesome midwifery" has been banned with some success from the labour ward, it has of recent years reappeared in antenatal supervision. In the course of time principles will be applied more correctly and the undoubted value of such supervision will be greatly enhanced.

<sup>1</sup> See THE LANCET, April 11th, 1936, p. 862, and April 18th, p. 913.

<sup>2</sup> THE LANCET, April 25th, p. 935.

## ANNOTATIONS

## SURGICAL RESEARCH

THE welcome gift of £25,000 from the Bernhard Baron trustees will make it possible for the Royal College of Surgeons of England to build and equip new laboratories. This will bring to fruition a plan for the development of surgical research which has long been taking shape in the minds of the College councillors. Some five years ago the upper floors of the College in Lincoln's Inn-fields were fitted up for surgical and pathological investigations and a little later Sir Buckston Browne endowed the research farm at Downe with a residential hostel attached. But neither in Lincoln's Inn-fields nor at Downe has it yet been possible to follow the example set by John Hunter at his Earl's Court seat. In dedicating the farm at Downe to the ideals of John Hunter, the then president of the College remarked "In the association of the surgeon with the biologist we look for the advances of surgery in the future," and the Bernhard Baron laboratories will provide research facilities for men on the staffs of London hospitals who wish to undertake investigations into problems suggested to them by their experience in hospital practice. Nor does their value end here. The College is already attracting to its laboratories men from all parts of Great Britain, from the British Commonwealth overseas, and from foreign lands, and they will now find a worthy centre for their varied activities. The College has in trust for the nation the world-famous Hunterian museum with its priceless collection of anatomical and pathological specimens. It is also the custodian of the Imperial War Collection formed during the war years and housed in the museum. The existing activities of the College in research are not confined to the field of surgery alone; it takes its share, for example, in the administration of the Imperial Cancer Research Fund. If surgical technique, as has been said, can develop little further, those who work at this London centre of investigation may find paths of future progress in biological surgery.

## BOARDING-OUT THE MENTALLY DEFECTIVE

IN public health circles increasing attention is being given to the socialisation or resocialisation of those who are unable, or likely from whatever cause to become unable, to take their proper place in the life and work of the community. Industrial and reformatory schools, rescue and preventive homes all have this object in view—there are, by the way, no preventive homes for boys. A special problem is presented by those who have suffered from mental breakdown and will require to lead a sheltered life in the future, or are the subjects of mental deficiency. A proportion of these can undoubtedly re-enter community life under suitable conditions of kindly care and supervision, when their happiness and self-respect will be increased by the knowledge that they are not shut off from the general life of their fellow beings, and that they can again be of some use in the house or on the farm. A few mental hospitals are boarding-out suitable patients in their own districts, either with relations or foster parents; recall to the hospital is at times necessary, but the results on the whole are satisfactory to the patients. They are also satisfactory in helping to break down the still widespread fear of persons who have been "under care"; further they are satisfactory from the ratepayer's point of view, for these patients cost

less and their absence helps to stave off a costly increase of accommodation at the hospital. Community care has long been in much more general use north of the Tweed than south of it; evidence of this may be found in the recent report of the Scottish Board of Control. Nearly one-third of the Scottish patients certified under the Mental Deficiency Acts are living in private dwellings, the proportion in England being a little over one in eight. In both countries a contributory cause of the boarding-out is no doubt the shortage of institutional accommodation, but in Scotland the importance is better recognised of using institutions as training places (the younger the patients are when they enter, the better) from which, when their period of training is over, they can be returned to community care if at all suitable. This resocialisation is one of the more hopeful signs for the future of mental deficiency practice.

## THE PREJUDICE AGAINST FINGER-PRINTING

WHY are we all so sensitive about the recording of our finger-print impressions? Even well-informed people, says the Commissioner of Police of the Metropolis in his latest annual report (Cmd. 5165, 1s. 3d.), are liable to misunderstand the matter. The wholly innocuous process of taking finger-prints is regarded as degrading, though it is as likely to assist in establishing innocence as in proving guilt. Few people, he remarks, object to the "identification parade" where a person is placed in a line with others in order to see whether complainants can identify somebody who is said to have committed robbery or assault. Nobody greatly minds if a suspect's arm is examined to see if he can be identified by the presence of tattoo markings. Yet the taking of finger-prints at any stage of the investigations is represented as the crowning insult to a possibly innocent man. In America there is a movement to extend the system of recording finger impressions to volunteers, in the hope that the collection will presently include the greater part of the population. No more doubts about persons who have lost their memories, no more failures to identify drowned bodies, no more mixing up of babies in hospitals.

The Commissioner notes the present difficulty in England with juvenile offenders. He denies that the recording of their finger-prints will reduce their chance of making a fresh start towards good citizenship. Without such records it is not always possible to give a magistrate the details of a lad's past history. One boy of 15, while several times in custody in London and at Hove, refused to have his finger-prints taken, as, under the present regulations, he is entitled to do. The magistrates never knew what kind of young man they were dealing with. On his last arrest in London he agreed to the impressions being recorded. The police at once were able to connect him with eight other house-breakings where he had left finger-prints; on learning this, he confessed to a further 16. It is easy to imagine the suspicion which must have fallen upon innocent persons before this identification could be established. Elsewhere in the Commissioner's report we learn the scope of the services rendered in the finger-print branch at Scotland Yard. During 1935 there were 21,767 identifications from 55,899 sets of finger-prints forwarded for search; 989 of the latter came from colonial and foreign police, and 5914 from Scotland and Ireland. The

collection now contains 563,411 slips. The regulations enabled 20,534 sets of prints to be received from prisons in England; in 13,714 cases the prisoner was found to have been previously convicted. It is doubtless the ends of criminal justice that the Commissioner has chiefly in mind when he asks us not to be so sensitive about our finger-prints.

Sir Francis Galton once wrote that there was "no prejudice to be overcome in procuring these most trustworthy sign-manuals." He was thinking perhaps of the experience of India where the inked fingertip enabled illiterates to make their mark for civil purposes and where the significance of the imprint, partly superstitious and partly ceremonial, has been comparable to the English practice of touching a seal or wafer and declaring that a document is thereby executed "as my act and deed." And yet our prejudices remain. We do not object to the registration of births, marriages, and deaths; we rely upon the evidence of these facts for purposes of identity. But, when we are invited to apply the simple method developed by Herschel and Galton, Faulds and Henry, and to furnish the means of universal identification through records which might be stored and classified by the Registrar-General at Somerset House rather than by the Commissioner of Police at Scotland Yard, we recoil from the suggested degradation.

#### EFFICIENT TREATMENT OF V.D. IN SEAMEN

VENEREAL diseases have always been rife among those whose calling means constant travel; and to treat such patients adequately is always difficult and sometimes impossible. From the public health standpoint the problem is of great importance in relation to men whose life at sea is interrupted by short calls at many ports. An international agreement signed at Brussels in 1924 provided for the free treatment of merchant seamen and watermen, without distinction of nationality, at the principal sea or river ports of the contracting countries. There are now 56 countries working this arrangement, and a revised list<sup>1</sup> of treatment centres in ports at home and abroad at which seamen can obtain treatment has just been issued by the Ministry of Health. Difficulties in the application of the agreement have been referred to the permanent committee of the Office International d'Hygiène Publique, and some important recommendations are contained in two communications from that office summarised in circular 1536 of the Ministry of Health. The "second communication" deals with the difficulties experienced by seamen in finding treatment centres open to them, as well as in ascertaining the days and hours of attendance. It is recommended that treatment should, as far as possible, be available at some time in the afternoons or evenings. Attention is drawn to the section of the agreement which requires that details of the facilities available shall be made known to the crews by masters of ships and ship-owners and by the sanitary officer at each port. Further recommendations are designed to ensure greater publicity through consuls in the ports and through the superintendents of seamen's homes and similar places. The "third communication" aims at securing more regular and uniform treatment for seamen in the earlier stages of syphilis. In the past difficulties have arisen from the fact that patients who attended many centres were treated according to many different schemes, with different drugs of varying dosage.

Under such circumstances regularity of treatment and adequate total dosage were rarely obtained. Now the excellent policy is to follow the principles of treatment laid down last year by the experts of the health organisation of the League of Nations.<sup>2</sup> Methods of adapting these schemes to the needs of seamen are discussed, and it is suggested that either the plan of intermittent treatment (I.) or the alternative continuous course (II.) be adopted. Attention is drawn to the importance of entering I. or II. clearly on the patient's personal card to indicate which course has been chosen, along with the stage reached in numbered weeks, and details of treatment and instructions given. Methods of obtaining regularity of treatment by bridging over the interval at sea are suggested and include schemes for coöperation with ships' surgeons or, in the absence of medical care, the substitution of oral remedies for drugs given by injection. The object of this standardisation is not to destroy the initiative of responsible medical officers, but to indicate satisfactory and uniform lines of treatment which may be modified at individual discretion. The recommendations should prove of great value to the medical officers of treatment centres and if carried out should bring a welcome improvement in the care of seamen.

#### AUTOMATIC VOLUME CONTROL FOR HEARING AIDS

DURING the last few years the technical construction of electric hearing aids has been greatly improved and they have become more widely used, to the advantage both of deaf persons and their friends. But they have a drawback which makes some people dislike using them and others to give them up entirely; a sudden loud sound is amplified to a degree which is unpleasant and may be even painful. For instance, in a theatre, when the volume control has been used to bring the amplification up to the level at which the performance on the stage can be clearly heard, a loud cough from a neighbour produces a disagreeable shock. The solution of the problem is an automatic volume control, which must come into operation almost instantaneously on very strong signals so as to avoid shocks of even short duration, and it must limit the loudness of sounds to a definite maximum which should be capable of variation to suit the sensitivity of various individuals; for many deaf people, especially nerve-deaf cases, are extremely sensitive to loud sounds. This control differs both in aims and in principle from the automatic volume control commonly employed in wireless receivers, where the strength of the carrier wave is used to vary the high-frequency amplification, so that strong and weak stations are received at approximately the same strength, but the relative amplification given to soft and loud passages is not affected. The Multitone Electric Company (of 17, New Cavendish-street, W.1) have developed an ingenious device which fulfils the necessary conditions very well, and which acts by allowing part of the output to bias the rest of the amplifier and so to lower the overall amplification. It is now fitted to a three-valve deaf-aid amplifier which is provided as well with the usual manual volume control for adjusting the general intensity of the sound. We have found that it is most efficient in preventing the jarring effect of even very loud noises; it is a valuable addition to these hearing aids and will enable the most sensitive to use them without fear of shock from sudden sounds. Another form of automatic control has

<sup>1</sup> Ministry of Health List 7A. (Revised.) March, 1936. H.M. Stationery Office. 6d.

<sup>2</sup> THE LANCET, 1935, I., 1170.

been evolved by the same firm for use in attachments to wireless sets and other speech amplifiers; this consists of a bridge circuit, of which the resistance of one of the arms changes with the current passing through it. This is incorporated in a unit intended for use with headphones in conjunction with an ordinary wireless set. It is an ingenious device to enable a deaf person to hear the broadcast programmes without making the radio output loud for the rest of the family; it is claimed that such a unit is very useful for practice listening and that some re-educative effect should be expected in favourable cases.

#### THE EPIDEMIOLOGICAL SCHOOL OF PETTENKOFER

LOYALTY to the memory of great men is an agreeable trait of human nature. Even those who are irritated by the Baconian theory of Shakespeare recognise the tribute to a great man. The epidemiological doctrines of Max v. Pettenkofer are of an intellectual value very different from the theories of Donnelly and Mrs. Gallup, but they are no longer popular. A small group of German epidemiologists, headed by Dr. Friedrich Wolter, remain faithful to the doctrines of the Munich master and their publications are always of interest. Dr. Wolter has recently issued two brochures,<sup>1</sup> one on the relation between climatology and epidemiology, the other on the ætiology of *Haftkrankheit*, a term not easily translated, because "gulf disease" would convey too general an idea. That epidemic diseases have long-waved and short-waved time movements has long been noticed; that there are short-waved movements in meteorological events is an equally familiar fact. Modern research suggests secular waves in climatological phenomena; the work of the late Prof. E. Brückner led him to postulate waves of short and long periods, 35 years and 200 years. Dr. Wolter seeks to bring the climatological and epidemiological waves into causal relation. How far he has succeeded is a question which different readers will answer differently. There is certainly nothing unreasonable in supposing that climatological and meteorological changes have important epidemiological consequences; but some readers may hold that diagrams never prove anything and that the arguments have a certain vague magnificence, a little suggestive of the illustrious Sydenham's language on this topic.

Dr. Wolter's second brochure deals with a subject more precisely defined. Twelve years ago much interest was aroused by a remarkable epidemic concentrated upon the Frisches Haff, a narrow gulf communicating with the Baltic. The cities of Königsberg and Danzig are near the shores of this gulf, to the north-east and south-west. Those affected were mainly fishermen and the symptomatology was much like that of the more famous Bornholm disease. There were, however, some differences; in fatal cases, actual degeneration of the muscle-fibres was noted and there was a peculiar pigmentation of the urine. In 1924 there were 600 cases with 6 deaths; in 1925 176 cases with 5 deaths. In the following two years a few cases occurred and then no more until 1932 when there was a fresh epidemic. This "new disease" was christened *Haftkrankheit*, and attracted considerable attention. W. Bachmann published a lengthy study (Arch. f. Hygiene, 1933, ex., 266; *ibid.*, 1934, cxi., 214), leading him to the

following conclusions. Coincidentally with the epidemic there was a mortality of domestic animals, particularly cats, the pathology of the disease in cats being similar to that of the disease in man. The epidemiological evidence did not point to spread by contagion and cases occurred in persons not exposed to the morning mist over the water, to which some had attributed importance. By feeding laboratory animals on fish of various kinds, obtained from the Frisches Haff, especially on the liver of the quappe, evidence of the presence of a toxic substance was obtained. It was, therefore, concluded that the epidemic was due to fish poisoning.

Dr. Wolter seeks to fit this epidemic into its niche as a particular example of a general law. The Frisches Haff is heavily polluted by the sewage of Königsberg and the outflow from various factories. Hence he finds a basis for a subsoil effect. But he identifies the new epidemic with a remarkable outbreak in 1529 in the Haff of Stettin—an outbreak which was part of the epidemiological phenomenon known as the English sweat—and stresses the analogy with the Bornholm disease which has been described in widely separated areas, among others, Wensleydale. Dr. Wolter's epidemiological hypothesis is substantially identical with that of Sir William Hamer. The general setting of an epidemic constitution is determined by climatological and meteorological phenomena in the widest sense of the terms. The particular events are determined by local conditions—for instance, the pollution of the water of the Haff and the consequent changes in the subsoil. The argument is persuasive, if a little vague. Here, however, one does have some concrete facts. Of 502 cases recorded in 1932–33, 314 were of men actually fishing the Haff and 211 of these were taken ill actually on the Haff. Among their wives were 22 cases. Nine other cases occurred in children or persons connected with the fishing industry. Among persons not connected with fishing there were 156 cases; in 39 the subjects had some work on or near the Haff, and another 89 lived within half a kilometre of it. Naturally one would have liked to have some knowledge of the general demography of the district. But if the whole explanation were fish poisoning, it is a little difficult to understand why there should be so great a discrepancy between the sexes. We doubt whether Dr. Wolter's brochures will convince those sceptical of Pettenkofer's theories, but they certainly provide material for argument.

#### PEROXIDES IN ANÆSTHETIC ETHER

It has been thought that convulsions and other undesirable after-effects of ether anaesthesia may be due to impurities and particularly to peroxides in the ether used. Hence it has been considered desirable to use fresh ether from an unopened bottle on each occasion when it is administered. S. R. Wilson, who first described ether convulsions in our columns (1927, i., 1117), was satisfied of their association with impurities in the ether used. Many other theories have been advanced, among them the very interesting suggestion of heat-stroke recently supported (May 2nd, p. 1005) by Drs. Woolmer and Taylor, who give good grounds for excluding impurities in the ether as the causal agent. Further evidence in the same direction was given at the May meeting of the Society of Public Analysts. The investigation was made at the request of the county medical officer for London by the former chemist-in-chief, Mr. J. H. Coste, in collaboration with Mr. D. C. Garratt, Ph.D. The authors confined their work to the effect of peroxides.

<sup>1</sup> Wolter, Friedrich: Seuchenentstehung und Klimaforschung. Pp. 43. Die Entstehungsursachen der *Haftkrankheit*. Pp. 56. (Kleine Hippokrates-Bücherei, vols. v. and vii. Stuttgart, 1936.)

Influenced by the probability on chemical grounds that ether itself would be more volatile than its peroxides, and by the fact that the patient breathes air with the vapour, they studied the evaporation of ether in currents of air and other gases with which it might be administered. They found that when ether was volatilised, either in the dark or in sunlight, in a current of air and the vapour condensed by means of solid carbon dioxide in alcohol, the proportion of peroxide carried over, even from ethers highly contaminated with peroxides, was negligible, although the recovery of ether was almost quantitative. The recovery of peroxide from the unevaporated residue was also almost quantitative and no indication of its formation during evaporation was obtained. This occurred equally whether the air stream was dried before passing through the ether or was of the humidity of the room air. Experiments with an open mask, even when precautions were taken to check loss of ether vapour, yielded poor recovery of ether, but that recovered was almost free from peroxide, whilst 48 to 100 per cent. of peroxide was recovered by washing the mask, after an experiment, with pure ether. The muslin of the mask was found to have no effect on the peroxide content of ether which was dropped on to it. Experiments with a Boyle's apparatus, using nitrous oxide and oxygen in about equal volumes, and allowing about half the ether in the apparatus to evaporate, yielded only very small amounts of peroxide in the condensates, almost the whole of the peroxide being found in the residual ether in the evaporating chamber. The experiments were carried out with ethers so badly contaminated with peroxide that they could not possibly have been used for anaesthetic purpose, and the authors conclude that peroxides themselves are not the cause of the after-effects which may be produced by impure ether. Dr. G. Roche Lynch, who presided, agreed that the rôle of peroxides had been exaggerated.

#### A SYNTHETIC SUTURE MATERIAL

SINCE the time of Lister there has been continuous search for a suture material which would satisfy the requirements of the operating surgeon as to sterility and absorbability while having adequate tensile strength, a non-slipping surface, and pliability. Manufacturers have found it fairly easy to obtain most of these desiderata, but at the sacrifice of one or other of them. A suture embodying all the desired qualities is apt to work out too expensive for general use. A claim is now being made for a synthetic suture material known as Synthofil, which has been tried out in several German surgical clinics.<sup>1</sup> Synthofil, which is a polymer of vinyl alcohol, can be spun in much the same way as an artificial silk fibre, but it has the advantage of being, from the beginning, sterile, strong, and pliable. The threads are perfectly homogeneous and can be made in almost any diameter, thus eliminating the necessity for spinning many threads together to produce a thicker strand. The inventors of the material claim that it can be made in two forms, absorbable and non-absorbable, but the clinical data so far published concern only the non-absorbable type. Synthofil appears not to be deleterious to the tissues, no abnormal reaction occurring around the ligature strand. When absorbed it is partly excreted by the kidneys unchanged and partly broken down in the animal body into non-toxic substances. The amount of polyvinyl alcohol which is excreted as such is relatively

small and from the experiments published it would seem that when used as a suture it is almost entirely broken up in the tissues, so that it cannot be recovered either in the blood or urine. We await with some keenness the publication of further information about the behaviour of the absorbable form of this substance.

#### PREVENTABLE BLINDNESS

THE report on the prevention of blindness drawn up by the standing committee of the Union of Counties Associations for the Blind has now been issued.<sup>1</sup> The membership of this committee includes on the one hand well-known surgeons representing the chief professional organisations concerned with ophthalmology and on the other nominees of the Ministry of Health, the Home Office, and the Board of Education, under the chairmanship of Mr. P. M. Evans, LL.D. A preliminary report, issued in December, 1931, contained a form of report and certificate of what has already been officially recommended for use (1) in the examination of persons for admission to the Register for the Blind, and (2) in the examination of school-children. The present report is divided into six chapters. The first is introductory and deals with the data on which statistical records should be drawn up. It stresses the point that to be of any value all statistical records should be based on the report of specialists in ophthalmology and that a common standard should be applied. The second chapter gives a general account of the eye in health and disease, including a short account of what is meant by errors of refraction and a summary of the chief diseases which are liable to cause blindness. The third chapter contains a detailed description of such measures as exist to safeguard the eyesight from infancy to old age, special emphasis being laid upon the precautions which should be taken to prevent the occurrence of ophthalmia neonatorum and the hospital facilities which to-day exist for the treatment of the disease if prevention fails. The fourth chapter is devoted to a study of occupational disease and accidents which occur in industrial processes. The remaining chapters contain summaries, recommendations, and suggestions for the future, of which the following are among the more immediately important.

The committee stresses the importance of a comprehensive and adequate system of antenatal supervision as a means of safeguarding the eyesight of both mother and child. It is encouraging to note that the proportion of women attending antenatal clinics in England, expressed as a percentage of total notified births (including stillbirths), rose from 27 per cent. in 1930 to 43 in 1934. The importance of close liaison between the antenatal work of an authority and the centres or clinics for the treatment of venereal disease is obvious, but where it is possible to arrange for women and children to receive treatment for venereal disease in association with a maternity and child welfare clinic rather than at the recognised venereal disease centre such an arrangement is to be preferred. Should ophthalmia develop in the newly born, the ideal to be aimed at is the admission of mother and child together into a hospital ward where the services of an ophthalmic specialist are available. In prevention the first essential is the proper cleansing of a baby's eyes at birth; the committee recommends, but does not insist on, the

<sup>1</sup> v. Brandis, H. J., König, W.: *Zentralbl. f. Chir.*, Reprint from No. 7, 1936; Braun, B.: *Melungen*, Inaugural Dissertation, 1936.

<sup>1</sup> Report on the Prevention of Blindness by the standing committee on the prevention of blindness of the Union of Counties Associations for the Blind. From the secretary of the committee at 66, Victoria-street, London, S.W.1. 2s. 6d.

application of 1 per cent. (but not stronger) nitrate of silver, these of which should be included in the midwife's training. The services of an eye specialist should be available for isolation hospitals, especially in cases of measles. Coming to school age, the committee recommends the examination of every child's sight as soon as possible after entry into school. The treatment of eye diseases at clinics should be carried out under the supervision of an ophthalmic surgeon. In the care of myopia the part played by the special school for the partially sighted is regarded as a most important problem which needs further consideration. The committee would fasten on local authorities the responsibility for ophthalmic supervision of all partially sighted children after leaving these schools, and any such scheme should apply also to children leaving the elementary school with serious eye defects. Miner's nystagmus, not being a cause of blindness, did not come within the purview of the committee, but the committee considers the risk to the eye in metal working, in chemical processes through the splashing of chemicals, and in stone dressing. One main difficulty is the prejudice of the workmen themselves against the wearing of goggles. In some instances their objections had good reason and improvements in the type of goggles themselves are suggested. A form of gauze veil advocated by the late Mr. Bernard Cridland, an original member of the committee, appears to have been an efficient substitute for goggles where it has been tried. Among agricultural workers most of the injuries to the eye happen during hedge cutting and trimming; for these as well as for other accidents occurring in country districts the main difficulty is to procure timely expert advice. This enhances the need for education in preventive measures, such as wearing goggles.

The value of this report is increased by the mass of corroborative detail in the appendices. Many of the problems on which it touches are still unsolved and the report points to the directions in which measures of reform are most urgent. It is a worthy successor to the departmental committee's report of 1922.

#### IN PERSON OR BY POST

TROUBLE of one kind or another is the raw material of the doctor's trade; he deals in it all day, and when he is off duty he does not like his friends and family to talk that kind of shop. This is one reason why medical charities are none too well supported; the busy practitioner gives much professional time and thought to people in distress, and he feels that he has done his bit when his day is over. A regrettable result, however, is that the Royal Medical Benevolent Fund, which every doctor ought to support, can offer no more than £40 a year to any of its beneficiaries—no matter how badly off. As Sir Thomas Barlow has pointed out, such an allowance, in the changed needs of the century, is inadequate, and those familiar with the work must feel thankful for the existence of the Ladies' Guild attached to the Fund which makes the little money go further and supplies help more valuable even than cash. Last year, as the annual report shows, there were more new cases than ever before—a fact both encouraging and discouraging. "It is not so much the thought of the poverty but the realisation of the dreariness of the lives of so many of our beneficiaries, which haunts me," writes the chairman of the case committee, and the Guild is not so preoccupied with coal, medicine, spectacles, dentures, convalescence, education, and

clothing that it does not also think of occupation—something to pass the hours of inactivity which must be peculiarly dreadful when spent in unaccustomed poverty. It is something to know that if there is all this unhappiness there are also many who are trying to relieve it. The Guild asks especially for more members among the younger doctors' wives, and while funds are always needed—especially for such objects as dental aid—there is hardly any domestic gift for which a use cannot be found. Clothes, curtains, carpets, furniture, blankets, towels, toys—all these, as we have said before, will be gratefully received if sent to the Ladies' Guild of the R.M.B.F. at B.M.A. House, Tavistock-square, London, W.C.1.

#### HUMAN PERSONALITY

IN the Salmon memorial lectures, now published in book form,<sup>1</sup> Prof. Macfie Campbell makes a plea for the direct study of human personality. The more impersonal investigations of human beings, made by the experimental or the comparative method, leave gaps which cannot in his opinion be filled otherwise than by a broad historical approach to man as a social unit, revealing in his aberrations from normality the deeper forces within his nature. The clinical psychiatrist has more to contribute to the understanding of human personality than a knowledge only of the symptoms and treatment of illness. He need not yield his territory to the laboratory worker or other specialist. Schizophrenic illness supplies a paradigm for the demonstration of how the psychiatrist can bridge the gap between normal and abnormal, and bring light to bear upon the structure of human personality and the forces that mould it. It would be difficult to find elsewhere so readable and persuasive an argument for the prosecution of the broad psychobiological method of study in clinical psychiatry and psychology.

THE joint congress of the Royal Institute of Public Health and the Institute of Hygiene opens in Edinburgh on Tuesday next, and will continue throughout the week.

THE next session of the General Medical Council will open at 2 P.M. on Tuesday, May 26th, under the presidency of Sir Norman Walker.

H.M. King Edward VIII., following the example of his royal predecessors from William IV. onwards, has given his patronage to the Royal Society of Medicine.

<sup>1</sup> *Destiny and Disease in Mental Disorders*. By C. Macfie Campbell, M.D., Professor of Psychiatry, Harvard University. London: Chapman and Hall, 1935. Pp. 207. 10s. 6d.

COMMONWEALTH FUND FELLOWSHIPS.—Commonwealth fellowships in medicine have been awarded to Dr. W. M. Honeyman and Dr. M. S. Jones. Dr. Honeyman intends to work at Columbia University and Dr. Jones at the University of Pennsylvania.

GRADING OF MILK.—The new Milk (Special Designations) Order made by the Minister of Health comes into operation on June 1st. As explained in our issue of May 2nd (pp. 1016 and 1036) the existing four grades of milk will be replaced by three grades designated tuberculin-tested, accredited, and pasteurised. A memorandum setting out in non-technical language the effect of the Order and the way in which it will work has been issued by the Ministry (Memo. 197/Foods) and may be had at 3d. from H.M. Stationery Office or through booksellers.



## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### CI.—CONGENITAL HEART DISEASE

In congenital heart disease the abnormality of the heart is a stationary lesion, and we are little concerned with such possibilities as relapsing or progressive infection or increasing degeneration. Consequently in trying to foretell the outlook for any individual patient we are in the position of being able to base our opinion, with rather less doubt than in acquired heart disease, upon those fundamental points which govern prognosis in all forms of heart disease. These are, first, the compensatory changes in the heart itself developed to overcome the handicap of the congenital cardiac lesion; and secondly, symptoms of failure on the part of the heart to maintain the circulation adequately, particularly in response to effort.

On the other hand, although the cardiac lesion remains stationary, with the growth in the development and activity of the child the calls upon the heart to maintain the circulation are increased, and so the effect of the congenital abnormality becomes relatively greater. Even though the growth of the child may be automatically retarded, as in cardiac infantilism, it is too great for the heart to respond to, and premature death results. This is the common course of events in such patients as show early signs and symptoms of cardiac inadequacy.

Changes pointing towards improvement as the child grows are quite exceptional in congenital heart disease. A baby who is severely cyanosed at birth may become rather less so in the first year or so of life, but such an improvement is probably never sufficient to make much difference to the ultimate survival of the child. In a few instances a harmless murmur, usually that associated with a patent ventricular septum, will disappear in the first five years of life. Although this may be a matter of comfort to those concerned, it is not of real importance in prognosis.

In the individual case, where the congenital anomaly is of clinical importance there will be compensatory changes in the heart, chiefly those of enlargement to the right, with (in severe cases) precordial bulging and even engorgement of the liver. Of still more importance, because easier to appreciate in the milder examples, will be the occurrence of symptoms of cardiac inadequacy. These consist of shortness of breath and cyanosis. In the milder cases, where the reserve power of the heart alone is affected, these will appear only in response to effort; but in the more serious types the power of the heart is diminished even when the patient is at rest and the symptoms are persistent, although increased by exercise. Some care must be taken in judging the accuracy of a history of such symptoms, for where an uneducated mother is asked by each doctor who examines her child if it is short of breath or goes blue on exertion, it is not unlikely that in the course of years these expected symptoms will be imagined. Personal observation by the doctor is therefore of more value. The commonest congenital lesions associated with cyanosis are stenosis of the pulmonary artery and patency of the foramen ovale. In pulmonary stenosis there is enlargement of the right side of the heart with a harsh systolic murmur most audible at the pulmonary area. At the point of the maximum intensity of the murmur there is a systolic thrill. Patency of the foramen ovale is less common and

much more difficult to diagnose than pulmonary stenosis. It is not as a rule associated with any murmur and its presence has to be surmised to account for unexplained cyanosis of cardiac origin.

In a great many instances, particularly amongst children who have survived to school age, the most careful survey will show that the congenital lesion is not handicapping the heart in any way at all. Where the circulation is maintained efficiently in all circumstances, and the heart shows no signs of compensatory change, these facts must be taken to govern the situation, and the mere presence of some abnormal sound in the heart must be regarded as quite a minor matter. It is hardly sufficiently realised in how many examples of so-called congenital heart disease the function of the heart is unimpaired and the condition negligible. In those who have reached school age this type predominates, and at later ages its predominance becomes greater and greater. The two common forms of congenital cardiac abnormality which are characterised by the presence of murmurs with no trace of cardiac insufficiency are patent ventricular septum (*maladie de Roger*) and patent ductus arteriosus, when they exist as solitary lesions. In the first there is a systolic murmur audible over most of the cardiac area, including the apex, with its maximum intensity in the fourth left interspace next the sternum, at which point a thrill may sometimes be felt synchronising with the murmur. In patent ductus arteriosus there is in early years a systolic bruit in the pulmonary area, unaccompanied by cyanosis; later a diastolic bruit develops, giving the characteristic continuous "mill-wheel" murmur. A triangle of dullness may be elicited above the third left rib next to the manubrium, and opacity in this area may be detected radiologically.

#### SUMMARY

The prognosis in congenital cardiac abnormalities depends upon the presence or absence of evidence of cardiac insufficiency. Its presence is shown by shortness of breath and cyanosis; where these are persistent the outlook is worse than where they appear only in response to effort. In the group with cardiac insufficiency adult life is not likely to be reached. There is a heavy death-rate in infancy, and only comparatively few survive to school age. As the child grows the handicap to the heart and the tendency to respiratory complications increase. An occasional case of marked cyanosis may be seen in adolescence; in such instances the abnormality consists probably of combined pulmonary stenosis and patent interventricular septum. On the other hand the cases in which there is no evidence of cardiac insufficiency are more numerous than is generally recognised. In such the murmur is discovered accidentally, and the less stress laid upon it the better. Such children should not be sent to special schools or handicapped by unnecessary restrictions.

In the rarer forms of congenital heart disease prognosis should be attempted on the general lines laid down in the opening paragraph of this article. It is thought that in all forms of congenital heart disease there is an added risk of acquired heart disease, particularly of malignant endocarditis.

REGINALD MILLER, M.D., F.R.C.P.,

Physician to St. Mary's Hospital and the Paddington Green Children's Hospital, London.

## SPECIAL ARTICLES

**THE RESULTS OF  
COLLOIDAL SELENIUM TREATMENT  
OF CANCER**

REPORT OF AN INVESTIGATION BY THE MEDICAL  
COMMITTEE OF THE ROYAL CANCER HOSPITAL, S.W.3\*

In 1934 Dr. A. T. Todd published the results of his treatment of malignant disease by Colloidal Selenium, and the claims made were so striking that we considered it of the utmost importance that the method should be tested independently. At our request, therefore, Dr. I. P. Murray was appointed to treat a series of cases by Dr. Todd's method under the general supervision of the medical staff. Dr. Murray took up her appointment on Oct. 1st, 1934, but before employing the treatment she visited Bristol and spent several days there learning from Dr. Todd the details of his technique. Since that time Dr. Murray has treated under our supervision 70 patients with malignant disease along the lines laid down by Dr. Todd, and the results of this work follow.

During the ten months October, 1934, to August, 1935, 70 cases have received selenide treatment at the Royal Cancer Hospital. Records were kept of every case, and filed according to the selenide number which was also stamped on the registrar's records, so that the different sets of notes may be correlated. These records include a clinical history of the case, measurements of the growth where possible, and diagrams with a graphic record of the weekly blood count and dosage of colloid and X rays. No selection of cases was made; all of them were in an advanced stage of the disease, and with one exception all had had previous surgical, radium, or X ray treatment. Cases were treated both as in-patients and out-patients. From the out-patient clinic patients were seen by their particular physicians or surgeons at definite intervals.

TECHNIQUE

In certain cases a preliminary "toilet operation" was carried out (surgical removal of a reasonably large part of the mass). The treatment aimed at for each patient was: (a) ionisation course (for a period of 8 weeks); (b) radio-active selenide course (for a period of 3 weeks); (c) alternation course (for a period of 4-6 months); but certain patients did not live long enough to complete the treatment; others refused to complete it and yet others began treatment so late in the investigation that the treatment was not completed during the period under review.

(a) During the ionisation course eight weekly injections of sulphur selenide were given, followed in 48 hours by X ray treatment, each dose equal to 75 r. giving a total in 8 weeks of 600 r. The initial dose of sulphur selenide was 1 or 0.5 c.cm. and was subsequently increased weekly by 1 or 0.5 c.cm. or reduced, according to whether there had been any previous reaction.

(b) Three weekly injections of radio-active selenide were given, commencing with 1 c.cm. and increasing weekly by 1 c.cm.

\* The members of the Medical Committee are Lord Horder, Mr. W. Miles, Sir James Dundas-Grant, Dr. H. Robinson, Mr. R. H. Jocelyn Swan, Dr. Stanley Wyard, Mr. Cecil Rowntree, Mr. P. P. Cole, Mr. C. A. Joll, Mr. C. E. Shattock, Mr. A. Lawrence Abel, Mr. R. C. B. Ledlie, Dr. C. O. Worster-Drought, Dr. H. W. Gordon, Mr. D. H. MacLeod, Mr. C. D. Shapland, Mr. W. A. Mill, Dr. T. B. Vaile, Prof. E. L. Kennaway, and Prof. J. M. Woodburn Morison.

The duration of the different courses was not rigidly adhered to, for in certain cases it was thought necessary to prolong the ionisation course.

(c) During the alternation course the patient was given alternate weekly injections of sulphur selenide and radio-active selenide for a period of 4-5 months. Treatment was then discontinued for a short period.

Six hundred and thirty-six injections were given over a period of ten months. In every case a rigor occurred, either immediately or up to three hours following the injection, whenever a sufficiently large dose of sulphur selenide was injected.

Dr. Todd defines<sup>1</sup> "a true focal reaction" as "a definite but moderate aggravation of the symptoms produced spontaneously by the neoplasm" and states that this reaction "sets in 3-12 hours following the injection." A "true focal reaction" was never seen in this series of cases, even with large doses of the colloid.

One case of sulphæmoglobinæmia occurred during the administration of sulphur selenide.

This was in a female, aged 49 years, with advanced carcinoma of the anal canal. Owing to poorness of the general condition no colostomy had been performed. The bowels were kept freely open with large doses of laxatives and daily rectal irrigations. Selenide treatment was commenced on March 4th, 1935. On April 8th, 1935, the patient was noticed to be a leaden-blue colour, especially marked about the lips, finger-tips, ears, and mucous membranes. She had received six injections of sulphur selenide, the total amount of colloid given was 23 c.cm., which contains 0.092 g. of sulphur, and X rays equal to 450 r., over a period of six weeks.

Specimens of blood and urine were examined spectroscopically by Mr. W. V. Mayneord, D.Sc., physicist to the hospital, who made the following report: "The specimen shows a very well-marked abnormal band in the red, together with some broadening of the green line of the oxyhæmoglobin pair. There is no obvious band in the blue. On comparison with standard spectra this is very suggestive of sulphæmoglobin. No evidence of sulphæmoglobin in the urine."

No further sulphur selenide was given for four weeks: then 3 c.cm., which contain 0.012 g. of sulphur, were injected, and the blood was examined after a period of one week. Dr. Mayneord now reported: "The blood shows a very strong absorption band in the red at a mean position of 628  $\mu$ . Artificially prepared human methæmoglobin shows a band at about 640  $\mu$  and of different structure. Sulphæmoglobin prepared from human blood gave a band of mean position 627  $\mu$ . From the general nature and position of the absorption band in the patient's blood it appears therefore that the absorption is probably due to sulphæmoglobin."

The selenide treatment was discontinued and the patient's colour gradually improved. On June 26th, 1935, acute obstruction supervened and the patient died eleven weeks after the last injection of sulphur selenide.

DRUG TREATMENT

Each patient was given the following: (a) Dry thyroid extract 1/10 grain daily. (b) Sodium iodide 5 grains three times daily. (c) Mist. calci. thiosulph. 1 oz. three times daily. (d) Radiostoleum 6 minims daily.

The analgesics used were Allonal; Mist. aspirin, phenacetin and caffeine; Tab. amidopyrin co.; Dial. Opiates were given only to patients in extremis. Of the above drugs, mist. calci. thiosulph. and sodium iodide were in some cases discontinued owing to their laxative action.

<sup>1</sup> Brit. Jour. of Surg., 1934, vol. xxi.

**PATHOLOGICAL INVESTIGATIONS**

(a) *Blood counts.*—Weekly blood counts were performed on all patients during the ionisation course, and on alternate weeks during the radio-active selenide and alternation courses, in order to ascertain the reactivity of the patient, and, accordingly, the amount of colloid to be given.

Dr. Todd has stated<sup>1</sup> that “an increase, absolute, not relative, of the small lymphocyte and eosinophil cells is favourable” and to be regarded as evidence of reactivity. Three hundred and seventy-eight total differential leucocyte counts were carried out during the period of ten months. Weekly normal control leucocyte counts on members of the staff, estimated over a period of seven weeks at corresponding hours of the day, have shown considerable variation (1) between individuals, and (2) according to the time of day at which the count is made—e.g., relationship to meals. Charts of leucocyte counts performed on patients receiving the selenide treatment showed no correlation between the dose of colloid given and the corresponding blood count obtained in any individual case. It seems probable that the leucocytosis is due to septic absorption from the fungating growth independently of any effect of the colloid injected. It would seem also that the increase of lymphocytes is in direct proportion to the total leucocyte count, and in fact no absolute increase occurs.

(b) *Blood lipase.*—Blood lipase estimations by the Rona technique were performed monthly when possible. It had been previously claimed<sup>1</sup> that the blood lipase tends to be high in cancer, but not invariably, and that a lowering level is usually favourable, and an increasing level usually a sign of advancing growth.<sup>1</sup> Sixty-two blood lipase estimations were performed over the period of ten months. The normal blood lipase has an index of 15. An error of +3 or -3 is probably due to alteration of surface tension with varying atmospheric pressure. Patients with progressing growths showed a slight rise in the lipase level followed by a definite fall, and this might have been read as an index of regression of the tumour although, in fact, on clinical grounds they were obviously progressing. The conclusion reached is that this method of control is not of any great value.

(c) *Blister test.*—The cytology of the blister fluid produced by the application of a standard-size cantharides plaster has also been regarded as a test of reactivity of the patient's tissues to a standard irritation since “the findings of a good take with increase of endothelial, lymphocyte and eosinophil cells is also favourable. Increase of epithelial cells is said to be of no importance.”<sup>1</sup>

Fifteen blister-fluid counts were performed. In these 15 cases it was found that the application of a standard-size cantharides plaster did not always produce the required blister; also it was extremely difficult to obtain satisfactory specimens of blister fluid on which an accurate cell count could be performed.

**RESULTS OF TREATMENT**

Although the treatment is long and tedious most of the patients coöperated in every possible way. Apart from the rigors which may occur the treatment is painless if the injection is given directly into a vein.

Of the 70 cases treated, 41 have died (see Table II.); 21 are still under treatment; 7 have refused further

treatment; and 1, who received merely prophylactic treatment, is still without evidence of recurrence (see Table III.).

**TABLE I.—Results of Selenide Treatment**

CASES TREATED OCTOBER, 1934, TO AUGUST, 1935 = 70

Deaths .. ..	41
Alive .. ..	29
(a) Still on treatment .. ..	21
(b) Refused further treatment .. ..	7
(c) Prophylactic treatment .. ..	1

**CASES TREATED**

Disease.	No. of cases treated.	Disease.	No. of cases treated.
<b>CARCINOMA.</b>			
Cerebral tumour ..	1	Carc. rectum ..	13
Rodent ulcer of face ..	2	“ anal canal ..	2
Epithelioma of face ..	1	“ prostate ..	1
Carc. submaxillary gland	1	“ testicle ..	1
“ tongue ..	2	“ cervix ..	9
“ larynx ..	1	“ vulva ..	2
“ breast ..	20	Total ..	68
“ lung ..	1	<b>SARCOMA.</b>	
“ oesophagus ..	1	Sarcoma of skull ..	1
“ stomach ..	2	Retroperitoneal myxoma	1
“ pancreas ..	1	Total ..	2
“ jejunum ..	1		
“ colon ..	6		

Of the 41 cases which died, in 37 the treatment appeared to have no effect whatsoever, and this conclusion was confirmed by the post-mortem and histological findings. In the remaining 4 a transient alleviation of pain occurred.

Post-mortem examinations were asked for in every

**TABLE II.—Deaths (41)**

Index No.	Disease.	Duration of treatment in months.	Total dose of colloid given.	
			S.Se.	R.A.S.
1	Carc. rectum.	5	c.cm. 63	c.cm. 24
2	“	1	12	—
3	“ anal canal.	5	91	21
5	“ breast.	2	50	—
6	“ tongue.	2	42	—
7	“ cervix.	2.5	50.5	2
8	“ rectum.	1	7	—
9	“ cervix.	2	50	—
10	Sarcoma of skull.	0.5	6	—
11	Carc. submaxillary gland.	0.5	3	—
13	“ cervix.	0.5	6	—
14	“ rectum.	1	20	—
15	“ stomach.	4	57	8
16	Epithelioma face.	2	42	—
17	Carc. colon.	1.5	22	—
18	“ breast.	1.5	17	—
20	“ stomach.	2.5	41	2
21	“ breast.	1.5	42	—
22	“ pancreas.	1	12	—
23	Rodent ulcer face.	3.5	59	10
24	Carc. larynx.	2.5	20.5	8
26	“ oesophagus.	2	8.5	—
28	“ rectum.	6	24.5	10
30	“ breast.	1	10	—
31	“ rectum.	5	24	8
32	“ colon.	0.75	6	—
33	“ rectum.	1	11.5	—
36	“ breast.	2.5	17.9	—
39	“	0.5	1.5	—
41	“	0.5	3	—
42	“	4	26	5
46	“ colon.	0.5	6	—
48	“ anal canal.	2.5	26	—
49	“ jejunum.	3.5	17.5	6
50	Retroperitoneal myxosarcoma.	3.5	24	7
53	Carc. breast.	0.75	6	—
54	“ prostate.	2	19	—
57	“ breast.	1	6	—
58	“ cervix.	3	15.5	1
59	“ breast.	2.5	22	—
60	“ cervix.	1.5	6.5	—

Average duration of life from commencement of treatment .. .. = 2 months.  
 Average age at commencement of treatment .. .. = 56.3 years.  
 Average duration of symptoms previous to treatment .. .. = 18.2 months.

case, and in 22 permission was granted and the examination performed.

Of the 21 cases that are still alive and on treatment: in 3 the growth appears to be stationary; in 2 there was a temporary, but definite, diminution in the size of the growth, but this was not maintained and the growths are now progressing; in 10 there was a definite alleviation of pain and temporary improvement of the general condition with gain in weight; in the remaining 6 (Cases 64 to 69 inclusive) the period of observation was too short for any appreciable result to be shown (see Table III.).

TABLE III.—*Patients Alive (29)*  
(a) *Still on Treatment, August, 1935 (21)*

Index No.	Disease.	Duration of treatment in months.	Total dose of colloid given.		Result.
			S.Se.	R.A.S.	
			c.cm.	c.cm.	
4	Carc. sigmoid.	10	107	34	Growth—
7	Cerebral tumour.	5	90	13	Stationary.
25	Rodent ulcer face.	9	22	14	Progressing.
27	Carc. breast.	8	29.5	16	"
29	" "	8	40	7	"
34	" rectum.	4	31	17	"
37	" "	8	42.5	28	"
38	" breast.	8	30	15	Stationary.
43	" tongue.	6	47	7	Progressing.
45	" colon.	5	54	24	Stationary.
47	" cervix.	5	50	8	Progressing.
55	" rectum.	4	31	17	"
56	" testicle.	3	22	3	"
61	" rectum.	4	24	12	"
63	" cervix.	3	26	1	"
64	" breast.	2	28.4	—	"
65	" cervix.	1.5	20	—	"
66	" rectum.	0.5	4	—	"
67	" sigmoid.	0.75	1.5	—	} appreciable change.
68	" breast.	0.5	3	—	
69	" "	0.5	4	—	
(b) <i>Refused Further Treatment (7)</i>					
12	Carc. breast.	2	52	—	} Growth progressing.
35	" "	2	16	—	
40	" vulva.	2.5	21	3	
44	" "	3	22	2.5	
51	" breast.	3	20	4	
52	" cervix.	3	36	3	
62	" lung.	1	10	—	
(c) <i>Prophylactic Treatment (1)</i>					
19	Carc. rectum.	4	51	10	No recurrence 3 months.

The Medical Committee have pleasure in acknowledging Dr. Todd's courtesy in demonstrating his method of treatment to Dr. Murray. They wish also to record their appreciation of the care and zeal with which Dr. Murray has performed her duties, and the skill with which she has carried out a not always easy technique.

PORTH HOSPITAL, GLAMORGAN.—On May 12th extensions to this hospital were opened which included an X ray department and 28 bed-rooms for the nursing staff. Sir William Thomas has given 1000 guineas to endow a bed in memory of men who fell in the war.

DR. BARNARDO'S HOMES.—At the annual general business meeting of Dr. Barnardo's Homes, National Incorporated Association held on May 13th, the report showed that 118,113 destitute boys and girls had entered the homes to Dec. 31st last. A total of 15,988 children and young people were dealt with during the year, and 1464 boys and girls and babies were admitted—1332 permanently and 132 temporarily. The number in residence at the end of the year was 8182. These homes, it is claimed, have no red tape and no waiting-list; the need of the child is the only consideration. The address of the association is 18, Stepney-causeway, London, E.1.

## INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE

(Continued from p. 1153)

At the meeting of the section of kinesitherapy on May 13th, held at the house of the Royal Society of Medicine and presided over by Dr. JAMES B. MENNELL, a paper was read by Major C. R. DUDGEON on

### Low Backache

He said that he proposed to make a general survey and to select certain points for particular attention. In the past, cases of low backache had been treated by applying hot irons, belladonna plasters, and liniments, and by all sorts of people; by the time the cases came to the practitioner of physical medicine the primary symptoms had become masked, and secondary symptoms had become well established. It was thus often very difficult to find out the nature of the primary causal factor in a given case. If low backache had lasted a considerable time, one condition which frequently became engrafted was that of neurasthenia, due to the long-continued pain. So obtrusive was the neurasthenia sometimes that the primary backache was almost forgotten. Yet it was the latter on which attention should be concentrated, because no efforts directed to curing the neurasthenia were likely to succeed until the cause of the backache had been discovered and treated. In an acute case it was often very difficult to arrive at a diagnosis, because the patient's only answer to the various manipulative efforts to localise the trouble was: "that hurts." When the patient presented himself to the physician he had probably been brought straight from bed to keep the appointment, and on his journey had sat on hard and uncomfortable seats in 'bus or train; and it was then good practice to put him on a bed for a time and apply infra-red rays or hot wax, and some massage for half an hour. The patient's relief was often so great that subsequent examination was much more revealing. Major Dudgeon attached considerable importance to an accurate history, particularly as to habits or unusual occurrences; not the long story of how someone left orange peel on the pavement and the twist the patient got from stepping on it, but rather an account of his general mode of life, or any periodic strains he had undergone. An instructive example was the following.

A woman of middle age complained of backache recurring on and off for several years. She said that her activities consisted of ordinary household duties. The diagnosis made was mild sacro-iliac strain, and the treatment was successful. But she returned with recurrences time and again. Eventually, after close questioning, it was ascertained that occasionally she did some glove-making at home, and to work the machines she had to adopt a cramped attitude for considerable periods. The attacks coincided with the bouts of glove-making, and when she followed the advice to stop this work the attacks of pain also ceased.

Low backache could often be classed as an occupational disease. On a cold winter morning backache might follow the laborious cranking of a motor-car. Some other causes were not so obvious. Motoring papers had had much to say recently about the need of having "anatomically shaped seats"; some recommended special rubber sponges which fitted into the back, pneumatic cushions, and so on. Generally speaking, the driver of a luxurious modern car took up a lolling attitude, probably with his lumbar curve reversed. At a stop he might get out,

stretch himself, and complain of backache; and at the end of a long journey he might be so distressed that his condition called for treatment. Passengers were not so much affected as they could relax and change their postures. The driver bestowed upon himself a series of small traumata in a false position, a factor being frequent application of the brake pedal. The pain in all but one of the cases of this kind which Major Dudgeon had seen was on the right side. One case of severe pain in the region of the fifth lumbar nerve was due to the tilt of a driver's seat, the springs having given way on one side. Previous treatment had been ineffective, but when the seat was put right his pain was cured. Mining was an occupation in which these cases occurred frequently; another was in small printing establishments, in which a man might perform a high treadle action to motivate a fly-wheel. Nurses who lifted heavy patients also tended to suffer from low backache. During the war a number of cases of so-called lumbago were due to the adoption of a stooping attitude by the occupants of shallow trenches who were sometimes burdened with a heavy pack. In cases of recurrent backache it was always wise to search for summations of slight traumata extending over considerable periods.

Treatment of low backache could be grouped as: (1) means to increase or to restore mobility; (2) means to prevent undue mobility or malposture where this was diagnosed as the cause of the pain; (3) means to stimulate local metabolism and decrease spasm.

*Means to increase or restore mobility.*—Various forms of manipulation and gymnastics were included in this group. Manipulation could be divided into (a) forced manipulation, usually under anaesthesia, and (b) the more gradual forms, including the loosening by shaking or otherwise of various parts. It was easy to abuse manipulation; in some conditions it was not only contra-indicated, but useless. A patient with fibrositis, for instance, should never be manipulated. Often manipulation was used as a shot-gun when a target rifle should have been employed. "Shaking loose" and gymnastics played but a secondary rôle in the treatment of low backache conditions. After undergoing manipulation, especially extensive manipulating, the patient should be given a respite from all weight-bearing functions; his musculature could be maintained in a vigorous condition by giving him functional exercises to carry out without weights. The muscles of the lower back were so strong, and spasm in them was so often present that, usually, it was unsatisfactory to manipulate them except under anaesthesia so deep as to ensure really good muscular relaxation. Physical training and re-education were of the first importance in the treatment of the low backache in which wrong posture was a definite factor.

The *prevention of malposture* should include all kinds of causes. Mobility might be excessive, as in constantly recurring sacro-iliac strain, or less than normal, as in patients with long transverse processes of the fifth lumbar vertebra, one of which impinged on the ilium. The aim should be to limit this movement by providing a support, or, as in lordosis, to properly distribute the strain. Webbing, with back plates, could be used, and excellent types of surgical belts and corsets were now available, which might be modified to suit the particular case. These supports must be made of inextensible material; the modern elastic or suspender belts were useless. The belt should fit firmly over the pelvis and possess means of rapid adjustment, so that most of the

counter-pressure was taken from that part of the belt or corset which was below the anterior superior spine—the only firm origin of support. Modifications could be carried out by means of front and back plates of celluloid, ebonite, or supports, such as those made of red fibre, which could be made up on the spot and fitted with a strut. Women of childbearing age who had suffered considerably from low backache should be directed to report pregnancy, for low backache was likely to recur as lordosis increased. A belt fitted with a generous back plate and adjustable to conform to a progressively altering contour, should be fitted and every effort should be made to maintain the lumbar curve during confinement and at the puerperium.

For the *stimulation of local metabolism and decrease of muscular spasm* Major Dudgeon favoured the use of pneumatic cupping which he had used with great success. The affected area of the back was thickly smeared with vaseline, and the cup was applied and then lifted, bringing the skin with it, when a sliding movement of the cup was carried out. The process might occupy ten minutes, at the end of which a definite hyperæmia was present over the area; this treatment was useful for abolishing or reducing spasm and coccydynia. The wax pack, introduced from Sweden, was also valuable. A spongy cellulose sheet which had been impregnated with wax by the makers was put on the back of the patient and covered with an electric heater. It acted in the same way as a wax bath, but without its inconvenience. The wax was left on after removing the source of heat. Muscular spasm was thus reduced, and the skin was left in an ideal condition for subsequent treatment. If cases of low backache radiating from a single sensitive spot did not yield to ordinary measures, ultra-violet rays up to the third degree of erythema might be efficacious.

Dealing with the question of coöperation by the patient, Major Dudgeon said sometimes the latter caused or aggravated the painful condition by attempts to help himself, for example, by doing gymnastics. For correction of posture or maintenance of mobility, the patient's help was essential. The type of bed used should be ascertained. A sudden change from a sagging feathered bed to a more rigid mattress might cause pain. Sometimes a lumbar pillow, or one between the knees was helpful. Sufferers from low backache should be told never to sit in a lounge chair, nor to loll in any chair, and not to choose the corner seat in a train.

Mr. A. L. P. JEFFERY demonstrated, by means of ingenious models, the mechanics of a number of the deformities and malpositions of patients complaining of low backache. He spoke of the importance not only of remedial postures and exercises, but of correct deportment and of a recognition of the lines of stress and weight-bearing. He described and demonstrated his methods of teaching students the essential points in the differential diagnosis of low backache.

On Wednesday, May 13th, with Dr. E. P. CUMBERTON (London) in the chair, a meeting of the section of electrotherapy was devoted to a series of papers on

#### SHORT-WAVE DIATHERMY AND ARTIFICIAL FEVER THERAPY

Dr. E. SCHLIEPHAKE (Giessen, Germany) gave an account of Ultra-short Waves in Internal Medicine. He said that ultra-short waves might be expected on theoretical grounds to have special depth effects and also specific effects. An increase of depth effect

had been found in the homogeneous di-electric but was much more pronounced in the substrata. Thus the distance of the electrodes from the skin determined the ratio of the heat produced in deep-lying areas and in the surface. The short-wave field directly affected certain ions, molecules, and colloidal suspensions, while adjacent parts of a different nature might be passed over. Hausser, Kuhn, and Giral had shown that side chains within a complex molecule might be affected independently. In fresh muscle an increase of hydrogen-ion concentration had been produced by short-wave penetration and the shorter the wave the greater the increase produced. Short-wave therapy was not just heat therapy. In some cases immeasurably small heat development had lasting curative effects; in others improvement had resulted where the use of heat and diathermy might have led to aggravation. The speaker had been the first to demonstrate the special effect of ultra-short waves on boils and carbuncles; demarcation, fusion, and expulsion of necrotic material was hastened by this means. He had treated 40 cases of pleural empyema and abscesses of the lung by short-wave therapy. Only two had died and in them the original disease had been peritonitis. These results were to be compared with a previous mortality of over 60 per cent. with medical and over 35 per cent. with surgical treatment. The dosage was especially important; dosage too weak had no effect, while overdosage broke down the leucocytic protective wall and the blood stream might become infected. Dr. Schliephake had had favourable results from treating rheumatism and arthritis without raising the temperature excessively, and he attributed this to the wave-length (12 metres) which he had used. Other investigators had used 30 metres. Only very weak doses should be used in the treatment of vascular diseases. Good results had been reported in angina pectoris, myocarditis, arterio-sclerosis, and spastic gangrene. Other promising fields were hypertrophy of the prostate, certain forms of tuberculosis, diabetes, and diseases of the nervous system. The scientific investigation of these fields would have to be pursued extensively and diligently without undue optimism.

Dr. RICHARD KOVACS (New York) spoke on the Clinical Comparison between Diathermy and Short-wave Diathermy. He said that in the United States short-wave diathermy had been introduced by the manufacturers. Small concerns with no experience of electro-medical apparatus had rushed into a promising field and sales propaganda had been unscrupulous. The consequence was that many inexperienced physicians had been saddled with apparatus which was both unstandardized and dangerous in its possibilities. Though competent men had by now carried out research and clinical work, the place of short-wave therapy would not be determined for several years. Short-wave diathermy differed from conventional diathermy in its greater powers of penetration and heating. In their effect on purulent skin infections he believed that short waves resembled other ways of heating and could not be considered specific. He considered short-wave diathermy safer than conventional diathermy though it had dangers—e.g. burns might result from a condenser effect by droplets of sweat. No flexible metal electrode should be used without interposition of a pad; coagulation at a depth without a burn on the surface was a further possibility. Short-wave diathermy was convenient in that the electrodes could be applied quickly and treatment could be

carried out over curved surfaces, wounds, and through plaster casts. The fact that this treatment could be administered through clothes, although advantageous to the expert, might tempt the beginner to carelessness and neglect of the rule that parts must be inspected before and after treatment. Conventional diathermy had the great advantage that in local treatment the dosage could be roughly gauged by a millimetre, and that the same dosage could be repeated. In short-wave treatments the skin sensation of the patient was the only guide for regulating current input. There was no proof that the maximum dosage was passing and there was no safeguard against burning of the skin or against damage to deeper parts in cases of deficient skin sensation. This crude method of dosage regulation was the greatest drawback of short-wave therapy, and until it was remedied many local treatments would be administered on the principle of hit or miss. In short-wave fever treatment the rise of temperature was a reliable guide. Many patients liked the absence of all faradic sensation in short-wave treatment. The speaker had had intelligent patients who doubted whether the short waves were as effective as conventional diathermy. He thought that some beneficial effects of diathermy might originate from reflex action through the skin. From the standpoint of ultimate results short-wave diathermy gave no proof of better results in the cases for which diathermy was usually of value.

Dr. W. M. SIMPSON (Dayton, Ohio) described his experience of Artificial Fever Therapy of Syphilis and Gonococcal Infections. He said that since the introduction in 1919 of malaria treatment for general paralysis of the insane the therapeutic effects of fever had come to be recognised. In a search for means of inducing fever he had tried hot air, hot lamps, hot blankets, and then short-wave therapy, and, in order to avoid burns from the condenser effect of sweat droplets during this last form of treatment, he had passed a current of hot dry air over his patients. An accidental omission to switch on the wave therapy one day had revealed that a rectal temperature of 106°–107° F. could be maintained by the hot air blast alone. He had therefore designed an apparatus which passed hot air of regulated flow, temperature, and humidity over the patient. The patient lay with only his head outside the apparatus; he was given from 2–5 litres of 0.6 per cent. saline, iced, to drink to replace the loss by sweating. Treatment had been given to 191 cases of syphilis and gonorrhoea. Twenty-one out of 27 cases of G.P.I. had obtained complete clinical remission; they had received injections of arsenic or bismuth 20 minutes before each of ten weekly sessions of artificial pyrexia. Each session lasted five hours and the course was followed by further 20 weekly injections of antisyphilitic preparations. Successful results had also been obtained by similar treatment of primary chancres; and the crisis of tabes had been relieved. For the treatment of gonococcal arthritis, salpingitis, and urethritis a rectal temperature of 106°–107° F. was induced for 5–7 hours twice weekly, and had good results. He considered the short-wave therapy apparatus too dangerous to be in the hands of any without expert training.

Dr. F. LOBRE (Paris) spoke about the Treatment of Salpingitis, Metritis and Gonococcal Metritis by Ultra-short Waves. He had concluded from experiments that the diverse effects obtainable by ultra-short wave therapy depended on their mode of application and were attributable to a transformation of the magnetic field into a current within the tissues.



Different cases required different applications of the waves; metritis and gonococcal metritis required treatment for many hours, gonorrhœa in man was treated by a local temperature of 41° C. for 10–12 hours, while salpingitis responded best to two-minute doses which were followed by reaction.

Dr. A. HALPHEN (Paris) read a paper by Drs. J. Auclair, M. R. Dreyfus, and himself on the Treatment of Gonorrhœa by Short-wave Heat Therapy. He said that the susceptibility of the gonococcus to heat was generally known. Heat therapy was therefore rational, and short waves seemed the best heating agent. Local treatment, although not suitable for gonococcal arthritis since this was but a manifestation of a systemic disease, could be used for all genito-urinary organs which could possibly harbour gonococci. By means of a special apparatus they had been able to effect a cure in almost all such cases, or at least to control the disease within a week of starting treatment. A temperature of 41° C. during 10–25 hours was essential. The method could be applied to acute or chronic urethritis and their complications in man, to gonorrhœa in women, and to vulvo-vaginitis of children.

Dr. W. D. McFEE (U.S.A.), discussing Electropyræxia, spoke of the use of this therapy to induce hyperæmia, to quicken chemical reactions in the body, and to foster movement of leucocytes. He said that fever therapy appeared to arrest the progress of cerebro-spinal syphilis and tabes. It was of value in some cases of gonorrhœa, more especially in those chronic cases where other treatment had failed; in disseminated sclerosis, asthma, and angiospasm. Contra-indications included recent tuberculosis, an age greater than 60 years, cardiac or renal insufficiency, and advanced dementia in general paresis.

Dr. W. KERR RUSSELL (London), speaking about Electropyræxia produced by Short and Ultra-short Waves, gave a detailed account of his experience of these methods during the past year. The ultra-short wave apparatus generating waves of 12 metres, although fitted with an accessory hot air circulating system, had given some difficulties: burns had occurred not only from accumulation of sweat but also from overheating of the sacrum; sometimes movements of the hands had produced sparks; and once extensive burning had been caused in a case of disseminated sclerosis with impaired sensation. The patients were admitted to hospital the day before or early on the day of treatment. The usual observations were made, including taking the blood pressure and an examination of the urine. No solid food was allowed on the morning of the treatment day and an enema was administered. Thick woollen socks and sponge rubber pads on the heels were necessary to prevent pressure sores. Restlessness during treatment was countered by Omnopon. The pulse was the best indication of the patient's condition, and signs of circulatory or respiratory embarrassment demanded that treatment should be stopped. The temperature should be kept below 107° F. for fear of heat-stroke. One fatality had occurred in a woman of 24 suffering from the parkinsonian syndrome; she had died about ten hours after receiving 1½ hours' treatment. Forty-nine cases had been treated, which included 24 of disseminated sclerosis, 12 of rheumatoid arthritis, and others of encephalitis lethargica and paralysis agitans, *B. coli* cystitis, asthma, gonorrhœa, chorea, and brachial neuritis. It was too early to judge the results. Some cases of disseminated sclerosis and post-encephalitic parkinsonism seemed better after treatment, and in a child of 8 with chorea all move-

ment had ceased after the first of four treatments. The speaker considered that electropyræxia should be administered only by expert doctors and with the help of specially trained nurses.

Dr. E. WEISSENBURG (Vienna) agreed with the French workers that very weak doses could produce definite results.

Dr. SCHLIEPHAKE considered that some cases required weak doses, others strong. Both the case and the dose must be selected.

In the afternoon of May 13th at a meeting of the section of electrotherapy held with Dr. E. P. CUMBERBATCH in the chair, papers were read on the

#### Physical Aspects of Short-wave Therapy

Mr. B. S. GOSSLING (London) discussed some Physical Aspects of Ultra-short Wave Technique. After commenting briefly on essential differences of outlook between therapy and radio-engineering he surveyed those aspects of the apparatus which had most effect on the technique of operation. An ultra-short wave therapy apparatus could be divided into four parts: the oscillation generator, the coupling, the application system including the electrodes, and the patient. The purpose of the high-frequency generator was to liberate energy in the patient. A simple calculation showed that only a small proportion of the available energy reached the patient, and that if changing technique caused a large proportion to do so dangerous conditions might arise. A generator, for instance, might have an output of 200 watts. That represented approximately the production of heat at the rate of 3000 gramme calories per minute, or the rise of 1° F. per minute in 12 pounds. Such energy if spread over the body would cause a rise of 1° F. in about 10 minutes, or if liberated in local treatment in a small mass of tissue a rise of several degrees a minute. The connecting system usually consisted of more or less parallel wires. Unexpected effects might be produced in them in special circumstances. If the length of these wires was a quarter of a wave-length, if, for example, they were 3 to 5 feet and the wave-length 6 metres, they might constitute a powerful transformer. Then a certain current at a certain voltage might enter at one end and quite a different current at a different voltage come out at the other. This transformer action could only occur if there were a marked difference in conditions at the two ends, one end being electrically more open than the other. The adjustment which had to be made at the generator end to obtain resonance would always close or open that end in agreement with the opening or closing at the patient end. In this way the output might be automatically adjusted to the geometrical form of the tissue. Considered in electrical terms, a patient generally amounted to some 10 ohms of resistance. As the current usually passed through the tissues in the course of treatment was only a few amperes the voltage required to drive that current could not be more than 100 volts or so, and the field strength in the tissues only a few volts per centimetre. The application might be made by the condenser field or the coil field method. In the condenser field method the patient was separated from the electrode plates by one or two centimetres. At the 6-metre wave-length the voltage required to drive an ampere through a centimetre cube of air was 40,000 volts, four hundred times as much as a cubic centimetre of tissue needed. Only a small proportion of the voltage therefore was applied to the patient, and it could be used to best advantage if the air gap were

small, the resistance of the patient great, and small electrodes used. The action of the alternating magnetic field of the alternating current in the coil was to produce in the peripheral regions of the tissue a voltage which drove a current round in a ring. The current had not to cross the air gap and the voltage required was low. The greatest effects were obtained here if the resistance of the patient were as low as possible. The effect of the coil tended to be superficial, while with the condenser, though possibly less intense, it could be deeper. Mr. Gossling mentioned that a weak field acting on a low resistance produced an appreciable current; he was tempted to speculate whether a nerve, acting as the conductor, might have set up a rectified current within it. The passage of even a small continuous current along a nerve could have a very marked effect on its sensitivity.

Dr. KARL M. WALTHARD (Geneva) spoke about the Heat Generated by High-frequency Currents. In the course of short-wave treatments he had wanted to gauge the amount of energy transformed into heat in the body. He had carried out experiments in which he had put glass vessels of saline of different sizes and shapes between the electrodes of a short-wave apparatus. He had then ascertained the heat generated at various strengths of current. He had not been able to determine the distribution of heat within the vessels.

Prof. B. ORNSTEIN (Vienna) described a special apparatus for generating short waves.

Dr. H. J. TAYLOR (London) had tried to ascertain whether wave therapy of any particular length had any specific effect on mouse tumours. He had been unable to detect any change in the dielectric constant of the tissue at any wave-length. Necrosis might be induced in mouse tumours by ultra-short waves, but this could only be attributed to the heat generated. He had determined the minimum effective dose, and had found it to be ineffective if a cold blast of air were blown on the tissues during treatment; one-tenth of the effective dose repeated 100 times had no effect. The necrosis could be produced at various wave-lengths. He had never seen the changes in the tissue limited to the tumour only.

Mr. B. D. H. WATERS, M.Sc. (London), described the Thermionic Valve as a Generator of High-frequency Currents. He told how the thermionic valve had evolved since its invention by Fleming in 1904 to the triode used in wireless and for the generation of high-frequency currents.

Prof. F. H. HOPWOOD (London) commented that the effects of ultra-short waves on the heterogeneous systems of physiology differed profoundly from those obtained in a homogeneous medium in the laboratory. In life local effects might, perhaps by trigger action, lead to further chemical actions.

---

**NEW SUSSEX HOSPITAL FOR WOMEN AND CHILDREN, BRIGHTON.**—In her broadcast appeal made for this hospital recently, Miss Irene Vanbrugh stressed the need for more private wards, and money to pay off the debt incurred in the building of the new nurses' home. The home is to be opened by Lord Leconfield this week. Princess Louise Duchess of Argyll has consented to become president of the institution. No fewer than 822 patients were admitted last year; 722 X ray examinations were made; 8700 treatments were given in the massage and electro-therapeutical department; 2014 investigations were made in the pathological department; and out-patients numbered 4489. Nearly all these figures show an increase compared with 1934. The deficit has grown to £469 as compared with £291 despite every care.

## VIENNA

(FROM OUR OWN CORRESPONDENT)

### THE NEW SYSTEM OF HEALTH INSURANCE

LAST July I described a new system of sickness insurance which had lately been introduced in Austria. It was originally intended to come into force at the beginning of 1936, but as it was a complete revolution and as there was justifiable fear that a serious hitch might follow rapid adoption of the new principles, the authorities decided to wait another three months before completely destroying the old institutions. Thus the public, the medical profession, and the officials would find it possible to adapt themselves to the new situation, and to find out what was useful and practical and what measures should be discontinued. On taking stock of the new system last month, it was believed that certain of the innovations were working satisfactorily. A merger of three sickness insurance institutes, comprising the employees of the commercial, the industrial, and the financial companies and businesses, has been organised, called *Arbeitsgemeinschaft der Angestellten-Krankenkassen* (coöperative institute of employees' sick clubs). All the medical men previously employed in these individual *Krankenkassen*, either at a fixed salary or on a capitation basis, can now be consulted without restriction by all members, who can choose from the 258 general practitioners and 114 specialists the one they think suits them best. There are also 92 dental surgeons at their disposal, whom they can consult free of charge, and 244 other dentists to whom they have to pay a small fee. The Coöperative Institute pays all medical men and dentists a certain fee for each consultation or call. This is not a fixed amount; it varies according to the finances of the institute, for it has been agreed with the medical profession that a certain proportion (25–30 per cent.) of its income shall be set aside for medical aid. This includes all the expenditure on fees, for medical, obstetrical, and dental treatment, therapeutic appliances, medicines, and hospital accommodation, as well as on the pensions of doctors who previously belonged to the insurance societies and are not to work under the new arrangement. The dependants of the insured persons are also entitled to obtain medical aid, but they have to pay the chosen doctor part of the fee (about 40 per cent.); the other part is paid by the institute. At present a unit of about 1s. 4d. for the ordinary consultation and 2s. for a call at the patient's home is thought to be covered by the means at the disposal of the institute, the fees for specialists being about twice that sum. But it is clearly understood that at the end of the year a committee of representatives of the profession and of the institute will meet to consider the financial situation. This committee is entitled to reduce these fees if necessary; it may however increase them, if the money is available out of the 30 per cent. premiums paid by the members. In no case will public funds be called upon to make ends meet, as was the custom previously. In order to control the working of the new system, and to prevent abuse of any kind—e.g., too frequent calls, and too much or too expensive treatment—a controlling body of medical men and officials of the institute has been appointed. Thus it is hoped that the profession, although forced to accept the lowering of fees, will find the new arrangement not wholly disappointing, while the insured employees will be able to select the doctor they want, and obtain more personal treatment.

The arrangements with the *Arbeitsgemeinschaft* of the labourers are based on somewhat different principles. Here it has become necessary, owing to the large number of insured members and the variety of their homes, to organise a special plan of appointments of medical men. In each district a certain number of doctors will be selected to minister to the needs of the insured members in such a way that the work will be more evenly distributed among them. Not all practitioners, however, will be admitted to the list of appointments. It is understood that medical men already working under the insurance system, or in the Government insurance institutes, or in the municipal services, will not be eligible in this labourers' coöperative institute. But as the dependants are also entitled to medical aid—their number is calculated at about 75,000—quite a large number of practitioners will have to be appointed to that list. It is therefore expected that the new system will allow the authorities to enable the large majority of practitioners to make some sort of living out of the new arrangements, whereas hitherto only about 25 per cent. of the Vienna doctors were employed in the services of the *Krankenkassen*. The arrangements concerning the fees are nearly identical with those of the *Arbeitsgemeinschaft* of the town employees: 25–30 per cent. of the income from the premiums of the members will be devoted solely for medical aid as explained above. But the fees will be lower by about 30 per cent.—a unit of 1s. for the office consultation, 1s. 6d. for the call at the patient's home, and about double the fees for the specialists. Again, a financial committee will regulate the value of the unit of fees at the end of each year, with power to cut it down or to raise it as is required or possible, and a control committee will see that no untoward or too liberal use of the funds is made by the members or doctors. In order to limit the expenditure on drugs each physician will be free to prescribe only up to a certain sum for each patient. If his prescriptions exceed this limit, he will be asked to refund the excess to the *Krankenkasse*.

One of the chief advantages to the profession under this system is the arrangement that all associations, committees, and corporations are based on the principle of collaboration between the profession and the insurance body, each delegating to every committee an equal number of representatives. This is expected to ensure a smooth-working organisation for the benefit of all concerned. It is however a regrettable drawback that a number of doctors will have to remain outside the list of those eligible. The arrangements here sketched will apply not only to Vienna but to the whole of the Republic. In the provinces where the overcrowding by medical men is not so serious as in the capital, the prospects of a fairly satisfactory state of affairs are very hopeful, as far as the finances of the doctors are concerned. But in any case, the entire arrangements are regarded as tentative, with a view to testing them for a year or two, before they are made permanent by legislation.

#### FOUNDATION OF AN AUSTRIAN SOCIETY FOR MICRO-CHEMISTRY

A few days ago there was founded in Vienna a society for micro-chemistry, which is intended to act as an international centre for this new branch of science. Prof. Molisch, the physiologist and botanist, is the president, whilst Prof. Emich of Graz, the originator of modern micro-chemistry, acts as honorary

president. The chiefs of thirty institutes of chemistry and pharmacology all over Europe have been elected as members, amongst them Prof. Böttges (Germany), Dr. Feigl (Vienna), Prof. Komarowsky (Russia), Prof. Miolatti (Italy), and Prof. Nieuwenburg (Holland). A museum for micro-chemistry is also being organised in the Vienna Pharmacognostic Institute, and all industrial and chemical institutions and laboratories will be free to ask for gratuitous advice on micro-chemical problems. A collaboration between medical, technical, and industrial research workers and students is aimed at so as to promote the use of these important new methods in everyday problems.

## PARIS

(FROM OUR OWN CORRESPONDENT)

### THE LEADERS OF FRENCH MEDICINE IN THE NINETEENTH CENTURY

THE theatre of Vieux-Colombier in Paris was filled the other day by an appreciative audience enjoying a lecture by Prof. Mauriac, of Bordeaux, on the influence on their time of the medical leaders of the nineteenth century. As far as the world of letters was concerned, he was inclined to think that the austere influence of great clinicians such as Laennec was much less than that of such fantastic figures as those cut by Mesmer, by Gall, the inventor of phrenology, and by Lavater, the creator of physiognomy. Such literary giants as Cabanis, Balzac, and Goethe were carried off their feet by the airy fancies of these three worthies, and Prof. Mauriac has come to the cynically dismal conclusion that the doctor who wishes to become influential and famous will do so with the greatest ease if he invades those ill-defined regions where the mysterious begins, and where medicine joins hands with faith and superstition. "In order to make a name, a more certain effect can be obtained by titillating the pituitary mucosa and by wielding a rod with dexterity than by practising orthodox medicine. Charlatans attract because there is something inexplicable about them." Prof. Mauriac's character sketches included Pasteur and Charcot. Pasteur seems to have been rather a dull dog. After dinner, when his pupils collected about him, he would take forty winks if the conversation turned on literature and politics, but he would wake up promptly when they discussed shop. "A one-book man, but how great a book!" Pasteur did, indeed, once put up for election to the Senate, but he was beaten by a politician; this was doubtless for the best, if not for the politician, at least for science. Claude Bernard and Grasset were influential only on account of their work, whereas Charcot scored most heavily by virtue of his personality. While he lived, the prestige he enjoyed was tremendous, but events have destroyed three-quarters of what he built; and hysteria, the disease he unknowingly created, has died with the last of his disciples. One of the points to which Prof. Mauriac returned more than once was the influence of medical pioneers on contemporary literature, the most recent example being Duhamel's indebtedness to Charles Nicolle.

### THE TRAFFIC IN MEDICAL PRACTICES

Dr. Paul Boudin, legal adviser to *Concours Médical*, has summarised in a recent issue of the journal, for the benefit of the younger generation of French doctors, the legal aspects of the traffic in medical

practices. The law adopts a none too sympathetic attitude towards it, refusing to accept the goodwill of a practice as a commercial commodity. In other words, the personal confidence a doctor enjoys in his practice cannot legally be assessed in terms of money. But this technical obstacle to the exchange of money for an exchange of practices can in practice largely be overcome by selling the lease of a house, equipment, &c., instead of the goodwill. The seller may also undertake not to practise any longer in the district in question; and when differences of opinion arise between the seller and the purchaser, it is customary to settle them by arbitration conducted by three colleagues, one chosen by each of the disputants, the third by the first two. The proceedings of the three are characterised more by common sense and an intimate knowledge of the conditions of medical practice than by any great learnedness of law. But it may happen that the dispute has ultimately to be settled by a properly constituted legal tribunal. In his advice to the participants in the negotiation of a practice, Dr. Boudin seems to credit the purchaser with more innocence and less perspicuity than the vendor. The purchaser must be particularly beware of him who shifts frequently from one practice to another, combing out and removing all the operable tonsils and appendices in a district, showing substantial returns for his operative activity, and then selling the newcomer the practice swept clean of these appurtenances. Another undesirable vendor is he who has left his practice for his practice's good, his professional shortcomings, his private life, or political or religious quarrels having constituted a very undesirable legacy for the newcomer. Dr. Boudin remarks that in his youth doctors were prepared to wait patiently till patients reposed confidence in them, and he adds that it is with reason that the law courts are inclined to look askance at disputes over the traffic in medical practices.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

### INSANITARY SCHOOLS IN COUNTY DUBLIN

GIVING evidence last week before the Local Government (Dublin) Tribunal, Dr. J. A. Harbison, medical officer of health for County Dublin, commented on the overcrowded and insanitary condition of certain school buildings in the county. He said that in 1934 he had reported three schools in the borough of Dun Laoghaire as being overcrowded, but nothing could be done in the matter. The floor space per pupil required in the Irish Free State was lower than that in most other countries. He thought that the total cost of building schools should be borne by the State. It was as much a function of national education as the provision of teachers. Bad school accommodation must be removed as part of the general scheme of preventive medicine. It is not only in County Dublin that insanitary school buildings are found. In the last published report of the Department of Local Government and Public Health it was stated that defects in sanitation were general in rural schools. It is not clear whether the responsibility for this state of affairs rests with the Department of Local Government and Public Health or with the Department of Education, but it is discreditable to both that it should be allowed to continue.

## MEDICINE AND THE LAW

### The Title of "Nurse"

REGISTERED medical practitioners naturally feel aggrieved when some impostor "wilfully and falsely" takes the title of "doctor of medicine" or "surgeon" or, in the words of Section 40 of the Medical Act, "any name, title, addition or description implying that he is registered under this Act." They can therefore sympathise with the registered nurses who have a similar ground of complaint when, as in a recent murder trial, someone is described as "Nurse Waddingham" whose name is not in fact upon the State Register. Newspaper reports of the coroner's proceedings upon the death of Miss Baguley indicated that Ronald Joseph Sullivan, who assisted "Nurse" Waddingham in conducting the "nursing-home," had the letters "S.R.N." printed after his name. Neither of the two was a registered nurse or a State certified midwife. A visiting-card is said to have shown the letters "S.R.N." and "S.C.M." after their respective names. Since doctors usually desire to use the services of registered nurses only, or at least to know when for some special reason they are employing an unregistered "nurse" it is disconcerting to find evidence of such impostures. How far is the doctor obliged to go in verifying the qualifications of nurses or midwives? A few years ago an impostor not only borrowed the name of a registered medical practitioner, but also stole his framed diploma and exhibited it to assist his fraudulent impersonation. The exhibition of a registered nurse's certificate upon the walls of a nursing-home might equally not be conclusive. The principle of professional registration must evidently be protected by vigilant and incessant action to expose fraud. This involves an elaborate organisation and considerable expense for prosecutions. Not all professions are equipped on the necessary scale. To return to the case of R. v. Waddingham, it was hardly possible during the trial to make any official statement to the effect that the accused was not entitled to the qualifications in question without prejudicing her prospect of a fair hearing. Any such statement made by leave of the judge at the conclusion of the proceedings is likely to obtain little publicity in comparison with the prisoner's previous identification with those qualifications.

### Juries as Judges of Insanity

English juries have to perform many difficult tasks and, in doing so, they must be unanimous. Otherwise the administration of justice breaks down. In a probate case tried last March (In the Estate of Wright, Lambert v. Woodham) the task was to decide whether a testatrix was or was not of sound mind at the time when she executed her will. Mental capacity is regarded as a question peculiarly suitable for decision by juries both in civil and in criminal cases. This particular jury, however, had found itself unable to attain unanimity. The members came back into court and confessed their failure. The judge then gave them a common-sense homily on the virtues of agreement. Here was an estate which had already been largely consumed by litigation. Disagreement would mean fresh litigation and fresh expense. The condition of the lady's mind was the sole issue; no moral principle was at stake. The court could not accept a majority verdict; the parties would not be satisfied with it. Do not feel too strongly, said the judge, about a matter

which is a question of degree, if you can fairly see that there is much to be said on the other side. It would be unfair to everybody if members of the jury did violence to their reasoned conviction; but they should "make a real broad-minded effort to see the other fellow's point of view." The jury tried again and reached a unanimous conclusion. The losing side thereupon appealed on the ground that the court had misdirected the jury by telling the minority to abandon its own judgment and to surrender to the majority. The Court of Appeal held that the judge had merely been admonishing the members against obstinacy: he had simply told them to try to pool their views and see whether they could not, by the ordinary process of discussion, arrive at a common conclusion. The Master of the Rolls thought the judge had gone rather near the line in some of his observations but had remained on the right side of it. The finding of the jury was not vitiated, and the appeal was dismissed with costs. Twelve laymen, not immediately unanimous, are thus the final authorities upon a question of insanity. Might not such issues be better left to a judge assisted by an expert assessor?

### POST-GRADUATE TEACHING OF PUBLIC HEALTH

THE Medical Act of 1886 required the General Medical Council to register such diplomas or degrees in public health as appeared to them to have been granted under suitable conditions of education and examination. In 1888 the Local Government Act made the possession of a *registered* diploma or degree in public health a condition of appointment in the case of medical officers of health of counties and of districts with a population of 50,000 or over. Accordingly the G.M.C. issued in 1889 their first set of Rules for the guidance of Licensing Bodies which desired to have such diplomas or degrees given recognition in the Medical Register. The first post-graduate course of training in public health had been instituted 19 years before these rules made their appearance. Trinity College, Dublin, led the way in 1870 and at the first examination held in 1871 Sir John Moore, recently chairman of the public health committee of the G.M.C., was one of the four successful candidates. It is hard to realise that the public health service of this country was brought into being and reached its present stage of development all within the professional lifetime of one who happily is still with us.

The rules of the G.M.C. have been revised at frequent intervals in order to keep pace with the rapid advances in preventive medicine and public health administration, and the hope that another revision would shortly be undertaken was expressed at a meeting on May 15th of the Society of Medical Officers of Health when the post-graduate teaching of public health was under discussion. It was pointed out that the course of training in public health had suffered in much the same way as had the ordinary medical curriculum; many new subjects had been added but no old subjects had been omitted. There was general agreement that, if the rules were simplified and some of the existing requirements modified, the course would be of greater educational value. Criticism was directed in particular against "Chemistry in relation to Public Health," mainly owing to the fact that practically all licensing bodies have interpreted this as meaning practical laboratory

work of the kind ordinarily undertaken by a public analyst. It is important that post-graduate students of public health should return for a time to the salutary discipline of the laboratory, but the two laboratory subjects to which their attention should in the main be directed must surely nowadays be bacteriology, together with immunology, and physiology in its application to problems of public health. Such chemistry as is included in the course should be taught first in relation to these two subjects and secondly with a view to enabling students to interpret intelligently the various analytical reports that may have to be dealt with administratively by the medical officer of health. Much of this teaching can be given in lecture-demonstrations and the student himself need practise only a very limited number of chemical laboratory exercises. There is, too, little to be said for the retention of practical chemistry in the examination for Part I. of the diploma in public health.

Various other suggestions were put forward at last week's meeting. One speaker entered a plea for the more practical study of statistics and for the separation of instruction in hospital administration from attendance on the clinical practice of a hospital for infectious diseases. Others advocated a return to the old system of apprenticeship to a medical officer of health as an essential part of the training of an entrant to the public health service. There seems to be a tendency in certain quarters to make the course for the D.P.H. almost entirely vocational in character. Important as it is for students to acquire the technique of public health administration, the aim of post-graduate teaching should rather be to provide them with a training in scientific method, to afford them opportunities of reading for themselves some of the literature of preventive medicine and, by discussion and demonstration, to develop their critical faculties. In such fashion medical men and women will acquire something which, added to their existing medical knowledge, should form a sound foundation upon which to build their subsequent public health practice. Some speakers pointed out the impossibility of providing a really adequate course of training on a part-time basis, while others expressed the opinion that numbers of students would be prevented from studying for the D.P.H. were whole-time attendance required at courses of instruction. At many teaching centres in this country whole-time and part-time students are working side by side and there are obvious difficulties in the way of providing both types of student with equally satisfactory training. Some clearer definition in the rules of the nature of the part-time attendance that should be permitted would not now be amiss.

Public health covers so vast a field of effort that no hard-and-fast system of training can possibly equip a man or woman for all the work undertaken by members of the public health service. Hence the rules governing the course of training and the examinations should never be too rigid. They should insist on certain essentials, but should be drafted in sufficiently wide terms to enable schools to develop freely along their own particular lines. There are advocates of the institution of subsidiary courses of training for those interested in such special branches as maternity and child welfare or school medical work. There is, however, much to be said for giving all those entering the public health service the same basic training and the same comprehensive outlook on preventive medicine. The desirability of providing short "refresher courses" dealing with recent

advances in clinical work and administrative practice is recognised. Certain courses of this kind are already available and doubtless others will be arranged from time to time. In any event, it is

important that the Society of Medical Officers of Health should give thought to the post-graduate teaching of public health in which so many of its members have played a prominent part.

## PUBLIC HEALTH

### SMALL-POX, MAJOR AND MINOR

#### THE RECENT TREND OF INCIDENCE AND FATALITY

PRECISELY when "variola minor" became in recent years epidemic in this country it is impossible to determine. It was certainly widespread in 1923 and there were indications of its presence in 1919 to 1922, or even earlier. In 1911-18 the notifications of small-pox were 906 and the deaths attributed to it numbered 80, a fatality of approximately 9 per cent. In 1919-34 the notifications reached the enormously high figure of 82,012, but the deaths were only 320, a fatality-rate of less than a half per cent. Even this low figure may overstate the real fatality since the rules of tabulation demand that many deaths certified to be due both to small-pox and another cause must be debited to small-pox. The epidemic reached its peak in 1927 and then slowly died out. In 1935 only 1 case of small-pox was recorded.

The situation is not, of course, unique to England. In recent years the prevailing strain has been of the non-virulent type in the United States, Canada, and South Africa. For instance, in the United States nearly 382,000 cases of small-pox were recorded in 35 States in 1921-30 with a case-fatality of only 0.9 per cent. On the other hand in India and other countries of the Far East the prevailing strain shows no change from the virulent type observed from ancient times, while in a few countries the non-virulent and the virulent strains exist side by side. Thus in some of the Southern States of America affected by the non-virulent type, with the low fatality referred to above, importation of the virulent type has taken place from Mexico and caused severe epidemics. This position has recently been discussed<sup>1</sup> by A. W. Hedrich, Sc.D., of the department of biostatistics in the School of Hygiene and Public Health of the Johns Hopkins University. He believes that the observed fatality-rates are not inconsistent with the view that there exist two principal strains of small-pox virus, the one a malignant form which produces fatality-rates distributed about an average of some 25 to 30 per cent. (an average which is perhaps unduly high), and the other a mild form with a fatality of less than 1 per cent., while if strains of intermediate fatality exist they have not succeeded in establishing themselves as successfully as have the very mild or very severe strains. Starting from this hypothesis he endeavours to explain the distribution of the types over the different countries of the world.

In very well vaccinated countries, such as those of continental Europe, Hedrich believes that the immunity of the population is raised to such a level that variola minor with a lower degree of infectivity than variola major is unable to maintain itself. The malignant form may still occasionally overcome the induced higher degree of immunity, so that the small-pox observed in such countries will be confined to the malignant type, with a low incidence rate but high fatality-rate. In very incompletely vaccinated countries, on the other hand, such as India, China, and Mexico (or in all countries in the pre-Jennerian days)

the population makes no effective attack upon either variety, with the result that variola major becomes the predominant type owing to its greater power of infectivity and diffusion. Finally, in such countries as England and the United States the appearance of variola major leads to the most vigorous efforts on the part of the highly organised health services, by means of isolation, control of contacts, and extensive vaccination and revaccination. Variola minor, on the other hand, is combated less vigorously. The problem of prevention is indeed much more difficult. As was pointed out in the report issued<sup>2</sup> by the Ministry of Health, unrecognised cases may be numerous, the identification or notification of cases may often be delayed till too late for effective action, vaccination is less readily accepted, and the difficulties of tracing contacts are substantially increased.

The result, Hedrich suggests, is that the dispersibility of the milder form is relatively high and it becomes the predominating type. The great discrimination between the attack made upon the major and minor varieties he illustrates by the experience of Detroit. In 1923 variola minor was epidemic but in spite of active propaganda the number of health department vaccinations averaged only about 6000 per month, mostly children. When shortly afterwards malignant small-pox was imported from Canada half a million persons were vaccinated within a month and about 70 per cent. of the entire population within five months. Hedrich admits that the predominance of variola minor in such areas as South Africa and the West Indies is difficult to reconcile with his thesis, but the information available is scanty and he leaves it to the future to determine whether "other causative factors" must be sought to explain this distribution. The course of the recent epidemic of variola minor in this country shows clearly that it is a type of infection which succeeds in attacking only a small proportion of the population, in spite of the difficulties of combating it and the apparent susceptibility of the population.

The remainder of Hedrich's study is devoted to a detailed consideration of small-pox in the United States. He finds, as has been seen in this country, that the vagrant migratory labourer has been influential in its spread. There are indications that the incidence has increased during times of prosperity through intensified migration to industrial centres from rural areas where, as a report<sup>3</sup> by S. D. Collins shows, the vaccination rates are relatively low and the attack rates somewhat higher than in the cities. Conversely during the recent industrial depression the incidence has declined, though the time sequence of an epidemic disease is, of course, notoriously difficult to interpret in relation to possibly correlated factors. Collins's study of the frequency of vaccinations and cases of small-pox shows that only a small proportion of the people of the United States, perhaps 10 per cent., are revaccinated at intervals of seven years or less, and the great majority of children vaccinated at entrance to school (when a large percentage of vaccinations appear to be carried out in the States) are never revaccinated. His survey shows that for persons above 15 years of age about 65 per cent. had been vaccinated and in addition 4-5 per cent. had been attacked by small-pox. Vaccination was more frequent in the highest and lowest income classes than in the intervening income group. Of the 17 cases of small-pox that occurred in the

<sup>1</sup> Public Health Reports, Washington, vol. li., No. 14 (April 3rd, 1936).

<sup>2</sup> Rep. on Pub. Health and Med. Subj., 1931, No. 62.  
<sup>3</sup> Public Health Reports, Washington, vol. li., No. 16, 1936.



surveyed population during the year 16 were among persons never vaccinated and only 1 among persons who had been vaccinated (in this one case forty years previously). The chief risk of variola major to the States comes, according to Hedrich, from Mexico and, in lesser degree, the Asiatic ports, if immigration, including smuggled labour from these sources, should be resumed with the return of more prosperous times.

### Small-pox in East Sussex

Among the Registrar-General's notifications of infectious diseases for the week ended May 2nd appeared two cases of small-pox in Brighton and one in Hove. We learn that the cases arose in this way. Mrs. A, who had been vaccinated and revaccinated—the last time in 1930, when it seems doubtful if it took—was returning from India and probably was infected at Port Said. She left the boat at Plymouth on April 1st, felt tired on the 5th, definitely unwell on the 6th, and on the 7th she had what she thought was an attack of malaria for which she took quinine. A doctor was called in on the 8th and prescribed further doses of quinine, which the patient took in more rapid sequence than was prescribed. By the 10th the temperature fell and spots appeared. The rash was considered suspicious of small-pox by the doctor but, as he had never seen a case of it himself, on April 13th he called in a consultant who diagnosed a quinine rash.

The first warning received by the local health authorities was when a nurse, who had been with Mrs. A on the 11th, 12th, and 13th, developed a rash on the 28th. On this occasion the doctor in attendance called in the medical officer of health for Hove. Small-pox was diagnosed and the case was removed to hospital on the 30th. The medical officer of health for Brighton then went to see Mrs. A, found numerous quite typical seeds in the soles of her feet, and learned that one of her maids was at her home ill. This illness was also found to be small-pox with onset on the 26th. Practitioners in Brighton and Hove were at once informed of the occurrence of small-pox and asked to notify any doubtful rashes. No further case of small-pox has been notified to date except the husband of the nurse who had been kept under observation and was removed on

suspicion at onset and before the development of the rash.

The vaccinal history of the four cases should be mentioned. Mrs. A, as already noted, had been vaccinated several times. The nurse had been vaccinated in infancy and revaccinated; she had a typical mild attack. The maid, aged 65, had been vaccinated in infancy; she had a typical severe attack and for a time was seriously ill. The nurse's husband had been vaccinated in infancy and at the age of 9; he developed only a few spots. Contacts were kept under close observation in the interval between the end of the incubation period and a fortnight after vaccination. All known contacts accepted vaccination. Further spread of small-pox is now improbable.

### INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED  
MAY 9TH, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1996; diphtheria, 926; enteric fever, 27; pneumonia (primary or influenzal), 931; puerperal fever, 48; puerperal pyrexia, 110; cerebro-spinal fever, 30; acute poliomyelitis, 1; encephalitis lethargica, 6; dysentery, 16; ophthalmia neonatorum, 109. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 15th was 5812, which included: Scarlet fever, 1056; diphtheria, 809; measles, 2677; whooping-cough, 559; puerperal fever, 22 mothers (plus 15 babies); encephalitis lethargica, 283; poliomyelitis, 2. At St. Margaret's Hospital there were 26 babies (plus 12 mothers) with ophthalmia neonatorum.

*Deaths.*—In 122 great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 63 (28) from measles, 10 (3) from scarlet fever, 29 (7) from whooping-cough, 32 (4) from diphtheria, 56 (20) from diarrhoea and enteritis under two years, and 41 (5) from influenza. The figures in parentheses are those for London itself.

Measles is now definitely on the wane, the number of deaths for the last eight weeks (working backwards) being 63, 83, 104, 102, 103, 81, 104, 114, for the country as a whole, and 40, 70, 68, 60, 43, 62, 62 for Greater London. Deaths from diphtheria were reported from 19 great towns, 4 from Liverpool, 3 from West Bromwich. Rochdale reported the only death from typhoid outside London.

The number of stillbirths notified during the week was 299 (corresponding to a rate of 42 per 1000 total births), including 47 in London.

## PANEL AND CONTRACT PRACTICE

### Spinal Jackets Again

THE Ministry of Health have recently informed an insurance committee that the Minister's medical advisers regard the term "spinal jacket" used in the Medical Benefit Regulations as including appliances known in the trade as "spinal braces." Care should however be exercised in ordering on an insurance prescription either a jacket or a brace for it is not in every case that the appliance may properly be prescribed. The regulation says "when required for treatment of fractures, dislocations or diseases of the spine." An insurance doctor recently received a letter from a hospital almoner saying that an insured person had been examined by the surgeon and recommended a spinal brace. The almoner added, "As this appliance comes under Medical Benefit will you kindly arrange to apply for the brace on your National Health Insurance form. Miss X is suffering from pseudo coxalgia of the right hip." The doctor in all good faith issued a prescrip-

tion which the patient took to a local chemist. Fortunately for the doctor the chemist, before arranging for the supply of the appliance, consulted the insurance committee, who pointed out that the affection of the hip could hardly be described as a fracture, dislocation, or disease of the spine. If the chemist had supplied the article he would have been entitled to be paid for it and the insurance committee would have had to surcharge the doctor—some eight guineas!

The moral is that in case of doubt it is prudent to consult the insurance committee before issuing a prescription for an appliance. It may be noted that the Scottish Department of Health is advised that spinal jackets when used in the circumstances indicated above may be regarded as splints within the meaning of the Scottish Medical Benefit Regulations, which, unlike the English regulations, do not specifically provide for the ordering of spinal jackets. The appliance must, however, be prescribed by insurance practitioners in the course of treatment being given

under their Terms of Service. For example, an appliance may have been required not in the course of medical treatment but for aesthetic purposes, or by way of a mechanical aid after any treatment had ceased; or the appliance may have been required for the purpose of treatment which the insured person was receiving, not from his insurance practitioner, but from a specialist not under contract with the insurance committee. In such cases the appliance would not be held to be available under medical benefit.

### Still Silent

Some months ago we referred (1935, ii., 1206) to the case of Dr. A, against whom a complaint had been made, who neither replied to the inquiries of the insurance committee nor attended their hearing by the medical service subcommittee. We pointed out that possibly Dr. A had a perfectly good answer in reply to his alleged failure to provide treatment for an insured person but he would now be asked by the Ministry of Health to explain not only this but his attitude to the committee, and that he ran the risk of removal from the medical list. The inquiry committee appointed by the Minister heard the case on Jan. 1st, but Dr. A neither appeared nor was he represented; all that he did was to send a letter saying that he wished to dispute any complaint brought against him with regard to professional attendance. He admitted he had not replied to the complaint. After the hearing by the inquiry committee, a further letter was received from Dr. A bearing the date Dec. 30th, 1935, in which for the first time he communicated the line of his defence to the charges which had been made. Certain comments in that letter have received publicity in the lay press, particularly a statement that while he was acting as superintendent of a hospital Dr. A had had to protect

and guide some panel practitioners; there were, he added, many more in practice who might be quite good as nurses, but not as diagnosticians who would take responsibility for no case other than a cold or an ingrowing toenail. He treated human beings to the best of his knowledge which was wider than that of the average practitioner and, therefore, he resented mud being slung at him.

The inquiry committee found the charges made by the insurance committee to be proved or admitted, and submitted that the conduct of Dr. A in the case of the insured person regarding whom complaint was made appeared to be a breach of Art. 8 (1) of the terms of service and to constitute negligence within the meaning of Art. 41 (5) of the regulations. They stated that the letter from Dr. A did not affect the view of the case which was formed at the hearing. He had offered therein no satisfactory explanation why he failed to visit the insured person, or to make arrangements for the receipt of messages, or how he came to charge an insured person a fee or why he failed to attend before the inquiry committee. The Minister decided not to remove Dr. A's name from the medical list; he has been informed that it was with some hesitation that this conclusion had been reached, and that he must not expect a similar degree of leniency in the event of any further representation for his removal being made and substantiated. The sum of £10 is to be withheld from the insurance committee and must be deducted from the remuneration payable to Dr. A, who also has been required to pay £5 towards the costs of the inquiry. The sequel is worthy of record as an illustration of the extent to which, under the present administration of the Insurance Acts, justice has been tempered with mercy. But it seems a woeful waste of public time and money on Dr. A's part.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. J. W. Tighe placed on the Retd. List.  
Surg. Lt. C. Ommanney-Davis to rank of Surg. Lt.-Comdr.  
Surg. Lt. E. L. Littler to *Pembroke* for R.N.B. and to *President* for R.A.F. Medical Officers' course.  
Surg. Lt. (D) H. P. L. Rhodes to *Victory* for R.N.B.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdrs. T. C. Larkworthy to *Pembroke* for R.N.B.; and J. L. Cox to *St. Angelo* for R.N. Hospital, Malta.  
Surg. Lts. R. Cormack and M. Godwin promoted to Surg. Lt.-Comdrs.; and D. R. Goodfellow to *Victory* for R.N.B.  
Proby. Surg. Lt. D. R. Maitland to *Caledon* for training.  
Surg. Sub-Lts. R. A. Stenhouse (proby.) and P. H. K. Gray to *Victory* for R.N. Hospital, Haslar.

### ROYAL ARMY MEDICAL CORPS

Maj. E. H. W. Elkington retires receiving a gratuity.  
Short Service Commissions: Capt. F. Williams resigns his commission.

### ROYAL AIR FORCE

Squadron Leader G. S. Strachan to Special Duty List while in interchange duty with the Royal Australian Force.  
Flight Lt. S. B. S. Smith to R.A.F. Station, Biggin Hill.

The vacancy as consultant in medicine, Central Medical Establishment, which will be caused by the retirement of Group Capt. H. A. Treadgold, will be filled by the appointment of Wing Comdr. A. F. Rook with effect from May 18th. He was appointed to the R.A.F. General Hospital, Palestine, last year. (*Vide* THE LANCET, Nov. 30th, p. 1262.)

### INDIAN MEDICAL SERVICE

Lts. G. R. C. Palmer, J. Revans, and T. Sommerville are restd. to the estabtd.

To be Lts. (on prob.): A. C. Taylor, E. N. Brockway (secd.), L. S. F. Woodhead, J. G. Thompson, J. R. Kerr (secd.), L. M. Kelly, and K. I. E. Macleod.

The notification in the *Gazette* of May 1st, 1936, regarding Lt. S. C. Misra, is cancelled.

The undermentioned officers have vacated appts. in India: D.D.M.S.: Maj.-Gen. T. G. F. Paterson, C.B., D.S.O., K.H.P., I.M.S. (since ret'd.). A.D.M.S.: Col. W. T. McCowen, V.H.S., I.M.S. A.D.H. and P.: Maj. J. S. K. Boyd, R.A.M.C. A.D.P.: Lt.-Col. L. Dunbar, O.B.E., R.A.M.C. D.A.D.H.: Lt.-Col. J. G. Gill, D.S.O., O.B.E., M.C., R.A.M.C. D.A.D.P.: Lt.-Col. R. B. Price, D.S.O., R.A.M.C. M.O., A.Sch. of Education: Capt. G. B. W. Fisher, I.M.S.

The undermentioned appts. have been made in India: A.D.M.S.: Col. J. B. Grogan, Brit. Serv. A.D.H. and P.: Lt.-Col. J. G. Gill, D.S.O., O.B.E., M.C., R.A.M.C. A.D.P.: Lt.-Col. R. B. Price, D.S.O., R.A.M.C. D.A.D.H.: Lt.-Col. K. Comyn, R.A.M.C. D.A.D.P.: Maj. C. D. M. Buckley, M.C., R.A.M.C.

Embn. Med. Offr., Kiamari: Maj. J. McFadden, R.A.M.C., March 9th, 1935.

### COLONIAL MEDICAL SERVICE

The following appointments have been made: Medical Officers, West Africa: Dr. R. J. C. Campbell, Dr. J. W. Pickles, and Dr. A. B. Weir; Uganda: Dr. D. G. Snell; Northern Rhodesia: Dr. K. C. P. Thomson. District Medical Officer, Windward Islands: Dr. L. M. Commissiong. Dr. J. M. Mackay becomes Deputy-Director of Health Service, Gold Coast, and Dr. P. S. Selwyn-Clarke Deputy-Director of Health Service, Nigeria.

## OBITUARY

**JOHN SMITH FRASER, M.B.,  
F.R.C.S. Edin.**

THE death occurred on May 11th, at his home in Edinburgh, of Dr. J. S. Fraser, who for the past fifteen years had been a lecturer in diseases of the ear, nose, and throat in Edinburgh University, and surgeon to the Royal Infirmary of Edinburgh in the ear, nose, and throat department. Dr. Fraser, who was 61 years of age, was born in Fife, where his father, who later was appointed a Commissioner in Lunacy, was medical superintendent of the Fife District Asylum. His mother was a sister of the late Sir John Batty Tuke. He was educated at George

Watson's College and Fettes College, and studied medicine at Edinburgh University, where he graduated with first-class honours in 1897. As an undergraduate he obtained his "Blue" as a member of the university tennis team. He held resident posts in the Royal Infirmary, both on the medical and surgical sides, and spent five years as an assistant in general practice in Lichfield. He then decided to specialise in diseases of the ear, nose, and



DR. FRASER

[Photograph by Ayton

throat, and spent some time in the study of these subjects in London and Vienna. On his return to Edinburgh in 1905 he was appointed clinical assistant in the ear, nose, and throat department of the Royal Infirmary, under Dr. McKenzie Johnston and Dr. Logan Turner, and in that year passed the examination for the fellowship of the Royal College of Surgeons of Edinburgh. In 1906 he was appointed assistant surgeon in the ear, nose, and throat department of the Royal Infirmary, and in 1921 was appointed surgeon in the department, and lecturer in diseases of the ear, nose, and throat in the University of Edinburgh.

Dr. Fraser was a man of high intellectual range, and with an infinite capacity for hard work. To quote from the words, in *The Scotsman*, of a personal friend and colleague:

"The mere enumeration of Dr. Fraser's appointments conveys very little idea of what he actually accomplished in his professional career, or of the high position to which he attained in the speciality during thirty-five years of service on the honorary staff of the Royal Infirmary. He was a happy example of the man who combined, in a somewhat unusual degree, the intellectual gifts which made him both a successful clinician and an earnest scientific investigator. From the first he threw himself heart and soul into the work of the laboratory, and during the years of waiting for practice—and, indeed, to the end of his life—he worked indefatigably at the many problems which interested him. The pathology of diseases of the ear still offered a fruitful field, calling for exploration, and, having mastered the difficult technique required in the preparation of that organ, a necessary preliminary

for its microscopical investigation, he applied himself to conscientious and painstaking research. Of particular merit is his work on congenital deaf-mutism, on tuberculous disease of the ear, on the chronic form of deafness familiarly known as otosclerosis, and in the demonstration of the pathways of infection from the ear to the brain, and its covering membranes.

"He thus laid a sure foundation upon which he built his clinical experience, his accuracy in diagnosis, and his well-deserved reputation as a successful operating surgeon. He was a prolific writer; his papers always showed evidence of very careful preparation and of his power of exact observation. A popular teacher, he expressed himself in lucid and simple language so that there was never any doubt as to his meaning or to the essential points he desired to make. In debate he was often a forceful and candid critic, enlivening the discussions at scientific meetings when they were perhaps inclined to languish. . . .

"Although handicapped by indifferent health during the past two years, Dr. Fraser faced the future with characteristic courage, and continued his work to the end. A loyal friend and a helpful colleague, with whom it was always a pleasure to work, and most considerate of the feelings of his patients, Jack Fraser will be greatly missed by a large circle of friends and acquaintances."

Dr. Fraser's work received wide recognition, not only in this country but abroad. By the Royal College of Surgeons, Edinburgh, he was awarded, in 1922, the Liston Victoria Jubilee Prize, a quadrennial award for meritorious contributions to practical surgery; from the Royal College of Physicians, Edinburgh, in 1929, the Ireland-Barbour Fellowship; and in 1930 the Norman Gamble Research Prize of the Royal Society of Medicine, London. He was president of the otological section of the Royal Society of Medicine in 1927-28, and president of the oto-rhino-laryngological section of the British Medical Association in 1934, and was an honorary member of the American and Austrian Otological Societies and of the Oto-Rhino-Laryngological Society of Madrid. He was the author of numerous articles in text-books and the medical press.

Dr. Fraser is survived by his wife, a daughter of Major Reichsritter von Bouvard of Vienna, and by two sons, graduates with honours, one in science and one in medicine, of Edinburgh University, and by two daughters.

**FRANK MAINWARING HUGHES, M.D. Brux.,  
M.R.C.S. Eng.**

Dr. Frank Hughes, who died at Cambridge on May 14th at the age of 48, was born in Assam the son of Dr. A. D. Hughes and educated at the Leys School, Cambridge. He proceeded for his medical training to the London Hospital where he qualified in 1912 with the English double diploma. He then acted as house surgeon, house physician and resident anaesthetist at the Poplar Hospital, and was assistant surgeon at the Gravesend Hospital when military duties called him abroad with the rank of captain, R.A.M.C. He continued his military services after the war as senior medical officer to the Red Cross Hospital, Kent, and received the Legion of Honour. Always closely associated with ambulance work he was an examiner, official surgeon, and lecturer for the St. John Ambulance Association, of which he was an honorary life member, and he was decorated by the Société Française de Sauvetage and received also for humanitarian work a Belgian order. He held many appointments in the south of Kent, was medical officer of health for Walmer, on the staff of the Victoria Hospital, Deal, physician to the Deal Infectious Diseases Hospital, and medical

referee under the Ministry of Pensions for the Deal district. He recorded interesting clinical experiences in both *The Lancet* and the *British Medical Journal*. An early death cut short a very useful career.

**WILLIAM W. R. ASPLEN, M.B. Lond.**

Dr. William Reginald Ward Asplen, who died on May 14th at Kenilworth, received his medical training at the Westminster Hospital and qualified with the English double diploma in 1909, proceeding to the degree of M.B., B.S. Lond. in the following year. He acted as house physician and house surgeon to the Westminster Hospital and later as house surgeon to the Coventry and Warwickshire Hospital. He served during the war with a commission in the R.A.M.C. and then started in practice in Warwick. He established a good position both in a private capacity and as the holder of responsible official positions. He was deputy coroner for central Warwickshire, visiting medical officer to the Justices in Lunacy for the

county, surgeon to the police, honorary medical officer to the Kenilworth Convalescent Home, and chairman of the Kenilworth Ratepayers' Association. He was a valuable friend to the community.

**MUKHTAR AHMED ANSARI, M.B. Edin.**

THE death is reported from India of Dr. Mukhtar Ahmed Ansari, who was well known for his political activities as a vigorous leader of the national movement in India. He was educated at the Muir Central College, Allahabad, and the Nizam's College, Deccan, and obtained his medical degrees in Edinburgh in 1905. He was appointed house surgeon at Charing Cross Hospital and later became resident medical officer at the Lock Hospital. He organised the All-India Medical Mission in Turkey in 1912-13. On his return to India he was elected president of the All-India Muslim League. His sudden death occurred on May 10th in a train during a journey from Mussoorie to Delhi.

## PARLIAMENTARY INTELLIGENCE

### MIDWIVES BILL IN COMMITTEE

ON May 12th, 14th and 19th the Midwives Bill was considered by Standing Committee C. of the House of Commons.

#### Non-County Boroughs as Supervising Authorities

On Clause 1 (Provision of domiciliary service of midwives) Major HILLS moved an amendment to leave out the word "supervising" with a view to enabling certain of the non-county boroughs to exercise control of the midwifery services in their areas. He said that certain of the smaller boroughs were now supervising authorities under the Midwives Act and a further number of smaller boroughs were also in the same position under Section 62 of the Local Government Act, 1929. Under that section non-county boroughs and county districts were authorised to apply to the Minister of Health to make them a supervising authority under the Midwives Act. But not many such authorities had passed the test and some of the larger ones still stood outside. What was wanted in the country was a prompt service for the pregnant woman, near her home and among people whom she knew. In the country the county council might sit many miles away from a non-county borough. He thought that those non-county boroughs which had established a maternity and child welfare service, and which employed a whole-time medical officer of health, should have the power to administer the Act. Six non-county boroughs at present employed salaried midwives.

Sir FRANCIS FREMANTLE said that since the passing of the Local Government Act, 1929, a great deal had been done in establishing municipal hospitals and the midwives had to work with those hospitals. If the midwife was appointed by the larger authority that authority could make arrangements to relieve her in case of sickness and holidays and would be in a position to provide for pension schemes. Under a larger authority there would also be far greater facilities for moving midwives round in different areas. He believed that the preponderating weight of argument was in favour of this service being under the larger authorities.

Captain ELLISTON supported the amendment.

Sir KINGSLEY WOOD said he had approached this matter entirely from the point of view of establishing a good midwifery service in this country. It was perfectly true that the local supervising authority was defined under Section 8 of the Midwives Act, 1902. The proposal in the amendment would mean the inclusion of a number of the smaller local authorities. Those authorities had done good work in connexion with maternity and child welfare, and he was

confident that whatever decision was reached on this matter they would secure the coöperation of those authorities. The amendment would involve the inclusion of 17 non-county boroughs whose population did not exceed 25,000. He was advised that if these authorities were included it would only mean the employment at the most of two or three midwives. That meant in effect that unless they adopted the proposals in the Bill they would not get what was essential as far as it could be obtained—namely, an adequate choice of midwife by the women concerned. Another thing which they should aim at was the raising of the status of the midwifery profession as a whole. How could they do that if the country was divided up into a number of small authorities employing only two or three midwives? Such a system would not provide proper opportunities for promotion. He would, however, undertake to give sympathetic consideration to any applications made to him by smaller local authorities to be made supervising authorities for midwifery in their areas.

The amendment was negatived by 36 votes to 11.

#### Position of Voluntary Organisations

Mr. REYS DAVIES moved an amendment to exclude voluntary organisations from the Clause. He said that in order to achieve the purpose of reducing the rate of maternal mortality in this country they must raise the status of the midwife and make her a more efficient servant of the public. The Ministry of Health in all its reports had condemned the present condition of affairs in regard to the midwifery service. This Bill, however, continued in part the very thing which had been condemned—namely, the voluntary system.

Mr. BEAUMONT said that magnificent work was being done by voluntary organisations at the present time in this country. Whatever views might be held on the general principle he thought most people would agree that it would be a great pity to scrap the work of the voluntary agencies and start again afresh.

Miss RATHBONE thought that if it was a question of starting a new midwifery service there would be much to be said for putting that service entirely under the auspices of the local authorities. But here they had a service which had been carried on for a long period largely by voluntary organisations which had accumulated an immense body of practical experience.

Sir FRANCIS FREMANTLE said that in this Bill the Government were taking the voluntary organisations for what they were worth, seeing what were their good points and what were their deficiencies and their

introducing a scheme which would fill in the gaps. They should, he thought, use whatever services were at present doing good work; that was the policy of the Joint Council on Midwifery on whose report this Bill was founded. The Queen's Institute of District Nursing was the main centralisation of these voluntary organisations. The nurses engaged in it were either Queen's nurses—whose qualifications included three years' training in an approved hospital and the training necessary to qualify under the Central Midwives Board—or else village nurse midwives. In many country districts there was neither the work nor the funds to justify the engagement of Queen's nurses and yet there was a great deal of general nursing work for village nurse midwives, and a system of employing them had grown up by degrees not only in a voluntary way but in coöperation with the public authorities. The result had been coöperation with the public authorities for general nursing, midwifery, school nursing, tuberculosis nursing, attendance at maternity and child welfare centres and antenatal clinics, and last but not least the nursing of necessitous persons under grants from the public assistance committees. These nurses were helped not only by the money but by the active sympathy of those who formed the voluntary nursing organisations. During the period 1924 to 1933, 606,000 confinements were attended by Queen's nurses with an average maternal mortality of 1.91 per 1000, compared with one of 4.5 for the whole country. In England and Wales there were 3169 associations employing 2150 Queen's nurses and 2956 other nurses or a combined strength of over 5000 nurses. There was an expenditure of over £1,000,000 and the cost of a Queen's nurse to the organisations was £231 per year and of a nurse in the other category £184 per year. This was a splendid work and was recognised even in those areas which were poorest and most distressed. It was clear that these voluntary organisations should continue.

Mr. BATEY said that if it were merely a question of nursing a good deal could be said for the voluntary organisations, but there could be no argument against putting the work of midwives into the hands of the local authorities.

Mr. LECKIE said that in Staffordshire the branches of these local associations were largely supported by working people who would resent any interference with their work.

Mr. BURKE said it was true that there had been a great deal of valuable work done by voluntary organisations in the past, but the time had come when these organisations would have to go by the board.

Mr. FRANKEL said it was only because the Government and the local authorities had not faced up to their duty that voluntary organisations had had to do some of the work. This Bill proved that there were many local authorities which possessed nearly all the powers contained in this Bill, but had not exercised them. It was not fair to compare the maternal mortality-rate of 1.91 per 1000 for confinements attended by Queen's nurses with the rate of 4.5 for the whole country, because voluntary organisations could pick and choose their cases. The cases that had little chance of survival went into the public municipal hospitals where the bulk of the poor people were being looked after. There ought to be no overlapping of control in regard to midwives.

Sir KINGSLEY WOOD said he believed that these voluntary organisations were part of the genius of the British people. He saw no prospect of voluntary effort ever failing in this country. He had designed this Bill, in conjunction with those who had helped him, with the object of enabling the voluntary organisations to participate in the work under the Bill to the fullest possible extent. He had also inserted a clause by which that work would be operated as part of the municipal service. He wanted to get the best from both sections. It should be pointed out that although for a considerable

time local authorities had been able to appoint midwives only 64 midwives had been so appointed up to that moment by the whole of the local authorities. The great burden of this work of midwifery so far as the rural districts of the country were concerned had been carried out by the great voluntary organisations. It was not a fact that their nurses picked and chose the cases. In a village where one of the Queen's nurses was a midwife she went to any case where assistance was wanted unless the mother desired to call in a doctor. The case for this Bill was largely based on the high standard of maternal care which had been attained by the voluntary organisations which employed salaried midwives at the present time.

The amendment was negatived by 28 votes to 14.

#### Period of the Midwife's Attendance

Mr. G. GRIFFITHS moved an amendment providing that the period of attendance by the midwife should be 15 days instead of 10 as proposed in the Bill, and by permission of the chairman another amendment in the name of Captain ELLISTON proposing that the period should be 14 days was discussed at the same time. Mr. Griffiths said that all the women's organisations in the country were asking for this amendment. Captain ELLISTON said the period of 14 days was suggested in the report of the Departmental Committee on the training and employment of midwives, and endorsed in the interim and final reports of the Committee on Maternal Mortality.

Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, said that the reason why the period of 10 days had been inserted in the Bill was because that was the period of attendance by the midwife qua midwife prescribed in the rules of the Central Midwives Board. In the Bill they went further however and insisted that local authorities should see that even where a doctor attended a maternity case the mother should have the chance of being nursed by a properly qualified woman. Therefore it was prescribed that the same period of nursing—namely, 10 days—should apply as had been applied by the C.M.B. when the woman attended solely as a midwife. Medical opinion was growing to the effect that it would be beneficial if this period could be extended. Since the second reading of the Bill the Ministry of Health had had a letter from the C.M.B. to the effect that it was their intention to extend the period for the attendance of a midwife qua midwife to at least 14 days. If the amendments were withdrawn the Government would put down before the report stage an amendment to the effect that the period of attendance of a woman as a maternity nurse should correspond to the period that should from time to time be laid down by the C.M.B. as the period for the attendance of a woman qua midwife.

In view of Mr. Shakespeare's statement Mr. Griffiths and Captain Elliston withdrew their amendments.

An amendment providing that arrangements should only be made with voluntary organisations in areas in which such organisations were already providing an approved service of salaried midwives was also defeated.

#### Midwives' Salaries

Mr. E. DUNN moved an amendment to secure that the salary of midwives employed under the Bill should in no case be less than that of health visitors employed by the authority or working in the same area. He said that the midwifery service was a matter of national importance, and it was right that the women who took part in that service should be paid reasonable salaries.

Captain ELLISTON and Miss RATHBONE also had amendments on the paper dealing with the same matter. Captain Elliston said that he hoped the Minister of Health would see that the Bill was amended in such a way as to ensure those safeguards for the proper remuneration of midwives which he indicated in his speech on the second reading. Miss Rathbone said there was nothing whatever in the Bill as it

stood which really guaranteed the salaries which would be paid to midwives, especially those employed by voluntary organisations. They had a responsibility to see that the midwifery profession was no longer sweated as it had been in the past.

Sir KINGSLEY WOOD said that in England and Wales about 60 per cent. of confinements were attended by midwives, 20 per cent. by doctors, and 20 per cent. were treated in hospitals. It was certainly the object of the Bill to improve the status and remuneration of midwives, and he believed that those objects would be secured. Any suggestion that the local authorities should not be free to fix the salaries and remuneration of their officers would be rightly resented under our democratic local government system. So far as the voluntary organisations were concerned the terms of remuneration to be paid to the midwives appointed by them would be the subject of discussion and agreement between the voluntary organisations and the local authorities in order to secure uniformity and in consideration of the further financial assistance which was to be given to the voluntary bodies under the Bill. After the Bill had been passed he proposed to send a circular to the local authorities stating that in the view of the Minister it would be well if the local authorities regarded the status of midwives as very much akin to that of health visitors, and recommending that the salaries paid to midwives should be approximately the same as that paid to health visitors, and that the authorities should secure on their negotiations with the voluntary organisations that the latter should follow the same course. He thought that the committee could be assured that under the scheme he had indicated the views of hon. Members in this matter would be met.

#### NOTES ON CURRENT TOPICS

IN the House of Lords on May 19th Lord GAINFORD presented the Public Health (Drainage of Trade Premises) Bill, to amend the law with respect to the discharge of trade effluents into the sewers of local authorities.

The Bill was read a first time.

#### Vivisection Petition

IN the House of Commons on May 14th Mr. GROVES presented a petition signed by 175,000 petitioners praying that the House would make illegal the present practice of vivisection.

#### Medical Research and Workmen's Compensation

The introduction of direct control by constituting an ad hoc body to be known as the Workmen's Compensation Board was a feature of the Workmen's Compensation Bill in the House of Commons on May 15th. In moving its second reading Mr. G. HARDIE said that its main object was to take the whole business of workmen's insurance outside the range of competitive insurance companies, to prevent profit making in such a service, and to prevent money intended for the injured being wasted over legal quibbles. The proposed Board, with employers and employees represented upon it, would, Mr. Hardie believed, bring a much more human atmosphere into the consideration of claims.

After some debate, from which it emerged that many who were dissatisfied with the present law of workmen's compensation had even less confidence in the new proposals, Mr. LLOYD, Under-Secretary, Home Office, said that though the objections to giving this Bill a second reading seemed to the Government to be overwhelming, his desire to improve the workmen's compensation system was extremely sympathetic. It was desirable to try to get closer coördination between the health services and workmen's compensation schemes in order to secure what all parties wanted, irrespective of compensation, that the workman should recover and be able to get back to work as soon as possible, though not before he was fully

fit for it. It was clear from the British Medical Association report on Fractures that up-to-date technical methods were being applied in particular cases, but not all over the country as they might be. He believed that special clinics at Norwich, at Bristol, and Birmingham had extended very rapidly and had treated 2000 cases by up-to-date methods in the last year. The re-education of the injured limb for instance was of vital importance. Mr. Lloyd quoted the case of a senior medical inspector of factories who had recently broken his ankle; when the joint was restored to a completely satisfactory state from the medical point of view he found the utmost difficulty in walking, though he knew perfectly well that he could walk. If that happened to a medical man it was much more likely to happen to the average layman, and particularly the injured workman. It was therefore of the utmost importance that methods of re-educating injured limbs should be available. The Home Office was also alive to other new branches of knowledge, notably those which took note of the psychological dangers resulting from accidents. The Home Secretary had set up a committee containing trade union members, employers, and a number of progressive doctors who had practical experience of these matters and had made a special study of them, such as Prof. Hey Groves and Mr. Henry Souttar "to inquire into the arrangements at present in operation with a view to the restoration of the working capacity of persons injured by accidents and to report as to what improvements or developments are desirable, and what steps are expedient to give effect thereto, regard being had to the recommendations made in the report issued by the British Medical Association in February, 1935, on 'Fractures'." The Home Office hoped that a workable scheme might be produced by this committee, on which they might take action. The proper course of the House of Commons was not to pass this Bill but to await the reports of these committees and then to consider what workmanlike improvements they could make in what was already a very fine system of workmen's compensation.

Mr. PALING said he wanted to see doctors placed in a rather better position than some of them were in at present. Some of them were what was called "compensation" doctors. He (Mr. Paling) had recently had a case before him of a man who had had the front of his skull fractured and he had to go to the "compensation" doctor. He had previously been told, what he already knew, that his eyesight was deteriorating as a result of the injury. The "compensation" doctor said: "Oh, now there is a strike on at your post and you will want to keep on the fund and you have developed bad eyesight." The doctor admitted afterwards that it was his job to get men back to work. That was not a desirable state of affairs.

The motion for the second reading of the Bill was negatived by 167 votes to 111.

#### HOUSE OF COMMONS

THURSDAY, MAY 14TH

#### Food for Expectant Mothers in Special Areas

Miss WARD asked the Minister of Labour to which towns the special grant supplied by the commissioner for the supplying of special foods for expectant mothers had been allocated; and on what basis the selection was made. —Lieut.-Colonel MUIRHEAD, Parliamentary Secretary to the Ministry of Labour, replied: I am informed that the Commissioner for the Special Areas (England and Wales) has recently decided to make a grant of £3000 to the National Birthday Trust Fund, to enable them to extend their scheme for the distribution of special foodstuffs to expectant mothers; and with that assistance, I understand that the Fund have agreed to operate the scheme in the county boroughs of Gateshead, Merthyr Tydfil, South Shields, and Sunderland, and the Special Areas of Monmouthshire. The selection was made in consultation with the National Birthday Trust Fund, having regard



to the facilities available and the extent of arrangements already made.

Miss WARD: If these experiments are successful from the point of view of helping the mothers will the scheme be extended to other towns?

Lieut.-Colonel MUIRHEAD: I think that it has always been an understood thing that the operations of the Commissioner in the Special Areas are experimental, and no limit has ever been laid down as to what will be done if the experiments are successful.

#### Unemployment Assistance and Needs of Invalids

Mr. GRAHAM WHITE asked the Minister of Labour whether it was the practice of the Unemployment Assistance Board to take into account the special needs of invalids and others requiring additional nourishment when assessing household needs, or whether such requirements were held to be medical needs.—Lieut.-Colonel MUIRHEAD replied: I am informed by the Board that wherever it is ascertained that persons whom the Board is assisting are in need of extra food, such need is taken into account by its officers in deciding the amount of the allowances to be granted. This provision does not cover drugs or surgical appliances, which are definitely medical needs and therefore outside the scope of the Board.

#### Defence of Civil Population against Air Raids

Mr. SHORT asked the Home Secretary what progress was being made with local authorities respecting the defence of the civil population in case of air raids; how many authorities had been approached; and how many had agreed to cooperate.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: Local authorities are now actively engaged in preparing schemes of air raid precautions. All local authorities were asked to cooperate with the Government in this matter and all but a very few are doing so. Progress is very satisfactory.

Mr. SANDYS: Is my hon. friend now in a position to tell us what progress is being made in providing instruction for medical practitioners in giving first aid in gas cases?

Mr. LLOYD: Yes, Sir, but I should require notice of that question.

Mr. SHINWELL asked the Home Secretary the number of gas masks it was intended to purchase for the use of the civilian population; how many were already available; the names of the gases with which these protective devices had been tested; whether the local authorities were in possession of all necessary information in respect of the precautions which might require to be taken in the event of an air raid in which gases were used; and whether the gas masks were all of British manufacture.—Mr. GEOFFREY LLOYD replied: As was explained in answer to a question on April 8th last, the final design of the respirator intended for use by the civil population has not yet been settled. The number of respirators to be made will depend on a variety of circumstances, but, in any event, it is not anticipated that less than 30,000,000 will be produced. The respirator is designed to give protection against any probable concentration of any type of poison gas which might be met in time of war, but it would not be in the public interest to state the names of the gases against which it is being tested. Local authorities have received a certain amount of information on the precautions which are required against poison gas, and further memoranda on the subject are in course of preparation and will be available shortly. In regard to the last part of the question, any respirators made for the Government, or approved by them, will be of British manufacture.

TUESDAY, MAY 19TH

#### Nursery Schools in Slum Areas

Mr. LYONS asked the President of the Board of Education what development had been made within the last year in the provision of nursery schools in areas cleared of slums or about to be so cleared.—Mr. OLIVER STANLEY replied: Nursery schools are as a rule provided in areas where the housing conditions are unsatisfactory. Ten such schools have been recognised during the last year. The Board have also recognised some nursery schools on housing estates for persons formerly resident in slum

areas. Two schools of this type have been recognised during the last year, and the provision of others has been approved in principle.

#### CHILD GUIDANCE

A MEETING to demonstrate its work and methods was held by the East London Child Guidance Clinic last Monday under the chairmanship of Dr. C. S. Myers, F.R.S. Lady Cynthia Colville pointed out that only those skilled in the working of the mental processes are able to discover the roots of delinquency, and spoke of child guidance as one of the greatest liberating forces in social work. Mr. J. J. Mallon, LL.D., referred to the grave figures of juvenile delinquency; 26 per cent. of those taken into custody for indictable offences in 1935 were under seventeen years of age, and the peak in cases of larceny was at thirteen. Most of these young offenders were not lost causes; they were simply children who needed help. One young boy, referred to a clinic as a persistent thief, was found to be suffering from an endocrine deficiency. He stole merely to satisfy his craving for sugar, and medical treatment led to his reform. We were apt to envisage two states—health and not health—but actually there were many intermediate conditions. Excellent as the school medical service was, it was concerned almost entirely with the physical element; one great value of a clinic of this kind was that it called the attention of the nation to a defect in our educational apparatus. Many human beings were marred by failure to receive the kind of treatment provided by a child guidance clinic.

Dr. Emanuel Miller said the clinic brought the workers into touch with every sort of home and many types of educational and social organisation, and a very large amount of valuable information was being collected. But they had to do something to cure the children. Sometimes this depended on manipulation of the environment either of home or school. The clinic had to consider the individual peculiarities of the child—his mentality, his imaginative life. In this connexion play often revealed a great deal about the child's efforts to get equal with the world. Not infrequently a child who was regarded as a public nuisance by parents, teachers, and the police, became a very pleasant child and a favourite at the clinic.

Illustrative cases were described by members of the staff, and demonstrations of psychological testing, of play therapy methods, and of children's drawings used for purposes of diagnosis were given. Dr. R. N. Salaman, president of the Jewish Health Organisation, spoke of the nine years' work which the clinic had carried on. It needed to be placed on a wider basis and to find more suitable premises. The chairman said that 60 per cent. of the patients treated at the clinic were non-Jewish, and the time had come for more general recognition and support by the whole community.

**NEW HOSPITAL FOR GORLESTON.**—The buildings of the Grange Club at Gorleston are to be converted into a new hospital for the town. A sum of £4500 is needed to open it free of debt next October.

**HIRE PURCHASE SCHEME FOR MOTOR-CARS.**—The Medical Insurance Agency already arranges insurance protection under such headings as pension, life, endowment, household, and children's education, and the Doctor's Special Motor Policy will be well known to our readers. The Doctors' Motor Finance Ltd., in connexion with the Agency, has now arranged to provide hire-purchase terms for motor-cars, and Messrs. Mann, Egerton and Co. will act as consulting motor engineers. Full information and terms can be obtained from the secretary, the Doctors' Motor Finance Ltd., Tavistock House (North), Tavistock-square, W.C.1.

## CORRESPONDENCE

## BLOOD COUNTS IN TUBERCULOSIS

To the Editor of THE LANCET

SIR,—Dr. Heaf calls attention to the variability of reports on blood counts. I suppose that no hæmatologist will deny that different observers examining the same blood film may obtain different results: even the same observer may not get identical results from the same films in successive examinations. Dr. Heaf's fourth table shows that closely comparable results may be obtained by different observers using the same film. Surely, the constancy of the result must depend upon several factors, of which by far the most important is the number of cells counted. If only some 300 cells are examined (as I imagine was the case in Dr. Heaf's series), the discrepancies will be considerable. Examination of 500 cells for the differential count decreases the apparent variation a great deal. And, if 1000 cells are passed under review, there is very little discrepancy.

It is, of course, obvious that the differential count suffers from being performed on a random sample of blood; and only a portion of the random sample is examined. Differences in results are decreased if all films are examined serially in the same direction—e.g., vertically. And films made on cover-glasses give far less divergent results than those made on slides. I feel sure that, if the films sent to 11 competent authorities by Dr. Heaf had been prepared on cover-glasses, the results in his first three tables would not be so different. With cover-glass films it is necessary to do half the differential count on the one and half on the other film. In this way a fair sample of a *whole* drop of blood is examined; whereas, when films are made on slides, it is impossible to ascertain the nature of the cells that remain adherent to the spreader. It is only when the total number of leucocytes is moderately low that a differential count of 500 or 1000 cells will give consistent results.

It would seem that Dr. Heaf's observations are an indirect support of the view that leucocyte examination should be more qualitative in the sense of Arneth or Schilling. Properly trained observers will get almost identical results in estimating the Arneth index, especially with Cooke's modification of the original method. It would be a great pity if Dr. Heaf's letter undermined the clinician's interest in blood counts, but it will be excellent if it calls his attention to the value of the much neglected "qualitative" blood picture.

I am, Sir, yours faithfully,

Park Square West, N.W., May 15th.

A. PINEY.

## (?) EPIDEMIC MYALGIA IN MANCHESTER

To the Editor of THE LANCET

SIR,—At present there seems to be an outbreak of the so-called Bornholm disease (epidemic myalgia) in Manchester. In my practice, which is not a large one, I have latterly been seeing steadily one new case a day. The condition appears to be confined to adults; so far as this outbreak is concerned, at any rate. The onset is sudden, with an initial fever up to 100.4° F., which does not recur. The patients have an air of being extremely ill, and they can hardly drag themselves about owing to the shortness of breath that comes on with exertion; even walking on the level provokes profuse sweating. Night sweats occur and the pain is so severe and so

constant that the patients get no rest day or night except under the influence of sedatives. One patient, indeed, compared her pains to "the tortures of the damned." Relatively rapid wasting of the muscle groups affected (deltoid, trapezius and rhomboids, intercostals, muscles of upper arm, &c.) occurs, but it is too early yet to say how the wasted muscles will respond on recovery.

The foregoing description is suggestive of textbook accounts of trichinelliasis, from which it differs in the important particular that these pains may be localised to one particular muscle group, more often than not unilaterally. Multiple cases in the same house are occurring—husband and wife, employer and servant-girl—while two consecutively encountered cases were in adjacent streets.

Salicylates seem useless either to cut short the disease or to ease the pain. Local massage is of slight temporary benefit, but the patients (who are irritable and difficult to manage) soon abandon it because its effect is so transient. Symptomatic treatment, with rest in bed, seems the best that can be done.

I am, Sir, yours faithfully,

W. J. RUTHERFURD.

Manchester, May 19th.

## MENTAL SICKNESS AND CERTIFICATION

To the Editor of THE LANCET

SIR,—While in agreement with the suggestion contained in Dr. Dillon's letter in THE LANCET of May 16th, I should like to correct the impression which he, and possibly some of your other readers, may have gained with regard to the Institute of Medical Psychology. The hostel which we hope will be built in the near future is only designed to accommodate *psychoneurotic* patients who are ambulant. The ultimate extension on the site which the Institute has acquired, while it will contain beds, is still only intended for the treatment of the psychoneuroses. In London, at any rate, there would appear to be adequate facilities already provided for the treatment of psychotic patients.

I am, Sir, yours faithfully,

J. R. REES.

Institute of Medical Psychology, Malet-place, W.C., May 16th.

## FELLOWSHIPS IN CHILD GUIDANCE

DR. D. R. MACCALMAN writes to call further attention to three fellowships offered by the Child Guidance Council and advertised in our issues of May 2nd and 9th. They are tenable at the London Child Guidance Clinic, and their object is to give training in the medico-psychological problems of childhood. "The number of child guidance clinics," he says, "is steadily growing, and there is, in consequence, an increased demand for skilled personnel. This is especially true since the Board of Education agreed to allow these clinics to rank equally for grant with other school medical services, and local education committees have become interested in having such a service. It has been suggested that local authorities who are contemplating the establishment of a clinic might find it possible to second, for the purpose of taking a fellowship, any physician in their service who has the necessary background of psychiatric knowledge. The closing date for applications has been given as May 22nd, but applications of the above nature will receive consideration if sent in before May 30th."

## MEDICAL NEWS

### University of Cambridge

On May 15th the degree of M.B. was conferred on J. P. S. Peck.

### Royal College of Surgeons of England

At a meeting of the council held on May 14th, with Sir Cuthbert Wallace, the president, in the chair, a letter was received from the trustees of the Bernhard Baron Trust offering to give £25,000 for the erection of new research laboratories at the College in Lincoln's Inn Fields. The trustees said that they were impressed with the importance and value of the work now being carried out under very difficult conditions, and felt sure that with improved accommodation results would be achieved of the greatest value in the prevention and treatment of disease. A resolution was adopted expressing the best thanks of the council for this generous gift. The new laboratories will be named after the late Mr. Bernhard Baron.

Diplomas of fellowship were granted to William John Lawrence Francois (Glasgow and London) and to Frederick Gordon Kergin (Toronto). Diplomas of membership were granted to those whose names were published in THE LANCET of May 9th, p. 1095, as having received the licence of the Royal College of Physicians, and diplomas in tropical medicine and hygiene and in anaesthetics were granted jointly with the Royal College of Physicians to those who were mentioned on the same page.

Mr. H. S. Souttar and Mr. E. Pearce Gould were elected members of the court of examiners. Mr. G. C. Knight, F.R.C.S., was reappointed a Leverhulme scholar, and Mr. William D'Auvergne Maycock, M.R.C.S., was appointed a Leverhulme scholar. The honorary gold medal of the College was awarded to Dr. James Alexander Murray, F.R.S., in appreciation of his services as director of the laboratories of the Imperial Cancer Research Fund. It was reported that Mr. R. B. Wade, president of the Royal Australasian College of Surgeons, had accepted the honorary fellowship of the College. He will come to London for his admission at some future date.

The president was appointed ex officio a member of the governing body of the British Postgraduate Medical School for one year. The council considered a comprehensive report from a committee on the preliminary examination in general education and decided to make no change in the present regulations for this examination. The following hospitals were approved, with the posts specified, for the six months' surgical practice required of candidates for the final fellowship examination:—

Llandough Hospital, Cardiff.—Senior Resident Surgical Officer, Junior Resident Medical Officer (to July 31st, 1938).

Royal Infirmary and Dispensary, Doncaster.—Senior Resident with charge of Casualties, House Surgeon to Unit 3, House Surgeon to Unit 2.

Smithdown-road Hospital, Liverpool.—Resident Surgical Officer.

The council accepted with great pleasure Lord Moynihan's offer to present to the College the portrait of himself by Mr. Richard Jack, R.A.

### University of Glasgow

Sir Hector Hetherington, vice-chancellor of the University of Liverpool, has been appointed principal of the University of Glasgow in succession to Sir Robert Rait who retires on Sept. 30th. Before he took up his present post in Liverpool in 1927 Sir Hector held the chair of moral philosophy in the University of Glasgow.

### University of Aberdeen

At a meeting of the university court last week, the Royal Commission was presented, announcing that Dr. W. Hamilton Fyfe, principal and vice-chancellor of Queen's University, Kingston, Ontario, has been appointed principal and vice-chancellor of the university. A legacy amounting to £2000 has been received to provide a prize to the student showing the greatest proficiency in biology. Another legacy also amounting to £2000 is to be used to present prizes to the duxes of the year in medicine and surgery respectively.

### Royal College of Surgeons of Edinburgh

At a recent meeting of the College, with Mr. Henry Wade, president, in the chair, the following were admitted to the Fellowship:—

Robert Emmett Mullarky, M.D. California; Cyril Ferdinand Hecker, M.R.C.S. Eng.; Keshav Sokarji Jayakar, M.D. Bombay; Edward Henry Connell Shepherd, M.B. Edin.; Thomas Victor Stubbs Brown, M.B. Sydney; Richard Osmond Burrell, M.D. Manitoba; Eric Noel Callum, M.R.C.S. Eng.; Brennan Scott Cran, M.D. Aberd.; Robert Hugh Dewar, L.R.C.P. Edin.; Clifford Robert Eugene Downing, M.B. Edin.; Robert Allan Elliott, M.B. Edin.; John Burke Ewing, M.D. Kingston; Mahmud Hafezi, M.R.C.S. Eng.; Albertus Wynand Louw, M.B. Edin.; Graham Macpherson, M.B. Edin.; Arthur Harold Morley, M.B. Leeds; George Brown Morton, M.B. Glasg.; and Arthur Manus Sheridan, M.B. Glasg.

The following candidates received the higher dental diploma:—

A. J. W. Day, F. E. Gillieron, Andrew Muir, G. E. Firth, T. L. Winn, and G. B. Ashworth.

### Glasgow University Club, London

Owing to Mr. Ramsay MacDonald's indisposition, the annual summer dinner of this club has been postponed until Friday, June 26th. It will be held at 7.30 p.m. at the Trocadero Restaurant, Shaftesbury-avenue, W., and the hon. secretaries may be addressed at 62, Harley House, N.W.1.

### University of London Medical Graduates' Society

At the annual meeting of this society on May 12th Dr. Dorothy Hare was elected president, Mr. Philip H. Mitchiner hon. treasurer, Dr. Louise Livingstone and Mr. J. P. Hosford hon. secretaries, and Mr. Victor Bonney hon. secretary for overseas members.

### St. John's Skin Hospital, London

This hospital held its annual meeting for the first time at the new premises in Lisle-street, Leicester-square, on May 14th, when Captain Eric Smith appealed for assistance in clearing off the debt at the bank.

### Royal Bucks Hospital, Aylesbury

The Duchess of York has promised to open the new special departments building of this hospital and the extension to the nurses' home in the autumn. The committee has to raise £50,000 for this purpose, and so far over £22,000 has been received.

### Royal Sanitary Institute

The Bostock Hill memorial shield, which is offered annually by this institute for the best celebration of health week in the Empire outside the British Isles, has been awarded for 1935 to Rangoon for the health week and exhibition held there last year, which was organised by the Burma branch of the Indian Red Cross Society. The health week in Lagos, Nigeria, was highly commended, and those of Pretoria, Transvaal, and Port of Spain, Trinidad were commended.

### National Temperance Hospital, London

It is proposed to build a maternity and gynaecological wing on a site adjoining this hospital, and King Edward's Hospital Fund have allocated £2500 to the cost of building and £500 towards purchasing the site. The wing when erected is expected to be self-supporting, but £100,000 is needed for the cost of the site, equipment, and provision of 91 beds. The hospital still has a debt of £26,000, although last year income exceeded expenditure by £4689.

### Medical Telephone Exchange

The Johannesburg branch of the South African Medical Association has appointed a committee to investigate the possibility of organising a central telephone office for doctors. The doctor will notify a central bureau of his movements for the day and the bureau will find him for patients who ring up. It will no longer be necessary to search for a doctor by a series of telephone calls. If a quarter of the city's 400 doctors agree to become subscribers to the exchange it is thought that the scheme will be feasible.

**King Edward's Hospital Fund for London**

The King has appointed the Duke of York president of this fund.

A series of visits has once again been arranged for those who wish to help the Fund and to see London. On Wednesday, May 27th, Hampton Court Palace and the Old Court House, formerly the residence of Sir Christopher Wren, will be shown to the party, while on June 10th visitors will be able to go by private omnibus from Charing Cross to the Air Port of London. On June 17th one of the directors of Messrs. J. Lyons will show them round Cadby Hall, and on July 3rd a visit will be paid to Windsor Castle and St. George's Chapel. Tickets, either for the whole series or singly, may be had from the secretary of the Fund, 10, Old Jewry, E.C.

**Health Scheme at Wallsend**

The Board of Education and the Ministry of Health are prepared to give favourable consideration to a proposal by the Wallsend town council to build a new maternity home, child welfare centre, and school clinic, and the council has decided to acquire a site and proceed with the undertaking.

**Public Schools Exploring Society**

Applications are invited for one or two honorary physicians or surgeons to accompany this society's expedition to Northern Lapland from August 5th to Sept. 20th. Further information may be had from Surg.-Commander Murray Levick, White Barn, Old Oxted, Surrey, who will lead the expedition.

**South London Hospital for Women**

Two new operating theatres and two new wards were recently opened here as part of an extension scheme which will cost £45,000, and will include new general and maternity wards and an enlarged pathological laboratory. At the opening a cheque for £1000 was presented to the hospital from former patients.

**St. George's Hospital**

A donation of £10,000 has been made to the rebuilding fund of this hospital by Smith's Potato Crisps (1929), Ltd., as a token of loyalty to the memory of King George, with a suggestion that it should be used to found an industrial health research laboratory. The hospital authorities propose to include a laboratory, which will bear the name of the firm, in the new building to be erected at Hyde Park Corner.

**Fellowship of Medicine and Post-Graduate Medical Association**

Courses to be given during June are as follows: gynaecology at the Chelsea Hospital for Women (all day, from June 8th to 20th); M.R.C.P. course in neurology and psychotherapy at the West End Hospital for Nervous Diseases (afternoons, from June 8th to July 4th); clinical and pathological M.R.C.P. course at the National Temperance Hospital (8 p.m. on Tuesdays and Thursdays from June 9th to 25th); M.R.C.P. course in chest and heart diseases at the Victoria Park Hospital (Wednesdays and Fridays at 6 p.m. from June 17th to July 10th); and an M.R.C.P. course in chest diseases at the Brompton Hospital (two afternoons weekly from June 15th to July 11th at 5 p.m.). The following week-end courses will be given during June and July: general medicine at the Prince of Wales's Hospital (June 6th and 7th); obstetrics at the City of London Maternity Hospital (June 13th and 14th); fevers at the Park Hospital (June 20th and 21st); general surgery at the Prince of Wales's Hospital (June 27th and 28th); children's diseases at the Princess Elizabeth of York Hospital (July 4th and 5th); and heart and lung diseases at the Victoria Park Hospital (July 11th and 12th). On Thursday, June 11th, at 8.30 p.m., at the Royal Society of Medicine, Dr. Roland T. de Hollebranth, of New Jersey, U.S.A., will lecture on the present-day treatment in the United States of gastric and duodenal ulcers. All members of the medical profession are invited to attend. Further information may be had from the secretary of the fellowship, 1, Wimpole-street, W.1.

**North-West Durham**

The Lanchester rural council is recommending to the Lanchester joint hospital board the erection of a central hospital to serve the needs of north-west Durham and to replace the existing four hospitals at Tanfield, Langley Park, Lanchester, and Leadgate.

**St. Ann's Hospital, Nottingham**

Sir Hubert Bond, senior commissioner of the Board of Control, has opened this hospital, which is an extension of the Nottingham City Mental Hospital. It is to be used as an admission hospital for women and has cost £66,000.

**Industrial Health Education Society**

Lord Luke, presiding on May 13th at the annual general meeting of this society, recalled the fact that the disability of workmen from sickness or accidents accounts for an annual loss to the country of 28,000,000 weeks' work. The aim of the society was, he said, so to educate the workman that by his cooperation this loss might be reduced. The general secretary, Mr. J. Mackenzie, reported that during the past year 418 lectures had been given to workers by members of the medical profession. This had been done at small cost as the district trade-unions provided the place of meeting and defrayed the cost of advertising and other charges. The adoption of the report was moved by Sir William Haldane, one of the founders of the society. The Minister of Health, Sir Kingsley Wood, welcomed the cooperation of the medical profession and the worker. Ignorance, he said, was one of the worst foes to good health. Over and above the financial loss through accidents and sickness among workmen, there was the fact that the worker was deprived of a fuller and happier life. Mr. George Hicks, M.P., general secretary of the Amalgamated Union of Building Trade Workers, said that educational work of this kind was desperately needed. Only those closely in touch with the everyday life of the working man could know the ill-effects of bad housing, insanitary conditions, poor food, and unemployment on his health and work. Thanks to the speakers were voiced by Dr. G. Clark Trotter, hon. secretary of the society.

**Births, Marriages, and Deaths****BIRTHS**

**BUTTAR.**—On May 13th, at Salisbury, the wife of Dr. F. L. Buttar, of a daughter.  
**CROFT.**—On May 7th, the wife of Dr. C. R. Croft, Devonport, of a son.  
**LIGHT.**—On May 13th, at St. Thomas's Hospital, the wife of Dr. L. H. B. Light, of Burnham-on-Crouch, of a son.  
**REUVID.**—On May 10th, the wife of Dr. L. Reuvid, of Lewisham Park, S.E., of a son.  
**WATSON.**—On May 14th, to Dr. Grace Mizen, the wife of H. Watson, of Chingford, E.—a son.

**MARRIAGES**

**FINLAYSON—ROBOTTOM.**—On May 11th, at St. Paul's Church, Durban, Victor Alexander Finlayson, M.C. recently of Kingswood, Surrey, to Phyllis Muriel Robottom, M.B. Lond., younger daughter of Mr. H. C. Robottom, of Harlow Common, Essex.  
**GORMAN—YOUNG.**—On May 9th, at the Parish Church, Erdington, Everard Noel Griffin Gorman, M.B. Birm., of Hove, to Muriel Winifred Young, B.A., only daughter of Mr. Thomas Young, of Erdington.  
**MACEWAN—CHALLONER.**—On May 9th, at the Church of St. Giles, Dundonald, Alastair Birkmyre MacEwan, B.A., M.R.C.S. Eng., to Aileen Strang, younger daughter of the late Mr. and Mrs. R. C. Challoner, Barassie, Ayrshire.

**DEATHS**

**ASPLEN.**—On May 14th, at Kenilworth, William Reginald Ward Asplen, M.B. Lond., aged 50.  
**CARR.**—On May 12th, at Walford, Mary Brice Carr, L.R.C.P. and S. Edin., of Liverpool, second daughter of the late Robert Carr, of West Ditchburn, Northumberland.  
**EMERSON.**—On May 12th, at Falmouth, Peter Henry Emerson, M.B. Camb., in his 80th year.  
**FAULL.**—On May 13th, at Elms-road, London, S.W., suddenly, William Collins Faull, F.R.C.S. Eng., of Durban, South Africa, in his 48th year.  
**HUGHES.**—On May 14th, at Cambridge (the residence of his friend, Dr. Rogers), Frank Mainwaring Hughes (late of Walmer), M.D. Brux., M.R.C.S. Eng.  
**McFEELY.**—On May 14th, at Woolton, Liverpool, Joseph Daniel McFeely, F.R.C.S.I., D.P.H., in his 84th year.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

# Medical Diary

## SOCIETIES

### ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, May 25th.

**Odontology.** 8 P.M. (Royal College of Surgeons, Lincoln's Inn-fields, W.C.). Annual General Meeting. Sir Frank Colyer will show New Specimens received in the Museum during the Past Year.

**Medicine.** 5 P.M. Annual General Meeting. Dr. Evelyn Holmes: Comparison of Different Methods of Treatment of Tuberculosis. Dr. W. D. W. Brooks: Circulatory Adjustments in Polycythemia Rubra Vera. Dr. Lee Lander: Massive Collapse of the Lung. Dr. F. C. Roles: Presclerosis: Some Observations on Early Arterial Disease.

**Pathology.** 8.15 P.M. (British Postgraduate Medical School, Hammersmith Hospital, Duane-road, W.). H. J. Burrows: 1. Changes Induced in the Adrenals of Mice by Estrogenic Compounds. S. T. Cowan: 2. Precipitin Reactions with Staphylococcal Extracts. 3. The V.P. Test in Staphylococci. J. Gray and C. V. Harrison: 4. Pathological Specimens. J. Gray and A. A. Miles: 5. A Case of Endocarditis due to *H. parainfluenzae*. G. A. D. Haslewood: 6. A New Method for Determination of Blood Chloride. 7. Artificial Standards for Protein in Urine and C.S.F. E. J. King: 8. A Simple Electro-dialysis Apparatus. 9. Methods for the Determination of Silica in Tissues. A. A. Miles and R. E. Johnston: 10. The Effect of CO<sub>2</sub> on the Surface Growth of Anaerobes. J. Vaughan: 11. Preparations from Sternal Marrow Biopsies. 12. A Case of Agranulocytosis in which Pyramidon was Demonstrated in the Urine.

WEDNESDAY.

**Comparative Medicine.** 5 P.M. Annual General Meeting. E. J. Pullinger: Influence of Tuberculosis upon the Development of *Br. abortus* Infections in the Guinea-pig. H. P. Bayon: The Treatment of Yellow Anemia in the Fowl by Means of Liver Extracts. J. P. Lockhart-Mummery: Evolution and Disease. Lantern slides will be shown.

THURSDAY.

**Urology.** 8.30 P.M. Annual General Meeting. Dr. S. Zuckerman: The Endocrine Control of the Prostate.

### BRITISH PSYCHOLOGICAL SOCIETY.

Medical Section.

WEDNESDAY, May 27th.—8.30 P.M. (1, Wimpole-street, W.). Prof. C. G. Seligman: Patterns of Culture. Dr. Audrey Richards and Prof. J. C. Flugel will also speak.

### MEDICO-LEGAL SOCIETY.

THURSDAY, May 28th.—8.30 P.M. (Manson House, 26, Portland-place, W.). Mr. Albert Crew: Proof of Identity of Persons in Criminal Cases in its Medico-legal Aspects.

### ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, Lisle-street, W.C.

WEDNESDAY, May 27th.—4.15 P.M., Annual General Meeting and Clinical Cases.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

### ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, May 26th.—5 P.M., Sir Bernard Spilsbury: Doctrine of Inflammation. (Last Croonian Lecture.)

### UNIVERSITY OF LONDON.

THURSDAY, May 28th.—5.15 P.M. (University College Hospital Medical School), Prof. Charles Singer: Recent Light on the History of some Tropical Diseases.

### EAST LONDON CHILD GUIDANCE CLINIC.

WEDNESDAY, May 27th.—3 P.M. (Jews' Free School, Bell-lane, Bishopsgate, E.1), Dr. Alfred Adler: Demonstration Clinic on Cases of Child Neurosis and Behaviour Disorder.

### HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.

WEDNESDAY, May 27th.—2 P.M., Mr. A. Simpson-Smith: Appendicitis: Acute and Chronic. 3 P.M., Dr. Alan Moncrieff: Significance of Blood Passed per Rectum. Out-patient Clinics daily at 10 A.M. and ward visits at 2 P.M.

### BRITISH POSTGRADUATE MEDICAL SCHOOL, Duane-road, W.

MONDAY, May 25th.—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Prof. W. Fletcher Shaw: Genital Prolapse.

TUESDAY.—2 P.M., Prof. Kettle, F.R.S.: Pathological demonstration. 3 P.M., Dr. Janet Vaughan: The Differential Red Cell Count.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).

THURSDAY.—2.15 P.M., Dr. Chassar Moir: Operative Obstetrics. 2.30 P.M., Sir Henry Gauvain: Surgical Tuberculosis. 3 P.M., Dr. R. A. Young: Non-tuberculous Pulmonary Diseases.

FRIDAY.—2.15 P.M., Dr. A. A. Davis: Gynaecological Pathology.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetrical and gynaecological clinics or operations.

### FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, May 25th, to SATURDAY, May 30th.—ST. JOHN'S HOSPITAL, Lisle-street, Leicester-square, W.C. Afternoon course in dermatology (open to non-members).—MAUDSLEY HOSPITAL, Denmark-hill, S.E. Afternoon course in psychological medicine.—ST. PETER'S HOSPITAL, Henrietta-street, W.C. All-day advanced course in urology.—GORDON HOSPITAL, Vauxhall Bridge-road, S.W. All-day course in proctology.—LONDON LOCK HOSPITAL, Dean-street, W. All-day course in venereal diseases (open to non-members).—Courses are open only to members except where otherwise stated.

### HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.

THURSDAY, May 28th.—3 P.M., Dr. Blake Pritchard: Demonstration.

### LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.

MONDAY, May 25th.—5 P.M., Dr. H. MacCormac: Treatment of Syphilis.

TUESDAY.—5 P.M., Dr. H. W. Barber: Psoriasis.

THURSDAY.—5 P.M., Dr. A. M. H. Gray: Scleroderma and Allied Conditions.

FRIDAY.—5 P.M., Dr. R. T. Brain: Physiotherapy.

### INSTITUTE OF HYGIENE.

TUESDAY, May 26th, to SATURDAY.—Joint Congress with the Royal Institute of Public Health at Edinburgh.

### UNIVERSITY OF BIRMINGHAM.

TUESDAY, May 26th.—3.30 P.M. (General Hospital), Mr. H. H. Sampson: Demonstration of Clinical Cases.

THURSDAY.—4 P.M. (Medical Faculty Buildings), Prof. W. W. C. Topley, F.R.S.: Other Mechanisms of Immunity. (William Withering Lecture.)

FRIDAY.—3.30 P.M. (Children's Hospital), Mr. E. B. Alabaster: The Treatment of Concomitant Squint.

### ANCOATS HOSPITAL, Manchester.

THURSDAY, May 28th.—4.15 P.M., Dr. W. J. S. Reid: Psychopathology.

### GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, May 27th.—4.15 P.M. (Eye Infirmary), Dr. Pendleton White: The Significance of a Hard Eyeball.

### MANCHESTER ROYAL INFIRMARY.

TUESDAY, May 26th.—4.15 P.M., Mr. Geoffrey Jefferson: Observations on the Surgery of the Gall-bladder.

FRIDAY.—4.15 P.M., Mr. F. G. Wrigley: Demonstration of Ear and Throat Cases.

## Appointments

CURRIE, D. W., Ch.M., M.D. Leeds, F.R.C.S. Eng., has been appointed Hon. Obstetric Surgeon to the Leeds Maternity Hospital, and Hon. Gynaecological Surgeon to the Hospital for Women, Leeds.

ELLIS, R. W. B., M.D. Camb., M.R.C.P. Lond., Assistant Physician to the Children's Department of Guy's Hospital.

GILL, T. P., M.B. Aberd., F.R.C.S. Edin., D.L.O., Aural Surgeon for the Kent Education Committee.

HOLMES, E., M.B. Leeds, F.R.C.S. Eng., M.C.O.G., Hon. Obstetrician and Gynaecologist to the Royal Lancaster Infirmary.

MCGARRITY, K., M.B. Sydney, Obstetrical Registrar at the Southend-on-Sea General Hospital.

PALMER, H. A., M.B. Manch., M.R.C.P. Lond., D.P.M., Senior Assistant Physician at the Woodside Hospital, London.

SHARPE, D. A., M.B. Lond., F.R.C.S. Eng., Assistant Obstetrician to the Elizabeth Garrett Anderson Hospital.

WILES, PHILIP, M.S. Lond., F.R.C.S. Eng., Visiting Orthopaedic Surgeon at the West Middlesex County Hospital.

Certifying Surgeons under the Factory and Workshop Acts: Dr. J. C. G. WHITELAW (Bruton District, Somerset);

Dr. A. W. B. WIGGINS (Hoyland Nether District, Yorks, W.R.); Dr. B. H. GILSBANK (Knottingley District, Yorks, W.R.); Dr. R. JACKSON (Nelson District, Lancs);

Dr. A. J. SHEDDEN (Stirling District, Stirling); and Dr. R. C. HEWITT (Walton-on-the-Naze District, Essex).

A VISIT TO BATH.—Last week-end the history of medicine section of the Royal Society of Medicine held a meeting in Bath, which was also attended by members of the International Congress of Physical Medicine. During the afternoon the members were conducted over the pump room and Roman baths, and the treatment establishment, where methods of treatment by the thermal mineral waters were demonstrated. Later, there was a short tour of the historic parts of Bath, in the course of which Sir D'Arcy Power unveiled a mural tablet at No. 12, South Parade, to the memory of John Hunter, who stayed at this house in 1785. At dinner in the Guildhall the Mayor welcomed the guests and Dr. E. W. Goodall, president of the section, and Prof. Louis de Pap, of Budapest, responded. The guests then returned to the pump room, where Dr. F. G. Thomson gave an address on some early physicians of Bath, and the times in which they lived. On Sunday, after a short expedition by motor in the afternoon, the Mayor and Mayoress, Dr. and Mrs. J. S. Carpenter, entertained the party to tea.

## NOTES, COMMENTS, AND ABSTRACTS

## FAMILY MEDICAL INSURANCE

It is a comforting thought that in the midst of political upheaval and international anxieties well-intentioned people throughout the world are studying intensively problems of human welfare. The type of social endeavour which has developed since the war is exemplified in the attempts being made to improve the medical services of this and other nations. The stimulus for these efforts is provided by the disturbing conviction, which no serious student of the subject can escape, that only a minority of people in this country, or for that matter in any other, receives the full benefit of modern medical science. Most people are agreed on at least one other point: that while considerable reorientation of both medical practice and medical education may be necessary, or soon become necessary, the principal need at present is for a better organisation of the available services. It is on the method of achieving this that divergence appears. The latest recruit to the ranks of benevolent realists who not only recognise defects in the present system but are prepared to outline a scheme for their removal is Dr. John Lachlan-Cope.

In a foreword to a small book entitled "Family Medical Insurance: a New Scheme with Evidence," he explains that following the advice of various people to whom he had propounded his scheme in typescript, he has had it printed in order to elicit discussion. An introduction explains the standpoint from which the author starts; there follows a chapter entitled Evidence, which contains a series of statements and quotations in support of the extension and completion of health services on a contributory system without limitations or restrictions, the general practitioner remaining the hub of medicine. The crucial chapter, embodying a scheme whereby this is to be effected, will disappoint those who seek not quotations from Charles Kingsley and others, but a brief and clear outline of what is proposed. The seven points which purport to embody the main features of the scheme are specific in certain immaterial details, but vague in what seem to be essentials for its comprehension. It appears that while complete medical, surgical, maternity, and all auxiliary services shall be available to all without restriction or limitation, the final acceptance of membership and its *continuance* (our italics) shall rest with the Board of Governors and there shall be no appeal against their decision. The Family Medical Insurance would have clinics where patients would be examined and advised on production of letters from their family doctors, who would also receive reports of the findings at the occasional examination held for preventive purposes. Prescriptions, whether from clinic or family doctor, would be dispensed at special fees at the clinics, but "in F.M.I. institutions for *in-patients* no charge would be made for medicaments. Domiciliary treatment or consultations can be arranged when the family doctor considers such to be absolutely necessary or when circumstances render any other course impracticable" (p. 48). These vast services would be for premiums—a sliding scale based on income. The final point made is that the F.M.I. scheme would relieve the voluntary hospitals' financial situation but it is not until seven pages further on (p. 55) that a hint is given in what way this is to be achieved. Here it is suggested that every clinic besides being attached to the F.M.I. central institution, which will contain the medical record department, is also to be attached to various local institutions, including general and special hospitals, cottage hospitals, and nursing homes, the cooperation services of these institutions being remunerated by an annual grant based on local membership. The final chapter deals with medical education and nursing and it is proposed that at the central institution mentioned above post-graduate studies and research facilities should be available.

Apparently in Dr. Lachlan-Cope's view the principal need is the provision of a large number of specialist diagnostic and treatment clinics to which the middle-class subscribers or members for whom the scheme is devised would have free access, there to obtain the type of specialist service from which the poor and the rich are assumed to derive such great benefit in hospitals and in the consulting-rooms of leading advisers. It is, of course, universally conceded that the days when the family doctor could provide almost all necessary medical advice and treatment are gone for ever, and that his good offices must frequently be supplemented by specialist and ancillary service. The danger which many people would foresee in meeting this need through such a system of clinics as is proposed is that their service would become a substitute for rather than a supplement to that of the family doctor, thereby accentuating the modern tendency to uncoordinated and disintegrated specialism. It is true that the scheme provides that, except in the case of emergency, a letter of introduction from the doctor will be required before examination is made and treatment given, but it also proposes, in the interests of prevention, to encourage members to present themselves for periodical examination, not to their own doctors but at the clinic, and in this case a doctor's note will not be required. There can be little doubt that under arrangements of this kind the population would very soon become "clinic-conscious" if we may coin a word from the advertisement vocabulary. The general practitioner would come to be considered, as indeed he already is by some, merely as a stepping-stone to the clinic, a sort of middleman whose services are tolerated only because of their value in emergency. The clinic would almost inevitably become in the eyes of the patient the primary source of medical help and guidance, and thus the basis of medical organisation. Such an organisation is in fact already favoured in many places and by many people, and is developing in the United States and to an even greater extent in Soviet Russia whose legislators have deliberately adopted it. A sentimental attachment to the centuries-old British tradition of the family doctor would not prevent us from giving consideration to this plan if it were likely to be in the best interests of patients. But it is a matter of general agreement in this country that, as the interim report of the Scottish Consultative Council on Medical and Allied Services puts it: "The first essential for the proper and efficient treatment of individual persons is, therefore, not institutional but personal service, such as can be rendered to the people in their own homes only by a family doctor who has the continuous care of their health; to whom they will naturally turn for advice and help in all matters pertaining thereto; who will afford them such professional services as he can render personally; and who will make it his duty to see that they obtain full advantage of all the further auxiliary services that may be otherwise provided."

It may well be, of course, that the divergence of opinion is not so great as it seems; there are two points at any rate on which Dr. Lachlan-Cope and his readers will agree—that the terms and conditions of any insurance service must be acceptable to those operating it and the administration must be efficient and enlightened if it is to be effective. Especially those who see (and deplore) a tendency at the present time towards a national or State service, based on the clinic system and administered by local government authorities, should take note of any published schemes for a voluntary service and express a considered opinion on them. Anyone who submits a scheme that provokes discussion among the profession on the future of medicine in this country does a public service.

ROYAL SOCIETY OF MEDICINE.—The house and library of this society will be closed from Saturday, May 30th, to Monday, June 1st, inclusively.



### NATIONAL BABY WEEK

THE first week in July has been allocated by the National Baby Week Council for a campaign to cultivate public opinion on certain hygienic matters. This year special attention is to be given to (a) maternal welfare, stressing the constructive aspects—welfare and happiness—as distinct from maternal mortality, disease, and morbidity; (b) the welfare of the two to five year old, whether all is being done for them that should be done, nationally and locally. The Council, whose address is 117, Piccadilly, London, W.1, offers advice and help in the organisation of propaganda and the choice of subjects for lectures and articles.

### THE EAST END HOSTELS ASSOCIATION

THE annual report of the John Benn Hostel and Milner Hall for 1935 should appeal to medical men, so obvious is it that the care of the health, physical, moral, and mental, that is offered by the institution must greatly benefit the children that come under such ministrations. The disastrous influence of unemployment on the young is patent to us all, and juvenile delinquency is to-day a feature in police courts. It is therefore very satisfactory to read of the success which the superintendent of the homes has met with in finding good employment for many of the boys. The warden wishes to induce employers to visit the institution, evidently believing that information so derived may lead to an extension of mutual advantages. The institution is very accessible, standing off the Commercial-road, E., quite near the Aldgate metropolitan and district stations.

### GUIDANCE FOR MOTHERS

THE public, especially perhaps that of the United States, grows yearly more nervous about its physical and mental health and that of its young. This fear leads among other things to a demand for books advising parents how to bring up their children. One which has recently appeared<sup>1</sup> is a collection of articles published originally in the *Parents' Magazine* of New York. More than a hundred medical and non-medical writers have contributed to it. Many of the articles are short and sketchy, so sketchy indeed as to bring alarm rather than reassurance to an anxious mother. The effort to maintain the standard of information at a level which will be intelligible to all has resulted in a tendency to make it too simple to be helpful. To suggest, for example, that calcium deficiency alone is a frequent cause of faulty posture in adolescents is to simplify that problem unduly. Many will think, too, that the danger of competitive games is needlessly stressed. Those with subjective or objective experience may doubt whether boys are likely either to overstrain themselves or hurt each other very seriously by playing football. The psychological outlook of the child is sympathetically outlined in various articles. Prenuptial chastity is advocated for both sexes and a warning to young people of the dangers of venereal disease is recommended. The mother who turns to this book will certainly find therein something about the matter that is worrying her. The question is whether she will find enough to allay her fears or merely that little knowledge which will drive her, perhaps needlessly, to the doctor for reassurance.

### "QUIET"

THE Anti-Noise League, now two years old, has come to the conclusion that if you want quiet you must make a noise about it. With the object of spreading information and propaganda about noise prevention, the League has started a magazine called *Quiet*, to be published quarterly at sixpence by the League from 66, Victoria-street, London, S.W.1. The first issue, which has just appeared, includes a message from the Minister of Health, a foreword by Lord Horder, and a note on some medical aspects of noise by Sir James Purves-Stewart. Mr. E. V. Lucas

<sup>1</sup>The Mother's Encyclopædia. By Various Authors. British edition. Edited by Len Chaloner. London: George Allen and Unwin Ltd. 1936. Pp. 692. 8s. 6d.

quotes some pleas for anti-noise from Shakespeare, and there are unsigned articles on scientific research on noise abatement and on quietening London's underground. Wing-Commander T. R. Cave-Browne-Cave writes on aircraft noise, Mr. J. K. Winsor on quieter wall-cutting, Mr. R. B. Serle on measurement of loudness, and Mr. Raymond Savage on possible individual action to prevent noise. *Quiet* is in touch with anti-noise organisations abroad, and hopes to publish messages and reports from these at intervals. Laudable as are all these efforts at noise abatement, we still think that more might be done by the individual towards acquiring the knack of turning the deaf ear. No doubt some are more naturally adept than others in this matter, but a measure of callousness to extraneous sounds can be cultivated by all where necessity demands it, as many newspaper reporters and novelists could testify.

### A GALAXY OF CENTENARIANS

IN Hungary we are told the nonagenarians have been called into consultation in an effort to discover the causes of longevity. Dr. Jean Perrigault collects centenarians and scours his native France in search of authentic specimens (*Siècle Méd.*, May 1st). So far he has collected 66, of whom 56 are women and only 10 men, a striking testimony to the fact that the female of the species is not only more deadly, but also more lively, than the male. A composite picture of 15 centenarians, 11 women and 4 men, illustrates his article, and it is no mere gallantry to say that they all look younger than their years. Among the ladies, Mme. Trottignon, 106, of Orbigny, and Mme. Roy, of Le Berry, a mere child of 100, remind one of Dutch oil-paintings. Mme. Pierre, 102, of Beaune-la-Rolande, has a look of great kindness and vigour, while Mme. Lanoix, 103, of La Demi-Lune, suggests a contemplative Mr. Punch. Among the men, M. Dufour, 101, of Sarlat, stands out as perhaps the most dogged and robust, but M. Delbos, of Dampniat, carries his 100 years so lightly that he would pass muster in any assembly of sexagenarians. There are also two separate portraits of Mme. La Baronne de Reinach, one at the age of 20 and the other at 102. The countenance of this lady, who still drinks her kirsch every evening, would seem to be almost impervious to time.

### TICS IN YOUNG CHILDREN

THE authors of a monograph,<sup>1</sup> one of a series on child development, have made a praiseworthy attempt to obtain data by objective methods on the incidence and characteristics of tics in small children, and to present them in a clear and unbiased manner. Half of the work is devoted to an historical survey, in which justice is done both to the neurological and the psychological aspects of the subject. There follows an account of the authors' investigations, which were made on a group of 25 children aged two to five, and of 32 children aged five to six, observed under different conditions in a nursery school and a kindergarten. A series of tables demonstrates the variety of tics observed during half-hour periods, their frequency, and the ages of the subjects. The same children were re-examined under varying conditions—free play, "circle play," and while lying down in relaxation. Analysis of the results showed no difference in the incidence in girls and boys, but a steady increase with the age. The influence of occupational factors was difficult to assess, but the frequency of tics was greatest during circle play, when "gross bodily movements" were most under restraint. It is unfortunate that the number of children examined was too small to furnish reliable evidence, for investigations of this kind may well form the basis of useful research on the ætiology of superfluous movements.

<sup>1</sup>The Study of Tics in Pre-school Children. By William E. Blatz and Mabel Crews Ringland. University of Toronto Studies, Child Development Series No. 3. University of Toronto Press; London: Humphrey Milford, Oxford University Press. 1935. Pp. 58. 3s.

## NEW PREPARATIONS

**EULYKOL** is a mixture of the phenylethyl esters of a selected fraction of the acids of *Hydnocarpus* oil; it is sometimes called "phenylethyl hydrocarbate." It has been shown clinically that hydrocarbate esters are capable of clearing up patches of lupus vulgaris and in investigations at the Wellcome Chemical and Physiological Research Laboratories it was found that phenylethyl esters were the least irritant and the most readily absorbed. By eliminating the small, uncrystallisable portion of the total fatty acids, it has been possible to prepare phenylethyl esters possessing a minimum irritant action. Eulykol is usually administered by intradermal injection, and favourable results are reported from its use. It is prepared by Burroughs Wellcome and Co. (Snow Hill Buildings, London, E.C.1) under a British patent, and is now available in bottles of 25 c.cm.

**VASOBROMAN**, made by Gedeon Richter (Great Britain) Ltd., of 1, Hardwick-street, E.C.1, is recommended as useful in relieving high blood pressure and associated symptoms. Each tablet is stated to contain theobromine calcium salicylate, grs. 4, papaverine hydrochloride gr.  $\frac{1}{2}$ , and bromisovaleryl carbamide grs. 3, and the dose suggested is one tablet thrice daily.

**SANATORIUM TREATMENT IN SWEDEN.**—The 80-bed private Swedish sanatorium of Sävsjö, the largest of its kind in Sweden, has issued a pamphlet dealing with its activities and the advantages it has to offer to foreigners. It is about one English mile from Sävsjö railway station on the main line between Malmö and Stockholm. The terms are from Kr.9 to 12.50 per day.

## Vacancies

For further information refer to the advertisement columns

- Accrington, Victoria Hospital.—H.S. £150.  
 Adelaide Children's Hospital, South Australia.—Two Res. M.O.'s. Each £100.  
 Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.  
 All Saints' Hospital, Austral-street, West-square, S.E.—Res. H.S. At rate of £100-£150.  
 Ashford Hospital, Kent.—Res. M.O. £150.  
 Ashton-under-Lyne District Infirmary.—Res. Surg. O. At rate of £200.  
 Aylesbury, Royal Buckinghamshire Hospital.—Sen. Res. M.O. At rate of £200.  
 Birmingham, Erdington House.—Asst. M.O. £650.  
 Bolton Royal Infirmary.—H.P. £200. Also two H.S.'s. Each £125.  
 Bradford Royal Infirmary.—H.P. At rate of £135.  
 Brighton, Borough Infectious Disease Hospital and Sanatorium.—Sen. Res. M.O. £400.  
 Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £120.  
 Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.  
 Bristol Eye Hospital.—Jun. H.S. At rate of £100.  
 Bristol Royal Infirmary.—Medical and Surgical Registrars. Each £400. Also Sen. Res. M.O. £200.  
 Cambridge University.—E. G. Fearnside's Scholarship for Clinical Research, &c.  
 Cardiff, King Edward VII. Welsh National Memorial Association.—Res. M.O. for Kensington Hospital. £350.  
 Cardiff, Llandough Hospital.—Jun. Res. M.O. At rate of £100.  
 Charterhouse Rheumatism Clinic, 9 $\frac{1}{2}$ , Hallam-street, W.—Hon. Clin. Asst.  
 Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.  
 Children's Hospital, Hampstead, N.W.—Res. M.O. At rate of £150.  
 City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Surg. and Med. Regs. £225 and £175 respectively.  
 City of London Maternity Hospital, City-road, E.C.—Jun. Res. M.O. At rate of £80.  
 Colchester, Essex County Hospital.—H.P. £150.  
 Connaught Hospital, Walthamstow, E.—H.S. and Cas. O. Each at rate of £100.  
 Coventry and Warwickshire Hospital.—Res. H.P. £160.  
 Croydon General Hospital.—Hon. Anaesthetist. Also Hon. Anaesthetist to Dental Dept.  
 Derby, Derbyshire Royal Infirmary.—H.S. £150.  
 Doncaster Royal Infirmary.—H.S. £175.  
 Dreadnought Hospital, Greenwich, S.E.—H.P. and H.S. Each at rate of £110.  
 Dunedin, N.Z., Otago Hospital.—Radiotherapist. £300.  
 Ealing, King Edward Memorial Hospital.—Sen. and Jun. Res. M.O.'s. At rate of £200 and £150 respectively.  
 Eastbourne, Royal Eye Hospital, Pevensey-road.—H.S. £100-£175.  
 East Ham Memorial Hospital, Shrewsbury-road, E.—H.S. to Spec. Depts. and Cas. O. At rate of £120. Also Hon. Ophth. Surgeon.  
 Edenbridge District Hospital.—Hon. Pathologist.  
 Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Hon. Asst. Phys. Also H.P., three H.S.'s, and Obstet. Surgeon. Each at rate of £50.  
 Grimsby and District Hospital.—Hon. Ophth. Officer.  
 Holl, Norfolk, Kelling Sanatorium.—Second Asst. Res. M.O. £350.  
 Hospital for Sick Children, Great Ormond-street, W.C.—Ophth. Surgeon.  
 Hospital for Tropical Diseases, Gordon-street, W.C.—H.P. At rate of £120.  
 Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.  
 Hull Royal Infirmary.—H.S. to Ophth. and Ear, Nose, and Throat Dept. At rate of £150. Also H.S. to Sutton Branch Hospital. At rate of £160.  
 Ilford, King George Hospital.—Hon. Asst. Dermatologist.  
 Kettering and District General Hospital.—Second Res. M.O. At rate of £125.  
 Kidderminster and District General Hospital.—H.S. £150.  
 Lancashire County Council.—Asst. County M.O.'s. Each £800.  
 Manchester City Mental Hospital, Humberstone.—Sen. Asst. M.O. £700. Third Asst. Res. M.O. £350. Also Locum Tenens Asst. M.O. 10 guineas.  
 Llanelly and District General Eye Hospital.—Res. Med. Supt. £300.  
 London County Council.—Practitioners. 7s. 6d. and 10s. a visit.  
 London Hospital, E.—Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.  
 Manchester, Ancoats Hospital.—H.S. At rate of £100.  
 Manchester, Hulme Dispensary, Dale-street.—Res. M.O. £250.  
 Manchester Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125. Also Res. H.S. At rate of £100.  
 Manchester Victoria Memorial Jewish Hospital.—Cas. H.S. At rate of £125.  
 Millwall (Isle of Dogs) Treatment Centre.—M.O. £66.  
 Mount Vernon Hospital, Northwood.—H.S. At rate of £150.  
 Murthly Perth District Asylum.—Med. Supt.  
 National Hospital for Diseases of the Nervous System, Queen-square, W.C.—Asst. Registrar. £200.  
 Newcastle-upon-Tyne Hospital for Sick Children.—Asst. Hon. Physician to Skin Dept.  
 Norwich, Norfolk and Norwich Hospital.—Cas. O. £120.  
 Nottingham General Hospital.—H.S. At rate of £150.  
 Nottingham General Dispensary, Gregory Boulevard Branch.—Res. Surgeon. £250.  
 Nottingham and Midland Eye Infirmary.—Res. H.S. £200.  
 Oldham, Boundary Park Municipal Hospital.—Asst. Res. M.O. £350.  
 Oldham County Borough.—Asst. M.O.H. and Asst. Tuberc. Officer. £750.  
 Oldham Royal Infirmary.—H.S. to Special Depts. and H.P. at rate of £175.  
 Princess Beatrice Hospital, Earl's Court, S.W.—Res. M.O. At rate of £150. Also Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.  
 Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £100.  
 Queen's Hospital for Children, Hackney-road, E.—Psychiatrist.  
 Queen Mary's Hospital for the East End, Stratford, E.—Hon. Asst. Surgeon, Res. M.O., and two Cas. and Out-patient Officers. Each at rate of £150. Also H.P.'s, H.S.'s, and Res. Anaesthetist. Each at rate of £120.  
 Radium Beam Therapy Research, &c., 16, Riding House-street, W. Asst. M.O. At rate of £250.  
 Relford, Notts, Rampton State Institution for Mental Defectives.—Medical Officer. £515.  
 Rotherham County Borough.—Asst. M.O. £300.  
 Royal Chest Hospital, City-road, E.C.—Surgeon.  
 Royal College of Physicians of London.—Charles Murchison Scholarship in Clin. Med. 20 guineas.  
 Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. and Res. Anaesthetist. At rate of £150 and £75 respectively. Also Children's Third H.S.  
 Royal Naval Medical Service.—M.O.'s.  
 Royal Northern Hospital, Holloway, N.—Hon. Radiologist.  
 Royal Waterloo Hospital, Waterloo-road, S.E.—H.S. At rate of £100.  
 Salvation Army Mothers' Hospital, Lower Clapton-road, E.—Jun. Res. M.O. At rate of £80.  
 Sheffield Royal Infirmary.—Ophth. H.S. At rate of £120.  
 Sheffield University.—Demonstrator in Anatomy. £300.  
 Smethwick County Borough.—Asst. M.O.H. and Asst. School M.O. £350.  
 Southampton, Isolation Hospital and Sanatorium.—Jun. Res. M.O. £200.  
 South Africa, Northern Free State General Hospital, Kroonstad.—Med. Supt. £1000.  
 St. John's Hospital, Lewisham, S.E.—H.S. At rate of £100.  
 Stockport Infirmary.—H.S. and Cas. O. £150.  
 Sunderland Royal Infirmary.—H.S. and H.P. Each £120.  
 Truro, Royal Cornwall Infirmary.—Hon. Surgeon.  
 University of London, King's College, Strand, W.C.—Asst. Lecturer and Research Worker. £300.  
 West London Hospital, Hammersmith-road, W.—Res. Asst. Surgeon. £200. Med. Reg. to Children's Dept. £100. Also two H.S.'s and Res. Cas. O. Each at rate of £100.  
 West Malling, Kent, Leybourne Grange Colony for Mental Defectives.—Asst. Res. M.O. £350.  
 Wolverhampton Royal Hospital.—H.P. and H.S. At rate of £125 and £100 respectively.  
 Worksop, Victoria Hospital.—Sen. and Jun. Residents. £150 and £120 respectively.  
 The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Haddington (East Lothian).

# ADDRESSES AND ORIGINAL ARTICLES

## LATE RESULTS IN THE OPERATIVE TREATMENT OF INTRACRANIAL TUMOURS \*

By HUGH CAIRNS, M.B. Adelaide, F.R.C.S. Eng.  
 SURGEON IN CHARGE OF THE DEPARTMENT OF NEURO-SURGERY, LONDON HOSPITAL

DURING the year September, 1926, to September, 1927, it was my privilege to act as assistant resident surgeon in the clinic of Dr. Harvey Cushing at the Peter Bent Brigham Hospital, Boston, and to make a report on the immediate results of the year's work to the Medical Research Council.<sup>3</sup> The present report is concerned with the ultimate fate of 135 patients with verified intracranial tumours who left hospital alive after having been treated during 1926-27 by a major intracranial operation (Tables I. and II.).

TABLE I

Verified Intracranial Tumours Treated by Operation During 1926-27

Tumours partly or wholly removed at operation in 1926-27 .. .. .	148
Tumours first verified at necropsy .. .. .	5
Tumours not surgically disclosed but found and verified at secondary operation in later years .. .. .	4
Died in hospital during 1926-27 .. .. .	157
Survivors of 1926-27 series .. .. .	22
	135

TABLE II.\*—Intracranial Tumours, 1926-27

Survival Periods of 157 Cases in Accordance with Pathological Type

Type.	Died in hospital.	Died subsequently.	Still living 7-9 years after operation.	Total.
Glioma .. .. .	11	40	8	59
Pituitary adenoma .. .. .	1	9	19	29
Meningioma .. .. .	5	8	18	31
Neurinoma (acoustic) .. .. .	1	1	8	10
Craniopharyngioma .. .. .	2	2	1	5
Cholesteatoma .. .. .	—	—	2	2
Blood-vessel tumour .. .. .	1	—	3	4
Metastatic tumour .. .. .	1	7	—	8
Granuloma .. .. .	—	2	1	3
Miscellaneous .. .. .	—	3	3	6
Total .. .. .	22	72	63	157

\* For various reasons these figures are not identical with those given in Table VI. of the report to the Medical Research Council.<sup>3</sup> Thus, 61 gliomas were cited in the original report, whereas now there are only 59. Two of the original cases have since been reclassified, after further operation, one as a sarcoma, another as a meningioma.

Contact has been maintained with every one of these 135 patients during the years between 1927 and 1935; of those who died the time and manner of death is in most cases known; with those who are alive regular correspondence has been exchanged and many have been examined from time to time. This follow-up work is done by Dr. Louise Eisenhardt, formerly of the Peter Bent Brigham Hospital and now in charge of the Brain Tumour Registry at New Haven, where records of Dr. Cushing's 2000 and more verified brain tumour cases<sup>9</sup> are kept. The fact that not one of these 135 patients has been lost

sight of indicates the thoroughness of the system. Without Dr. Eisenhardt's work the present study could not have been undertaken. When I revisited the United States in the autumn of 1935 she kindly collected the necessary material for me, with the help of Miss M. Stanton. Through the kind interest of Dr. Cushing I was able to examine personally many of the survivors of the series.

The primary aim of such an investigation as this is to estimate the lasting value of surgical treatment of intracranial tumours. Table II. shows the survival-rates of the patients operated on in 1926-27. Of 135 patients discharged from hospital 63 were alive when last heard from seven to nine years later. With intracranial tumours a survival table tells us little. This one supports in a general way the impression that about half of all intracranial tumours coming to operation are benign and the other half malignant, but it does not indicate the value of treatment; for a patient may live indefinitely after removal of an intracranial tumour and yet be so maimed that his life is a burden to his relatives and to himself. What we need to know is the period of useful life of a patient after operation.

To assess the value of surgical treatment it is obviously necessary to consider each pathological type of tumour separately. Not only does the life-history of intracranial tumours vary as between one type and another, but in some instances the criteria by which results can be judged also differ. For example, some patients are operated upon to relieve loss of sight rather than to save life, and in these the results of treatment must be judged by the condition of their eyesight and not by longevity.

Table III. gives a detailed analysis of the late results according to pathological type. In this and the succeeding table the duration of life after operation is given in years. A certain number of patients have had more than one intracranial operation and the duration of life is calculated from the time when the tumour was first removed. For example, a patient was operated on during 1926-27 for recurrent meningioma, the first operation having been performed in 1919; this patient died in 1932 and the duration of life was thus 13 years. In the last column of Tables III. and IV. is recorded the longest post-operative survival period so far achieved among the 2000 tumour cases of the collection for each type of tumour. These compensate in some measure for possible errors of judgment, due either to the small number of cases observed in one year, or to the fact that only 8-9 years have elapsed since operation. †

### GLIOMAS

The course of the gliomas in this series is shown in Table IV.

*Glioblastoma multiforme.*—This is typically a rapidly growing tumour of the white matter of the cerebral hemisphere of middle-aged and elderly people. It is an invasive tumour and usually contains areas of necrosis and hæmorrhage. At times it contains one or more cysts. The illness runs as a rule a fairly rapid course, measurable in weeks or months. At operation the tumour may appear to be sharply defined from the surrounding softened white matter, but, even after an apparently complete removal, in

† These figures have kindly been supplied by Dr. Eisenhardt from an unpublished paper presented before the Association for Research in Nervous and Mental Disease, Dec. 28th, 1935.

\* The full report is being published in the Yale Journal of Biology and Medicine, May, 1936.

TABLE III.—INTRACRANIAL TUMOURS, 1926-27

*Duration of Life in Years Calculated from the Time when the Tumour was First Removed*

Type.	Total.	Dead.											Still living 7 or more years after operation.	Useful life.	Longest post-op. survival recorded in Registry.	
		Post-op.	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10				10-14
Glioma .. .. .	59	11	11	18	3	1	2	2	..	1	1	1	..	8	5	26 +
Pituitary adenoma .. .. .	29	1	..	..	2	..	3	..	1	1	1	1	..	19	10	24 +
Meningioma .. .. .	31	5	..	..	..	1	3	2	..	..	..	..	2	18	14	25 +
Neurinoma .. .. .	10	1	..	..	..	1	..	..	..	..	..	..	..	8	2	25 +
Cranio-pharyngioma .. .. .	5	2	..	1	..	..	1	..	..	..	..	..	..	1	..	20
Cholesteatoma .. .. .	2	..	..	..	..	..	..	..	..	..	..	..	..	2	2	16 +
Blood-vessel tumour .. .. .	4	1	..	..	..	..	..	..	..	..	..	..	..	3	1	22
Metastatic tumour .. .. .	8	1	5	..	2	..	..	..	..	..	..	..	..	..	..	5
Granuloma .. .. .	3	..	1	..	1	..	..	..	..	..	..	..	..	1	1	15 +
Miscellaneous .. .. .	6	..	3	..	..	..	..	..	..	..	..	..	..	3	2	..
<b>Total .. .. .</b>	<b>157</b>	<b>22</b>	<b>20</b>	<b>19</b>	<b>8</b>	<b>3</b>	<b>9</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>63</b>	<b>37</b>	<b>..</b>
Percentage of total number of cases .. .. .	..	14.0	12.7	12.1	5.1	1.9	5.7	2.5	0.6	1.2	1.2	1.2	1.2	40.1	..	..

most cases it quickly recurs. Radiation in various forms usually fails to prevent recurrence.

In this series there were 8 cases of glioblastoma multiforme. In 6 cases removal of tumour at operation appeared to be complete, in the other two partial. In one patient a second operation was done and the tumour was again removed, 4 months after the first operation; the patient died 5 months later. In all cases the tumour recurred after a brief interval and every one of the patients soon died. The shortest survival period from the time of operation was 2½ months, the longest 14 months, the average about 6½ months. The longest period of freedom from symptoms after operation was 2 months.

*Cerebellar Medulloblastoma.*<sup>1 7</sup>—This is another very unfavourable type of glioma. Arising usually in the vermis of children and young adults it grows rapidly and quickly produces hydrocephalus. The diagnosis of cerebellar tumour rarely presents difficulty. At operation the tumour can be shelled out apparently completely, but soon, usually within a year, there is recurrence. Metastases occur in the cerebral and spinal subarachnoid spaces and in the ventricles.<sup>4</sup> X rays or radium produce prompt amelioration of symptoms, for the tumour is at first very sensitive to radiation, more so than any other form of intracranial tumour. But as times goes on radiation ceases to give relief and the patient dies.

In this series there were 5 cases of cerebellar medulloblastoma. All died at intervals of 2 to 19 months after operation. The average survival period

was 13 months. In van Wagenen's series of 17 cases it was 14.5 months. When Cushing<sup>7</sup> reported the medulloblastomas in Lund, only 3 of the 61 cases he had treated up to that time were still alive.

Though the survival period is short the proportion of it that may be regarded as useful life is usually high. The patients recover quickly and completely from operation provided hydrocephalus has been relieved, and with regular courses of X ray treatment are able to get about with every appearance of normality and happiness for about a year. The period of final illness is usually mercifully short, though not invariably so, for sometimes incapacitating symptoms arise from spinal metastasis when there is no clinical evidence of recurrence within the cranium.† But in the majority of cases, short as the respite is, the parents of the patient seem so grateful for this extra time that it is impossible to conclude that surgery is not worth while in this variety of tumour. And that is just as well, for it is practically impossible to distinguish clinically between this tumour and the benign astrocytoma (q.v.) that occurs in the same situation.

*Cerebral Medulloblastoma.*—Occasionally medulloblastoma has been described as occurring in the cerebral hemisphere, but with far less frequency than in the cerebellum. Moreover, cerebral medulloblastomas do not appear to have the same life-history

† Hence the importance after operation of prophylactic radiation of the spinal canal.

TABLE IV.—GLIOMAS, 1926-27

*Duration of Life in Years Calculated from the Time when the Tumour was First Removed*

Type.	Total.	Dead.										Still living 7-9 years after operation.	Longest post-op. survival recorded in Registry.		
		0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10				
Glioblastoma multiforme	8	6	2	..	..	..	..	..	..	..	..	..	..	..	4 +
Medulloblastoma—															
Cerebellar .. .. .	5	2	3	..	..	..	..	..	..	..	..	..	..	..	7 +
Cerebral .. .. .	2	..	..	..	1	1	..	..	..	..	..	..	..	..	5
Oligodendroglioma .. .. .	2	..	1	..	..	..	..	..	..	..	1	..	..	..	13
Astroblastoma .. .. .	4	1	1	..	..	..	1	..	..	..	..	..	..	1	12 +
Ependymoblastoma .. .. .	1	..	1	..	..	..	..	..	..	..	..	..	..	..	10 +
Spongioblastoma polare	1	..	..	..	..	..	..	..	..	..	..	..	..	1	15 +
Papilloma .. .. .	1	..	..	..	..	..	..	..	..	..	..	..	..	1	8 +
Astrocytoma—															
Cerebellar .. .. .	4	..	1	..	..	..	..	..	..	..	..	..	..	3	26 +
Cerebral .. .. .	15	1	7	3	..	1	..	..	1	..	..	1	..	1	21 +
Unclassified .. .. .	5	1	2	..	..	..	1	..	..	..	..	..	..	1	..
<b>Total .. .. .</b>	<b>48</b>	<b>11</b>	<b>18</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>..</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>8</b>	<b>..</b>	<b>..</b>

as cerebellar medulloblastoma, nor, as a rule, the same radio-sensitivity. There were two gliomas of the cerebral hemisphere in this series that were classified as medulloblastomas, but this interpretation of the histological picture is not free from possibility of error, and, moreover, the group is too small to justify conclusions. One patient died 5 months after operation without improvement. The other patient survived nearly 5 years.

*Cerebellar Astrocytoma.*<sup>8</sup>—This proves to be one of the most satisfactory intracranial tumours to deal with surgically. Composed of fully differentiated astrocytes, it occurs chiefly in young adults and children in the vermis and lateral lobes of the cerebellum and appears to be almost invariably quite circumscribed and benign. If all the tumour tissue visible to the naked eye is removed at an operation in which the lesion is adequately exposed, the tumour does not as a rule recur, though in this connexion it must be noted that symptoms of recurrence after incomplete operations may be delayed for as long as eleven years, and perhaps longer.

In this series there were 4 young female patients with cerebellar astrocytomas. In one case only part of the tumour was removed, and the patient died after a second attempt to remove the tumour fourteen months later. In the other cases the tumour was completely removed during 1926-27 and all three patients were well, in full work, and free from symptoms when last heard from seven to nine years after operation, with the exception that one complained of occasional headaches and tremor of the left hand and foot. This patient and another had married since operation, and each had borne two healthy children. The third was seen recently by me and was free from symptoms.

*Cerebral Astrocytoma.*—Astrocytoma of the cerebral hemisphere differs from the cerebellar astrocytoma in being less sharply defined and not wholly composed of astrocytes, but often containing an admixture of oligodendroglia and other cells. Furthermore, the astrocytes are often immature and some tumours show mitotic figures. These tumours are often difficult to remove completely, and sometimes they infiltrate the brain to such a remarkable degree that complete removal, short of removing the cerebral hemisphere, is impossible. Recurrence after apparently complete removal of the tumour is common, whereas in cerebellar astrocytoma it is rare.

In this series there were 15 cerebral astrocytomas, a remarkably large number. The survival periods are shown in Table IV. and it can be seen that the majority (all except 4) died within three years. Of the 15 patients 8 had a second operation for recurrence of tumour. The average survival period for the whole group was 37.0 months.

Of the patients who survived operation for more than three years one, a young man with a cystic left temporal astrocytoma (Cushing,<sup>6</sup> Case 9), lived nine years from the time of his first operation, being free from symptoms and doing active farm work for six of those years. Another, a man with a cystic right parietal astrocytoma (Cairns,<sup>3</sup> Case 8), blind from secondary optic atrophy before his first operation, was still alive when last heard from seven and a half years after operation. Another, a woman with a large solid left occipital astrocytoma (Cairns,<sup>3</sup> Case 9; Horrax and Putman,<sup>13</sup> Case 6), subtotally removed, was free from symptoms of recurrence of tumour for nearly seven years after operation, but died six months after a further operation for recurrence.

There is little doubt that there is considerable variation in the rate of growth of individual astrocytomas. Whether this can be explained on a histological basis has not yet been established. With the improvements in diagnosis and operative technique which have been taking place in more recent years it is reasonable to expect that in the future permanent cures of some of the more benign cerebral astrocytomas will be obtained.

*Oligodendrogloma.*—This tumour also appears to vary considerably from case to case in its rate of growth and method of spread. There were only two cases discharged from hospital alive in this 1926-27 series. In one, death occurred suddenly one year and nine months after removal of the tumour, from what was thought to be cerebral hæmorrhage. The other patient lived for nearly nine years from the time of his operation, and during that time had three further operations for removal of recurrent tumour. He was able to conduct his business satisfactorily for about six of these years, but the benefit of removal of tumour became less with each succeeding operation.

*Astroblastoma.*—In this tumour there appears to be considerable variation in the rate of growth. Of the 4 patients in this series from whom tumours of this type were removed one lived three months and another thirteen months; the third had previously had a tumour removed in May, 1926, and a recurrent tumour was removed six months later; after that she lived for over four years.

The fourth case is one of the most satisfactory cases in the whole series, and the result of operation is one that would not have been predicted when the patient was in hospital. The patient, a middle-aged woman, had suffered for five months from profound and progressive mental disturbance followed by severe frontal headache. At operation a cystic and solid tumour was removed from the right frontal lobe (Cairns,<sup>3</sup> Case 31). Apart from one convulsive seizure one year after operation she had remained in perfect health up to the time when she was last seen nine years after operation. It is necessary to add that the histological interpretation of this tumour has been difficult. Dr. Eisenhardt's opinion after further study in 1935 was that it was an astroblastoma. Whatever the exact nature of the tumour may be, the clinical picture before operation suggested that it was a tumour of rapid growth and one that might not respond favourably to surgical treatment.

#### PITUITARY ADENOMA

During the year 1926-27 29 patients were operated on for pituitary adenoma (Table V.). At that time

TABLE V.—*Pituitary Adenomas*

Total	..	..	..	..	..	..	29
Chromophil adenomas	..	..	..	..	..	5	
Chromophobe	..	..	..	..	..	24	29
Trans-sphenoidal operation*	..	..	..	..	..	27	
Transfrontal	..	..	..	..	..	2	29
Died in hospital	..	..	..	..	..	1	
Died some years later	..	..	..	..	..	9	
Living 7-9 years after operation	..	..	..	..	..	19	29

\* As the initial or only operative procedure.

it was customary in the clinic to treat pituitary adenomas by the trans-sphenoidal operation unless there was difficulty in excluding some suprasellar tumour, such as suprasellar meningioma or cranio-pharyngioma. Since 1927 the transfrontal approach has been the more routine procedure. A number of

patients operated on by the trans-sphenoidal route during 1926-27 have since undergone a second operation by the transfrontal route.

Nine patients have died since leaving hospital, from intracranial or nasopharyngeal extensions of tumours, from intercurrent disease, and in two cases from coma for which no satisfactory cause was found at necropsy. In these cases there was no ketosis. The working ability of the 19 survivors is shown in Table VI.

TABLE VI.—*Pituitary Adenoma*  
*Working Ability of 19 Survivors*

No information.	Full work.	Intermittent work.	No work.
3	11	1	4 } Mental symptoms 2 Blindness 1 Headache 1

Some of the patients who were in full work when last heard from had previously suffered from periods of ill-health since the time of operation. Many still have disturbance of reproductive function. Mental symptoms have appeared in two patients, probably as a result of intracranial extension of the tumour. Attacks of unconsciousness as isolated incidents have appeared in four patients. Periods of weakness and extreme drowsiness lasting a week or more have marked the course of several patients both with chromophil and chromophobe adenomas. One patient has had an attack of vertigo. Bouts of headache, sometimes accompanied by diplopia, have occurred in some cases. Constipation, gastric disturbance, excessive appetite, and obesity are other symptoms mentioned. It seems likely that operation in its present form does not stay the course of the endocrine manifestations, even though it may diminish their rate of progress to some extent.

Of the 19 survivors 12 had good sight (6/12 or better in both or one eye) seven to nine years after operation; 6 had severe loss of vision; and the condition of sight of the other was unknown. Of the 9 fatal cases 5 had good vision at the time of their death and 4 were almost or quite blind. Critical judgment of the value of operation in preserving vision is a difficult matter. So far as I am aware there is no good series of control cases in existence, yet it is known that, while the general tendency is one of progressive hemianopia and reduction of visual acuity, there are nevertheless cases in which chromophil adenoma, and probably also chromophobe adenoma, exist for many years without producing more than a slight degree of bitemporal hemianopia, and other cases in which the fields and visual acuity may improve spontaneously after a fairly advanced stage of defect has been reached. In this series, also, it is not easy to test the relative merits of different forms of treatment. X ray treatment was given at one time or another to most of the patients, but it is difficult to draw any conclusions as to its value, because of its close but variable relation to operation, and the lack of any immediate dramatic effect.

The series does give, however, some important and unexpected information about the results of the trans-sphenoidal operation. Improvement of vision after this operation has been usually delayed and gradual, and the condition of sight at the time when the patient was discharged from hospital gives no true indication of what the ultimate result will be.

Thus, a man aged 39, a sleepy apathetic rather obese individual with a large chromophobe adenoma, who had been virtually blind for four months (3/200 in the right eye and no P.L. in the left), ultimately improved after trans-sphenoidal operation to a surprising degree. At the time of discharge from hospital there was little improvement, but eighteen months later he could see enough to walk about by himself; three years after operation he could see well enough to resume his work as manager of a shop, and during the next five years, up to the time when I last saw him, he had not lost a day at work. Nine years after operation his vision was 20/30 in the right eye and the other eye was blind. Although he was free from symptoms there was clinical and radiological evidence of a large tumour at the base of the skull.

While the transfrontal operation is now the method of choice in most cases, yet in cases of extreme visual loss with a large intrasellar tumour it is probable that better results may sometimes be achieved by the trans-sphenoidal operation.

#### MENINGIOMAS

The meningioma or dural endothelioma is a tumour that is attached usually to the dura and grows slowly, embedding itself in the brain in the process, but so gradually that the tumour frequently attains a large size before it produces serious symptoms. These tumours are often extremely vascular and consequently difficult to remove. But they are usually quite circumscribed, and have been considered to give the most favourable outcome of any intracranial tumour in cases where the patient has survived complete removal.

Of the 31 patients with meningiomas 5 died after operation. Of the 26 survivors 8 have since died at varying intervals, all from recurrence of tumour (Table III.). In 6 of these cases the tumour was known to have been only partly removed at operation, but in the other 2 removal of the tumour had apparently been complete. These last 2 were cases of recurrent meningioma in which the first removal of tumour had been undertaken some years previously, when there was still no clear understanding the prime importance of removing all bone and dura in the slightest degree suspect through invasion of tumour cells. Another patient, operated on for the first time in 1926 for removal of a large bilateral sagittal meningioma with a large overlying neoplastic hyperostosis, was left at the conclusion of operation with a small fragment of tumour tissue in the superior longitudinal sinus. Symptoms of recurrence of tumour appeared about a year later and were ultimately fatal. Recurrence is not unknown up to seventeen years after the removal of a meningioma.

From seven to nine years after operation 18 patients were alive and well. Of these, 8 were completely well or suffering only from minor symptoms, and were at work. A further 6 were at work but had major symptoms; 3 of them suffered from visual loss which had been present before operation; 1 had slight mental symptoms which had been present before operation; and 2 had occasional fits. The remaining 4 patients were living but unable to work, 2 because of the presence of an actively growing tumour which was irremovable, 1 because of blindness that was present before the tumour was removed, and 1 because of mental symptoms which were present before operation.

The frequency of post-operative epilepsy after removal of supratentorial tumours is probably much higher than has hitherto been realised. In 8 of the 14 supratentorial meningiomas of this series occasional epileptic manifestations persisted after the



tumour was wholly or subtotally removed. Often they were of minor character and infrequent, and in none did they prevent the patient from working. But cases may arise in which post-operative epilepsy greatly mars what would otherwise be a very satisfactory surgical result, and these present a problem of treatment that still awaits solution.

Although it has long been known that a meningioma may invade the overlying bone, and although malignant meningiomas have been encountered by most neurosurgeons and reported by a few, this tumour has usually been regarded as the most benign of intracranial tumours. Certain cases in this series provide excellent late results of removal, but a study of the series as a whole provokes the question whether the results are ever likely to be so uniformly good as the late results of removal of cerebellar astrocytomas and hæmangiomas, and there is evidently still much to be done in perfecting the operative treatment of meningiomas. The treatment here discussed is, of course, that given during 1926-27, and since that time advances in technique have already been made, perhaps more for meningiomas than for any other variety of tumour.

#### ACOUSTIC NEURINOMAS

During 1926-27 10 cases of acoustic neurinoma were operated on by the method of intracapsular extirpation, the greater part of the capsule with a shell of tumour tissue being left in place (Table III.).

*Dead* (2).—One patient died in hospital soon after operation, and another died three years after operation from what was probably bronchiectasis following chronic dysphagia.

*Living* (8).—When last heard from seven to nine years after operation three were unable to work and were completely or severely incapacitated by ataxia. One had severe disturbance of gait, but there was no information about his working capacity. One had suffered from severe unsteadiness after operation, and then returned to work for about three years, and had later become ill again with high blood pressure, gastric ulcer, and recurrence of his original symptoms. One was able to do light work.

Two were in full work. One of these was handicapped by greatly reduced vision which had been present before operation. The other patient when seen eight years after operation was found to be in practically normal health. She said that for about a year after operation she had suffered from severe disability of the arm and leg corresponding to the side of the tumour, and that she had not been able to resume a normal life until two years after the operation. It is probable that the story of prolonged post-operative disability given by this patient is by no means unusual.

The symptoms of acoustic tumour before operation, as is well known, can be grouped for the most part in three categories: those due (1) to rise of intracranial pressure; (2) to cranial nerve palsies; (3) to impaired coördination of movement. After operation, though there is an occasional case in which an internal hydrocephalus is merely converted into an external hydrocephalus, rise of intracranial pressure is usually relieved and blindness prevented; and the residual disability is mainly one of disturbed coördination. With incomplete operations disturbance of balance may be more pronounced than it was before. Even with complete removal of the tumour it may persist for a year or more after operation.

A study of the 1926-27 cases shows the serious nature of the problem. Of 8 patients, 6 were left with severe disturbances of balance, lasting through a period of years after operation. Further attempts have been made to improve 5 of them by secondary

operations with removal of more tumour, and 2 of them have each had two secondary operations. None of these patients has been seen and fully examined recently, and the amount of improvement that has resulted cannot therefore be accurately gauged; but from letters and reports it is doubtful whether the improvement has been great. In none of the secondary operations was the tumour completely removed.

Increasing experience may show that in some cases it is easier to remove the tumour completely at a second operation after an interval than it was at the first. The tumour may not then be so vascular and the formation of cystic collections of fluid may facilitate its removal. Dissatisfaction with the results of previous intracapsular operations led Cushing<sup>6</sup> in 1928 to introduce a more radical exposure, obtained by removing the lateral cerebellar lobe overlying the tumour. Since that time much more radical operations have been done, and it is likely that the late results of 1929 would prove better than those of the year at present under consideration.

Another way of attacking the problem advocated by Dandy<sup>11</sup> and by Olivecrona<sup>12</sup> is to remove the tumour completely. With increasing experience there is no doubt that most neurosurgeons are tending to do more and more radical operations of this nature, but the mortality is likely to be high if this method is applied indiscriminately. So much depends on the consistence and vascularity of the tumour, on the firmness of its adherence to the side of the pons and restiform body, on the condition of the patient, and on the ease with which the early stages of the operation are accomplished. Probably there will always be some cases in which it is necessary to do two-stage operations. The problem is worthy of the most earnest and sustained attention because the tumour is quite benign.

#### CHOLESTEATOMA

There were 2 patients in this group, one with a tumour of the anterior and middle fossæ not in any way connected with middle-ear disease, and the other with a tumour in the cerebellopontine angle. Both these patients were well seven years after operation although in neither case had removal of the tumour capsule been complete. The evidence of these cases, so far as it goes, suggests that it is unnecessary to remove the capsule of a cholesteatoma.

#### BLOOD-VESSEL TUMOURS

One of the most favourable varieties of intracranial tumour is the hæmangioblastoma of the cerebellum, if it can be completely removed, but that fact is not shown by this series of cases, though it is well established by previous report.<sup>10</sup> In 1926-27 one patient died after complete removal of a cerebellar hæmangioblastoma. In another it was found at operation that the tumour could not be removed. This patient was still alive seven years after the decompression operation, but was seriously incapacitated by ataxia of all four limbs.

There were 2 cases of arterio-venous angioma of the cerebral hemisphere, and both patients were alive eight years after operation. In one the result was poor, for the patient suffered from right hemiparesis and aphasia and frequent focal fits. In the other the result was satisfactory. This case provides fairly good evidence of the value of X ray treatment in arteriovenous angioma.

## GRANULOMAS

One patient with a left frontal parasagittal granuloma, thought to be a gumma, died two years and nine months after operation of prostatic abscess, pelvic cellulitis, and peritonitis. One patient with a cerebellar tuberculoma, partly removed on the supposition that it was a meningioma, died four months after operation, death being preceded by progressive cranial nerve palsies and other symptoms of posterior fossa disturbance. Another patient from whom a left temporal tuberculoma had been removed was alive at the time of this report, but suffered severely from epilepsy. For more extensive information about the late results of surgical treatment of tuberculomas the reader is referred to the paper of van Wagenen<sup>22</sup> though it is probable that further experience will be less unfavourable than his.

## METASTATIC TUMOURS

Of the patients with metastatic tumours 1 died in hospital and 7 were discharged alive (Table III.). Of these, 5 died within five months of operation, but the other 2 lived more than two years. One of them had respite from hemiplegia for six months after operation, but then for a long time before death lived a vegetative existence. The other had fifteen months of useful work as a tramdriver between his operation and his death. This patient had a large right parietal metastatic carcinoma from an unknown source, involving pericranium, bone and dura, and projecting into the cranial cavity like a meningioma. Clinically there had been a lump on the head and before operation meningioma had been suspected.

A much larger series of metastatic tumours from this clinic, studied by Meagher and Eisenhardt<sup>16</sup> showed that the patients survived cranial operations for an average of only six weeks, but Oldberg<sup>17</sup> has reported two remarkable cases in which there was freedom from intracranial symptoms for two years after the cerebral tumour was removed.

## MISCELLANEOUS TUMOURS

Two patients with tumours of the skull, one a myeloma and the other a sarcoma, died about two months after operation. One patient with a fibrosarcoma in the right temporal lobe died one year after operation. The other 4 patients in this group were living seven or more years after operation. Their respective lesions had been a hydatid cyst of the right parietal lobe, a simple cyst of the cerebellum, and an osteoma of the orbit. The first patient suffered from acute alcoholism and epilepsy, and the other two were quite free from symptoms.

## BIBLIOGRAPHY

1. Bailey, P., and Cushing, H.: Arch. Neurol. and Psychiat., 1925, xiv., 192.
2. Bramwell, B.: In Allbutt and Rolleston's System of Medicine, 2nd ed., London, 1910, vol. viii., p. 284.
3. Cairns, H.: A Study of Intracranial Surgery, Med. Research Council, Spec. Rep. Ser. No. 125, London, 1929.
4. Cairns, H., and Russell, D.: Brain, 1931, liv., 377.
5. Cushing, H.: Amer. Jour. Dis. Child., 1927, xxxiii., 551.
6. Cushing, H.: Surg., Gyn., and Obst., 1928, xlvii., 751.
7. Cushing, H.: Acta Path. et Microbiol. Scand., 1930, vii., 1.
8. Cushing, H.: Surg., Gyn., and Obst., 1931, lli., 129.
9. Cushing, H.: Intracranial Tumors. Notes upon a series of 2000 verified cases with surgical-mortality percentages pertaining thereto, Springfield, Ill., 1932.
10. Cushing, H., and Bailey, P.: Tumors Arising from the Blood-vessels of the Brain: Angiomatous Malformations and Hemangioblastomas, Springfield, Ill., 1928.
11. Dandy, W.: Bull. Johns Hopkins Hosp., 1922, xxxiii., 344.

(To be concluded)

**IRISH HOSPITALS SWEEPSTAKES.**—The draw for the eighteenth in the series of sweepstakes in aid of the Irish hospitals was held in Dublin on May 22nd and 24th. It was reported that the receipts on the present draw showed an advance of nearly £50,000 on those on the last sweepstake on the Derby, although the interval for preparation had been eleven days less. The sum that will be devoted to the hospitals from the present sweepstake is £377,973. The total amount collected for the hospitals in the eighteen sweepstakes beginning in November, 1930, is £9,618,186.

## THE DIAGNOSIS OF CARCINOMA OF THE CERVIX IN A VERY EARLY STAGE\*

BY DR. WALTER SCHILLER

PATHOLOGIST OF THE II. FRAUENKLINIK, VIENNA

WHEN 12 years ago the question of how to improve the carcinoma statistics was discussed in the laboratory of the Vienna II. Frauenklinik I made up my mind to try to do it by systematic work. I saw three ways: (1) to improve the operative methods; (2) to improve the radiotherapy; (3) to find a method of early diagnosis.

An improvement of the operative technique hardly seemed possible, both radical operations—Wertheim's abdominal and Schauta's vaginal—being the best that operative technique can achieve. The small modifications of these methods occasionally indicated do not change the results. Improvement in X ray or radium therapy is not possible with ordinary apparatus, which to-day is at its maximum efficiency. An improvement of radiotherapy might be obtained only by applying stronger or more efficient rays. There therefore remains, per exclusionem, only the third way—the improvement of early diagnosis.

### The Pathology of Early Cancer

The first question I put to myself was: What do the early, the earliest, stages of a cancer of the cervix look like? They need not necessarily look like a miniature reproduction or a small piece of the fully developed carcinoma. The present definition of cancer is not exact; it has developed in the course of centuries into a complex idea and has not been deduced from predefined concepts. The idea of cancer that has become classical concerns the histology both of the individual cells and of the groups of cells in the tumour tissue; neither is sharply defined, but merely empirical. The cellular characteristics are polymorphism and non-conformity of type; the many attempts, however, of latter years to measure or count the nuclei by statistical methods were for practical purposes all failures. The distinguishing feature of the tumour tissue, invasive growth, is generally considered the main characteristic of malignancy. The question arises whether the youngest and earliest stages of cancer are also definitely polymorphous and atypical, as well as invasive. In other words it is a question whether a cancer shows in its earliest stages all the characteristics of the advanced stages; this may be, but is not necessarily so.

Does cancer in its earliest stages—i.e., from the beginning—show all the three qualities on which we usually base our diagnosis of a progressed cancer? Are its cells atypical, polymorphous, and is it invasive? Of these the last is of great diagnostic importance, for to the pathologist whether the cells are polymorphous and atypical is a matter of individual judgment, while invasion can easily be demonstrated.

One of the most interesting and valuable observations was made by Kermauner concerning the borderline between normal and carcinomatous tissue.

He examined most carefully a great number of solid cervical cancers of the uterus to study the way in which the normal tissue is demarcated from the carcinomatous.

\* Part of the Lloyd Roberts lecture delivered in Manchester on May 19th, 1936.

In the great majority (about 95 per cent.) there is a narrow zone between the carcinomatous and the normal epithelium, and in it there is a stroma covered neither by carcinomatous nor by normal epithelium, but which appears somewhat ulcerated owing to inflammatory erosion (Fig. 1 A). We

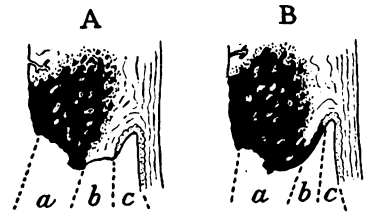


FIG. 1.—Carcinoma of the cervix. (A) 90-95 per cent. of cases. (B) 5-10 per cent. of cases (see Table I.). (a) Carcinomatous zone. (b) Intermediate zone. (c) Normal epithelium.

call this the zone of demarcation. It forms a sort of neutral area between the carcinomatous and the normal tissue but is not occupied by either. This is the usual picture as it presents itself in the majority of cases. In the remainder (about 5 per cent.) there is a different kind of demarcation (Fig. 1 B). The carcinomatous and the normal epithelium are in a contiguity with a zone of epithelium between them that has about the same thickness as the normal epithelium with which it is in direct connexion but the cells are polymorphous and atypical, corresponding completely with those of the carcinoma on the other side. From the cytological point of view there is no difference between the carcinoma and the epithelial intermediate zone. The characteristics of the three zones according to their cytological and histological state are shown in Table I.

TABLE I.—Marginal Zones of Cancer (Fig. 1 B)

	Polymorphous and atypical cells.	Down-growth.	Ulceration.
(a) Carcinoma	+	+	+
(b) Intermediate zone	+	-	-
(c) Normal epithelium	-	-	-

The question arises of how to classify the intermediate link. Is it carcinoma or normal tissue or is it a sort of transition stage? Kermauner without entering into discussion considered it carcinoma.

The Search for the Youngest Growths

I have attempted to find as early stages as possible in the following way. A really early cancer is one that has escaped diagnosis by the usual speculum examination. If a carcinoma is so big that it can be diagnosed clinically in the ordinary way special means are not required. The aim of my experiments was to work out a method that would enable us to detect such cancers as are lying beyond the limits of clinical visibility.

To state what a young carcinoma looks like it was necessary first of all to get young growths for histological examination. But I was looking for a carcinoma not visible or palpable by the usual methods; consequently it could not be discovered by an ordinary clinical examination. As such a method for finding early cancers had still to be worked out, there was only one possibility of getting young carcinomata for histological examination—namely, by chance. Such a chance would come about with mathematical certainty if enough uteri were examined for the condition of the cervix. To increase the probability I increased the number of examinations as much as possible—i.e., for several years I examined histologically the cervix of every uterus extirpated for whatever reason at our clinic. I examined under the microscope the cervix of every such uterus by several radial sections. There were cases of fibroids, chronic adnexial tumours, hyperplasia of the endometrium,

adenomyosis, &c., the portio vaginalis of which seemed above suspicion. All of these I examined systematically. After having carried on these examinations for a number of years I found a series of cases which could be fitted into several groups, forming an uninterrupted series that began with the already known pictures and by gradual transition led to an as yet unknown early stage (Table II. and Fig. 2). The largest and best developed, Stage I., is in complete accord with Kermauner's findings. The next stage whose pathological area was correspondingly smaller again showed the three zones, but in the first zone of carcinoma there was no ulceration. The youngest stage (III.) showed no down-growth either; thus the zone of carcinoma and the superficial intermediate zone are alike. These three stages form a complete series with gradual transitions.

If in advanced cancer the superficial layer described by Kermauner and Schottländer is considered part of the carcinoma and consequently carcinoma itself then we are justified in considering the superficial layer of Stage I. as carcinoma. If this superficial layer is considered carcinoma then the superficial layer of Stage II. is carcinoma as well, because the secondary ulceration of the surface cannot establish the character of carcinoma. The last and perhaps the most difficult question to be settled is whether Stage III., which has only the superficial layer, is to be classed as carcinoma. In consideration of the logical development of our ideas we must go a step further. From the morphological and cytological point of view there is no difference whatever between the superficial layer of the margin area of extended carcinoma and the superficial layers that are found by themselves and isolated, which I described as Stage III. The character and pattern of the cells

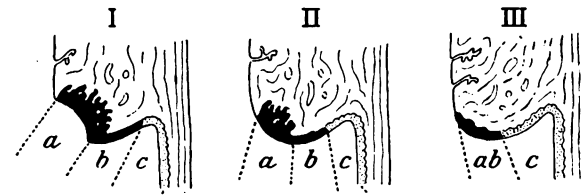


FIG. 2.—Carcinoma of cervix. The three early stages (see Table II.). (a) Carcinomatous zone. (b) Superficial intermediate zone. (c) Normal epithelium.

TABLE II

	I.			II.			III.	
	a	b	c	a	b	c	ab	c
Polymorphous and atypical cells ..	+	+	-	+	+	-	+	-
Invasion .. ..	+	-	-	+	-	-	-	-
Ulceration .. ..	+	-	-	-	-	-	-	-

and the structure of the epithelium are identical, and having diagnosed the superficial layer of the margin as part of the carcinoma in spite of its not showing down-growth we are bound to consider the isolated layer as carcinoma. From our experience that down-growth is not one of the positive characters of carcinoma, and that the first stages of a carcinoma are characterised only by the cytological character not by the histological conditions—that is, by invasion—we come to a new conception of carcinoma, based

exclusively upon the cellular structure and not upon the histological localisation in general and the down-growth in particular.

According to the diagnosis given above, the development of a solid carcinoma of the squamous epithelium of the cervix is as follows:—

First a part of the epithelium of the surface, beginning at the external os, is changed into carcinoma—i.e., into a superficial layer analogous to the superficial layers of the marginal zones of advanced cancers. Next begins the invasive growth at the central part nearest to the external os, with plugs from the superficial layer penetrating into the depths. The last phase is the inflammatory breaking down of the surface by which the carcinoma ulcerates on the surface. This occurs rather late, so that a case with distinct ulceration may no longer be considered an incipient carcinoma.

The genuine early cancers consist of a superficial layer, first without and then with cones penetrating deeply. Therefore all early growths have a smooth surface, the superficial layer lying quite flush with the normal surface and showing no papillary growth, recesses, or ulceration. This is what makes it so difficult to diagnose the first stage of cancer, because the superficial layer is not distinguished either in colour or in form from the normal surrounding epithelium. I convinced myself of this by examining a large number of operation specimens. Only in isolated cases, which doubtless are the minority, the carcinomatous layer—i.e., the incipient cancer—shows certain differences that are revealed only by very exact observation.

These differences are:—

(1) The carcinomatous superficial layer is sometimes slightly higher than its surrounding—i.e., its margins are somewhat elevated from the surrounding epithelium. This difference of level is only a fraction of a millimetre and generally is only to be noticed by lateral inspection.

(2) The surface of the carcinomatous superficial layer is not smooth and shiny as the surface of the normal epithelium, but frequently dull and eventually wrinkled.

(3) While the normal squamous epithelium is transparent enough to allow the stroma and its vessels to shine through which gives it a reddish or blueish discoloration, the carcinomatous superficial layer is less transparent and thus appears to be of a brighter white and lighter in colour than the normal epithelium. The incipient carcinoma when clinically recognisable appears as leukoplakia.

How can the cancer not forming a leukoplakia be made clinically visible and how can it be made more easily visible when it is leukoplakic? The changes in a leukoplakia are not very conspicuous and easily apt to escape examination. My first efforts were in the direction of differentiating the normal epithelium from the carcinomatous by some vital staining. These experiences, which I tried with a great number of dyes, gave no useful results. But numerous histological examinations which I had carried out of beginning cancers and of carcinomatous layers showed a way which finally led to my goal. The normal squamous epithelium of the portio vaginalis shows in its superficial layers more or less flattened cell alveoli which consist only of thickened cell walls and eventually of shrunken, trabecular, dark nuclei. The inner part, normally occupied by the protoplasm, appears vacant in the slides, and only at the margins adherent to the thickened walls of the cells slight remnants of the shrunken protoplasm are eventually to be found. The usual stainings show these superficial cells as empty alveoli: if, however, such a slide is stained by Best's method the empty alveoli can be seen to contain great quantities of

granular glycogen, which forms an inner coating of the walls of the cells. This glycogen is a physiological part of the vaginal and cervical epithelium which under normal conditions is never missing.

By comparative histological examinations we may prove that stratified epithelium nearly always contains glycogen in its superficial layers, as long as it does not get keratinised; for example, the external skin in the embryonal development shows a phase of formation of glycogen as long as it does not get hornified. Staining showed that the glycogen disappears with the change of normal epithelium into a carcinomatous superficial layer, just as it does in keratinisation. As the transition of normal epithelium into carcinoma occurs suddenly and without intermediate stages the glycogen is also seen to disappear suddenly in the areas where the normal epithelium changes into carcinomatous epithelium (Fig. 3). The proof of the presence or the absence of glycogen may serve to make the borderline between normal epithelium and cancer apparent. There are two methods of demonstrating glycogen by staining:—

(1) *Best's alkaline carmine method.*—This is very good for sections and gives clear, fine histological pictures, but it is not in the least suitable for the living tissues and for the demonstration of the borderline between carcinomatous and normal epithelium on the living, because the carmine solution is too alkaline, the amount of ammonia causing oedema and consequent necrosis of the tissues.

(2) *The aqueous iodine test.*—This method is not specially suitable for histological purposes, but is very satisfactory for demonstration in vivo and on the living patient, the aqueous solution of iodine causing no injury of any kind. The stratified squamous epithelium of the cervix and vagina is stained dark brown, while the carcinomatous epithelium and the superficial cancerous layer remain quite white and unstained. If the cervix is washed

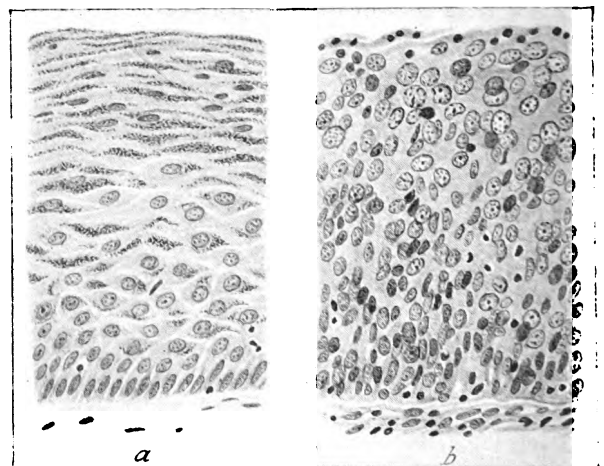


FIG. 3.—Cervical epithelium, stained by Best's method. (a) Normal: showing glycogen granules in upper part. (b) Malignant: complete absence of granules.

with the solution the normal epithelium will become stained dark brown in 20–30 seconds while the carcinomatous epithelium will remain white. In this way there is a sharp distinction and the cancerous epithelium is distinctly marked off in an area which appeared covered with normally coloured epithelium. Of course, only a watery solution must be used for this demonstration; if an alcohol is used the differentiation is visible only in the first few seconds and disappears rapidly, when the entire epithelium, carcinomatous as well as normal, is

stained a homogeneous dark brown. I found the following combination the optimal solution, the so-called Gram's solution: pure iodine, 1 part; potassium iodide, 2 parts; water, 300 parts. This weak concentration has the disadvantage that the staining will take longer, 30-60 seconds instead of 10, but this is of no importance. Yet it has the great advantage of staining much more distinctly and giving much finer differentiations. This diluted solution is also much cheaper than a concentrated one.

It must be stated again that this iodine test is not specific for carcinoma but marks off only the areas which contain no glycogen. Glycogen is always absent in cancer but not only in cancer. It is also absent—

(1) In carcinomatous transformation of epithelium. These early cancers of the surface are to be distinguished by their sharp and map-like demarcation. With the central part of their periphery they touch the external os—i.e., the borderline between the columnar epithelium of the cervical canal and the squamous epithelium of the portio uteri (Fig. 4).

(2) In hyperkeratosis of the squamous epithelium of the cervix. This occurs in syphilis. These luetic leukoplakias were first described in the mucous membrane of the mouth by Schwimmer. Apparently they are not uncommon in the oral cavity but are doubtlessly very rare in the cervix. In 15 years I could find only 4 cases that showed luetic hyperkeratosis of the cervical epithelium; of these, 2 cases were clinically not very distinct. The clinical diagnosis of such luetic leukoplakias is therefore not of great importance. There was an interesting case of a woman whose uterus was extirpated for fibroids. At the histological examination I found a spot with genuine hornification. The patient denied any luetic infection and having no prolapse a Wassermann examination was made. It was positive and after six months anti-syphilitic treatment the Wassermann reaction became negative.

(3) Keratinisation developing in prolapse may also cause the glycogen to disappear. This generally grows from multiple foci, but several more or less cornified spots may become confluent. The iodine staining gives a picture of white and brownish spots upon a dark background, often joining like clouds and often ill-defined.

(4) When the superficial layers of glycogen containing epithelium have been rubbed off by inflammation, by maceration, or by the examining finger or speculum. These traumatic desquamations are easy to diagnose, being sharply defined and somewhat deepened areas.

Thus we have different possibilities which cause the epithelium of the surface to remain white. A histological examination of the suspicious spot is therefore absolutely necessary. The positive or negative diagnosis of carcinoma is far too important not to require the complete security only to be obtained by histological examination. That is why I always refuse to make any diagnosis upon the mere iodine painting and always make a point of having the suspicious area histologically examined. This examination is restricted to the epithelium without losing any of its value, for in these early cases the question is whether the epithelium is carcinomatous or normal, and the positive or negative diagnosis is to be made from the part of the superficial layer that remained white. For this purpose it is quite sufficient to scrape off the superficial epithelium with a sharp spoon; sometimes it is easier to lift the epithelium with a spoon and then to get hold of it with a tissue forceps.

For fixation it proved advantageous not to use watery formaldehyde, but to use the combination recommended by Carnoy—alcohol abs. 60 parts, chloroform 30 parts, glacial acetic acid 10 parts. This solution has the advantage of fixing the tissue quickly and it does not contain water.

In the slide of the scrapings a diagnosis of cancer

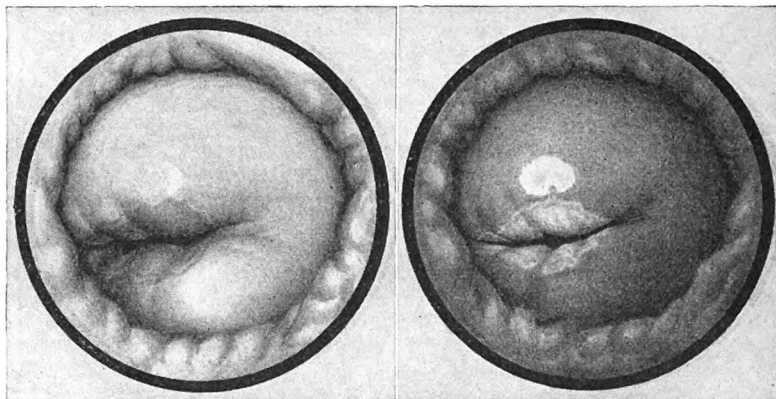


FIG. 4.—The iodine test. Appearance of carcinoma of the cervix (left) before and (right) after application of iodine.

or no cancer has to be made; it must be based almost exclusively upon the characteristic cell which are polymorphous and atypical, and upon the carcinomatous change and differentiation of epithelium. There is no uniform rule to follow for this diagnosis; certainly it is not as easy as the diagnosis of, say, tuberculosis or malaria. It requires experience and practice and must be learned systematically; but it is certain that no one should take the responsibility of giving a diagnosis in a doubtful case without a thorough study of the histology of each carcinoma and without profound practice.

The method of the iodine painting is easily carried out in an out-patient department, requiring no special training for the doctor and causing the patient no pain. It does not need complicated apparatus nor does it take long to do. The procedure of introducing a speculum, painting with iodine, wiping it off, and examining can be carried out within 3-4 minutes; the cost of the iodine solution is negligible. I must point out that the staining will vanish after a few minutes by evaporation and resorption of iodine. Ill-effects in patients hypersensitive to iodine were never seen.

A further field of application for the iodine painting is in the revelation of cancerous marginal zones of progressed carcinomata. These marginal zones frequently are clinically invisible and consequently are hidden from the eye of the operator. It will happen that the doctor believes he has operated the cancer in the healthy tissue while in reality the operation was carried out within the marginal cancerous superficial layer and part of it was left behind; then, of course, a recurrence will follow. This can be avoided if the operator will paint the border zone between cancer and normal epithelium with iodine. If there is a white zone the operation must not be confined to the white zone but carried into the brown zone. The operation is only radical if the line of incision is within the brown parts.

#### RESULTS

The method can be applied without difficulty, but it has its full value only when carried out on

as many patients as possible. I have seen patients 25-26 years of age with smooth, homogeneous shining white portios that seemed altogether above suspicion to the eye of the clinician, but when painted with iodine they showed a small white speck, which when scraped off proved to be a carcinoma. No case should be considered absolutely and even should a portio appear clinically quite harmless the iodine staining may reveal an incipient cancer. The gynaecologist who paints only the suspicious cases is sure to miss the most important stage—the smallest, clinically latent cancer. The consequence is that the more general the examination by iodine painting the smaller will be the proportion of positive cases. In my last series, out of every 100 women examined in our out-patient department about 20 showed suspicious areas, and of these 20 only 1 or 2 proved to be cancers in the histological examination of the scrapings. But even if only 1 per cent. of the examined women give a positive diagnosis the result is still exceedingly satisfactory, for we must not forget that a carcinoma when detected and treated at that early stage gives nearly 100 per cent. security for definite permanent healing.

The iodine test has been tried by many gynaecologists; in England by Beattie, in France by Forgue and Pouliot, in Italy by Boschetti, Casati, and Cuizza, and in America by Graves, Norris, Smith and Pemberton, Stearns, &c. The last published negative results, but immediately afterwards he told me by letter that by iodine painting he had succeeded in revealing a cancer of the cervix that was diagnosed by the pathological institute of the University of Nebraska as the youngest carcinoma ever seen there. In America efforts are being made to examine patients two or three times a year by iodine painting. If the test is negative there is the certainty that there is no carcinoma in the area of the squamous epithelium. Should a cancer develop before the next examination the cancer if revealed at that next control examination will be so small that it will fully ensure definite permanent healing. If it were possible by this procedure to examine systematically at few months' intervals as large a number of women as possible, we might hope to get in this way a predominant proportion of cervical cancers for treatment at such stages as would fully guarantee permanent healing. Thus it would be possible greatly to lower the mortality of this disease.

#### BIBLIOGRAPHY

- Beattie, J.: *St. Bart.'s Hosp. Rep.*, 1932, lxx., 151.  
 Boschetti, M.: *Atti d. Soc. Ital. di obst. e gyn.*, 1928, vol. xxvii., Casati, A.: *Boll. d. Leg. Ital. per la lotta con. cancro*, 1928.  
 Forgue, E.: *Progrès méd.*, 1935, p. 1029.  
 Graves, W. P.: *Surg., Gyn., and Obst.*, 1933, lvi., 317.  
 Cuizza, T.: *Rev. ital. di ginec.*, 1930, xi., 331.  
 Heidler, H.: *Wien. Klin. Woch.*, 1928, xli., 852.  
 Henriksen, E.: *Surg., Gyn., and Obst.*, 1935, lx., 635.  
 Gandolfo-Herrera, K.: *Rev. méd. latin-off. amer.*, 1934, xix., 843.  
 Norris, C. C.: *Amer. Jour. Cancer*, 1934, xx., 295.  
 Pouliot, L.: *Méd. internat.*, Jan., 1932; *Soc. méd. praticiens*, July, 1932.  
 Pauchet, V.: *Clinique*, Paris, 1933, vol. xxviii.  
 Schiller, W.: *Virchow Archiv f. path. Anat.*, 1927, cclxiii., 279; *Arch. f. Gynäk.*, 1928, cxxxiii., 211; *Zentralbl. f. Gynäk.*, 1928, lii., 1562, 1886; *Ibid.*, 1929, liii., 1056; *Wien. med. Woch.*, 1931, lxxi., 1172; *Wien. klin. Woch.*, 1931, xlv., 1563; *Surg., Gyn., and Obst.*, 1933, lvi., 210; *Arch. f. Gynäk.*, 1934, clv., 415; *Virchows Archiv f. path. Anat.*, 1934, cccxli., 577; *Wien. klin. Woch.*, 1934, xlvii., 1161; *Amer. Jour. Surg.*, 1934, li., 269.  
 van Smith, George, and Pemberton, F. A.: *Surg., Gyn., and Obst.*, 1934, lix., 1.  
 Stearns, R. J.: *Nebraska Med. Jour.*, 1934, xxix., 375.

BRISTOL'S HOSPITALS.—The seven voluntary hospitals of Bristol need at least £250,000 for modernisation, equipment, and extension. A house-to-house collection is being taken to help to raise this sum.

## OBSERVATIONS ON CASTLE'S INTRINSIC FACTOR IN PERNICIOUS ANÆMIA

By C. C. UNGLEY, M.D., Durh., M.R.C.P. Lond.

ASSISTANT PHYSICIAN TO THE ROYAL VICTORIA INFIRMARY,  
NEWCASTLE-UPON-TYNE; LEVERHULME RESEARCH SCHOLAR OF  
THE ROYAL COLLEGE OF PHYSICIANS OF LONDON; AND

ROBERT MOFFETT  
TECHNICAL ASSISTANT

THE classical experiments of Castle and his fellow workers<sup>1,7</sup> have shown that material effective for blood regeneration in pernicious anæmia arises from the interaction of an intrinsic (gastric) factor present in normal gastric juice and an extrinsic (food) factor. Literature up to November, 1935, is reviewed elsewhere.<sup>8</sup>

In November, 1935, at the suggestion of Dr. H. D. Dakin, we began experiments with the object of determining whether or not the hæmopoietic factor in gastric juice and gastric mucosa might be pepsinogen. The intrinsic factor was known not to be pepsin,<sup>4</sup> but this did not exclude pepsinogen: the precursor of an enzyme may have an action entirely different from that of the enzyme itself. Castle<sup>7</sup> obtained no positive result with gastric juice and meat muscle unless the mixture was neutralised before administration. Dakin<sup>9</sup> suggested as a possible explanation of this that beef muscle by adsorbing pepsinogen protected it from destruction even at pH 3, but that if the acidity persisted all pepsinogen was converted to pepsin. On this theory, the hæmopoietic inactivity of fundus \* mucosa as reported by Meulengracht<sup>10</sup> was explained as being due to the destruction of pepsinogen in the presence of hydrochloric acid from the fundus glands. There were certain facts which could not well be explained on this hypothesis, such as the presence of intrinsic factor in desiccated pylorus<sup>10</sup> which was free or almost free from peptic activity and presumably from pepsinogen. †

The first step in the present work was to investigate the pepsinogen theory. For this purpose the fundus mucosa of pigs' stomachs was extracted under alkaline conditions designed to preserve pepsinogen. Subsequently the same method was applied to pylorus mucosa with results to be described. Later (February, 1936) the trend of investigations was modified by Greenspon's suggestion<sup>11</sup> that the gastric anti-pernicious anæmia factor was a hormone effective alone if protected from the action of pepsin. He described 2 cases of pernicious anæmia which responded to depepsinised desiccated gastric mucosa fed without the addition of beef. The feeding of cold neutralised normal gastric juice, collected and administered under conditions designed to prevent peptic activity, was effective in one case of pernicious anæmia, without the addition of beef or other source of "extrinsic factor." On the basis of these findings Greenspon questioned the existence of an "extrinsic factor" as conceived by Castle, and suggested that in Castle's basic experiments beef, by adsorbing pepsin, merely protected the gastric hæmopoietic factor from destruction. With regard to autolysed yeast, as used in Castle's later experiments,<sup>6</sup> Greenspon suggests that it "contains ele-

\* English terminology, corpus region.

† The method used<sup>10</sup> involved adding an amount of edestin solution at pH 1.5 almost certainly sufficient to activate pepsinogen had it been present.



ments that are capable of stimulating the cells that elaborate the gastric anti-anæmic agent, or that these elements furnish material for the synthesis of the latter."

In view of past observations,<sup>12</sup> however, it seemed to us unlikely that the rôle of autolysed yeast could be entirely explained in this way, nor did it seem probable that adsorption of pepsin would account for its effect. Subsequent experiments were therefore modified to test the validity of Greenspon's theories.

#### THE INQUIRY AND ITS RESULTS

Fourteen fully investigated cases of Addisonian pernicious anæmia in relapse, all showing a histamine-refractory achlorhydria, were utilised for this work. For brevity, clinical and biochemical findings other than those required for the present analysis are omitted. No case utilised showed evidence of spontaneous remission during a control period of 10 days. A shorter period was allowed in cases where the erythrocyte count fell rapidly. In Case 9 a small reticulocytosis without rise of red blood-cells occurred during the control period, but the counts remained stationary during the 10 days preceding the commencement of treatment.

The patients received a meat-free diet throughout. Fundus and pylorus mucosa extracts were fed as a drink without flavouring. When Marmite was used it was given either in sandwiches or as a drink together with white bread and butter. When the object was to prevent their interaction stomach extracts or gastric juice were given four hours before breakfast and the marmite at tea-time. When interaction was desired, the stomach preparation and the marmite were fed at the same time (3.30 P.M.). Liquid yeast extracts, such as a 65 per cent. alcohol-soluble fraction of unflavoured, unsalted marmite (A.E.M.), were mixed with the stomach extract immediately before administration. The results are summarised in the accompanying Table.

*Fundus Mucosa Extract.*—The fundus area<sup>10</sup> was excised from the stomach of freshly killed pigs and the mucosa dissected from the muscle. The mucosa, rich in peptic and oxyntic glands,† was minced and extracted under conditions designed to preserve pepsinogen and prevent activation of pepsin.<sup>13</sup> The materials were ground together in a mortar in the proportion of one part mucosa, one-tenth part kieselguhr, and four parts tenth-normal sodium bicarbonate solution. After filtration through nainsook, the fundus mucosa extract (pH 8 to 8.5) was kept at 0° to 2° C. until administration. The peptic activity, after acidification, was usually 32 units by Fuld's edestin method (pH before addition of edestin 1.5 approx.). 150 c.cm. of this extract, derived from 40 g. of fundus mucosa, was fed simultaneously with marmite to 3 patients. The results were negative but inconclusive in Case 1, and definitely negative in Cases 2 and 14. In a further patient (Case (5a)), a concentrate of 2.6 per cent. pure pepsinogen in glycerin 80 to 90 per cent. (kindly supplied by Dr. R. M. Herriott of Princeton, U.S.A.) was given daily in doses of 1.5 c.cm. (diluted to 30 c.cm.) along with marmite. Except for a slight reticulocytosis the result was negative.

*Pylorus Mucosa Extract.*—The method of extraction described for fundus was next applied to pylorus mucosa. Part of the pyloric end of pigs' stomachs was excised<sup>10</sup> and the mucosa† dissected off. From

each pig's stomach (average weight 700 g.) the average yield was 56 g. of fundus mucosa and 35 g. of pylorus mucosa. As with fundus extract, the pH was 8.0 to 8.5, and 150 c.cm., derived from 40 g. was given daily. No peptic activity could be detected by the method mentioned above. To overcome difficulties associated with bacterial infection later batches of fundus and pylorus extract were filtered through a cotton-wool plug and rendered 0.3 per cent. in respect to trikresol.

The pylorus mucosa extract was given simultaneously with a source of extrinsic factor (marmite 12 g. or 65 per cent. alcohol-soluble fraction of unflavoured, unsalted marmite (A.E.M., 12 c.cm.)) in 8 cases. In one instance (Case 4) the experiment was abandoned after two days because of gastro-enteritis. In Case 12 treatment was discontinued after seven days because of gastro-enteritis and fever lasting from the sixth to ninth day, but there was nevertheless a moderate reticulocytosis and a satisfactory rise of red blood-cells, both delayed by the infection.

Five patients (Cases 3, 5 (b), 9 (b), 10 (b), and 11 (b)) received for 10 days pylorus extract together with marmite 12 g. Although the reticulocyte responses were small, subjective improvement was rapid and the rate of increase of red blood-cells satisfactory. Despite a high average initial red blood-cell count (2.02 millions per c.mm.) these 5 cases showed an average increase of 0.63 million in 10 days, and 1.20 millions in 20 days. This compares well with the increases of 0.46 and 1.25 millions in 10- and 20-day periods (from an initial level of 1.35 millions), which followed the feeding of extract derived from rather more than 250 g. of liver daily (see Ungley, Davidson, and Wayne,<sup>15</sup> Table III.c, calculated from data reported by Minot, Cohn, Murphy, and Lawson<sup>16</sup>). The average increase in 20 days (derived from figures available in 4 out of the 5 cases) is particularly satisfactory, since potent material was administered only during the first half of that period.

In Case 13 there was a less satisfactory response, which may or may not have been due to the use of A.E.M. 12 c.cm. instead of marmite 12 g., or to the fact that the preparation of the stomach extract had been modified (further filtration, addition of trikresol to 0.3 per cent.). During the ensuing 10 days the same materials incubated for three hours at 37.5° C. immediately prior to administration produced a secondary reticulocytosis but no other evidence to suggest that such incubation had led to increased potency.

The hæmopoietic effectiveness of pylorus mucosa is in contrast with fundus mucosa's inactivity in this respect, and accords with Meulengracht's findings: pepsin (and pepsinogen) and the anti-anæmic factor are disassociated physiologically and anatomically in the stomach.<sup>10</sup>

*Inactivation of Pepsin with Alkali.*—Peptic activity is destroyed at pH 9.8 and at Dr. Dakin's suggestion this method was used in the present investigation to "depepsinise" normal gastric juice and stomach extracts. The gastric juice was collected from normal students during a period one hour after the administration of histamine 0.5 mg. Immediately after withdrawal each sample of juice was placed in a vessel surrounded by ice, and normal caustic soda added from a burette, with rapid stirring, until the mixture was just alkaline to litmus. The day's yield of juice was then adjusted to pH 9.8 by the addition of normal NaOH, the pH being measured by electric potentiometer. Material treated in this way showed

†Characteristics of fundus and pylorus mucosa confirmed microscopically.

## SUMMARY OF RESULTS

No.	Age, sex.	Initial R.B.C. millions per c.mm.	Treatment.		Retic. response, per cent.		Increase in R.B.C., millions per c.mm.				Complicating factors.	Result.	
			Days.	Material.	Actual peak.	Day	Expected maximum	Days					
								10	15	20			30
1	49 M.	(a) 2.36	0 to 9	Fundus ext. + marmite.	Nil	—	12.4	Nil	—	—	—	Diarrhoea. Cystitis (S.C.D.) Cystitis.	Negative (inconclusive). — —
		(b) 2.31	10th day	Liver ext. 400 mg.	5.6	9	18.5 (i.v.)	Nil	—	—	—		
		(c) 2.28	19th &c.	Liver ext. 600 mg. twice week.	(6.3)	5	18.5 (i.v.)	0.58	0.82	1.21	1.69		
2	64 F.	(a) 2.38	0 to 10	Fundus ext. + marmite.	Nil	—	12.4	0.24	(0.31)	—	—	—	Negative.
		(b) 2.68	11 to 21	Desicc. stomach 28 g.	2.9	7	8.5	0.42	—	—	—		
3	53 F.	2.89	0 to 9	Pylorus ext. + marmite.	Nil	—	6.2	0.62	—	—	0.98 (50)	—	Positive.
4	58 F.	1.75	0 to 1	" "	—	—	—	—	—	—	—	Expt. abandoned owing to V. & D.	—
5	51 F.	(a) 1.92	0 to 9	Pepsinogen conc. 1.5 c.cm. + marmite.	4.6	10	20.3	Nil	(Nil)	—	—	—	Negative.
		(b) 1.82	12 to 22	Pylorus ext. + marmite.	(7.1)	7	22.2	0.48	1.08	1.40	—	—	Positive.
6	53 M.	(a) 2.73	0 to 9	Pylorus ext. (taken to pH 12.1).	2.0	9	8.5	0.26	(0.47)	—	—	—	Neg. or slight.
		(b) 3.07	12 to 21	Pylorus mucosa 40 g.	—	—	4.1	0.25	(0.29)	—	—	—	Neg. or slight.
		(c) 3.32	22 to 32	Pylorus mucosa + marmite.	—	—	2.2	0.38	0.86	0.96	—	—	Positive.
7	59 F.	(a) 1.31	0 to 9	Depepsinised G.J. and marmite separately.	4.7	7	33.2	Loss	(Loss)	—	—	—	Negative.
		(b) 0.98*	10 to 19	Same together.	(15.8)	8	41.8	0.31	0.30	—	—	—	Mild positive.
		(c) 1.27	27th day	Liver ext. 50 mg.	(14.2)	6	38.8 (i.v.)	Nil	—	—	—	—	Gastro-enteritis with fever 9th to 13th day.
8	52 M.	(a) 1.38	0 to 4	Fundus ext. + marmite (taken to pH 9.8).	Nil	—	30.8	Loss	—	—	—	—	Infection with fever 5th day to 7th day.
		(b) 1.13	5th day	Liver ext. 600 mg.	21.9	8	44.3 (i.v.)	0.96	1.50	2.16	—	—	Expt. abandoned.
9	55 M.	(a) 1.62	0 to 9	Pylorus ext. + marmite separately.	Nil	—	26.2	Loss	(Nil)	—	—	—	Negative.
		(b) 1.39	10 to 19	Same together.	5.7	7	30.8	0.36	0.45	0.51	0.75	—	Mild positive.
10	55 F.	(a) 1.97	0 to 9	Pylorus ext. + marmite separately.	8.1	7	18.6	Loss	(Nil)	—	—	—	Slight †
		(b) 1.59	10 to 19	Same together.	8.1 (10.2)	5 9 8.9	26.2	0.55	0.80	1.07	1.33	—	Positive.
11	41 M.	(a) 2.63	0 to 9	Pylorus ext. + Y.E. 6 c.cm.	4.7	8	9.8	Loss	(0.49)	—	—	—	Neg. or slight.
		(b) 2.42	10 to 19	Pylorus ext. + marmite.	(3.7)	3	12.4	1.14	1.63	1.83	—	—	Positive.
12	51 M.	(a) 1.48	0 to 6	Pylorus ext. + marmite taken to pH 9.8.	15.0	15	28.4	Nil	0.50	1.02	—	—	V. & D. with fever 6th to 9th day.
		(b) 2.47	25th day	Liver ext. 50 mg.	11.9	6	15.5 (i.v.)	0.41	—	—	—	—	—
13	51 M.	(a) 1.36	0 to 9	Pylorus ext. + A.E.M. 12 c.cm.	12.6	9	30.8	0.33	(0.40)	—	—	—	Positive.
		(b) 1.69	10 to 19	Pylorus ext. + A.E.M. 12 c.cm., incubated 3 hours.	5.4	11	24.2	0.14	—	—	—	—	Sl. increased effect †
14	55 M.	(a) 2.43	0 to 9	Fundus ext. + A.E.M. 24 c.cm.	Nil	—	12.4	Nil	—	—	—	—	Negative.
		(b) 2.25	10 to 19	Pylorus ext. + A.E.M. 24 c.cm.	—	—	13.9	—	—	—	—	—	Expt. incomplete

## EXPLANATORY NOTES

*Days* refers to days after the commencement of treatment.  
*Reticulocytes*.—Except in the case of injected liver fractions where figures for intravenous liver therapy (i.v.) are given, the "expected maxima" are those calculated by Bethell and Goldhamer<sup>14</sup> for desiccated stomach. In assessing the effect of therapy account must be taken of the fact that "secondary" reticulocyte peaks (given in parentheses) do not usually reach the levels expected from a "primary" response. Where the summit of the response was a "plateau" rather than a "peak" (Case 10 (b)) counts closely approximating to the maximum are given.

*Red blood-cell increases* attributable to experimental material (i.e., material other than liver extract or desiccated stomach) are printed in heavy type. When the rise of red blood-cells

at 10 days was of doubtful significance, the ineffectiveness of the material was sometimes made evident by the absence of any further increase at the 15th day (given in parentheses where this point occurred 5 days after the commencement of the second experimental period). When effective material was fed the red blood-cell count had not usually risen by the 5th day, but on the other hand the increase, evident at the 10th day, usually continued for 15, 20, or even 30 days, despite the absence of further treatment.

*Abbreviations*.—R.B.C. = red blood-cells. Retic. = reticulocyte. Ext. = extract. Conc. = concentrate. G.J. = gastric juice. V. & D. = vomiting and diarrhoea. S.C.D. = subacute combined degeneration. Expt. = experiment. Sl. = slight. R.R. = reticulocyte response.

\* Count on 13th day. † Response delayed by infection.

no peptic activity as measured after acidification (see fundus extract). In Case 7, with a red blood-cell level of 1.31 millions per c.mm., 100 c.cm. of such juice was given on an empty stomach at 5.30 A.M. with no food for four hours. Marmite 12 g. was given at 3.30 P.M. either in sandwiches or as a drink. There was a slight reticulocytosis (4.7 per cent.) but the patient became worse and the red blood-cells fell to 0.98 million. At the end of 10 days the depepsinised gastric juice was given simultaneously

with the marmite at 3.30 P.M. so that interaction could take place within the body. Reticulocytes rose to 15.8 per cent. on the eighth day and the red blood-cells rose from 0.98 to 1.29 millions per c.mm. on the tenth day, with subjective improvement and cessation of sore tongue. The subsequent injection of liver fractions led to further reticulocytosis, and a satisfactory rise of red blood-cells. The sub-maximal response to gastric juice and marmite even when given together suggests either (1) that the dose

of gastric juice was too small or (2) that pH 9·8 impaired hæmopoietic activity or (3) that the patient was relatively resistant to oral therapy. Besides indicating the necessity for interaction with extrinsic factor, this case shows that subjection to pH 9·8 for 30 minutes, which will inactivate pepsin and pepsinogen, is not sufficient to abolish hæmopoietic activity. This result is confirmed in Case 12 with red blood-cells 1·48 millions: pylorus extract subjected to pH 9·8 fed together with marmite led to a reticulocyte response of 15 per cent. and a satisfactory rise of red blood-cells (both delayed by inter-current infection). The negative or slight effect obtained in Case 6 (a) is not relevant since no source of extrinsic factor was provided in this instance; neither is the negative result obtained with fundus extract subjected to pH 9·8 (Case 8) since fundus is in any case without hæmopoietic effect (see above).

*Necessity for Interaction with Extrinsic Factor.*—The relative or absolute ineffectiveness of sources of intrinsic factor fed without or separate from material containing extrinsic factor is indicated by the negative or inconclusive results obtained with depepsinised gastric juice (Case 7(a), already described), pylorus mucosa (Case 6(b)), and pepsin-free extracts of pylorus mucosa (Cases 9(a), 10(a), 11(a)§). In Case 6(b) and (c), with an initial red blood-cell count of 3·07 millions per c.mm., the feeding of pylorus mucosa alone was associated with an increase in red blood-cells of only 0·29 million per c.mm. in 15 days, whereas simultaneous administration with marmite led to a rise of 0·86 million per c.mm. in 15 days. In Case 9, with red blood-cells 1·62 millions per c.mm., there was no response to pylorus extract and marmite fed separately in a manner designed to prevent their interaction. When, for the next 10 days, these materials were given simultaneously, there was a reticulocytosis of 5·7 per cent. on the seventh day and a gain in red blood-cells of 0·36, 0·45, 0·51, and 0·75 million per c.mm. in 10, 15, 20, and 30 days respectively without further treatment. In Case 10, with red blood-cells 1·97 millions per c.mm., the administration of pylorus extract and marmite given separately to prevent their interaction was accompanied by a reticulocytosis of 8·1 per cent. on the seventh day, but the red blood-cell count fell to 1·59 millions per c.mm. When fed simultaneously for the next 10 days these materials produced a prolonged secondary reticulocytosis reaching 8·1, 7·9, 8·2, 8·9, 10·2, and 8·9 per cent. on the fifth to tenth days respectively, and without further treatment the red blood-cells increased by 0·55, 0·80, 1·07, and 1·33 millions per c.mm. in 10, 15, 20, and 30 days.

In the case of a 65 per cent. alcohol-soluble fraction of autolysed yeast, which was effective as a source of extrinsic factor (Case 13), no diminution of peptic activity could be detected after this extract was incubated in contact with gastric juice or fundus mucosa extract. Altogether it is evident that the rôle of extrinsic factor in autolysed yeast cannot be explained solely, if at all, by adsorption of pepsin. Moreover, it is unlikely that its rôle is to stimulate the cells that elaborate the gastric anti-anæmic agent,<sup>11</sup> otherwise one would have expected much the same effect in Cases 7, 9, and 10 whether the two materials (a) depepsinised gastric juice or pylorus extract and (b) marmite were given at widely separate intervals or simultaneously.

§ In Case 11 the yeast extract given in the first period (a) was clearly ineffective as a source of extrinsic factor, since no significant response occurred until marmite was substituted.

## SUMMARY AND CONCLUSIONS

(1) Experimental data obtained in 14 cases of pernicious anæmia are recorded.

(2) A watery extract of fundus mucosa of pigs' stomachs (pH 8·0 to 8·5), containing pepsinogen but prepared in a manner designed to prevent activation of pepsin, when administered together with a source of extrinsic factor gave negative results in 2 cases and a negative but inconclusive result in a third.

(3) A concentrate of pure pepsinogen in glycerin was likewise ineffective as a source of intrinsic factor in 1 case.

(4) A watery extract (pH 8·0 to 8·5) of pylorus mucosa, prepared as for fundus, when administered in amounts derived from 40 grammes of mucosa, together with a source of extrinsic factor, was effective in 6 cases.

(5) The intrinsic factor was not destroyed by a degree of alkalinity (pH 9·8 for 30 minutes) which will inactivate pepsin and pepsinogen (2 cases).

(6) Pepsinogen and the anti-anæmic factor are dissociated physiologically and anatomically in the stomach (cf. Meulengracht<sup>10</sup>).

(7) Depepsinised gastric juice and pepsin-free extracts of pylorus mucosa had little or no hæmopoietic effect when given perorally unless interaction with a source of extrinsic factor (e.g., autolysed yeast) was allowed.

(8) In these circumstances the rôle of the extrinsic factor could not be attributed to adsorption of pepsin, since none was present.

(9) The effect of intrinsic and extrinsic factors given simultaneously is considerably greater than the sum of effects, if any, produced by the two factors given under conditions designed to prevent their interaction.

(10) This interaction of intrinsic and extrinsic factor does not require incubation outside the body.

(11) Since autolysed yeast in the dose employed (12 g. daily) required interaction with normal gastric juice or pylorus extract to render it effective for blood regeneration, it probably acts by virtue of its content of extrinsic factor and not because "it contains elements that are capable of stimulating the cells that elaborate the gastric anti-anæmic agent or because these elements furnish material for the synthesis of the latter."<sup>11</sup>

(12) None of the findings in this investigation was incompatible with Castle's basic hypothesis.

## REFERENCES

1. Castle, W. B., and Locke, E. A.: *Jour. Clin. Invest.*, 1928, vi, 2.
2. Castle: *Amer. Jour. Med. Sci.*, 1929, clxxviii., 748.
3. Castle and Townsend, W. C.: *Ibid.*, 1929, clxxviii., 764.
4. Castle, Townsend, and Heath, C. W.: *Ibid.*, 1930, clxxx., 305.
5. Castle, Heath, and Strauss, M. B.: *Ibid.*, 1931, clxxxii., 741.
6. Strauss and Castle: *New England Jour. Med.*, 1932, ccvii., 55.
7. Castle: *Science*, 1935, lxxxii., 159.
8. Ungley, C. C.: *Nature*, 1936, cxxxvii., 210.
9. Dakin, H. D.: Personal communication.
10. Meulengracht, E.: *Acta Med. Scand.*, 1934, lxxxii., 352; *Proc. Roy. Soc. Med.*, 1935, xxviii., 841.
11. Greenspon, E. A.: *Jour. Amer. Med. Assoc.*, 1936, cvl., 266.
12. Ungley and James, G. V.: *Quart. Jour. Med.*, 1934, n.s. lii., 523.
13. Holter, H., and Northrop, J. H.: *Proc. Soc. Exper. Biol. Med.*, 1935, xxxiii., 72.
14. Bethell, F. H., and Goldhamer, S. M.: *Amer. Jour. Med. Sci.*, 1933, clxxxvi., 480.
15. Ungley, Davidson, L. S. P., and Wayne, E. J.: *THE LANCET*, Feb. 15th, 1936, p. 349.
16. Minot, G. R., Cohn, E. J., Murphy, W. P., and Lawson, H. A.: *Amer. Jour. Med. Sci.*, 1928, clxxv., 599.

## MODERN TECHNIQUE IN BRONCHOGRAPHY

By G. S. ERWIN, M.B. N.Z.

RESIDENT MEDICAL OFFICER, BROMPTON CHEST HOSPITAL,  
LONDON

WITH the increasing use of a variety of opaque media to delineate the bronchial tree, it has become necessary to employ a word to denote the process itself as apart from any particular medium, and to this end the term "bronchography" has been coined. It seems, therefore, indefensible to continue the use of the trade name "Lipiodol" as a synonym, for although this French product is the one chiefly employed for the purpose in this country, it is by no means the only one. Others are Neo-hydriol, an English compound of similar constitution, and Iodipin, which comes from Germany.

Iodism of varying degrees from a mild rash to a severe and even fatal reaction<sup>1</sup> has in a small proportion of cases followed the introduction of these iodine-containing media, so that for patients who have previously shown iodine sensitivity it is advisable to use a brominised oil such as Brominol or Bromipin. These media are less opaque to X rays so that the resultant bronchograms are not as a rule well defined.

A retrospective study of the earlier bronchograms in which we were pleased to see a little lipiodol in some bronchi, even if not the diseased ones, takes us through the stages of evolution to present-day complete bronchography and the reasons which have engendered it. In the first place, a radiologist who is faced with a film showing incomplete filling of the bronchi, but in which such bronchi as are outlined appear to be normal, can only report to that effect; he cannot give a satisfactory opinion on the remainder, so that disease thereof has not necessarily been excluded. Secondly, the increasing safety and success of lobectomy and pneumonectomy, particularly for bronchiectasis, have made it essential that the exact number of lobes involved in the disease process should be known beforehand in order that the risks of operation and the chances of complete or partial cure may the more surely be assessed. An ancillary consideration is the follow-up of these cases, in which a complete bronchography before and after the operation is imperative. Even in the medical treatment of bronchiectasis the recent successful introduction of continuous postural drainage<sup>2</sup> has rendered a more exact localisation of the disease desirable, so that we may decide the correct position or positions to be adopted in any particular case. Again the follow-up of serious medical treatment demands complete outlining of the bronchi.

### ANATOMICAL CONSIDERATIONS

The methods to be described here of studying the bronchial tree have been evolved from a consideration of its anatomy as described recently by Nelson,<sup>2</sup> a recapitulation of the main features of which will help in the understanding of the technique involved.

The lung is considered fundamentally to consist of four lobes—upper, middle, lower, and dorsal. On the right side the lower and dorsal elements are fused to form what is known as the lower lobe, the other two remaining separate, whilst on the left side the upper lobe consists of upper and middle elements combined, and the lower represents, as on the right, lower and dorsal elements. There is a separate main bronchus to each of the four elements, and it is

necessary in complete bronchography to fill all of these as well as their more important branches. The upper lobe bronchus on the right runs laterally from the lateral wall of the main bronchus for about 1 cm. before dividing into its three components, apical, pectoral, and axillary, terms which are self-explanatory. On the left side the upper and middle lobe bronchi spring from a common stem which arises from the antero-lateral wall of the main bronchus. The upper lobe components are similar to those on the right except that the apical and axillary branches are fused in the earlier part of their course. The middle lobe bronchus on the right springs from the main bronchus and runs forwards, upwards, and downwards. On the left it pursues a similar course after taking origin from its stem in common with the upper lobe bronchus. The dorsal branches are almost identical on the two sides, springing from the main descending bronchus, which then proceeds as the lower lobe bronchus for a short distance before dividing into its three basal branches, anterior, axillary, and posterior.

### TECHNIQUE

From a study of these anatomical points it will be seen that an antero-posterior view of the chest is quite insufficient for a satisfactory review of the bronchial tree after injection of an opaque medium, and that a lateral view will be required. If, however, both sides have been filled indiscriminately, the overlap in the lateral view will be at best a poor palimpsest, at worst a confused tangle of bronchi impossible to unravel. Stereoscopic radiograms will overcome this disadvantage, but, as few hospitals in England are equipped with apparatus even to take stereoscopic bronchograms, still less to view them in ward and theatre, it has been incumbent on us to devise a technique which will render the procedure superfluous.

It is found in practice that the complete outlining of each lung separately with corresponding antero-posterior and lateral views is almost always satisfactory, the only disadvantage being that two sessions are necessary. This is no hindrance in an in-patient as an interval of two days is usually sufficient to clear the treated lung of the greater part of the opaque substance so that it does not obscure the lateral view of the other side, but it does constitute a grave disadvantage in out-patients who are working and unable to come up more than once, and in nervous patients who may refuse further to submit themselves after their first ordeal. For these patients a one-stage compromise of great usefulness has been devised—namely, the filling of the diseased or most diseased side completely, the taking of an antero-posterior and a lateral film immediately, followed by filling of the other side partially or completely as circumstances may dictate, and a further antero-posterior film. In practice it is usually sufficient to fill the lower and middle lobes of the less affected side.

The lower lobe being the one most frequently involved in bronchiectasis, and the most easily filled, indeed being not infrequently the only one filled by the older methods, we proceed to outline its bronchi first. With the patient in a semi-recumbent position and slightly turned to the side which it is proposed to fill, about 10 c.cm. of the oil is introduced and a few seconds allowed for it to run down to the smaller bronchi of the lower and dorsal lobes. The patient then sits up, still leaning to the same side and also a little forward;

about 5 c.cm. of the medium is introduced and it will be found that this runs directly into the middle lobe. Again the patient is returned to the semi-recumbent position, but this time lying completely on the side that is being filled, and the remaining few c.cm. injected. This last portion runs down the lateral wall of the trachea and main bronchus and enters the orifice of the upper lobe bronchus by gravity, but, as the left upper lobe bronchus arises rather more anteriorly, it is advisable to have the patient slightly inclined to the prone position to make more certain of it when filling this side. The oil having been injected and having already commenced to fill the axillary part of the upper lobe, the apical and pectoral divisions are filled most reliably by turning the patient almost completely on his face and tilting the head down or the feet up. The filling of the one side is then complete and films are taken as described.

#### METHODS OF INTRODUCING OPAQUE MEDIA

It is outside the scope of this paper to enter into a full discussion on the vexed question as to which is the best method of introducing iodised oil into the bronchi. I prefer the usual cricothyroid route, which possesses only one disadvantage in connexion with the methods described—namely, that it is necessary to remove the needle during the filling of the upper lobe, thus necessitating its reinsertion if it is desired to fill the other side at the same session. In practice this is of no importance as the area is already anaesthetised and no added discomfort is caused to the patient. The nasal catheter method is perhaps preferable in some ways, not having this disadvantage, but on the other hand, to obtain full benefit from the procedure, it is advisable to watch the progress of the opaque oil under the screen and yet to be able to take a radiogram at suitable intervals, a feat which is not possible in many hospitals owing

to the disposition of the X ray plant. The trans-nasal method recently described by Forestier and Leroux<sup>3</sup> is much simpler but less certain, though good results in filling the upper lobe are claimed. The other method in common use, transglottic injection with a laryngeal syringe, is the most difficult for complete bronchography because of the dexterity required for injecting oil when the patient is in the recumbent lateral position.

Whatever the method of injecting the opaque medium employed however—and no doubt each will prefer that to which he is accustomed—the positions adopted for filling individual lobes will be the same, as should by now be evident. The superiority of the technique described lies, not in its absolute certainty, for no method can have this, but in the principle that by its calculated completeness it reduces error to a minimum. It will readily be understood that the neurotic patient and the patient who coughs abundantly will defeat even the most painstaking efforts, and that a dose of opium preceding the manoeuvres is still our best antidote for both. Care must be taken, too, that the oil is at a suitable temperature, for if too hot it will run rapidly into the alveoli and obscure the bronchograms, and if too cold it will not reach the lesser bronchi. Children under a general anaesthetic present constant difficulty in posturing, but with a little practice a fair attempt at the one-stage technique may be made; the middle lobe is sometimes filled more easily in the prone position, the upright posture being difficult to accomplish.

My thanks are due to Mr. H. P. Nelson and Dr. Lee Lander for some suggestions about the one-stage technique described.

#### REFERENCES

1. Scadding, J. G. : Brit. Med. Jour., 1934, ii., 1147.
2. Nelson, H. P. : Ibid., 1934, ii., 251.
3. Forestier, J., and Leroux, L. : Radiology, 1935, xxiv., 743.

## CLINICAL AND LABORATORY NOTES

### A SIMPLE TEST FOR LATENT JAUNDICE

By H. S. BRODRIBB, B.M. Oxon.

LATE HOUSE PHYSICIAN, ST. BARTHOLOMEW'S HOSPITAL; AND

E. R. CULLINAN, M.D., F.R.C.P. Lond.

ASSISTANT PHYSICIAN, ST. BARTHOLOMEW'S HOSPITAL;  
PHYSICIAN, WOOLWICH MEMORIAL HOSPITAL

IN the diagnosis of suspected hepatic or biliary disease it is important to know whether the bilirubin in the blood is increased. Unfortunately, this fact can seldom be recognised by the observation of jaundice in the skin or sclerotics until the concentration of bilirubin has risen from the normal (between 0.1 and 0.4 mg. per cent.) to 2 mg. per cent. (4 units of van den Bergh) or over. The exact concentration can, of course, be determined by the van den Bergh reaction, but this is often impracticable at the bedside. O. Klein<sup>1</sup> (1931) showed that wheals produced in the skin of jaundiced patients by the intradermal injection of minute quantities of histamine became more deeply yellow than the surrounding skin. Further, he found that a yellow colour could be seen in histamine wheals when the concentration of bilirubin in the blood, though raised, was insufficient to produce jaundice in the rest of the skin or in the sclerotics. He attributed this phenomenon to the abnormal permeability of the capillaries for bile-pigment caused

by the histamine, allowing the pigment to escape and concentrate in the wheal.

We have carried out this test on a number of cases and have found it to be a simple and reliable method of determining qualitatively the presence of latent jaundice. It is useful particularly as a clinical test, even if only as a preliminary to more complicated quantitative estimations. In cases of obstruction of the biliary tract or of damage to the liver cells the test is constantly positive when the concentration of bilirubin in the blood has risen above 0.5 mg. per cent. (1 unit of van den Bergh). In cases of hæmolytic jaundice the test is not positive until the concentration of bilirubin is rather greater (between 1.1 and 1.4 mg. per cent.). This conforms with the clinical observation that in cases of hæmolytic jaundice the yellow colour is not seen in the skin or sclerotics until the concentration of bilirubin has reached a higher figure than in cases of obstructive jaundice.

#### TECHNIQUE

The patient is placed in good daylight. Direct sunlight and artificial light are unsatisfactory. A small area of skin free, if possible, from sunburn and freckles is cleaned with spirit. The most suitable site is usually on the upper arm or on the back. One minim of a sterile solution containing 0.1 mg. of histamine is injected *intradermally* into this area by means of a fine hypodermic or special intradermal needle. It is essential that the injection should be made intradermally and if it is done correctly a small

<sup>1</sup> Klin. Woch., 1931, x., 2032.

white circumscribed bleb is produced in the skin. The dose of histamine should not exceed 0.1 mg. as larger amounts may produce an unpleasant reaction. The preparation used by us was histamine acid phosphate (Burroughs, Wellcome and Co.): 0.3 mg. of this salt is equivalent to 0.1 mg. of histamine. Within about five minutes a circular wheal, surrounded by an erythematous zone, develops in the region of the injection. This may also extend in a linear fashion for a short distance along the neighbouring lymphatics. In 10 to 20 minutes the wheal reaches its maximum size; any moisture on the surface of the wheal should be wiped away before it is examined.

If the test is positive the wheal is definitely yellow when compared with the normal skin outside the erythematous zone. This yellow colour is much enhanced by the pressure of a glass slide or by placing the two thumbs on each side of the wheal and stretching it between them, the observation being made at arms length. If there is any doubt as to whether the wheal is yellow or not, the test is regarded as negative. When the patient is already jaundiced, the colour of the wheal will be a deeper yellow than that of the adjacent skin, but in such cases the test is obviously unnecessary.<sup>2</sup>

Table Showing Results of the Test

	No. of cases.	Bilirubin.		Result.
		Mg. per cent.	Indirect Van den Bergh units.	
OBSTRUCTIVE AND HEPATOGENOUS GROUP —i.e., cholelithiasis, catarrhal jaundice, toxic jaundice, &c.	20	Over 2.5	Over 5.0	Pos.
	13	2.5 to 0.8	5.0 to 1.6	Pos.
	2	0.75	1.5	Pos.
	3	0.7	1.4	Pos.
	3	0.6	1.2	Pos.
	1	0.55	1.1	Pos.
	2	0.5	1.0	Pos.
	2	0.5	1.0	Neg.
	1	0.45	0.9	Neg.
	1	0.4	0.8	Neg.
HÆMOLYTIC GROUP —i.e., acholuric jaundice, pernicious anæmia, &c.	6	Over 2.5	Over 5.0	Pos.
	5	2.5 to 1.8	5.0 to 3.6	Pos.
	2	1.6	3.2	Pos.
	1	1.5	3.0	Pos.
	2	1.4	2.8	Pos.
	2	1.1	2.2	Neg.
	2	1.0	2.0	Neg.
	3	0.8	1.6	Neg.
3	0.7 to 0.5	1.4 to 1.0	Neg.	
NORMAL CONTROLS . . . .	22	0.3 or less.	0.6 or less.	Neg.

#### RESULTS

The results of the test in a number of cases are shown in the accompanying Table. The obstructive and hepatogenous group includes such cases as cholelithiasis, catarrhal jaundice, and toxic jaundice. It will be seen that the threshold for this group is clearly defined at 0.5 mg. per cent. of serum bilirubin (1 unit indirect van den Bergh). The hæmolytic group includes such cases as acholuric jaundice and pernicious anæmia. The threshold for this group is higher and lies somewhere between 1.1 and 1.4 mg. per cent. serum bilirubin (2.2 to 2.8 units indirect van den Bergh).

We wish to thank the members of the department of chemical pathology at St. Bartholomew's Hospital for the van den Bergh estimations.

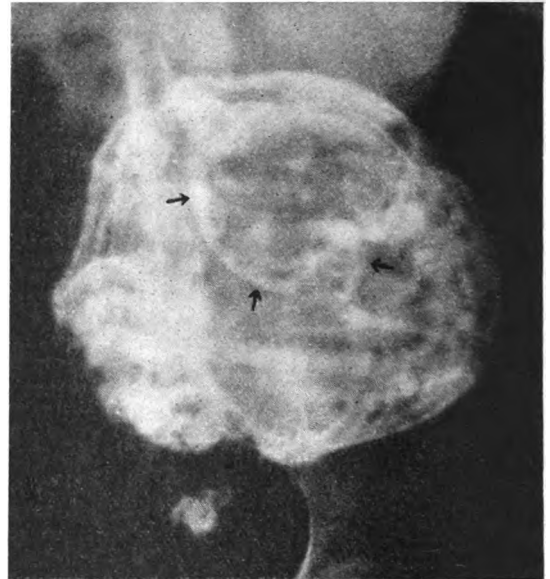
<sup>2</sup>The presence of abnormal pigments in the serum, other than bilirubin, is very uncommon; but it might be expected that the colour of such pigments would concentrate in a histamine skin wheal. We found this in a case of carotinæmia in which the concentration of bilirubin was normal.

## LITHOPÆDION IN A CENTENARIAN

BY LOH GUAN LYE, L.M.S.  
OF THE GENERAL HOSPITAL, SINGAPORE

ABOUT 212 cases of lithopædion have been reported during the last 340 years.<sup>1</sup> The length of time during which the one here reported was retained makes the present case of unusual interest.

A wizened old Chinese woman came to the Singapore General Hospital in March, 1936, complaining of abdominal pain. She said that this arose from a lump that had been present in the abdomen for 60 years but had given no symptoms until three months previously. Asked about the lump, she said that it was a baby, and she gave the following history. Menstruation commenced when she



Radiogram of lithopædion: showing skull (indicated by arrows) and vertebræ.

was 13 years of age. She was married at 18. Her first pregnancy occurred when she was 30, and a healthy female child was born after a normal labour. At 40 she had a second pregnancy which proceeded normally until near full term, when severe abdominal pains occurred. These she thought were labour pains, although very intense. A Malay woman was called in to massage the abdomen, after which all fetal movements ceased and no child was born. Pain disappeared within a month. Menstruation started again a year later, and continued regularly until the age of 70.

Examination showed a lax abdominal wall, through which a hard, nodular, tender mass could be felt. This lay near the centre of the abdomen, but was freely movable through a range allowed by the pedicle which connected it to the pelvis. No further information could be gained by examination of the stenosed vagina or of the rectum. The radiogram shows a rounded shadow in which the skull and vertebral column of a fetus are readily recognised. Her pain was evidently not severe, and after reassurance she went home.

There must remain a little doubt as to the exact age of the mother and of the fetus. The patient maintains that she did not reach the menopause until 30 years ago, when she was 70. This raises a suspicion that she may have exaggerated her age, and there is no birth certificate to confirm it. It is suggested that the radiographic shadow is the result of an ectopic pregnancy that went to term some 60 years

<sup>1</sup>Bland, P. B., Goldstein, L., and Bolton, W. W.: *Surg. Gyn., and Obst.*, 1933, lvi., 939.



ago, but its size gives little indication of the degree of maturity of the foetus which gave rise to it, for the death of a foetus is always followed by shrinkage.<sup>2</sup>

My thanks are due to Mr. J. K. Monro for permission to publish this case, and to Dr. D. Ross McPherson for the radiograph.

### TREATMENT OF PAROTID FISTULA

BY JAMES COOK, F.R.C.S. Edin.

DEPUTY MEDICAL SUPERINTENDENT AT THE BIRKENHEAD MUNICIPAL HOSTEL

FISTULÆ of the parotid gland appear to vary greatly in their tendency to spontaneous cure. This note records a somewhat chronic case of the condition and outlines what appears to be a satisfactory operation.

A boy, aged 10, was admitted to Birkenhead Municipal Hospital on Feb. 11th, 1936. Seven years before a left-sided parotid abscess had burst and had been followed by a fistula, which continued to discharge clear fluid until his admission to hospital. As the child grew up the

<sup>2</sup> Emmert, F.: *Ibid.*, 1932, lv., 646.

condition became an increasing source of annoyance, since he could not partake of a meal without soaking his neckwear; even the thought of food brought a copious flow of saliva from the external opening.

*Examination.*—The patient was fairly healthy and well built. The tonsils were slightly enlarged and there were a few carious teeth. He was given an orange to eat and there was a profuse flow of clear, limpid watery fluid from a small orifice over the left parotid gland. Between meals there was practically no discharge. The entire secretion of the gland could be made to enter the buccal cavity by external pressure over the opening. Palpation excluded a salivary calculus.

*Operation* (Feb. 17th).—The fistulous track was excised and a portion of fascia lata carefully sutured to the parotid capsule, and the wound closed. For the next few days the patient was kept under the influence of atropine with a view to diminishing the salivary secretion and so promoting healing of the wound.

Seen almost three months after the operation the wound was entirely satisfactory and there had been no recurrence of the discharge. The mental outlook of the boy had greatly improved.

I have to thank Mr. R. A. Grant for permission to publish these notes.

## MEDICAL SOCIETIES

### ROYAL SOCIETY OF MEDICINE

#### SECTION FOR THE STUDY OF DISEASE IN CHILDREN

At a meeting of this section held on May 22nd the chair was taken by the president, Sir LANCELOT BARRINGTON-WARD, and a paper on

#### Congenital Deformities of Mechanical Origin

was read by Mr. DENIS BROWNE. Present teaching, he said, varied between a flat denial and a rather deprecating acknowledgment that pressure in utero plays a part in causing deformity. With a child in the normal position in the womb, dimples were produced wherever a bony point was in contact with the uterine wall. Dimples, in his opinion, were the result of compression of tissues, followed by adhesions. They were "the footprints on the lawn" of the detective story. They were absent if there was no mechanical pressure, and increased if pressure was increased. Abnormal positions produced dimples in other parts. The feet were the most exposed to pressure of any part and if abnormally placed were curved into the talipes position with a collection of dimples over the convexity. Sometimes a further set of abnormal dimples was found near the toes of the abnormal foot corresponding with those on the normal hand—showing that the foot had taken pressure on its dorsum as the hand did always. When little toes were malpositioned because of talipes a dimple would be found just where the toe had rested on the other foot. A case of postural torticollis showed a depressed ear due to the pressure of the shoulder. One child he had seen folded up so that its feet fitted into its face; it had dorsiflexed halluces and an abnormally depressed nose, and the two fitted precisely. Acrocephalic syndactylysm might well be due to pressure of the hands against the head. Congenital dislocation of the hip (due to pressure on the knee) and congenital fracture of the tibia were best explained by mechanical pressure. Dimples were found in the latter just where they

would be if the leg had been folded and broken across the other leg. Club-hands belonged to this category: the hand was bent back owing to the absence of ulna, and dimples corresponded.

If the limbs of an adult were kept closely confined for a long time the tissues degenerated and the limbs became stiffened and atrophic. Similar changes were found in deformed babies which had been compressed in a normal position. When abnormal position was added to abnormal mechanical pressure, muscles and joints were bad and the cases were very hard to treat, although the deformity was the same to look at as in other cases. Spina bifida combined with talipes and paralysed legs was due to compression just as the foetus was starting to bend from a flat plate; the plate therefore failed to close and the limb buds grew upwards instead of forwards, so that the feet were jammed on the shoulders. (Mr. Browne showed a film demonstrating how such a child folded up with straight legs; in one case the deformed feet fitted perfectly into one another; in another they had been protected by the head.) Dimples, he continued, were sometimes found over misplaced coccyges. Amniotic bands had only been an obvious factor in one case he had seen. Spasmodic muscular pressure caused another group of deformities. A normal hip might be dislocated by such spasm. Pressure sores had been seen on new-born babies.

More arguable were the effects of increased hydraulic—as opposed to mechanical—pressure. This would affect the blood pressure, so that the tissues near the heart and sheltered by the elastic recoil of the chest received a fair amount of blood but distant parts were starved, so that arms and legs would be atrophic. In hydramnios the baby could adopt positions impossible in a normal uterus and there should be no dimples or normal pressure signs. Children were born fulfilling these conditions—for example, a child with stiff extended hips, atrophic arms and legs, and no dimples or normal mouldings. Veterinary surgery knew a congenital deformity of lambs with stiff and atrophic limbs; shepherds foretold this by the large belly of the ewe

(hydramnios). This was an interesting corroborative point.

Deformities not due to mechanical conditions included local failures of formation, ring constrictions, and congenital amputations. Sprengel's shoulder was a failure of migration, like an undescended testicle, and showed no dimples. Achondroplasia was quite different. Of the other explanations put forward for the conditions now ascribed to pressure none were convincing.

Asked if there was any correlation of deformity with foetal movements, Mr. Browne said he had had several cases of deformity where the mother had felt less movement than usual, but he thought the sensations were produced by knocks of the child's hands and not by kicks. The hands were usually free in these cases. He could not offer an explanation of the presence of six fingers.

#### Miscellaneous Diseases

Dr. REGINALD LIGHTWOOD reported, on behalf of Drs. N. F. MacLagan and J. G. Williams and himself, a case of *persistent acidosis of unknown cause*. The child showed surprisingly hypotonic muscles and fair nutrition when first seen, but later became gravely ill with bronchitis, diarrhoea, and vomiting. A study of six cases showed a syndrome of wasting, muscle hypotonia, a trace of albuminuria, occasionally blood-cells and bacilli in the urine, and coarse calcium deposits in the boundary zone of the kidney. There were no other disorders of the kidney, and all cases so far seemed to have died with a terminal infection. The case presented had appeared to resemble this syndrome and had shown persistent acidosis. After treatment by rectal saline and glucose the child had recovered.—Dr. MACLAGAN pointed out that the child had had a severe acidosis which appeared to break all the ordinary rules and for which no cause was apparent.—Dr. DONALD PATERSON said the syndrome was recognisable, once seen. Foreign body in the kidney was strongly suggested by an ailing, vomiting child between 6 and 12 months of age, with albumin and large lymphocyte-like cells in the urine. The prognosis was very bad.—Dr. LIGHTWOOD emphasised the importance of keeping patients free from infections and from overdosage with vitamin D. The kidney condition resembled D-poisoning in animals, but in the cases recorded the children had not had D-concentrates. Alkalis might be given to correct the acidosis.

Dr. REGINALD WILSON (for Dr. Paterson) showed a case of *actinomycosis of the lung* involving the chest wall in a girl of 9. The child had been given vaccine and had apparently recovered.—Dr. PATERSON pointed out the rarity of recovery in such cases.—The PRESIDENT said the only cases of actinomycosis he had seen recover were those in the right iliac fossa.—Dr. K. H. TALLERMAN said that in a case he had known the patient had been apparently well for three years but was now in hospital going rapidly downhill.

Dr. WILSON also showed a case of *congenital blindness* in a male aged 5 months. An uncle and three cousins had all been blind and died young. All the affected members of the family were males and half the females of the family were producing defective children. An eye had been removed from one of the cousins and showed gliosis of a detached retina which was not as much as was usual in a glioma. Dr. Greenfield preferred to call it an exudative, proliferative choroiditis. The diagnosis lay

between glioma, pseudoglioma, and the familial hereditary angiomatous retina.—Dr. E. A. COCKAYNE said that glioma retini was never a sex-linked recessive.

Dr. T. COLVER (for Dr. Paterson) reported a case of *ethmoidal suppuration* with orbital involvement; external drainage had led to rapid improvement.

Dr. G. H. NEWNS (for Dr. Paterson) showed encephalograms of a case of *subarachnoid hæmorrhage* in a child of 7 who had fallen on his head a month earlier. No evidence of subdural hæmorrhage had been found. The trauma must have ruptured a small aneurysm which had leaked for a while, then bled more actively and clotted up.

Dr. TALLERMAN reported a case of *infantile myxœdema* in a girl of 5 who had appeared normal up to the age of 2. The child was now much the same size as at that age. Acquired thyroid deficiency was very rare. The radiograms showed delayed ossification of femoral heads.—Dr. PATERSON had only seen one case: a small boy who developed an adenoma of the thyroid at the age of 4, and became normal on thyroid treatment.—Dr. COCKAYNE also had only seen one case. The prognosis was much better than in a cretin.

Dr. P. R. EVANS (for Dr. Wilfrid Sheldon) showed a case of *pneumothorax and bronchial collapse following chest injury* in a girl of 9. A car wheel had passed over the chest and fractured the right third and fourth ribs. Bronchoscopies to enable air to enter the lung had been partially successful, and the patient had been able to return to school and to win a 100-yards race; the heart was still to the right of the sternum and the right lower and middle lobes collapsed. The collapse of the bronchus had protected the lung from infection. Lobectomy did not seem indicated.—Dr. PATERSON asked if carbon dioxide and oxygen had been given.—Dr. EVANS replied that the accident had occurred three years before and there was little chance now of aerating the remaining lobes.

Dr. J. V. BRAITHWAITE showed a case of *myopathy* in a girl aged 5 with no family history and a history of not having walked until 3, which was against pseudo-hypertrophic muscular dystrophy.—Dr. COCKAYNE thought this condition occurred sometimes in girls and might be either a recessive or a sex-linked recessive.

#### NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

At the last meeting of this society, held in Leeds, with Dr. RUTH NICHOLSON, the president, in the chair, a number of cases were reported.

##### An Unusual Metastasis

Mr. A. GOUGH described a case of carcinoma of the cervix uteri with metastases in the glands of the neck.

The patient, a 9-para aged 66, presented herself in February, 1935, because of a discharge of blood, which had already continued for six months. A typical cancerous excavation of the cervix was found. The growth appeared to be invading the base of the bladder, and it was classified as Stage III. Histologically it was found to be a squamous carcinoma of an ordinary cervical type.

The patient was treated with radium by the Stockholm technique. She received three applications—3200 mg.-hours on each occasion. The immediate result was good.

She came up for examination after three months and again at the end of six months, and everything was found satisfactory. At the end of twelve months there was still no sign of recurrence in the pelvis, but enlarged glands were found in both subclavian triangles. On the right side there was a gland the size of a cherry; on the left side it was the size of a bantam's egg, and it was obviously adherent to the subclavian vessels. The gland was removed from the right side of the neck, and section showed the structure of a squamous carcinoma of the same type as the uterine growth. The patient was sent to the radium department for treatment of the neck.

Mr. Gough thought the cancerous deposits in the glands of the neck might reasonably be supposed to be metastases from the uterine growth, for they were of the same type and there was no evidence of any other primary source. The disease had presumably travelled along the thoracic duct. This was the first time he had seen such extension to the neck in a case of cancer of the uterus, and he did not remember ever to have read of it. It had, however, occasionally been observed in connexion with cancer of the ovaries and other abdominal organs. Other observers had commented on the greater frequency of metastases after the radium treatment of cancer of the cervix. The treatment, it seemed, succeeded in abolishing the growth within a certain radius, but there might be continuing spread at the periphery, where the intensity of the radiations had been insufficient to destroy the cancer cells.

Mr. ERIC STACEY (Sheffield) was inclined to think that carcinoma sometimes spread by way of the blood stream, metastatic emboli being produced as an effect of the radium treatment.—Mr. B. L. JEAFFRESON had seen a case of first-stage carcinoma of the cervix, in which metastases had already extended to the bronchial glands, as demonstrated by radiography.

#### Tuberculosis of the Uterus

Mr. Gough also reported a case of tuberculosis of the pelvic organs.

The patient, an unmarried woman of 21, complained of increased menstrual loss for the past ten months, the periods lasting as long as a fortnight, although the intervals were clear. There was no pain and no other symptom. Her general condition was good; she was well nourished, and did not appear anæmic.

On abdominal examination nothing was made out except general tumidity in the lower zone. By the rectum it was possible to feel a mass the size of a large orange. It was inseparable from the uterus, and several prominences could be felt on its surface. Its mobility was decidedly less than that usually found in a case of myoma of the uterus. Nevertheless, in spite of the youth of the patient, a provisional diagnosis of myoma was made, and operation was performed on April 3rd.

The abdomen was opened by a left paramedian incision. Universal adhesions were found among the pelvic organs, and on separating these, some ounces of yellow serous fluid escaped. Many of the peritoneal surfaces were seen to be studded with tubercles. The uterine appendages formed irregular swellings on both sides, and the uterus itself was considerably enlarged. From this enlargement, and taking into consideration the menorrhagia, it was concluded that the uterus must be involved in the disease. It was therefore removed, with both appendages. When the uterus was cut open, it was seen that the enlargement was mainly due to a thickening of the myometrium. There was also a tuberculous endometritis. The upper part of the corporeal endometrium was studded with yellowish tubercles. The characteristic structure was seen in microscopic sections.

Mr. Gough considered that tuberculosis of the Fallopian tubes was not uncommon, but in his experience it was rare to find tuberculosis of the uterus.

Here he was leaving out of consideration the scattered miliary tubercles which are seen on the outer surface of the uterus in cases of tuberculous peritonitis. This was only the second occasion on which he had removed a uterus for tuberculosis. The first case was very similar to the present one, and the patient, refusing sanatorium treatment, had died six months after operation from general tuberculosis.

Mr. STACEY believed that tuberculosis of the genital tract was commoner than was generally supposed. During the past three months he and his colleagues in Sheffield had found tuberculosis in nine cases—proved by section of curettings.—Mr. ST. GEORGE WILSON (Liverpool) was of opinion that the endometrium was as a rule also involved in cases of tuberculous salpingitis. In treatment he preferred X rays to surgery.—Prof. MILES PHILLIPS (Sheffield) thought that if careful inquiry were made a history suggestive of tuberculous peritonitis in childhood could often be obtained. The trouble might lie dormant and be lit up after marriage.—Mr. GOUGH, in reply, expressed surprise at the high incidence which was apparent in Sheffield as compared with Leeds. He stated a personal preference for operative treatment.

Mr. W. R. ADDIS read a note on impaction of the bladder, and Mr. D. W. CURRIE reported a case of hæmorrhage into an ovarian tumour at the third month of pregnancy.

## REPORTS AND ANALYSES

### PATZENHOFER GENUINE GERMAN LAGER BEER (LIGHT)

(JOHN C. NUSSLE & CO., LTD., 21, SOHO SQUARE, LONDON, W.1. SOLE CONCESSIONAIRES FOR GREAT BRITAIN, I.F.S., AND EXPORT)

THIS well-known beer is of the Pilsener Lager type, and is brewed and bottled at the Patzenhofer Brewery, Berlin. When analysed the following results were obtained:—

Original gravity before fermentation ..	1049°
Present gravity .. .. .	1009°
Alcohol by volume .. .. .	5·18 per cent.
Equivalent to proof spirit .. .. .	9·03 " "
Matters in solution .. .. .	4·19 " "
These include—	
Carbohydrates (maltose) .. .. .	1·41 " "
Dextrin, hop extract, &c. .. .. .	2·37 " "
Proteins .. .. .	0·23 " "
Mineral matter .. .. .	0·12 " "
Acidity (as acetic acid) .. .. .	0·06 " "
Carbon dioxide .. .. .	1710 c.cm. per litre.
Sulphurous acid .. .. .	2·24 grains per gallon.

The beer is very pale in colour and has an agreeable palate typical of a high-class export lager, and with a less pronounced hop flavour than English bottled beer. About two-thirds of the original gravity was lost during fermentation. The content of carbon dioxide is normal for a bottled beer; the sulphurous acid present is negligible, and was derived from the raw materials used in brewing. The beer is brilliant and entirely free from any sediment.

HOSPITAL COÖRDINATION AT LEEDS.—A scheme for the coördination of the voluntary and municipal hospitals is being evolved at Leeds, and a committee has been appointed by the city council to meet representatives of the voluntary hospitals.

## REVIEWS AND NOTICES OF BOOKS

**The Medical Annual**

By Various Contributors. Edited by H. LETHEBY TIDY, D.M. Oxon., F.R.C.P., and A. RENDLE SHORT, M.D., B.Sc., F.R.C.S. Fifty-fourth year. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 845. 20s.

To decide what book is most worthy to be called the general practitioner's bible might prove no easy task but the Medical Annual would certainly be in the short list. The 1936 edition contains much new and important material. Sir Weldon Dalrymple-Champneys writes on undulant fever and Sir Leonard Rogers, F.R.S., adds a note on atypical forms of that disease. Dr. A. H. Douthwaite contributes articles on gout and chronic rheumatic disorders. Another newcomer is Mr. K. H. Pridie, who collaborates with Prof. Hey Groves in six articles on orthopædic subjects. The article on therapeutics, by Dr. Philip Hamill, discusses among other controversial matters the vexed question of the barbiturates. Mr. Sampson Handley writes on diseases of the breast, and Dr. John Underwood on the school medical service. There is a long and authoritative article by Sir Morton Smart on manipulative surgery; this should inspire the practitioner who reads it to be less timorously conservative than hitherto in his treatment of minor but disabling injuries to bones and joints, with benefit to his patients and, incidentally, to his own professional reputation. With the exception of two writers on para-medical subjects, the only notable absentee among the contributors to this year's Annual is Dr. Robert Hutchison. The editors, as usual, are also contributors—Dr. Tidy writes on various intra-abdominal disorders, and Mr. Rendle Short contributes more than a dozen articles on various aspects of abdominal surgery, including one on adrenalectomy. Much recent work on blood diseases is described, including a reference to the treatment of hæmophilia with Russell's viper venom, now available on the market. An interesting article is that on malaria and its treatment with atebtrin and atebtrin mussonate, and a sensible note deals with the diet of athletes. Attention is drawn to the recently noted association between gall-bladder and heart disease, and there is a long article on the all-important pituitary. The increasing potentialities of surgery, especially that of the thorax, are discussed. We learn that, in the last decade, the mortality of lobectomy has fallen from 80 to 14 per cent., and that pneumonectomy is now quite practicable. "Chronic interstitial mastitis" in patients under forty is said to respond well to treatment by X rays and ovarian extract. Certain neoplasms of the lung also respond well to radiation. Otosclerosis is being treated with thyroxine. Radiology is proving increasingly valuable in cardiology, antenatal examination, and even in the differential diagnosis between pneumonia and acute abdominal conditions. Cyclopropane is held to be perhaps the most promising of the new anæsthetics, but vinethane and supersaturated ether are being tried out with success.

These are a few of the interesting pieces of information taken at random from this book. The editors note with satisfaction in the introduction to the Annual that the material gleaned from another year's medical literature shows "that there have emerged an unusually large number of comparatively simple methods of new treatment, for a great diversity of ailments, well worthy of the attention

of every practitioner who desires to relieve his patients safely, quickly, and pleasantly."

**A Textbook of Surgery**

By American Authors. Edited by FREDERICK CHRISTOPHER, B.S., M.D., F.A.C.S., Associate Professor of Surgery at Northwestern University Medical School; Chief Surgeon, Evanston (Illinois) Hospital. London: W. B. Saunders Co., Ltd. 1936. Pp. 1608. £2 2s.

THIS text-book of surgery, designed for the use of undergraduates, is interesting from several points of view. It deals with the whole of surgery except that of the special senses, and although it contains over 1600 pages it has been kept to a reasonable size. Its most remarkable feature is the number of contributors who include men of world-wide reputation: Henderson, Smith-Petersen, Adson, Rankin, Balfour, Blair, Bunnell, Graham, Ivy, Orr, among others. The editor has selected them not only because of their special knowledge of the particular section of surgery about which they write, but also because they are, for the most part, teachers who are known to possess gifts of exposition.

The result is a book which is thoroughly up to date, and, moreover, makes attractive reading. The extreme subdivisions of subjects show how very specialised is surgery in America to-day. For example, there are separate authors for femoral and inguinal hernia; five deal with the rectum, and seven with the stomach. No less than nineteen authors write on fractures of the limbs. One gathers that the one who describes fractures of the shaft and upper ends of the tibia and fibula is not considered so great an authority on fractures of the lower ends of these bones; the coöperation of two experts has been deemed necessary on the question of fractures near the elbow-joint, and the same applies to fractures of the phalanges and metacarpals. It is not astonishing that the contributions are uneven in quality. Among the inadequate sections is that on tuberculous disease of the hip, which though it may be a rapidly disappearing disease still merits more notice than seven lines of print for its pathology and twelve and a half lines for its symptomatology and treatment combined. That this article is illustrated by some good pictures of the not very common operation for extra-articular fusion of the joint only emphasises the omission of a full account of the disease. The sections on Pott's disease of the spine and on diseases of the tongue are also too brief. The good sections far outnumber those which do not present their subject in a way suitable for the undergraduate. A useful feature is the break away from tradition in arrangement; to give only one example, painful affections of the lower back are discussed together in a most effective way, instead of being treated in separate compartments according to the anatomical lesion. The modern outlook is presented in such a manner that life is infused into the duller subjects and the reader's interest is held throughout.

The book cannot fail to stimulate all who read it. Students will use it as an adjunct to a practical course of demonstrations or lectures in surgery, and surgeons and practitioners will wish to possess it because it contains first-hand teaching by many leaders of surgery.

## The Medical Dictator

*And Other Biographical Studies.* By Prof. MAJOR GREENWOOD, F.R.S., D.Sc., F.R.C.P. London: Williams and Norgate Ltd. 1936. Pp. 213. 7s. 6d.

Prof. Major Greenwood has already earned our gratitude by his introduction to the study of epidemiology entitled "Epidemics and Crowd Disorders." The literary grace, the learning without parade, and the spontaneous use of epigram displayed in that book, will all be found in his new volume of essays. Each chapter in the *Medical Dictator* is composed of acute desultory musings on six men of an absolutely different standing in their common profession of medicine and in their influence on society. This reviewer does not propose to select one chapter more than another as worth attention; they should all be read—a pleasant task, though the easy reading implies hard writing.

The men introduced to us are Galen, Freind, Peter Mere Latham, William Farr, Pierre Louis, Osler, and Arthur William Bacot. Galen, for some 1500 years the medical dictator of the civilised world, is put in his place as an overrated thinker, who none the less had influence for good, probably in an unintentional manner. Freind, the author of the "History of Physick," is an unfamiliar name to most of us, and such references as may occasionally be seen allude to him as a Latinist, in which character he would make a sure appeal to his biographer. Prof. Greenwood says of him, in reference to his diagnostic and therapeutic methods, that "he is as clear as Macaulay and he has demonstrated completely that he was wholly destitute of the qualities which make a scientific investigator," adding that he must not be sneered at for ignorance of things which have been discovered since his death. But the little biography closes with the suggestion that Freind owed the regard in which he was held not to his learning but to his hatred of pretence, the real reason why Freind was beloved "and why a gracious memory of a stout-hearted, enjoying English gentleman and scholar has come down to us," being his intolerance of dictatorship. He is bracketed with Osler and Allbutt of our own generation in a genuine affection for the humaner letters, and with P. M. Latham for his scorn of affectation.

In the chapters on William Farr and Pierre Louis Prof. Greenwood is dealing with pioneers in the section of learning which he himself adorns. He finds Farr to have arrived at his general deductions by methods that a properly equipped actuarial mathematician would regard with horror, but none the less he endorses an official description of him attributing to his work great services for the advancement of national health. The numerical method of Louis is closely criticised, and the difficulties to be overcome in establishing a scientific system in diagnosis and prognosis in the manner of which Louis hoped for are recognised. But Louis did not obtain the support of the medical profession, and the systematic use of statistical methods in clinical medicine never entered into the routine of French hospital work. This fact provides Prof. Greenwood with the caustic commentary that "if only Louis had succeeded in really commanding the support of the great clinical teachers of Paris, why, we should have had to do something about it in England." Osler is sympathetically if not over respectfully treated, and an amusing piece of leg-pulling is retailed where Osler, the hardened joker, is himself the victim of "Popsey" Welch. The closing chapter is a biographical sketch of Bacot, the great entomologist;

it is a record of an intimate friendship which provides at the same time a vivid picture of Bacot's wonderful technique.

Prof. Greenwood succeeds in these charming essays in justifying his view that the lives of all his subjects give a favourable impression of human nature; but we feel that he finds human nature to be frequently frail, and this estimate escapes him in the guise of quotation and quip.

## The Diagnosis and Treatment of Pulmonary Tuberculosis

By JOHN B. HAWES, M.D., President of the Boston Tuberculosis Association; and MOSES J. STONE, M.D., Assistant Professor, Diseases of the Chest, Boston University School of Medicine. London: Henry Kimpton. 1936. Pp. 215. 12s. 6d.

A SHORT book of this kind, which is addressed to practitioners, students, nurses, and social workers, cannot be made complete, and the best work for its purpose is one which combines lucid exposition with correct emphasis of those aspects of the subject which, in the light of recent knowledge, are held to be the most important. Judged by these standards this is a first-rate book. In the opening chapters the authors point out that evidence of active disease which is not at once volunteered by the patient may often be obtained by careful history-taking. Physical examination of the chest is discussed adequately but refinements of detail, especially in percussion, are discouraged, a few honest persistent râles being regarded more seriously than much doubtfully impaired resonance. Although the study of physical signs should not be neglected, the writers note that radiology is now taking such an important place in the routine examination of the lungs that percussion must take second place in the detection of areas of consolidation. Tidal percussion of the bases is unnecessary when the movement of the diaphragm can be seen so much more clearly by screen examination. "Do not waste time over *non-essentials*. Much time has been wasted, for instance, in percussing out the narrow strip of normal resonance, known as Krönig isthmus"; this is an extract typical of the practical common sense which pervades the book.

In the chapters on treatment the sanatorium is described as being the best place for the great majority of early cases; it should be situated relatively near the patient's home. It is conceded that the much vaunted climate of Colorado may offer something to the consumptive who can afford to go there, as the surroundings are certainly more beautiful and the weather more pleasant than for example in New England, but it is emphasised that quite satisfactory results are obtained near sea level in the Eastern States. In contrast to some recent American writers, the authors are not obsessed with the risks of adults catching tuberculosis from one another. Infection of children should be rigorously avoided, but although precautions should not be neglected in adult contacts the problem here is considered to be much more one of hygiene than infection.

Among the concluding chapters that on rehabilitation in pulmonary tuberculosis deserves special mention; occupational therapy in the sanatorium, the sheltered workshop, and the farm or industrial colony all have a place in the struggle against tuberculosis. The Papworth scheme is looked on as providing the ideal after-care and this is one which should have many

imitators. There is room for criticism only in the reproduction of some of the X ray films, but it would be ungrateful to expect higher value than is here given for such a modest sum as is charged for this excellent book.

## MEDICINE AND THE LAW

### Medical Officer's Action Against Mental Hospital

THE action brought by Dr. Hugh Charles McManus, formerly assistant medical officer to the Park Prewett Mental Hospital near Basingstoke, ended unsuccessfully last week after several days of litigation. He claimed damages under heads so various as conspiracy, libel, negligence, breach of contract, and wrongful dismissal. He sued (a) Dr. R. F. B. Bowes, the former medical superintendent of the Park Prewett Hospital, (b) the late Duke of Wellington as chairman, and two other defendants as members, of the hospital visiting committee, (c) the clerk to the hospital, and (d) the clerk to the Hampshire Joint Mental Hospital Committee. He complained that Dr. Bowes had wrongfully induced the hospital authorities to break their contract with him. The plaintiff's case was eloquently opened with allegations which the different defendants were unlikely not to resist. Dr. McManus was represented as an enthusiastic and enterprising young medical officer who, on coming to the Park Prewett Asylum in 1923, found it run on mechanical lines—not a single modern text-book, no scientific instruments, the clinical examinations taking place in the wards, no pathologist, X ray treatment administered by the resident engineer who was not a radiologist, post-mortem examinations carried out by an unqualified person, and so on. Dr. McManus, it was suggested, made his reforms at the expense of his popularity. He altered the inadequate system of keeping records and he won his fight for a separate room for clinical examinations. His zeal was unappreciated and he was subjected to petty annoyances. His health suffered from the strain of obtaining the diploma of psychological medicine: the matron used to give him a cup of beef tea at 11 A.M., but, when he gained his diploma, she was forbidden to do so. There was an objectionable slander about a nurse being seen to leave his room in the evening; it was even said that he drugged himself. His health finally broke down. He was told to leave, and, since October, 1927, he had been unable to obtain further appointments.

All these allegations the defendants denied; they merely said that Dr. McManus, if he were entitled to any notice at all, was given proper notice to terminate his engagement. At the closing of the evidence for the plaintiff, the case against Dr. Bowes was found to be unsubstantiated. Eventually Dr. McManus withdrew all his charges and claimed only damages for wrongful dismissal and the return of his superannuation contributions. Mr. Justice Macnaghten, who was trying the case with a special jury, thereupon ruled that it was undesirable that the same jury, after hearing so many matters which were not now being proceeded with, should be asked to determine the lesser issues which remained. It might be hard for the jurors to dismiss from their minds the copious evidence which was now largely irrelevant. He therefore dismissed the jury and announced that a fresh jury would be sworn in for deciding the remaining question whether Dr. McManus was entitled to three months' notice or not. On this

point the plaintiff's counsel argued that Section 189 of the Public Health Act of 1897 (giving express authority to dismiss an officer "at pleasure") did not apply: no such words were to be found in Section 276 of the Lunacy Act, 1890: the whole policy of the Asylum Officers' Superannuation Act, 1909, indicated some permanence of tenure for the staff of mental hospitals. On the other hand, the defendants contended that Section 276 of the Lunacy Act justified the hospital committee in revoking the appointment of Dr. McManus at its pleasure and without assigning any reason; if so removed, he could not, of course, draw the salary and emoluments of the office; his position was not affected by the Local Government Act, 1933, which enabled local authorities to agree that notice should be given to a medical officer.

When the case was ready to proceed afresh under the new jury, Dr. McManus was unfortunately ill and unable to give evidence on the question of his dismissal. The judge thereupon gave his decision upon the arguments. Observing that neither at the time of the plaintiff's engagement nor at any other time was there any mention of notice, the court decided that he was employed at the committee's pleasure; the terms of his engagement implied that he could have no complaint if the committee told him to leave. With regard to the claim for the return of his superannuation contributions under the 1909 Act, he could only be entitled to have them back if he were not entitled to a superannuation allowance. He had claimed superannuation allowance in an application to the Home Office. The hospital could not repay the contributions while that claim was pending. At the date of the writ in 1933 Dr. McManus was not entitled to receive the deductions made under Section 10 of the 1909 Act; the claim for superannuation allowance was finally decided against him by the Home Office and the court thought the question could not now be reopened. The result was that Dr. McManus lost at all points and the whole of his actions were dismissed with costs against him.

### Complaint of Wrongful Certification

The Sunderland town council has lately discussed a complaint that a sane boy was wrongly certified and sent to the borough mental hospital. It seems to be agreed on all sides that the boy was backward and undeveloped. It is alleged on behalf of his parents that he needed nourishment and that his tonsils should have been removed but that there was no occasion to send him to an asylum. It is said on the other side that he was a boy of 17 with the mentality of a child of 10 or 12 and that he left the mental hospital in a condition greatly improved by treatment. The town council decided by 11 votes to 7 (the majority of the councillors abstaining from voting) to ask the Minister of Health to hold an inquiry into the circumstances. The matter being thus sub judice, further statement or comment may be postponed. It may, however, not be improper to record an expression used in the council chamber by a speaker who referred to "the stigma which this boy will have to carry for the rest of his life." A Royal Commission suggested certain reforms which were afterwards enacted in the Mental Treatment Act of 1930. Its report reminded us that the proper treatment of doubtful cases in mental hospitals is in the best interests of the patients. It may be hoped that some day our social standards will be so changed that treatment for mental ailments, great or small, will be regarded as no more shameful than treatment for mumps or measles.



# THE LANCET

LONDON: SATURDAY, MAY 30, 1936

## ANXIETY ABOUT HOSPITAL FINANCE

In his introduction to that modern epic, Evans and Howard's "Romance of the British Voluntary Hospital Movement" (London, 1931), Sir W. ARBUTHNOT LANE spoke of a new era ending the hygienic chaos with which the voluntary hospitals have been striving for centuries to deal. He was referring to the effect of the Local Government Act in opening vast new sources of revenue to historic institutions—which were finding it increasingly difficult to carry on—by making it possible for the municipalities to contribute without interfering with their voluntary character. The great voluntary hospitals, he said, are called upon to lead in a way they have never before been called upon to lead in their history, for the new law enables the people to organise the followers without any fear of overlapping, conflict, or, worse still, the deterrent stigma of pauperism which attached to the old infirmaries. Nevertheless the Hospitals Year-Book, which has just appeared<sup>1</sup> for the sixth time, betrays some anxiety about the position of the voluntary hospitals.

There is no question about the extent or the urgency of the work that these hospitals are doing; in the year 1934 which is reviewed 1,300,000 patients were treated in their wards and 6,000,000 patients in their out-patient departments, being an increase of 60,000 and 285,000 over the numbers treated in the preceding year, an increase described in the Year-Book as normal. At the same time the difference between a 100 per cent. occupation of beds in some of the large hospitals and a 10 per cent. occupation in some of the small ones suggests that due weight has not been given to the factor of transport facilities, and the lesson of overcrowding of large hospitals by patients from the country district has not been borne in mind. Mr. R. H. P. ORDE, the able editor of the Year-Book, expects no improvement in the situation until agreement has been reached about the proper place of the cottage hospital in the general health scheme of the country. Recalling the declaration in the Cave report of 1921 that the voluntary hospital system, which is peculiar to the English-speaking peoples, is part of the heritage of our generation, Mr. ORDE remarks that the future of these hospitals does not depend upon a brave phrase and a consciousness of their own integrity, but upon action of a kind to which they are by the nature of things unaccustomed and

for which they are singularly ill-equipped. It was, he thinks, for this reason that in the Act of 1929 the voluntary hospitals figured only in one small section, inserted almost grudgingly at the last moment; and even the passing of that Act awoke them from their complacency for only a little time. It was not until June of last year that the British Hospitals Association at the Leamington conference set up a commission under Lord SANKEY to develop their policy and safeguard their future. This commission has asked the county councils and boroughs what they have done, in making provision for hospital accommodation under the Act, to consult with the voluntary hospitals. It seems that no more than 83 of the 146 authorities have set up voluntary hospital committees. Moreover, in 34 instances the formation of such a committee has been the end of the matter; only in 16 instances have joint committees been formed representative of the public authorities and the voluntary hospitals. The county areas in general are profoundly inactive.

SIR CHARLES HARRIS tells much the same story in his financial review. He is not dazzled by the magnificent net surplus of a million pounds on the maintenance account in the aggregate, for he demonstrates the existence of a numerous class of hospitals waterlogged by the accumulated weight of successive annual deficits. The day of high-pressure begging is, he thinks, gone; at any rate it is likely to obey the law of diminishing returns, and in many places the contributory schemes have their own management funds and reserves, so that what the hospital receives is in the nature of payment for services rendered. What most troubles him is the downward trend of the free legacy. The peak was reached with £20 per available bed in 1927-28, and the figure is now below £17. Expenditure on the other hand continues to rise; the average increase over the previous year was £3.1 per available bed, the largest component being under the heading of salaries and wages. The only prospect of reducing future expenditure lies, he thinks, in constructive economies, the possibilities of which are still unexhausted. But year after year a substantial minority of provincial hospitals refuse to adopt the uniform system for hospital accounts which would make comparisons valid and combined action possible. This stone-walling of purposive central effort is one of the unlovely characteristics of voluntarism. Sir CHARLES HARRIS speaks of the complete absence of team spirit in a minority of units which goes far to destroy the value of the whole scheme.

## CHOLANGIOGRAPHY

THE visualisation of the biliary ducts by direct injection of fluids opaque to X rays, in contrast to cholecystography by the recognised routes of oral or intravenous administration, has been done occasionally in selected cases for more than a decade. Tenney and Patterson<sup>1</sup> in 1922 investigated

<sup>1</sup> The Hospitals Year-Book 1936: an annual record of the hospitals of Great Britain and Ireland incorporating "Burdett's Hospitals and Charities." Issued under the auspices of the Joint Red Cross Council and the British Hospitals Association by the Central Bureau of Hospital Information, 12, Grosvenor-crescent, London, S.W.1, pp. 336, 198.

<sup>1</sup> Jour. Amer. Med. Assoc., 1922, lxxviii., 171.

a case of external biliary fistula by injection of bismuth paste under pressure; the pyrexia, jaundice, and abdominal pain which followed were probably due to temporary blocking of the common bile-duct. Mallet-Guy, Beaupère, and Armanet<sup>2</sup> in 1927 used lipiodol for the same purpose, and in 1930 Ginsburg and Benjamin<sup>3</sup> reported a series of cases of post-operative biliary fistula in which the injection of lipiodol proved to be of much diagnostic value when X rays were taken immediately. In the absence of active infection of the bile-ducts they found such injections to be simple and safe when done under fluoroscopic control, and showed that if the common bile-duct is unobstructed, lipiodol injected into an external biliary fistula appears almost immediately in the duodenum; the intrahepatic bile-ducts were rarely outlined unless there was some organic obstruction of the common bile-duct. In 1930 W. B. Gabriel<sup>4</sup> described a case in which the common bile-duct had been drained by a T-tube following removal of a large stone; some three weeks later proof of the patency of the common bile-duct was obtained by the injection of lipiodol through the tube prior to its removal. A similar use of lipiodol through a tube inserted at operation for purposes of drainage has been reported by R. H. Overholt (1931), A. H. Kretchmar (1933), and Judd and Phillips (1933). J. Cosbie Ross<sup>5</sup> has recorded a considerable experience of lipiodol in these cases. On account of the rapidity with which lipiodol passes into the duodenum a small residual stone in the common duct is not likely to be shown unless it is causing obstruction. The lipiodol may be held up at the lower end of the common bile-duct, either through spasm of the sphincter of Oddi or to impaction of a stone; if it is spasm that causes the obstruction injection of atropine, followed after three-quarters of an hour by a further radiogram, may show that the lipiodol has passed into the duodenum. This condition of abnormal tonus of the ampullary sphincter, or biliary dyssynergia, is of importance; B. R. Best and N. F. Hicken<sup>6</sup> note that it may occur independently from cholangitis, stones, or duodenitis, and lead to hepatic neuralgia and the occasional persistence of symptoms after cholecystectomy. Direct injection into the common bile-duct is not the only way of using lipiodol as an aid to diagnosis in this region. It may be run into the gall-bladder after cholecystostomy in order to investigate the cystic and common bile-ducts. Chiraz and Lomon<sup>7</sup> have obtained excellent radiograms by its injection through cholecystostomy catheters; these may show, for example, gross distension of the common bile-duct from impaction of a calculus and dilatation of the intrahepatic bile-ducts from compression of the hepatic ducts by secondary carcinomatous deposits.

The most recent application of cholangiography was initiated by Mirrizi<sup>8</sup> who reported successful visualisation of the biliary ducts while the patient was on the operating table, the method adopted being the insertion of a T-tube into the common duct, the injection of lipiodol and an immediate X ray. Robins and Hermanson<sup>9</sup> now describe, with many valuable details, their results in 25 cases in which this technique was used. The patient is placed on the operating table with a metal tunnel holding a 14 by 17 film under his back. The abdomen having been opened the cystic duct is identified and clamped; then by means of a 30 c.cm. syringe and a No. 15 or 18 gauge needle, 20 to 25 c.cm. of Hippuran (a 40 per cent. aqueous organic iodine solution) are injected into the common bile-duct. The surgical team makes way for a portable X ray apparatus to be wheeled into position and an exposure is made. In six minutes the surgeon should be able to see the developed film, and may thus gain visual help in deciding whether or not the common duct should be opened. If, for instance, an obstruction due to the impaction of a calculus is revealed the duct is opened and the stone removed; a T-tube for drainage is inserted and by a further injection of hippuran (30 c.cm.) the surgeon can see if his efforts to remove the obstruction have been successful. Robins and Hermanson say that in 24 of the 25 cases examined in this way accurate visualisation of the condition present was obtained. The only contra-indication to the method seems to be acute infection of the biliary tract. A further interesting observation was that in each of the 4 cases in which the pancreatic duct was visible abdominal exploration showed chronic pancreatitis to be present.

Surgeons able to command the necessary facilities by the provision of a shock-proof X ray apparatus in the operating theatre should take note of this work. Cholangiography may evidently provide valuable assistance, not so much in the typical case of gall-stones, as where there is a history of jaundice, or where laparotomy shows a dilated common bile-duct, or in those difficult patients in whom an operation on the biliary tract has been performed previously and recurrent symptoms necessitate a further exploration.

## STORAGE OF BLOOD FOR TRANSFUSION

IN Soviet Russia for many years the blood of corpses has been used for transfusion; yet the method is seldom mentioned in the medical journals of Western Europe and America. Lately YUDIN, surgeon-in-chief of the Sklyfasovsky Central Emergency Hospital in Moscow, has provided needful information by reporting in both English<sup>10</sup> and French<sup>11</sup> on a thousand transfusions performed with cadaver blood.

The idea of using blood from casual corpses for

<sup>2</sup> Lyon, méd., 1927, cxi., 215.

<sup>3</sup> Ann. of Surg., 1930, xci., 233.

<sup>4</sup> THE LANCET, 1930, i., 1014.

<sup>5</sup> Brit. Med., Jour., 1932, i., 1026; THE LANCET, Feb. 1st, 1936, p. 251.

<sup>6</sup> Surg., Gyn., and Obst., December, 1935, p. 721.

<sup>7</sup> Presse Médicale, 1936, xli., 300.

<sup>8</sup> Bol. y trab. Soc. de Cirug. de Buenos Aires, 1932, xvi., 1133.

<sup>9</sup> Surg., Gyn., and Obst., 1936, lxii., 684.

<sup>10</sup> Yudin, S. S.: Jour. Amer. Med. Assoc., March 21st, 1936, p. 997.

<sup>11</sup> Judine, S.: Presse méd., Jan. 11th, 1936.

infusion into living human beings is at first thought repugnant, and though the distaste is purely sentimental it is easy to rationalise it. For example, we may urge the danger of infection and the possible toxic effects of hypothetical post-mortem changes in the blood. But M. G. SKUNDINA and S. I. BARENBOIM, working in the Sklyfasovsky Institute, seem to have overcome these and most other non-sentimental objections. They find that the blood must be taken from bodies in which life has not been long extinct; the limit of time after death for withdrawal is arbitrarily set at six hours in summer and eight in winter; moreover, death must have been sudden and preferably from an acute cardiac condition or electrocution. Using such corpses and withdrawing the blood through cannulae inserted into the jugular veins with the body in the Trendelenburg position these workers find it to be sterile; they have demonstrated that the blood of the portal circulation is the first to become infected by organisms after death and that this is not tapped by the method used. Their inquiries also bring to light a further point of great interest. They find that blood abstracted in this way from the corpse of a person who has died suddenly coagulates almost at once but liquefies again in 1-1½ hours; this peculiarity they state to be shared by the blood of patients still living but in a state of profound shock. Blood taken from the corpse of a person who has died slowly, on the other hand, clots and remains clotted. This observation obviously calls for further investigations, and these are promised. YUDIN states that the decoagulated blood derived from the body a few hours after sudden death actually gives rise to fewer reactions than citrated blood.

At a temperature of 1-3° C. cadaver blood keeps well, and it has been successfully infused after a month's storage. By using cadaver blood YUDIN and his associates have been able to keep on tap an ample supply for all emergencies. To make available such a supply, however, calls not only for an ample supply of suitable corpses but also for a highly organised system. On both these considerations—leaving prejudice aside—it is unlikely that under present circumstances the practice will come into vogue in this country. And inasmuch as cadaver blood appears to have no advantage over that from living men and women, which is readily obtainable here, there seems to be no reason why it should. The question of the storage deserves none the less more attention than it has hitherto received. It is the custom in this country to infuse blood shortly after its removal, and for this purpose donors are called upon, often at considerable inconvenience to themselves, as required for individual cases. Yet there is no apparent reason why stocks of Group O blood should not be kept on hand in institutions performing many transfusions; or some central institution might serve large areas of the country with bottles or cans of blood as required. PALAZZO and TENCONI,<sup>11</sup> of Buenos

Aires, are among the few that have recorded observations on the keeping properties of blood and its transmission, and blood sent by them from South America has been successfully infused by JEANNENEY and VIÉROZ<sup>12</sup> in Bordeaux. The Argentine workers took the blood into citrate, centrifuged out the red cells and suspended them in a mixture of two parts of 3.8 per cent. citrate solution and five parts of either 10.3 saccharose or 5.4 dextrose solution. For infusion the red cell emulsion was given either alone or after recombination with its plasma. Whether any advantage attaches to this separation of red cells and plasma appears to be doubtful; the whole problem stands in need of further study.

## GUY'S HOSPITAL REPORTS

THE present issue of *Guy's Hospital Reports* is a centenary number; for the first volume, its editor believes, appeared in 1836, although, as it was reviewed in THE LANCET dated Jan. 9th of that year, it would look as if we received an advance copy or as if it was actually available in the previous year. For a presentation copy the notice in our columns was, as Sir Humphry Rolleston suggests in his preface to the centenary number, not very kind, but we should remember that the Editor of THE LANCET was himself on the point of bringing out week by week under the heading of Hospital Reports just such observations as appear in this volume. For then, as now, a noteworthy feature of *Guy's Hospital Reports* is that the articles represent original work contributed solely to its columns and not printed elsewhere. In fact, as Rolleston remarks, "Archives" would convey better than "Reports" an indication of the contents. In this first volume appeared, for instance, a contribution on the thyroid gland by Wilkinson King and Astley Cooper so fundamental that they would probably have gone on to find the explanation of cretinism had not Cooper been so old and King so delicate. This is Sir William Hale-White's opinion in his article on Thomas Wilkinson King as the father of endocrinology. In the first volume, too, appears the most extensive account published of Bright's disease by the man who gave it his name, and in the second volume, along with further papers by Bright, is one by Addison on the Diagnosis of Pneumonia. In 1836 Hodgkin was still curator of the museum and lecturer on pathology at Guy's, and it was Wilks who proposed the eponym Hodgkin's disease for the enlargement of the lymphatic glands and spleen described by Hodgkin in 1832, and it was Wilks who wrote in the *Reports* many of the articles about Addison's work on disease of the suprarenals which led to his name being attached to it. Many other hospitals followed the example of Guy's in bringing out annual reports. Its near neighbour St. Thomas's, in fact, seems to have been first in the field by a week or two. But none started quite with the splendour of the three names which have made the Guy's school famous, and the *Reports*, now for 15 years issued by Dr. Arthur Hurst, worthily maintain the tradition.

<sup>11</sup> Palazzo, R., and Tenconi, J.: *Semana méd.*, 1934, 1, 766; *Rev. sud-amér. de endocrinol.*, 1935, xviii., 40.

<sup>12</sup> Jeanneney, G., and Viéroz, J.: *Bull. et mem. Soc. nat. de chir.*, 1934, lx., 1305.

## ANNOTATIONS

## FEVER IN THE TREATMENT OF VENEREAL DISEASE

AMONG the topics discussed at the International Congress of Physical Medicine held in London a fortnight ago was the therapeutic value of artificial fever.<sup>1</sup> Several speakers referred to its beneficial effects in certain forms of syphilis and gonorrhœa, and Dr. W. M. Simpson, who initiated and directs the research in fever therapy at the Miami Valley Hospital, Dayton, Ohio, and is also associated with the United States public health service, made this the subject of his paper. He described the development of the "Kettering hypertherm"—an air-conditioned cabinet of relatively low cost which, in expert hands, combines the merits of safety and efficacy. Since this work began at Dayton 5½ years ago, 431 patients have undergone the treatment, many of them having sustained a temperature of 106°–107° F. for a total of fifty hours or more, and there have been no fatalities. The only complications have been slight burns occurring in a few patients early in the evolution of the method. Dr. Simpson's report deals with 191 sufferers from venereal disease who have received adequate treatment along these lines and have been observed over subsequent periods ranging from 6 months to 5½ years. Excellent and often remarkable results have been obtained in a large proportion of patients with gonorrhœa, of all types and in all stages. The combination of chemotherapy and induced fever in early syphilis has led to rapid clinical and serological improvement, and the available evidence suggests that the two methods combined may bring about cure in a much shorter time than is possible with antisyphilitic drugs alone. Patients with sero-positive primary and secondary syphilis have remained clinically and serologically negative for years, after only thirty weeks' treatment by these means; whereas with chemotherapy alone treatment commonly continues for two years or more. In late syphilis, congenital syphilis, and neurosyphilis the results have been equally encouraging, and the treatment of 27 patients with general paralysis by the combined method resulted in complete clinical remission in 21, while 4 others showed definite improvement. Admittedly the total is small, but within these restricted limits the figures compare favourably with the published results of malarial therapy.

Following the success of early experiments with this method of induced fever, 55 "hypertherms" were supplied to 25 other centres in the United States and at 23 of these the results obtained have been substantially the same. From the quality of the work and the length of time the investigation has been in progress we may say that this form of treatment has now passed beyond the experimental stage. In reviewing some of the results reported from Dr. Simpson's clinic, the Mayo Clinic, and elsewhere—reports strongly suggesting that the method is useful in gonococcal urethritis and in metastatic complications of gonorrhœa—we urged<sup>2</sup> that an investigation of the possibilities of fever therapy as a means of shortening the acute stage of gonorrhœa and preventing complications should now be undertaken by public health authorities in this country, in conjunction with the medical officers of venereal disease treatment centres. The inclusion of all stages of

syphilis within the scope of fever therapy opens a yet wider field for the relief of suffering, the reduction of economic loss, and the saving of public money. It seems possible that we are at the beginning of a beneficent revolution in methods of treatment which are wearisome and often unsatisfactory, and it is to be hoped that those with opportunities of testing these methods fully and impartially will show the necessary spirit of active inquiry.

## HEALTH ORGANISATION ON THE RAND MINES

A CHARACTERISTIC of the native labour force working in the Witwatersrand gold-mines is its instability. The report for the year 1935 of Dr. A. J. Orenstein, chief medical officer of the Central Mining—Rand Mines group, shows that for the mines under his control the average number of natives employed was 99,187; but during the year there were 96,057 recruits, which represents a labour turnover of nearly 97 per cent. Such vast changes complicate the interpretation of the annual death- and sickness-rates, for it has been repeatedly found that new natives are more susceptible to respiratory diseases than the old hands, so that during periods of increased labour supply there is usually observed a rise in these diseases and in meningococcal cerebro-spinal meningitis. Accident-rates appear to be less susceptible to the influx of new labour, a fact which Dr. Orenstein attributes partly to the system of preliminary training in vogue on the mines and to the activities of a Prevention of Accidents committee.

Both the incidence of and the mortality from pneumonia show an increase from 1933 to 1934 and from 1934 to 1935. Towards the end of 1934 an experiment was inaugurated with a mixed anti-pneumonia vaccine at two of the 11 mines on the Rand in the group, every alternate native entering employment at one mine being inoculated and all new recruits at the other being inoculated. At the former the inoculated natives showed a somewhat lower incidence of both lobar and broncho-pneumonia—104 cases amongst 3740 new natives inoculated to 143 cases amongst 3746 uninoculated. At the latter the incidence rose very slightly but the mortality declined. It is clearly too early to draw definite conclusions, but the results are regarded as sufficiently encouraging for the experiment to be continued this year and perhaps extended to further mines. Enteric fever plays an important part in the mortality of natives, constituting 11 per cent. of the total mortality in 1934 and 5 per cent. in 1935. A comparison of the incidence-rate on mines provided with water-borne sewage with that on mines served by night-soil buckets is illuminating. On the former the cases per 1000 employed per annum was 2.65, on the latter 3.99, and it is calculated that if the former rate had prevailed over all the mines there would have been a reduction of 888 cases. In a high proportion of the autopsies performed on natives healed enteric ulcers are found, which suggests a wide prevalence of the disease in the native territories, and probably accounts for its endemicity on the mines. Meningitis occurred on nearly all the mines of the group in 1935, and of the 118 cases nearly 70 per cent. proved fatal. Only 15 cases of hookworm were recorded among the European employees, though it is estimated that at least 10 per cent. of the native labour force are "carriers." Reliance is

<sup>1</sup> THE LANCET, May 23rd, 1936, p. 1201.

<sup>2</sup> *Ibid.*, March 28th, 1936, p. 726.

placed entirely on latrine control and the use of salt which thus appears effectively to prevent transmission to the European miners.

Dr. Orenstein's staff consists of 13 full-time medical officers, 1 research medical officer, 81 subordinate European personnel, 79 female native nurses, and 262 other native personnel, apart from sanitary supervision and ambulance officers employed by the individual mines who come under the indirect supervision of his department. That no pains are spared in enlisting the intelligent coöperation of compound officials is clear from the Notes on Elementary Hygiene, by Dr. Orenstein in collaboration with Mr. A. Gordon, chief health inspector, issued in book form for their use, of which a second edition has just reached us. Introductory remarks on the human body and its requirements and the theory of health and disease are followed by admirable chapters on housing, the disposal of wastes, disinfection and cleanliness, food, kitchen methods, the rat-proofing of buildings, compound inspection, recreation, and finally an elementary account of the common diseases and injuries which includes notes on pneumonia, tuberculosis, enteric, typhus, plague, chicken-pox, hookworm, injuries, and sepsis. Very clear diagrammatic illustrations of buildings and equipment complete a manual which merits more than a local circulation.

#### THE DISADVANTAGES OF TANNIC ACID IN MILD BURNS

THE application of tannic acid is rapidly becoming the stereotyped treatment for burns. In severe burns it has given results in the saving of life and in the prevention of pain and disfigurement far superior to those following any other form of treatment. It is sometimes forgotten, however, that the tanning effects of the solution are not confined to the dead tissues. Dr. Frederic Taylor<sup>1</sup> is concerned about the growing tendency to use tannic acid as a universal application for burns of all degrees of severity. In the second degree burn he thinks that the damage to the delicate layer of the epithelium is a serious consideration. Intact skin is protected by the cornified layer of the epithelium, but when that layer is once destroyed the growing cells responsible for the regeneration of the surface epithelium are at the mercy of the tannic acid and may easily be killed by it. The effect of tannic acid on the skin of rabbits illustrates this point. The rabbit's skin contains no protective cornified layer; tanning extends throughout the surface epithelium and even along the epithelium of the hair follicles. Dr. Taylor's advice is to withhold coagulating applications except in burns of such severity that they are needed to save the life of the patient. Of the coagulating solutions he prefers gentian-violet as being least harmful to the generating epithelium. In all milder burns he advises bland applications such as sodium hypochlorite and ointments, as he regards rapidity of epithelial regeneration as of first importance. The stupidity of causing deep injury to tissues, by drastic treatment carried out to promote healing of a comparatively superficial lesion, is self-evident. There may well be many burns in which the old-fashioned methods yield satisfactory results; but in the rather common type of burn of moderate severity it seems to us that the increased incidence of pain and suppuration, which Dr. Taylor admits to be a disadvantage of treatment by ointments and such like, is a big

price to pay for rapidity of healing. May it not be that the enthusiasm of some surgeons for the tannic acid treatment has carried them too far, and that they are using the solutions too strong and applying them unnecessarily often? After all, if deep destruction of the epithelium results, scarring will follow, and that is one of the sequelæ the treatment is particularly designed to avoid.

#### EARLY AMPUTATION FOR SEVERE INJURY

A FEW months ago we published a paper from Cairo<sup>1</sup> recommending very early amputation for severe crushing injuries of the limbs. An impressive series of cases led Abdelsamie to conclude that these seriously injured patients stand operation quite well, and that the risk of death increases as amputation is delayed. Benajas,<sup>2</sup> on the other hand, is not convinced of the necessity for speedy operation in every case. Its advantages, he considers, are that it anticipates the development of infection and possibly of septicæmia, and so may save life or the unnecessarily extensive sacrifice of tissue; that it prevents shock by removing the source of toxins; and that in cases where the great vessels are destroyed the patient is spared the sufferings and dangers associated with gangrene. Objections, however, are that it is likely to increase traumatic (as contrasted with toxic) shock, and that it carries a risk of removing either too little or too much tissue, whereas with delayed operation a line of demarcation has had time to form and shock and hæmorrhage have been treated. Benajas believes in immediate amputation (1) where infection has already set in and the patient's general condition is bad, (2) where the great vessels are injured and operation is required to check hæmorrhage, and (3) where the principal nerves (especially in the upper limb) are destroyed. He admits that if a patient is seen within the first three hours, before shock has developed, it is best to operate at once, but he maintains that if shock has already set in the operation should be delayed while anti-shock treatment is carried out. This is in direct opposition to the conclusions of Abdelsamie, who has watched two patients die during the interval and would therefore avoid a minute's unnecessary delay. In practice the decision is often made harder because other injuries are present which make one hesitate to attempt operative treatment of any kind. Surgeons will always be divided into two camps, the bold and the cautious, but it seems highly desirable that both types should have a background of information derived from further observations on the "immediate" method.

#### NITROUS OXIDE AND ASPHYXIA NEONATORUM

CONTINUING his valuable studies on the chemistry of the blood of the new-born baby, N. J. Eastman<sup>1</sup> has tried to ascertain whether anæsthetics play a part in the causation of asphyxia neonatorum. Blood samples were obtained from the umbilical artery and vein in a special segment of cord removed immediately after birth, before the delivery of the placenta, and before the onset of respiration. Maternal blood specimens were also taken from the arm vein and radial artery. The blood of forty babies delivered from mothers under anæsthesia was examined in this way. In four cases the anæsthetic was chloroform, in eight ether, and in twenty-eight

<sup>1</sup> Jour. Amer. Med. Assoc., April 4th, 1936, p. 1144.

<sup>1</sup> Abdelsamie, L.: THE LANCET, Jan. 25th, 1936, p. 187.

<sup>2</sup> Benajas, P. C.: Medicina Latina, 1936, ix., 183.

<sup>3</sup> Amer. Jour. Obst. and Gyn., April, 1936, p. 563.

nitrous oxide and oxygen in various proportions; in addition the blood of fifteen infants delivered without anaesthesia was examined as a control. The results show that chloroform anaesthesia has no appreciable effect upon the oxygen saturation of the foetal blood. In the eight cases of open ether anaesthesia there was a slight depression of the average oxygen saturation in the foetus, to about 45 per cent. (It must be borne in mind that while the arterial blood of the mother is usually 95 per cent. saturated with oxygen, the arterial blood going to the foetus at the moment of birth is only about 50 per cent. saturated.) With nitrous oxide greater changes were found; where a gas-oxygen mixture containing 90 per cent. of gas was used for operative interference the oxygen saturation of the foetal blood was only 25 per cent. Previous observations suggest, however, that saturations as low as this are readily withstood by infants at birth, severe asphyxia being usually associated with figures below 10 per cent. Such a state of affairs was reached only when the percentage of nitrous oxide exceeded 90, when it was given for more than five minutes. The practical lessons of Eastman's study are that while weak gas-oxygen mixtures are perfectly satisfactory for inducing analgesia, the stronger mixtures, administered to produce longer periods of true anaesthesia, carry serious risks for the baby. An adequate saturation of the foetal blood with oxygen cannot be guaranteed unless the mother receives 15 parts of oxygen in every 100 parts of the gas mixture. Particularly after a long labour, babies withstand anoxaemia poorly, and if operation is necessary in such cases, ether on an open mask is the anaesthetic of choice, as carrying the least possible risk for the mother and child. The forms of apparatus designed to produce analgesia with "gas and air" do not deliver a strong mixture provided their valves are in working order. But clearly the dangers to the infant arising from high percentages of nitrous oxide must be kept in mind by those who advocate the wider use of this gas in midwifery practice.

#### THE DENTAL TRIBUNAL

THE funds of the General Medical Council have to be carefully husbanded to cover its statutory duties of protecting the public and of ensuring a proper standard of medical education and registration. The Dental Board of the United Kingdom is in a happier position, for after having discharged these obligations the Board has a large surplus available to make dental schools more efficient and to increase the number of their students. This comes about owing to the regulation which requires everyone on the Dentists Register to pay an annual retention fee. At the opening of the thirtieth session of the Board on May 13th Sir Francis Acland expressed his gratification at the prospect that the Board's income would remain for some time on a stable basis. Under a scheme initiated six years ago with the object of attracting young dental practitioners to adopt teaching as a career, nine dental schools have been assisted by contributory grants to establish teaching posts in operative dental surgery, orthodontics, or allied clinical subjects. At the present time the Board is committed to annual grants of £4000 for eight teachers of professorial rank, £2800 for twelve teachers in the demonstrator grade, leaving £8000 a year for bursaries to dental students. During the last two years nearly £7000 has been allotted to four dental schools for new equipment and to one school for new premises. Those who resent the obligation to

pay a retaining fee may at least have the satisfaction of feeling that they have contributed to the advance of dentistry as a scientific study. In some respects, Sir Francis points out, the methods of the Dental Board of the United Kingdom are not as drastic as those of some others. In the Irish Free State the dental board has taken action in the matter of signs and announcements. In the opinion of the Irish board the position of a dentist's premises is sufficiently indicated to persons seeking him by the display of a small name-plate, at the entrance to the premises, bearing the dentist's name and qualifications. Anything in excess of this must at the instruction of the board be removed within ten days. Compare with this Sir Francis Acland's ruling on the question whether dental surgeons should carry long rows of capital letters on their professional plates. To separate the R.C.S. or the R.F.P.S. from the preceding L.D.S. may suggest a double qualification, and the solution that appeals to Sir Francis himself is for the qualification to appear in the form L.D.S. (R.C.S. Eng.). But he does not (at present) suggest that the board should make any regulation on the subject; he is content to add, as his mother's Quaker grandmother used to say to her: "Thee may do as thee likes, but thee knows what I wish."

#### TYPHUS FEVER

To the January-March issue of the *Epidemiological Report* of the Health Section of the League of Nations Dr. Yves Biraud and Dr. S. Deutschman contribute the first part of an elaborate article on the geographical distribution and epidemiology of typhus and typhus-like rickettsia infections. They point out in the first place that after a decade of steady decline the prevalence of typhus has increased in several countries during the last five years. The return of lice-borne typhus, which they attribute partly to disappearance of the population immunised during the war and partly to the prolonged economic depression in rural areas, is not limited to the pandemic focus of eastern Europe, but has also taken place in North and South Africa, South America, and Mexico. The new epidemic wave reached its peak in 1933 in Egypt and China and in 1934 in South Africa and most countries of eastern Europe. In Soviet Russia the number of cases reported rose from 32,035 during the twelve months ending Sept. 30th, 1934, to 66,636 in the following year. The seasonal incidence in Soviet Russia was more irregular than in Poland and Rumania, and reached its maximum earlier than in other countries in eastern Europe. With the exception of Lithuania the Baltic countries were not affected by the disease in 1934 and 1935. In certain districts of Poland there was an increase in typhus in 1935 as compared with the previous years, and a decline or unchanged condition in others. In Czechoslovakia, apart from an isolated case in Slovakia, no case of typhus was reported outside Sub-Carpathian Russia. In the beginning of 1936 there was a substantial increase in the number of cases in Sub-Carpathian Russia, and in March a mild type of disease invaded eastern Slovakia. In Hungary there was a decrease in the sporadic cases reported in 1934-35, whereas in Rumania 1935 was the worst year since 1927. In January, 1936, 572 cases were notified throughout that country, and in February, 1905. The fatality-rate varied between 9.5 and 10.5 per cent. from 1932 to 1935. During 1934 an increase in the number of typhus foci was reported in Bulgaria. Among the other countries in southern Europe Portugal has recently had the greatest number of cases, 104 with



32 deaths having been reported in 1934-35. As regards the countries of North Africa an increase in endemo-sporadicity occurred in 1935 in Algeria, Tunisia, and Morocco, whereas in Egypt the situation was better in 1935 than in the two previous years. The rest of the article will deal with the distribution of the tick-borne diseases variously known as benign summer dermatophus, exanthematous fever, or boutonneuse fever throughout the Mediterranean basin, and of murine typhus in various European countries.

#### SIR CHARLES KENDERDINE

THE death on Monday last at Lewes of Sir Charles Halstaff Kenderdine removes one whose services rendered to the victims of the European war were of outstanding value. A well-known land agent, he was at the outbreak of war secretary of the Land Union, but when the disabled soldiers and sailors began to reach home he became the leading spirit in the care and treatment of thousands of badly mutilated men. He was director of the artificial limb supplies and chairman of the advisory council on artificial limbs at the Ministry of Pensions from 1917-20; the light metal limbs which were soon devised were a substantial improvement on anything previously in use, while great attention was paid to standardising the construction of limbs. The restoration to conditions approaching normal life of many who would previously have been doomed to hopeless crippledom was frequent and the good results of the work cannot be exaggerated. When Queen Mary's Hospital at Roehampton was established for the reception of mutilated sailors, soldiers, and airmen, Sir Charles was the main instrument in raising through public subscription sufficient money to buy Roehampton House, where the beneficent work was later extended to the civilian as well as the military disabled. Sir Charles, who was created K.B.E. in 1918, was also one of the founders of the Queen's Hospital at Sidcup where facial injuries received during the war were treated, often with sensational results. The hospital is now a convalescent centre under the dispensation of the London County Council;

#### SILICOSIS IN SOUTH WALES

THE recent appointment of Prof. T. David Jones, Ph.D., as professor of mining in the University College of South Wales and Monmouthshire, is of interest to many members of the medical profession because of Prof. Jones's long association with the late Dr. J. S. Haldane, F.R.S., in work relating to industrial risks in the various mining industries. Prof. Jones has taken an early opportunity of urging mining engineers throughout the South Wales coalfield to pay more attention to the problem of silicosis—a problem whose final solution necessarily demands coöperation between workers trained in very different fields of science, medical, engineering, chemical, and geological. His lecture on silicosis in the South Wales coalfield, given at the South Wales Institute of Engineers on May 14th, was one of three addresses in which he proposes to cover the different aspects of silicosis and allied dust diseases in this area. While fully admitting the importance of what he called classical silicosis in coal-miners engaged in special work involving exposure to the dust of hard stone, hard heading workings, borers, and sinkers, he suggested that among those accepted for compensation by official bodies there were a proportion that might be described as "official"

silicosis, in which the type of disease failed to conform to the classical description, and whose exact nature must be held doubtful. Many of these cases, he thinks, are in reality cases of bronchitis, under which name indeed they are usually diagnosed by the doctors in the mining areas; and he made a strong plea for various improvements in mine hygiene, including the protection of miners from exposure to cold in "spakes" in the anthracite field. He also appealed for treatment facilities for early cases of this condition, and suggested that the Welsh National Memorial Association, already equipped for the treatment of tuberculosis, might be a suitable body for this purpose, if the necessary additional expense could be met. While paying a tribute to the conscientious work of the medical officers of the Silicosis Board, he suggested that they might well be given additional facilities in order to clarify the diagnosis in doubtful cases.

Prof. Jones's lecture was followed by a valuable discussion, in which several medical men as well as mining engineers took part. There was general agreement that the silicosis of the South Wales coalfield is a genuine problem complicated to a very great extent by the fact that there is exposure to a combination of dusts, some chemically active, some relatively inert, so that the clinical picture is far less simple than that, for example, presented in the gold-mining industry on the Rand.

#### AN AUSTRALASIAN COLLEGE OF PHYSICIANS

At a meeting held in Melbourne on May 8th and 9th, the Association of Physicians of Australasia agreed to the principle that a College of Physicians should be inaugurated in Australasia. The preliminary steps are now being made to put the resolution into effect. We understand that it is intended to model the new college so far as possible on the pattern of the Royal College of Physicians of London.

THE centenary of the Royal Medical Benevolent Fund is to be celebrated by the Royal Society of Medicine on Wednesday, June 10th, when Dr. Robert Hutchison and Sir Thomas Barlow, the two presidents, will receive guests at an evening reception at the Society's house in Wimpole-street, W.

Sir Thomas Lewis, F.R.S., will deliver the George Alexander Gibson lecture of the Royal College of Physicians of Edinburgh on Monday and Tuesday, June 8th and 9th, at 5 p.m. His subject is Symptoms and Signs of Embolism in the Limbs, with special reference to pain.

OUR last issue contained an announcement that Sir Robert Rait, principal and vice-chancellor of Glasgow University, was retiring on Sept. 30th and would be succeeded by Sir Hector Hetherington. Sir Robert's retirement was due to ill-health, and we regret to record that he died on Monday last in his 63rd year.

THE board of governors of Westminster Hospital have accepted the offer of about £350,000 for the site of the hospital made by the firm of John Laing and Son of Carlisle. A further sum of £250,000 will however be required to complete the rebuilding of the hospital on its new site in Horseferry-road. Messrs. Laing intend to build a block of offices on the old site.

## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### CII.—PROGNOSIS OF “ENLARGED” TONSILS

TONSILS used to get so big that they obstructed the fauces, leading to defective respiration and to deformity of the chest. They were accompanied by a similar hypertrophy of the other masses of lymphoid tissue of the upper respiratory tract and were associated with the symptoms described as “mucous disease” by Dr. Eustace Smith. In the words of Morell Mackenzie they were the size of walnuts, often of bantam’s eggs and sometimes of hen’s eggs. If one saw such to-day it is probable that the right treatment would be to cut off the redundant tissue by the old operation of tonsillotomy; but it is doubtful whether anyone would have the courage to do it. Actually we do not see them; the whole syndrome has practically disappeared. It is reasonable to argue that all these tonsils were “septic” and that to-day they would have been enucleated before they had become “enlarged.” I do not myself believe that that is so, but that it was a form of reaction of the body to some state of hygiene that no longer exists, just as we no longer see the cases of hypertrophic rhinitis nor advanced cases of atrophic rhinitis, although the big air-way which underlies the last is commoner than it was.

A pertinent question then arises. If the condition for which our laryngological grandparents devised a small operation has disappeared, why do we not only continue to operate upon tonsils, but to perform an operation which is a much greater one than the old? The answer is that we enucleate tonsils because they are “septic,” and by their being septic we mean that there are living in the crypts organisms which are doing harm locally or to the body generally by absorption into the blood stream. Our problem of the prognosis of “enlarged” tonsils becomes then changed to the problem of the prognosis of “septic” tonsils. There is no certain relationship between the two; either a tonsil of moderate size—which would be called “enlarged” to-day by those who do not remember the really big ones—or a small tonsil may be a “septic” one. This altered problem may be approached by considering what would happen if no tonsils were removed. The local harm shows itself by a series of illnesses known as “acute follicular tonsillitis” or as “sore-throats” when described by the patient. When three of these occur in a twelvemonth the removal of tonsils is followed by their cessation. We can therefore say that in such cases tonsillectomy saves the patient further pain and distress, avoids his taking time off duty with the consequent loss of work or of schooling, and perhaps results in some improvement of general health. It is doubtful whether lives are saved thereby; our grandparents did not die from acute follicular tonsillitis nor from the associated quinsies and there is a definite tendency for one to grow out of the former if the tonsils are left alone. It is true that it is only rarely that we see the acute non-suppurative phlegmons that are described in the old books; but it is by no means certain that these and allied conditions such as erysipelas of the throat have anything to do with the tonsils. The last time any quantity of cases was reported was before 1913 when the subject was discussed at the International Congress of Medicine held in London in that year.

### SEPTIC TONSILS

So far as the tonsils which show local evidence of sepsis are concerned therefore the problem is a fairly easy one. We have however often to decide on “sepsis” in tonsils without any evidence of follicular tonsillitis objective or subjective being obtained. This brings up the thorny problem of so-called “focal sepsis.” We can ask the question in one of two ways. How much good do we do by removing tonsils for focal sepsis? or How much harm would come if we left them all? With regard to the first, we can say at once: Undoubtedly one works miracles thereby on occasion.

I can remember three such cases in 17 years:—

The first was a young doctor who for weeks could not rise from his bed for sciatica. There was no evidence that the tonsils were a source of sepsis, but other methods of treatment having failed, Dr. J. A. Ryle said that he thought the tonsils must be removed. This was done under local anaesthesia. Within 48 hours the pain of the sciatica was gone and it never returned. The second was an income-tax inspector with pain in the back which did not keep him from work, but which for years had impaired his efficiency and damaged his temper. Tonsillectomy made a different man of him. The third was a married woman approaching middle age who was crippled with aches and pains without objective signs. Almost as soon as her throat was healed she was able to return to her golf.

In none of these three cases was there any history of tonsillitis or sore-throat; in all of them the tonsils were small and gave no physical signs that would distinguish them from the numerous tonsils removed without any improvement, or from the tonsils seen in persons of the same ages who have no lesions that can be attributed to focal sepsis.

Three such cases in 17 years is a poor return; but it must be remembered that in each case the result changed the meaning of life to the patient. It is this which compels us to go on and to try to find some further guidance in the selection of cases. Where there are tonsils that should come out on pharyngological grounds we are on firm ground. I can add a fourth case from this category.

A young nurse was in danger of having to give up owing to flat-footedness. Profoundly sceptical as to any relation between this and her tonsils, I agreed to remove these owing to the recurring tonsillitis. The flat-footedness at once disappeared, she was able to finish her training and to follow her profession as a nurse.

In the rheumatoid arthritis of the middle-aged woman I believe that the cases in which improvement may result are those in which there is a history of recurring tonsillitis in adolescence or young womanhood; but I must confess to bitter disappointment in the results, hoping at the most that I may have stayed the progress of this cruel disease from time to time. Further improvement in selection must come from the physicians. It is impossible to get from these what organism they suspect. They ask for a report on “focal sepsis,” and when pressed with the question “In relation to what organism?” they fail to reply. When general medicine has advanced to the stage of knowing what type of organism may be causing any given lesion cultivation of the tonsil before and after removal may give some guidance for the future in the decision to operate.

Would harm come if we left all the tonsils other than those that give a clear indication for removal on

pharyngological grounds? So far as the two lethal diseases of childhood—acute rheumatism and nephritis—are concerned, the answer is in the negative. There are still some physicians who demand the removal of tonsils as a routine in these diseases, but as with all rules-of-thumb in clinical medicine this routine is almost certainly a failure.

We may approach our problem once again by asking why there are so many tonsil operations performed? Although the number is now on the down grade they are still too many; and the reason is that this idea of "sepsis" is neither an anatomical nor a pathological entity. There must therefore be a wide divergence of opinion on the value to be laid on different pieces of evidence, general and local, objective and subjective, upon which the decision is made.

Finally, with Hippocrates, we must ask not only what good can be done by removing "septic" tonsils, but what harm can ensue from the removal of tonsils which are not septic? This is an important question in prognosis and, in my opinion, the harm may be of wide range and of varying intensity.

#### ILL-EFFECTS OF DRASTIC REMOVAL

*In children.*—In all children under 5 and perhaps under 8 the removal of tonsils seriously impairs resistance to infection, not of the specific diseases such as diphtheria or measles, but to that general infection which leads to severe sore-throats, colds, being generally "off-colour," and the appearance of diffuse shotty glands in the neck. This particularly results from the type of operation in which the pharynx is practically flayed of lymphoid tissue. The so-called lingual prolongations of the tonsils are removed almost to the midline of the tongue, and in addition a thorough adenoid operation results in all the lymph tissue being removed from the nasopharynx. In the children of the well-to-do not much harm results, nature has provided so many resistances that those remaining are enough to combat such organisms as are met under good conditions of hygiene. Even in these however a deafness of a catarrhal type may occur between the ages of 14 and 16 causing much anxiety to the parent.

In the children of the poor, however, who have to combat a greater degree of sepsis in the Listerian sense varying with the conditions of hygiene under which they live, the results may be very serious and vary from a fading away of the child for no apparent reason to a chronic nasal catarrh which makes it seem that the child is never free from a cold. Removal of tonsils seldom cures recurring colds; it may make them worse. Nor does it cure otitis media, except in rare cases, but what is not generally known is that it is extremely difficult to get well an otitis media that occurs in a tonsillectomised child, especially if the operation has been that which I have called the flaying of the pharynx.

*In the adult* retention of lymph tissue is not so important. There is, however, one condition in which conservation is necessary. It is the person with the large nasal air-way, a large nasopharynx, and an oro-pharynx in which the soft palate, usually a small one, hangs down at an undue distance from the posterior pharyngeal wall. These people complain of "sore-throat" which on inquiry proves to be daily or constantly present. They have large red tonsils as though nature had tried to limit the cross-section of the air-way by their hypertrophy. The removal of these makes the symptoms much worse.

#### SUMMARY

We may sum up by saying that the "enlarged" tonsil no longer exists. It is doubtful whether inflammations of the tonsil ever kill, but the condition of "septic tonsils" causes much ill-health. When this takes the form of recurring tonsillitis the removal of the tonsils will almost certainly cure, but when this indication is not present the results are disappointing, though occasionally miraculous. In the adult not much harm is done by removing unaffected tonsils, but in children—especially among the poor—the damage may be serious and far-reaching, though difficult to assess. The mistake most often made is that of confusing the reaction of the tonsils to a droplet infection with an inflammation arising from organisms residing in the tonsil.

T. B. LAYTON, M.S., F.R.C.S.,  
Surg. in Charge of the Throat and Ear  
Department at Guy's Hospital.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. J. G. Boal to *President* for course.  
Surg. Comdrs. W. A. Hopkins to *Galatea*, and F. B. Quinn to *Victory* for R.N.B.  
Surg. Comdr. (D) A. D. McHaffie to *Barham*.  
Surg. Lt.-Comdrs. T. L. Cleave to *Iron Duke*, and S. Jenkinson to *Excellent*.  
Surg. Lts. F. W. Gayford to *Excellent* and to *Victory* for R.N.B.; D. M. Beaton to *Lucia*; W. J. F. Guild to *Boscawen* for R.N. Hosp., Portland, and for dockyard; S. J. Van Pelt to *President* for three weeks' course and to *Courageous*; and T. J. Harkin, M. G. H. Heugh, L. Merill, E. H. Murchison, and G. A. Maxwell Smith to *Victory* for R.N.B.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdr. A. S. Pearson to *Curacoa*.

### REGULAR ARMY RESERVE OF OFFICERS

Col. J. W. Langstaff, D.S.O. (late R.A.M.C.), having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

### MILITIA

Lt.-Col. (local Lt.-Col.) R. M. Gorssline, D.S.O., M.B., and Maj. (local Maj.) J. E. Hunter, M.D., of Permt. Active Mila. of Canada, relinquish local rank on ceasing to be empld. on Mil. duty in the United Kingdom.

### ROYAL ARMY MEDICAL CORPS

#### ARMY DENTAL CORPS

Short Service Commissions: J. A. O'Gorman to be Lt. (on prob.).

#### TERRITORIAL ARMY

Majs. W. W. Hallchurch and R. J. W. A. Cushing, T.D., to be Lt.-Cols.  
Capts. J. Cook and R. W. Power to be Majs.  
Lts. B. L. McQuillan and W. N. S. Donaldson to be Capts.  
W. A. Bellamy to be Lt.  
J. R. Hamerton (late Cadet Dulwich Coll. Contgt., Jun. Div., O.T.C.) to be Lt.

### ROYAL AIR FORCE

Flying Offrs. promoted to the rank of Flight Lt.: L. E. A. Dearberg, H. L. Willcox, P. A. Cooper, A. R. C. Young, and R. C. H. Tripp.  
Flight Lts. T. D. L. Bolan to Medical Training Depôt, Halton, and V. D. A. Blackburn to No. 1 School of Technical Training (Apprentices), Halton.  
Flying Offr. R. F. Courtin to Medical Training Depôt, Halton.  
*Dental Branch.*—A. P. Britton and A. J. S. Wilson are granted non-permanent commissions as Flying Offrs. and to Medical Training Depôt, Halton.

#### RESERVE OF AIR FORCE OFFICERS

Flight Lt. N. P. Henderson resigns his commission.

## SPECIAL ARTICLES

MEDICAL TRUANTS<sup>1</sup>

By Lord MOYNIHAN OF LEEDS, M.S. Lond.,  
F.R.C.S. Eng.

CONSULTING SURGEON, LEEDS GENERAL INFIRMARY

[Lord Moynihan reviewed, in an eloquent dissertation, the careers of a number of men who, while medical by profession and occasionally by practice, became more famous for other than medical reasons. Thomas Linacre, in whose honour the lecture is founded, formed a good example, for he was known in his day as classical scholar rather than as physician, in spite of his early connexion with the Royal College of Physicians of London.

The lecturer first reviewed the association in Greece at the dawn of scientific medicine with philosophy and pointed out the additions in anatomy and physiology made by Alexandrian, Roman, and Arabian leaders. The debt to Hippocrates, Galen, and Avicenna being acknowledged, their followers were criticised mainly as recorders; though encyclopædic in their generalisations they preserved the old traditions and discussed every old device and tortured new meanings out of old phrases. "Tyrannous indeed," said the lecturer, "was the control which Hippocrates and Galen exercised for so many centuries; in all that sterile period no new thought is found, no new method, no new experiment, and to deny the authority of Hippocrates and Galen or to dissent from their teaching was not merely heterodox, it was heresy punishable by death itself."

The awakening of learning and with it the growth of medicine came from the great schools of Italy and the leaders of mediæval medicine were subjected to scrutiny in a similarly apt manner, particular attention being drawn to William Gilbert, doctor of medicine of Cambridge University in 1569 and a graduate of Linacre's college. For it was Gilbert who asked, speaking of magnetism, "why should I submit this noble science and this new philosophy to the judgment of men who have taken oath to follow the opinion of others, to the most senseless corruption of the arts, to lettered clowns, grammaticists, sophists, spouters, and the wrong-headed rabble, to be denounced, torn to tatters and heaped with contumely?" Other great medical truants enumerated were Galileo, once a medical student; Galvani, physician and physicist; Robert Boyle, the possessor of an honorary medical degree and the formulator of Boyle's Law; John Locke, physician, philosopher, and theologian; Lower and Mayow, known as experimenters, W. H. Wollaston, a country practitioner whom the lecturer found the most expert chemist and mineralogist of his age; Prout, physician and deliverer of the Goulstonian lectures on the application of chemistry to physiology and the originator of Prout's hypothesis; and the great Thomas Young, a physician to St. George's Hospital, famous for his work in physical optics and as the interpreter of the Rosetta Stone. Woodward, again, the geologist, was a doctor earning a right to practise through a medical degree conferred by the Archbishop of Canterbury which was later confirmed at Cambridge, while another doctor known for his

geological learning was James Hutton, who made the first geological maps. Famous scientific truants also enumerated were Linnaeus, Joseph Hooker, for 20 years director of Kew Gardens, and Thomas Huxley, champion of evolution. He continued:—]

## Truants to Politics

Sir STARR JAMESON (1852–1917), whose name will be forever associated with the Transvaal "raid" in 1895, took the degree of M.D. London in 1877, practised in Kimberley, but entering political life became Member of Parliament for Kimberley in the Cape Legislative Assembly and in 1904 Prime Minister.

One of the greatest truants who ever strayed from medicine to become our only Lord Chancellor was ROBERT BANNATYNE FINLAY, Viscount Finlay (1842–1929). Born at Trinity, near Edinburgh, the eldest of a family of eleven children, he was the son of a medical man, and was destined at once for the profession of his father. He was educated at Edinburgh Academy, where he won almost every prize and where he gained the deserved reputation of an exact and critical classical scholar. His scholarly instinct and the severe mental discipline of his youth served him well at the Bar. His faith in a classical education found expression when as President of the Classical Association he advocated the teaching of Latin conversationally as a living language. He qualified as M.B. at the Edinburgh University. He was active as speaker at the University Debating Society. After qualification he visited Europe and became an accomplished linguist, speaking German, French, Spanish, Italian, and modern Greek. He never practised medicine or his favourite branch surgery, for the reason, I am told, that his hands did not obey the commands of his brain to a degree that gave him satisfaction. He turned to the Bar, and was called to the Middle Temple at the age of 25. He took silk in 1882. His success was immediate and considerable; he owed it to his clearness, good sense and directness of argument. Moreover he looked the part. . . . In December, 1916, on the formation of Mr. Lloyd George's first Government, he became Lord Chancellor, an appointment enthusiastically welcomed by the whole legal profession among whom he had worked for 50 years. Later he became a judge of The Hague Court, and finally, when almost 80 years of age, he was appointed the British Member of the Permanent Court of Arbitration at The Hague, a post for which he possessed every qualification but youth.

WALTER BALTHASAR FOSTER, first Lord Ilkeston (1840–1913), who was the second medical man to be raised to the House of Lords—Lister having been the first—came from the north of Ireland, and attended the same Grammar School in Drogheda which long before had first guided the mind of the Duke of Wellington. Trinity College, Dublin, gave him his degree. He went to Birmingham as Medical Tutor to Queen's College; he was then made Professor of Anatomy and finally was appointed to the medical staff of the Birmingham General Hospital. He quickly distinguished himself in professional circles, acquired a wide practice, and contributed much to the medical and political literature of the day in THE LANCET, upon whose staff he served, and elsewhere. Inspired by Mr. Joseph Chamberlain, the maker of Birmingham's political life, he took active part in civic duties and in 1883 was elected a member of the City Council, where his work for the public health was of great value. He was accomplished as a man of affairs and an excellent speaker. In 1885 he entered Parliament as member for Chester, and at the next election he stood for the Ilkeston division of Derbyshire. He was gradually recognised as a remarkable personality, quick in recognition of faces and in memory of names, and at once on friendly

<sup>1</sup> Excerpt from the Linacre lecture delivered at St. John's College, Cambridge, on May 6th, 1936.



GUILLOTINE



CLEMENCEAU



SUN-YAT-SEN

terms with his constituents. He became Parliamentary Secretary to the Local Government Board, where his energy and his tireless capacity found full scope when an outbreak of cholera was threatened. In 1910 he was raised to the peerage, took the title Ilkeston, and was made an honorary freeman of that town.

A medical truant to politics who considerably enlivened procedure in the House of Commons was CHARLES K. D. TANNER (1850-1901). Son of a physician in Cork, he was educated at Winchester and Queen's College, Cork, whence he graduated in 1872, taking his diplomas in medicine in 1875 and the M.D. of the Royal University of Ireland in 1876. He visited the Schools of Medicine in Paris, Vienna, Berlin, and Leipzig, and on his return home quickly gained hospital and teaching appointments, the due rewards of brilliancy. But politics claimed him for its own. In 1885 he was returned for Mid Cork, and threw himself with amazing fervour into the Nationalist movement. In the House of Commons his combative instincts were rarely allowed to rest. Brilliant, witty, and sometimes unanswerable assaults on the Government greatly amused the House; these, combined with his joy in practical joking at the expense of his opponents, prevented him from receiving the serious attention, his merits fully deserved. In private greatly loved, in political strife both feared and enjoyed for his audacity, truculence, and bitter but witty irony, his death was mourned alike by friend and foe.

[Lord Moynihan then alluded to the facts that the present Prime Minister of Northern Rhodesia,

Mr. Martin Huggins, is F.R.C.S. Eng., and that two of his own contemporaries in medicine in this country, Dr. Christopher Addison and Mr. Walter Elliott, reached cabinet rank. He resumed:—]

In France, medicine has rendered great service to the State. J. P. MARAT (1742-1793) lived for a time in Soho (1766-1777), returning to his native country as Physician to the Guard, thereto appointed by Comte D'Artois, afterwards Charles X. While in England he published two pamphlets—"A Singular Disease of the Eye," and "On the Gleet." Both in England and in France he achieved some fame as practitioner. In 1788 his medical life was over, and his active political life began. In the notoriety of that life his scientific and philosophical knowledge were to be forgotten, the high position his merits had gained to be denied him, and himself to be scoffed at and derided as an ignorant charlatan who had acquired wealth by selling quack remedies. In his later years persecution, misery, and poverty were his lot; he hid in sewers for his safety, and there, it was said, contracted a terrible form of skin disease. Politically he was always in opposition, "der Geist der stets verneint," and was merciless in his bitter condemnation of all who held power. On July 13th, 1793, he was stabbed in his bath by Charlotte Corday.

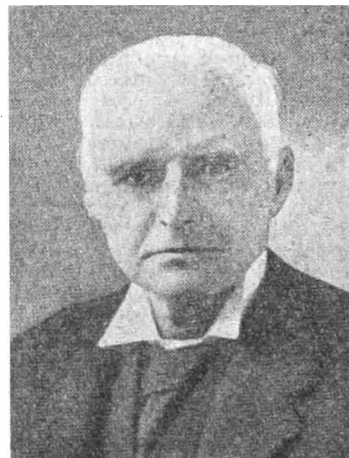
In medicine we are not unfamiliar with the improper attachment of names to methods or inventions. "Lister's sounds" are not sounds, but metal bougies; they were not invented by Lister but by Syme. Foreign annexations are not unknown; "Basedow's disease" was first described by Graves; and "Mikulicz's operation" first performed by Paul.



STARR JAMESON



LEONARD WOOD



FINLAY

Not the least of these oddities in eponymous nomenclature is concerned with that instrument for decapitation known as the guillotine. JOSEPH IGNACE GUILLOTINE (1738-1814) was a French physician and an ardent humanitarian. He was a very distinguished student, and settled in practice in Paris. To him the Revolution came as the revelation of a new heaven, and it gained his unflinching support. With Chemier and Lavoisier he joined the "Society of 1789," which later affiliated itself to the Jacobins. At the constitutional assembly of which he became a member he proposed that "for all classes capital punishment should be by decapitation." This was unanimously accepted. Venal judges ceased to have power to torture prisoners, for Guillotine had also secured the absolute equality of criminals, irrespective of rank, position, or the nature of their crime; and he had secured also the least painful execution for all condemned to death. Decapitation, hitherto the hereditary privilege of the few, became the right of all condemned to die. He abhorred the association of his name with the instrument of death, devised by an army surgeon, Antoine Louis, and at first known as "la Louissette."

The most romantic life among modern truants from Medicine to Statecraft has perhaps been that of CLEMENCEAU, who was born in Vendée in 1841 and died in 1929. He qualified in 1865. He visited London and the United States, returned to Paris, and shortly after the outbreak of the Franco-Prussian war of 1870, was elected Mayor of Montmartre. His political career had, however, begun many years before, and so long ago as 1862 he was imprisoned for two months for his share in a Republican demonstration. From 1871 to 1893 he sat in the Chamber of Deputies, playing the part of ardent radical, in manner not unlike Joseph Chamberlain and Sir Charles Dilke at the same time in England. They, however, became gradually sobered by age and experience, but Clemenceau suffered no abatement of those wild and virulent methods of opposition which made him so dangerous an antagonist of Gambetta and Ferry, which gave him the nickname of "The Tiger," but which left on the public mind in his earlier years a conviction that so ruthless a destroyer could have no constructive power. In 1893 he lost his seat and for nine years devoted his time to literature, was a protagonist with Zola in the Dreyfus campaign, and his power as journalist was unexcelled. In 1902 he became Senator for the Var and Minister of the Interior, and from 1907 to 1909 was Prime Minister of France. It was felt then that his political career was at an end, but the war came, and on July 22nd, 1917, the French senate heard from his lips a speech which convinced them that the only man capable and energetic enough to lift France from the moral crisis of a dark year was Clemenceau. He proved the Saviour of France and "deserved well of his country."

The first President of the Chinese Republic, SUN-YAT-SEN (1866-1925), was a doctor. He early devoted himself to politics, especially while living in Hong-Kong. He entered the College of Medicine in Hong-Kong in the year of its inauguration, 1887, and in 1892 was its first graduate. For a time he practised in the Portuguese Colony, Macao. He lived however, much abroad, and spent his days in stirring up plots against the Manchu dynasty. A revolution in China broke out on Oct. 10th, 1911, and on Dec. 25th he was elected President of the Chinese Republic, resigning in March, 1912, to Yuan-Shih-Kai, who in 1915 proclaimed himself Emperor. Sun-Yat-Sen returned to China, organised a new rebellion, and led South China against Yuan-Shih-Kai. In 1917 he was appointed Generalissimo of the Canton Government. His efforts to come to friendly understanding with Russia were not without result; and he introduced Russian ideas, military and civil, into China. He died of cancer in 1925.

The greatest colonial administrator America has yet produced, General LEONARD WOOD (1860-1927), was a medical truant. Son of a medical man, he

took to the same profession and qualified at Harvard in 1884. He entered the army as an assistant surgeon and soon saw service in Arizona against Apache bands. He took his share in fighting and gained the rare and coveted "Congressional Medal for Valour." After service under three presidents in Washington, he and Theodore Roosevelt were jointly authorised, when the war with Spain broke out in 1898, to raise and equip a regiment of rough-riders. After the action of Las Guasimas he was promoted Brigadier-General and became Governor of Santiago after its capture. With enormous energy and with a passion for patriotic service, he civilised the whole province. He then became Governor-General of Cuba. Administratively, and especially in connexion with medical problems, his success was immense. He brought order out of chaos, and his elimination of yellow fever from the island was the model for the later stupendous work of Gorgas at the Panama Canal. His work made possible the creation of the Republic of Cuba in 1912. He owed his success to unbounded energy, determination, common sense, and a high personal character; he had studied not without profit much of the history of recent British colonial administration. When his old colleague Theodore Roosevelt became President of the United States, he conferred upon Leonard Wood the most difficult post he had to bestow. This was the military governorship of the Moro province of the Philippines. Before taking this post he had visited Germany, and had made friendship with Lord Roberts. These two were convinced of the threat of Germany to the world, and they agreed that "Peace could be preserved only by the power to preserve it." Until 1905 he remained Governor of Moro, and by his labours there he turned over the government of the province to his successor when "law and order, and a strong and stable government" had been established. He became chief of the General Staff in 1910. In the States he played the same part as Lord Roberts did in England. He sought to raise enthusiasm for military preparation against the world crisis he felt to be impending. But, like Roberts, his preaching raised little response. After the outbreak of war in August, 1914, he strove with endless vigour and enthusiasm to equip America for the share that he realised she must take. But in search of active participation he was elbowed into the background and only towards the end of 1917 was he allowed to visit France. He was wounded in 1918, and returned to Washington. Democrats in power did little to help this great Republican. After the war he became Governor-General of the Philippines in 1921. Though he sought to educate the people in the principles of popular democratic government and to bring them more and more into a share of the administration, he was tenacious in his belief of the necessity of American sovereignty. He died with his work unfinished in 1927; and since his death his reputation as the greatest of American colonial administrators has become unassailable.

A distinguished truant from medicine to politics was Sir HILARION MARCUS FERNANDO of Ceylon. After a most successful career at the Royal College, Colombo, he came to England to study medicine. At University College Hospital his career was one of uninterrupted success which culminated in his winning the scholarship and gold medal at his M.B. Lond. examination. On returning to Ceylon his brilliant academic success was recognised by his appointment to the staff of the General Hospital, Colombo, but at the height of medical success he suddenly played truant to medicine, took to a political life, and greatly distinguished himself in works connected with agriculture in the island and with economics. He died early in the year 1936.

#### Truants to Literature

Many truants from medicine have escaped to literature; but not a few of those who remained



faithful have adorned the pages of English letters with prose hardly excelled in beauty or pregnancy of meaning by other writers. Among such men my old teacher, Clifford Allbutt, was perhaps supreme among physicians, as was Sir James Paget, greatest of our orators, among surgeons. But they were by no means the first.

Though I may be omitting poets worthy of mention, first of whom was Empedocles (500 B.C.), let me begin the story of authors who were truant with FRANCOIS RABELAIS (1483?-1553), born in Touraine. He became a monk to please his father, and joined the Benedictine Order from which, however, he resigned after punishment for indecorous behaviour. When 47 years of age he studied medicine at Montpellier and later practised at Lyons, taking a doctor's degree in 1537. In later life he returned to the Church and became Rector of Meudon. His most famous work, still widely and appreciatively read, was "The Lives, Heroic Deeds and Sayings of Gargantua and Pantagruel," an extravagant, but despite its grave blemishes and coarseness, a delightful satire on monks, priests, popes, and pedants. The obscenity and absurdity are blended with learning, wit, and humour. As priest he was exemplary in many respects, devoted to the welfare of his flock, beloved by children and generous to all, especially to those in need. His house was the resort of the learned.

JULIUS CÆSAR SCALIGER (1484-1558), the distinguished classical scholar, was also in the ranks of medicine. Born on Lake Garda, he became page to the Emperor Maximilian whom he served in war and peace for 17 years. It was only on leaving the army at the age of 40 that he applied himself to the study of medicine, and not less to the acquisition of languages. His first work "A Defence of Cicero," was prompted by the "Ciceronianus" of Erasmus, wherein the Latin author was harshly ridiculed. His invective against Erasmus stirred the whole world of learning. His erudition was considerable, but his vanity and insolence greatly lessened the high esteem in which otherwise he would have been held by all contemporary scholars.

THOMAS LODGE (1558-1625) had one of the most interesting and varied careers of mediæval times, and may be regarded as a truant in the opposite direction—from a life of endless variety and thrilling incident to medicine. Second son of Sir Thomas Lodge, Lord Mayor of London in 1562, member of a family dating from the reign of Henry I., he graduated at Oxford in 1577, having already written verses. He early abandoned law for literature, and was soon welcomed as companion by Drayton, Lyly, and Watson. His vagaries seem to have alienated the affections of his family and his name was omitted from his father's will. He has been described as one who was "hunted by the heavy hand of God and became little better than a vagrant, looser than liberty, lighter than vanity itself." His early life indeed was marked by continuous unrest and perpetual unhappiness, though he was prodigal with his pen, which was often rancorous. In 1588 and again in 1591 he went to sea, travelling to South America and visiting among other places, Santos and its then famous library. On his return he published more verse referring to the sea. In later years he earned a measure of public approval and support, and is said to have won the commendation of Spenser. After 1595 he wrote only a few volumes of prose. He began the study of medicine in 1596 and took a degree at Avignon in 1600 and at Oxford two years later. In 1599, when the plague raged in London, he wrote "A Treatise on the Plague." In 1609 he is mentioned in a list of the chief physicians of the day. It is, however, as lyric poet that Lodge is most worthy of remembrance, and he is described by a contemporary as a writer of "those pretty old songs and madrigals which are very much the strain of these times"; his lyrics, indeed, are still regarded as among the finest in our language, though it is admitted that he owes much to the French author, Desportes, and something to Ronsard. Sir Humphry Rolleston

says that the most interesting of his plays is "Rosalynde: Euphues Golden Legacy," 1590, which provided young Shakespeare, who was then but 26, with the plot of "As You Like It."

Supreme among all truants must surely be Sir THOMAS BROWNE, of Halifax and Norwich, whose "Religio Medici" continues to be the delight and inspiration to an endless host of his successors. Sir Thomas Browne (1605-1682) was educated at Winchester and Oxford. He practised for a time in Oxford but soon left for the Continent, visiting Montpellier and Padua, and at the age of 28 was given the degree of M.D. at Leyden. On his return he began practice at Shibden Hall, near Halifax, which still stands. After a few years he left Yorkshire for Norwich, and then took his degree of M.D. at Oxford in 1637. He quickly gained high repute as a physician. In 1641 he married and despite his opinion that the act of coition was "the foolishest act a wise man commits in all his life, nor is there anything that will more deject his cooled imagination than to reflect upon the folly he hath committed," he became the father of ten children. The most famous of all his books "Religio Medici" was published surreptitiously in 1635. It was written while he was in Yorkshire, for the occupation of his leisureable hours and for his private exercise and satisfaction, at the age of 30. It suffered from the premature publication of unauthorised versions of which there is nevertheless evidence that the author was not unaware. Sir Thomas, like other great men, believed in the influence of the stars upon the affairs of men, and he held this as explaining the fact that "he was not disposed for the mirth and galliardise of company." Perhaps the most learned of Sir Thomas's work was "Pseudodoxia Epidemica." Its compilation was the work of many years, and the scholarship and research therein contained are remarkable. The reader of to-day will smile as he realises the extent to which Satan is here reproving sin, for credulity was the inherent weakness of a great mind. He believed in astrology, alchemy, witchcraft, and magic, and his faith in the Ptolemaic system of astronomy was unshakable. He showed his credulity when in a trial for witchcraft he was asked by the presiding judge to give his opinion of the case, he said: "That the fits were natural, heightened by the devil's cooperating with the malice of the witches at whose instances he did the villainies"; an opinion which did much to secure conviction. He regretted that in his professional works he had no time to make "those infallible experiments and those assured determinations which the subject sometimes requireth." His reputation for wide and remote knowledge spread throughout the land, and his opinion and guidance were sought by men themselves learned in philosophy, in natural history, and in medicine. He wrote upon "Urn burial," and made it an occasion for quoting Dante. Sir Thomas Browne received a knighthood when Charles II. visited Norwich, after the refusal of the Mayor for whom the honour was first considered.

Sir RICHARD BLACKMORE (1650-1729) took a degree in Arts at Oxford and in Medicine at Padua. His philosophical poem "The Creation" was praised by Addison. His poems were written as he travelled on his rounds. He said:—

"In leisure hours in epic song he deals,  
Writes to the rumbling of his coach's wheels."

Physician to William III. and afterwards to Queen Anne, he is chiefly remembered for the distinction of those who attacked him, among them being Dryden and Sir S. Garth. Colonel Coddington wrote:—

"By nature formed, by want a pedant made,  
Blackmore at first set up the Whipping trade.  
Next quack commenced: then fierce with pride he swore  
That toothache, gripes, corns should be no more.  
In vain his drugs as well as birch he tried  
His boys grew blockheads, and his patients died."

Of medical men who for a time strayed into other paths, we may recall THOMAS DOVER (1660-1742),

inventor of the eponymous powder. In younger days he sailed from Bristol in a privateer commanded by a man of parts, William Dampier, captain in the Navy, hydrographer, buccaneer, to whom he was second in command. We owe to him the discovery of the original castaway, Defoe's model for Robinson Crusoe. The powder which bears his name is in high repute even to this day. He was known colloquially as the "quicksilver doctor," because of his faith in the use of mercury.

Sir SAMUEL GARTH, a Yorkshireman, though never wholly truant (1661-1719), was of high repute in his day, both as physician and as poet. "Dispensary, a Poem," published in 1699, certainly led to the creation of these invaluable institutions for the poor. He delivered the Goulstonian lectures in 1694 and in 1697 the Harveian oration at the Royal College of Physicians. He obtained permission from the College for the body of Dryden to lie there before burial, and he delivered a Latin oration over it. He enjoyed a large practice, held office at the Court, and was, Pope said, the "best natured of men." His couplet in the "Dispensary" is of all his work the best worth remembering :

"To die is landing on some distant shore  
Where tempests never beat nor billows roar."

Later, we claim JOHN ARBUTHNOT, F.R.S. (1667-1735), an Aberdonian, a graduate of St. Andrew's physician and wit, a man whose extraordinary ability was hailed by Pope. By good fortune he was present at Epsom when Prince George of Denmark was taken suddenly ill. He became physician to Queen Anne, and, Swift says, was her "favourite physician." He attended her on her death bed. He gave the Harveian oration in 1727. Fifteen years earlier he published "Law in a Bottomless Pit, or the History of John Bull"; and it is probable that therein he created our national character and name. He contributed to the "Memoirs of Martinus Scriblerus" of which Pope was editor.

MARK AKENSIDE (1721-1770), poet and physician, after little success as practitioner in the provinces, went to Hampshire, and then to Bloomsbury-square, financed by an old friend, Jeremiah Dyson, until prosperity came to him. While still in Newcastle he wrote "The Pleasures of the Imagination," a poem that did not lack success; and was, indeed, claimed as his own by a charlatan, Rolt. It bears Akenside's name only on the second edition. His most famous poem, however, is "Hymn to the Naiads." He became F.R.S. and M.D. Camb. in 1735, and in 1755 delivered the Goulstonian lectures at the Royal College of Physicians, and in 1756 the Croonian lectures. He died on the bed on which Milton had died, having kept silence as poet during the days of his large practice. His name was originally spelt Akinside, but it was soon realised that its sound was unfortunate for one practising medicine, and a change was made. He was satirised in "Peregrine Pickle," by Smollett, a famous truant.

TOBIAS GEORGE SMOLLETT (1721-1771) studied at the University of Glasgow and was there apprenticed to a surgeon. At the age of 18 he sought his fortune in England, and brought with him a tragedy "The Regicide," the very worst effort of his pen. The failure of this wretched play became a stock grievance throughout his life; he was, indeed, reduced to starvation until by influence he obtained the post of surgeon's mate on H.M.S. *Cumberland*, sent to attack Cartagena. In "Roderick Random," licentious though it is, he has left an historic account of the miseries endured by sailors and soldiers alike in that campaign. On his return he began practice in Downing-street, and "attracted more attention as a wit than as a leech," but he had an important share in the revision of Smellie's "Midwifery," the standard book of that time. In 1750 he took the degree of M.D. at Aberdeen, and a year later published "Peregrine Pickle." Like its predecessor, it has no plot; and is merely a string of adventures loosely held together, but the wealth

of amusing incident and the rapidly moving crowd of eccentric figures atone for much coarseness. Two years later he abandoned medicine for literature, and acquired fame and a fortune which he lavishly squandered. Hume likened him to a cocoa-nut—"rough outside, but full of human kindness within." His powers of observation and brilliancy of description have rarely been equalled in imaginative literature.

Best-known and perhaps best-beloved of all literary truants is OLIVER GOLDSMITH (1728-1774). There is, however, some doubt as to whether Goldsmith was ever justified in describing himself as doctor. Admission to the church, the calling of his father and brother, being refused, he was then intended for the law. He was financed by a generous uncle with the sum of £50, lost at once in a gaming house. A little money was collected for him, and at the age of 24 he became a student at Edinburgh, spending 18 months in the acquisition of some knowledge of chemistry and biology. From there he drifted to Leyden where he remained for more than a year leaving with little knowledge of medicine, with only the clothes he wore and a flute. He wandered through France, Switzerland, and Italy, living on charity, casual gifts, and the frequent support given by monasteries:—

"Remote, unfriended, melancholy, slow  
Or by the lazy Scheldt or wandering Po  
My fortune leads to traverse realms alone  
And find no spot of all the world my own."

In 1756 he returned to England, penniless, friendless, with a medical degree obtained somewhere, and attested only by his own unsupported statement. He practised for a time in Bankside, Southwark, as physician to the poor. Amongst his patients was a printer's workman through whose influence with Samuel Richardson Goldsmith was appointed corrector to the press in Salisbury-court. To earn a pittance he later became usher in a school, and afterwards obtained a medical appointment with the East India Company, which subsequently revoked it. He presented himself then for examination for the post of "mate" to a hospital; but even for this humble post he was rejected. Turning to literature for a pittance he found immortality. His farce "She Stoops to Conquer," is incomparable. The "Vicar of Wakefield" will be read so long as our language lasts. His poems, his plays, indeed all his writings, show simplicity and austerity, with an engaging beauty. He was friend, if often the butt of Johnson, Garrick, Reynolds, Burke, and others. The contrast between his written and spoken word is a puzzle to all. Garrick wrote of him:—

"Here lies Nolly Goldsmith, for shortness called Noll,  
Who wrote like an angel, but talked like poor Poll."

But his companionship meant much to great men. When he died Burke burst into tears, and Reynolds laid aside his brush for many days. It was supposed that his death was hastened by indiscriminate attachment to James's powder.

### Other Famous Truants

[Among other truants to literature of whom the lecturer discoursed we find the names of Edward Jenner, the discoverer of vaccination, alluded to as "in a very minor sense a poet"; George Crabbe "of all men truant from medicine professionally the most incompetent," but described by Byron as "Nature's sternest painter yet the best"; the famous German poet Schiller; Keats, "One whose instincts and faculties were more finely poetical than those of any of his contemporaries which included Byron, Scott, and Wordsworth"; Peter Mark Roget, author of the "Thesaurus"; John Brown of the delightful "Horæ Subsecivæ"; Sir Henry Thompson, surgeon, artist, and novelist; Conan Doyle; Robert Bridges, who retired from practice

at the age of 37 to become later Poet Laureate; Ronald Ross, of malaria fame, who wrote poetry, prose, and mathematical exercises; Oliver Wendell Holmes; Weir Mitchell; Sir Francis Seymour Haden, the famous etcher. Other medical truants described included the explorers Mungo Park and Livingstone, and Henry Jones, who as "Cavendish" was the supreme authority on whist. Lord Moynihan concluded:—]

I have given a brief and imperfect record of some of the truants from medicine who have helped to create or develop our own or other branches of science, who have been greatly distinguished in law, literature, or elsewhere. Their careers illustrate the influence of scientific training upon all mental activity, no matter in what field it may be expended. The habits early inculcated of acute and accurate observation, orderly and relevant arrangement of thought, close criticism of every stage in the manifold processes leading to judgment and decision, conciseness in final expression, and impeccable intellectual integrity throughout are for many of us acquired with infinite difficulty, but, once made our own, may be worn with natural ease and appear almost automatic. A scientific training is useful, not only in the work of an arduous and scientific profession, but in all other callings into which by accident or deliberate intention a man may chance to wander.

## BUCHAREST

(FROM OUR OWN CORRESPONDENT)

### JUVENILES AND THE LAW

THE new penal code, to be issued shortly, is very liberal to juveniles. Those under 14 are regarded as children and cannot be held responsible for their misdeeds. Adolescents between 14 and 19 can be blamed only if there is evidence of their being possessed of full powers of judgment when committing the offence. If they are not held responsible, the authorities, after a preliminary study of the circumstances, may resort to the following measures: They may first instruct the family to exert greater supervision, or the director of the school may be asked to apply discipline. If there are no parents, or if they are unsuitable, supervision is entrusted to other relatives. In their absence the child may be placed in charge of another reliable person or of a suitable institution. If neither of these is possible the adolescent is sent into a reformatory. These measures hold good not only up to the age of 19 but to the end of the twenty-first year. Abnormal, weak-minded, and sick juveniles can be treated in special institutions. If the adolescent was fully capable of judgment when committing the crime, as a safety measure he is kept under supervision or sent into a reformatory, or as a punishment he may be publicly reprimanded and sentenced to light imprisonment. Supervision is for one year, and if the youth does not improve during this time he may be sent to a reformatory or sentenced to light imprisonment. With good conduct the board of the reformatory may release him on probation for two years, after which he is entirely free; cases of bad conduct are kept in the reformatory until the twenty-first year. Terms of imprisonment for felony are from 3 to 15 years, and for misdemeanour half the adult sentences, with a maximum of 3 years. Subjects under 16 cannot be sentenced to more than

10 years. They are placed in special institutions. After two-thirds of the sentence, they may be discharged with conditional liberty, but after release from gaol a juvenile may be sent to a reformatory until he becomes of age. The care of those released is in the hands of a society.

### LAYMEN AND THE DIRECTION OF MEDICAL AFFAIRS

Some paragraphs of the new law on public administration allow the magistrates to interfere in organisation of public health institutions. It is obvious that this intervention would harm the normal progress of public health institutions. On the other hand, the new law does not stipulate that the administrative magistrates should hear the opinion of their medical advisers before bringing in any public health measure. This induced the Medical Association to make representations to the Prime Minister, the Minister of Public Health, and the Speaker of the Chamber of Deputies requesting, first, that in questions of public interest the health officer should be consulted, and that he shall have a place on all councils where questions relating to public health and hygiene are discussed. Secondly, that the medical officers, who through the new law are subordinated to the county prefect, should remain, as hitherto, under the control of the Ministry of Health; although the new law empowers the prefects to supervise medical institutions, they are not competent to decide medical questions. Thirdly, the local chief constable may be able to instruct the physician at best to hold lectures of public health interest, but he cannot give instructions in any other direction, having no qualification in matters of public health.

### MEDICAL REFORMS IN ALBANIA

In the post-war years public health in general and the competency of physicians in particular have advanced a great deal in Albania. The State is granting a great number of scholarships for medical students to study abroad, so that on their return they may introduce Western advances. The latest achievement is a new Bill that lays down rules and regulations for medical practice and establishes a medical chamber. Hitherto quacks and magicians could practise in Albania to their hearts' content, but the new law will apply very strict measures against them. According to the Bill foreign physicians may practise in Albania only with the Government's permission, which is given only in exceptional cases, because the country is amply supplied with its own doctors.

Prof. Pierre Duval, of the University of Paris, whose specialty is gastro-intestinal surgery, radiology of the digestive tract, and war surgery, was a guest of the University of Bucharest for eight days, and during this time he delivered several addresses.

On the initiative of Dr. M. Liviu Popovici, professor of pediatrics at the University of Cluj, capital of Transylvania, a new society has been formed for the furtherance of pediatrics. It intends to hold public lectures to enlighten the public on the education, for instance, of nervous and mentally deficient children. The first president of the society, which has 40 members, is Prof. Popovici. It intends to publish a quarterly bulletin.

The International Society for Medical History has elected Dr. Victor Gomoiu, the founder of the Rumanian Medical History Society, as president for the next five years.

## OBITUARY

### JOSEPH DANIEL McFEELY, F.R.C.S.I., D.P.H.

THE death occurred at Woolton on May 15th of Dr. Daniel McFeely who had much important medical work to his credit first in Ireland and for the last 30 years in Liverpool. He was born in Londonderry, the son of a Londonderry merchant, and educated at the Letterkenny High School, at Trinity College, Dublin, and the Catholic University, Dublin. He obtained the Irish double diploma in 1885, and was for a time resident surgeon in the Jervis-street Hospital, Dublin, and later civil surgeon at the Military Hospital, Cork. In 1896 he became F.R.C.S.I., took the public health diploma, and was appointed coroner and medical officer of health for County Donegal. He was also appointed surgeon to the Mercer's Hospital, a post which he filled for seven years. At the Royal College of Surgeons in Ireland he was a member of the council and of the court of examiners, while to his other appointments he at one time added that of assistant surgeon to the National Maternity Hospital. In 1904 he removed to Liverpool, where he was appointed visiting surgeon at the Mill-road Infirmary and carried on a considerable private practice with headquarters in Shaw-street. Among his other activities he worked as emigration officer to the Catholic Emigration Association in respect of children emigrating to Canada. He contributed occasionally to medical journals and wrote an interesting little book composed of his reminiscences as a practitioner. At the close of his life Dr. McFeely lost his sight, and latterly had resided at Holly House, Woolton, where he died. Dr. McFeely married Sarah, daughter of the late J. C. Lenon, and leaves four sons.

### JOHN HERBERT GODSON, M.B. Camb., D.P.H.

Dr. John Godson, who died early in the month, was very well known in the Cheadle district where he was born and where the family had a large professional connexion. He was the second son of the late Dr. Alfred Godson, and had two brothers, medical men. He was educated at Aldenham and Cambridge, and graduated as M.B., B.Chir. in 1893, completing his medical training at Guy's Hospital. There he was resident obstetrician, while he also held posts at the Great Ormond-street Children's Hospital and the East London Children's Hospital. He then joined his father in practice, whom he succeeded as medical officer of health for the Cheadle and Gatley urban district, a post which he held until just before his death. Dr. Godson was prominent in the promotion of the social activities of the neighbourhood; he was a keen churchman, a trustee of the literary institute, and a supporter of the local athletic clubs. He was 69 years of age.

### THEODORE FRANCIS DILLON, M.B. R.U.I.

Dr. Theodore Dillon, who died recently in Cardiff, was educated at Black Rock College, Dublin, and Queen's College, Cork, where he graduated as M.B., B.Ch. in 1898. He was holding a medical appointment at the Ophthalmic Hospital in Cork when he entered the Army Medical Corps to serve in the Boer war. Later he went into general practice in Cardiff where he practised in partnership with the late Dr. Cantillon for over 30 years. He received a commission in the R.A.M.C. during the European war,

and served in France and Gallipoli. Dr. Dillon was a devout Catholic and deeply interested in the affairs of his church, and was also vice-president of the local branch of the Ancient Order of Hibernians. He was 64 years old at the time of his death.

### HENRY JOHN MACKESON WYLLYS, F.R.C.S. Edin.

Dr. Mackeson Wyllys, who died at his residence in Yarmouth on May 11th, was a prominent member of the local medical profession, the son of the late Dr. Wyllys of Yarmouth and brother of Dr. William Wyllys of that town. He received his medical training in Glasgow, and on qualification was for a time house surgeon at the Norfolk and Norwich Hospital. In 1906, on the retirement of his father, he went into partnership with his brother in Yarmouth, where in due course he held a number of professional appointments. He became senior surgeon to the Yarmouth Hospital, and was a life member of the committee of governors and chairman of the nursing committee. He was an honorary member of the Eastern Counties Convalescent Home for Children, and in addition to his professional relations was well known in the town for his support of the cricket club. He was also a noticeable figure for his reluctance to give up the horse and gig for the motor-car. Dr. Wyllys married Miss Ballance, sister of the late Sir Charles and late Sir Hamilton Ballance, and his son is a prominent cricketer.

### MOSES UMANSKI, M.D. Berne, L.S.A.

Dr. Moses Umanski, who died in London recently, was a Russian, the son of Jacob Umanski, and was born in 1862 at Ekaterinoslav and educated in the University of Kharkoff and in Berne and Berlin. He graduated in medicine at Berne and took the diploma of medicine at the University of Kharkoff in 1886 and shortly afterwards came to England. He qualified as L.S.A. Lond. in 1895 and settled in Leeds where he was medical officer to the Jewish Sick Charity and various friendly societies, medical officer to the Leeds Jewish Maternity Charity, and medical superintendent of the Herzl-Moser Memorial Home, for the dying, a post he held for 20 years, from the foundation of the institution. He spent the last ten years of his life in London, where he won the regard of many by his amiable qualities. He was a great champion of the Zionist movement.

### PAUL POWER, M.B. N.U.I.

THE sudden death is announced of Dr. Paul Power, late secretary of the International Medical Agency, Bedford-street, W.C. Dr. Power was born at Tulla, Co. Clare, and educated at St. Mungo's College, from whence he entered the University of Dublin and graduated as M.B., B.Ch., B.A.O. in October, 1928. He volunteered for service in Abyssinia shortly after the outbreak of hostilities and was attached to the British Red Cross unit. He was at Diredawa for a considerable period, and was presented to the Emperor who heartily thanked him for his services. His death occurred from malaria at Aden, while homeward bound. He was only 33 years of age and had fine prospects in practice before him.

## CORRESPONDENCE

## INFLAMMABLE DRESSINGS

*To the Editor of THE LANCET*

SIR,—My council has asked me to report a case it recently considered which appears to contain a significant pointer to members of the profession engaged in general and surgical practice. A patient sustained a slight injury as a result of the puncture of one of his fingers by a chicken bone. This was followed by cellulitis which required frequent and regular dressing. These dressings produced, as they commonly do, a sodden condition of the tissues which our member thought would be corrected by application of a spirit dressing. He accordingly applied a spirit dressing and asked the patient to return within 48 hours for a further inspection of the infected part. The patient had no sooner left the surgery than he attempted to light a cigarette. The dressing is said to have "blown up," and he quickly returned, holding aloft a hand which resembled a flaming torch. Our member dealt with the situation promptly and efficiently and provided the necessary treatment.

It is to be noted, incidentally, that the settlement of this case involved the Medical Defence Union in the expenditure of a considerable sum of money. The moral to be drawn from the foregoing unfortunate experience is that patients who receive spirit dressings should be warned of the dangers of flame or fire of any kind which is likely to ignite the dressing and thereby cause grievous damage.

I am, Sir, yours faithfully,

ROBT. FORBES,

Secretary, Medical Defence Union.

49, Bedford-square, London, W.C., May 25th.

## MENTAL SICKNESS AND CERTIFICATION

*To the Editor of THE LANCET*

SIR,—I appreciate that, as Dr. Rees informs us in your issue of May 23rd, it is the intention of the Institute of Medical Psychology to receive only psychoneurotic cases for treatment, but that does not dispose of the point I raised. The law makes no distinction between psychoneurotic and psychotic cases. Patients who are certifiable, even if diagnosed psychoneurotic, are subject to the legal complications mentioned in my previous letter.

I am, Sir, yours faithfully,

Wimpole-street, W., May 23rd. FREDERICK DILLON.

## VISITS TO RUSSIA

*To the Editor of THE LANCET*

SIR,—It will, we feel sure, be of interest to your readers to know that special arrangements are being made, by the Society for Cultural Relations, to enable doctors and surgeons to carry out a study of the medical services in Soviet Russia. As is probably well known, the Russian health services are organised on a different basis from those in this country. Competent observers have expressed the opinion that the results achieved are worthy of notice. Sir Arthur Newsholme and John A. Kingsbury, for instance, state in their book "Red Medicine," that Soviet Russia "has removed the doctor almost entirely from the field of monetary competition, and has thus abolished a chief source of inadequate medical service."

It is proposed that groups should leave London on June 20th and July 25th for three or four weeks. The programme will give ample opportunity for

studying the organisation of the medical services as a whole, and in addition facilities will be given to enable individual members of the groups to investigate the research and practical work being done in the particular branches of medicine in which they are themselves specialists. Full details of the arrangements can be obtained from the Secretary, S.C.R., 3, Bedford-place, W.C.1.

We are, Sir, yours faithfully,

SOMERVILLE HASTINGS,

JULIAN S. HUXLEY,

J. R. MARRACK.

May 20th.

## SELENIUM TREATMENT OF CANCER

*To the Editor of THE LANCET*

SIR,—The report from the Royal Cancer Hospital on the selenide treatment of cancer in your issue of May 23rd demands some comment. When I received a typed copy in February of this year I returned the following reply: "It is considered highly regrettable that errors of prime importance were allowed to persist throughout the series." I pointed out these errors to the Bristol Royal Infirmary Cancer Committee; in the interest of cancer therapy it is considered desirable that they should be more widely circulated.

The Cancer Hospital sent to Bristol a youngish woman graduate, of the house-physician standing, for a short period to learn what she could about the method. Every facility was given her to learn, and errors of capital importance, such as immediate reaction and rigors after injection, were carefully stressed. The X ray dosage was taught as well as was possible to her and to Prof. Morison who was only available for a few minutes. No communication or request for guidance was made during the "trial."

The report states that the initial dose of S.Se. was 0.5 to 1 c.cm., that increments were of the same amount and that immediate reaction, or rigors, occurred every time it was given. The initial dose was therefore about 25 per cent. of what is recommended, and with such increments the optimal dose would rarely have been attained before the eight X ray treatments had terminated. Then again, immediate reaction, such as followed each time, would prevent the optimal dose of colloid being ascertained. The total dosage of colloid noted in the table is very low, less than one-third of what would be given here for these types and durations. As regards the colloid R.A.S. It is stated that the initial dose was 1 c.cm. and that it was increased by the same amount each week. In the article (Brit. Jour. Surg., 1934, xxi, 619) it is advised that the initial dose should be two-thirds of the last dose of S.Se. For example, a case of rectal carcinoma would probably end with 12 c.cm. of S.Se.; the initial dose of R.A.S. would be 8 c.cm., and in the three weeks after X radiation he would receive at least 24 c.cm. of R.A.S.—but at the Cancer Hospital he would only be given a total of 6 c.cm.

The X ray technique was standardised, each case received 75 r. It is advised that the X ray dosage should be altered to meet the findings in each case, and, at Bristol, doses from 30 to 150 r. are given. Patients only received eight séances, although it is advised that séances given before attaining the optimal dose of colloid should not be counted. This standardisation is possibly a corollary to immediate reaction or rigors, for neither optimal colloid nor X ray dosage could possibly be ascertained if rigors

occurred. Since X ray action is the product of séances and colloid dosage, the amount of ionisation per patient would not be more than about 20 per cent. of the optimal.

Much space is given to a case developing sulphæmoglobinæmia. No example of this has occurred amongst the hundreds treated at Bristol, but we guard very carefully against rigors and immediate reaction. It is possible that sulphæmoglobinæmia may follow faulty technique with some frequency.

The finding that the hæmatological reactions were not as are found here is not surprising; it is regarded as further evidence that the treatment given at the Cancer Hospital differed widely from that given at Bristol.

To sum up the more glaring of the errors: the dosages of colloid were far too low and chemical alteration occurred during injection; the X ray dosage was standardised, and, with the low dosage of colloid, must have been almost inoperative. Though these errors were pointed out, no effort was made to check them—from which one may make inferences better left unwritten. In spite of the fact that practically every error possible was stereotyped through the series, the results are not reported as being completely negative. It is therefore confidently concluded that no clinic need expect worse results than this report contains, and that genuine adherence to the published technique is likely to benefit the cancer patient to a degree comparable with that found here. Lastly, one is justified to ask why this burlesque was allowed to be published; a comparison of the method described with the original should have shown such discrepancies that to call it an independent test is far from the truth.

I am, Sir, yours faithfully,

Bristol, May 23rd.

A. T. TODD.

#### PROPHYLACTIC ENUCLEATION OF LOWER WISDOM TOOTH FOLLICLES

To the Editor of THE LANCET

SIR,—Mr. Bowdler Henry, in THE LANCET of April 18th, recommends the early removal of the germ of the lower third molar in cases where there is evidence that there will be a subsequent impaction, thereby avoiding all the dangers and difficulties which may follow the ordinary operation for the removal of the impacted tooth. The chief objection, however, to this operation is the difficulty of deciding whether a tooth germ will be subsequently impacted or not. It may appear to be irregularly placed at an early stage and yet erupt normally later. On the other hand, it may appear to be normal and fail to erupt when fully developed. It follows, therefore, that many of these operations may be performed on tooth germs which would erupt normally if allowed to develop or, alternatively, would develop in such a manner that their subsequent removal would be simple.

It would appear to be necessary, therefore, before accepting the prophylactic operation as a routine measure, to ascertain whether it is possible to diagnose with certainty a future impaction of the type which would necessitate a severe operation, and, if, so whether the tooth germs of probable impactions of this type are not themselves in such positions that their removal would present difficulties and dangers comparable with those encountered in the removal of impacted teeth. It must also be remembered that the great majority of impacted third molars can be removed with very little local or general disturbance, and that it is a question whether the fatalities and

difficulties which occur are not due to some idiosyncrasy of the patient or to local conditions which often occur in the third molar region when there is no impaction at all.

I am, Sir, yours faithfully,

Rickmansworth, May 15th.

S. WILSON CHARLES.

#### PORTRAITS OF PUBLIC HEALTH PIONEERS

To the Editor of THE LANCET

SIR,—In connexion with the public health section of our museum here, I am making a collection of the portraits of past pioneers in public health, and already have secured a considerable number. There are, however, several of whom so far I have been unable to trace portraits, and am venturing to append a list of these in the hope that some of your readers may be able to give me references to publications where any of these can be found, or in the event of their possessing portraits of any of them, would be willing to lend the same to me for copying.

Those particularly required are:

George Baker .. .. .	1722-1809
Sir Gilbert Blane .. .. .	1749-1834
Edwin Lankester .. .. .	1814-1874
John Haygarth (of Chester) .. .. .	1740-1827
Thomas Percival (of Manchester) .. .. .	1740-1804
C. Turner Thackrah (of Leeds) .. .. .	Died 1851

Any portraits entrusted to me would be carefully copied and returned with the least possible delay.

I am, Sir, yours faithfully,

H. B. NEWHAM,  
Director of the Museum.

London School of Hygiene and Tropical Medicine,  
Keppel-street, (Gower-street), W.C.1, May 22nd.

#### TUBERCULOUS CERVICAL GLANDS

To the Editor of THE LANCET

SIR,—I am interested to notice that Mr. Vernon Thompson has again raised the question of the propriety of operating in cases of tuberculous cervical glands. This matter has concerned me for many years and I have satisfied myself that there are circumstances in which an operation is the most important event in the treatment of some cases, whereas in others it is only a subsidiary and occasional requirement.

The whole question turns on the portal of entry in any individual case. When this route is the nasopharynx, then the tuberculosis of the corresponding cervical glands is probably a first and localised result of such infection and in these circumstances, the focus having been dealt with, the glands are best removed by radical operation. If, on the other hand, the glands in the neck are merely an outlying part of an infection which owes its origin to a portal in the mediastinum or mesentery, then the most important requirement is the efficient treatment of the individual to raise the resistance against the focus to the highest possible pitch. Even in the latter group, there may be glands that require excision because they break down or are the seat of repeated periadenitis, or are so obvious as to be an eyesore.

I have tried to set these matters out in some sort of order in various communications, especially in a paper in the *Newcastle Medical Journal* for July, 1931. I find that many members of the profession are still without an understanding of a pathological basis which might be a guide to successful treatment.

I am, Sir, yours faithfully,

G. GREY TURNER,  
Professor of Surgery, British Postgraduate  
Medical School.

May 20th.



**SYNTROPAN IN SEA-SICKNESS***To the Editor of THE LANCET*

SIR,—I have just returned from a ten weeks' voyage to South America as ship's surgeon and before leaving was induced by Prof. Stanton Hicks's letter, published in *THE LANCET* of Jan. 25th last, to take with me a supply of a new sea-sickness preparation produced by the Hoffmann-La Roche Chemical Works Ltd. The preparation is said to contain an antispasmodic of an atropine-like nature (Syntropan) and a mild sedative (Sedormid), but I may say that it was with a certain amount of scepticism that I used it, having heard of so many vaunted cures for this very distressing ailment.

Anyway I tried it out on about a dozen cases and in all with success. It had an immediate effect in all cases and those who were travelling under the best conditions reacted, as one would expect, most satisfactorily. Two of the crew who were sleeping right aft and above the propellers were the slowest in being cured, but the passengers only required a tablet or two and were then all right again and, moreover, had no recurrence although the sea was very rough at times. Feeling a little squeamish myself one day, I thought I would try it on myself. Although not really sick, I was not at all well, took one tablet, and in twenty minutes all feeling of discomfort had gone. I had no after-effects, no dryness of the mouth, no mydriasis, no palpitation.

All those to whom I gave the drug agreed that they felt immediate relief. I can cordially recommend it to other ship's surgeons who will gain great kudos from their seasick patients and win their gratitude for being relieved of what is a most distressing and discomforting ailment.

I am, Sir, yours faithfully,

THOS. NORTH, M.D., F.R.C.S.I.

Chiltern-court, N.W., May 25th.

**FAMILY MEDICAL INSURANCE***To the Editor of THE LANCET*

SIR,—I would like to make some observations on your very kind review of my book "Family Medical Insurance." Your reviewer states that the crucial chapter embodying the scheme whereby the "F.M.I." scheme is to be effected is "specific in certain immaterial details, but vague in what seem to be essentials for its comprehension." I admit the absence of financial or administrative details, but there are no statistical data available upon which to quote figures even provisionally for such services as proposed, while administrative details await investigation and coöperation of existing institutions and bodies. As is stated in the foreword, this is not a cut-and-dried scheme and those associated with me seek criticism and help. The main concern is that the problems raised shall not be shelved.

It is stated that the "F.M.I." scheme accentuates "the modern tendency to uncoördinated and disintegrated specialism." The whole object of the scheme is to improve the general practitioner service by a complete coördination and use of the specialities, with a consequent improvement, it is maintained, of the general practitioner's economic problems. This coördination is to be through existing institutions: the proposed clinics, wherever they be, are not mainly treatment centres but rather special investigation centres and "clearing houses." The report of the Scottish Consultative Council in Medical and Allied Services, which your reviewer quotes,

expresses as far as it is cited exactly the "F.M.I." principles.

The statement that periodical examinations, as proposed under the scheme, would result in the general practitioner becoming "a sort of middleman whose services are tolerated only because of their value in emergency" is hardly fair as it is definitely stated that the findings of such examinations "will be embodied in a report to the practitioner." They will not be given to the patient, and the doctor is of course free to adopt within reason what attitude he likes to the report.

While thanking you for your constructive criticism may I appeal for interest and support to enable us to carry out the spade work necessary for obtaining statistical and other data, and for the formation of a representative body to keep these problems before both the professional and lay citizen?

I am, Sir, yours faithfully,

Harley-street, W., May 25th.

J. LACHLAN-COPE.

**INDUCTION OF PREMATURE LABOUR***To the Editor of THE LANCET*

SIR,—In your leading article last week (p. 1191) you write: "It will be recalled that Mr. J. H. Peel recently published in our columns an account of a hundred consecutive cases in which induction had been performed for disproportion in primigravida." Reference to your columns (April 25th, 1936) shows that only *sixty* of the hundred cases were primigravida. The children of these primigravida induced by bougies had a stillbirth-rate of 20·8 per cent., a result due, I think, in part to the small number of cases and in part to the use of forceps to deliver (in no less than 35·8 per cent.). Of 85 primigravida induced at University College Hospital 10 children died (11·7 per cent.). Large statistics show that the maternal mortality-rate of induction in these cases is about 0·2 per cent., the infant mortality-rate about 12 per cent. What is wanted is not "negative evidence" but positive evidence, furnished by large statistics, showing that "trial labour" with its consequential forceps, Cæsarean section, or craniotomy can give equally good or better results.

I am, Sir, yours faithfully,

HERBERT R. SPENCER.

Bickenhall Mansions, W., May 23rd.

**OBSERVATIONS ON PEPTIC ULCER***To the Editor of THE LANCET*

SIR,—Dr. D. T. Davies's Bradshaw lecture, published in your issues of March 7th and 14th, contains statements and views which I cannot fully accept. May I offer the following comments?

Twenty years ago, at the 1st medical clinic of the University of Budapest, the healing without operation of a peptic ulcer of the lesser curvature, perforating between the layers of the lesser omentum, was observed. The size of the ulcer shadow greatly diminished after routine dietetic treatment,<sup>1</sup> and this accidental observation led us to the idea that callous and penetrating ulcers of the lesser curvature—which at that time were considered to be amenable only to surgical therapy—might possibly be cured in a simpler way, by instituting a careful dietetic regimen before perforation occurred. We found at that time 326 cases of peptic ulcer among 3500 patients coming to the clinic complaining of gastric discomfort, and in 35 cases of callous and penetrating ulcers of the lesser curvature we were able to follow systematically the course of the illness and the size of the ulcer.

<sup>1</sup> Rosenthal, E.: Berlin. klin. Woch., 1916, No. 34.

In all of these a progressive decrease in the size of the ulcer shadow or (in nearly all) complete disappearance of the ulcer niche was noted. When the late Prof. Bálint and I reported our experience before the Royal Hungarian Medical Association in 1917 I laid stress on the fact that callous ulcers of the lesser curvature can be cured by conservative regimen. This first observation of mine has since been corroborated, and here I need only mention that Schindler has been able to demonstrate by gastroscopic examination that disappearance of the ulcer shadow, as observed on the X ray screen, is tantamount to healing of the ulcer. Though I published my above-mentioned observations, together with some others concerning the treatment of peptic ulcer, somewhat later—in Hungarian in 1918, whereas my German monograph<sup>2</sup> appeared in Berlin in 1920—there can be no doubt that Davies is mistaken if, as appears from his lecture, he credits Nicholas and Moncrieff,<sup>3</sup> in 1927, with the first description of disappearance of the ulcer shadow after conservative treatment. Our observations on 35 cases were soon followed by accounts of 4 cases by Hamburger<sup>4</sup> of Chicago, and of 6 cases by Oehnell<sup>5</sup> of Stockholm. In my opinion the only reliable criterion of the healing of an ulcer is the disappearance of the ulcer shadow on X ray examination: this will explain my having gone at some length into its historical side.

I agree with Davies in attributing an important rôle to nervous impulses in the genesis and chronicity of peptic ulcers. I must add, however, that on the other hand favourable influences may considerably promote the healing of ulcers by way of the nervous system. This fact I emphasised in a post-graduate lecture given a few years ago. The chief source of unfavourable nervous influences is occupational worry and strain, and therefore I have always insisted on the importance of bed rest in ulcer treatment; hospital care is much to be preferred. In this way proper treatment of the ulcer may be better carried out, and, in addition, removal of the patient from his home is likely to be an advantage rather than not. Of course, there have been cases in which I have been obliged to adopt ambulatory treatment, because the patient could not afford to stay in bed for 4-6 weeks at home, or, still less, in hospital. With ambulatory treatment, however, symptoms will improve much more slowly and there is also considerable delay in disappearance of the ulcer shadow. Therefore I cannot endorse ambulatory treatment of ulcers as suggested by some authors and also by Davies.

Finally I wish to add some remarks on the acidity values as presented by Davies. In the monograph mentioned I pointed out that a true picture of acidity values associated with peptic ulcer can be obtained only if the data are arranged in separate groups according to the various locations of ulcers. Survey of unspecified data is not at all instructive; but if the percentage of hyperacid and non-hyperacid (normacid, hypacid, and anacid) ulcers on the lesser curvature, in the prepyloric region, at the pylorus, and in the duodenum is examined, interesting data will be obtained. Thus duodenal and pyloric ulcers are often associated with hyperacidity (70 and 55 per cent. respectively), whereas with ulcers of the prepyloric region and of the lesser curvature increased

secretion is much less common (28 and 30 per cent. respectively). It will be observed, first, that the proportion of hyperacid cases varies with the site of the ulcer, a marked increase being observed towards the duodenum; and secondly—and not less important—that in a considerable number of ulcers there is normal, decreased, or deficient secretion of acid. These facts have caused me to abandon the inviting and almost traditional theory of ætiological relationship between hyperacidity and peptic ulcer. Cholelithiasis, too, is often associated with excessive acid values; but the coincidence of peptic ulcer and cholelithiasis is rare.

For the time being the problem of the causation of peptic ulcer is not completely understood. The importance of changes in the internal milieu, emphasised by Bálint and possibly supported by recent observations of Dodds, cannot be evaluated until further proof is available. Meanwhile, in order to promote unprejudiced development of our views, it seems best to consider that a strict ætiological relationship between hyperacidity and peptic ulcer has not been definitely established.

I am, Sir, yours faithfully,

Budapest, May 6th.

EUGENE ROSENTHAL.

### PUERPERAL SCARLET FEVER

To the Editor of THE LANCET

SIR,—The article by Drs. Burton and Weir in your issue of May 16th on the inter-relationships of streptococcal disease, and your leading article in the same issue, have led me to recall an experience of my own fifty years or more ago. The relations of scarlet fever and puerperal fever were then being hotly debated in the medical papers; some of the best known obstetricians in London took part in this discussion and, as was to be expected in such a difficult question, expressed widely different opinions.

At that time I was (unqualified) assistant in a practice in an agricultural district which consisted of five separate villages distant from each other about three miles. In the month of February I saw in one of these villages a severe case of scarlet fever; the medical officer of health failed to trace its origin, and there had been no case in the district for months. Within a week I took scarlet fever (I had attended scores of cases before) and the next day the young son of my principal was taken ill with a temperature of 105.2° F. followed by convulsions and died next day. He had no rash. My attack was mild, my rash was of the slightest, and I kept bed for only one day, and in two days more I went my rounds quite well without faucial or nasal discharge. Within a week I was sent at night to a case of confinement in an isolated village. The case was easy and normal and nothing was done to the patient. The following day (32 hours after confinement) the patient was very well, but the day after the husband came in haste on horseback to fetch me, when I found the woman with a temperature of 105.2° F., sore-throat, very dry strawberry tongue, and delirium. She died the next day. Two days afterwards three children in the same house came out with mild scarlet fever. The outbreak did not spread further.

This was perhaps the most tragic event in my long professional life, and it so impressed me that I have hardly referred to it since, except as a warning to my assistants. The causal connexion between scarlet fever and puerperal fever was indelibly imprinted on my mind.

I am, Sir, yours faithfully,

Ystalyfera, Swansea, May 20th.

W. J. LEWIS.

<sup>1</sup> Rosenthal, E.: Die Diagnose und Therapie der Geschwüre des Magens und Duodenums, Berlin, 1920.

<sup>2</sup> Nicholas, F. G., and Moncrieff, A. A.: Brit. Med. Jour., 1927, i, 999.

<sup>3</sup> Hamburger, W. W.: Amer. Jour. Med. Sci., 1918, p. 204.

<sup>4</sup> Oehnell, H.: Arch. f. Verdauungskrankh., 1918.

## TEST-MEALS IN THE DIAGNOSIS OF GASTRIC CANCER

To the Editor of THE LANCET

SIR,—Two articles in your issues of May 16th and 23rd reveal a striking difference of opinion about the value of test-meals in the diagnosis of gastric cancer. Sir James Walton (p. 1101) apparently regards test-meals as valuable aids to diagnosis. Prof. Anschütz (p. 1175) does not even mention them, but relies on a combination of radiology and the occult blood test. While no one would deny the importance of the latter, it does seem strange that one should expect to learn more about the stomach from the stools than from the gastric contents.

Having recently made a statistical inquiry into this very subject (THE LANCET, 1934, ii., 471), may I suggest that the test-meal is of value in diagnosing gastric cancer, particularly in those cases exhibiting achlorhydria with a doubtful radiological picture. The point as I see it is briefly this: Achlorhydria by itself means little, for it will be found in from 10 to 25 per cent. of normal persons in the cancer age-period, but *achlorhydria plus gastric deformity of any type* is extremely suggestive of carcinoma. This is because only about 2 per cent. of benign ulcers have achlorhydria—even less if histamine is used—while the incidence of achlorhydria in carcinoma of the stomach is about 70 per cent. The well-known changes in the resting juice must also be mentioned, although they are perhaps rarely an early manifestation of malignant disease.

I feel that these considerations indicate sufficiently

the diagnostic value of the test-meal in all cases where the stomach is abnormal radiologically. Even a "simple" gastric ulcer crater should be viewed with suspicion if associated with achlorhydria.

I am, Sir, yours faithfully,

N. F. MACLAGAN.

Westminster Hospital, S.W., May 26th.

## THE BIOCHEMICAL LESION

To the Editor of THE LANCET

SIR,—The lecture by Prof. Peters in your last issue is important to students of nervous pathology. He shows very clearly that serious organic changes will result from a biochemical lesion; that, to quote his words, "the absence of an important factor in the development of energy from carbohydrates would be sufficient to stop the normal functioning of some groups of nerve-cells. Those which normally had most work to do might be expected to run out of their supply of the catalyst B<sub>1</sub> sooner than others." Replace this catalyst by some enzyme necessary to normal tissue oxidations, and of which there is a certain deficiency in an individual, and the result will be such changes as are met with in the psychoses, especially if any extra strain is thrown on certain cell groups from which the greatest energy is required. In the treatment of such conditions what the nerve-cell needs above all is rest and freedom from fussy interference.

I am, Sir, yours faithfully,

B. H. SHAW,

Medical Superintendent, Staffordshire  
Mental Hospital.

May 25th.

## PANEL AND CONTRACT PRACTICE

### Public Medical Services

THE Essex public medical service, which was founded in 1923 to provide medical attendance on the families of insured persons on a contract basis, has issued its twelfth report. At the end of 1935, after deducting cancellations, there were 16,534 books on which payments were being made, an increase of 1668 over the previous year. These books represent 15,231 adults and 13,725 children, treatment for whom is provided by 263 active and 82 honorary members. The largest totals collected for individual practices were: metropolitan £364, urban £1250, semi-rural £377, and rural £510. The appliances fund gave help in 62 cases, 35 of which were surgical belts, trusses, &c., and the remainder elastic stockings and bandages, special drugs, ambulance charges, doctors' bills, nursing, and massage. On the year's working there is a balance of income over expenditure of £540. Collections totalled £21,207, some £2000 in excess of the previous year, payments to doctors were £16,075, and a sum of £5126 was transferred to office account. The collections would have shown an even better figure but for bad weather and illness among the collectors at the end of December.

A similar service in and around Brighton covers Hove, Portslade, and now Southwick. Its personnel is increasing—88 doctors as compared with 77 at the commencement of the year and 108 pharmacists as against 96. During the year 6489 persons joined the scheme, and accessions average a hundred a week. The participants are of all ages from a

few weeks old upwards; medical services have been provided under the scheme for 1015 children under ten years of age.

### Benefit Overpayments

The insurance doctor is often the detached friend to whom his insured patients bring their troubles for solution. The alleged non-payment, or underpayment, of sickness benefit is one of the commonest of these troubles and one of its causes may be overlooked by the practitioner when trying to suggest what has gone wrong. One does not often get too much change at a booking office, but it seems that too much sickness benefit is occasionally paid out, and the society concerned then has to do its best to get repayment from the insured person. Clearly it is better if possible to secure this, if necessary in instalments, while the member is well and earning wages, but, if he refuses, other means have to be adopted. The overpayment is a debt due from the member to the society which is entitled to take reasonable steps to recover. But the extent to which a society is entitled as of right to secure the repayment of benefit previously overpaid by withholding benefits which become due later is limited:

- (1) to a period within four years of the date on which the overpayment was made;
- (2) the deduction must not exceed one-fourth of the amount which would otherwise be payable; it may be claimed
- (3) from sickness or disablement benefit only, not from maternity benefit.

In certain cases the right to recover is not restricted

as above—e.g., when excess benefit has been paid in the following circumstances :

(a) an advance pending settlement of a compensation claim ;

(b) an advance to a disabled ex-Service man pending settlement of a claim to a maximum rate disability pension ;

(c) benefit overpaid to a married woman owing to her failure to notify the society of her marriage.

In the event of the insured person concerned in (a)

being a woman deduction may be made from maternity benefit payable from her own insurance, and the same applies to (c). The benefit rates for married women who continue to be employed are now different from those applying to their unmarried sisters. An overpayment made to a husband cannot however be deducted from maternity benefit payable from his insurance in respect of his wife's confinement ; for this benefit is the property of the wife.

## PUBLIC HEALTH

### London Maternity Services

IN a report to the hospitals and medical services committee of the L.C.C. just issued (London : P. S. King and Son. No. 3195. 1s.) Sir Frederick Menzies has much of interest to say about the 65,300 confinements which occurred in London in 1934. Rather more than a fifth of these women (13,250) were confined in L.C.C. hospitals, and of these 87 per cent. had received antenatal care at L.C.C. clinics and most of the remainder some supervision by doctors, midwives, or borough clinics. Practically all the 32,000 women attended by voluntary associations had received antenatal care as a condition of attendance. Ample opportunities for regular supervision are available in London through the borough clinics if not through the attendant with whom the woman books for her confinement, and this opportunity is evidently appreciated. The women attend as often as is asked and travel long distances if required. Lapsed cases are very few, and if a woman fails to receive antenatal care in London it is either (a) because she belongs to a small and recalcitrant class who think it is not worth while ; (b) because she is a multipara who is bound by household ties and has lost her fear of childbirth ; or (c) because she is a single girl deterred for obvious social reasons. Judged by the conditions considered adequate at L.C.C. clinics, the antenatal care provided by experienced midwives may seem inadequate, but it stands the test of success. It seems that certain institutions, such as the East End Maternity Hospital, which claim a low mortality-rate, particularly from toxæmia, had this low rate before routine antenatal care began.

There was little to criticise during the year in the conduct before admission of cases which died in L.C.C. hospitals. Five years ago, it is said, there were twelve deaths where grave criticism could be made of the persons responsible for the treatment provided before admission ; in 1934 there were only four such cases. An examination of the notes of the 458 women delivered in hospital who subsequently died and of a large number of others delivered before admission does not show a single case of gross error on the part of a midwife. In fact during the past three years no midwife has been referred by the L.C.C. to the C.M.B. on account of neglect or malpractice.

Lack of reasonable facilities is held to play little part in contributing to the maternal mortality-rate in London. The L.C.C. hospitals are open to all and refuse no patient either for antenatal care, confinement, abortion, or abnormal puerperium. It is the policy of the L.C.C. to make a maternity unit sufficiently large to have a highly skilled resident staff on duty for 24 hours of the 365 days in the year. Certain of the boroughs provide excellent domiciliary services for which there seems to be a diminishing demand. Moreover an ample supply of competent private midwives is available but, it is added, in

many cases under present conditions they cannot make an adequate living. The lack of facilities, says Sir Frederick, which seems of most practical importance in London as elsewhere, is that midwives are obliged to send for doctors, suggested by their patients, who may have no special experience in midwifery.

According to this report the preventability of maternal death and the allocation of its blame are by no means so certain and absolute as has been supposed. Insufficient attention has been paid to the fact that the deaths analysed came from districts with widely differing mortality-rates. The maternal mortality-rate, like all other rates in public health, will inevitably be much easier to reduce if above the average than if below the average. Of every two deaths in childbirth one has been regarded as avoidable ; it is, Sir Frederick thinks, perhaps nearer the truth to regard 6 to 8 out of 10 deaths in some areas as avoidable, in other areas only one or two.

An interesting paragraph suggests reasons for the fact that the maternal mortality-rate for the East End of London is and always has been lower than for the West End, especially as regards sepsis. This may be explained partly by the higher proportion of primiparæ and of illegitimate births in the western boroughs, partly by the much higher proportion of confinements in hospital in the eastern boroughs.

### INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 16TH, 1936

*Notifications.*—The following cases of infectious disease were notified during the week : Small-pox, 1 (Hove) ; scarlet fever, 2000 ; diphtheria, 904 ; enteric fever, 24 ; pneumonia (primary or influenza), 887 ; puerperal fever, 48 ; puerperal pyrexia, 121 ; cerebro-spinal fever, 19 ; acute poliomyelitis, 3 ; encephalitis lethargica, 4 ; dysentery, 12 ; ophthalmia neonatorum, 114. No case of cholera, plague, or typhus fever was notified during the week.

The case of small-pox notified from Hove was included among the four cases in East Sussex on which comment was made last week (p. 1209).

The number of cases in the Infectious Hospitals of the London County Council on May 22nd was 5626, which included : Scarlet fever, 1026 ; diphtheria, 814 ; measles, 2561 ; whooping-cough, 563 ; puerperal fever, 21 mothers (plus 14 babies) ; encephalitis lethargica, 284 ; poliomyelitis, 2. At St. Margaret's Hospital there were 22 babies (plus 12 mothers) with ophthalmia neonatorum.

*Deaths.*—In 122 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 61 (31) from measles, 8 (3) from scarlet fever, 23 (3) from whooping-cough, 28 (4) from diphtheria, 55 (16) from diarrhoea and enteritis under two years, and 42 (10) from influenza. The figures in parentheses are those for London itself.

Leeds reported 4 deaths from measles, Liverpool, Bristol, Gloucester, and Great Yarmouth each 2. Deaths from diphtheria were reported from 20 great towns, 3 from Manchester, no more than 2 from any other large town. Gateshead had 3 deaths from whooping-cough. The only fatal case of typhoid was at Lincoln.

The number of stillbirths notified during the week was 286 (corresponding to a rate of 40 per 1000 total births), including 45 in London.

## GENERAL MEDICAL COUNCIL

## PRESIDENT'S ADDRESS

IN opening the 143rd session on Tuesday last Sir Norman Walker began by speaking of the loss sustained by the Council through the death of Prof. Francis Dixon and Sir John Marnoch. The former had represented the University of Dublin since 1916 "and as the years went on became probably the best beloved of our members." His successor, Prof. J. W. Bigger, was the third son to follow a father on the Council (the others being Mr. Pridgin Teale and Sir Humphry Rolleston). Besides Dr. Bigger, the new representatives whom the President welcomed were Prof. David Campbell (Aberdeen University) and Prof. E. W. Hey Groves (Royal College of Surgeons of England).

After paying tribute to the work of the late Mr. Farquhar Macrae, inspector of examinations, and latterly as secretary of the new Medical Council of India, Sir Norman mentioned that Sir Robert Bolam's appointment at Durham brought the number of vice-chancellors at present on the Council to four, and then turned to the statistics of the profession.

"The number of medical students registered in England in 1935," he said, "was the second highest on record, 1363, 12 less than that of the peak year of 1919, and 269 more than last year. Scotland had five fewer at 719, and Ireland 11 fewer at 521. 1884 names were added to the Medical Register by registration in 1935. Deducting deaths and removals for other reasons, the net addition is 1057, 27 more than the average of the last 20 years, raising the total number of registered practitioners to 58,363, 867 more than last year."

The Medical Council of India, Sir Norman Walker continued, had applied for the recognition of the degrees of certain Indian universities. Up to 1920 the executive committee had accepted for registration the degrees and diplomas of the universities of Bombay, Calcutta, Lucknow (Allahabad), Madras, and the Punjab. In 1921, however, a questionnaire on the teaching of midwifery was addressed to these universities and the replies showed that this was not, save in Madras, of a standard which would be recognised for licensing bodies in this country. With

the object of finding a solution of an admittedly difficult question Sir Norman had accepted an invitation to proceed to India and to discuss the difficulties with the authorities there. In his report to the Secretary of State in 1922 he considered it possible for each of the universities to arrange that its regulations could be brought sufficiently into accordance with the resolutions and recommendations of the Council to enable the Council to continue to recognise its diplomas. He proposed that the services of Colonel R. A. Needham, deputy director-general of the Indian Medical Service, who accompanied him throughout his tour, should be accepted as those of inspector, and for four or five years Colonel Needham's careful and conscientious reports were the basis of the Council's continued recognition of the degrees. In 1926 Sir Norman again went to India to report on the progress that had been made, not only in the teaching of midwifery, but in regard to the subjects of medicine and surgery also, and found evidence of general improvement almost everywhere. In September, 1933, an Act was passed constituting a Medical Council of India, with a constitution on lines similar to that of the General Medical Council, and Mr. Farquhar Macrae became its first secretary.

"Now for the future: there are eight universities under the jurisdiction of the Medical Council of India which confer degrees—Andhra, Bombay, Calcutta, Lucknow, Madras, Patna, Punjab, and Rangoon. The reports of medical inspectors to the Indian Council on Bombay, Lucknow, and Patna were received just before the meeting of the executive committee in February, and that on Madras in March. These have been carefully considered by the executive committee, and they resolved yesterday that the degrees of M.B., B.S. granted by the universities of Bombay, Lucknow, and Madras (together with other qualifications granted by the universities of Bombay and Madras which were previously registrable) should again be recognised for registration if granted on or after Feb. 25th, 1930; and that the degrees of M.B., B.S. granted by the University of Patna should be recognised for registration if granted on or after May 11th, 1935."

The President announced that Wednesday and Thursday mornings would be devoted to discussion of the medical curriculum. The Council then proceeded to a consideration of penal cases.

## PARLIAMENTARY INTELLIGENCE

## MIDWIVES BILL IN COMMITTEE

ON May 21st and 26th the Midwives Bill was further considered by Standing Committee C. of the House of Commons.

## Midwives' Salaries

Discussion continued on the amendment moved by Mr. E. DUNN providing that the salary of midwives employed under the Bill should in no case be less than that of health visitors employed by the authority, or working in the same area.

Mr. G. GRIFFITHS said that the Minister of Health should not leave it to voluntary organisations to fix the salary of midwives. Such a course would be very dangerous. The Minister through the local authorities should decide that the minimum salary for midwives should be at least equal to that of the health visitors.

Mr. LYONS appealed to the Minister to give an assurance that in the circular which he proposed to send to local authorities on this subject he would lay down a satisfactory minimum salary for midwives so as to ensure the best working of the system.

Mr. LEACH said that the Minister had made it clear that he proposed to put in his circular to local authorities the statement that in his judgment the status of midwives should be regarded as akin to that of health visitors. If that were the case he might just as well put it in the Bill by accepting the amendment. Over and over again in that committee reference had been made to the low pay of midwives, but no figures had yet been produced. Dr. Moore had told a conference in 1929 that the average income of midwives practising in Huddersfield, 39 in all, was £58 2s. 6d.; he was satisfied that the figure had not risen since. The Maternal Mortality Committee had said that good midwifery could never be self-supporting in working-class areas.

Sir KINGSLEY WOOD said that the difference between himself and those who supported this amendment was the difference between democracy and autocracy. Midwives were as much the servants of local authorities as health visitors, and if they were to maintain proper democratic government in this country they must trust local authorities to fix the remuneration of their own servants. Broadly

speaking the local authorities had fixed the salaries of health visitors at a satisfactory figure—there might be some exceptions—and he trusted they would do the same for midwives. If in any case it was found that midwives were not properly paid the Minister had the final power in his hand of withholding the Government grant.

The amendment was negated by 23 votes to 15.

Mr. SILVERMAN moved an amendment providing that the proposals to be submitted to the Minister by local authorities should include the provision by the authority of sterilised maternity outfits in every case.—Sir KINGSLEY WOOD said that the local authorities already had power to provide such outfits.—The amendment was negated.

#### L.C.C. and Borough Councils

Mr. KEELING moved an amendment providing that the L.C.C. should not employ midwives in the area of any metropolitan borough council unless the L.C.C. satisfied the Minister that it was impracticable to make efficient arrangements with such borough council either directly or through a voluntary organisation. The committee had rejected an amendment on behalf of the non-county provincial boroughs, but the case of the London boroughs for running midwifery services of their own was far stronger. A great part of the Minister's argument against the provincial boroughs was that they were so small. Could the Minister justify the anomaly whereby Wimbledon with a population of 60,000 was to have its own midwives, whereas the adjoining metropolitan borough of Wandsworth with a population of 360,000 was to be handed over to the L.C.C.? Many of the London boroughs went far beyond the requirements of the Bill in providing gynaecologists and bacteriological services and there was proof of their efficiency in the fact that in both 1934 and 1935 the maternal mortality of London was little more than half what it was in the provinces. The L.C.C. had no experience of domiciliary work; it only dealt with cases in hospitals and other institutions. The borough councils were in a position to make arrangements with both the voluntary and municipal hospitals.

Sir KINGSLEY WOOD said he was afraid that if the amendment were carried it would make the difficulties of administration almost worse than if the borough councils were entrusted with all the duties under the Bill. The special position of London arose from the very large number of voluntary hospitals which had external midwifery services in the metropolitan area. In London there were 22 voluntary hospitals with external midwifery services and two of those hospitals actually served parts of seven boroughs and five others served parts of six boroughs. If the amendment were carried the L.C.C. would presumably have to make all the arrangements with the voluntary hospitals in London so far as the external midwifery work was concerned, and then the appointment of midwives was apparently to shift over to the borough councils. That would be a hopeless and impossible position.

Major HILLS said that the metropolitan boroughs had built up health services which were a model to the world. He pleaded for a unified service for the whole of health provided that the authority was large enough to give a substantial choice of midwives to the mother and had shown that it had the capacity to run a health service efficiently. He wanted to see more care given before and after the birth of the child. He could not see how the midwifery services in these boroughs were going to be made better by the L.C.C.

The amendment was negated by 32 votes to 5.

#### Financial Provision

Mr. LEACH moved an amendment providing that a midwife employed by an authority in pursuance of this Act should be entitled to travelling expenses incurred in the discharge of her duties in accordance with the scale approved by the authority.—Mr. SHAKESPEARE said that every local authority naturally provided travelling

expenses for all its servants and midwives would be included. He could give the hon. Member an assurance on that point.—Sir J. HASLAM said that he remembered the day when doctors generally went to their cases on bicycles. Now they nearly all had motor-cars and the result was that they arrived fresh and fit for their work. He thought it was desirable that midwives should also be encouraged to be fresh when they arrived at their cases.—The amendment was by leave withdrawn.

Mr. SHAKESPEARE secured agreement on an amendment giving power to the Minister to see that justice was done to old and infirm midwives by local authorities in respect of compensation for their practices.

Mr. FRANKEL raised the question of the grants to local authorities for midwifery services, and suggested that under the provisions of the Bill many authorities would be forced to go slow in the development of the work.—Mr. SHAKESPEARE said he thought that Mr. Frankel was unreasonably apprehensive. Local authorities were as keen as any member of the Government to see these services operating. When the Ministry of Health were negotiating with the local authorities the suggestion was made that they should block grant this service straight away, but the local authorities pointed out that they wanted a number of years to find out exactly what the service would cost before the service was stabilised in a block grant. Therefore it was arranged that for the third grant period—from April 1st, 1937, to March 31st, 1942—the grant should be an annual grant related to the new expenditure for each of the five years. He thought that the great bulk or all of the local authorities would be able within five years to get an efficient midwifery service running.

### HOUSE OF COMMONS

WEDNESDAY, MAY 20TH

#### Pit Refuse and Public Health

Mr. KENNEDY asked the Secretary of State for Scotland if he was aware of the complaints regarding the deposit of refuse from the Lochhead Pit, Fifeshire, into a passing stream causing what was regarded as a menace to public health in the neighbourhood of East Wemyss; and if steps could be taken to abate the nuisance.—Colonel COLVILLE, Under-Secretary of State for Scotland, replied: I am informed that no refuse is deposited in the Den Burn from Lochhead Pit but that pit water is discharged into the burn. The county medical officer of health is satisfied that no danger to health is involved, and as water in the condition in which it is raised from the mine is exempt from the operation of the Rivers Pollution Prevention Acts my right hon. friend is unable to intervene. I am informed that flooding from the stream has recently occurred at East Wemyss and this matter is at present under the local authority's consideration.

#### Female Labour in Mines

Mr. HEPWORTH asked the Minister of Labour which countries had not ratified the covenant adopted by the International Labour Conference, 1935, prohibiting the employment of female manual workers on underground work in mines; and whether any such work was permitted in any part of the British Empire.—Lieut.-Colonel MUIRHEAD, Parliamentary Secretary to the Ministry of Labour, replied: So far as I am aware, no country except Cuba has yet ratified the draft convention prohibiting the employment of women on underground work in mines of all kinds, but I would point out that the period allowed by the Treaty of Peace within which States must bring draft conventions before the competent authority for legislation or other action has not yet expired. The intention of H.M. Government to ratify this convention was notified to Parliament in a Command Paper (No. 5141) laid last March. With regard to the second part of the question, the employment of women underground in mines is prohibited in the United Kingdom. I am advised that in the large majority of the non-self-governing Colonial dependencies where mines exist such employment is prohibited by law, and that in the very few territories where no legislation to this effect has been enacted women are not so employed.



THURSDAY, MAY 21ST

**Inflammable Toys**

Mr. LEACH asked the Home Secretary if he was yet in a position to introduce legislation for the prevention of injury and death due to the numerous everyday articles, particularly toys, on sale made of celluloid or other highly inflammable substance, which were purchased mostly by a public ignorant of the danger incurred.—Sir JOHN SIMON replied: I am afraid that this is a matter which it would be most difficult to deal with by legislation.

**Vocational Training of Deaf Boys and Girls**

Sir WILLIAM JENKINS asked the President of the Board of Education if he would take steps to educate and train deaf boys and girls to some suitable vocation and make it compulsory upon education authorities to equip all adults in some industry.—Mr. OLIVER STANLEY replied: Vocational training is given in special schools for the deaf to children under 16, and five vocational courses for deaf students over 16 are recognised by the Board. I am not at present satisfied that a sufficient case exists for making it compulsory for local education authorities to provide such training for deaf adults.

**Public Assistance to Persons Over Sixty-Five**

Mr. HERBERT WILLIAMS asked the Minister of Health what proportion of the persons, other than dependants, in receipt of poor relief were over the age of 65.—Sir KINGSLEY WOOD replied: On Jan. 1st, 1936, the proportion of the total number of men and women in receipt of poor relief (excluding rate-aided patients in mental hospitals) who were over 65 years of age was 31 per cent. The figure for men and women, excluding dependent wives, is not available, but the corresponding proportion for men only was 34 per cent.

**Housing of Aged Persons**

Miss WARD asked the Minister of Health whether local authorities would qualify for subsidy under the Overcrowding Act by erecting special houses for old people and using the houses vacated by these persons for housing people for whom accommodation had to be provided as a result of the provisions of the Overcrowding Act.—Sir KINGSLEY WOOD replied: Exchequer subsidy would be available for houses built in the circumstances indicated by my hon. friend, if the conditions of the Act are otherwise satisfied. I referred to the desirability of building special houses for old people in a circular which I issued in October last.

MONDAY, MAY 25TH

**The Case of Mr. Bunner**

Mr. COCKS asked the Secretary of State for Foreign Affairs whether he could give the House any further information regarding the case of Mr. Bunner, the British subject who was arrested by the Italians at Dire Dawa.—Mr. EDEN replied: As my noble friend informed the House on Thursday last, as soon as press reports of Mr. Bunner's arrest reached London, a telegram was sent to His Majesty's Minister at Addis Ababa asking him to ascertain the facts. When on Saturday definite information reached me that Mr. Bunner was under arrest, H.M. Ambassador at Rome lost no time in taking up this case, on instructions from H.M. Government, with the Italian Government. I am happy to be able to state that I have now received a telegram from H.M. Consul at Harar stating that Mr. Bunner has now been freed, and that he was due to leave for the coast on the evening of May 23rd. I will circulate a detailed account of this case.

The following is the statement referred to: A telegram was sent by H.M. Consul at Harar to H.M. Minister at Addis Ababa on May 22nd and received in London from Sir Sidney Barton on May 24th. In this telegram H.M. Consul stated that Mr. Bunner was now free and was due to leave with the rest of the British ambulance by the next train, on May 23rd evening or Sunday morning. An order had been made for the value of the money seized to be returned to him in lira. Meanwhile, through the kind assistance of the French Consulate and the French doctors Renault and Martin, Mr. Bunner had started a series of antirabies injections with good serum, and

Dr. Empey, the head of the British ambulance, was being given a sufficient quantity of serum to complete the course. The sequence of events appeared to have been as follows: Mr. Bunner had been denounced by one, Gabre Christos, who was said to be of Turkish birth but Ethiopian by naturalisation, as Captain Rudolph Brunner, an Austrian formerly employed with the Ethiopian military forces in the Ogaden. This charge was supported by an Ethiopian boy, aged about 12, formerly a body servant to Vehip Pasha. In view of the above evidence, the Italian authorities interrogated Mr. Bunner during the evening of May 17th, and wishing to continue interrogation the following day, kept him in custody that night in a room which he described as an incinerator. Hearing that he might be shot before the Italian authorities discovered their mistake, he escaped during the night. This seemed to the Italian authorities to confirm his guilt. He was re-arrested on the evening of May 20th. When H.M. Consul saw him on the 21st he looked none the worse for his adventure. H.M. Consul secured his immediate release on his personal parole that he would produce him when required. He then joined the rest of the Ambulance, which had decided to remain until the affair was settled. This satisfactory outcome, which had been achieved by vigorous representations to the Italian authorities, was confirmed by telegram to Dire Dawas from General Fuizzi, commanding in Harar. Difficulties were accentuated by Mr. Bunner's ignorance of any language but English, the absence of his passport which had gone on to Jibuti, the military character of his rank and of the wording of the instructions found on him from his superiors in the Ambulance, and finally his attempted escape. Undoubtedly Mr. Bunner should not have been held under close arrest on the night of the 17th after H.M. Consul had once stood sponsor for him. But I understand that this was an act of inferior officials misled by statements of lying witnesses and by the production of the visiting card of Rudolph Brunner inscribed as Captain of the Ethiopian Army which Gabre Christos alleged Mr. Bunner had given him.

**Service Recruits and Physical Unfitness**

Mr. KENNEDY asked the Prime Minister the number of applicants for enlistment in the Army, Navy, and Air Force in England, Scotland, and Wales, respectively, who had been rejected on the ground of physical unfitness during the last 12 months; and how many of the intending recruits were unemployed at the date of their application for enlistment.—Mr. BALDWIN replied: The number of applicants from April 1st, 1935, to March 31st, 1936, who have been rejected on the grounds of physical unfitness are:—

			Army.		Navy.
England	..	..	18,765	....	18,212
Scotland	..	..	3,654	....	2,709
Wales ..	..	..	1,442	....	1,095
			23,861		22,016

Similar figures for the Royal Air Force are not available for the three countries separately, but the total number of such rejections was 8558, of whom 526 were examined in Belfast. As regards the last part of the question, I regret that the information is not available.

**Town and Country Planning**

Lieut.-Colonel MOORE asked the Minister of Health in what approximate percentage of cases in the last 12 months where an appeal was made to him under the Town and Country Planning Act, 1932, and the Town and Country Planning (General Interim Development) Order, 1933, a decision was given favourable to the local authority.—Sir KINGSLEY WOOD replied: The approximate percentage of interim development appeals dealt with during the 12 months ended April 30th, 1936, on which a decision was given favourable to the local authority was 34. In 49 per cent. agreement was reached between the parties or the appeals otherwise lapsed. In the remaining 17 per cent. the appeals were allowed.

**Small-pox**

Mr. LEACH asked the Minister of Health how many cases of small-pox had been discovered by the port

authorities of London, Liverpool, Bristol, and Cardiff on ships arriving at those ports during the last 20 years.—Sir KINGSLEY WOOD replied: The following are the Notifications of Small-pox in Port Sanitary Districts for the years 1916–35 inclusive:—

London .. ..	39	Bristol .. ..	2
Liverpool .. ..	30	Cardiff .. ..	4

TUESDAY, MAY 26TH

### Maternal Mortality in Scotland

Mr. MATHERS asked the Secretary of State for Scotland if he was now in a position to make a statement with regard to legislation to deal with the problem of maternal mortality in Scotland.—Sir GODFREY COLLINS replied: I hope that it will be possible during the present session to secure the passage into law of a Scottish Bill dealing with this subject.

### Influenza and the Common Cold

Mr. LEES-JONES asked the Secretary of State for War what experiments and/or investigations had been made on behalf of the War Office into the prevention and cure of the common cold and influenza within the last six years; and what success, if any, had attended them.—Mr. DUFF COOPER replied: Investigations have been undertaken in vaccine therapy and in prevention by extensive hygienic precautions, without, however, satisfactory evidence being obtained as to the efficacy of vaccines in relation to either influenza or the common cold. An inquiry now being conducted in collaboration with the Medical Research Council, however, gives hope of more promising results.

### Royal Army Medical Corps Deficiency

Mr. DAY asked the Secretary of State for War the deficiency in the authorised establishment of the Royal Army Medical Corps; and whether he could give the reason for this shortage.—Mr. DUFF COOPER replied: The deficiency is 60 officers and 309 other ranks. As regards officers, the shortage, which is being temporarily met by the employment of 38 temporary commissioned officers and a number of civilian medical practitioners, is a considerable improvement on the deficiency of 97 which existed when the present conditions of service came into operation two years ago, and I have every reason to hope that it will be made good at no distant date. The reason for the shortage must, of course, be a matter of opinion, but in the case of other ranks, it is accentuated by a recent increase of 169 in the establishment.

### Sale of "Prepared" Honey

Mr. PERKINS asked the Minister of Health whether he was aware that a commodity composed of a mixture of sugar and other ingredients, including a small proportion of honey, was being sold as honey; and whether he would take steps to protect the public from this deception.—Mr. SHAKESPEARE replied: My right hon. friend is aware that a substance which is not pure honey is sold under the name of "prepared honey" with a label indicating that it is a mixture. My right hon. friend has no power to take any action in the matter, but if the circumstances of the sale are such as to constitute an offence under the Food and Drugs (Adulteration) Act, the duty of enforcement rests on the local authorities, and it is also open to any person to take proceedings.

## MEDICAL NEWS

### University of Oxford

Dr. H. A. B. Whitlocke and Dr. A. S. MacNalty have been nominated for election to the board of the faculty of medicine in place of Dr. C. F. T. East and Dr. C. P. Symonds who are retiring.

### University of London

Mr. Arthur Wormald, D.Sc., senior lecturer in biochemistry in the University of Leeds, has been appointed to the university chair of biochemistry tenable at St. Bartholomew's Hospital medical college, and Dr. W. F. Harper, lecturer in anatomy in the University of Aberdeen, to the university readership in anatomy tenable at London Hospital medical college.

Dr. Wormald was born in 1900 and educated at Leeds Modern School and the University of Leeds, where he graduated B.Sc. in 1921, his studies being interrupted by seven months' war service in 1918. He went on to take his M.Sc. in 1924 and his D.Sc. in 1930, while acting as demonstrator in biochemistry at the University. In 1926 he was appointed to a lectureship and in 1933 became senior lecturer. In June, 1928, he was granted a year's leave of absence, while holding a Rockefeller medical fellowship, to study the chemistry of immunology at the Rockefeller Institute for Medical Research, New York. In 1930 he was sent out to Uganda by the Colonial Office and carried out biochemical and immunological studies on sleeping-sickness. Dr. Wormald has contributed many articles to biochemical and bacteriological journals.

Dr. Harper, who is 35 years of age, was educated at St. Andrews, where he studied first in the faculty of science, obtaining his B.Sc. degree with first-class honours in 1923. After three years spent in research as holder of a grant from the Department of Scientific and Industrial Research and as a Carnegie scholar, he took his Ph.D. degree. In 1930 he graduated as M.B. St. And., with honours, and was awarded the Rutherford gold medal. In the same year he was appointed assistant in the department of anatomy, and in 1931 lecturer in regional anatomy at University College, Dundee. After taking his M.D. with honours he moved in 1934 to Aberdeen to take up his present post. Among other subjects he has written on the vascularity of human cardiac valves and on Dupuytren's contraction in the thumb.

### University of Leeds

Dr. Albert Hemingway has been appointed to the chair of physiology and Mr. L. R. Braithwaite to the chair of surgery.

Dr. Hemingway graduated B.Sc. with first-class honours in physiology at the University of Leeds in 1922, and took his M.B. in 1925. He has held the posts of demonstrator in the department of physiology at King's College, and senior assistant at University College, London. In 1927 he was appointed to his present post of lecturer in experimental physiology at the

Welsh National School of Medicine, Cardiff. His published work is largely concerned with the kidney.

Mr. Braithwaite, who is at present clinical lecturer in surgery in the University, is a graduate of medicine of both Leeds and Manchester, and became a fellow of the Royal College of Surgeons of England in 1907. After qualification he held house appointments at the Leeds General Infirmary, to which he is now honorary surgeon. During the war he held a major's commission in the Royal Army Medical Corps. In 1923 he was Arris and Gale lecturer at the Royal College of Surgeons, and in 1933 he was elected a member of the council. He is the author of many papers on surgical subjects, especially on the pathology and surgery of the abdomen.

### Society of Apothecaries of London

At recent examinations the following candidates were successful:—

*Surgery.*—H. O. Dole, Univ. of Manch.; R. C. H. Ensor, Queens Univ., Belf., and Guy's Hosp.; C. J. Roberts, Westminster Hosp.; and J. K. Sargentson, Univ. of Camb. and St. Mary's Hosp.

*Medicine.*—H. Bentovim, Univ. of Manch.; N. Bickford, Univ. of Camb. and Middlesex Hosp.; and M. Q. H. Siddiki, Univ. of Leeds.

*Forensic Medicine.*—H. Bentovim, Univ. of Manch.; and M. Q. H. Siddiki, Univ. of Leeds.

*Midwifery.*—F. C. E. Diamond, Univ. of Durh.; L. W. La Chard, St. George's Hosp.; M. V. Matthew, Univ. of Manch.; and J. S. Wood, Univ. of Liverp.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery: H. Bentovim, H. O. Dole, R. C. H. Ensor, and M. Q. H. Siddiki.

### A Scholarship in Sociology

The council of Bedford College for Women will award next month on the recommendation of the Lady Huggins committee a scholarship of the value of £70 for one year for study or research in some branch of sociology. The scholarship is open to women holding a university degree, preference being given to graduates who have taken honours in philosophy, psychology, economics, or sociology. It would give opportunity for a recently qualified medical woman to spend a year studying some subject common to medicine and social science, such as hospital administration or health on a new housing estate. The successful candidate will be expected to enter upon her work in October, 1936. Applications must reach the principal of Bedford College, Regent's Park, London, N.W.1, by June 6th.

### National University of Ireland

At a meeting of the senate on May 21st it was decided that the hon. degree of D.Sc. should be conferred upon Dr. Simon Flexner, director of the Rockefeller Institute for Medical Research since its foundation.

### Manchester Medical Society

At the annual meeting of this society on May 6th, Mr. Garnett Wright was elected president for the coming year. Dr. L. A. Parry gave an address summarised on p. 1276.

### Research Scholarship in Tropical Medicine

The London School of Hygiene and Tropical Medicine invites applications for the Wandsworth scholarship which will be vacant from Oct. 1st. The scholar, who need not hold a medical qualification, will be required to devote his whole time to research in tropical medicine. Further information will be found in our advertisements columns.

### A Tribute to Dr. Morax

On May 15th, at the end of the annual congress of the Société Française d'Ophthalmologie, a portrait of the late Dr. Victor Morax was unveiled at the Lariboisière Hospital. Speeches were made in his honour by Dr. Magitot, Dr. Coutela, Dr. Coppez, and others. Mr. A. F. MacCallan represented the Ophthalmological Society of the United Kingdom.

### Medical Congress in Brussels

The Journées Médicales de Bruxelles will be held this year from June 20th to 24th under the presidency of Prof. Robert Danis. The opening address will be given by Dr. Maurice Bedel who will present a "petition to doctors in the name of the sick." The secretary of the congress is Dr. R. Beckers, 141, rue Belliard, Brussels.

### Research Defence Society

The annual general meeting of this society will be held at the London School of Hygiene, Keppel-street, W.C., on Tuesday, June 9th, at 3 p.m., when Sir Malcolm Watson will deliver the tenth Stephen Paget memorial lecture. His lecture will be entitled Manson, Ross, and Reed, Pioneers in Research on Tropical Diseases.

### Royal Infirmary, Edinburgh

Last week Lady Kinnaird, wife of the Lord High Commissioner, laid the foundation-stone of the new nurses' home at this hospital. The building is to be one of seven floors of fireproof construction. There are to be six stairways and four lifts, and gardens will be built on the roof. It will contain 278 bedrooms, each fitted with a wash-hand basin and built-in furniture. There will be one bath available for every five nurses, while shampoo rooms and pantries are to be arranged on each floor. A ward for sick nurses will accommodate 22 patients. The ground floor of the building is to be allocated entirely to recreation and sitting-rooms which, if necessary, can be converted into one room of 140 ft. in length for special functions.

### International Organisation against Trachoma

A meeting was held in Paris on May 11th during the annual congress of the French Ophthalmological Society, when an introductory address was given by the president of the organisation, Mr. A. F. MacCallan, and papers on the treatment of trachoma in children were read by him, Dr. Wibaut (Holland), and Dr. Zachert (Poland). In the discussion which followed Dr. Ragazzi and Prof. Baslini (Italy), Dr. Joseph Jitta (League of Nations), Dr. Aubaret (France), Dr. Nataf (Tunisia), and Dr. Marin Amat (Spain) took part. Later on the same day there was a combined meeting of this organisation with the International Association for the Prevention of Blindness under the presidency of Prof. de Lapersonne, when Prof. Terrien read a paper on the classification of conjunctivitis, Dr. R. P. Wilson gave an account of conjunctivitis in Egypt, and Mr. MacCallan reported on the relationship between conjunctivitis and trachoma. The reports of Dr. Park Lewis (U.S.A.) and of Mr. Bishop Harman (London) were circulated. Copies of proceedings may be had from the International Association at 66, Boulevard Saint-Michel, Paris, 6e.

The Spanish Government has conferred the decoration of Comendador de la Orden de la República upon Sir Henry Wellcome, F.R.S., founder of the Wellcome Research Institution, London.

### University College Hospital

The King has consented to become the patron of this hospital, which since its foundation in 1833 has always been under the patronage of the reigning sovereign.

### Liverpool School of Tropical Medicine

A four days' course of instruction in hygiene for non-medical people proceeding to the tropics will be held at the school from Tuesday, June 9th, to Friday, the 12th. Further particulars may be had from the laboratory secretary at the school.

### Institute of Medical Psychology

An intensive short course, open only to registered medical practitioners, will be held in the evenings and on Saturday afternoons from June 15th to 27th at this institute. The lecturers will be Dr. Emanuel Miller, Dr. J. A. Hadfield, Dr. H. Crichton-Miller, Dr. H. V. Dicks, Dr. Laura Hutton, and Dr. William Nunan. The course is intended for those with some knowledge of elementary principles. Further information may be had from the educational secretary at the institute, Malet-place, W.C.1.

### Royal Edinburgh Hospital for Sick Children

The annual report of this hospital shows that its work is still increasing. During 1935 3144 cases were treated in the wards and there were nearly 28,000 attendances at the out-patient department. There was also a considerable increase in the work carried out in the urological, radiological, massage, and sunlight departments. The ordinary expenditure for the year was £19,437, which was less than the ordinary income by £4590. Legacies and donations received during the year amounted to over £21,000.

### Hospital Study Tour in Czechoslovakia

A tour has been organised by the International Hospital Association and the Association of Czechoslovakian Hospitals, from August 29th to Sept 15th, for those connected with hospital work and organisation. Among the towns to be visited are Carlsbad, Prague, Zlin, Brunn, and Moravská Ostrava. Visits will be paid to the Government Health Institute in Prague, the Masaryk Home in Kre, the Bata Hospital and Social Welfare Institution in Zlin, the tuberculosis department of the Municipal Hospital at Bulovka, and the sanatoriums of the high Tatra mountains. Further particulars may be obtained from the Czechoslovak Travel Bureau (Cedok), Ltd., 21, Regent-street, London, S.W.1.

### Canadian Rheumatic Disease Association

An association with this name has been formed to study and control rheumatic diseases in Canada. It is a branch of the Ligue Internationale contre le Rheumatisme, and will cooperate with the Canadian Medical Association. At the inaugural meeting Dr. J. C. Meakins (Montreal) was elected hon. president, Dr. Almon A. Fletcher (Toronto) president, and Dr. W. S. Barnhart (Ottawa) secretary.

### Testimonial to Dr. R. D. Clarkson

On May 22nd Dr. R. D. Clarkson, who has retired from the office of medical superintendent of the Royal Scottish National Institution, Larbert, was entertained to dinner in the Caledonian Hotel, Edinburgh. The Earl of Marr and Kellie, in proposing Dr. Clarkson's health, spoke of his record of strenuous, anxious, and successful work over 41 years. Dr. Clarkson, in replying, referred to the change since 1894 when interest in mental deficiency was confined to a very small number of religious and philanthropic people. Prof. D. K. Henderson said that the Institution had great traditions and had created confidence. It had become something bigger than an institution: it was a community with an organised society of doctors, nurses, teachers, and tradespeople all doing what they possibly could for the welfare of those in their charge.

A presentation was made to Dr. and Mrs. Clarkson in recognition of their service.

### Australian and New Zealand Association for the Advancement of Science

A meeting of this association is to be held in Auckland, New Zealand, from Jan. 12th to 19th, 1937. Medical men who are likely to attend this meeting, and who wish to present papers to the section of medical science and national health, are asked to communicate with the sectional secretary, Dr. J. Egerton Caughey, 3, Alfred-street, Auckland, N.Z., at their earliest convenience.

### Brazilian Society of Orthopædic Surgery

The first of the annual congresses that the new Sociedade Brasileira de Orthopedia e Traumatologia intends to promote will be held in Sao Paulo, Brazil, at the beginning of June. Prof. Rezende Puech will preside, and Prof. Vittorio Putti will attend at the special invitation of the society. Subsequent congresses will take place in the different capitals of the Brazilian States.

### Demonstrations of Contraceptive Technique

On Thursday, June 4th, at 2.30 p.m., at the clinic (106, Whitfield-street, W.) a practical demonstration of the technique of the use of a variety of contraceptive methods will be given by Mrs. Marie Stopes, D.Sc., and Dr. Evelyn Fisher. Application for tickets from medical practitioners and senior students should be made to the hon. secretary at the clinic.

### Excursions to Russia

Dr. Stella Churchill is forming a party to visit Russia, leaving London on June 27th. The journey will be made by sea between London Bridge and Leningrad and arrangements will be made to visit in that city and in Moscow special centres of social and medical interest. In Leningrad the party will have an opportunity of inspecting the Pavlov, Yaffa, and Semenov Institutes, the Metchnikov Hospital, radiological and optical institutes, and creches with their playgrounds. In Moscow attention is drawn to the visits to be made to the abortion and birth control clinic, the institutes of nutrition, tropical research, and, especially, of genetics. Houses of correction, rest homes, and workers' clubs will also be open for inspection. The inclusive price to tourists of all necessary requirements from London back to London is set down at £36, though optional extensions at approximately £1 15s. per day can be arranged if notice is given before departure. Further particulars can be obtained from the Wayfarers Travel Agency Ltd., 33, Gordon-square, London, W.C.1.

A letter on p. 1261 announces arrangements made through the Society for Cultural Relations with Soviet Russia, 3, Bedford-place, London, W.C.1, for a study by medical men of Russian health services. The S.C.R. party starts a week earlier, but for most of the time the visits will be simultaneous.

### Association of Industrial Medical Officers

The fourth meeting of this association was held in Birmingham at the end of last week. After the business meeting on May 22nd a paper on Labour Management and Medical Service, read by Dr. H. B. Trumper, a regional medical officer, I.C.I., was discussed by Prof. M. Culpin and Mr. R. Lloyd Roberts, chief labour officer, I.C.I., present as a guest. The importance of the industrial medical officer being in close contact with works management was emphasised. In the evening the association was entertained to dinner in the Midland Hotel by the directors of Imperial Chemical Industries Ltd., with Mr. J. Rogers in the chair. Amongst the guests were Dr. Stanley Barnes (dean of the Faculty of Medicine), Dr. M. W. Paterson, (hon. sec. of the Association of Certifying Factory Surgeons), Dr. E. R. A. Merewether (H.M. Medical Inspector of Factories), and Dr. Clyde McKenzie. The toast of "The Association" given by the chairman was replied to by Dr. N. Howard Mummery (J. Lyons and Co.) and Dr. L. P. Lockhart (Boots Pure Drug Co.). On May 23rd at I.C.I. Metals Limited, Witton, a discussion on the Treatment of Industrial Injuries was opened by Dr. Donald Stewart (I.C.I.) and Dr. Margaret Hossell (Rowntree's). Members of the association had the opportunity of seeing in detail much of the non-ferrous metal industry, the potential risks of injury, and the measures taken to safeguard health and welfare.

### Royal Society of Tropical Medicine and Hygiene

The King has consented to become a patron of this society.

### Orthopædic Clinics in Cornwall

The work of orthopædic clinics in this county is greatly on the increase. Six years ago only 90 cases were under treatment during a year; in 1935 the total was 1148, and 32 beds instead of 14 are to be reserved for this work at the Royal Cornwall Infirmary.

### Society for Relief of Widows and Orphans of Medical Men

The annual general meeting of this society was held in London on May 20th with the president, Mr. V. Warren Low, in the chair. During the past year £4914 was distributed in grants to the widows and orphans of members. The grant to widows over sixty-five years of age was £75 each; to those under sixty-five £65, and to orphans £50 each. In addition a Christmas present of £15 was made to each widow over seventy-five, £10 to each widow under that age, and £10 to each orphan. On the last day of 1935 there were 51 widows and 8 orphans in receipt of grants, which by the constitution of the society are made only to the necessitous widows and orphans of deceased members. Special grants are made to orphans over the age of sixteen, at which age the ordinary grants cease, to enable them to study for some business or professional career. In 1935 a sum of £194 was distributed with this object. During the year 6 widows in receipt of grants had died; 1 of these had been on the funds for 15 years and received in grants £1210. Her husband on election had paid a life-subscription of £21. The total membership of the society is now 263. Membership is open to any registered medical practitioner who, at the time of his election, is resident within a 20-mile radius of Charing Cross. Admitted under thirty-five years of age the annual subscription is two guineas. Full particulars from the secretary of the society at 11, Chandos-street, London, W.1.

## Births, Marriages, and Deaths

### BIRTHS

- BASSETT.—On May 21st, the wife of John Mories Bassett, M.D., F.R.C.S. Edin., of Cranley-gardens, London, S.W., of a son.
- CLEGG.—On May 24th, the wife of Hugh Clegg, M.R.C.P., of 27, Lawn-road, N.W.3, of a son.
- DAVISON.—On May 16th, to Grace Davison, M.B. Durh., the wife of Max Davison, M.B. Durh., of Dorking—a daughter.
- FOSSEL.—On May 22nd, to Attie (née Joekes), wife of Dr. Max Fossel, of Graz, Austria—a son.
- LEASK.—On May 14th, at Southampton, the wife of Dr. Norman H. Leask, of Southampton, of a son.
- MOODY.—On May 12th, at Ilford, the wife of Dr. J. Arthur Moody, of a son.
- SIMS.—On May 17th, at Exeter, the wife of Dr. Charles Sims, of a daughter.
- THOMSON.—On May 21st, the wife of Dr. Robert Thomson, of New Cavendish-street, W., of a son.

### MARRIAGES

- DAWE—TURNER.—On May 14th, at St. Andrew's Church, Bath, J. H. Dawe, M.B. Edin., of Bath, to Rosanna, youngest daughter of the late Edward Turner of Greenwich.
- SHUTTLEWORTH—CUSHING.—On May 9th, at Southwark Cathedral, Cyril William Thomas Shuttleworth, M.R.C.S., L.D.S., of New Eltham, to Yvonne Alicia Cushing, only daughter of Dr. and Mrs. Cushing of Bristol.

### DEATHS

- CAMPBELL.—On May 24th, at Walton-on-the-Hill, Tadworth, Surrey, Surgeon Lieut.-Col. William Campbell, late Grenadier Guards, aged 86.
- DIGBY.—On May 19th, at Felixstowe, William Everard Sherrard Digby, M.R.C.S. Eng., late West African Medical Service, and of Rushmere, Ipswich.
- HEWETSON.—On May 19th, at Birmingham, John Thomas Hewetson, M.D., F.R.C.S., in his 64th year.
- HUGHES.—On May 23rd, at Cookshill, Mundesley, Norfolk, Lieut.-Col. Thomas Arthur Hughes, M.D., Sc.D. Dub., F.R.C.P. Lond., I.M.S., aged 51.
- JEANS.—On May 25th, at a London nursing-home, Alfred Norman George Jeans, M.R.C.S. Eng., of Holmfild-court, Belsize-grove, N.W., son of the late Sir Alexander Jeans of Liverpool.
- MASON.—On May 17th, at 216, Braid-road, Edinburgh, Victor Harold Mason, M.C., M.B., Ch.B.
- WORTHINGTON.—On May 17th, at Birchington, Kent, Harry Edward Worthington, M.R.C.S. Eng., aged 69.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

## Appointments

BECCLE, L. F., M.B. Lond., has been appointed Coroner for Romford.  
 WALDRON, F. R., M.D. N.U.I., D.P.H., Medical Officer of Health for Greenwich.  
 WALKER, D. G., M.B., B.Dent.Sc., Hon. Assistant Dental Surgeon to the Royal Dental Hospital of London.  
 Certifying Surgeons under the Factory and Workshop Acts: Dr. J. D. CRERAR (Tutbury District, Staffs); Dr. H. D. LANDER (Burnham-on-Crouch District, Essex, formerly known as Southminster); Dr. G. R. BURNETT (Keswick District, Cumberland); and Dr. R. A. NEILL (Middlewich District, Cheshire).

## Vacancies

For further information refer to the advertisement columns

**Albert Dock Hospital, Connaught-road, E.**—Res. M.O. At rate of £110.  
**Ashton-under-Lyne District Infirmary.**—Res. Surg. O. and H.S. At rate of £200 and £150 respectively.  
**Aylesbury, Royal Buckinghamshire Hospital.**—Sen. Res. M.O. At rate of £200.  
**Barnsley, Beckett Hospital and Dispensary.**—H.P. £200.  
**Bath, Royal United Hospital.**—Hon. Asst. Gynecologist and Obstetrician.  
**Battersea General Hospital, S.W.**—H.P. and Cas. O. At rate of £120.  
**Boole General Hospital.**—H.S. or Cas. O. At rate of £150.  
**Bradford Royal Infirmary.**—H.P. At rate of £135.  
**Brighton, Borough Infectious Disease Hospital and Sanatorium.**—Sen. Res. M.O. £400.  
**Brighton, New Sussex Hospital for Women, Windlesham-road.**—H.S. £100.  
**Bristol, Brentry Colony for Male Mental Defectives, Westbury-on-Trym.**—Res. Med. Supt. £800.  
**Bristol Eye Hospital.**—Jun. H.S. At rate of £100.  
**Bristol Royal Infirmary.**—Medical and Surgical Registrars. Each £400. Also Sen. Res. M.O. £200.  
**Bristol, Southmead Municipal General Hospital.**—Jun. Asst. Res. M.O. At rate of £200.  
**British Postgraduate Medical School, Duane-road, W.**—First Asst. to Obstet. and Gyn. Dept. £300.  
**Burnley, Municipal General Hospital.**—Jun. Res. M.O. £150.  
**Cambridge, Addenbrooke's Hospital.**—Res. Anaesthetist and Emergency Officer. At rate of £130.  
**Cardiff, University College of South Wales and Monmouthshire.**—Lecturer in Experimental Physiology. £750.  
**City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.**—Surg. and Med. Regs. £225 and £175 respectively. Also H.P. At rate of £100. Also Asst. Radiologist.  
**City of London Maternity Hospital, City-road, E.C.**—Jun. Res. M.O. At rate of £80.  
**Connaught Hospital, Walthamstow, E.**—Dental Clin. Assts. 1 guinea per session.  
**Coventry and Warwickshire Hospital.**—Res. H.P. £160.  
**Derby, Derbyshire Royal Infirmary.**—H.S. £150.  
**Dreadnought Hospital, Greenwich, S.E.**—H.P. and H.S. Each at rate of £110.  
**Dunedin, N.Z., Otago Hospital.**—Radiotherapist. £800.  
**East Ham Memorial Hospital, Shrewsbury-road, E.**—H.S. to Spec. Depts. and Cas. O. At rate of £120. Also Hon. Ophth. Surgeon.  
**Eastern Dispensary, Leman-street, E.**—Physician.  
**Great Yarmouth General Hospital.**—H.S. £140.  
**Hammersmith Hospital, Duane-road, W.**—Asst. Radiologist. £700.  
**Hartlepool Hospital.**—Second H.S. At rate of £150.  
**Holt, Norfolk, Kelling Sanatorium.**—Second Asst. Res. M.O. £350.  
**Hospital for Sick Children, Great Ormond-street, W.C.**—Ophth. Surgeon. Also Res. Aural Reg. £150.  
**Hospital for Tropical Diseases, Gordon-street, W.C.**—H.P. At rate of £120.  
**Hull, Municipal Maternity Home and Infants' Hospital, Hedon-road.**—Sen. Res. M.O. £450.  
**Hull Royal Infirmary.**—H.S. to Ophth. and Ear, Nose, and Throat Dept. At rate of £150. Also H.S. to Sutton Branch Hospital. At rate of £160.  
**Ilford, King George Hospital.**—Res. Cas. O. and Surg. Reg., Res. Med. Reg. Each £150. Two Res. H.S.'s. Each £100. Also Hon. Asst. Dermatologist.  
**Ipswich, East Suffolk and Ipswich Hospital.**—H.S. £144.  
**Kettering and District General Hospital.**—Second Res. M.O. At rate of £125.  
**Kidderminster and District General Hospital.**—H.S. £150.  
**Leek, Cheddleton Mental Hospital.**—Asst. M.O. £600.  
**Leicester City Mental Hospital, Humberstone.**—Sen. Asst. M.O. £700. Also Third Asst. Res. M.O. £350.  
**Leyton Borough.**—Deputy M.O.H. and Deputy School M.O. £660.  
**Liverpool Port Sanitary Authority.**—Asst. Port M.O. £700.  
**Liverpool Royal Babies' Hospital.**—Res. M.O. At rate of £90.  
**Liverpool Sanatorium, Delamere Forest, Frodsham.**—Second Asst. to Med. Supt. £250.  
**Liverpool Stanley Hospital.**—H.S. At rate of £100.  
**Liverpool University.**—Supervisor of Dental Mechanics and Dental Prosthetics. £750.  
**Liverpool, Walton Hospital.**—Second Sen. Res. Obstet. and Gyn. Officer. £350.  
**Llanelli and District General and Eye Hospital.**—Res. Med. Supt. £300.

**London County Council.**—M.O. (Grade I.). £350. Asst. M.O.'s (Grade II.). Each £250. Also Temp. Dist. M.O. At rate of £235.  
**London Homoeopathic Hospital, Great Ormond-street, W.C.**—H.S. At rate of £100.  
**London School of Hygiene and Tropical Medicine, Keppel-street, W.C.**—Wandsworth Scholarship. £350.  
**Maidstone, West Kent General Hospital.**—H.S. £175.  
**Manchester, Ancoats Hospital.**—Combined H.S. (Aural) and H.P. post. At rate of £100.  
**Manchester, Christie Hospital and Holt Radium Institute, Withington.**—Res. Surg. O. At rate of £150.  
**Manchester, Crumpsall Hospital and Institution.**—Jun. Asst. M.O. At rate of £200.  
**Manchester, St. Mary's Hospitals.**—Four H.S.'s for Special Depts. Each at rate of £50.  
**Middlesbrough, North Riding Infirmary.**—Third H.S. At rate of £125.  
**Mildmay Mission Hospital, Austin-street, E.**—Asst. Cas. O. At rate of £125.  
**Monmouthshire County Council.**—Asst. M.O. £500.  
**National Hospital for Diseases of the Nervous System, Queen-square, W.C.**—Asst. Registrar. £200.  
**National Temperance Hospital, Hampstead-road, N.W.**—Res. M.O. At rate of £175. Also Cas. O. and H.S. At rate of £120 and £100 respectively.  
**Norwich, Norfolk Mental Hospital.**—Asst. M.O. £350.  
**Nottingham General Hospital.**—H.S. At rate of £150.  
**Oldham County Borough.**—Asst. M.O.H. and Asst. Tuberc. Officer. £750.  
**Oldham Royal Infirmary.**—H.S. At rate of £175.  
**Preston and County of Lancaster Royal Infirmary.**—Cas. H.S. £150.  
**Princess Elizabeth of York Hospital for Children, Shadwell, E.**—Cas. O., H.P., and H.S. Each at rate of £125.  
**Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.**—H.S. At rate of £100.  
**Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.**—Res. Anaesthetist. At rate of £100. Res. Anaesthetist and Dist. Res. M.O. At rate of £90. Also Asst. Res. M.O. At rate of £80.  
**Queen Mary's Hospital for the East End, E.**—Res. M.O. and two Cas. and Out-patients' Officers. Each at rate of £150. H.S.'s, H.P., Obstet. H.S., and Res. Anaesthetist and H.P. Each at rate of £120. Also Hon. Asst. Surgeon.  
**Queen's Hospital for Children, Hackney-road, E.**—Psychiatrist, Radium Beam Therapy Research, &c., 16, Riding House-street, W.—Asst. M.O. At rate of £250.  
**Reading, Royal Berkshire Hospital.**—Hon. Asst. Anaesthetist, Retford, Notts, Rampton State Institution for Mental Defectives.—Medical Officer. £515.  
**Rotherham County Borough.**—Asst. M.O. £300.  
**Royal Chest Hospital, City-road, E.C.**—Surgeon.  
**Royal Free Hospital, Gray's Inn-road, W.C.**—Res. Cas. O. and Res. Anaesthetist. At rate of £150 and £75 respectively. Also Children's Third H.S.  
**Royal Northern Hospital, Holloway, N.**—Hon. Radiologist.  
**St. Bartholomew's Hospital, E.C.**—Asst. Physician to Children's Dept. Also Asst. Surgeon.  
**St. John's Hospital, Lewisham, S.E.**—H.S. At rate of £100.  
**St. Mark's Hospital for Cancer, &c., City-road, E.C.**—H.S. At rate of £65.  
**St. Peter's Hospital for Stone, &c., Henrietta-street, W.C.**—Clin. Assts. to Hon. Staff.  
**Salford Royal Hospital.**—Res. Surg. O. £200. Also two H.S.'s. Each at rate of £125.  
**Salvation Army Mothers' Hospital, Lower Clapton-road, E.**—Hon. Obstet. Surgeon. Also Hon. Clin. Asst.  
**Shrewsbury, Royal Salop Infirmary.**—Res. Surg. O. £250.  
**Souhampton, Isolation Hospital and Sanatorium.**—Jun. Res. M.O. £200.  
**Southampton, Royal South Hants and Southampton Hospital.**—H.S. to Ear, Nose, and Throat Dept., and Res. Anaesthetist. At rate of £150.  
**South Eastern Hospital for Children, Sydenham, S.E.**—Jun. Res. M.O. At rate of £100.  
**Southend-on-Sea General Hospital.**—Med. Reg. and R.M.O. £300.  
**Southport General Infirmary.**—Sen. and Jun. H.S.'s. £200 and £150 respectively.  
**Taunton and Somerset Hospital.**—H.P. At rate of £100.  
**Truro, Royal Cornwall Infirmary.**—Hon. Surgeon.  
**University of London, King's College, Strand, W.C.**—Asst. Lecturer and Research Worker. £300.  
**Wadley Mental Hospital, near Sheffield.**—Sen. Asst. M.O. £650.  
**Wakefield Mental Hospital.**—Asst. M.O. £350.  
**West Ham County Borough.**—Asst. School M.O. £500.  
**West London Hospital, Hammersmith-road, W.**—Res. Asst. Surgeon. £200. Med. Reg. to Children's Dept. £100. Also two H.S.'s, H.P., and Res. Cas. O. Each at rate of £100.  
**Westminster Hospital, Broad Sanctuary, S.W.**—Two Radiologists.  
**Wolverhampton Royal Hospital.**—H.P. and H.S. At rate of £125 and £100 respectively.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Duns (Berwick), Presteign (Radnor), and Enfield (Middlesex).

**LEWES VICTORIA HOSPITAL.**—The nurses' home at this hospital, which has been erected at a cost of £4500, will shortly be ready for occupation. Six beds are to be added to each of the hospital's wards, and it is intended to provide more beds for paying patients. To complete this extension scheme a further sum of £3000 is needed.

## NOTES, COMMENTS, AND ABSTRACTS

## SOME PSYCHOLOGICAL FACTORS IN SICKNESS ABSENTEEISM \*

BY THOMAS M. LING, B.M. Oxon., M.R.C.P. Lond.  
MEDICAL OFFICER, JOSEPH LUCAS LTD., BIRMINGHAM

DURING the year 1934 the insured population of this country, approximately 14 million in number, lost roughly 28 million weeks in sickness, or an average of 14 days per person. Between 45 per cent. and 50 per cent. of these people were ill at one time or another during the year, and in some districts the proportion rises to 70 per cent. This loss falls in ever-widening circles on the individuals themselves, their families, society, and the industrial structure. During the same period the loss of time due to industrial disputes was only 10 per cent. of that due to sickness. The economic and moral loss eventuating to the nation from disputes is recognised by all thinking people, and the marked decline in these figures during the last decade may be regarded as a striking justification for the conciliatory steps that have been taken by all those concerned. If the far greater problem of sickness absenteeism is faced during the coming years with the same objective realism, there is no reason why results as valuable should not be obtained, but from the very nature of the problem, it is one where medicine must cooperate with the allied fields of sociology, economics, and psychology in a common effort. Quite apart from the urgency and perhaps the intangibility of the subject, the most striking feature is the reorientation demanded in our own viewpoints as practitioners of medicine. It is notorious that every age is one of change and it would seem that these changes are taking place around us at an ever-increasing speed. Modern industry, rationalisation, the aggregation of a large number of people earning their livings as members of a single unit, all bring in their trail new problems, with which we, as doctors, are intimately concerned. The relationship of people to their work, to the organisation by which they are employed, and to their associates in the organisation, whether above or below them, all play a highly significant part in the individual's mental contentment and his capacity to deal with "the slings and arrows of outrageous fortune," whether these be physical illness, domestic troubles, or the just reprimands of his superiors.

The great developments of public health have solved many of the pressing problems of physical disease that bore so heavily on the employed classes during the last century; typhoid fever, scurvy, and alcoholic cirrhosis are to-day clinical curiosities, thanks largely to improved education and the excellence of our various health services; tuberculosis has shown a most striking decline, due probably to improved nutrition and the various preventive measures that have been taken since Osler spoke of it so feelingly at the beginning of the century. Despite these improvements, for which our profession and the various lay organisations concerned can feel justifiable satisfaction, the sickness rates among the insured population are disquietingly high and the subject is now a major social problem pressing for solution.

Just as clinical diseases change, so must our viewpoint change to face the new situation that has arisen and evidence is rapidly accumulating to show that psychological factors are playing an increasingly prominent part and that no consideration of the subject is complete without an appreciation of the importance of this aspect.

## The Old and the New Viewpoint

The emphasis placed on morbid anatomy and detectable structural changes during the last 50 years

\* Paper read before the Association of Industrial Medical Officers at the London School of Hygiene and Tropical Medicine on March 27th, 1936.

has overshadowed the aggravating emotional disharmonies that always coexist in cases of frank "organic" illness and that in many cases may so alter visceral functioning that the patient is partly or completely incapacitated from taking his place in a gregarious community. This emphasis on terminal changes and the attempt to deduce from them a clear picture of the living patient has resulted in what may be termed a "nosographical" method of diagnosis. The objective in such an approach is to place the patient in one or another medical pigeon-hole. It consists, in other words, in the determination of a nosographical label, a label of one of the "diseases" to be applied to the patient; for example, duodenal ulcer or mitral stenosis or migraine. But the emphasis so placed on the organic and bacteriological method of diagnosis, which is still the predominant method utilised in contemporary medicine, has caused a serious misconception regarding disease and the methods to be used for its alleviation, especially among ambulatory patients. Those who see and appreciate only organic diseases, as a natural sequence, have divided individuals who seek advice for their health into those who are really ill—that is who show predominant morbid manifestations in an organ, or give evidence of a distinct infection with a particular micro-organism, and those who are not really ill—that is those in whom no organic manifestation and no infection can be found. These last individuals are classified as "functional" or "neurotic" and are in general dismissed either with smiling encouragement and the questionable piece of advice that there is really nothing the matter with them, or with an atmosphere of frank disapproval or contempt for not "pulling themselves together." Such an attitude is really indefensible from all points of view: a patient who feels ill is ill and is as worthy of all the help that we can give him, as the individual with the rare but dramatic disease manifesting itself as a tumour or an unusual association of cranial nerve palsies. To divide individuals into "organic" and "functional" must result in a form of therapeutic nihilism and it is only by considering and treating primarily the person's "dis-ease" and not the "disease" that we shall obtain the binocular vision required to see man as a whole.

It is perhaps insufficiently recognised that definite physical conditions can be brought about by a mental cause, although we all recognise that an emotion can make one feel very happy or make one depressed according to its implications. A persistent emotional disharmony can in addition cause headache, indigestion, and generalised autonomic spasm with all its attendant sequelae. Thus Cannon,<sup>1</sup> in speaking of emotions and bodily changes, tells a story of a woman patient who had to come up to a city from the country to have a test-meal done, and after spending the night at her hotel went along in the early morning to the pathologist. The meal was withdrawn, but with it was returned the majority of her previous evening's dinner, quite undigested. The explanation for this was that the lady's husband, having come up to town with her, had unfortunately gone out on an alcoholic party that night. The test was repeated the following morning under happier domestic circumstances and the results were perfectly normal. This is a well-marked example of a morbid process that is found in many people, and that plays an unexpectedly important part in this whole question of sickness absenteeism and its relation to the vegetative neuroses.

It is admittedly very difficult to modify our earlier teaching, which has stressed the fact that morbid anatomical changes must always precede changes of function, while in reality the reaction is a reversible one. Actually the deciding factor adopted by the disciple of the "mechanistic" or Virchow School for deciding whether the individual is suffering from



an "organic" or "functional" condition, is the instrument he happens to use to record the abnormality of the organ under observation. Just at present the instrument on which most reliance is placed is the microscope with a limit of magnification of about twelve hundred diameters. Suppose that to-morrow some physicist invents a microscope with a much greater magnification. At once abnormalities may be seen where none was visible previously. But why confine ourselves to the microscope? Certainly there are other ways of recording abnormalities of the human organism besides visual observation of fixed and sectioned tissues. For example, the spectroscopist may show us that a certain type of sugar is found in the urine of an athlete before a race. This is an observation which may be recorded photographically; it is a phenomenon which can be shown to occur regularly; by chemical methods the sugar may be estimated quantitatively. The average histopathologist, nevertheless, will maintain strenuously that there is no organic pathology in this anxious runner and that the disease is merely functional. What the pathologist really means is that after an autopsy on this athlete no lesion would be visible in stained sections of tissue with a microscope of the type in use in 1936. The impossibility of drawing a line between "organic" and "functional" is succinctly expressed by the German physician, Dr. Mohr<sup>2</sup> :—

"There is no such thing as a purely psychic illness or a purely physical one, but only a *living event* taking place in a living organism, which is itself alive only by virtue of the fact that in it psychic and somatic are united in an indissoluble unity."

#### Extent of the Psychoneuroses

This modern or Neo-Hippocratic approach has its immediate application to the problem of sickness absenteeism and its causative factors, as evidenced in the various reports published during the last few years by the Industrial Health Research Board. The attendant problems referred to in these publications throw into relief the complexity of the subject. What is a "normal" sickness rate? When does a person cease to be sick and become disabled? To what extent do local economic and sociological factors influence the situation? To all these questions, and to many more, the answers are as yet not clear; *inter alia* the policy of individual firms to their sick employees obviously plays a big part. If a company readily dismisses its sick workers, it will have an apparently low rate that will not be statistically comparable with those of a firm with a more developed social viewpoint. Despite all these variables, the predominant factors influencing the sickness rates are primarily emotional in origin. Thus in the twelfth annual report of the Board the following summary is given :—

"Although it has not been found possible as yet to isolate in particular cases the causative factors in sickness absenteeism, there is evidence to support the hypothesis that a high rate may be expected where the following occur: (1) rigidity of conditions; (2) routine work offering few prospects of promotion; (3) clerical as against productive or organising work; (4) badly selected departmental heads; (5) anomalies of payment."

As part of these investigations, Prof. Culpin and Dr. May Smith<sup>3</sup> interviewed over a thousand people of both sexes, in Government offices and commercial firms, factory operatives, people in administrative posts, and students, to ascertain the extent of nervous symptoms among the working population. The value of this investigation is obvious, as it is impossible to generalise about "sick" people until reliable information is available regarding our so-called normal population. Actually they found that some 30 per cent. of these workers showed varying degrees of psychoneurotic symptoms, while some 7 per cent. were in urgent need of suitable treatment for conditions that were crippling their effectiveness in the ordinary business of life. In addition, as they point out,

"there is a tendency for the nervous people to have more sick leave, not necessarily diagnosed as nervous."

The following quotation shows the main outlines of the interviewing technique used :—

"Information with regard to these various attitudes to life was sought from each subject in an interview lasting about 20 minutes. A rigid questionnaire was not used, for the variety of symptoms and their mode of expression is infinite. As the work progressed, however, a general scheme was evolved by which the subject was led through various hypothetical situations that would stimulate the symptoms most commonly encountered. If a subject talked easily he was allowed to follow his own path, questions being interpolated either when he had stopped or when some point required elucidation."

By the use of this method and by inquiring about the individual's reaction to his work, those in authority over him, and his reaction to himself, it was found possible to form a fair estimate of his personality and the degree of neurotic qualities that he showed. Of the 30 per cent. who manifested clinical evidence of neuroticism, the majority were anxiety states, while approximately 12 per cent. were predominantly of the obsessional type; by virtue of the fact that only those actually in a fit condition to be employed were interviewed, frank cases of conversion hysteria were not observed.

#### Manifestations of the Anxiety State

An anxiety state is generally regarded as a manifestation of underlying fear or worry, and is liable to occur when an individual is confronted with difficulties and is unable to meet them in an appropriate adult fashion. It is often fortuitous whether the predominant symptoms are cardiac, gastrointestinal, genito-urinary, or respiratory; further inquiry in such cases will always elicit evidence of generalised dysfunction, although the conscious disturbance may vary in different parts. As Cannon<sup>1</sup> has emphasised, the whole digestive process, which is under the influence of the sympathetic system, may be profoundly deranged by anxiety and distress, with the minor aspects of fear. The natural processes of the alimentary tract are fundamental to all other functions of the body and any disturbance of normal peristalsis, segmentalism, and secretion of the digestive fluids may have widespread ill-effects on the organism. The cardiac system, like the digestive system, is under the influence of the sympathetic nerves, but instead of being inhibited it is stimulated by them. The same sense of fear which stops digestion makes the heart beat more rapidly and raises the blood pressure by contracting the blood-vessels. In this connexion it is of interest that Sir Maurice Cassidy<sup>11</sup> has recently stated that 39 per cent. of the cardiac cases coming under his observation are essentially psychoneurotic in origin. This process of fear is essentially subconscious but the appearance of the physical manifestations permits the mind to neglect the distasteful situation that provoked the symptoms and to concentrate on the outward manifestations that are apparently evidences of underlying illness and, therefore, honourable. The process is strictly comparable to the development of shell-shock during the war among men who were unable to face the continued anxiety associated with the conflicting calls of duty and self-preservation.

Now difficulties are universal while neurotic reactions are fairly uncommon; individuals who fall into the latter category have, due to faulty emotional developments in their early years, acquired the habit of fleeing from their problems rather than of facing and solving them, so that when a particularly difficult situation arises "breakdown" occurs. It follows from this that the main difficulty may arise in any aspect of the individual's life—e.g., in his home, his social relationships, or in his occupation—although it is found in such cases that the adjustment to all these situations tends to rest on a false basis. Under modern economic conditions, with the development of large organisations and the associated likelihood

of personal anonymity, there is an increasing tendency to project the blame for personal disharmony on to the occupation and its concomitant associations, although in my experience the aggravating factors are to be found as often in the home as in the factory or office. It is perhaps not generally realised that physical conditions of employment, at any rate in the more prosperous industries, are improving every year in this country, and I feel that we, as members of this Association and representing the more progressive industries in the country, are entitled to claim some credit for these changes. On the other hand, the breakdown of family ties, the changes in religious influence, and the planless growth of anonymous "housing estates" all bring in their trail problems that throw increasing strain on the mental equanimity of our younger population.

#### Diagnosis of an Anxiety State

It follows from what has been said that a searching anamnesis is indicated which will consider in their true perspective social, occupational, and environmental relationships and the reaction of the individual to his life's situation. Thus inquiries regarding the individual's enjoyment of his work, his reaction to authority, his social contacts, and his reaction to noise, will in a comparatively short while bring to light valuable information for obtaining some insight into the patient's emotional patterns. Such questions cannot be asked pedagogically but are used rather to help him to express himself about significant matters. Elton Mayo,<sup>5</sup> who has recently carried out a most valuable investigation into sources of content and discontent in industrial life, has emphasised the way in which some individuals will pick on one particular problem and in their very insistence on the subject, show its significance in their minds. A complete and painstaking physical examination is as essential here as in all other aspects of medicine, and even when completely "negative" has a comparative therapeutic value as fears of various diseases are a common part of the anxiety state. As a rule the death of a relative from a particular disease will cause the patient to concentrate his attention on the "dis-ease" in the corresponding system in himself. In such cases, as Ross<sup>6</sup> points out, dogmatism is essential and permits of the sympathetic causation being explained to the patient as a necessary preliminary before the emotional factors are discussed.

These various factors are shown very clearly in the following case:—

A typist, aged 25, was seen on account of prolonged absence due to "dyspepsia." Family history negative and childhood free from gross disturbances apart from "night terrors" and somnambulism. In June, 1934, she was absent for two weeks on account of "abdominal rheumatism"; she returned for three days and then changed her doctor, who stated that she had a chronic appendicitis, for which an operation was performed. Microscopic examination of the appendix was negative. She started work again after eleven weeks' convalescence and continued for four months complaining frequently to her supervisor of "indigestion" and "heart burn." In March, 1935, she was absent for a week with "colitis" and again in September, 1935, with "gastritis." She was then seen by a consultant who said it was only "nerves" and she had got to pull herself together. She became much worse after trying to perform this impossible gymnastic feat and when seen in October she was living on peptonised milk and complained of a continued sense of fullness, constipation, nausea, headache, palpitation, and inability to concentrate. As a result of these various symptoms she was convinced that she must have either an ulcer or a new growth. Physical examination was completely negative, except for hyperæsthesia and tenderness over the appendix scar, and evidence of sympathetic over-action in the form of *tâche cérébrale* and dilated pupils. A complete anamnesis revealed the fact that she had been unofficially engaged for eighteen months to a young engineer with an invalid and somewhat possessive mother, but that the question of eventual marriage was

never referred to by his family. An explanation of the method of production of symptoms was given to the patient and the implications of the situation were discussed with the young man. Two days later the girl felt well enough to return to work, the engagement was "officially" recognised, and since that time the patient has not lost a single day, although she still gets occasional palpitation. In addition her supervisor states that she is now "a totally different girl and a really good worker again."

Such a case is essentially a problem in social medicine and illustrates very clearly the way in which anxiety over extrinsic matters, either conscious or subconscious, may manifest itself physically by generalised disturbance of all systems under the influence of the autonomic system. To deal with the somatic symptoms without investigating the causal psychic factors only tends to convince the patient that there must be some obscure disease to cause so much discomfort.

#### REFERENCES

1. Cannon, W. B.: *Bodily Changes in Pain, Hunger, Fear, and Rage*, Boston, p. 17.
2. Mohr, Fritz: *Klin. Woch.*, 1927, vi., 772.
3. Culpin, M., and Smith, M.: *The Nervous Temperament*, Report No. 61, Industrial Health Research Board, 1930.
4. Howe, E. G.: *Motives and Mechanisms of the Mind*, London, 1932.
5. Mayo, E.: *Human Problems of an Industrial Civilisation*, Philadelphia, 1932.
6. Ross, T. A.: *The Common Neuroses*, London, 1923, p. 69.

(To be concluded)

#### THE DOCTOR AS DETECTIVE

Dr. L. A. PARRY, of Brighton, took this title for an address delivered at the annual meeting of the Manchester Medical Society on May 6th. His theme was the value of medico-legal and scientific evidence in the detection of crime, especially major crime such as murder. As an example he referred to the Fox case where at the inquest a verdict of death from suffocation by smoke was returned. As the result of suspicions aroused by some remarkable insurance transactions, a further examination was made on the exhumed body of the murdered woman. It was found that there were no sooty particles in the larynx and no carbon monoxide in the blood, both of which should have been present if the cause of death had been suffocation. But there was evidence of death from strangulation. The doctor, acting as a detective, was the means of securing the conviction of a very brutal matricide.

The growth of toxicology was illustrated by three cases—the trials of Mary Blandy in 1752, of Dr. Smethurst in 1859, and of Dr. Crippen in 1910. In the first case, one of the earliest if not the first in which medical evidence was given in a poison trial, Dr. Addington testified to analysing some of the powder which had caused the death of Mr. Blandy, and finding arsenic. No examination of the viscera was made. In the Smethurst case it was pointed out that Dr. Swayne Taylor, the celebrated toxicologist, had at the police-court sworn he had found arsenic in a bottle from the house of the accused. Later he acknowledged the arsenic was contained in the copper gauze he had used for his test. In spite of this terrible blunder, Smethurst was convicted, but afterwards pardoned because of a united outcry of the medical and legal professions in London. In the Crippen case the medical evidence was immensely important, first as regards a mark on the piece of flesh found buried in Crippen's cellar, and secondly through analysis of the viscera found there. The prosecution called evidence that the mark on the piece of flesh was a scar, and as the woman Crippen was charged with murdering had a scar in an identical position, the significance of the mark was of vital importance. For the defence it was contended that the mark was not a scar but simply a fold in the skin, and in support of this claim evidence was given that in microscopic sections a few hair follicles and sebaceous glands were seen. The prosecution rebutted

this, and said that often a small fragment of epidermis was included in a scar, and this would account for the appearances noted. There was no doubt that the mark was a scar. In analysis of the viscera, Dr. Willcox had found a vegetable alkaloid which dilated the pupil. He could exclude cocaine, and that left only three other possibilities, atropine, hyoscyamine, and hyosine. By differential tests he proved it to be hyosine. Crippen had purchased five grains of this drug at a chemist's and could not account for its use. The defence claimed that Dr. Willcox had not proved he had found hyosine. The substance might be a cadaveric alkaloid produced by decomposition. Dr. Willcox said he had employed Vitali's test which differentiated between vegetable and cadaveric alkaloids, and this test was conclusive. A text-book by the doctor appearing for the defence was produced, in which he stated that he regarded Vitali's test as accurate. Why had he altered his opinion? He replied that he had looked further into the matter and had in connexion with this case come to the conclusion that his first view was wrong. This statement necessarily reduced the weight attached to his opinion. Crippen was found guilty and was hanged.

Dr. Parry also referred to the value of the evidence of the doctor in many other cases, such as those in which wounds and injuries of all kinds were inflicted, in workmen's compensation cases, and in the detection of blood stains. In conclusion, he contended that the scientific witness was at least keeping pace with the ingenuity of criminals, and was a potent factor in bringing home guilt to the offender.

#### DESIGN IN NEW BUILDING

THE Minister of Health recently received a deputation organised by the Royal Institute of British Architects on the employment of architects on public building works. The object of the deputation, which was introduced by Lord Crawford, was to request the Minister to bring his influence to bear on local authorities in order to ensure that the large and increasing amount of housing and other building work undertaken by local authorities should be designed and supervised by fully qualified architects.

Sir Raymond Unwin said they were putting forward no suggestion that architects should displace engineers, surveyors, or other men qualified for different branches of work when employed in their proper spheres; the architect was however specially trained in design and planning. In the work to which they were referring there was no conflict between use or efficiency and good appearance; just as in any written statement, there was no conflict between accuracy of fact or soundness of sense and clearness of charm, in the form of expression. The designer, or planner, saw both ends together, but sought to provide for useful purposes in a form which would be orderly, pleasing, or beautiful; all were inextricably bound together. There was in this country a great variety of local conditions, local building materials, and local treasures of ancient buildings erected according to them. This was a national possession, which neither individuals nor local authorities had any right needlessly to destroy. It could only be guarded by the employment of those who had given years of study to the problems of planning and design, which included the satisfying of all practical requirements in a manner that harmonised with the surroundings. They appealed to the Minister to use all the influence at his disposal to secure this end.

Lord Crawford reminded the Minister that in matters affecting the health of the community he always insisted that the best men available should be employed; it was, he said, becoming vitally important that only the best architectural skill obtainable should be utilised on matters of planning and design.

In reply, Sir Kingsley Wood said he fully recognised the desirability of employing professional architects over as wide a field as possible. He was

glad to say that local authorities were more and more employing architects and architectural assistants as permanent officers on their staffs. The architect was, in fact, more and more taking his proper place in combination with the engineer, the surveyor, the doctor, and the housing director in house building. The deputation could rely upon him to use his best offices to secure within the limits of local government good design and good planning. In a circular he was about to address to the local authorities in regard to rehousing for the abatement of overcrowding, he proposed to stress again the desirability of employing skilled architects for designing cottages in rural districts with a view to securing harmonious development. In default of employing an architect, the authorities would be invited to confer with the architect's department of the Ministry at the earliest stages.

#### NEW PREPARATIONS

"NEOKET" COMPOUND MANDELIC ACID GRANULES.—The successful use of mandelic acid in urinary infections depends on keeping the urine acid, and this can be done with ammonium chloride. The objection to ammonium chloride is that it often causes nausea, and in Neoket the Boots Pure Drug Co. Ltd. (Nottingham) replace it by sodium acid phosphate. Their preparation consists of pleasantly flavoured, effervescent granules sweetened with saccharin and containing mandelic acid and sodium acid phosphate, with enough sodium bicarbonate to neutralise the mandelic acid. According to the manufacturers it causes no alimentary upset, and usually makes the urine sterile in 8-10 days; but a little ammonium chloride sometimes has to be taken in addition during the first few days if sufficient acidity is not attained. The dose recommended for adults is two teaspoonfuls (45 grains) four times daily. Fluid intake is limited to a couple of pints a day, and mandelic acid treatment, it is emphasised, should not be given if renal function is impaired.

IMMUNE GLOBULIN (Human) is prepared by Lederle Laboratories, New York, for use as an alternative to "convalescent" or "adult" serum in the prevention, modification, and treatment of measles. They quote observations showing that extract derived from a placenta has the same protective power as the blood of the mother, and since their Immune Globulin extracts are obtained from about 600 placentas the antibody content should be uniform. For prevention of measles it is advised that at least 4 c.cm. should be given; for modification 2 c.cm. is to be injected as soon as a child is known to have been exposed to infection. The injections are intragluteal, and in a small proportion of cases give rise to mild local and febrile reactions. It is stated however that these are rarely produced by the improved preparation now marketed, which is obtainable in this country (in vials of 2 and 10 c.cm.) from Chas. F. Thackray Ltd., Gt. George-street, Leeds, 1.

LYSANTOL, a new fluid antiseptic made by Allen and Hanburys Ltd., London, E.2, is described as "non-corrosive, non-poisonous, and harmless to the skin," though much more powerful than carbolic acid. (Rideal-Walker coefficient, 4.) It has a pleasant smell, leaves no stain, and is miscible with water forming a translucent solution free from scum. It can be applied to wounds without dilution, but for cleansing cuts and abrasions, or for application to insect bites and stings, a tablespoonful in half a pint of water is recommended. In weaker mixtures it serves as a disinfectant appropriate to many surgical and domestic purposes.

A POCKET CAUSTIC HOLDER.—Johnson and Sons (Hendon Way, London, N.W.4) have devised a convenient method of carrying and applying silver nitrate pencils. The Argentic Caustic Holder resembles a small fountain pen; it is neat and compact, and is fitted with a pocket clip. The nitrate pencils

are supplied in glass tubes, each already mounted in a milled cap, which can be screwed into the holder, where it is firmly held until a refill is needed. They are ordinarily made according to the B.P. formula, but other types are also obtainable.

### SPOTLIGHT GOLF

MANY doctors play golf and some play extraordinarily well, though it is quite likely that those get no more amusement out of the sport than the less accomplished exponents. But for all golfers an invention which enables the game to be played indoors will have an interest, and remembering the encroachments upon the time of the medical practitioner, the new invention styled Spotlight Golf may have particular attraction. The invention consists of an electrical apparatus, the motor detector box, to which is attached the ball, while the striker takes up his position a few feet from a screen. The result of any stroke becomes revealed; it is possible to know whether the ball has been truly struck or not, a matter which in the normal game it is only easy to detect at the end of the flight. A record of all shots played with a full set of ordinary clubs is made. The face of the cabinet shows the picture of the hole which is to be played. The length of the shot is indicated along the side of the hole by means of an arrow travelling the number of yards marked which the ball would have reached if played on an actual golf course, and its position is shown within the limits of the fairway by means of a "spotlight"—one player being red and the other white. There are various key lights, and the player whose correct turn it is to play is shown by red or green at the foot of the cabinet. A shot played wide of the fairway is shown by a blue light which calls for another shot by that player. Should the ball finish in a bunker the depth in feet is indicated, and it is only by playing a sufficiently lofted shot that the ball can be properly played out; if this is not done the ball, indicated by a light, remains in the bunker and the player has to continue to play until out of the bunker and until he passes his opponent's ball. The shots being accurately recorded a true picture is obtained of an actual game as played on a natural course.

We congratulate the inventor, Mr. L. J. Simon, on a very ingenious apparatus which is made by the Electrical and Musical Industries, Ltd., 185, Regent-street, London. It seems that there might be a medical use for the invention in providing suitable patients with interesting indoor exercise.

### ILLICIT TRAFFIC IN DANGEROUS DRUGS

THE League of Nations Advisory Committee on Dangerous Drugs have recently had before them a report on illicit transactions and seizures during the first quarter of this year. Clandestine manufactories of narcotics have been discovered in Hong-Kong and Shanghai. In the international settlement in Shanghai it was found that 682 grammes of heroin had been manufactured in three days at a clandestine factory, and a complete laboratory equipment with chemicals was handed over to the Japanese consular police. One of the Chinese persons implicated was sentenced to six years' imprisonment.

Some 30 seizures of raw opium from China, Port Said, and some European and American ports were made; the largest consignment, which was confiscated and destroyed, amounting to 2418 kg., was at Wuhu, China. Prepared opium, mostly in small quantities in the Far East or in America, was reported as having been seized in 29 cases. Last year no less than 10,885 kg. of prepared opium and dross were reported to the secretariat of the League as having been seized. Of morphine ten seizures were reported in the first quarter of this year; the largest amounts were captured at Batavia, Manila, and at Portland, Oregon. Eighteen seizures of heroin were effected, the largest, amounting to more than 6 kg., being at Shanghai. Of cocaine there were sixteen seizures, the largest, of more than 12 kg., was at Prague on

the information of the Government of Czechoslovakia.

The Advisory Committee has been considering the practicability of adopting more drastic measures for the prevention of illicit traffic in dangerous drugs on ocean-going vessels; and the coöperation of seamen's unions for the same purpose was advocated. A report from the secretariat giving estimates of the number of addicts in various countries was withdrawn for further consideration.

**CORRIGENDUM.**—The method of describing hearing aids for the deaf is stated in the notice which appeared on our advertisement page 2 of May 23rd to be covered by British Patent No. 576986. The number should have been given as 376986.

## Medical Diary

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

### SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.  
WEDNESDAY, June 3rd.

*Surgery.* 3 P.M. Laboratory Meeting at the Buckton Browne Surgical Research Farm, Downe, Kent.

THURSDAY, FRIDAY, and SATURDAY.

*Laryngology and Otolaryngology.*

June 4th, 3.30 P.M. Cases and Specimens. 4.30–6 P.M. Discussion. 7–7.45 P.M. Pathological Demonstration by Col. Hamerton at the Zoological Gardens, Regent's Park, N.W.

June 5th, 10.30 A.M. Mr. I. A. Tumarkin: Facial Paralysis. Mr. G. H. Steele: Technique of the Ballance-Duel Operation for Facial Palsy (film). Dr. Douglas Guthrie and Mr. Gavin Livingstone: Intratympanic Medication with Special Reference to Thyroxine. 2.30 P.M. Mr. Andrew Campbell: Two Cases of Laryngostomy. Mr. A. Lowndes Yates: Invisible Scars in External Operation on Frontal and Ethmoidal Sinuses. Mr. V. S. Thacker-Neville: Radical Treatment of Peritonsillar Abscess. 5 P.M. Prof. G. Ohngren (Stockholm), Mr. E. Musgrave Woodman, and Mr. Norman Patterson: Malignant Disease of the Upper Jaw. (Cases and specimens at 4 P.M.)

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.  
THURSDAY, June 4th.—8.30 P.M. (Kensington Town Hall) Prof. William Wright: The Princes in the Tower. (Cavendish Lecture.)

**LECTURES, ADDRESSES, DEMONSTRATIONS, &c.**  
MEDICAL ASSOCIATION OF THE INTERNATIONAL CLINIC.

FRIDAY, June 5th.—5 P.M. (Wigmore Hall, Wigmore-street, W.), Prof. and Mme. Joliot-Curie: The Synthesis of New Radio-active Elements.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

WEDNESDAY, June 3rd.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).

THURSDAY.—2 P.M., Dr. Chassar Moir: Operative Obstetrics. 2.30 P.M., Sir Henry Gauvain: Surgical Tuberculosis. 3 P.M., Dr. R. A. Young: Non-tuberculous Pulmonary Diseases.

FRIDAY.—2.15 P.M., Dr. A. A. Davis: Gynaecological Pathology.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetrical and gynaecological clinics or operations.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.  
WEDNESDAY, June 3rd.—4 P.M., Visit to International Clinic, Sherwood Park, Tunbridge Wells.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, June 1st, to SUNDAY, June 7th.—MAUDSLEY HOSPITAL, Denmark Hill, S.E. Afternoon course in psychological medicine.—LONDON LOCK HOSPITAL, 91, Dean-street, W. Afternoon course in venereal diseases (open to non-members).—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. Sat. and Sun., course in general medicine.—Courses are open only to members of the fellowship.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

WEDNESDAY, June 3rd.—2 P.M., Dr. B. E. Schlesinger: Bilious Attacks and Cyclical Vomiting. 3 P.M., Dr. A. Signy: Foci of Infection in the Intestinal Tract.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

UNIVERSITY OF BIRMINGHAM.

FRIDAY, June 5th.—3.30 P.M. (Queen's Hospital), Dr. O. Brenner: Interrelations of the Heart and Lungs in Disease.

ANCOATS HOSPITAL, MANCHESTER.  
THURSDAY, June 4th.—4.15 P.M., Dr. W. J. S. Reid: Anxiety States.

# ADDRESSES AND ORIGINAL ARTICLES

## TREATMENT OF HUMAN PUERPERAL INFECTIONS, AND OF EXPERIMENTAL INFECTIONS IN MICE, WITH PRONTOSIL\*

BY LEONARD COLEBROOK, M.B., B.S. Lond.

MEMBER OF THE SCIENTIFIC STAFF, MEDICAL RESEARCH COUNCIL

MÉAVE KENNY, M.R.C.S. Eng., M.C.O.G.

RESIDENT MEDICAL OFFICER, ISOLATION BLOCK, QUEEN CHARLOTTE'S HOSPITAL, LONDON

AND THE MEMBERS OF THE

HONORARY STAFF OF QUEEN CHARLOTTE'S HOSPITAL

EARLY in 1935 a startling chemotherapeutic success was announced by Domagk<sup>1</sup> in Germany. Hæmolytic streptococci of human origin were injected into the peritoneum of 26 mice. An hour and a half later 12 of them received by stomach-tube a single dose of a dark red dye, the hydrochloride of 4'-sulphamido-2 : 4-diaminoazobenzol—which had been synthesised by Mietzsch and Klarer (see Hörlein<sup>2</sup>), and all survived, at any rate for seven days. (Their ultimate fate is not stated.) Of the remaining 14 animals which served as untreated controls 13 were dead of their streptococcal infection within three days, and the last 1 on the fourth day. It is of interest to note that some of the treated animals received only 0.02 mg. of the drug—i.e., at least 100 times less than the maximum tolerated dose. So far as we are aware this is the only animal experiment which has been reported from Germany. Domagk described the substance—which was named Prontosil—as showing an "elektive Wirkung" upon streptococcal sepsis but as having some action also on staphylococcal infections in the rabbit.

In France, Levaditi and Vaisman,<sup>3</sup> using a similar compound synthesised by Girard and working with a streptococcus "M" of human origin, obtained curative results in mice which were somewhat similar to those of Domagk but less completely successful. The treated animals did not as a rule survive indefinitely after a single dose of the drug but lived a few days longer than the controls. A little later Nitti and Bovet<sup>4</sup> showed that with hæmolytic streptococci of comparatively low mouse-virulence, freshly isolated from human infections, very little or no curative effect was obtained in mice, while with a strain of high mouse-virulence definite prolongation of life was obtained as in Levaditi and Vaisman's experiments. In their most recent paper Levaditi and Vaisman<sup>5</sup> have claimed that by the subcutaneous administration of a large dose (50 mg.) of prontosil in suspension, mice are frequently protected against a fatal dose of streptococcal culture injected 5-10 days later.

In addition to the reports of animal experiments, there have appeared about a dozen papers in Germany referring to the use of the drug in human infections—e.g., erysipelas, puerperal fever, and so forth (Schreus,<sup>6</sup> Anselm,<sup>7</sup> Schranz,<sup>8</sup> Scherber,<sup>9</sup> Fuge,<sup>10</sup> Kramer,<sup>11</sup> and others). These clinical reports are unanimously favourable, but their evidential value must be regarded as small since, in most cases, the recovery of patients is unhesitatingly ascribed to the treatment, and too

little allowance is made for the tendency to spontaneous cure of these infections. The bacteriological and clinical data supplied are nearly always very scanty—e.g., we are not told whether the cases were all infected by hæmolytic streptococci, whether those organisms were present in the blood before the treatment was commenced, nor in how many of the cases there was present any clinical condition, such as generalised peritonitis, which habitually connotes a very high mortality. The papers do serve, however, to indicate that the drug is well tolerated by the human subject and what dosage has given apparently good results.

### Laboratory Experiments

The following laboratory experiments and clinical trials have been carried out at Queen Charlotte's Hospital.

#### CURATIVE EXPERIMENTS ON MICE

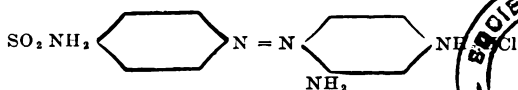
Trials were first made with strains of streptococci freshly isolated from human puerperal infections—i.e., after only two or three passages upon artificial nutrient media.

Mice were inoculated into the peritoneum with an amount of culture which preliminary experiments had shown to contain approximately 10-100 minimum lethal doses. A single dose of prontosil or the more soluble related compound (issued for a time under the name of Streptozon S) was given 1½ or 2 hours after, either by stomach-tube or by subcutaneous injection. In later experiments a series of doses was given—e.g., 1½, 5, 24, 48, 72 hours, and so forth after the injection of culture.

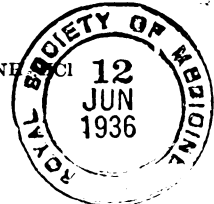
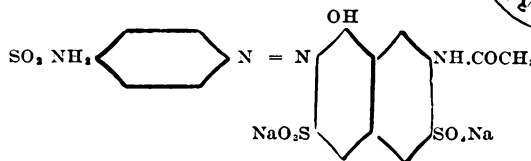
*Results.*—Although occasionally the treated animals survived a little longer than the untreated controls, there were practically no survivals, and the experiments were regarded as negative, failing to confirm Domagk's claim. Six different strains were employed in such tests.

It is important to note that Domagk's original paper refers to two quite distinct substances, both of which gave curative effects in infected mice. The one, prontosil, has the structural formula shown below (I) and is only slightly soluble in water (to 0.25 per cent.); the other, issued for a time under the name Streptozon S, but now as prontosil soluble, is the disodium salt of 4'-sulphamido-phenyl-2-azo-7-acetylamino-1-hydroxynaphthalene 3 disulphonic acid and is represented by the formula (II) below. This is soluble up to 4 per cent.

Formula I



Formula II



In our animal experiments we have used only prontosil soluble obtained from Germany, and the French equivalent of prontosil prepared by Girard. It is possible that the latter substance differed slightly from that used by Domagk in his published experiment. For the clinical trials reported in this paper both substances have been administered to every patient—prontosil by the mouth and prontosil soluble by injection—and both had been prepared in Germany.

\* A preliminary report to the Therapeutic Trials Committee of the Medical Research Council. 5884

TABLE I.—Curative Effect of Prontosil Solubile

	Deaths in each 24-hour period.									
	1	2	3	4	5	6	7	8	9	
4 mice were infected with 4000 streptococci ("Richards") intraperitoneally; and 1½ hours later received 7.5 mg. of prontosil soluble subcutaneously. Further doses were given after 1½ hours, 5 hours, and 1, 2, 3, 4, 6 days.	0	0	0	1	0	0	0	0	0	3 remained well and were killed on 60th day.
4 mice were infected as above; and received prontosil soluble (15 mg.) by stomach-tube 1½ hours later—and also the following day.	1	0	2	1	..	..	..	..	..	—
7 control mice (no prontosil).	1	3	..	..	..	..	..	..	..	—
{ 4 infected with 4000 streptococci (approx.) 3 infected with 400 streptococci .. ..	0	2	0	0	0	0	0	0	0	1 survived.

At this point we were informed by the courtesy of Dr. Buttle, of the Wellcome Physiological Research Laboratories, that he had obtained more success with a streptococcal strain "Williams" which we had formerly isolated from a puerperal fever case and sent to him. This strain differed from those we had previously employed in that it had been transmitted through a series of 23 mice and had acquired a very much higher virulence for those animals. Our next experiments were therefore carried out with a similar highly virulent passage strain "Richards" (a different serological type from "Williams"). With this strain we began at once to get striking curative results in mice, although the animals only survived indefinitely if a series of 6 or 7 doses was given over a period of several days. Typical results are given in Tables I. and II.

*Comment.*—The results shown in these tables—and others like them, not set out here—seem to indicate quite clearly that the administration of the drug does exert some curative effect upon infections by these hæmolytic streptococci in the mouse, which normally terminate in peritonitis and septicæmia. They can be checked in the majority of the animals if treatment is commenced within three hours of the injection of culture. If delayed much beyond that time the death of the animals may be postponed for a day or two but it is not usually avoided. It is of interest to note that one mouse survived after treatment although hæmolytic streptococci were already present in the circulating blood in considerable numbers (a small drop of blood from the tail gave colonies equivalent to 400 per c.cm.) before the drug was administered.

PROPHYLACTIC EXPERIMENTS ON MICE

Mice were injected subcutaneously with 50 mg. of prontosil (kindly supplied by Dr. Girard) in

aqueous suspension (10 per cent.)—and four days later were given a dose of streptococcal culture into the peritoneum. The mice showed no toxic effect of the drug at any time. The results are shown in Table III. It will be seen that whereas 9 out of 12 of the animals which did not receive the drug were dead within three days, only 2 of the 12 treated mice succumbed to streptococcal infection within that period. (Two died somewhat later.)

When the surviving animals were subsequently killed there was a large deposit of undissolved prontosil at the site of injection, and it seems probable that the prophylactic effect shown in the table was due to slow absorption from this depôt. The urine had an orange colour during the whole 26 days after the mice received the drug.

ANIMAL EXPERIMENTS WITH *p*-AMINO BENZENE-SULPHONAMIDE

In view of the discovery by Trefouel and his collaborators<sup>12</sup> (since confirmed by Goissedet and others<sup>13</sup>) that the diazo linkage in prontosil was not essential for its therapeutic efficacy in animals and that the parent sulphonamide (a colourless compound) was equally effective, we have carried out a few experiments with this latter compound kindly prepared for us by Dr. Harold King, F.R.S., of the National Institute for Medical Research.

The curative effect upon infections by the "Richards" strain is clearly shown in Table IV. No prophylactic effect was obtained when 40 to 50 mg. of the drug was given in aqueous suspension subcutaneously four days before the injection of culture. Probably this was due to absorption of the drug from the subcutaneous depôt more rapidly than in the case of prontosil.

TABLE II.—Curative Effect of Prontosil Solubile

	Deaths in each 24-hour period.										
	1	2	3	4	5	6	7	8	9	10	
8 mice were infected intraperitoneally with approx. 2160 streptococci ("Richards") and 1½ hours later received 7.5 mg. of prontosil soluble subcutaneously. Further doses were given after 5 hours, 20 hours, and 2, 3, 4, 6 days.	0	0	0	0	1	2	0	0	0	0	5 remained well and were killed on 42nd day.
6 mice were infected with streptococci as above; and received the first dose (7.5 mg.) of prontosil soluble 3 hours later. Further doses were given after 7½ hours, 24 hours, and 2, 3, 4, 6 days.	0	0	0	0	0	0	0	0	0	?	4 remained well and were killed on 42nd day.
6 control mice { 4 infected with 2160 streptococci (approx.) (no prontosil). { 2 infected with 216 streptococci (approx.)	2	0	1	0	0	0	0	0	0	0	1 survived.
	0	2	0	0	0	0	0	0	0	0	—



TABLE III.—*Prophylactic Effect of Prontosil*

	Deaths in each 24-hour period following infection.							
	1	2	3	4	5	6		
12 mice received 50 mg. prontosil subcutaneously.	6 were infected 4 days later with 396 streptococci ("Richards" strain) into peritoneum.	0	1	0	0	0	1	4 remained well and were killed on 22nd day after infection. (1 had a streptococcal abscess, the other 3 were normal and cultures sterile.) 1 died on 17th and 1 on 20th day. 3 remained well and were killed on 22nd day. (Cultures sterile.)
	6 were infected with 3960 streptococci (same strain).	0	1	0	0	0	0	
12 control mice (no prontosil).	6 were infected with 396 streptococci as above.	0	4	1	0	0	0	1 survived.
	6 infected with 3960 streptococci.	0	4	0	0	0	0	2 survived.

**Upon what Does the Antistreptococcal Influence of Prontosil Depend ?**

Although there can be no doubt as to the curative effects of the drug in mice its mode of action is at present obscure. The chief positive facts which emerge are that multiplication of the streptococci in the peritoneal cavity is prevented, and that this happens quickly—within a few hours. At present it appears very unlikely that the cocci are actually destroyed, either by the drug itself or by some compound formed from it in the animal body.

EXPERIMENTAL DATA

(1) Although the 2.5 per cent. solution used for treatment kills hæmolytic streptococci slowly (1-3 hours) it does not do so if diluted slightly with serum. A tenfold dilution in human serum just prevented multiplication of the cocci; a 1 in 50 dilution allowed multiplication of 57 cocci to 500,000—i.e., very much less than in control serum without prontosil.

(2) The serum of rabbits taken at intervals—e.g., ½ hour, 2 hours, 5 hours, and 24 hours after a large intravenous dose of prontosil soluble (8-10 c.cm.)—was unable to kill even a very small number of hæmolytic streptococci ("Richards" strain). These grew out as freely as in the serum taken before the drug was given.

(3) The serum of puerperal fever patients taken at intervals after doses also showed no bactericidal effect, but the outgrowth of the cocci in such sera was definitely less vigorous than in the serum taken before treatment. Example: 5 cocci of the strain isolated from Case 26 planted in her serum before treatment began grew out by the following day to 54 millions per c.cm. The same implant of cocci in serum taken one hour after the first intravenous dose (20 c.cm.) grew to 4 millions per c.cm. In serum taken two hours after the third dose (20 c.cm. intramuscular) they grew to 650,000 per c.cm. In serum taken on the third day of treatment—one hour after the fourth dose (20 c.cm. intramuscular)—they grew to 100,000 per c.cm. A similar restricted outgrowth was obtained with the sera of two other patients.

It may be noted that this growth-retarding influence of the patients' sera does not come into operation until after the first four hours of incubation.

Nor is there any evidence that administration of the drug promotes more active killing of the streptococci by the whole blood. This has been tested with the defibrinated blood of treated mice and rabbits—the streptococcal population in the bactericidal mixtures being sampled at different intervals—from 1 hour to 24 hours. On no occasion were we able to detect any killing of the "Richards" strain cocci and on several occasions the blood taken after treatment actually allowed more growth than that taken before.

Human leucocytes are but little affected by the drug. A concentration of about 1 in 10 of prontosil soluble, 2.5 per cent., in blood is necessary to diminish their bactericidal activity (as indicated by the killing of staphylococcus in slide cells); and we have failed to find satisfactory evidence that at any weaker concentrations their activity is enhanced.

The leucocyte count of patients and of animals under treatment has shown somewhat variable results.

In two patients out of three at the beginning of their treatment there occurred a rise after the first dose (5600 to 9300 in one; 15,700 to 20,000 in the other) and a subsequent fall towards the original level during the next two days. In the third patient there was a fall after the first dose (14,700 to 10,400) and the lower level was maintained. In two mice and one rabbit the count fell for some hours following relatively large doses (7.5 mg. and 250 mg. respectively).

Apart from the slight growth-retarding influence exhibited by the serum of treated cases there is therefore not much to suggest that either the blood fluids or the blood-cells play a predominant part in checking the invasion of the tissues by the streptococci. Nor have we been able to find any indication that the invasive character of the streptococcus is

TABLE IV.—*Curative Effect of p-Aminobenzenesulphonamide in Mice*

	Deaths in each 24-hour period.							
	1	2	3	4	5	6	7	
3 mice were infected intraperitoneally with 30,000 streptococci ("Richards"); and 3 hours later were given 5.25 mg. of sulphonamide subcutaneously. Further doses were given after 9 hours, 24 hours, and 2, 3, 4, 5 days.	0	0	0	0	0	0	0	1 died of streptococcal infection on 32nd day. The other 2 were killed on 35th day and showed no infection. (Cultures sterile.)
3 mice were infected with 30,000 streptococci and received 9 mg. of sulphonamide subcutaneously at intervals stated above.	0	0	0	0	0	0	0	All remained well for 34 days and were killed. (Cultures sterile.)
9 control mice (no sulphonamide).	3 infected with 30,000 streptococci ..	0	2	0	0	0	0	1 survived.
	2 " " 3,000 " ..	0	2	0	0	0	0	—
	2 " " 300 " ..	0	2	0	0	0	0	—
	2 " " 36 " ..	1	1	0	0	0	0	—

TABLE V.—Summary of 38 Cases Treated with Prontosil and Prontosil Solubile

No.	Age.	Pathological condition.	Blood culture.	Day of puerperium.	Prontosil, grammes.			Days of administration.	Result.	Remarks.
					By injection.	Orally.	Total.			
1	28	Local uterine infection with threatened spread to general peritoneum.	—	4th	6	20·4	26·4	12	R	Very ill, S.R.; T. 104°–106°, P. 140–150 for 24 hours; T. normal without further rise after 0·5 g. i.v. (8 c.cm. antitoxic serum also given).
2	29	„ „	—	6th	2	17·2	19·2	4	R	Very ill, S.R.; T. 104°–105°, P. 140–150 for 24 hours; T. normal without further rise on 4th day of treatment.
3	33	Septicæmia with threatened general peritonitis.	+ (a)	5th	3·75	18	21·75	10	R	Very ill, debilitated and anæmic; T. 103°–104° for 5 days. T. and P. normal without further rise, and blood culture negative after 4 days' treatment.
4	30	Local uterine infection.	—	3rd	5·25	25·2	30·45	14	R	Very ill, several rigors, delirium; T. 104°. T. and P. persistently normal after 24 hours.
5	35	„ „	—	4th	4	23·4	27·4	13	R	Very ill, debilitated and anæmic after severe p.p.h.; P. 130–140 for 24 hours, T. over 104°. T. persistently normal after 3 days' treatment.
6	36	Septic endometritis, pelvic cellulitis, and tonsillitis.	—	8th	2·5	17·4	19·9	10	R	Very ill, debilitated, delirious. After admission condition grew worse for 3 days before prontosil. Spectacular improvement, cellulitic mass resolved rapidly.
7	40	Septic endometritis with extensive infected lacerations.*	—	6th	2·5	7·2	9·7	4	R	Condition fair on admission, became steadily worse; T. over 104°. After 1st dose prontosil T. fell rapidly and general condition remarkably improved.
8	40	Septicæmia with pulmonary emboli and multiple metastases.	+	11th	6·25	24·6	30·85	11	R	Very ill. General condition improved steadily; blood cultures negative on 3rd day of treatment. Metastatic abscesses resolved rapidly.
9	30	Pelvic peritonitis threatening to generalise.	—	6th	4·25	18	22·25	10	R	Very ill; T. 103°–104°, P. 120–130 for 48 hours. T. persistently normal after 24 hours' treatment. Threat of general peritonitis rapidly abated.
10	34	General peritonitis.	—	7th	21	23·4	44·4	13	R	Desperately ill. After massive doses of prontosil signs of peritonitis rapidly abated. A very striking result.
11	24	Acute septic endometritis with extensive infected lacerations.	—	4th	5·5	21·6	27·1	12	R	Severe case, drowsy and toxic, S.R. T. and P. fell in 24 hours, but general improvement flagged.
12	29	Pelvic cellulitis, threatened general peritonitis.	—	11th	3·25	27	30·25	16	R	Very ill, S.R. Remarkable improvement in general condition after 24 hours' treatment; signs of peritonitis rapidly disappeared. Treatment suspended too early, cellulitic mass resolved slowly.
13	29	Early generalising peritonitis.	—	7th	1	1·8	2·8	1	R	Very ill. Signs of peritonitis abated within 24 hours. Treatment stopped on account of albuminuria which was present before 1st dose.
14	32	Early generalising peritonitis with septicæmia.	+ (b)	4th	5·5	18	23·5	10	R	Very ill on admission; T. 104°, P. 140, rising; diarrhoea. Spectacular remission of symptoms and signs within 24 hours. Steady improvement followed.
15	28	Local uterine infection.	—	11th	2·5	11·4	13·9	7	R	Very ill on admission; T. 104°, P. 130–140 for 48 hours. Several rigors. T. persistently normal after 2 days' treatment. General improvement striking.
16	31	Acute generalising peritonitis.	—	5th	8	18·0	26	10	R	Ill-nourished woman, very ill. Spectacular and rapid abatement of signs of peritonitis.
17	38	Local uterine infection.	—	11th	3	21·6	24·6	12	R	Moderately severe case; T. 103°–104° for 4 days. T. and P. settled rapidly. No spread of infection.
18	28	Septic endometritis with infected lacerations.	—	4th	2·25	12·6	14·8	7	R	Mild case; T. 102°–103°, P. 110–120 for 5 days. T. and P. settled without further rise 48 hours after administration of prontosil.
19	28	Local uterine infection.	—	5th	2·75	18·0	20·75	10	R	Moderately severe case. T. and P. subsided without further rise on 3rd day of treatment. General condition improved rapidly.
20	21	Local uterine infection and tonsillitis.	—	6th	4·25	18	22·25	10	R	Moderately severe case; T. 102°–103°, P. 120. T. and P. persistently normal in 48 hours.
21	26	Local uterine infection.	—	4th	1·75	13·8	15·55	8	R	Mild case. T. and P. persistently normal after 24 hours' treatment. Rapid general improvement in debilitated patient.

\* Group B, hæmolytic streptococci.

TABLE V.—Summary of 38 Cases Treated with Prontosil and Prontosil Solubile.—(Continued)

No.	Age.	Pathological condition.	Blood culture.	Day of puerperium.	Prontosil, grammes.			Days of administration.	Result.	Remarks.
					By injection.	Orally.	Total.			
22	22	Local uterine infection.	—	3rd	3.75	21.6	25.35	13	R	Moderately severe case, S.R. T. persistently normal after 3rd day of treatment.
23	30	" "	Not done.	5th	1.5	5.4	6.9	3	R	Mild case. Afebrile in 24 hours.
24	26	Acute septic endometritis with infected lacerations.	—	3rd	2	23.4	25.4	13	R	Moderately severe case; flabby, anæmic patient. T. 103°–104°, P. 120–130. T. and P. settled rapidly. General condition greatly improved.
25	30	Pelvic cellulitis.	—	8th	1	9	10	5	R	Very ill on admission. General condition improved rapidly, but prontosil probably stopped too soon. Resolution of cellulitic mass was rather slow.
26	29	Local uterine infection.	—	8th	2.25	11.6	13.85	7	R	Moderately severe case; 7 days' fever. T. subsided rapidly under treatment.
27	39	Septic endometritis with extensive infected lacerations.	—	5th	3.5	16.2	19.7	9	R	Moderately severe case. 5 days' fever.
28	29	" "	—	5th	2.25	14.4	16.65	8	R	Moderately severe case, S.R., rapid resolution of T. and symptoms in 24 hours. Marked general improvement.
29	26	Local uterine infection.	—	5th	2	4.2	6.2	3	R	Moderately severe case, S.R., and severe constitutional symptoms. Prontosil stopped early on account of † toxic effects.
30	34	Pelvic cellulitis, infected lacerations.	Not done.	10th	1.75	6.6	8.35	4	R	Moderately severe case. T. fell within 24 hours of 1st dose.
31	24	Septic endometritis with infected lacerations.	—	8th	2	7.8	9.8	5	R	Moderately severe case. Rapid resolution of signs and symptoms.
32	32	" "	—	12th	1.25	9.0	10.25	5	R	Mild case. Rapid recovery.
33	28	" "	—	6th	5	11.4	16.4	6	R	Moderately severe case. Rapid resolution of signs and symptoms.
34	32	Pelvic cellulitis and extensive infected lacerations.	Not done.	13th	4.5	14.4	18.9	8	R	Late admission, moderately severe case, cellulitic mass already developed. Condition apparently not affected by prontosil.
35	22	Pelvic cellulitis with <i>B. coli</i> pyelitis. †	—	9th	2.5	10.8	13.3	5	R	Large cellulitic mass on admission. Grew worse under prontosil † due to associated pyelitis. Renal symptoms aggravated. Treatment stopped.
36	28	Septicæmia. Thrombophlebitis (ovarian vein).	+	6th	3.75	14.4	18.15	7	D	Extremely severe infection. Blood grew 170 colonies streptococci per c.cm. on admission. No apparent effect of treatment. P.M. showed thrombophlebitis whole R. ovarian vein and pulmonary infarct.
37	30	General peritonitis with septicæmia.	+	11th	2.5	5.4	7.9	4	D	Desperately ill, S.R. General peritonitis probably present several days before admission. No apparent effect of treatment. † inadequate dosage. (Vide No. 10 supra.) P.M. large peritoneal effusion, R. ovarian thrombosis, metastasis.
38	35	Septicæmia, probably thrombophlebitis. No P.M.	+	5th	12.5	25.2	37.7	10	D	Vide end of Note (1) infra.

(a) Before prontosil. (b) On admission. (c) 6 times. † Group G, hæmolytic streptococci. S.R. = Scarlatiniform rash.

changed by contact with the drug or any hypothetical compound formed from it in vivo.

Cocci of the "Richards" strain were suspended for four hours at 37° C. in normal rabbit serum to which prontosil soluble had been added (1 in 8 of the 2.5 per cent. solution); in the same serum without prontosil; and in serum taken from a rabbit which had received 8 c.cm. of prontosil intravenously an hour before. The mouse-virulence of the three samples of cocci remained the same after the four-hour period of incubation.

It has been suggested (Levaditi and Vaisman<sup>14</sup>) that the formation of a protective capsule by the streptococcus is interfered with under the influence of the drug, but this again is not confirmed by our experiments. The virulent "Richards" strain was found to form capsules readily when grown in defibrinated blood. (Wright's stain as recommended

by Seastone.<sup>15</sup>) They were demonstrated just as readily when the blood contained prontosil.

The possibility that the cocci in the treated animals might cease to elaborate certain toxic products which may be directly responsible for death is under consideration, but at present we know of nothing in support of it.

Finally, we have to keep in mind the possibility that the drug activates the reticulo-endothelial system—or some other tissue which may play a vital, but as yet unknown, part in checking invasion by this microbe.

#### Clinical Experiences with Prontosil

In view of the fact that the cure of mouse infections had been obtained only with hæmolytic streptococci

in a condition of unusual virulence, and not in the condition in which they are usually recovered from human infections, it seemed somewhat doubtful whether an analogous curative effect would be exerted in the human subject. But the exact significance of a high mouse-virulence is very imperfectly understood at present and, since all the clinical reports on the treatment of human infections in Germany were very favourable, it was decided to undertake clinical trials on a group of puerperal fever cases all known to be infected with hæmolytic streptococci. (All group A except two.)

The 38 cases summarised in Table V. were all under treatment in the isolation block of Queen Charlotte's Hospital. The list includes every case to whom the drug has been given, with the exception of :—

(1) Mrs. A. B., to whom it was given on admission under the mistaken impression that she would prove to be infected by hæmolytic streptococci. On finding that this was not the case we continued the drug for five days in order to see whether it would affect the course of the fever. It did not appear to do so. She ultimately developed a large abscess of the buttock due to infection by an unidentified anaerobic bacillus (Gram negative).

(2) Mrs. B. C., to whom the drug was given for the same reason as above but discontinued after two days on finding that her fever was due to *B. coli* pyelitis. The temperature had already become normal when the treatment was stopped and remained so.

At first only the more severe cases (10 in number) were treated by prontosil, but during the last few weeks we have included every case (28) infected by hæmolytic streptococci unless there was any contra-indication—e.g., nephritis. No other "specific" treatment has been employed at the same time, except in the case of two patients, Nos. 1 and 11, a single small dose (8 to 10 c.cm.) of antitoxic serum (because they presented an intense scarlatiniform rash). On account of the very severe constitutional disturbance caused by these doses of serum (intravenous) they were not repeated.

*Dosage.*—We have followed the more recent German authors in using rather large doses (actually very much less, weight for weight, than those which give curative effects in mice). At first 20 c.cm. of the 2.5 per cent. solution now issued as prontosil soluble (0.5 gramme) was injected either intravenously or intramuscularly each day, and six tablets per diem, each containing 0.3 gramme of prontosil, were given by mouth. Latterly the amount given by injection in several cases has been increased to 40 c.cm. per diem (occasionally 60 or even 90 c.cm.), and this amount has been diminished pari passu with the clinical improvement of the patient. The total amounts given are shown in Table V.

In view of the sometimes severe, although transient, malaise and nausea induced by the intravenous administration of 20 c.cm. doses we have recently employed this route only for the first treatment and given subsequent doses intramuscularly. Since the drug is absorbed very rapidly it is doubtful whether any advantage is secured by intravenous injection. Intramuscular doses, given rather slowly, cause no pain and have not resulted in any local inflammation or abscess formation.

#### COMMENTARY ON THE 38 CASES SUMMARISED IN TABLE V

*General analysis.*—It behoves us to be very cautious in drawing conclusions as to the curative effect of any remedy upon puerperal infections such as those due to the hæmolytic streptococci in which the exact significance of signs and symptoms is notoriously difficult to assess with accuracy, and in which the prognosis is correspondingly difficult to estimate. At every point it is a matter of fine judgment, instructed by long experience.

Forty-five per cent. of our cases, Nos. 17 to 33 in the table, were judged by us to permit of no conclusion as to the effect of the treatment. All of them would, in all probability, have recovered without the treatment—and perhaps as quickly.

Another group, representing 42 per cent. of the cases (Nos. 1 to 16), left us with the impression that the drug had in all probability hastened or determined recovery from the infection. All these were cases which undoubtedly presented signs and symptoms of septic infection so severe as to give ground for anxiety; and cases which, in the light of our previous experience over several years, surprised us by the prompt clinical improvement and remission of fever following the first few doses of prontosil. It is worthy of note that the average age of this group was 31.8 years.

Three of the cases of this group, Nos. 10, 14, and 16, were of specially great evidential value. Although exploratory laparotomy was not performed there was good reason to suppose that in all 3 cases the infection had already involved the general peritoneal cavity (abdominal as well as pelvic) and was quickly becoming diffuse. Case 14 had, in addition, a few streptococci in the blood stream—a circumstance which made the prognosis extremely grave. In this latter case, and in Case 16, the indications of diffuse peritonitis disappeared within 48 hours, and in Case 10 a little more slowly, after the beginning of treatment by very large doses of prontosil (60 c.cm. per diem, by injection, as well as six tablets by mouth for the first few days. In view of the generally recognised gravity of this condition—and taking into account the fact that all three women were over 30 years of age—it appears to us very unlikely that they would have made a spontaneous recovery. In 5 other cases of this group there were indications on admission that a spread of infection from the pelvic to the abdominal peritoneum was beginning. Those indications quickly disappeared.

The clinical course of 5 cases, Nos. 34 to 38, did not run so smoothly. In 2 of them who recovered (Nos. 34 and 35) we had a suspicion that the treatment might be exerting an unfavourable effect, and in 1 of these (infected by a group G streptococcus) improvement did set in as soon as the drug was discontinued. The other case, No. 34, did not come under treatment till the thirteenth day of the puerperium, with cellulitis already developed. She was a very neurotic subject. Cases 36 and 37 who had an overwhelming infection on admission—a heavy septicæmic invasion in the one and a fully developed diffuse peritonitis (probably of several days' standing) in the other—showed no apparent effect of the treatment one way or the other. It may be noted that in neither of these cases did we employ the heroic doses which seemed to give an unexpectedly good result in Cases 10, 14, and 16. The post-mortem findings of Case 36 suggested that she might possibly have recovered had we done so.

The last case (No. 38) of very severe septiciæmia without peritonitis does not allow of any definite conclusion as to the influence of the prontosil. Treatment began within two days after the first rise of temperature (the blood then growing 40 colonies of streptococci per c.cm.) and was continued very vigorously for seven days, but the temperature did not fall satisfactorily and streptococci were grown again from the blood on three more occasions (60, 12, and 96 per c.cm.). After eight days, although her general condition remained remarkably good, she became exhausted by the frequent large injections (20 c.cm., t.d.s.) and the drug was discontinued.

altogether. In all probability her septicæmia was attributable to an extensive thrombo-phlebitis—streptococci being continually thrown off into the blood stream from the breaking down blood-clot. It is hardly to be expected that any chemotherapeutic agent can come into effective operation upon the microbes in such a focus. After an interval of seven days, during which her condition grew worse and her blood gave three more positive cultures, she was given two still larger doses (100 and 150 c.cm. by intravenous drip with a 24-hour interval), but she died on the sixteenth day.

#### MORTALITY-RATES OF TREATED AND UNTREATED CASES

There have been 3 deaths in the 38 cases treated by prontosil—that is 8 per cent. In considering the significance of this figure it has to be borne in mind that the first 10 cases were chosen because they were severe or moderately severe cases—the mildest being deliberately excluded; and, further, that the death-rate fluctuates to some extent according to whether few or many late cases—particularly late peritonitis cases—are admitted to the hospital. The following figures give an idea of the usual mortality-rate for *all* cases admitted to the isolation block and found to be infected by hæmolytic streptococci.

In the 38 cases admitted immediately prior to the use of prontosil (August to December, 1935) there were 10 deaths—i.e., 26.3 per cent. In the 38 cases immediately preceding these (March to July, 1935) there were 9 deaths—i.e., 23.7 per cent. During the four years 1931–34 the rate varied between 18 and 28.8 per cent. (average 22 per cent.).

While, therefore, there would appear to have been a very considerable reduction of the death-rate among the prontosil-treated cases it would be unwise to assume on the basis of so small a series that the reduction will be maintained. Nevertheless we are of the opinion that the very low death-rate, taken together with the spectacular remission of fever and symptoms observed in so many of the cases, does suggest that the drug has exerted a beneficial effect. It may be added that there is no reason to ascribe the clinical results to any other change in the local or general treatment of the cases.

#### TOXIC AND OTHER EFFECTS ASSOCIATED WITH THE TREATMENT

A remarkable feature has been the sensation of burning, chiefly located in the infected tissues, which is experienced by some patients (not by all) during the intravenous injection of 10–20 c.cm. of prontosil soluble. This was particularly well marked in the case of a medical man suffering from acute streptococcal sepsis of the hand. As previously stated, a number of patients have also experienced a rather unpleasant feeling of faintness and nausea (and sometimes an urgent desire to defæcate) for a few minutes following the intravenous injection of 20 c.cm.—not intramuscular injection. In the case of the medical man just referred to there was a much more prolonged feeling of ill-being but this has been quite unusual. The skin has acquired a slightly red or terra cotta tinge in several of the cases who received large doses of the drug.

The urine is always deeply tinged by the dye during the treatment and, contrary to the experience of the German authors who have reported upon clinical trials, many of our cases have given evidence of a mildly irritant effect upon the urinary tract tissues. About 75 per cent. of them have

shed epithelial cells in varying numbers at some time during the treatment; a much smaller number (40 per cent.) have passed red blood-cells and a few of them also casts. Case 10, who received 44 grammes of the drug, had a considerable number of casts, red blood-cells, and epithelial cells towards the end of the treatment. The casts disappeared within a week but the red cells persisted somewhat longer.

In 70 per cent. of the cases treated no albumin was found in the urine during treatment, or there was no increase of the trace originally present. Twenty per cent. showed a slight increase of the albumin (a trace) originally present—or developed a trace under treatment.

Ten patients (8 of them from the Group 1–16 who had received fairly large doses of the drug) have shown no indications of renal or other ill-effects on routine examination 3–5 weeks after discharge from the hospital.

The most striking toxic manifestation has been the development in 3 recent cases of cyanosis—associated with sulphæmoglobinæmia.

In No. 30 the condition was first noticed on the third day of treatment, after she had received only 4.0 grammes of prontosil. As the possible connexion with the drug was not at first suspected she received treatment for three more days, the cyanosis becoming all the time more intense, but unaccompanied by any increase of the respiratory rate or subjective symptoms. No active treatment for the cyanosis was adopted, and it diminished very much within ten days after the discontinuance of prontosil.

No. 31 had been under treatment for five days (9.8 grammes in all) when the cyanosis first attracted attention, and like the other case had made a good recovery from a mild infection. Her cyanosis was never so deep as that of No. 30.

No. 33, another case of mild uterine infection, had received 16.4 grammes of prontosil during six days' treatment before the cyanosis was noticed. She also showed no respiratory embarrassment or other symptoms.

Spectroscopic examination of the blood of all 3 cases by our colleague, Dr. A. T. Fuller, showed the presence of sulphæmoglobin.

The association of this condition with the taking of an azo dye recalled the description of some similar cases by van den Bergh and Revers<sup>16</sup> following the administration of pyridium. These authors suggested that the simultaneous taking of magnesium sulphate in their cases might have contributed to the development of sulphæmoglobinæmia. Whether this hypothesis can be substantiated we do not know, but as a matter of fact we found on inquiry that all of the prontosil-treated cases had also been taking magnesium sulphate.

It is too early yet to assess the importance of the sulphæmoglobinæmia in the affected cases. A note with regard to their subsequent history, and as to the occurrence of any fresh cases, will be submitted later.

#### SURVIVAL OF HÆMOLYTIC STREPTOCOCCI IN PRONTOSIL-TREATED CASES

In about 60 per cent. of puerperal fever cases infected by hæmolytic streptococci these organisms continue to be present in the discharge from the uterus for at least three or four weeks—sometimes much longer. Routine examinations have shown that they persist for approximately the same length of time in the prontosil-treated cases.

#### Summary and Conclusions

(1) A single dose of prontosil or prontosil soluble given by stomach-tube or subcutaneous injection did

not suffice to save mice infected 1-2 hours earlier with hæmolytic streptococci (group A), but subcutaneous injection repeated daily for six days was usually effective—even against 100 to 1000 minimum lethal doses.

(2) Such curative effects in mice were only obtained against hæmolytic streptococci of very high mouse-virulence; they were not obtained with 6 strains of medium or low mouse-virulence, freshly isolated from human infections.

(3) A large subcutaneous dose (50 mg.) of prontosil in suspension protected mice against infection four days later with the highly virulent streptococcus. Protection after a longer interval was not tested, but absorption of the drug from the subcutaneous depôt continued for at least three weeks, as judged by discoloration of the urine.

(4) Curative effects in mice (but not prophylactic effects) similar to those obtained with prontosil were obtained by repeated injections of the colourless compound, *p*-aminobenzenesulphonamide.

(5) Thirty-eight puerperal fever cases infected by hæmolytic streptococci have been treated by oral plus intravenous or intramuscular doses of prontosil. Subject to confirmation by further experience the impression has been gained that in many of the more severe cases the drug has exerted a definitely beneficial effect, manifested by unexpectedly prompt fall of temperature and remission of symptoms; and this impression is supported by a substantial reduction in the case-mortality of the whole series. Three patients in whom there was judged to be a generalising peritonitis on admission (one with a positive blood culture) have recovered without laparotomy under very large doses of the drug. The clinical results, together with the mouse-protection experiments, support the view that further clinical trial is amply justified, and that there is more hope of controlling these streptococcal infections by the early administration of this or some related chemotherapeutic agent than by any other means at present available.

(6) While the drug has been well tolerated by most of the patients there have been transient toxic effects in some cases, and many have shown indications of a mildly irritant effect upon the tissues of the urinary tract. Three cases have developed sulphæmoglobinæmia.

(7) There is at present no indication from animal experiments that the drug is likely to have a beneficial effect upon puerperal infections by organisms other than the hæmolytic streptococci; and in view of the toxic effects referred to above its administration should be confined to such cases.

(8) Apart from the fact that growth of the streptococcus is somewhat retarded (*although not suppressed*) in the serum of patients under treatment by the drug very little is known at present as to the nature of its antimicrobial influence in the animal body. On the one hand the invasive character of the streptococcus seems to be unchanged by contact with the drug or the serum of treated animals; and, on the other hand, there is no evidence of any "immune-response" being evoked by it.

The prontosil used in this clinical investigation was supplied to the Therapeutic Trials Committee by Messrs. Bayer Products Ltd., to whom acknowledgments are due.

## REFERENCES

1. Domagk, G.: *Deut. med. Woch.*, 1935, lxi., 250.
2. Hörlein, H.: *Proc. Roy. Soc. Med.*, 1936, xxix., 313.
3. Levaditi, O., and Vaisman, A.: *Compt. rend. de l'Acad. des Sci.*, 1935, cc., 1694.

(Continued at foot of next column)

## PROTECTION OF MICE AGAINST STREPTOCOCCAL AND OTHER INFECTIONS BY *p*-AMINOBENZENESULPHONAMIDE AND RELATED SUBSTANCES

BY G. A. H. BUTTLE, M.A. Camb., M.R.C.S. Eng.

W. H. GRAY, M.Sc. Wales

AND

DORA STEPHENSON, Ph.D. Leeds

(From the Wellcome Chemical Research Laboratories,  
London, and the Wellcome Physiological Research  
Laboratories, Beckenham, Kent)

MANY attempts have been made to protect animals against bacterial infections by means of antiseptic drugs. The most successful of them was that of Morgenroth and Levy<sup>1</sup> who showed that ethyl dihydrocupreine (Optochin) would protect mice infected with pneumococci. Protection against streptococci had not been demonstrated until Domagk, who was working with azo-dyes, noticed that the presence of a sulphonamide group, while lessening the efficiency of the dye as an antiseptic in vitro caused it to protect infected mice (Hörlein).<sup>2</sup> In 1935 Domagk<sup>3</sup> reported a very notable effect with one of these dyes, the hydrochloride of 2:4-diaminoazobenzene-4'-sulphonamide (Prontosil, formula I.). One dose varying from 0.02 to 10 mg. given an hour and a half after infection was effective against a lethal dose of one strain of streptococcus inoculated into the peritoneum. Domagk showed that scrapings of peritoneum taken 48 hours after infection were free from cocci in treated mice, whereas large numbers of cocci were present in the controls. In a later paper the same author<sup>4</sup> states that the administration of 1/10 to 1/50 of the tolerated dose (0.2 to 1 mg.) for three to five days after infection protects most of the mice, and that some less acute infections could be controlled with 1/100 to 1/500 of the tolerated dose.

Levaditi and Vaisman<sup>5</sup> confirmed the results of Domagk, but they were not able to protect every treated mouse, although all the mice showed delay in the time of death. These authors noted that the dye was not active against the staphylococcus, the paratyphoid bacillus, bacillus pseudotuberculosis, or Friedländer's bacillus. They showed that the cocci could be recovered from the spleen of the treated animals up to the eighth day after infection, but that if the animals lived longer than this the spleens were sterile. Nitti and Bovet<sup>6</sup> confirmed the general result, but they could not protect every mouse; they found that

(Continued from previous column)

4. Nitti, F., and Bovet, D.: *Compt. rend. Soc. de biol.*, 1935, cxix., 1297.
5. Levaditi, O., and Vaisman, A.: *Ibid.*, 1936, cxxi., 803.
6. Schreus, H. T.: *Deut. med. Woch.*, 1935, lxi., 255.
7. Anselm, E.: *Ibid.*, p. 264.
8. Schranz, H.: *Munch. med. Woch.*, 1935, lxxxii., 419.
9. Scherber, G.: *Wiener med. Woch.*, 1935, lxxxv., 284, 346, and 376.
10. Fuge, K.: *Deut. med. Woch.*, 1935, lxi., 42.
11. Kramer, W.: *Munch. med. Woch.*, 1936, lxxxiii., 603.
12. Trefouel, J., and Mme. Nitti, F., and Bovet, D.: *Compt. rend. Soc. de biol.*, 1935, cxx., 736.
13. Goissedet, P., Despois, R., Gaillot, P., and Mayer, R.: *Ibid.*, p. 1082.
14. Levaditi, O., and Vaisman, A.: *Compt. rend. Soc. de biol.*, 1935, cxix., 946.
15. Seastone, C. V.: *Jour. of Bact.*, 1934, xxviii., 481.
16. van den Bergh, H., and Revers, F. E.: *Deut. med. Woch.*, 1931, lvii., 706.



TABLE I.—Treatment of Mice Infected with Streptococci (Strain "Richards").  
Comparison of *p*-Aminobenzenesulphonamide and Prontosil

Infecting dose of culture (Intra-peritoneally). (c.cm.)	Approx. number of organisms.	Treatment.	Number of mice out of a group of 12 injected dying on each day after infection.							Survived 3 weeks.
			1st	2nd	3rd	4th	5th	6th	6-15th	
10 <sup>-9</sup>	5	Controls. Untreated.	0	5	3	1	..	..	..	3
10 <sup>-7</sup>	500		4	7	1	..	..	..	0	
10 <sup>-5</sup>	50,000		7	5	..	..	..	..	0	
10 <sup>-5</sup>	50,000		0	0	0	0	0	0	12	
10 <sup>-5</sup>	50,000		0	0	1	0	0	0	9	
10 <sup>-5</sup>	50,000		0	0	1	2	1	1	6	
10 <sup>-5</sup>	5,000,000		4	4	1	0	0	0	1	
10 <sup>-5</sup>	50,000		2	3	2	0	0	2	3	
10 <sup>-5</sup>	50,000		0	1	4	0	0	1	2	
10 <sup>-5</sup>	50,000		0	1	4	0	0	1	2	

The drugs were given by the mouth immediately after infection; the same doses were repeated 8 times: 7 hours, 1, 2, 3, 4, 6, 9, and 12 days after infection.

mice were not protected against strains of low virulence by the drug. J. et Mme. Trefouel, Nitti, and Bovet<sup>7</sup> noticed that azo-compounds which did not contain a sulphonamide group attached to one benzene nucleus were inactive, whereas the substituent groups in the other nucleus could be varied considerably without influencing the protective power; this led them to the conclusion that the animal was able to break down the compounds with the formation of *p*-aminobenzenesulphonamide. They showed that *p*-aminobenzenesulphonamide hydrochloride had an action similar to that of the azo-dye (prontosil) derived from it in protecting mice. Goissedet, Despois, Gailliot, and Mayer<sup>8</sup> confirmed the conclusion of J. Trefouel that the azo-linkage was not necessary for this action on streptococci; they found that benzylidene-aminosulphonamides were active, also sodium *p*-aminobenzenesulphonamidemethylenebisulphite.

Experimental \*

Confirming the results of Trefouel, Nitti, and Bovet, we found that the hydrochloride of *p*-aminobenzenesulphonamide has an action on infected mice which is similar to that of prontosil. The compound was found to be freely soluble in water, but the resulting solution was acid and produced a local necrosis when given by subcutaneous injection. To avoid this effect *p*-aminobenzenesulphonamide base has been used in these experiments.

The toxicities of prontosil and *p*-aminobenzenesulphonamide base and hydrochloride were compared, giving the drugs in a suspension of gum acacia by the mouth to mice of 19 to 22 g. weight.

12 mg. of prontosil was innocuous, 25 mg. killed four out of six mice, 50 mg. five out of six, and 100 mg. six out of six. With *p*-aminobenzenesulphonamide base or hydrochloride, 50 mg. was innocuous, 100 mg. killed two out of six mice, and 200 mg. six out of six. Larger doses of prontosil (50 mg.) were tolerated if given subcutaneously.

In the therapeutic experiments, the strain used was

\* G. A. H. Buttle and D. Stephenson are responsible for all the experiments on animals.

a mouse-virulent hæmolytic streptococcus obtained from a case of puerperal septicæmia ("Richards") by Dr. Colebrook; it has been repeatedly passaged through mice. The cocci were grown for six hours in a broth described by O'Meara and Brown.<sup>9</sup> Dilutions of the culture were made in broth so that 0.3 c.cm. could be used for each intraperitoneal injection. For a comparison between different drugs it is necessary to use mice infected at the same time, as streptococci grown under apparently identical conditions vary somewhat in virulence.

The drugs were given by the mouth immediately after infection and the doses repeated every day for three days or more; this method of administration has been found to give the maximum protective effect. In our original experiments, mentioned in THE LANCET (1935, ii., 840), when one dose only was given—as in Domagk's original experiment—a prolongation of life of about two days only was obtained.

Table I. gives a representative example of a series of these therapeutic experiments. In all of them prontosil and *p*-aminobenzenesulphonamide are equivalent in protective activity with doses of 2 mg. With larger doses the toxic action of prontosil interfered with the comparison of therapeutic efficiency. The drugs also protect when injected subcutaneously. The protection shown with *p*-aminobenzenesulphonamide is better than that obtained with prontosil. †

The efficacy of a drug for protecting against streptococcal infection can be assessed by two criteria: (1) an estimate of the number of average lethal doses of cocci against which the drug will protect when it is given to the infected mice under optimal conditions for its action; and (2) by an estimate of the latest

† The prontosil referred to is the hydrochloride of 2:4-diaminoazobenzene-4' sulphonamide. Prontosil soluble is a different substance—preliminary experiments indicate that it protects as well as *p*-aminobenzenesulphonamide.

TABLE II.—Protection of Mice against Streptococcal Infection by *p*-Aminobenzenesulphonamide

Infecting dose (c.cm.)	Approx. number of organisms.	Treatment.	Number of mice out of a total of 6 injected dying on each day after infection.											Survived 1 month.	
			1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	10-20th		
10 <sup>-9</sup>	5	Untreated.	1	1	1	1	0	0	0	0	0	0	0	2 killed.	0
10 <sup>-7</sup>	500		1	4	1	..	..	..	..	..	..	..	..	..	0
10 <sup>-5</sup>	50,000		4	2	..	..	..	..	..	..	..	..	..	..	2
10 <sup>-5</sup>	50,000		0	0	0	0	0	0	0	1	1	0	0	0	1
10 <sup>-5</sup>	5,000,000		0	1	1	2	0	0	0	0	0	0	0	0	1
10 <sup>-5</sup>	50,000		1	0	0	0	1	0	0	0	0	0	0	0	4
10 <sup>-5</sup>	50,000		0	2	2	0	0	0	0	0	1	0	0	0	1

The treated mice received 20 mg. of *p*-aminobenzenesulphonamide base by the mouth; the dose was repeated 8 hours later and again every day for the first 4 days.

TABLE III.—Protection against Different Strains of Streptococci

Strain.	Griffith's serological type.	Dose (c.cm.).	—	Number of mice out of a total of 6 injected dying on each day after injection.										Survived 1 month.		
				1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th		10-20th	
"Richards."	Type 3	10 <sup>-5</sup>	Untreated.	4	2	0	0	0	0	0	0	0	0	0	0	0
			Treated.	0	0	0	1	0	0	0	0	1	2	1	0	0
"Williams."	" 14	10 <sup>-5</sup>	Untreated.	5	1	0	0	0	0	0	0	0	0	0	0	0
			Treated.	0	1	0	0	0	1	1	1	0	0	1	0	1
"Pope."	" 14	10 <sup>-5</sup>	Untreated.	1	3	1	0	0	0	0	1 k.	..	..	..	..	..
			Treated.	0	0	0	0	0	0	0	0	0	1	0	..	..
"Gillard."	" 17	10 <sup>-5</sup>	Untreated.	2	3	1	0	0	0	0	0	0	0	0	0	0
			Treated.	0	0	0	0	0	0	0	0	0	0	0	2	4
C.203.	" 1	10 <sup>-5</sup>	Untreated.	5	1	0	0	0	0	0	0	0	0	0	0	0
			Treated.	0	0	0	0	1	1	0	0	0	0	0	1	3
Aronson Schnitzer.	—	10 <sup>-5</sup>	Untreated.	2	4	0	0	0	0	0	0	0	0	0	0	0
			Treated.	1	3	2	0	0	0	0	0	0	0	0	0	0
Aronson Schnitzer.	—	10 <sup>-8</sup>	Untreated.	6	0	0	0	0	0	0	0	0	0	0	0	0
			Treated.	0	0	1	2	0	0	0	0	0	0	0	0	0

The treated mice had 5 mg. of *p*-aminobenzenesulphonamide subcutaneously immediately after infection; the dose was repeated 5 hours later and again every day for 6 days. k. = killed.

time after infection when administration of the drug will still be operative in saving these animals. The action of *p*-aminobenzenesulphonamide base in protecting mice inoculated with multiple fatal doses of streptococci is shown in Table II., which also shows the effect of giving the drug at different times after infection. The lethal dose of culture for untreated mice is 10<sup>-9</sup> c.cm. (this dose kills 4/6 of the mice and should more properly be called the "2/3 lethal dose"). The drug will protect mice infected with 10,000 lethal doses of cocci. If a million lethal doses are used for the infection, the treated mice die at similar times to the untreated controls receiving one lethal dose. Protection can be demonstrated if the drug is given by the mouth to mice eight hours after infection; the drug protected 4 mice which had no cocci in the blood at the time of treatment, delayed for five days the death of a mouse with 500 cocci per c.cm. and failed to protect another with 3000 per c.cm. of blood.

If the drug was given 19 hours after infection, 1 out of the 6 mice were saved and the death of the the others delayed slightly.

EFFECT OF *p*-AMINO BENZENESULPHONAMIDE ON DIFFERENT STRAINS OF STREPTOCOCCI

The protective action of the drug has been tested with six different strains of virulent streptococci. The results are shown in Table III. The first four strains used in this experiment were mouse-virulent streptococci obtained from cases of puerperal sepsis by Dr. Leonard Colebrook, the last two, C.203,

a scarlet fever strain, and "Aronson" (Schnitzer) strains were obtained from Dr. E. W. Todd. They are all Group A strains by the Lancefield classification, although belonging to different serological types as shown in Table III., they have all been repeatedly passed through mice.

The puerperal strains and C.203, the scarlet fever strain, all give the same results as the "Richards" strain used for the experiment in Table I. It is evident that protection can be obtained equally well against streptococci of different serological types. Protection against the "Aronson" strain can only be obtained if a very small dose is used for the infection. Protection against a Lancefield Group B strain "Aronson" (Neufeld) has been obtained by Dr. Colebrook (personal communication): 7.5 mg. of prontosil or *p*-aminobenzenesulphonamide injected daily protected mice against 100 fatal doses of this strain.

EXPERIMENTS WITH ORGANISMS OTHER THAN STREPTOCOCCI

Experiments with *staphylococci* have so far failed to show any protection. The staphylococcal strains available will only kill mice with a very large dose, and it has already been shown that there is no protection with a large dose of a relatively avirulent streptococcus (Nitti and Boyet).<sup>6</sup>

Some preliminary protection experiments with mice infected with *meningococci* done in coöperation with Mr. H. Proom have given favourable results. The organisms were injected intraperitoneally in a suspension of 5 per cent. mucin as described by

TABLE IV.—Protection of Mice against Meningococcal Infection by *p*-Aminobenzenesulphonamide

No. of organisms.	Treatment.	Number of mice out of a total of 10 injected dying on each day after infection.						Survived 1 month.
		1st	2nd	3rd	4th	5th	6th	
10,000	Untreated.	5	2	0	1	0	0	2
	Treated.	0	0	2	0	0	0	8
1 million.	Untreated.	1	4	5	0	0	0	0
	Treated.	0	0	0	0	0	0	10
100 million.	Untreated.	4	6	..	..	..	..	0
	Treated.	0	2	3	0	0	0	5

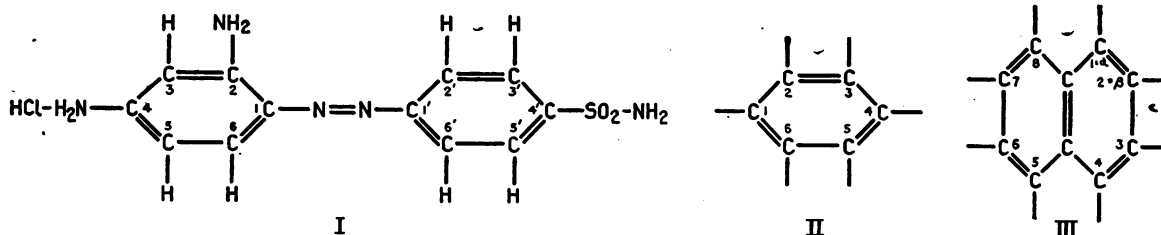
The meningococci were injected intraperitoneally in a suspension of 5 per cent. mucin. The treated mice received 5 mg. of *p*-aminobenzenesulphonamide base immediately after infection; the dose was repeated 8 hours later and again every day for the first three days.

Miller.<sup>10</sup> Table IV. shows that the degree of protection with one strain of meningococci (Type II.) is of the same order as that with streptococci. Protection against another strain of lower virulence was also obtained. Further work with several strains is required.

Against *pneumococcal* infection (*pneumococcus* Type I.) the drug has little effect; it is only just possible to demonstrate a slight effect with a very small infective dose of the cocci.

acid (cf. Stewart<sup>11</sup>) but this reaction was found to be not a general one. New compounds are marked with an asterisk. The preparation of 2:4-diaminoazobenzene-4'-sulphonamide (formula I.) was postulated in English Patent No. 149,428/1920, but actually described for the first time in E.P. 430,580/1935. The specimen made for the purpose of the present tests conformed in melting-point with the figure given in the patent, and had the same therapeutic action as the commercial material.

TABLE V



Group†	No.	Name of substance.	Orientation in Formula II.	Melting-point.	Therapeutic activity.
A.	1	<i>p</i> -Aminobenzenesulphonamide.	NH <sub>2</sub> : SO <sub>2</sub> -NH <sub>2</sub> = 1 : 4.	165°	+++
	2	<i>p</i> -Acetylaminobenzenesulphonamide.	NH-CO-CH <sub>3</sub> : SO <sub>2</sub> -NH <sub>2</sub> = 1 : 4.	218°	+++
	3	<i>N</i> -Methyl- <i>p</i> -acetylaminobenzenesulphonamide.	N(CH <sub>3</sub> )-CO-CH <sub>3</sub> : SO <sub>2</sub> -NH <sub>2</sub> = 1 : 4.	153°	++
	4	<i>p</i> -Toluenesulphonamide.	CH <sub>3</sub> : SO <sub>2</sub> -NH <sub>2</sub> = 1 : 4.	144°	++
	5	† <i>p</i> -Sulphonamidobenzeneazodihydrocupreine.	N <sub>2</sub> -C <sub>10</sub> H <sub>11</sub> O <sub>2</sub> N <sub>2</sub> : SO <sub>2</sub> -NH <sub>2</sub> = 1 : 4.	—	+
	6*	Tropinone <i>bis</i> -sulphonamidophenylhydrazone acetate.	N <sub>2</sub> -C <sub>10</sub> H <sub>11</sub> O <sub>2</sub> N <sub>2</sub> S : SO <sub>2</sub> -NH <sub>2</sub> = 1 : 4.	210°	+
B.	7	<i>p</i> -Aminobenzenesulphonanilide.	NH <sub>2</sub> : SO <sub>2</sub> -NH-C <sub>6</sub> H <sub>5</sub> = 1 : 4.	198°	+++
	8	<i>p</i> -Acetylaminobenzenesulphonanilide.	NH-CO-CH <sub>3</sub> : SO <sub>2</sub> -NH-C <sub>6</sub> H <sub>5</sub> = 1 : 4.	214°	+++
	9	Sulphanilic acid.	NH <sub>2</sub> : SO <sub>2</sub> -OH = 1 : 4.	—	++
E.	10	<i>m</i> -Aminobenzenesulphonic acid.	NH <sub>2</sub> : SO <sub>2</sub> -OH = 1 : 3.	—	+
F.	11	$\alpha$ -Acetylaminonaphthalene-4-sulphonamide.	Orientation in Formula III. NH-CO-CH <sub>3</sub> : SO <sub>2</sub> -NH <sub>2</sub> = 1 : 4.	247°	+
	12	Sodium $\alpha$ -Naphthylamine-4-sulphonate.	NH <sub>2</sub> : SO <sub>2</sub> -ONa = 1 : 4.	—	++

† This substance has been previously described (Heidelberger and Jacobs<sup>12</sup>) as having an indefinite decomposition point at about 190°. The other four cinchona alkaloid derivatives mentioned in this paper behave similarly. ‡ Compare discussion.

The following had only a trace of therapeutic activity: *p*-Sulphonamidobenzeneazodihydrocupreidine, \**p*-Sulphonamidobenzeneazoquinoline, \**p*-Sulphonamidobenzeneazo-isoapoquinine, \**p*-Sulphonamidobenzeneazoisoapoquinidine, \**p*-Toluenesulphonamido-phenylhydrazine-*p*-sulphonic acid. (\* = new compounds).

The following were inactive: Benzenesulphonamide, *p*-Aminoacetanilide, *p*-Hydroxybenzenesulphonamide, *p*-Chlorobenzenesulphonamide, *m*-Aminoacetanilide, *o*-Nitroacetanilide, *m*-Nitroacetanilide, *p*-Nitroacetanilide, 2:6-Dibromo-1-aminobenzene-4-sulphonamide, 1-Aminobenzene-2:4:6-trisulphonamide, *p*-Toluenesulphonamido-phenylhydrazine, Sodium benzenesulphonate, 4-Nitro-1-aminobenzene-2-sulphonic acid,  $\alpha$ -Naphthalenesulphonamide,  $\beta$ -Naphthalenesulphonamide,  $\alpha$ -Naphthylamine-5-sulphonic acid, Sodium  $\beta$ -Naphthylamine-1-sulphonate.

The drug has been tried without effect for protecting against *Trypanosoma equiperdum* in mice and against malarial infection in canaries.

### Substances related to *p*-aminobenzenesulphonamide

The success attained with these simply constituted compounds naturally directed attention to the study of others more or less closely related to them, with the object of obtaining a clue to the chemical structure requisite for the development of this form of bactericidal activity. Trials of a number of readily available substances were made (Table V.).

In this Table the constitution of the substance dealt with is indicated in column 2 by the formulæ of the substituents, numbered in accordance with the orientation shown in the typical formulæ at the head of the Table. Thus, in the case of *p*-sulphonamidobenzeneazodihydrocupreine (No. 5), the -NH<sub>2</sub> group in position I. of formula II. is replaced by the azodihydrocupreine group, -N=N-C<sub>10</sub>H<sub>11</sub>O<sub>2</sub>N<sub>2</sub>, the sulphonamide group in position 4 remaining unchanged.

In the preparation of some of these substances, the intermediate sulphonyl chlorides were with advantage made directly by means of chlorosulphonic

The results obtained were as follows:—

(A) *Substances in which the amino group -NH<sub>2</sub> in position 1, formula II., was modified or replaced.*—Replacement of the -NH<sub>2</sub> group by -NH-CO-CH<sub>3</sub>, -N(CH<sub>3</sub>)-CO-CH<sub>3</sub>, and -CH<sub>3</sub> produces compounds with considerably less activity. A series of azo-compounds in which -NH<sub>2</sub> was replaced by -N=NR, where R is the dihydrocupreine, dihydrocupreidine, apoquinine, isoapoquinine or isoapoquinidine residue, or =N-N=R', where R' is the tropinone residue, all proved to be only slightly active, as did an azo-compound in which R was the protein of mouse-serum. Replacement of the -NH<sub>2</sub> by -H, -OH, or -Cl, produced inactive compounds.

(B) *Substances in which the sulphonamide group in position 4, formula II., was modified.*—Substitution of -C<sub>6</sub>H<sub>5</sub> for one of the hydrogen atoms of the sulphonamide group produced a compound (*p*-aminobenzenesulphonanilide No. 7) as active as *p*-aminobenzenesulphonamide; the acetyl derivative was less active. Sulphanilic acid, No. 9, containing the group -SO<sub>2</sub>-OH in place of -SO<sub>2</sub>-NH<sub>2</sub>, was only one-twentieth as active. Modification of either group attached to the benzene nucleus diminished or destroyed the activity, with the surprising exception of the anilide. The possibility that anilide group had some specific action of its own led us to examine *m*- and *p*-aminoacetanilide and *o*-, *m*-, and *p*-nitroacetanilide, but all of these proved to be very toxic, and showed no action in tolerated doses.

(C) *Introduction of additional substituents into the benzene nucleus, formula II.* (Footnote to Table V.).—Two

bromine atoms, in the 2 and 6 positions, gave an inactive compound. 1-Aminobenzene-2 : 4 : 6-trisulphonamide was also inactive.

(D) *p*-Toluenesulphonamide derivatives, formula II. (Footnote to Table V.).—*p*-Toluenesulphonethylamide was less active than *p*-toluenesulphonamide, and the corresponding diethyl-compound was inactive.

(E) *Sulphonic acids, formula II.*—*m*-Aminobenzenesulphonic acid was slightly active. Sulphanilic acid has been mentioned above. Phenylhydrazine-*p*-sulphonic acid had a slight activity. Benzenesulphonic acid and 4-nitro-1-aminobenzene-2-sulphonic acid were both inactive. The presence of the basic group ( $-NH_2$ ) attached to the benzene ring appears to be more important than that of the sulphonamide group alone.

(F) *Naphthalene derivatives, formula III.*— $\alpha$ - and  $\beta$ -Naphthalenesulphonamides were both inactive;  $\alpha$ -acetylamino-naphthalene-4-sulphonamide active, but not quite as good as the corresponding benzene derivative.  $\alpha$ -Naphthylamine-4-sulphonic acid (tested as sodium salt) had the same degree of activity as sulphanilic acid, the benzene analogue.  $\alpha$ -Naphthylamine-5-sulphonic acid and  $\beta$ -naphthylamine-1-sulphonic acid (sodium salt), on the other hand, were quite inactive.

### Summary

1. *p*-Aminobenzenesulphonamide will protect mice against streptococcal infection. It has the same therapeutic activity as prontosil, but is less toxic when given by the mouth, so that it is possible to obtain better protection by giving larger doses.

2. Protection can be obtained against streptococci belonging to different serological types.

3. Some protection of mice against meningococcal infection has been demonstrated, but it has not been possible to demonstrate protection against staphylococci or pneumococci.

4. Increase in the number of sulphonamide groups attached to the benzene nucleus to three is accompanied, not by increase, but by extinction of the streptococcid activity.

5. The anilide of sulphanilic acid is as active as the amide.

6. Sulphanilic acid itself has a smaller, but not negligible, protective action.

7. Azo-compounds derived from *p*-aminobenzenesulphonamide and phenolic cinchona alkaloids are inferior to prontosil in this respect.

We have pleasure in acknowledging our indebtedness to Dr. T. A. Henry and Dr. Colebrook for the interest which they have taken in this work and for many helpful suggestions; to Mr. A. W. Chapman for much help in the preparation of the substances; and to Mr. N. McLaren and Miss J. Smith for assistance with the animal experiments. We have to thank Dr. Colebrook and Dr. Todd for the supply and serological typing of the strains of streptococci.

### REFERENCES

- Morgenroth, J., and Levy, R.: Berlin. klin. Woch., 1911, xlviii., 1560.
- Hörlein, H.: Proc. Roy. Soc. Med., 1936, xxix., 313.
- Domagk, G.: Deut. med. Woch., 1935, lxi., 250.
- " " : Angew. Chemie, 1935, xlviii., 657.
- Levaditi, C., and Vaisman, A.: Compt. rend. Soc. de biol., 1935, cxix., 946.
- Nitti, F., and Bovet, D.: Ibid., 1935, cxix., 1277.
- Trefouel, J., and Mme., Nititi, F., and Bovet, D.: Ibid., 1935, cxx., 756.
- Goissedet, P., Despois, R., Gailliot, P., and Mayer, R.: Ibid., 1936, cxxi., 1082.
- O'Meara, R. A. Q., and Brown, A. M.: Jour. Path. Bact., 1936 (in the press).
- Miller, C. P.: Proc. Soc. Exp. Biol. and Med., 1935, xxxii., 1136.
- Stewart, J.: Jour. Chem. Soc., 1922, cxxi., 2558.
- Heidelberger, M., and Jacobs, W. A.: Jour. Amer. Chem. Soc., 1919, xli., 2145.

## A MACROSCOPIC AGGLUTINATION TEST IN WEIL'S DISEASE

BY A. W. POT, M.D.

OF THE NATIONAL INSTITUTE FOR PUBLIC HEALTH, UTRECHT

NONE of the methods described for the serological diagnosis of Weil's disease—Schüffner's agglutination and lysis test, Bessemans's and Gaeltgens's complement-fixation tests, and the adhesion test of Brown and Davis—is anywhere near as simple as Widal's reaction for typhoid.

The preparation of the antigen for Gaeltgens's complement-fixation test, in which a culture of leptospiræ is centrifuged and the sediment suspended in saline containing 0.3 per cent. carbolic acid, induced me to try whether a similar, definitely turbid reagent would give a *macroscopic* agglutination with anti-serum.

Since carbolic acid dissolves the leptospiræ, the sediment from about 250 c.cm. of Korthof's liquid medium was suspended in 10 c.cm. of meat broth (pH 7.6) to which 0.2 per cent. of commercial formalin was added. This suspension was kept in the ice-chest and thoroughly shaken each day for a week; it was then brought to the required density by the addition of saline and 0.2 per cent. formalin.

In order to save antigen, narrow tubes were used for the reaction, of such a size that 0.25 c.cm. of dilute serum with an equal volume of leptospira suspension gave a sufficiently high column of liquid. The serum was diluted in a series of larger tubes (1:25, 1:50, 1:100, &c.); 0.25 c.cm. was taken from each of the dilution tubes by means of Dreyer's pipette, and introduced into the testing tubes with 0.25 c.cm. of the reagent. The series of tubes were then placed for 2 hours in a water bath at 52° C.; less satisfactory results were obtained when they were kept for 2 hours in an incubator at 37° C.

The control tube, containing 0.25 c.cm. of saline solution and 0.25 c.cm. of leptospira suspension, always showed a fine granulation, which was readily observed with a magnifying glass against a dark ground. Probably the dimensions of the leptospiræ, which are much greater than the bacteria that we are usually concerned with in agglutination tests, are responsible for this phenomenon. This condition does not interfere however in a *weak* agglutination, if the test and control tubes are compared with one another.

Sera from 26 patients positive to Schüffner's agglutination and lysis test were examined; in 20 of these cases it was also known that the complement-fixation test was positive. The sera were kept in the ice-chest without preservative, sometimes for longer than 6 months, without apparent deterioration. The macroscopic agglutination test was positive in 25 cases; the titres varied between 1:50 and 1:51,200. One serum (agglutination and lysis test positive at 1:1000; complement-fixation test positive at 1:320) gave a negative result.

Of 15 sera sent in for a Wassermann reaction, all gave negative results to this test; the smallest dilutions at which these controls were examined were 5 sera at 1:50 and 10 sera at 1:20.

Although the preparation of the suspension is a simple matter, one must not underestimate the difficulties which the cultivation of large quantities of leptospiræ can offer. Whether or not the macroscopic agglutination test will become of practical importance depends, among other things, on whether an institute provided with all the necessary equipment will be prepared to undertake the preparation of the reagent in quantity and put it at the disposal of laboratories. If such a suspension is made available, the carrying out and the reading of this macroscopic agglutination test is as simple and also as harmless as that for typhoid with Ficker's reagent.

## LATE RESULTS IN THE OPERATIVE TREATMENT OF INTRACRANIAL TUMOURS

BY HUGH CAIRNS, M.B. Adelaide, F.R.C.S. Eng.

SURGEON IN CHARGE OF THE DEPARTMENT OF NEURO-  
SURGERY, LONDON HOSPITAL

(Concluded from p. 1228)

### REGIONAL CLASSIFICATION OF THE RESULTS

So far the results have been considered according to the pathological type of the lesion without taking into account its site. Certain types of tumour tend to favour particular sites of origin, yet in most instances their predilection for such sites is not constant enough to be reliable for prognosis. With a clinical syndrome of tumour in the cerebello-pontine angle the probability is very great that the tumour will prove to be an acoustic neurinoma, and reasonable certainty can indeed be attained by thorough differential diagnosis which includes examination of the protein content of the cerebro-spinal fluid. With an intracerebellar tumour the chances are about equal that it will be a benign astrocytoma or a malignant medulloblastoma, but there are many other, though less likely, possibilities: ependymoma, papilloma, metastatic tumour, dermoid cyst, and so forth. It will be useful, therefore, to consider broadly the relation to prognosis of the site of the tumour.

TABLE VII.—Regional Classification

	Total.	Living 7-9 years after operation.	Useful life.	Useful survival per- centage.
Frontal .. .. .	25	11	9	36
Central and paracentral ..	24	2	..	..
Temporal .. .. .	15	1	..	..
Parietal .. .. .	13	4	3	23
Occipital .. .. .	6	3	2	33
Pituitary .. .. .	30	19	10	33
Juxtapituitary .. .. .	7	3	2	28
Lateral ventricle .. .. .	1	1	..	..
Cerebellar .. .. .	23	10	9	39
Extracerebellar .. .. .	13	9	2	15
Total .. .. .	157	63	37	..

Percentage of the 135 who survived operation still leading useful lives = 27.4.

Percentage of the 157 patients treated still leading useful lives = 23.5.

Table VII. shows the results classified on a regional basis. Partly because a more rigid definition of the categories is impracticable, and partly because the number of cases included is small, the Table is not of great significance. The total number of tumours for each region is given in the first column, and in the second the number of patients who were still alive 7-9 years after operation. The central, paracentral, temporal, and, to a less extent, the parietal regions are clearly unfavourable regions, because it is in these that malignant gliomas and metastatic tumours abound; a conclusion contrary to that of earlier writers (Gowers<sup>12</sup>). Intracerebellar tumours are on the whole the most favourable tumours of all.

### RESULTS ACCORDING TO AGE

Table VIII. shows the results according to age. The number of cases is small, but as in Cushing's analysis<sup>5</sup> of over a thousand cases, the highest incidence of brain tumours is in the fourth and fifth decades. The percentage of survivors is greatest

in the third decade, and only slightly less in the second, fourth, fifth, sixth, and seventh decades. In the first decade the survival percentage is very low, but in view of the usual frequency of cerebellar astrocytoma in the first ten years of life it is quite likely that another series might show a very satisfactory survival percentage in this period. With the reservation that this is a very small number of cases, and perhaps to some extent selected, it may be concluded that, for intracranial tumours as a whole, age has no great bearing on prognosis until the eighth decade is reached.

If inquiry is made into the types of tumour in the survivors it is found that certain types preponderate among the survivors in different decades; glioma is the common tumour in the survivors of the second decade, pituitary adenoma in the fourth decade, meningioma in the fifth decade, and meningioma and acoustic tumour in the sixth decade. These differences depend mainly on the varying frequency of benign types of tumour at different ages. Among the 44 survivors who were over thirty years old when they came for treatment there is only 1 case of glioma.

The fact that a patient is over fifty, or even over sixty, when he comes for operation is evidently no bar to survival, and it is important to note that out of the 25 patients who presented themselves for treatment when they were already over fifty 12 were still alive when last heard from 7-9 years after operation. These comprised 5 meningiomas, 4 acoustic neurinomas, 2 pituitary adenomas, and 1 blood-vessel tumour.

### GENERAL SURVEY OF RESULTS

Table VII. shows the combined results as regards useful life. In the third column is given the number of survivors who were living a useful life when last heard from. This column has not been difficult to compile. It includes those free from all symptoms and those who are able to work though suffering from symptoms. Information on this point was reasonably accurate in all cases. There are 37 useful survivors from among the 157 patients operated on 7-9 years before. This gives a useful survival-rate of 23.5 per cent.; or, if we consider only the 135 patients who survived the dangers of operation, a useful survival-rate of 27.4 per cent. Thus, for patients with verified intracranial tumours undergoing operative treatment in the clinic in 1926-27 the chances of useful survival for a period of 7-9 years were roughly one in four.

Of the whole series of 157 cases, as can be seen from Table III., 14 per cent. died within a few weeks of operation; a further 12.7 per cent. after leaving hospital died in the first year; 12.1 per cent. died in the second year, while in the third year the percentage dropped to 5.1 and remained thereafter low. At the end of 7-9 years 40 per cent. were alive and 23.5 per cent. were living a useful life. There is some evidence that the incidence of benign tumour in this series is greater than would be found in a series of unselected tumours. This is elaborated in the full report on this inquiry.

These results are for the most part not so good as those obtained with tumours affecting other parts of the body. In a large series of histologically verified cases of carcinoma of the breast Lane-Clayton<sup>14</sup> found about 25 per cent. (206 out of 818) alive ten years after operation. For carcinoma of the cervix uteri the survival percentage ten years after abdominal hysterectomy was 36.6 (Lane-Clayton and McCullagh<sup>15</sup>). For three- or five-year periods the results of operation or radium treatment of carcinoma

TABLE VIII.—PROGNOSIS IN RELATION TO AGE  
*The Table is Based on the Age of Each Patient at the Time of his First Operation*

Age in years.	Total cases.	Dead.												Living 7-9 years.
		Post-op.	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-14	
0-10	11	4	1	4	..	..	1	..	..	..	..	..	..	1
10-20	17	2	1	5	..	..	..	..	..	..	..	1	1	7
20-30	22	4	1	3	..	1	1	..	..	..	..	1	..	11
30-40	39	4	2	2	5	1	4	1	..	1	..	..	1	18
40-50	37	2	9	5	1	1	..	2	1	..	2	..	..	14
50-60	22	5	4	..	1	..	2	..	..	1	..	..	..	9
60-70	8	1	2	..	1	..	1	..	..	..	..	..	..	3
70-80	1	..	..	..	..	..	..	1	..	..	..	..	..	..
Totals ..	157	22	20	19	8	3	9	4	1	2	2	2	2	63

of the lip, tongue, and rectum are still better. But for all these lesions there is always a preliminary sorting before surgical treatment is undertaken; the tumour can be felt and usually seen, and in certain cases examination will show that it is not radically operable. With intracranial tumours there is no easy way of rejecting the tumours that are unfavourable for radical treatment.

Intracranial tumours as a group are in some respects more favourable than the lesions mentioned above, since they include benign as well as malignant tumours. No true comparisons can be made, but from these considerations it is clear that the practical results of intracranial surgery to-day are not so very far behind those obtained in other fields of neoplastic surgery, notwithstanding its inherently greater difficulties and comparatively recent development. With development of technical and clinical knowledge and with more selection the late results for intracranial tumour are likely to improve still further, though it will always be necessary to bear in mind that the condition of patients at the end of a post-operative period of ten years or so is not the sole criterion of the value of operation. There will probably always be some use for palliative operations which can give temporary respite.

#### RESULTS COMPARED WITH OTHER SERIES OF INTRACRANIAL TUMOURS

Very little material is available for comparing the results of this series with those of other series. There is first the study of van Wageningen<sup>23</sup> in 1932 of the 149 cases treated in Dr. Cushing's clinic in 1924-25 (Table IX.). van Wageningen has estimated the survival and useful survival periods of his cases in average figures for each pathological group, and has not discussed the usefulness of all the survivors. Consequently it is not possible to tabulate his material for close comparison with the present series, but Table IX. gives some of his results and these may be compared with certain items in Tables III. and VII.

In van Wageningen's year the survival-rate 7-8 years after operation was 34.9 per cent. as compared with 40.1 per cent. of the present series. In his year there were more gliomas and fewer meningiomas than in 1926-27, but the balance was probably favourable to the year 1924-25, since there were 11 cerebellar astrocytomas as compared with 4 in 1926-27. Such an important difference in the incidence of one variety of tumour from year to year throws doubt on the significance of any conclusions that might be

drawn from comparing the results of the two years. The number of cases is too small. But the results on the whole are probably better in the 1926-27 group, though it may be noted that the useful survival of the acoustic neurinoma appears to have been much better in his series than in this one. In the two series the results in the malignant gliomas and metastatic tumours are, without exception, similar.

A more useful comparison can be made with the series of cases studied by H. M. Tooth at the National Hospital, Queen-square, between the years 1902 and 1911. Tooth's papers on this work<sup>20 21</sup> have probably not been given the attention they deserve. They are clearly documents of the first importance in the history of brain surgery, and at the time when they were published evidently constituted a valuable and sincere endeavour on the part of a neurologist to point the way for further improvements in surgical treatment of intracranial tumours.

Tooth analysed 500 cases of practically certain intracranial tumour which had come under observation at the National Hospital during the years 1902-11, and of these slightly less than half were histologically verified. His papers contain many valuable observations on different varieties of brain tumour.

TABLE IX.—*van Wageningen's Series, 1924-25*

Type.	Total.	Dead.	Untraced.	Living.
Glioma .. ..	80	68	..	12
Pituitary adenoma ..	26	3	1	22
Meningioma .. ..	16	8	..	8
Neurinoma .. ..	11	4	..	7
Craniopharyngioma ..	6	5	..	1
Blood-vessel tumour ..	4	3	..	1
Metastatic tumour ..	4	4	..	..
Miscellaneous .. ..	2	1	..	1
Total .. ..	149	96	1	52

Survival percentage = 34.9.

Table X. has been compiled from Tooth's material<sup>21</sup> for comparison with the present series. It comprises those tumours histologically verified by operation or necropsy in which the late result was known. The results are not strictly comparable with those of the present series for various reasons, but especially because it was not found possible by Tooth to subdivide the gliomas, and because the fate of the survivors was sometimes not known beyond a period of nine months. But comparison of the tables shows clearly that a tremendous reduction in post-operative mortality has been effected in the twenty-five years



TABLE X.—TOOTH'S SERIES, 1902-11

Type.	Total.	Dead.									Living.
		0- $\frac{1}{2}$	$\frac{1}{2}$ -1	1-2	2-3	3-4	4-5	5-6	6-7	7-9	
Glioma .. .. .	92	39	31	8	4	2	..	..	..	..	8
Endothelioma .. ..	30	10	4	..	1	..	1	..	..	..	13
Extracerebellar fibroma and fibroglioma .. ..	27	17	5	..	..	..	..	..	..	..	5
Sarcoma .. .. .	15	10	4	1	..	..	..	..	..	..	..
Carcinoma .. .. .	7	3	4	..	..	..	..	..	..	..	..
Tuberculoma .. .. .	5	1	3	..	..	..	..	..	..	..	1
Cyst .. .. .	5	2	..	..	..	..	..	..	..	..	3
Pituitary tumour .. ..	4	1	1	..	..	1	..	..	..	1	..
Cholesteatoma .. .. .	2	..	1	..	..	..	..	..	..	..	1
Totals .. .. .	187	83	53	9	5	3	1	..	1	1	31

Tooth<sup>11</sup> in 1913 reported 265 cases in which operation had been done for intracranial tumour between 1902 and 1911 inclusive. In 78 cases either the tumour was not verified or the condition of the patient on discharge from hospital was not known. In the remaining 187 cases the tumour was verified at operation or necropsy, and the late result of the operation was known in the cases of the survivors for periods varying between 9 months and 9½ years. The fate of these 187 patients is set out in the above Table. Pineal tumours and papillomas of the choroid plexuses have been included with gliomas. The remainder are placed in the pathological groups in which they were originally described, extracerebellar fibrogliomas and fibromas being grouped together. From study of the protocols it is probable that many cases classed as sarcoma would at present be regarded as gliomas.

The deaths after operation were classified by Tooth according as the patient lived hours, days, months, or years. In this Table all those dying within the first month have been grouped

together, as have all those dying between the second and twelfth months. This interferes with the chance of working out accurately the operative mortality, but in some cases that would have been impossible from the information available. Certainly the operative mortality was greater than 44 per cent. (83 deaths in 187 cases), for a number of the patients in the second column of the dead died in the hospital. Reference to the condition of the living is given in the text.

This method of dealing with the material takes no account of the unverified tumour cases and 32 such patients were living when last heard of. However, perusal of the protocols shows that most of them were in poor condition; only a possible 9 were able to do any work. In this present report the series of unverified intracranial tumours for 1926-27 has not been analysed or discussed because it does not provide information of any help in establishing the prognosis of tumours actually verified and pathologically classified.

that separate the two series, a reduction from over 50 per cent. to 14 per cent. and the survival-rate has greatly increased, from 16 to 40 per cent. The incidence in the operating theatre of benign tumours, such as pituitary tumours and to a less extent meningiomas, has considerably increased, and this fact favours the survival-rate of the later series. But this is balanced by the fact that the survivors of Tooth's series were incompletely traced; only 10 of the 31 survivors had been traced for as long a period as the survivors in the 1926-27 series. Of these, 4 were endotheliomas, 2 were cerebellar gliomas, 3 were cerebellar cysts, and 1 was an extracerebellar fibroma. Of the 31 survivors 14 were able to do some work at the time when they were last heard of.

Advances in surgical technique have doubtless played the major part in this improvement, but not a little must be attributed also to increased accuracy of diagnosis. Thus we find in Tooth's series that in 9 out of 44 verified frontal tumours exploration was made in the cerebellar region or over the wrong cerebral hemisphere. For the gliomas as a group exploration was in the right place in 76 cases and in the wrong place in 17 cases; while in the endotheliomas (meningiomas) exploration was in the right place in 29 cases and in the wrong place in only 4 cases. It is impossible not to admire the accuracy of diagnosis in meningiomas based as it can only have been on the most skilful interpretation of symptoms and signs, often of an inconspicuous or "false localising" character, and without the help of X rays, ventriculography, and other methods that have since proved so fruitful. In the year 1926-27 exploration was made in the wrong place in only 3 cases.

Sepsis also claimed a larger number of fatalities in Tooth's series than in the 1926-27 series, though it would give a false impression to imply that this complication of intracranial operations has been entirely eliminated.

Comparison of the two series shows that the outstanding improvement in the second lies in the immediate post-operative mortality which has, of

course, a considerable effect on the survival and useful survival-rate. It is not possible to measure the increase of longevity that may have resulted from other causes, such as more radical and effective treatment of the tumour.

The earliest literature on the results of surgical treatment of intracranial tumours affords no material for comparison with this series since it was, naturally enough, concerned almost exclusively with the immediate post-operative results; or, when late results were reported, the series of cases was too small to be of any statistical significance. It is fairly clear, however, that the number of useful survivors must have been very small. Thus in 1910 Byrom Bramwell<sup>2</sup> wrote, from a very wide experience, "In only two cases of intracranial tumour which have come under my notice in which an operation has been performed has complete cure resulted." Successes were expected by Starr<sup>19</sup> and by Gowers<sup>12</sup> chiefly in superficial tumours about the fissures of Rolando and Sylvius, tumours which are now found to comprise a rather unfavourable group, because in this situation such a high proportion of them are malignant; Starr and other writers of his time constantly refer to the high mortality of cerebellar explorations and to the inaccessibility of that region. The more recent observations of my series and of van Wagenen's series show that cerebellar tumours are on the whole by far the most likely to give lasting good results.

So much depends on accurate diagnosis and the safety of surgical access. It may well be found in ten years' time that the most favourable cases from the point of view of lasting useful survival are certain tumours of the third ventricle. Indeed, a growing number of observations already point in that direction.

CONCLUSION

It will be clear that I have been afforded the privilege of examining freely and critically the results of my former teacher, Dr. Harvey Cushing, and it is my earnest hope that I have done justice to this small section of what must be called his

epochal work. His cases have been accurately documented in pursuance of a far-sighted design, and the records are available in the Brain Tumour Registry at New Haven for such examinations as the future may indicate to be desirable. It is to be hoped that further inquiries of this nature may be made by others of Dr. Cushing's former assistants, so that before many years there will be added to the initial studies of van Wageningen and myself a greater and statistically more significant volume of knowledge on the late results of treatment of intracranial tumours. That such unrestricted studies of one man's work by his pupils are possible indicates to some extent the sense of partnership with which Dr. Cushing has invested his clinic, a quality that is the mark of all great teachers.

## BIBLIOGRAPHY

12. Gowers, W.: A Manual of Diseases of the Nervous System, London, 1893, 2nd ed., vol. ii., p. 526.
13. Horrax, G., and Putnam, T.: Brain, 1932, iv., 499.
14. Lane-Clayton, J.: A Report on the Late Results of Operation for Cancer of the Breast, Rep. Pub. Health and Med. Subjects, No. 51, London, 1928.
15. Lane-Clayton, J., and McCullagh, W.: A Report on the Treatment of Cancer of the Uterus at the Samaritan Free Hospital, Rep. Pub. Health and Med. Subjects, No. 47, London, 1927.
16. Meagher, R., and Eisenhardt, L.: Ann. of Surg., 1931, xciii., 132.
17. Oldberg, E.: Jour. Amer. Med. Assoc., 1933, ci., 1458.
18. Olivecrona, H.: Arch. f. klin. Chir., 1934, clxxx., 445.
19. Starr, M.: Organic and Functional Nervous Diseases, 1st ed. London, 1903.
20. Tooth, H.: Brain, 1912, xxxv., 61.
21. Tooth, H.: Seventeenth Internat. Cong. of Med., London, 1913, Section VII., Part 1, London, 1913, p. 203.
22. van Wageningen, W.: Arch. Neurol. and Psychiat., 1927, xvii., 57.
23. van Wageningen, W.: Jour. Amer. Med. Assoc., 1934, cii., 1454.

## CESTRIN TREATMENT OF CYSTIC DISEASE OF THE BREAST

By E. DAHL-IVERSEN, M.D.

PROFESSOR OF SURGERY IN THE UNIVERSITY OF COPENHAGEN

THE conservative management of cystic mastopathy finds a new basis in recent observations on the favourable influence of cestrin. Under this treatment the symptoms either disappear or are considerably relieved, and examination shows that the signs are diminished or almost absent, the results being especially good in early cases. The brownish or greenish discharge becomes serous and either decreases or stops. Cutler,<sup>1</sup> Gabrielianz,<sup>2</sup> and Taylor<sup>3</sup> have reported equally satisfactory experience of the cestrin treatment of mazoplasia and mastodynia.

During the year 1935 we have treated 22 cases of cystic mastopathy with cestrin and have obtained considerable recovery in 18. In 2 patients, both between twenty and thirty, the local and general condition was aggravated; and in 2 cases there was no effect. In older persons—i.e., in the middle forties—cestrin treatment will sometimes do harm, presumably because the patient, just before the menopause, is already suffering from a relative excess of cestrin; and the worsening of the general condition of the two patients under thirty resembled that usually observed in the middle forties, with flushes, sweating, anxiety, and especially dizziness.

In the light of our present experience we should advise a dosage of 2000–4000 mouse-units daily

<sup>1</sup> Cutler, M.: Jour. Amer. Med. Assoc., 1931, xcvi., 1201; 1932, xcix., 2152; 1933, ci., 1217. Ann. of Surg., 1931, xcii., 223. Surg., Gyn., and Obst., 1929, xlviii., 463. Amer. Jour. Obst. and Gyn., 1933, xxv., 504.

<sup>2</sup> Gabrielianz, A. G.: Amer. Jour. Obst. and Gyn., 1933, xxv., 499.

<sup>3</sup> Taylor, H. C., Jr.: Arch. of Surg., 1930, xxi., 42; Surg., Gyn., and Obst., 1933, lvii., 627.

by mouth or 10,000–20,000 m.u. once a week intragluteally. The course of treatment should last 3–6 months and in some cases should be continued longer, with pauses. The idea that the remedy is more than symptomatic is supported by the evidence of biopsy in the case described below. The treatment seems applicable especially to cystic mastopathy in young women, in the hope of avoiding operation. Surgery should be regarded as inadvisable unless cestrin proves of no avail or there is some doubtful change in the clinical picture. On the other hand, the conservative treatment necessitates close and continuous observation of the patient. The affected breast should be supported but on no account compressed.

We also try conservative treatment in older persons, but if it does not help we have less disinclination to operate, particularly if there is any suspicion of papillomata in the lactic ducts, or of early carcinoma. With older patients conservative treatment demands even closer and more continuous supervision. If operation is decided upon partial extirpation finds favour if the process is clinically localised; for experience shows that as a rule the condition does not recur, for many years at least. But partial operation likewise carries the necessity for careful observation. Where the changes are diffuse, partial extirpation is of course unwise and the best plan is ablatio mammae, with possible retention of skin, areola, and papilla. Whatever operation is adopted microscopical examination is essential, so that a radical removal may be performed if need be.

As an example of considerable recovery after cestrin treatment the following case may be quoted.

The patient was 49 and had had two children, the second being 15 years old. The menopause had taken place nearly eight years ago, menstruation having previously been normal. On and off for the past two years she had had stabbing pains in both breasts, and had been able to squeeze a dark, greenish, slimy liquid out of the papillae. Examination three months ago showed that the whole right breast was of firmer consistency than is normal, and full of numerous small lumps. A greenish, slimy liquid could be pressed out of the papillae from all quadrants. In the left breast there were corresponding changes in the two upper quadrants, and the process also extended a little way down into the two lower ones. The same sort of secretion as in the right breast could be pressed out of the papillae from the affected regions. Both breasts were slightly tender. The axillary glands were not swollen. Examination of the internal genital organs revealed no abnormalities.

After the patient had taken 86,000 m.u. of cestrin by mouth (3000 daily) there was considerable improvement. The stabbing pains were now less frequent and comparatively slight. The affected parts of the corpora mammae were softer and less tender, the small lumps were either not palpable, or only to be felt indistinctly in a few places. The discharge, which was now nearly serous, could be pressed out of only a few lactic ducts. In a limited region in the upper lateral quadrant of the left breast, however, the improvement was less pronounced than in the other parts, and in view of the patient's age a portion was excised under local anaesthesia. The histological picture was not characteristic, being suggestive of the regressive processes seen in a breast that has been subjected to energetic X ray treatment, or simply those observed at the menopause. There was a cellular reaction round the lactic ducts and this, in association with the characteristic pale epithelium and the presence of numerous glandular tubes without corresponding acini, speaks of regressive changes. The breast had evidently been the seat of abnormal development of the glandular tubes such as we see in benign cystic disease. There was no indication of malignancy.

We continued the cestrin, this time as a weekly dose of 20,000 m.u. intergluteally. After another 100,000 m.u.

had been given in this way we stopped the treatment and found both breasts soft, of almost normal consistency. The small lumps were no longer palpable. When the right breast was squeezed hard it was possible to press a little greenish discharge out of one of the lactic ducts, and from another one a little serous fluid. In the left breast a little serous liquid could be obtained from a single lactic duct, but only after firm pressure. The tenderness had disappeared. Eight months after ending the œstrin treatment the condition remains the same.

It will be observed that in this case of bilateral cystic mastopathia excellent results followed administration of œstrin (86,000 m.u. by mouth and 100,000 by injection). As already stated we are able to record a considerable degree of improvement in 18 of 22 cases in which œstrin has been used.

## THE EVIDENCE OF A BULLET WOUND SELF-DEFENCE OR MURDER?

By G. R. OSBORN, M.B. Melb.

FORMERLY MEDICAL OFFICER IN CHARGE OF THE COMMONWEALTH  
HEALTH LABORATORY AT KALGOORLIE, AUSTRALIA

THE deductions drawn from injuries caused by bullets may be of great importance in the law courts, and medical men who may have to give evidence about such injuries should be familiar with their characteristics. This was brought home to me by the following case.

### THE STORY

Z. is a Jugo-Slav employed as a miner on the Kalgoorlie goldfields; he is happily married and has three small sons. L. was a Montenegrin, also a miner, and the two men were formerly good friends. The friendship broke off when L.'s infatuation for Mrs. Z. became obvious, and he was warned to keep away from the house.

A few days before the shooting he sent a message to Mrs. Z. saying that he would go to see her at 9 p.m. on Monday (at a time when Z. would be at work in the mine). Mrs. Z. gave the message to her husband, who decided, he said, to give L. a bad fright. He borrowed a 0.44 Winchester rifle from his butcher, "to shoot a mad cat" and bought a few bullets from the local store. These bullets are made of lead without a hard jacket and carry a heavy charge of black powder; they are of the type used for shooting kangaroos. He took the rifle home and hid it under a bed in the front bedroom. He took no lawful steps to have L. restrained.

On the Monday afternoon Z. went to work as usual, but at 8 p.m. he pretended he was ill, was brought to the surface and went home. Reference to the plan of his house (Fig. 1) is necessary to follow the events which then took place. He found his wife sitting (at the place marked z<sup>1</sup>) sewing in the living-room by a long table. He told her not to worry and went into the front bedroom where his boys were sleeping. He then loaded the rifle and waited in the dark for the arrival of L. At the appointed time L. entered by the back door and walked up to the spot marked L beside Mrs. Z. He put his arms around her and started making love to her. When Z. heard this he rushed out of the bedroom to the spot z, and, holding the rifle with the butt under his elbow and the barrel pointing upwards, called out "Hands up, hands up!" L. was then shot dead. Z. did not move from the point z, and was still there when his brother-in-law returned with the police.

Z.'s story of the shooting was that when he called out to L. the latter lunged at him with his right hand while thrusting his left towards an inside coat pocket—a movement which Z. decided was to get a revolver. Actually the police found a fully loaded revolver in this pocket. Z. said that he then realised that if he did not shoot he would himself be killed, and

so he fired. He estimated that the distance from the muzzle of his rifle to L.'s head would be three or four feet. He said that L. fell straight backwards on to the floor, where he was found on his back with his feet towards Z. and that he did not move or utter a sound.

When the police arrived they found Z. standing at the point marked z; Mrs. Z. in the bedroom

quietening the three boys; and the body stretched out as described. Around the right side of the head there was a rather large pool of blood which was virtually part of a pool of blood and brain matter on the table (see Figure).

At a point marked B, near the kitchen door, was found a fragment of bullet, which had evidently had no velocity when it reached this spot, for there were no marks on the soft wall. The

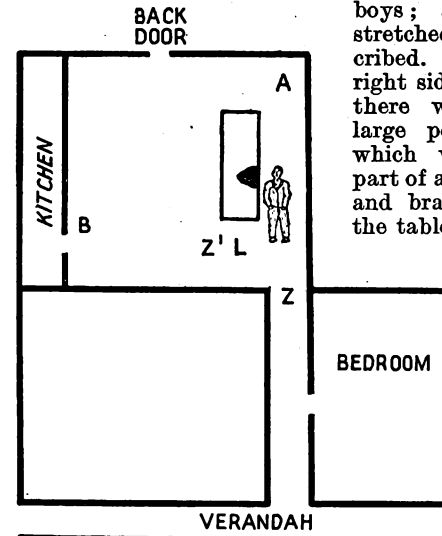


FIG. 1.—Diagram of scene of shooting. z marks position of Z. when shooting L. z<sup>1</sup> shows position of Mrs. Z. and L. that of L. beside her. B shows where a fragment of the bullet was found, and A shows theoretical position if victim was shot from behind. The position of the body and blood stains on the table are indicated.

walls were of paper over hessian, and it would not be possible for the bullet to rebound from them.

### THE POST-MORTEM FINDINGS AND THE CONCLUSIONS DRAWN FROM THEM

On post-mortem examination a large gaping wound was found just behind external angle of the right eye, about 2 in. in diameter (Fig. 2). There was no bone in this hole and the brain substance, much macerated, could be seen through it. Behind this wound and immediately above the right ear was another hole, which was not ragged, but clean-cut; it admitted only the little finger and also communicated into the brain substance. No scorching or blackening was detected. On dissection the bones of the skull were found to be extensively fractured on the right side. The brain substance was also macerated very extensively on the right side and much of it was missing. In its substance were many fragments of small bone, and two pellets of lead were extracted.

From these findings the examiner drew the following conclusions:—

It is my opinion that the damage was caused primarily by a leaden bullet which had entered the head through a clean, well-defined hole above the right ear, smashing the bone there in radiating fractures, entering the brain substance, part of it remaining, and another portion escaping through the ragged tear in the soft tissues at the outer corner of the orbital cavity and that instantaneous death was the result.

This conclusion was presumably based on the belief, which is widely held, that bullets make a small wound on entry and a large one on exit. It gave

overwhelming support to the Crown's contention that Z. was lying and that he had shot L. from the back—in other words, that he was guilty of pre-meditated murder. The judge was quite emphatic that if the victim was shot from the front it could be self-defence—which was the plea advanced—but if he was shot from the back then the defence must fail and the jury could only bring in a verdict of wilful murder. The conclusion as to position drawn by the Crown medical witness accordingly became the central point of the trial. In fact there was virtually nothing else in dispute.

#### RECONSIDERATION OF THE EVIDENCE

Z. had been well known to me as a patient for over two years, and I had a high opinion of him. I was accordingly impressed by his absolute refusal to alter his account of the shooting. His lawyer told him that falsehoods would prejudice his case, and that the Crown was sure that L. was shot from the back; he suggested that perhaps L. had turned his head away as he fired. But Z. replied: "If I am to hang for it I cannot say anything else." We accordingly reinvestigated the evidence and I came to the conclusion that the Crown witness was wrong in supposing that the small wound is necessarily the one by which the bullet entered.

This idea, I found, is in fact based on the behaviour of hard (e.g., nickel-jacketed) rifle bullets of high velocity (over 2300 ft. per sec.) fired at a range of round about 200–800 yards, and it is not in the least applicable to soft lead bullets fired with a low muzzle velocity or at short range. Even the hard rifle bullet, at less than 200 yards, will probably cause a large ragged hole—(1) because of the terrific force of impact, virtually causing an explosion, and (2) because it is pointed, not truly cylindrical, and therefore "wobbles" in the early part of its flight, before being steadied by wind-resistance.

Hence, contrary to the general belief, a large entrance wound is the rule with rifle bullets fired at close range; and during the late war such wounds often gave rise to unfounded accusations that the enemy was using dum-dum bullets—i.e., bullets whose point has been removed in order that they shall flatten out instead of penetrating. (It is difficult to see that warfare is any less horrible when waged with nickel bullets.)

In the case before us, however, the bullets were of soft lead, unjacketed, and fired at very short range from a rifle with a muzzle velocity of about 1300 ft. per second. As soon as such bullets strike the body they "mushroom out," like dum-dums, and thereby cause great destruction of tissues. The result is that the entrance wound will probably be much bigger than the exit wound—if indeed there is an exit. If the soft bullet also has a wobble, which is likely if it is fired at close range, it is almost impossible for it to make a clean-cut entrance wound. This fact can readily be applied to the present case.

Referring once more to Fig. 2, the small clean-cut wound was at a point *g* over the right ear, and the large wound was 2 in. in diameter with its centre at *D*. *G-D* is approximately 2½ in.; for the first 1½ in. the skull is in place though extensively fractured, while the last inch has neither skull nor scalp. To cause a large circular hole the bullet must have struck the skull at, or slightly proximal to, the mid-point *D*, and approximately perpendicularly to the surface. If *g* is the entrance wound then *D* must have been struck from about the centre of the brain and emerged in the direction *D-J* which leads to a point *A* in the room (Fig. 1) where the bullet was not found. The absurdity of a course such as *G-K-D-J* is at once obvious,

for there is nothing in the brain to deflect a bullet. If the bullet entered the brain at *g* then the nearest it could possibly get to *D* would be about the centre of the forehead along a path such as *G-K-E*; much more probably it would have struck the skull again on the left side. Accordingly we can say it is impossible for *D* to have been struck from within the skull. There is however one other course which can be made out with *g* the entrance—i.e., *G-C-H*—which would leave the bullet nearer the back door but still a long way from *B* near the kitchen door. If the bullet did not at once enter the brain at *g* but tracked between the skull and scalp it would tend to take the course *G-C-H* which is ¾ in. away from *D* at its nearest point, and a course *G-C-D* is absurd.

By anatomical considerations we are forced to conclude that *g* cannot be the wound of entrance. This conclusion is strengthened by the fact that, though only one of three pieces of the bullet emerged from the head, the bone substance was driven into

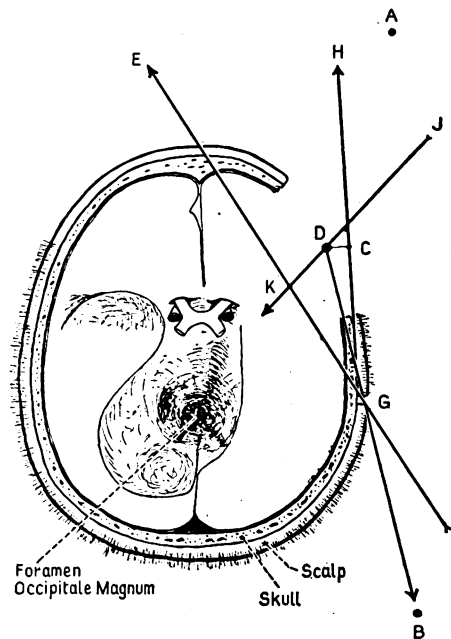


FIG. 2.—Diagram showing head injuries of the dead man and possible courses of the bullet. For explanation of letters, see text.

the brain and the loss of bone substance is from the anterior wound. A soft bullet has lost most of its energy when it mushrooms out, and a third of a spent bullet could not have caused the extensive injuries found anteriorly.

If on the other hand we examine the wounds as Z. said they were inflicted their anatomical explanation is simplicity itself.

If the bullet were fired in a direction such as *J-D* it would cause a large wound of entrance such as was found with its centre *D*. As soon as it hit the head it would mushroom out and burst into the three pieces in which it was found. Two of these three pieces continued on into the brain and were found there—i.e., their force was largely spent. The third piece of bullet was guided by the skull around between the scalp and bone in the direction *D-G*, in which plane it would not meet with any resistance until it reached the place where the skull and scalp turn medially towards the occiput. This place is, of course, over the ear, where the small round hole was found, and the course *J-D-G* leads directly to the point *B* near the kitchen door where the fragment of bullet was actually discovered.

No burning or powder marks were found around the wounds. The likelihood of such marks being present when the victim is shot from a short distance

depends primarily on the type of powder used. With cordite for example there is almost complete combustion in the firearm and no powder marks will be found, even at a distance of a few feet. With black powder, on the other hand, such as was used by Z., it is the rule to get powder marking at a considerable distance—e.g., 20 ft. or more. Hence in our case, with a range of only about 4 ft., if the small posterior wound was really the entrance a heavy black powder marking might certainly have been expected round it. If on the other hand the large anterior wound was the entrance the reason for its absence is obvious. At this short range the dispersion of the powder would be less than half the diameter of the part of the scalp and skull blown out, so that it must have been blown off also. Accordingly the evidence of the powder marking strongly supports Z.'s story.

We can also argue the position of the victim from the position of the body and blood stains on the table and floor.

Concussion is a hyperacute cerebral compression; it is manifested clinically by an instantaneous paralysis of the entire body and all its functions. Although people who are shot through the body may twist around in a great variety of ways before dropping down, those who have an injury which causes concussion always fall straight down limply. The injuries which L. received would cause instantaneous concussion and death, and he should fall as Z. said he did—straight back to where he was found without any movement at all. Had he fallen in this way it is clear that the right side of his head would have been towards the table as he fell, and the reactionary force would cause the blood and soft brain matter to fly out on to the table as the head fell past it, and then to form the pool on the floor to the right side of the head which was virtually part of the pool on the table. Had he been shot from behind the blood would have shot in the opposite direction—away from the table, and the body should have been on its face. The explanation offered was that the body fell on to the kitchen side of the table, lay there for a while and then rolled over to the position in which it was found. This is a most unlikely course, however, because the natural tendency would be to fall to the kitchen side of the table, and in any case it does not fit the facts nearly as readily as the simple description given by Z.

The jury returned a verdict of "not guilty" and Z. was discharged. The verdict was very popular, but it was clear that the life of the accused rested almost entirely on a medical argument.

EVIDENCE WHICH WAS OVERLOOKED

Details were submitted to Prof. Sydney Smith of Edinburgh for his criticism, and I wish to record my appreciation of his kindness in allowing me to quote the following passage from his letter:—

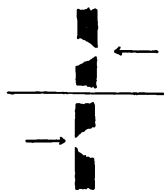


FIG. 3.—Beveling of skull in line of fire.

"There are one or two points which are of extreme importance which have not been described—namely, the examination of the wounds in the skull bone gave no indication about beveling. This is most important for it is almost invariable that the bone bevels in the direction of fire, and in the clean-cut

hole which was found posteriorly, beveling on either the inside or the outside was almost certain to be present, and if it were present, if it were on the outer table, it would indicate that the posterior wound was the outlet wound of the bullet; whereas if the beveling were on the inner table it would indicate that it was the entrance wound (Fig. 3). It would be more difficult perhaps to see whether there was

any beveling in the anterior wound, but if the fragments had been carefully collected and the skull reconstructed, it should have been possible to make this observation also.

"Secondly, no information is given about the amount of bone fragments that were found in the brain. The post-mortem report says in its substance were "many fragments of small bone pieces," and the question arises whether the number of fragments were more than could be accounted for by the loss of substance of bone in the posterior wound. If the number was greater, then they must have been driven into the skull from the anterior wound, for obviously if it were the exit wound, all bone fragments would be blown outside the skull.

"Thirdly, there is no evidence in the report to show where the fragments of bullet were found. This might also be helpful in fixing the line of fire."

SUMMARY

This is a case in which justice nearly miscarried through misinterpretation of post-mortem findings. It was wrongly supposed that bullets necessarily cause a small clean-cut wound at entry and a large irregular wound at exit. This is usually true of jacketed bullets fired from rifles with a high muzzle velocity (over 2100 ft. per second) at a range of 200-800 yards; but the same bullets encountered at shorter range, or soft bullets, or bullets fired from firearms with a lower muzzle velocity, may have the opposite effect, and the entry wound may be larger than the exit.

When black powder has been used powder marking may be expected up to a range of 20 ft. or more, and this may help to confirm anatomical deductions about the line of fire. Such deductions should be founded on very careful examination, bearing in mind the details of fundamental importance.

LEBANON HOSPITAL FOR MENTAL DISEASES, SYRIA. Sir Hubert Bond presided at the thirty-seventh annual meeting of this hospital held at Friends House on May 18th, and presented the report of the medical director, Dr. Stewart Miller. There had been a record number of 556 patients under treatment during the year, and the chairman commented on the surprising proportion of admissions (239) to the number of beds (370). As in England, the largest group of patients was of the schizophrenic reaction type (90 cases), the next largest being the more hopeful group with recurrent phases of excitement or depression (42 cases); 57 patients had been discharged during the year recovered, 69 improved, 18 not improved, 3 not insane. Of the 147 discharged, 75 had been there for less than three months, and all but 26 for under one year. The large proportion of early cases might be accounted for by the absence of certification in Syria. Dr. E. W. G. Masterman, chairman of the general committee, said that the work requiring doing at their own door was sufficient to warrant the erection of another hospital of equal size, if funds were forthcoming. They had decided: (1) to expand the hospital up to 500 beds; (2) to deal with borderland cases in a branch convalescent home in the Lebanon. A hundred new beds had been added during the last 18 months; there were now 12 houses, and the unit was considered a model for the country. Patients came for treatment from Egypt and other neighbouring countries. The director's position as lecturer at the University of Beirut on mental and nervous disorders brought him in touch with the fifth-year students who were the future practitioners of the Near East. The hospital stood in a key position there, and its influence as a healing centre amidst political strife was one of its brightest features. The new report will be sent on application to the secretary, Lebanon Hospital Committee, Drayton House, Gordon-street, London, W.C.1.

## MEDICAL SOCIETIES

ROYAL SOCIETY OF TROPICAL  
MEDICINE AND HYGIENE

A MEETING of this society was held on May 21st at Manson House, with Sir ARTHUR BAGSHAW, the president, in the chair. The subject for discussion was

**Intestinal Absorption in the Steatorrhœas**

Dr. N. HAMILTON FAIRLEY opened with a paper on tropical sprue, with special reference to intestinal absorption. The difficulty of presenting this subject had, he said, been considerably increased by the recent tendency in America and on the Continent to identify celiac disease, idiopathic steatorrhœa, and tropical sprue. While absence of intestinal lesions at autopsy and deranged intestinal absorption were common to the three diseases, the inclusion of tropical sprue was not justifiable. Idiopathic steatorrhœa included two groups: (1) adult celiac disease, cases of which presented bony deformity and a history of prolonged intestinal disturbance in childhood; (2) non-tropical sprue, which was a much rarer and more severe disease than tropical sprue, and often ended fatally despite modern treatment. Dr. Fairley's subsequent remarks concerned only tropical sprue. In this condition steatorrhœa was an outstanding feature and 80 per cent. of cases showed a total fat value exceeding 25 per cent. of the dried fœces (70 cases) on a single examination. With recovery the fœcal fat returned to normal limits. Over 50 g. of fat was not uncommonly excreted in 24 hours in severe cases when on a mixed diet. Hypocalcæmia was common and in 80 cases the average blood calcium equalled 8.8 mg. per 100 c.cm. In 11, it ranged from 5.1 to 7.0 mg. All had tetany. The blood phosphorus varied from 1.6 to 4.0 mg. per 100 c.cm. This finding precluded parathyroid deficiency as a basis of the hypocalcæmia. In 42 out of 50 cases flat glucose curves and curves showing a submaximal or a delayed maximal rise were demonstrated. Such findings had been attributed to the increased rate of removal of sugar from the blood due either to endocrine disturbance (Thaysen) or hypersensitivity to insulin resulting from compensatory excessive carbohydrate intake when fat was being poorly absorbed (Himsworth). Fairley and Bromfield had held defective absorption of glucose responsible. To test these views an intravenous glucose test had been devised. Of 10 cases of tropical sprue so investigated all showed high curves compared with the normal and a marked delay in the return to the fasting sugar level. Furthermore, on recovery, the intravenous glucose curves were always found to be lower and to approximate closely to the normal. This sluggish utilisation of sugar on intravenous injection was attributed to a decreased sensitivity to insulin resulting from defective absorption of glucose which was also the true explanation of the flat and delayed oral sugar curves. It followed that intravenous glucose and insulin were both indicated in gravely ill patients. Unabsorbed glucose underwent fermentation in the small intestine and gave rise to intestinal distension and the gaseous, acid features of the stools. Unabsorbed fat accounted for their greasy, bulky character. Calcium in the gut united with excess of fatty acids to form insoluble calcium soaps and this was probably the basis of the hypo-

calcæmia. Certainly the treatment of tetany by calcium per os was ineffective until the fat content of the stools had been adequately reduced by lowering the fat intake in the food.

Patients developing sprue sought medical advice for intestinal trouble, not for anæmia. Later in the primary attack and in relapses, anæmia was more constant and more severe, and when fully established it was megalocytic in type and indistinguishable from pernicious anæmia. The Price-Jones curves were similar and true megaloblastic hyperplasia of the bone-marrow occurred. Hyperchromia or orthochromia was the rule; if hypochromia were present complications should be sought. Microcytic anæmia in tropical sprue was invariably due to intercurrent disease. In 100 cases of sprue only 22 failed to secrete acid when histamine (0.25 mg.) was injected. After recovery it was found that the curve of acid secretion gradually returned to its normal level whatever that might have been. Similarly, clinical results indicated that the secretion of intrinsic factor was often only transiently deranged, for many cases of sprue resident in England remained perfectly fit in the absence of a maintenance dose of liver extract. In both these respects tropical sprue differed essentially from pernicious anæmia. Excellent results followed oral liver extract (1½ lb. whole liver daily) provided this treatment was combined with a series of graded high-protein, low-fat, low-carbohydrate diets. There was almost always a maximal reticulocyte response from the seventh to the tenth day and rapid regeneration of both erythrocytes and hæmoglobin. The adverse results reported by Castle and his colleagues (1935) with liver by mouth could only be attributed to the fact that appropriate dietetic measures had not been simultaneously instituted. The rapidity with which sprue patients responded to liver extract per os under these circumstances was comparable to that observed in pernicious anæmia and suggested that defective production of hæmopoietic principle rather than defective absorption caused the megalocytic anæmia. Iron absorption also was unexpectedly good; only occasionally did hæmoglobin production lag sufficiently behind the red cell output to render iron therapy necessary.

Provided appropriate dietary measures were instituted the relative efficacy of liver extract given orally or parenterally appeared to be essentially a question of dosage. In those rare cases where an inadequate hæmatological response followed administration of liver by mouth, parenteral injections were effective only in a correspondingly larger dosage. Clinical experience suggested that both oral and parenteral liver extracts might have effects over and above those explained by their content in anti-anæmic principle. Three crystalline substances had been isolated by Dakin and West. It did not follow, however, that any additional beneficial effects liver extract might possess depended necessarily on its content in a factor or factors absent from the diet of sprue patients. Obviously the pharmacological action of such constituents and their possible direct or indirect effect on the absorptive function of the intestine demanded consideration.

Castle and Rhoads and their co-workers last year attributed sprue in Porto Rico to a deficiency of extrinsic factor in the diet. In Dr. Fairley's series patients came from India, Malaya, China, Manila, and other parts of the world. At the time of develop-



ing sprue the vast majority were living on a diet which compared favourably in its protein content with that taken in Europe and included abundance of eggs and meat, besides vegetables and fruit. Many had been taking beef twice a day, fish once, and eggs and bacon for breakfast. They mainly comprised well-to-do people such as merchants, government officials, judges, bishops, lawyers, and army officers, and in general belonged to a class which did not develop avitaminosis. In Dr. Fairley's opinion the conception of sprue as a primary deficiency disease caused by lack of extrinsic factor or any known vitamin was quite untenable. The theory was not in accord with facts regarding the origin of sprue in parts of the world other than Porto Rico, nor with its absence in countries like Africa where dietary deficiencies were common. Finally it failed to explain the fundamental biochemical findings in regard to fat and sugar metabolism in this disease.

In summarising, Dr. Fairley elaborated his own view that the phenomena of tropical sprue could best be explained in terms of a metabolic breakdown of the gastro-intestinal tract characterised by defective absorption in the small intestine with or without defective secretion of Castle's intrinsic factor by the pyloric and Brunner's glands. Malabsorption generally affected both fat and glucose simultaneously. There were cases, however, where one or other was predominantly implicated; under these circumstances either steatorrhœa and hypocalcæmia or carbohydrate fermentation with decreased glucose tolerance dominated the picture. Avitaminosis, when it occurred, was a secondary phenomenon dependent on malabsorption or too restricted a diet self-imposed with the object of cure. In regard to causation, he pointed out that a somewhat similar intestinal breakdown occurred in hill diarrhœa under conditions of low barometric pressure and high humidity. In tropical sprue the factor and factors determining the breakdown had not been elucidated. The real enigma was geographical distribution, and whoever solved that problem would solve the ætiology of tropical sprue.

#### CELIAC DISEASE

Dr. C. WALLACE ROSS read a paper on intestinal absorption in cœliac disease, with remarks on the effect of liver extract upon carbohydrate metabolism. He began by summarising the recognised deficiencies of cœliac disease, including those relating to fat, protein, vitamins A, B, C, and D, calcium, phosphorus, iron, and Castle's anti-anæmic factor—the last being a great rarity. He then proceeded to examine the position in regard to carbohydrate absorption. Three explanations had been put forward for the flat oral glucose-tolerance curves found by workers in cœliac disease—namely, an endocrine disturbance (MacLean, Sullivan, Thaysen, and others), an excessive tolerance for glucose based on a high carbohydrate intake (Himsworth), and a simple absorptive deficiency (Marfan, Parsons, and others). The speaker presented a number of intravenous and oral glucose-tolerance curves and insulin depression curves showing (1) the association of high intravenous curves with flat oral ones; (2) the possibility of reducing these high intravenous curves towards normal by giving glucose intravenously over a period of time; and (3) the existence in cœliac disease of a state of relative insensitivity to insulin, comparable to that of a normal person on a low carbohydrate diet. These three findings were deemed good evidence of an absorptive deficiency for carbohydrates. A number of intravenous glucose-tolerance curves were then shown which had been derived from cases of cœliac

disease, chronic intestinal indigestion without steatorrhœa, abdominal tuberculosis, and cirrhosis of the liver, before and after treatment with Campolon or Anahæmin by injection, or liquid extract of liver by mouth. From these it was suggested that total liver extracts contain a factor, possibly identical with Himsworth's "insulin-kinase," which is capable of improving the glucose tolerance or the sensitivity to insulin where this is impaired by carbohydrate deprivation or by liver disease, sometimes to the great clinical benefit of the patient. This factor is not identical with Castle's "essential, anti-anæmia factor" and is not present to any great extent at least in anahæmin (Dakin and West's fraction). There was at present no evidence that this factor affects absorption.

#### DISCUSSION

Prof. L. G. PARSONS (Birmingham) said he saw no essential difference between cœliac disease in childhood and the idiopathic steatorrhœa of adults. There were, however, differences—especially in the blood picture—between cœliac disease and tropical sprue. Apart from occasional megalocytic anæmia and glossitis he failed to see any connexion between pernicious anæmia and cœliac disease either in the child or adult. Ross's observation that campolon intravenously improves the impaired glucose tolerance in cœliac disease, while anahæmin has almost no effect, appeared to be an insuperable objection to Castle's view that pernicious anæmia and cœliac disease are conditional deficiencies caused by lack of specific reaction between extrinsic and intrinsic factors. Whatever might be the cause of cœliac disease its symptoms par excellence were those of a deficiency disease; yet, as Fairley had shown in tropical sprue, this was not due to any known deficiency in the diet, but to malabsorption in the gut. It was a question of starvation in the land of plenty! Steatorrhœa was an erroneous term. Not only was there malabsorption of fat, but carbohydrate was involved as well. British pædiatricians had underrated the latter fact, but the work of Ross showed that glycorrhœa was as characteristic of cœliac disease as steatorrhœa.

Dr. H. P. HIMSWORTH said in view of the evidence now brought forward by Fairley and Ross he agreed that his own suggestion was wrong concerning the origin of the low glucose-tolerance curves in steatorrhœa. Glucose apparently was absorbed by an active process involving phosphorylation, lævulose by a process of simple diffusion. This might account for the different behaviour of the two sugars referred to by Prof. Parsons. Dr. Fairley had brought forward convincing evidence that calcium was inadequately absorbed. Johnson in America had recently shown that calcium gluconate in the gut prohibits the absorption of glucose; perhaps there was some connexion between the two. The effect of campolon in increasing the utilisation of glucose described by Ross was very interesting. He himself had tried to demonstrate this kinase action, but had failed.

Dr. JANET VAUGHAN agreed with Prof. Parsons that there were no essential differences between the cœliac disease of children and the idiopathic steatorrhœa of adults. She agreed there was evidence of malabsorption in idiopathic steatorrhœa and reviewed the biochemical results regarding fat, calcium, and glucose. In 9 out of 11 cases flat oral glucose curves had been found, but in contradistinction to the findings in tropical sprue the flat curves persisted after the clinical condition of the patient had enormously improved. Preliminary investigations

in conjunction with Dr. King indicated that there was a wide variation between the venous and arterial blood-sugar level when glucose was injected intravenously, and in this respect there appeared to be a difference in the utilisation of sugar in steatorrhœa patients and normal people. The blood picture was variable. The anæmia might be (1) hypochromic, responding to iron; (2) of megalocytic hypochromic type, responding to Marmite; or (3) erythroblastic (rarely). In cases responding to marmite the anæmia did not arise from lack of extrinsic factor as suggested by Castle.

Dr. REGINALD MILLER commented on the agreement of all speakers that malabsorption was the essential factor in cœliac disease. In his opinion defective absorption of fat was the essential defect and the carbohydrate disturbance secondary.

Dr. ROSS, in reply, said that in 6 cases which still had cœliac disease, but which had improved clinically, there was only slight improvement in the curves—less than he would have anticipated from their clinical progress. He thought Dr. Himsworth's idea regarding the absorption of lævulose a reasonable one.

Dr. FAIRLEY, in reply, said that demonstrable osteoporosis was rare in tropical sprue, though it probably did occur to some degree in chronic cases with persistent hypocalcæmia. In a certain number of selected cases at the Hospital for Tropical Diseases Dr. Mather Cordiner had failed to demonstrate it when people of similar age were used as controls. Obviously tropical sprue was altogether a milder breakdown than that of cœliac disease or of idiopathic steatorrhœa. With recovery both the oral and intravenous blood-sugar curves returned to normal; if they did not the patient had not recovered.

## ROYAL SOCIETY OF MEDICINE

### SECTION OF DERMATOLOGY

At a meeting of this section held on May 21st, with Dr. H. W. BARBER, the president, in the chair, a paper was read by Dr. S. LOMHOLT (Copenhagen) on

#### Alpha and Beta Rays in Skin Therapy

In such a city as London, he said, there were easy means of employing radium emanation, especially beta rays, in the practice of dermatology. During the last 40 years the importance of this treatment had been increasingly recognised in this speciality. Finsen's work on concentrated chemical rays was fundamental, and this method of treating lupus was still the best available. Treatment by X rays and radium had become even more important, but unless great and skilful care were exercised there was a real risk of producing burns, some of which remained incurable. Recent improvements in machines had rendered these burns less frequent however. Finsen's ultra-violet rays did not cause burns, as their potency was almost infinitely less than that of X rays or radium. The magnitude of the energy quantum varied inversely with the wave-length, the energy in the case of short waves being far greater than for long waves. Lord Rutherford had shown that the greater part of the mass of the atom was concentrated in a small nucleus of very high specific gravity. Though a cell might not be killed by irradiation it might suffer permanent damage, and so might lose its power of reproduction. The energy of the ultra-violet ray was comparatively small, but its effect on pathological cells was greater than on normal

cells. Alpha rays penetrated the skin to only a short distance, and hence were very suitable in the treatment of superficial skin lesions. It was an effective treatment for psoriasis on the body. Dr. Lomholt showed a number of plaques, charged with emanation, which could be divided up into pieces to fit the lesions to be treated; the amount of charge was regulated according to the particular requirement, with due allowance for loss of potency in the post.

Prof. E. RAMEL (Lausanne) read a paper on  
**Neuropathic Eczema**

He used the term neuropathic for the type of eczema in which the autonomic nervous system acted as a regulator mechanism on the allergic sensitivity of the skin. Recent investigations on the microbial flora of eczematous lesions had proved that the saprophytic microbes were able to produce sensitisation and an eczematous reaction of the skin. Dr. Ramel considered that this power of bacterial sensitisation of the skin was under the control of the autonomic nervous system, and that a certain type of eczema was met with which seemed to be of neuropathic nature, and which could be recognised by the appearance and development of the rash. This was a papulo-vesicular eczema, which at first was limited to one area, but soon showed a tendency to become generalised with a symmetrical distribution. After a period of oozing the eczema assumed the lichenoid form, and the confluent lesions became secondarily lichenified, thus closely resembling neurodermatitis. An important pigmentary change complicated the eczematous lesions, and on the more severe lesions vitiligo appeared. At the time of the appearance of the rash there was a complaint of definite symptoms—i.e., pruritus and intense burning sensations, to the accompaniment, in some cases, of insomnia, and the lack of response to the usual external treatment was a confirmation of the neuropathic character of the trouble. Tests, such as Platz's, showed the presence of a variable neuro-vegetative irritability, which was a subconscious result of the psychic shock. These patients often showed, also, great swelling of the lymphatic glands of groins and axillæ owing to the prolonged scratching. The blood always showed a high eosinophil count. Emaciation followed the injury to the trophic nerve centres; in some cases this went on even to cachexia. A knowledge of psychiatry was a great help in successful treatment.

## MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY

At a meeting of this society held on May 14th, Dr. EMANUEL MILLER read a paper on the

#### Limits of Psychopathology

These limits, he said, are defined by two conditions. First the mechanical limit or the limit imposed by heredity and by physical disorder, and (2) the idiosyncrasy of the nervous system. The reaction types can be regarded as in part dependent upon constitutional differences which determine the lines along which emotional development will take place. Whatever be the emotional patterns which develop the neurosis or the psychosis will be along fairly specific lines, although daily psychiatric experience is concerned with varieties and with "mixtures." Whatever be our theories the ultimate neurotic and psychotic forms will be, to this extent, predetermined and outside the range of psychotherapy. We can

hope, however, to restore to a patient his basic pattern by reducing the tensions which personal conflicts and frustrations in childhood and adolescence and maturity have produced.

With regard to the limits determined by the psychopathologies themselves, these are determined by the ideology of the theories, their fundamental assumptions. There is a tendency in most scientific disciplines to look for a unifying concept which shall explain the facts they have discovered. If it satisfies a large number of facts it more easily becomes a foundation-stone of doctrine, and the superstructure of theory takes on the shape predetermined by this foundation concept, sometimes where subsequent facts warrant alternative theories. The danger of these unitary ideas in psychological medicine is that the structure of the mind and the method of therapy are profoundly influenced. Adler has taken the idea of superiority and sees it permeating all human behaviour. That this is derived from the inferiority feeling is admitted. Both inferiority and superiority are complex mental states, and while the one may underlie the other, it is in Adlerian analyses not very fundamental. But Adler has nowhere made clear what this really means, whether it is gregariousness, whether it is or not an instinct or search for others and a satisfaction in their presence. We nowhere are told whether these are inborn dispositions or derivations. At most we can say they are all high level conative dispositions, and little if

any reference is made to the potency of unconscious processes.

The Freudian psychology has much more to recommend it inasmuch as it bases itself on an instinct psychology which lies at the root of psychogenesis. But here too the search for unitary principles has limited the structure of the mind by the narrow concept of a libido which makes a reductive analysis almost an infinite regress. It is freer, however, from limitations of more superficial psychopathologies in that it gives room for levels of conative activity—the it or instinctual level, the ego level and the level of ego—superstructures—morals, ideals, and sublimations. Psycho-analysis concerns all three levels simultaneously, but it limits the interpretation in lumping together erotic libido and ego libido in two mutually incompatible groups. Furthermore, despite recent developments in the psychology of aggression it does not take us beyond the pleasure principle. The death instinct is a piece of biological speculation and is an illegitimate attempt to escape from the impasse of hedonism to which psycho-analysis has become committed. That the load of sexual tension is greater than all other instincts is undeniable, but psychopathology is unduly limited and human nature unnaturally confined by the exclusion of other fundamental conative drives. For practical purposes as well as for theory a wider instinct theory is more illuminating, and what sheds most and widest light is calculated to produce the best therapy.

## REVIEWS AND NOTICES OF BOOKS

### Hydrotherapy and Climatotherapy

By MATTHEW B. RAY, D.S.O., M.D., M.R.C.P., Senior Physician, British Red Cross Clinic for Rheumatism, Peto-place, N.W. With a Foreword by Lord HORDER. London: Edward Arnold and Co. 1936. Pp. 312. 12s. 6d.

THIS book is divided into two sections of which the first contains an admirable introduction to the principles of hydrotherapy and notes on its practical application. Various systemic disorders are also discussed—those of the circulatory, respiratory, and genito-urinary systems, disorders of the skin and of the nervous system, and finally the rheumatic diseases. The author has classified and described the spas "in accordance with their main therapeutic indications" as regards the above disorders. This method of grouping the spas will not meet with general approval, for many hold that a first-class spa should be looked upon as essentially a repairing dépôt for disorders of metabolism. Any suggestion that this or that spa is only suitable for this or that disorder is to be deprecated, in so far as it may bolster up ill-equipped spas at the expense of those more deserving of support. Incidentally Harrogate and Bath are scarcely mentioned in connexion with the rheumatic diseases; yet both these spas have long had large voluntary hospitals where hundreds of cases of chronic rheumatic disorders are admitted and treated with a good measure of success every year.

The second section of the book deals with climatotherapy, and here the elementary principles are well set out considering our imperfect knowledge of what part the climatic factor plays in maintaining or promoting health. The short extracts about the health resorts require revision in certain respects. For example, for elderly invalids Weston-super-Mare is recommended in autumn and winter, but not in spring. Anyone who has experienced the cold autumnal and winter winds would discourage

elderly invalids from residing there during such months, whereas no place could be more delightful than Weston-super-Mare in April or May. The information supplied on foreign spas and health resorts is rather cursory, but there is much in the book which will stimulate the interest of practitioners in this country.

### Electrical Engineering in Radiology

By L. G. H. SARFIELD, M.Sc., M.I.E.E., A.Inst.P., Research Department, Woolwich. London: Chapman and Hall Ltd. 1936. Pp. 284. 25s.

THE developments of post-war years have wrought many changes in the design of X ray equipment, and the simple laboratory hook-up of former times has now been displaced by a comparatively much more complex if more efficient high-tension equipment. A certain amount of electrical knowledge is necessary for anyone who wants to understand every part of this technical work, but of this volume the greater portion is devoted to descriptive matter—notably historical surveys, results of experimental work and development, electrical characteristics, and constructional details, which are all clearly outlined. Mr. Sarsfield points out that recognised engineering standards are now being applied as far as possible to the manufacture of X ray equipment, while at the same time the peculiar requirements of the work to be done by this type of apparatus permit of the application of new standards. Such matters as the choice of suitable materials for the various duties, dielectric stresses, and methods of assembly are dealt with, specimen design sheets being included.

The realm of purely operative technique is avoided but many important hints are given on the best electrical conditions for service; the characteristics of the various components of an X ray set are outlined, and questions of lay-out are discussed. Valve filament operating conditions, the measurement of

essential electrical factors, tests, and the advantages and disadvantages of different methods of rectification all receive attention. In dealing with sphere gap measurements it is pointed out that misleading results may follow breakdown of the gap due to the presence of peaks superimposed upon the fundamental voltage wave applied to the X ray tube. This no doubt accounts for the discrepancies often apparent between the exciting tension as indicated by radiographic results and that indicated by the sphere gap measurement, especially where mechanical rectification is concerned. In this connexion the necessity for knowledge of wave shape is stressed, and, generally speaking, if Mr. Sarsfield's plea for accuracy of measurement is observed, much lower film bills will follow. High-tension systems, high-voltage cables, and the importance of proper earthing are also considered.

Little space is given to the purely physical aspect of X ray tubes, but the various types are well described. Various circuit arrangements, methods of control, maintenance, faults in apparatus, and the vexed question of signals are outlined, while protective measures, electrical safety, and radiation output efficiencies are discussed at some length. A chapter is devoted to describing special equipments for diverse applications in radiology, and such subjects as dark room lighting, heating of developing solutions, protective measures are not ignored. Examination apparatus for medical work does not form part of the subject matter, the author devoting the whole of his attention to the apparatus between the main supply and the X ray tube. Radiologists, X ray students, technicians, and others will welcome this treatise on a highly specialised subject. The book is well illustrated.

### The Variation of Animals in Nature

By G. C. ROBSON, M.A., Deputy Keeper of Zoology, British Museum (Natural History); and O. W. RICHARDS, M.A., D.Sc., Lecturer in Entomology, Imperial College of Science and Technology. London: Longmans, Green and Co. 1936. Pp. 425. 21s.

It is not generally realised to what extent modern theories of the causes of evolution are based upon selected evidence and upon the prejudices of the theorist. The fact that at least three fundamentally different theories are in currency at present makes us welcome this unbiased survey of the main facts and conclusions therefrom which have been used in support of these theories. The authors have covered a wide field and have subjected their material to the most searching criticism. Most biologists have assumed either that natural selection (to which 135 pages are devoted) is the main driving force of evolution, or that it is at least a necessary factor in the process, and elaborate mathematical theories have been erected on this basis. It will therefore come as a surprise to many that there is hardly any direct evidence for either of these assumptions, though in connexion with certain phenomena such as mimicry the circumstantial evidence is very strong. The origin and distribution of variations, the effects of isolation, and the concept of "adaptation" are here discussed very fully, and a chapter is given to an examination of the main theories of evolution other than the selection theory. The authors are in the end almost embarrassingly non-committal. They say truly that "any attempt to form an unprejudiced conclusion [as to the causes of evolution] labours under technical difficulties which frustrate it and limit it to a summing of possibilities," but it is difficult to

discover to which of these possibilities they consider the present evidence to point. They seem to favour the theory that the variations which have been mainly significant in evolution are of the nature of the mutations of the geneticist, though admitting that it is by no means certain that the environment may not have played a direct part in inducing changes under certain conditions. They do not consider the evidence sufficient to warrant the conclusion that selection has been an all-important factor in the spread of variations. And in this they are at one with the trend of discussion at the Royal Society summarised in a recent leading article (p. 1189).

There can be no doubt that a restraining influence of the kind here attempted is badly needed. Theories are being erected and even accepted as truth which are based upon unproven assumptions and upon experimental evidence of doubtful application to conditions in nature. On the other hand, it is unlikely that such sober argument will prove inspiring to readers. It must be admitted that well-directed flights of the imagination, provided there is a readiness to return to earth at a moment's notice, are the life blood of scientific progress.

### Youth, Sex and Life

By GLADYS M. COX, M.B., B.S. Lond. London: C. Arthur Pearson Ltd. Pp. 229. 3s. 6d.

To write a book on sex for young people and also for their parents is a difficult task. Dr. Cox has accomplished it with conspicuous success. "Of all the obstacles that stand in the way of human progress and happiness," she writes, "I believe that ignorance, prejudice and intolerance are the most potent, and that selfishness and deliberate cruelty are, more often than not, the products of these three." The book does not purport solely, as do so many that have recently appeared, to give to the young instruction on sexual physiology; it has the broader aim of providing information and guidance upon all the activities in which boys and girls are involved. The chapters deal with the following topics: physical fitness; physiology and health; how the mind works; drugs and gambling; exercise for health and pleasure, and sun-bathing; reproduction in man; adjustment to society; some thoughts on preparation for marriage; and sex problems. They are all written clearly and simply, without those pseudo-religious invocations which modern parents are apt to find slightly nauseating. Dr. Cox does not hesitate to give the reader advice; in fact the book is full of it. But the advice is so balanced and restrained, and couched in such simple and friendly language, that few adolescents could escape being favourably influenced by it. Difficult subjects are deftly handled. Psychology is not an easy subject to teach in such a way as to be intelligible and useful; human reproduction, which in this book is made to fit naturally into a wider context, is notoriously hard to explain to young people without irrelevant circumlocutions. Yet both these topics are dealt with with grace and judgment. Many parents are a little nervous of preaching to their children; and many have inhibitions which deter them from speaking openly about subjects on which they feel that children should be informed. This book should do much to remove these inhibitions. Practitioners are often asked to deal with adolescents passing through difficult phases. They could hardly do better than to introduce this volume to the parents with the suggestion that if it is found acceptable it should be handed on to their young.

# THE LANCET

LONDON: SATURDAY, JUNE 6, 1936

## THE CHEMOTHERAPY OF STREPTOCOCCAL INFECTIONS

THE history of attempted chemotherapy in bacterial infections is so discouraging that any indisputable success in this direction is almost totally unexpected. It has seemed, hitherto that some radical difference between protozoal and bacterial infections offers an insuperable bar to the treatment of the latter by chemical means. Nothing in therapeutics is more certain than the disappearance of malaria parasites or trypanosomes under the influence of appropriate drugs; nothing has been more uncertain or perhaps more frankly disappointing than the effect on such a condition as streptococcal septicæmia of administering all manner of supposedly bactericidal compounds. It is true that many of these are demonstrably incapable of exerting any bactericidal effect in the dilution and under other conditions in which they find themselves within the body, but even were these conditions theoretically favourable in any particular instance, he would be an optimist who expected the old ideal of *therapia sterilisans magna* to take actual shape. In perhaps the only clear example of an interstitial or generalised bacterial infection which is susceptible to chemotherapy, the action of the drug is almost certainly indirect; this is the action of organic arsenical compounds in anthrax. It may well be true that apart from certain special situations, of which the skin and the urinary tract are examples, the bacteria of established infections are inaccessible to any direct bactericidal agent, either known or yet to be tried. Hence the startling nature of the success claimed for a drug, known best under the name of Prontosil, which made its début in Germany last year. This substance is one of a long series of dye compounds which had been synthesised in the hope of stumbling on something of therapeutic utility, and the original evidence in its favour consisted of experiments in which the development of streptococcal infections in mice was prevented by its administration, and of a number of rather uncritical but highly enthusiastic clinical reports of its effect in acute streptococcal infections in man. These reports and their confirmation on the experimental side by LEVADITI and VAISMAN have already been commented on in these columns.<sup>1</sup>

Now that English workers have fully satisfied themselves of the validity of these claims on the experimental side, and reached a significant if not conclusive stage in clinical trials, the importance of this discovery is brought nearer home. This development is marked by the appearance of two papers in our present issue. Dr. G. A. H. BUTTLE and his co-workers are not only in a position to confirm the original observations on the action of prontosil in mice, but they have studied a number of other new compounds, one of which, *p*-aminobenzenesulphonamide, has proved superior to prontosil itself. The significance of the animal experiments recorded in this and in the paper by Dr. LEONARD COLEBROOK and Dr. M. KENNY which precedes it may perhaps not immediately be grasped. It was shown repeatedly years ago that streptococcal infection in mice could be prevented if within an hour or two of infection the inoculated area were infiltrated with acriflavine or other substances of similar composition. At first sight these new experiments may appear to be of the same nature and of no greater significance, especially as they are sometimes referred to as protection experiments. The difference is that the action of acriflavine is directly bactericidal and purely local, whereas the action of prontosil, whatever it may be, is almost certainly not due to direct bactericidal action, and is obtained by introducing the drug, not locally, but either via the alimentary tract or by subcutaneous injection remote from the site of infection, which in these experiments is in fact the peritoneal cavity. Not only does this drug work, so to speak, at a distance, but it works when administered some days before, or at least some hours after, infection takes place; indeed it appears to have determined recovery in an animal already the subject of bacteræmia. This at any rate is something quite new; it is the first time that any drug has been shown to have a specific and regular effect on an acute bacterial infection when administered by the mouth. All observers are agreed that the effect is limited to infections due to *Streptococcus pyogenes*, although there are slight indications in Dr. BUTTLE's work that the meningococcus may also prove susceptible.

The conclusions drawn by Drs. COLEBROOK and KENNY on the basis of their clinical experience are commendably cautious. It is very much to be hoped that the therapeutic trial which they have initiated in this country will be extended and made to embrace types of acute streptococcal infection other than puerperal fever. It may well prove that others, mainly for anatomical reasons (since the type of streptococcus, within the *pyogenes* group, appears to be indifferent), react more favourably; erysipelas, for instance, is said by W. KRAMER<sup>2</sup> and others to respond remarkably to the treatment. The other side of the question with which this paper deals to some extent is the least satisfactory in the sense that almost nothing is known about it. How do these compounds act? They are only weakly bactericidal

<sup>1</sup> THE LANCET, Feb. 1st, 1936, p. 269.

<sup>2</sup> Münch. med. Woch., April 10th, 1936, p. 608.

in water, and not bactericidal at all and only bacteriostatic to a limited degree in serum; the serum of treated animals and patients supports the growth of streptococci, though to a somewhat diminished extent, and their virulence after contact with the drug in such fluids is unimpaired. LEVADITI and VAISMAN's facile and improbable idea that the drug acts by preventing capsule formation is unsupported in these experiments. Even in the whole blood of treated animals no bactericidal action was demonstrable. In fact no in-vitro mixture of bacteria, leucocytes, serum, and the drug itself can be made to do anything which will account for the therapeutic effects observed; clearly nothing short of the whole animal is a suitable field for the activity of this compound. Here therefore is a substance, identified as useful by the method of trial and error, the mode of action of which is wholly unknown. There is presumably a chemical side to the mechanism by which infection is overcome about which we know next to nothing, and on which it happens that this particular type of compound can exert an influence. This discovery, while obviously a therapeutic advance and possibly the prelude to others, is at the same time an indication that in this sphere of medicine we are only groping in darkness and finding something here and there, more by good fortune than by intelligent design. This is not to detract from the great achievements of pioneers in chemotherapy past and present; the symbols "205," "606," and "914" are a sufficient reminder of what they have attained. But these symbols are an indication also of the blind and laborious method by which alone such results can at present be achieved.

### MINERAL METABOLISM AND THE SUPRARENAL GLAND

THE growth of knowledge in some departments of medicine is painfully slow. Progress remains at a standstill sometimes for decades together, and, until lately at any rate, it has been difficult for the physician to reply to the layman who taunts him with the common cold or the measles epidemic. On the other hand, progress in some departments is so rapid that even the specialists are bewildered by the frequent reorientation of thought which the new discoveries necessitate. This is the case to-day with certain of the biochemical aspects of medicine, and is well illustrated by the fact that two arresting contributions have been made in the last few weeks to our knowledge of the rôle of the suprarenal gland in mineral metabolism.

One of these comes from investigations at the University of Virginia. SILVETTE and BRITTON,<sup>1</sup> whose work on suprarenal deficiency is already well known, have for some years attributed the fatal effects of suprarenalectomy to the disordered carbohydrate metabolism which ensues rather than to the fall of serum sodium and its attendant complications. In the common laboratory animals

these two effects generally go hand in hand, although a partial separation may be effected by administering salt in large quantities. SILVETTE and BRITTON, however, deliberately set out to enlarge the number of species on which suprarenalectomy had been performed in the hope of finding one in which the two effects might have been separated by Nature herself. This they have done, for they have found that in the opossum and marmot removal of the suprarenal leads to the usual disorder of carbohydrate metabolism and death in 6-8 days, but to a rise rather than a fall in the serum sodium. These results do not of course constitute a contradiction of the findings that suprarenal underactivity in dogs, cats, rats, and humans is associated with a sodium deficiency. This is a fact which has been well established by workers all over the world, as will be seen from Dr. McCANCE's Goulstonian lectures lately published in this journal. The theoretical significance however of SILVETTE and BRITTON's observations can hardly be over-emphasised, and it is to be hoped that the explanation of their findings may lead to a better understanding of the whole subject.

The other discovery, which has been made at the Mayo Clinic,<sup>2</sup> is not only of theoretical but also of considerable immediate clinical value. It has been known for some time that one of the signs of suprarenalectomy in the common laboratory animals and of Addison's disease in man is a rise in the serum potassium. The significance of this has not been understood, and the observations have not so far formed the basis of any therapeutic measures. It has now been found, however, that a crisis can be precipitated in suprarenalectomised dogs by the administration of potassium salts, and that a low-potassium diet greatly increases the animal's chances of survival after suprarenalectomy. Further, three patients with Addison's disease were made very much worse by an increased intake of potassium, and a diet low in potassium proved very beneficial. An unsatisfactory potassium-sodium ratio in the diet then may explain those disappointing and all too familiar cases in which the administration of salt has failed to maintain the patient's life. It is clear that, besides being given extra salt, patients with Addison's disease should now be placed on a low-potassium diet; but here a practical difficulty supervenes, for the planning and construction of such diets is not a matter which anyone can undertake. Fortunately the essential data are ready to hand, for potassium content has been determined in all the common American foods by SHERMAN, and the same service has been rendered for English foods by a group of workers at King's College Hospital. It should therefore be an easy matter for an experienced dietitian to give sufferers the necessary advice, and if the results live up to their early promise there is no doubt that directions for the preparation of low-potassium diets will soon be available for all.

<sup>1</sup> Silvette, H., and Britton, S. W.: *Amer. Jour. Physiol.*, 1936, xv., 618.

<sup>2</sup> Wilder, R. N., et al.: *Proc. Staff Meet. Mayo Clin.*, 1936, xl., 273; Allers, W. D., et al.: *ibid.*, p. 283.



## THE SURGERY OF BRAIN TUMOURS

WE publish this week the concluding part of a report on the late results of the surgical treatment of intracranial tumours. It constitutes the most thorough and critical analysis of a series of cases of brain tumour yet undertaken, and is a logical sequel to the same author's report to the Medical Research Council in 1929. Mr. CAIRNS has taken the identical cases he encountered when he was Dr. CUSHING's assistant in 1926-27, and has followed their after-history. While his facts were gathered during a visit to New Haven last year, his paper has been written, and his conclusions formed, since his return to England, and his judgment is the less influenced by local colour and argument. The result, it will be agreed, is a model of how the surgeon should evaluate his handiwork. As he says, the results are from the clinic of one "who has no peer in the art of neuro-surgery," and the organisation of Dr. CUSHING's unit can scarcely be overpraised. The M.R.C. report revealed one aspect of its efficiency, and the present paper bears witness to the success of its follow-up department. Of the cases which left hospital, "contact has been maintained with every one of these 135 patients." How many surgeons in this country could make a similar statement? There is surely no excuse for our general slackness in this direction. Money would be forthcoming for the inevitable expenses if we were sufficiently dogmatic about its necessity. Every hospital ultimately provides the operating paraphernalia its surgeons require, and such follow-up departments are as essential as special instruments. Lack of coöperation of patients is most often due to lack of contact between surgeon and patient. Frequently in hospital practice, the latter sees his surgeon only once—or even not at all—before and after operation, and there is no opportunity for more intimate discussion. The patient fails to realise that his need of the surgeon is not to be satisfied by the operation alone, but also by post-convalescent observation; and he remains unaware, on the other hand, that the surgeon depends on him for the amassing of experience. Now that the ranks of the profession are better filled, lack of time should no longer be a bar to the formation of this personal contact.

Comparable with the Registry of Bone Sarcomas, there has been set up at New Haven a Registry of Brain Tumours, consisting of full details of Dr. CUSHING's 2000 cases. As those will realise who have visited or worked in such a clinic—and similar ones are now firmly established in Britain—the amount of work entailed by such careful recording is enormous. But without it such an investigation as Mr. CAIRNS has made would be impossible. His observations will be found important, moreover, to general practitioners as well as to specialists, since they bring home clearly the need and value of early recognition of brain tumours. It is a tragedy that even nowadays, through unnecessary delay, blindness due to gross papilloedema or severe optic atrophy often follows otherwise successful operations for pituitary

tumours. And, if he does his part, what prognosis may the practitioner expect? This depends largely, of course, on the type of tumour, and some of the information Mr. CAIRNS provides will seem revolutionary to those unacquainted with the progress of this branch of surgery. The total operative mortality was 14 per cent., which is the mean between figures which vary from 5 per cent. to 30 per cent.; and be it noted, almost every case, however bad the "risk," was given the chance of surgical relief. Of the 135 survivors that left hospital, 63 were still alive at the time of the investigation, a remarkable proportion. Mr. CAIRNS probes much more deeply than this, and shows that 37 are still living useful lives. The bare survival figure would compare very favourably with the results of treatment of tumour elsewhere in the body, but he sees fit to make the comparison with the "useful life" survival-rate.

It is apparent that the glioma must no longer be considered as necessarily malignant: in fact emphasis is laid on the brilliant and permanent results which follow the removal of cerebellar astrocytomas in children. Surprisingly enough, these provide some of the best results of all. Against this must be weighed the fate of patients who have glioblastomas or medulloblastomas—tumours which constitute nearly half of all gliomas and are so persistently invasive as completely to resist surgical extirpation. Most surgeons, indeed, would refrain from operating on a glioblastoma if they could recognise it with certainty, but unluckily there are curable conditions that may closely mimic it. Has the future anything fresh to offer in the treatment of such growths? Radiation has provided means of temporary control, leading at times to remarkable recession of symptoms, and considering the advance of brain surgery during the past thirty years it is reasonable to hope for greater things to come, from one direction or another. For pituitary tumours the prognosis has lately been dealt with by Mr. CAIRNS in a contribution to our Prognosis Series (Dec. 7th and 14th, 1935) in which he said that since pituitary tumour destroys sight rather than life, the risks to life of operative treatment must be reduced to the lowest dimension. This is of course strictly true, but is only half the truth. In the present series, though there was only 1 operative death in 29 cases, as many as 9 more died during the subsequent years, either from evident tumour extension or intercurrent disease. This suggests that a more radical operation would have been justifiable on statistical grounds. Of the 19 survivors, 11 were at full work. The operation through the nose, responsible for these figures, has now been superseded by the transfrontal approach, and doubtless a similar inquiry into the late results of this procedure would prove more favourable, both as regards expectation of life and recovery of vision. Dr. CUSHING quotes figures by W. R. HENDERSON showing that during the decade 1921-31 42 per cent. of transfrontal and 37 per cent. of transphenoidal operations were followed by considerable visual recovery. Virtually complete restoration of vision followed 21 per

cent. of transfrontal operations but only 9 per cent. of transphenoidal. Nevertheless the older operation may still be the better in selected cases.

The question is often asked: Is the surgery of intracranial tumours based on sound economics? Are its results worthy of the enormous expenditure of energy involved? Strictly speaking the reply to such questions comes within the range of the politician; it is no part of the surgeon's duty to consider whether the cost of his apparatus would be better spent on cod-liver oil or battle-ships. But assuming that we are concerned less with economic organisation than with saving individual patients it becomes possible to reach a limited answer by stages. First, is it worth while, out of 157 cases suffering from a disease otherwise

inevitably lethal, to save the lives of 63? Most people would have no hesitation in answering "Yes," though the critical would rightly add, "if the life were worth living." Even they, however, could hardly avoid repeating "Yes" if told that 37 are useful members of society. Do such results justify the means? No one can measure the value of a life, but most of us believe it desirable that we should learn how they may be saved at whatever cost. The means adopted are the responsibility of the neurosurgeons themselves. Though they rest on a very different economic basis from other branches of surgery, and demand a disproportionately greater sacrifice from those interested, they appear to be fully justified by their achievement.

## ANNOTATIONS

### REPRISALS TO THE DOCTOR'S BILL

EXPERIENCED observers believe that allegations of professional negligence or want of skill are being increasingly employed as a weapon of defence against claims for medical fees. A vast amount of professional treatment is obtained on credit. No tariff or price-list is exhibited upon the surgery wall. Ancient tradition, fortified by judicial recognition, adjusts the charges to the patient's means. Accounts are probably not rendered until the crisis of the illness is over. It would therefore be not surprising if, when at last the bill is presented, the patient's gratitude for past services is less vividly fresh. The defaulting payer may be a husband or a father who is disappointed at the rate of recovery. He may be one who expects much for little or who looks upon the doctors as magicians who guarantee infallibility of diagnosis and certainty of cure. Accusations of negligence, unfortunately, have won a few glittering prizes in the law courts, supported by expert witnesses who will declare with retrospective confidence that some other treatment could or should have been tried. The last thing that an unpaid practitioner desires is worry over the collection of debts; he has other things to think of. If the prospect of allegations of negligence be added, he knows that even complete victory in the law courts will leave him worse off than before. Are these troubles so frequent under a system of cash payment or contract practice? If it be true that they are most often encountered where credit is given, how is the practitioner to mitigate them? The delay in asking for payment, the lump-sum bill, and the uncertainty of the scale of charges—these are elements which in part explain the occasional irritation of the person liable. Yet, after all, the remarkable feature of the situation is not so much the awkwardness of fee-collecting as the fact that default and recrimination are comparatively rare.

### COMPLETE CURE IN CARCINOMA OF THE COLON

IN view of the tendency of cancer to occur in the later years of life, survival without evidence of recurrence for twenty years seems justifiable grounds for reporting a "cure." C. F. Dixon and P. F. Olson are able to report 12 of these cases.<sup>1</sup> The time that elapsed since operation ranges from 20 to 24 years. Two of the patients died over 20 years after the

resection of the growth, the cause of death in one being unknown, and in the other amputation of an arm. Of the 12 patients 10 were alive at the time of inquiry. The age at operation varied from 30-64; in 9 patients it was 40-60 years. There is no question of the malignancy of the growths removed, for not only are the original pathological reports available, but the growths themselves have been preserved and in every case have been examined again to confirm the diagnosis. The authors normally grade sections of carcinomatous growths, according to certain criteria of malignancy, under four heads. They consider it very significant that in none of the 12 cases of 20 years' survival was the malignancy of the two highest grades. In 6 cases it was Grade I. and in 6 Grade II. It gives some idea of the prognosis of carcinoma of the colon if these figures are compared with the percentage frequencies of the four different grades in a series of cases. For 453 specimens of cancer of the colon, Dixon and Olson give the following figures: Grade I., 14 per cent.; Grade II., 61 per cent.; Grade III., 18 per cent.; and Grade IV., 7 per cent. They also found that the five-year survival-rates in these grades were 66, 54, 38, and 30 per cent. respectively. They feel that the relatively good chance of cure that can be offered to patients with certain types of carcinoma of the colon is a fact that should be recognised and made known.

### UNDULANT FEVER IN FRANCE

Dr. Justin Abet, who devotes his inaugural thesis<sup>1</sup> to this subject, states that the first cases of undulant fever to be reported in France were those published in 1908 by Danlos, Wurtz, and Tanon in the Paris district. In 1909 seven cases occurred at Marseilles and epidemics were reported at St. Martial (Gard) and St. Bauzile de Montmel (Hérault). From 1909 to 1912 numerous cases appeared in Languedoc, Provence, and Basses-Cevennes. The disease then came to a standstill and there appeared to be a progressive disappearance of the original foci. In 1920, however, undulant fever made its appearance in several places so that at the Hygiene Congress in 1925 Dubois and Lisbonne classified the affected departments into two groups—viz., (1) those which had been permanently affected, such as Corsica, Alpes-Maritimes, Var, Bouches-du-Rhône, Gard, Hérault, Aude, Pyrénées Orientales and the adjacent

<sup>1</sup> Surg., Gyn., and Obst., May, 1936, p. 874.

<sup>1</sup> Thèse de Paris, 1936, No. 236.

departments of Basses Alpes, Hautes Alpes, Vaucluse, Drôme, Ardèche, Lozère, and Aveyron; and (2) six departments with indigenous cases—viz., Haute Garonne, Hautes Pyrénées, Isère, Savoie, Doubs, and the Rhône. At first undulant fever in France was confined to the regions where abortion in sheep and goats was prevalent and was not found in those in which epizootic abortion in cattle occurred. After 1930 numerous cases of undulant fever of bovine origin began to make an appearance, cases being reported in Isère, Franche Comté, and Lorraine. In 1932 a ministerial order was issued making undulant fever notifiable and recommending examination of the blood in suspected cases in special laboratories. The recent increase in the number of cases is shown by the following figures. In 1933 408 cases were notified in 44 departments, in 1934 424 cases in 48 departments, and in 1935 427 cases in 53 departments. The notifications, it seems, considerably under-estimated the real incidence of the disease and are only really carried out, according to Dr. Abet, in departments possessing sanitary inspectors and in which practitioners, veterinary surgeons, and laboratories combine in tracking out the disease. The wide dissemination of undulant fever in France is an undoubted fact, but it is impossible to give even an approximate idea of the number of actual cases. In 1925 Lisbonne estimated the annual number of cases at 3 to 4000, but it is probable that this figure has been exceeded at the present time in view of the fact that many cases in country districts are overlooked or not reported.

#### DIFFERENTIAL CELL COUNTS OF PITUITARY GLAND

It is satisfactory to find that differential cell counts of the pituitary gland, originally devised by Rasmussen, are being made by research workers despite the extremely tedious nature of such work. It is only thus that the random claims of some endocrinologists, to the effect that specific alterations in the numerical proportions of the three types of cell in the anterior lobe characterise certain pathological conditions, can be verified or disproved. In a recent paper Dr. Frank Hawking<sup>1</sup> reports the results of differential counts of the anterior lobe of the pituitary in 12 cases of essential hypertension, 4 cases of nephritis, 6 cases of diabetes mellitus, 6 cases of hyperthyroidism, and 2 cases of Addison's disease. In 2 cases only of hypertension was the proportion of basophils greater than normal. Hawking cautiously concludes that this increase is not regular enough to be regarded as significant. This conclusion is of importance because it has been widely assumed, following Kraus and Berblinger, that an increase accompanies hypertension whether essential or secondary to nephritis, and this assumption has been a main plank in explaining the constancy of hypertension in Cushing's syndrome. An increase of basophils was found by Hawking in 1 case of diabetes, in 3 cases of hyperthyroidism, and in 1 case of nephritis. There is no confirmation of Kraus's statement that the acidophils are decreased in diabetes nor is there any evidence in hyperthyroidism of a correlation between the acidophil cells and hyperactivity of the thyroid gland. In 3 cases the percentage of basophils was high but the figure was within normal in 2 of these. It is difficult therefore to subscribe to the current view that the pituitary plays a dominant rôle in Graves's disease. In Addison's

<sup>1</sup> Jour. Path. and Bact., May, 1936, p. 689.

the clinical impressions of chancellors and prime ministers are apt to be as fallible as any physician's unless backed up by scientific knowledge. While it is improbable that many of his readers will follow Dr. Glover all the way, it should be impossible for any open-minded person, following the argument, to fail to pause and think, and to question some at least of the behaviour he has previously assumed to be rational and civilised. It is interesting that Dr. Glover considers that at present the greatest danger of being human is to give way to those periodic waves of smugness, affecting individuals and nations alike, in which self-satisfaction completely dulls any capacity for self-criticism or self-improvement.

#### MAN-MADE MALARIA IN INDIA

THE director of the Malaria Survey of India, Lieut.-Colonel J. A. Sinton, has found it necessary to point out, in properly vigorous language,<sup>1</sup> the great extent to which certain procedures, intended to increase prosperity and health in India, have in fact added to poverty, sickness, and death, merely because there has been disregard of their well-known effects in producing conditions favourable to the spread of malaria. Irrigation schemes form one of the most striking examples of this indictment. An engineering department makes its estimates for bringing water to agricultural land, but these are without proper provision for taking the water away when it has done its work. The result is a water-logged soil, whose fertility is thereby lessened, and a high water-table exposed in places as pools whose dangerous anopheles-breeding edges are probably quite disproportionate to the area the pools cover. Malaria follows, bringing not merely its own direct misery but its subsequent weakness, so that the victims can no longer get the best out of their already damaged land, nor the State its proper revenues from them. This sequence has been known in India for ninety years, yet man-made malaria is still being brought into being by it there. A main cause of this deplorable state of affairs was pointed out by Sir Herbert Emerson, Governor of the Punjab, at the opening of the Punjab Engineering Congress in 1935; it lies in the tendency of Government departments to look on matters only as they affect their own budgets, and not as they play a part in the prosperity of the whole Province; for the putting right of these grave defects is not merely expensive, but the cost, so far as the damage can be made good at all, is apt to fall on some other department. The remedy proposed is that work on no project of this sort should be begun until it has been considered by a committee representative of all interests concerned (engineering, agriculture, financial, public health, and any others), and unless all expense necessary to prevent harm has been included in the original estimate. But interdepartmental policies play but a small part in producing man-made malaria in India. The Malaria Commission of the League of Nations wrote in 1930 that attempts at malaria control had failed in that country, not merely through lack of coöperation but through religious objections not always sincere, and through irresponsible opposition in the press; while the Royal Commission on Labour in India wrote next year that action in health matters was too often limited to the toil of filing a written report. Though, then, there has been fault in the administration, now realised and in a fair way met, there has still to be faced by the

<sup>1</sup> Indian Med. Gaz., April, 1936, p. 181.

administration that opposition of vested interests, that stupidity, folly, pig-headedness, and even wickedness whose strength seems not to have been appreciably lessened in the past twelve years.<sup>2</sup>

### "DIE EWIGE MASKE"

FEW of us can resist a busman's holiday, especially when it promises a ride through familiar country. The Swiss film "The Eternal Mask," now running at the Academy Cinema, Oxford-street, London, W., shows first the professional dilemma of a young physician-pathologist, portrayed with great skill by Mr. M. Wieman, and later his reaction to the crisis he has precipitated. Convinced by animal experiment of the value of a serum he has produced against epidemic meningitis, Dr. Dumartin tries it on a dying man, in defiance of his chief's orders, with initial success. The patient, after rallying, dies of an embolism which, it is suggested rather surprisingly, could not possibly be due to the intravenous injection of the serum. Unfortunately the hero has been unwise enough to hint to the patient's wife that he is experimenting with a new remedy, and the most stirring episode in the film, from the medical point of view, is the demonstration of the swift consequences of this indiscretion. The widow turns on him, the local newspapers print abusive headlines, and the efforts of his chief to cover his action and to defend the reputation of the hospital are fruitless because Dr. Dumartin has disappeared. His wanderings about town, half-crazed by the tumult he has raised, his rescue from attempted suicide, and his painful return to sanity make a dramatic story. The contrast between the unsuccessful methods of handling the doctor's distemper and the wise psychotherapy which finally restores memory and balance is more likely to impress lay than medical members of the audience, but all will admire the effective use of film technique to suggest the mental adventures of a split personality. There is little to criticise in the vivid presentation of hospital life and ethics, though we ourselves have never met an institution so fortunate in attracting good-lookers to its medical and nursing staff.

### DUM-DUMS

THE dramatic excursion into detection which Dr. Osborn describes on p. 1295 has led him to make some useful comments on bullet wounds, and it is appropriate that these should appear at a time when the air is thick with accusations about the use and misuse of the so-called dum-dum bullet. On reviewing the evidence it will be found, we believe, that there is no good reason for regarding these as more horrible than other instruments of warfare. In the first place the definition of them is in practice exceedingly loose. We learn from the "Shorter Oxford Dictionary" that they are named after Dum Dum, a military station near Calcutta, and that the term refers to "a soft-nosed bullet which expands on impact." But the word "expand" is a little deceptive; for all that the soft-nosed bullet does is to break into smaller portions when it encounters hard tissues such as bone. It is here that it differs from jacketed bullets which, when fired at high velocity, have a considerable penetrating power; and the two types of bullet are designed to have different uses. The soft-nosed bullet is not intended to pass *through* the body; its whole force is utilised in inflicting a violent blow, and it has a correspondingly high stopping-power. Hence it is

used in hunting large or dangerous animals (e.g., rhinoceros or leopard), which are apt to take little immediate notice of a penetrating bullet; and for the same reason it has been employed by civilised nations in some of their colonial wars. The "dum-dum" bullet is now banned by the rules of war, but the line between legitimate and illegitimate is so slight that British prisoners came near to execution by the Germans in 1914 because they carried the regulation soft lead bullets for their service revolvers! The objection to the dum-dum seems in fact a little unrealistic. Lord Mottistone, in the House of Lords on May 12th, after speaking of them—perhaps truly enough—as more cruel than gas, went on to describe the kind of wound these projectiles make in animals. "There may be a very little hole in front," he said, "but I have frequently seen on the other side a hole as big as both palms." Since the object of the dum-dum is to avoid passage through the body, this type of wound must clearly be exceptional; but the real objection to Lord Mottistone's argument is that he said nothing about the havoc wrought by the standard jacketed bullet from the ordinary service rifle (to say nothing of the high explosive shell). The jacketed bullet fired at high velocity (over 2300 feet per second) can cause wounds as serious as any dum-dum, its exact effect depending mainly on the distance it traverses. At close range (under 200–300 yards) it travels with a slight wobble which usually leads to a large entry wound; at 300–800 yards it leaves the classical small entry and large exit wounds; at over 800 yards it is again likely to make a large jagged hole at entry. The regulation British service rifle bullet, with a velocity of 2400 feet per second, may thus reproduce the damage done by a dum-dum; but even if this is avoided the destruction of tissues along its track can be at least as disastrous. It may cause no wound "as big as both palms," but when fired at close ranges it may have a hidden cavitation action, producing a "tissue quake" with hæmorrhages an inch or more from the path of the bullet, which often means gross destruction. This particular effect of the penetrating hard bullet is obtainable only under appropriate conditions. To get the effect of the dum-dum, however, is ordinarily quite easy. There is no need to break international conventions by cutting the hard jacket off the bullet's point: all that is necessary is to use a rifle of high muzzle velocity at short range, or a firearm of low muzzle velocity with a soft lead bullet.

### RESEARCH DEFENCE SOCIETY

THE antagonists of medical research have been less pugnacious than usual during the past year, but the country is still being flooded with the propaganda of the financially well-supported antivivisection societies. Sir Leonard Rogers, as honorary treasurer of the Research Defence Society, has inquired into the finances of these societies and has discovered that since 1912, when the report of the Royal Commission appeared, condemning antivivisection methods, they have succeeded in collecting no less than £600,000 from the public. In its annual report the society's committee draws attention to the antivivisectionist shops that have become permanent features in certain localities. Some years ago in the House of Commons the Home Secretary said that he had no power to stop these displays: he thought then that the persons responsible could only damage their own cause by spreading the false belief that in this country cutting operations on animals were

<sup>2</sup> A leading article on the subject (quoted by Sinton) appeared in THE LANCET in 1924 (vol. i., p. 855).

allowed to be performed without anaesthetics. In the past year the Research Defence Society has been devoting increased attention to educating the public in the medical and scientific progress resulting from experiments carried out under the Act of 1876. Sir Leonard Rogers has been able to give many lectures to large audiences at universities and medical colleges, to local scientific and debating societies, and, on two occasions, to the boys of well-known public schools. The information given was valuable in helping the hearers to form a balanced opinion on the vivisection controversy. There has also been an increased demand for the society's leaflets, lantern slides, and general information from health authorities and numerous individuals, for use in local debates and lectures. Financially the society's position has slightly improved, thanks to a small legacy and to increasing subscriptions. Continued efforts are being made to obtain new members, in view of the enormous financial resources of the opponents of experiment.

### THE ROYAL SOCIETY CONVERSAZIONE

At the annual conversazioni of the Royal Society workers in different branches of science entertain one another with a wide range of exhibits and demonstrations. As a rule no contributions of purely medical interest are to be found: this is not to be regretted, since medical societies provide many occasions on which doctors show specimens, and the clinical investigator can always get entertainment and often help from seeing technical "tricks" from the repertoire of his colleagues in other sciences, and even if the more complex ones are beyond him enjoy those demonstrations that have a spectacular appeal. This year an exceptionally large number of guests assembled on May 28th. Practical hygiene provided two interesting collections of exhibits. That a brightly polished surface reflects heat well and absorbs it badly has been known for more than a century; the application of these facts to the protection of workers in the tropics or in the furnace rooms of industrial workshops has been shown to be practicable by covering the various materials used in the manufacture of sun-helmets, masks, gloves, and clothing with a layer of metal foil.<sup>1</sup> The use of similarly prepared materials in the construction of houses, factories, ambulances, and ships was illustrated by scale models. Other models showed the methods used in the attempted arrest of transmitted vibrations and noise for the exclusion of such everyday sounds as those of footsteps, electrical motors, and typewriters and for the elimination of traffic vibrations. Prof. H. H. Woollard's serial microphotographs of sensory endings in the human skin have been shown previously to medical audiences. In association with a new aesthesiometer for testing sensibility of the skin to touch and a new tachistoscope for experiments in visual perception and recognition they provided a remarkable group of exhibits. From the physicists came two attractive demonstrations: a collection of beautifully phosphorescent powders and an exhibition of the fluorescent effects excited by mercury vapour discharges in certain mineral salts. The estimation of oxygen in very small quantities of blood, the estimation of minute traces of carbon dioxide given off by living plants, and the micro-analysis of very small volumes of mixed gases provided examples of the greatly increased sensitivity and accuracy of chemical laboratory methods. Some common insects were used for three of the biological exhibits. It was

shown that the fine hairs of the anal cercus of a cockroach, clearly visible under the microscope, vibrated so rapidly on the approach of a bowed tuning-fork that they became invisible. The frequency of the responses set up by these hairs in their afferent nerves bears the same relation to the frequency of stimulation as does that set up in the mammalian auditory nerve by stimulation of the cochlea, so that it is possible, with a suitable stimulus, to obtain responses from tactile end-organs of a form that has hitherto been regarded as peculiar to the auditory apparatus. The blood-sucking bug rhodnius moults five times during development, passing through four newt and one adult stage. A very small gland in its head secretes both a moulting and an inhibitory hormone: the former, given to a first-stage newt, turns it immediately into a minute adult; the latter, given to a fourth-stage newt, causes it to turn into a giant nymph. The third biological contribution, one of more direct medical interest, is concerned with the study of the climatic factors influencing the multiplication of fleas. Mice, each sown with a numbered population of fleas, are kept separately for several weeks under standard conditions of humidity, warmth, and air supply. The conditions thus defined as inimical to the survival and to the propagation of fleas are expected to have important practical application in the control of flea-borne diseases such as plague.

### CHILDREN UNDER SCHOOL AGE

ON May 29th the Minister of Health addressed a circular (No. 1550) to local authorities charged with child welfare, expressing his anxiety about the attention given to the health of children between the ages of eighteen months and five years. In this transition period between infancy and school life, 16 per cent. of the children suffer from some disease or defect which is only discovered on entering school. The Minister recalls the intentions of the circular (B. of E. No. 1444), issued last January, about the provision of nursery schools and the admission of young children to infants' departments of elementary schools; he adds: "It is clear that whatever provision is made on the lines there suggested, very considerable numbers of children under the age of five will remain at home." It should, he states, be the duty of the health visitor to see these children at regular intervals; for, even in the few places where there are pre-school (sometimes called toddlers') clinics, their success must depend largely on regular visiting at home by the health visitor. The circular points out how desirable it is for the same authority (then, of course, the school medical service) to be concerned throughout with the health of the growing child, and where there is divided authority the Minister suggests ways in which the drawbacks could, and should, be removed; and finally he insists that no authority will get efficient work out of its health-visiting staff unless it pays them proper salaries. The circular ends with a R.S.V.P. to the addressee, to which we may hope the reply will be very prompt.

At a meeting of the court of Edinburgh University last week, intimation was made of a grant from the Rockefeller Foundation for research work in neurosurgery. The work will be carried out by a team of workers under the direction of Mr. Norman Dott, and the grant which totals £7500 will be applied to these studies during the five years from June 1st, 1936. A special ward will be provided for Mr. Dott's use at the Royal Infirmary.

<sup>1</sup> See THE LANCET, 1934, i., 37.



## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### CIII.—PROGNOSIS OF URINARY CALCULI

IN considering the prognosis of urinary calculi it is convenient first to view the urinary tract as a whole, and then to discuss in more detail calculi in kidney, ureter, bladder, prostate, and urethra. Urinary calculi, for all practical purposes, may be considered to originate in the kidney or bladder: they may be *primary*—i.e., occurring in an otherwise healthy urinary tract—or *secondary* to infection or obstruction. The common primary stones are composed of (1) uric acid, ammonium and sodium urate, or calcium oxalate, all of which occur in acid urine; or (2) calcium phosphate, or calcium carbonate, which occur in neutral or alkaline urine. Secondary stones, which are deposited in alkaline urine as a result of bacterial decomposition, are formed of calcium, ammonium and magnesium phosphate ("triple phosphate"), and calcium carbonate. The most common organism associated with stone is the *Staphylococcus albus*; in fact, when it is found in a urine, search should be made for stone. In considering the prognosis of each individual case various questions present themselves: what is the risk of leaving the stone alone, what are the chances of the patient passing it himself, what are the operation risks, and what the indications for operation; what should be regarded as contra-indications, and what can be done to prevent recurrences in the future? The answer to all these questions will be found in complete and systematic investigation of each case by X rays, pyelography (intravenous or ascending), cystoscopy, examination of the separated urines, bacteriology, and blood-urea estimate.

If a stone remains in the kidney it ultimately destroys the organ: the kidney undergoes fibrosis, and the pelvis and calices dilate, resulting in hydronephrosis. Sooner or later infection follows, and this in turn may result in pyonephrosis and perinephric abscess. A kidney with stone is also more likely to develop malignant disease than is a normal kidney. It has been estimated that 50 per cent. of unoperated cases of renal stone end with bilateral stones. A stone in the ureter usually produces incomplete obstruction, but eventually causes equally severe damage to the kidney. Should the obstruction become complete, anuria may result. A stone left in the bladder may produce obstruction and infection of the bladder and eventually pyelonephritis. A shadow shown in the kidney area by X rays should not be accepted as a kidney stone—especially on the right side where it may be a gall-stone—until it is proved to occupy the same position in the kidney in skiagrams taken during inspiration and expiration. A lateral X ray, moreover, will show a kidney stone to be lying on the bodies of the vertebrae: an intravenous pyelogram will settle any further doubt and give valuable information both as regards the position of the stone and the condition of the kidney. A stone fixed in one of the calices is less likely to pass naturally, but on the other hand it is doing a minimum of damage, and one can afford to wait: a uroselectan X ray will show whether it is held by a neck too narrow to allow its passage into the pelvis. When a calculus has passed out of the kidney into the ureter, it may be held up there, the commonest places of obstruction being the upper end, lower end, and, less often, the pelvic brim where the ureter crosses the iliac vessels. A stone which reaches the bladder generally passes

without difficulty, especially in women, but it may stick in the internal meatus or in the urethra.

#### KIDNEY STONES

Assuming an otherwise healthy subject, when the urine is uninfected and the stone of such a size that it can be removed through the renal pelvis, the operation risk is a small one, estimated at about 2 per cent.: whereas in cases of urinary infection, and a stone too large to allow removal through the pelvis, which necessitates cutting into the renal parenchyma, the risk may be as high as 20 per cent. From the foregoing considerations it is seen that most aseptic kidney stones are best removed, though exception may be made in the case of a fixed stone which is doing no damage and producing little in the way of symptoms or disability. It may be unnecessary also to remove multiple small stones from a patient who passes them from time to time. When the stones are bilateral, it is advisable to operate on the better kidney first; this gives the surgeon a free hand to deal with its fellow later on. Large bilateral stones are probably best left alone. The kidney function is already impaired, and removal of the stones involves cutting into the kidney tissue and producing further damage; there is also a risk of secondary hæmorrhage, which does not occur when the stone is removed through the pelvis.

The onset of infection is an indication for operation, since when infection is added to back pressure damage to the kidney progresses more rapidly. In most cases in which infection is secondary to stone, the infection clears when the stone has been removed.

*Secondary* stones come into a different category: it is doubtful how far removal of the stone will effect recovery of the kidney, and unless the infection is cured, the stone will recur. Provided the second kidney is healthy and uninfected, nephrectomy may be preferable to pyelolithotomy or nephrolithotomy; this is especially so when the infecting organism is the *Staphylococcus albus*. Patients with large branched bilateral calculi, plus infection, should be operated upon only if some urgent complication demands it. Much can be done for them by spa treatment.

#### URETERIC STONES

Eighty per cent. of the stones which pass the ureteropelvic junction eventually reach the bladder, without producing a complete persisting block or necessitating operation. Surgical intervention becomes necessary however if a complete kidney block persists: the onset of this is characterised by severe kidney pain, and may be accompanied by complete anuria. Other indications for operation are symptoms of infection and evidence of dilation of ureter and kidney, determined by intravenous pyelography. Once dilation begins behind the obstruction the chances of the stone passing naturally are diminished. Every case of ureteral stone should be X rayed every two months, and if the stone has not progressed downwards since the last X ray examination, intravenous pyelography should follow. The position of the stone should be confirmed shortly before operation, in every case that comes to operation.

#### BLADDER STONES

A stone lodged in the intravesical portion of the ureter gives rise to frequency and pain at the end

of micturition, symptoms which might lead to the conclusion that it had reached the bladder. An X ray may be deceptive, so that cystoscopy is advisable. The majority of bladder stones, however, that one has to legislate for, are relatively large and their most fertile causes are (1) obstruction and infection, (2) conditions which prevent proper emptying of the bladder—e.g., a diverticulum, and (3) diseases of the central nervous system. The ideal method of treating an uncomplicated bladder stone is to crush and evacuate it; in skilled hands this is a safe procedure, and entails only a few days in bed. Recurrence is due, not to leaving fragments behind (as can be proved by cystoscopy), but to continuation of the conditions which produced the stone. For example, a stone associated with prostatic obstruction is only an incident in the course of an enlarged prostate, and the correct procedure is prostatectomy. A stone associated with stricture may be crushed after internal urethrotomy. Stones formed round a foreign body are not suitable for litholapaxy; the latter is contra-indicated also with sacculated stones (dumb-bell-shaped stones, of which one part lies in a sacculus and the other projects into the bladder), and when a diverticulum is present, as this prevents proper evacuation of the fragments. Care is needed when litholapaxy is done on a patient whose bladder has been opened suprapubically on some former occasion, since it is easy to tear the bladder from the scar with the evacuator and thus to produce a perforation.

#### PROSTATIC STONES

Two kinds are described: (1) those arising in the gland itself, and (2) those whose origin is in kidney or bladder. The latter rank as urethral stones. The former are small dark yellow-brown stones, like grape seeds, composed of an albuminoid substance with lecithin: they are of little importance, but may increase in size from deposit of phosphates.

#### URETHRAL STONES

The most common sites for a stone to lodge are in the region of the triangular ligament, and at the fossa navicularis. A stone held in the former position can be pushed back, with a large bougie, into the bladder, where it can be crushed and evacuated; whereas in the latter situation it can be delivered by meatotomy. A stone lodged behind a stricture may necessitate urethrotomy. Large stones are found occasionally in the posterior urethra. I removed recently, by suprapubic operation, one that had resisted treatment by Christian Science for seven years.

#### Prophylaxis

We now have to consider what can be done to prevent recurrence of stone. We know little about its causation, but the main factors appear to be the deposit of crystals from the urine, and the presence of an "irreversible" colloid which acts as a scaffold round which the stone is built. Heredity, climate, food, and water-supply ("chalky" or hard water) all play their part, and deficiency of vitamin A may be a factor. Heredity is exemplified by the tendency to produce uric acid and the rarer cystin stones: in hot climates the concentration of the urine favours stone formation; and the influence of food is shown in India, where stone is common in the wheat-growing areas, but rare in the rice-growing ones. Crystals deposited in the urine may be of uric acid, calcium oxalate, or phosphates; and the

general principles to be adopted by those who pass crystals are to eat moderately, to attend to the bowels carefully, to take regular exercise, and to flush the urinary tract daily with appropriate mineral waters; this is done best before breakfast, when the stomach is empty. The recurrence of secondary stones may be prevented by relieving obstruction, treating the bacterial infection, and keeping the urine acid. Spa treatment from time to time is of great benefit with both primary and secondary stones.

The uric acid in the urine is partly endogenous, from the products of metabolism, and partly exogenous, from food nucleins. The indications, therefore, in patients passing uric acid crystals or stones are to eliminate foods rich in purins (liver, sweetbread, kidney meat extracts) and to flush the urinary tract with alkaline waters (Contrexeville, Evian, Vichy); so-called uric acid "solvents" are of doubtful benefit. The oxalates in the urine, normally kept in solution by the acid sodium phosphate, are also partly exogenous, derived from the oxalic acid and calcium of the food, and partly endogenous from protein metabolism. Insoluble calcium oxalate crystals are deposited in acid urine, especially after ingestion of substances with a high oxalate content. A vegetarian diet is more prone to produce oxaluria than a meat one. Oxalate stones are the least likely to recur, and though we have little control over endogenous oxalates much can be done to prevent recurrence by diet and moderation of alcohol. These patients should avoid strawberries, raspberries, pears, rhubarb, beetroot, asparagus, spinach, and tomatoes: they should abstain from excess of sweets, chocolates, and jams. Meat extracts and "insides" (liver, kidney, sweetbread) should be forbidden. The best alcoholic drink for them is dry cider, malic acid being a solvent of oxalates, but they are allowed in moderation claret, burgundy, dry sherry and dry champagne, old whisky, and gin. They should flush the urinary tract daily with alkaline minerals, as already indicated. Magnesium salts—e.g., Dinneford's magnesia—taken from time to time may be helpful.

In phosphaturia there is a diminution in the urine of the acid salts which keep the phosphate in solution, and when the urine becomes neutral or alkaline these are deposited. With certain bacterial infections the urine becomes alkaline and triple phosphates are deposited. Phosphaturia is apt to follow the ingestion of too much alkali; it occurs also with dyspepsia and with overwork, worry, and mental strain. In patients suffering from phosphaturia these conditions should be corrected, the urine should be rendered acid—by dilute mineral acids or acid sodium phosphate—and the vegetable food limited.

SYDNEY G. MACDONALD, F.R.C.S.,

Surgeon in charge Genito-urinary Department, West London Hospital; Genito-urinary Surgeon to Royal Masonic Hospital.

---

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.—It is hoped that the nurses' home extension to this hospital will be finished this year, the main hospital block by October, 1938, and the administrative block by March, 1941. The cost of reconstruction has been estimated at about £400,000, of which £100,000 has been contributed. In the new hospital the total accommodation will be about 290 public cots, and 36 paying-patient cots; the buildings will be divided into units of 20 cots, each entirely self-contained. To reduce the risks of cross-infection, some of the wards will contain only one cot, and the largest number of cots in any one ward will be 6.

## SPECIAL ARTICLES

## THE POISONS RULES

WHAT EVERY PRACTITIONER SHOULD KNOW

POISONS law is an intricate subject and the practitioner who would try to master it should read Mr. Linstead's excellent book,<sup>1</sup> but, before doing so, let him be warned that he may require more leisure than he has a right to expect and a reserve of patience which should, more properly, have been exhausted in coping with the sick—and their relations. Nevertheless, whether they wish to go deeply into the subject or not, all practitioners must willy-nilly familiarise themselves with certain points in the new poisons rules which came into force on May 1st last.

Two general rules applicable to all poisons should be borne in mind. The first deals with the storage of poisons in the surgery or dispensary. Henceforward the doctor must see that all his containers are impervious to the poisons they contain and that they are stout enough to prevent leakage. Secondly, when he supplies an embrocation, liniment, lotion, liquid antiseptic, or any other substance for external application, he must ensure that the container in which it is supplied is labelled so as to show not only the nature of the article—e.g., "The Lotion," "The Liniment," &c.—but also the words "For external use only."

The new rules comprise 12 schedules. Mercifully for him, the practitioner need concern himself with only two of these—namely, the first and fourth—the remaining 10 schedules being matters for the pharmacist. Appended is a list of the poisons in the First and Fourth Schedules, and we think that the practitioner would be well advised to cut it out and hang it conspicuously in his surgery so that he, and his dispenser if he has one, can readily refer to it. The First Schedule consists of a large number of substances to which special restrictions apply. For the purposes of his profession, a doctor may buy poisons from any "authorised seller of poisons"—i.e., a chemist or a wholesale or manufacturing firm—but, under the new rules, these substances in the First Schedule can only be supplied by a seller to a doctor on receipt of a written order signed by the doctor. It is true that, in an emergency, the doctor can get a supply of any substance in this schedule either by going in person to the chemist and signing the poisons register or, alternatively, by promising to send the written order, duly signed, to the chemist within 24 hours of receiving the substance; but, should he forget or otherwise fail to supply the written order, he becomes liable under the Dangerous Drugs Act to a penalty which may take the form of a fine or even imprisonment—not, we are relieved to find, of banishment or execution. Again, when dispensing a medicine containing a substance in the First Schedule, the practitioner is now required to label the bottle with his own name and address, to enter the date of supply of the medicine in his day-book, and also the ingredients of the medicine, the quantity, and, finally, the name of the person to whom the medicine was supplied.

So much for the rules about poisons in the First Schedule in so far as they affect practitioners. By referring to the list at the end of this article it will be seen that the Fourth Schedule consists of some of the drugs in the First Schedule in respect of which

the restrictions are even more exacting. Under the new rules, a doctor's prescription is necessary before any substance in this group or any preparation containing one of them can be sold retail, and this applies to all proprietary preparations, sold under trade names, which contain any of these substances. Not only must the prescription be signed by a doctor and dated in his own hand. It must also have his address on it (unless it is a N.H.I. or local authority prescription), the patient's name and address, the total amount of medicine and the dose. Further, unless the doctor specifies how many times or at what intervals the prescription is to be repeated, it can only be dispensed once and, unless the prescription is made out accurately according to the rules, it cannot be dispensed at all.

It is not easy to foresee as yet all the end-results of these new restrictions but one obvious and salutary effect of them will be the disappearance of these poisons, notably amidopyrine, from patent medicines, which should help to check the deplorable habit of indiscriminate symptomatic self-treatment so freely indulged in by the public. This, in itself, should help to console practitioners for the extra trouble involved. It was not to be supposed that the new rules would work smoothly from the beginning without a hitch of any kind. Most of the difficulties which have so far cropped up have been primarily matters of concern to pharmacists rather than to doctors, but one or two points of interest to both may be mentioned. For example, into what category fall such things as mouth-washes, eye-drops, ear-drops, and douches? Are they to be regarded as medicines for internal or external application? The ruling here seems to be that they should be dispensed in "poison" bottles but need not be labelled "For external use only." The Pharmaceutical Society has also asked the Home Office for a ruling, which has not yet been promulgated, on the question as to how many times a chemist may repeat a barbiturate prescription marked "To be repeated." Pending the Home Office decision, we would point out that, according to the letter of the rules, such a prescription is inaccurate and therefore should not be dispensed at all.

## FIRST SCHEDULE

*Substances falling within the Poisons List to which special restrictions apply*

Alkaloids, the following; their salts, simple or complex:

- Acetyldihydrocodeinone.
- Aconite, alkaloids of, except substances containing less than 0.02 per cent. of the alkaloids of aconite.
- Apomorphine except substances containing less than 0.2 per cent. of apomorphine.
- Atropine except substances containing less than 0.15 per cent. of atropine.
- Belladonna, alkaloids of, except substances containing less than 0.15 per cent. of the alkaloids of belladonna calculated as hyoscyamine.
- Benzoylmorphine.
- Benzylmorphine.
- Brucine except substances containing less than 0.2 per cent. of brucine.
- Calabar bean, alkaloids of.
- Coca, alkaloids of, except substances containing less than 0.1 per cent. of the alkaloids of coca.
- Cocaine except substances containing less than 0.1 per cent. of cocaine.
- Codeine except substances containing less than 1 per cent. of codeine.
- Colchicine except substances containing less than 0.5 per cent. of colchicine.
- Coniine except substances containing less than 0.1 per cent. of coniine.

<sup>1</sup> Poisons Law. By Hugh N. Linstead, secretary of the Pharmaceutical Society of Great Britain. Reviewed in a leading article in THE LANCET of May 16th (p. 1121).

- Cotarnine except substances containing less than 0·2 per cent. of cotarnine.
- Curarine.
- Diacetylmorphine.
- Dihydrocodeinone.
- Dihydrohydroxycodone.
- Dihydromorphine.
- Dihydromorphinone.
- Egonine except substances containing less than 0·1 per cent. of egonine.
- Emetine except substances containing less than 1 per cent. of emetine.
- Ergot, alkaloids of.
- Ethylmorphine except substances containing less than 0·2 per cent. of ethylmorphine.
- Gelsemium, alkaloids of, except substances containing less than 0·1 per cent. of the alkaloids of gelsemium.
- Homatropine except substances containing less than 0·15 per cent. of homatropine.
- Hyoscine except substances containing less than 0·15 per cent. of hyoscine.
- Hyoscyamine except substances containing less than 0·15 per cent. of hyoscyamine.
- Jaborandi, alkaloids of, except substances containing less than 0·5 per cent. of the alkaloids of jaborandi.
- Lobelia, alkaloids of, except substances containing less than 0·5 per cent. of the alkaloids of lobelia.
- Morphine except substances containing less than 0·2 per cent. of morphine calculated as anhydrous morphine.
- Nicotine.
- Papaverine except substances containing less than 1 per cent. of papaverine.
- Pomegranate, alkaloids of, except substances containing less than 0·5 per cent. of the alkaloids of pomegranate.
- Quebracho, alkaloids of.
- Sabadilla, alkaloids of, except substances containing less than 1 per cent. of the alkaloids of sabadilla.
- Solanaceous alkaloids, not otherwise included in this Schedule, except substances containing less than 0·15 per cent. of solanaceous alkaloids calculated as hyoscyamine.
- Stavesacre, alkaloids of, except substances containing less than 0·2 per cent. of the alkaloids of stavesacre.
- Strychnine except substances containing less than 0·2 per cent. of strychnine.
- Thebaine except substances containing less than 1 per cent. of thebaine.
- Veratrum, alkaloids of, except substances containing less than 1 per cent. of the alkaloids of veratrum.
- Yohimba, alkaloids of.
- Allylisopropylacetylurea.
- Amidopyrine; its salts.
- Amino-alcohols, esterified with benzoic acid, phenylacetic acid, phenylpropionic acid, cinnamic acid or the derivatives of these acids, except in substances containing less than 10 per cent. of esterified amino-alcohols.
- Antimonial poisons except substances containing less than the equivalent of 1 per cent. of antimony trioxide.
- Arsenical poisons except substances containing less than the equivalent of 0·01 per cent. of arsenic trioxide.
- Barbituric acid; its salts; derivatives of barbituric acid; their salts; compounds of barbituric acid, its salts, its derivatives, their salts, with any other substance.
- Barium, salts of.
- Cannabis; the resin of cannabis; extracts of cannabis; tinctures of cannabis; cannabin tannate.
- Cantharidin except substances containing less than 0·01 per cent. of cantharidin.
- Cantharidates except substances containing less than the equivalent of 0·01 per cent. of cantharidin.
- Digitalis, glycosides of, except substances containing less than 1 unit of activity (as defined in the British Pharmacopœia) in 2 grammes of the substance.
- Dinitrocresols; dinitronaphthols; dinitrophenols; dinitrothymols.
- Ergot; extracts of ergot; tinctures of ergot.
- Guanidines, the following: polymethylene diguanidines, dipara-anisyl-phenetyl guanidine.
- Hydrocyanic acid except substances containing less than 0·1 per cent. of hydrocyanic acid (HCN); cyanides except substances containing less than the equivalent of 0·1 per cent., weight in weight, of hydrocyanic acid (HCN); double cyanides of mercury and zinc.
- Lead, compounds of, with acids from fixed oils.
- Mercuric chloride except substances containing less than 1 per cent. of mercuric chloride; mercuric iodide except substances containing less than 2 per cent. of mercuric iodide; nitrates of mercury except substances containing less than the equivalent of 3 per cent., weight in weight, of mercury (Hg); potassio-mercuric iodides except substances containing less than the equivalent of 1 per cent. of mercuric iodide; organic compounds of mercury except substances containing less than the equivalent of 0·2 per cent., weight in weight, of mercury (Hg).
- Metanitrophenol; orthonitrophenol; paranitrophenol.
- Nux Vomica except substances containing less than 0·2 per cent. of strychnine.
- Opium except substances containing less than 0·2 per cent. of morphine calculated as anhydrous morphine.
- Oubain.
- Oxycinchonic acid, derivatives of; their salts; their esters.
- Phenetidylphenacetin.
- Phenylcinchoninic acid; salicyl-cinchonic acid; their salts; their esters.
- Phenylethyldantoin; its salts; its acyl derivatives; their salts.
- Picrotoxin.
- Savin, oil of.
- Strophanthus, glycosides of.
- Thallium, salts of.
- Tribromethyl alcohol.

## FOURTH SCHEDULE

*Substances required by Rule 12 to be sold by retail only upon a prescription given by a qualified medical practitioner, registered dentist or registered veterinary surgeon*

- Amidopyrine; its salts.
- Barbituric acid; its salts; derivatives of barbituric acid; their salts; compounds of barbituric acid, its salts, its derivatives, their salts, with any other substance.
- Dinitrocresols; dinitronaphthols; dinitrophenols; dinitrothymols.
- Phenylcinchoninic acid; salicyl-cinchonic acid; their salts; their esters.
- Sulphonal; alkyl sulphonals.

A leaflet prepared by the Pharmaceutical Society gives the following list of some of the substances coming within the Fourth Schedule, in the form in which they are usually prescribed:—

- |                                  |                         |                               |
|----------------------------------|-------------------------|-------------------------------|
| Acitophosan.                     | Didial.                 | Pernocton.                    |
| Agotan.                          | Diethylbarbituric acid. | Pfanodorm.                    |
| Alepsal.                         | Diethylamonylurea.      | Phenobarbital.                |
| Algodorm.                        | Dinitrocresols          | Phenobarbitone.               |
| Allobarbitone.                   | dinitronaphthols;       | Phenquin.                     |
| Allonal.                         | dinitrophenols;         | Phenylcinchoninic acid.       |
| Amidophen.                       | dinitrothymols.         | Phenyl-ethyl-barbituric acid. |
| Amidopyrine.                     | Disulphamin.            | Prominal.                     |
| Amytal.                          | Ditonal.                | Proponal.                     |
| Anegrine.                        | Diogenal.               | Pyramidon.                    |
| Angiolylin.                      | Ephepyrin.              | Quadro-nox.                   |
| Anotal.                          | Eupaco.                 | Quinophan.                    |
| Arcanol.                         | Euvaleol elixir B.      | Rutonal.                      |
| Asciatine.                       | Evipan.                 | Salicylcinchonic acid.        |
| Atocin.                          | Gardan.                 | Sandoptal.                    |
| Atophan.                         | Gardenal.               | Sciatego.                     |
| Atophanyl.                       | Gorun cachets.          | Sedal.                        |
| Atoquinol.                       | Hebural sodium.         | Sinepan.                      |
| Barbital.                        | Hemynpnone.             | Sonnacetin.                   |
| Barbitone and soluble barbitone. | Ipral.                  | Somnifaine.                   |
| Barbituric acid.                 | Leucotropin.            | Somnifene.                    |
| Benzedo compound.                | Luminal.                | Somnosal.                     |
| Cafinal.                         | Malonal.                | Sonalgin.                     |
| Chineonal.                       | Malonurea.              | Soneryl.                      |
| Chloroxyl.                       | Medinal.                | Sulphonal; alkyl sulphonals.  |
| Cibalgin.                        | Merbaphen.              | Tetronal.                     |
| Cinchophen.                      | Methylsulphonal.        | Theogardenal.                 |
| Cinchosal.                       | Nembutal.               | Theominal.                    |
| Codeonal.                        | Neocinchophen.          | Theotone.                     |
| Compral.                         | Noonal.                 | Tolysin.                      |
| Creslumin.                       | Neophenoquin.           | Trigemin.                     |
| Cyclobarbital.                   | Neoquinophan.           | Trional.                      |
| Dekrysil.                        | Neurinase.              | Veramon.                      |
| Dial.                            | Novasulol.              | Veronal.                      |
| Dialacatin.                      | Novatophan.             | Verongen.                     |
| Diallylbarbituric acid.          | Optaldon.               | Veropyron.                    |
| Dibromin.                        | Optinoktin.             |                               |
|                                  | Pentobarbital.          |                               |

## GENERAL MEDICAL COUNCIL

SUMMER SESSION, MAY 26TH-29TH, 1936

At the conclusion of the presidential address summarised in our last issue a vote of thanks to Sir NORMAN WALKER was proposed by Dr. Letheby Tidy and seconded by Mr. R. E. Kelly. Sir Robert Bolam was then elected chairman of business, and the Standing Orders were suspended in order that the Council might arrange to meet on Wednesday and Thursday mornings. An application from Mr. Sylvester Davidson Fairweather for the removal of his name from the Register as he had ceased to practise was agreed to. After deliberation in camera the President announced the restoration to the Dentists Register of the name of William McCulloch Lawson.

## Cases Referred by the Dental Board

*The Case of James Alexander Randolph Allison*, registered as of 26, Seedhill-road, Paisley, "Dentist 1921," who had pleaded guilty and been convicted of fraud at the Greenock Sheriff Court on Dec. 11th, 1935, and sentenced to six weeks' imprisonment. He had not appeared nor been represented at the inquiry of the Dental Board. His name had been erased from the Dentists Register previously and the Council had consented to its restoration at the November, 1935, session. The Board recommended the erasure of his name again. He was not present. Mr. Harper, solicitor to the Council, explained the facts, and the President, after deliberation in camera, announced that the Registrar had been directed to erase Mr. Allison's name.

*The Case of John Drain*, registered as of 21, Albert-street, Alexandria, Dumbarton, "Dentist 1921," who had been sentenced at Woking on Feb. 22nd, 1936, to three months' imprisonment for embezzlement and theft from his employer. He had pleaded guilty. He had not attended the inquiry nor been represented, and the Board recommended the erasure of his name from the Register. Mr. Drain was not present nor represented. Mr. Harper laid the facts before the Council, which, after deliberation, decided to erase the name of Mr. Drain from the Dentists Register.

*The Case of Lionel Richard Sanders*, registered as of 350, High-road, Tottenham, London, N.17, "Dentist 1921," who had appeared before the Dental Board on the following allegations:—

1. You committed adultery with Gwendoline Lanston, a married woman, of which adultery you were found guilty by the decree of the Probate Divorce and Admiralty Division (Divorce) of the High Court of Justice, dated Dec. 17th, 1935, in the case of Sanders, Nora Silk v. Sanders, Lionel Richard, in which you were respondent.
2. The said Gwendoline Lanston was a patient of yours from July to September, 1933. Alternatively: 3. (a) By carrying on immoral and improper relations with Gwendoline Lanston at the premises 350, High-road, Tottenham, where you conducted your practice as a dentist; (b) by signing and giving to the said Gwendoline Lanston on Sept. 23rd, 1933, a receipted account purporting to be for professional attendance on her in order to conceal and dissemble your true association with her. And that in relation to the facts so alleged you have been guilty of infamous or disgraceful conduct in a professional respect.

The complainant was William Lanston.

The Dental Board had found the facts alleged proved to their satisfaction and recommended the erasure of Mr. Sanders's name.

Mr. Sanders attended, accompanied by Mr. Wynn Werninck, counsel, instructed by Messrs. Bein and Lawrence, solicitors. Mr. Werninck addressed the Council, questioning whether the admitted misconduct could be said to be in a professional respect. The association had begun before respondent knew the lady was married, and the professional receipt in evidence had been given only in an attempt to make the husband think she was a patient which in fact she was not. Mr. Winterbottom (solicitor to the Council) pointed out that the Dental Board had not made any pronouncement as to whether Mrs. Lanston was a patient or not.

After deliberation in camera the President announced that the Registrar had been directed to erase Mr. Sanders's name from the Dental Register.

## Cases Referred from Previous Sessions

*The Case* (adjourned from May 30th, 1935) of *James Francis Patrick Devlin*, registered as of Old Chapel House, Richmond Hill, Leeds, 9, M.B., B.Ch. 1916, N.U. Irel., who had been summoned to appear before the Council on a conviction at Huddersfield in January, 1935, for being under the influence of drink to such an extent as to be incapable of having proper control of a car of which he was in charge.

The Council had found the charge proved and had postponed judgment for a year. Dr. Devlin now appeared, and had submitted the required testimonials as to his conduct in the interval. He repeated his apologies and his determination to act on the warning he had received. After deliberation in camera the President announced that the Council had decided not to erase Dr. Devlin's name.

*The Case* (adjourned from May 29th, 1935) of *William Graham*, registered as of Bridge House, Manor-road, Tynemouth, M.B., B.S. 1923, U. Durh., who had been summoned to appear before the Council as a result of various convictions for motoring offences. The charges had been found proved and judgment had been postponed for twelve months.

Dr. Graham appeared, accompanied by Mr. Oswald Hempson, solicitor, who put in the required testimonials and reiterated on behalf of his client his promise to abstain altogether from alcohol. He also drew attention to the serious punishments imposed by the court, which included disqualification for life from holding a driving licence. After deliberation, the President announced that Dr. Graham's name would not be erased.

*The Case* (adjourned from May 28th, 1935) of *Alexander Beck Cluckie*, registered as of 14, Gay-street, Bath, M.B., Ch.B. 1908, U. Glasg., who had been summoned to appear before the Council on account of convictions in the Bath City Police-court for drunkenness while in charge of a car and other motoring offences. The charge had been found proved and judgment postponed for a year. Dr. Cluckie now appeared, bringing seventeen testimonials, and reiterated his vow of abstinence. His name was not erased.

*The Case* (adjourned from May 30th, 1935) of *William Mervyn Crofton*, registered as of 22, Park-square, London, N.W.1, M.B., B.S. 1904, R.U. Irel.; M.D. 1911, N.U. Irel., who had been summoned on a charge (brought by the Medical Defence Union) of advertising by press interviews, public notices, and a speech to opticians. Dr. Crofton was not present and had not been asked to attend. The Council considered his testimonials in camera as they were only interim reports, final judgment having been postponed at the 1935 hearing for two years.

*The Case* (adjourned from May 29th, 1935) of *Oladipo Lahanmi*, registered as of 2, Levenshulme-road, Gorton, Manchester, L.M.S.S.A. Lond., 1932, who had been summoned to appear on charges of stealing microscopes from the Liverpool School of Tropical Medicine, for which he had been convicted and fined at the police-court. The charge had been found proved but the Council, in consideration of youth and other circumstances, had postponed judgment. Dr. Lahanmi now submitted the testimonials required of him and appeared. After deliberation the Council decided not to order the erasure of his name.

*The Case* (adjourned from May 29th, 1935) of *Samuel Patrick McGrath*, registered as of 54, Kinross-avenue, Worcester Park, Surrey, M.B., B.Ch. 1924, N.U. Irel., who had appeared on a charge of unprofessional conduct after convictions for driving a car under the influence of drink. Judgment had been postponed, subject to the usual provisos. Dr. McGrath appeared, accompanied by Mr. Oswald Illempson, solicitor, who produced testimonials and voiced his client's assurances for the future. Dr. McGrath's name was not removed.

*The Case* (adjourned from May 29th, 1935) of *Cecil John Rhodes Morrison*, registered as of c/o National Bank of India, 26, Bishopsgate, London, E.C.2, L.R.C.P. Edin., 1925; L.R.C.S. Edin., 1925; L.R.F.P.S. Glasg., 1925, who had been summoned to appear before the Council as a result of convictions for drunkenness. Dr. Morrison attended, with the testimonials that had been required of him, and the President announced that his name would not be erased.

*The Case* (adjourned from June 1st, 1934, and May 28th, 1935) of *George Francis Donaldson Perrott*, registered as of 25, Bromefield, Stanmore, Middlesex, M.R.C.S. Eng., 1928; L.R.C.P. Lond., 1928, who had been summoned to appear before the Council on similar charges of drunkenness. Dr. Perrott attended, accompanied by Mr. Levy Teesdale, solicitor, who gave his client's assurance as to good conduct in future, and put in the testimonials asked for by the Council. Dr. Perrott's name was not erased.

### New Penal Cases

#### CHARGES OF DRUNKENNESS

*The Case of Alan Gray*, registered as of 65, Moston-lane, Blackley, Manchester, M.B., B.S. 1925, U.Durh., who had been summoned to appear before the Council on the following charge:—

That you were convicted, after pleading guilty, of the following misdemeanour, viz., on Jan. 13th, 1936, at the Manchester City Police-court, of being under the influence of drink whilst in charge of a motor-car, and were fined £20 and 5s. costs and were disqualified for holding a driving licence for twelve months.

Dr. Gray was not present. Mr. Harper said that the Notice of Inquiry had been acknowledged by a Mrs. Gray, who had forwarded it to the respondent on a ship which was at sea. It was agreed to postpone the case.

*The Case of John Muir MacKenzie*, registered as of Hollymoor Mental Hospital, Northfield, Birmingham, M.B., Ch.B. 1921, U. Glasg., who had been summoned to appear before the Council on the following charge:—

That you were convicted, after pleading guilty, at the Birmingham Police-court of the following misdemeanours: (1) on July 29th, 1933, of being drunk, and were fined 5s. or seven days' imprisonment; (2) on Oct. 29th, 1934, of being drunk, and were fined 10s. or seven days' imprisonment; (3) on Nov. 2nd, 1935, of driving a motor-car

whilst under the influence of drink, and were fined £10 and £1 16s. costs or 28 days' imprisonment, and were disqualified for holding a driving licence for 12 months.

Dr. MacKenzie appeared, accompanied by Mr R. A. Willes, counsel, instructed by Messrs. Barlow, Lyde and Gilbert, agents for Messrs. James Ore, Birmingham. Mr. Winterbottom laid the facts before the Council and read the evidence given by the police officers. Mr. Willes addressed the Council on Dr. MacKenzie's behalf, emphasising that the offence occurred when respondent was off duty, and that respondent had a remarkably high professional reputation and had recently obtained the D.P.M. Lond. and performed valuable research work. He called Dr. T. Yoxall, who said he had known Dr. MacKenzie for ten years, and testified warmly to his excellence as a man and a doctor. To witness's knowledge, respondent could not safely take any alcohol and had now become a teetotaler. Dr. MacKenzie also testified on his own behalf. After deliberation in camera the President announced that the charge had been found proved but judgment would be postponed for 12 months, subject to the usual provisos.

*The Case of David Davidson Watson*, registered as of 55, Corstorphine Hill-gardens, Edinburgh, 12, M.B., Ch.B. 1926, U.St.And., who had been summoned to appear before the Council on the following charge:

That you were convicted (1) of the following offence: on Dec. 2nd, 1933, at the Sheriff Court, Edinburgh, of driving a motor-car whilst under the influence of drink, and were fined £15; (2) of the following misdemeanour: on March 30th, 1936, at the Wakefield City Police-court, of being in charge of a motor-car whilst under the influence of drink, and were fined £20 and £2 1s. costs and disqualified for holding a driving licence for 12 months.

Dr. Watson appeared in answer to his Notice; Mr. Winterbottom laid the details before the Council, and Dr. Watson spoke on his own behalf, and said he had had no intention of driving the car and was not in it. He answered questions and gave his assurance for the future. Judgment was postponed for 12 months, subject to the usual provisos.

*The Case of William Douglas*, registered as of 282, Goldhawk-road, Shepherd's Bush, London, W.12, M.B., Ch.B. 1921, U.Edin., who had been summoned to appear before the Council on the following charge:—

That you were convicted of the following misdemeanours, viz.: (1) On March 19th, 1935, at Beaconsfield Police-court, of driving a motor-car whilst under the influence of drink (date of offence, Feb. 27th, 1935), and were fined £10 and £3 4s. costs, and disqualified for holding a driving licence for one year; and (2) on Dec. 30th, 1935, at the Bucks Quarter Sessions held at Aylesbury, of driving a motor-car whilst under the influence of drink (date of offence, Dec. 7th, 1935), and were sentenced to three months' imprisonment and disqualified for holding a driving licence for two years.

Dr. Douglas appeared, and Mr. Harper laid the facts before the Council. The respondent repeated the assurances of future good behaviour which he had already written to the Council, and judgment was suspended until May, 1937, subject to the usual provisos.

#### ALLEGED BREACH OF D.D.A. REGULATIONS

*The Case of Joseph Hirschmann*, registered as of 127, Maida-vale, London, W.9, M.B., B.Ch., 1920, U.Dub., who had been summoned to appear before the Council on the following charge:—

That you were on Feb. 28th, 1936, convicted, after pleading guilty, at the Marylebone Police-court (a) of failing to enter in register particulars of dangerous drugs



obtained from F. E. Dee, chemist (date of offence, August 31st, 1935); (b) of failing to enter in register particulars of dangerous drugs obtained from C. J. Hewett and Sons, Ltd., chemists (date of offence, Sept. 12th, 1935); and (c) of failing to enter in register particulars of dangerous drugs obtained from C. J. Hewett and Sons, Ltd., chemists (date of offence, Sept. 14th, 1935), contrary to the Dangerous Drugs (Consolidation) Regulations, 1928, and the Dangerous Drugs Acts, 1920-25, and were fined £50 and £10 10s. costs in respect of each of the three offences.

Dr. Hirschmann appeared, accompanied by Dr. Reginald Hearn, counsel, instructed by Messrs. Vivian J. Williams and Co.

Mr. Harper said that the police-inspector had said that the police had evidence that the respondent did not administer proper medical treatment to certain addicts under his care, but increased their doses. The charges concerned three separate quantities of morphine sulphate tablets: grs. 54, grs. 200, and grs. 144. The respondent had pleaded guilty. The Home Office had withdrawn his authorisation to use dangerous drugs, and had notified the Council.

Dr. Hirschmann gave evidence on his own behalf. He said that he had failed to enter the grs. 54 in his book because he had thought they were ordered by a prescription given to a patient instead of, as in fact they were, by an order to supply to himself. The grs. 200 had been sent him by mistake and had never been opened. He had failed to enter the grs. 144 through carelessness; it had all been given to a patient with rectal cancer shortly before operation. At the hearing before the magistrates his counsel had advised him to plead guilty as the offence was only a technical one. He had actually been carried into court, suffering from the effects of a severe motor accident. Instead of treating the charge as merely a breach of regulations, the magistrate had taken a serious view of it and had not only fined him fifty pounds and ten guineas costs, but demanded payment that day. The respondent had only complied with great difficulty. This unfortunate plea of guilty had made his appeal of no avail and deprived him of the right to reopen the case before the Council.

The Council, however, examined Dr. Hirschmann on the facts at considerable length. After an adjournment to enable him to fetch his books, he answered questions by the legal assessor, Dr. Bone, and other members of the Council relating to the entries about dangerous drugs. He gave details of the six addicts he had been treating at the material time. His books, he said, had been regularly inspected by the N.H.I. regional medical officer. He had never in his life started a case on morphia or heroin.

Dr. Philip Hamill testified to the good character of respondent and said the doses given were quite suitable for addicts of long standing, so far as his knowledge went.

After deliberation the Council did not see fit to order the erasure of Dr. Hirschmann's name.

#### CHARGES OF ADULTERY

*The Case of Walter Edgar Masters*, registered as of Old Hill House, Chislehurst, Kent, L.M.S.S.A. Lond., 1913; M.R.C.S. Eng., 1918; L.R.C.P. Lond., 1918; D.P.H. R.C.P.S. Eng. 1928, who had been summoned to appear before the Council on the following charge:—

That being a registered medical practitioner (1) you committed adultery with Hetty Elizabeth Sykes, a married woman, of which adultery you were found guilty by the decree of the Probate Divorce and Admiralty Division (Divorce) of the High Court of Justice, dated March 3rd, 1936, in the case of Sykes v. Sykes and Masters, in which you were the co-respondent; (2) you stood in

professional relationship from March to December, 1933, with the said Hetty Elizabeth Sykes, who was a patient during that period at Old Hill House Nursing Home, Chislehurst, Kent, of which you were the medical officer. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

Respondent was not present.

Mr. Winterbottom explained the steps taken to acquaint Dr. Masters with the date of the inquiry and put in receipts for the registered letters sent to his only known addresses. The Standing Orders had been complied with and the Council, after deliberation in camera, decided to proceed with the case. Mr. Winterbottom put in a copy of the divorce decree and adduced facts in support of the professional relationship from the evidence in court of an employee of the nursing-home. He then called Mrs. Masters, who testified to her statutory declaration and the nursing home case-book. She said she had run the home for inebriates since her husband left her, as matron and proprietor; the case-book showed clinical notes in her husband's writing relating to Mrs. Sykes as a patient entering the home on March 20th, 1933, and the last entry being dated Dec. 14th.

After deliberation the Council decided to erase Dr. Masters's name from the Register.

*The Case of David Gaston*, registered as of 55, Bromley-road, Catford, London, S.E.6, M.B., B.Ch. 1914, Q.U. Belf., who has been summoned to appear before the Council on the following charge:—

That being a registered medical practitioner (1) you committed adultery with Queenie Grace Painter, a married woman, of which adultery you were found guilty by the decree of the Probate Divorce and Admiralty Division (Divorce) of the High Court of Justice, dated April 11th, 1935, and made absolute on Oct. 28th, 1935, in the case of Painter v. Painter and Gaston, in which you were the co-respondent; and (2) you stood in professional relationship from 1927 to 1934 with the said Queenie Grace Painter and her husband, Frederick Thomas Painter. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainant was Mr. Frederick Thomas Painter.

Dr. Gaston attended, accompanied by Mr. J. C. Smuts, instructed by Messrs. J. and C. Dodd.

Mr. Winterbottom said the facts were admitted, and called complainant.

Frederick Thomas Painter testified to his statutory declaration, which said that his parents and family had been under Dr. Gaston's care before his marriage and up to 1934. In 1927 his wife went to the doctor professionally, but had not previously met him. Later the two couples became friendly and went about together. Throughout, the Painters remained Dr. Gaston's patients. The divorce proceedings had been defended by Dr. Gaston only on the question of damages. In cross-examination he said that if Mrs. Painter had met Dr. Gaston before 1927 it was without his knowledge.

Mr. Smuts addressed the Council, urging that the relationship with Mrs. Painter had started before respondent began practice in Catford and did not arise out of a professional introduction. The relationship had lasted eleven years and there was no suggestion of any other woman in respondent's life. All relationship with Mrs. Painter had now ceased and Mrs. Gaston was living with her husband. The adultery had only lasted for a year and respondent had ceased practice and left the neighbourhood to avoid any scandal on his profession. He had already

suffered heavily through divorce damages and loss of livelihood, and deeply regretted his offence.

After deliberation in camera the President announced that the Registrar had been directed to erase Dr. Gaston's name from the Register.

*The Case of William James Woodward*, registered as of Enfield Villa, Station-road, Billingham-on-Tees, Co. Durham, M.B., Ch.B. 1928, U.Glasg., who had been summoned to appear before the Council on the following charge:—

That being a registered medical practitioner (1) you committed adultery with Elizabeth Mott, the wife of Wilson John Mott, on various dates between August, 1933, and January, 1934, at 3, North-terrace, Stockton, at Billingham, and at High-street, Norton, your surgeries, and at 16, Balder-road, Norton, the residence of the said Elizabeth Mott and her family; (2) Miss Linda Mott, a daughter, and Gordon, a son of the said Mr. and Mrs. Mott, were patients of yours, and the said Mrs. Mott had occasion to call on you at your surgeries on behalf of and in relation to the health of her said daughter and her daughter's baby; (3) you arranged meetings and committed adultery with the said Elizabeth Mott at your said surgeries in order to conceal and disseminate your improper and immoral association with her. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainant was Mr. Wilson John Mott.

Respondent was present, accompanied by Mr. W. A. Macfarlane, counsel, instructed by Messrs. Le Brasseur and Oakley, on behalf of the London and Counties Medical Protection Society.

Mr. Harold Darcy, solicitor, on behalf of the complainant, a relieving officer, said that at the end of the summer of 1933 respondent was in practice in Stockton in partnership. Arbitration proceedings between the partners came to a head at the end of the year and it became known to complainant that Mrs. Mott was being approached as a witness in these proceedings. Respondent was not the medical attendant of Mr. or Mrs. Mott, but his partner was the daughter Linda's panel doctor. Linda always lived with her grandparents. Mrs. Mott had visited the surgery about the girl and had there been told that the partner was not available and had been attended to by Dr. Woodward, then and on two subsequent visits. On the third visit respondent made improper advances, and misconduct occurred. He had asked if he might visit her at home. Thereafter visits had been exchanged frequently and messages had been sent by various hands. On June 13th, 1934, Mr. Mott had written to Dr. Woodward asking for an explanation of the frequent visits of which he had been unaware, and threatening to report the facts to the General Medical Council. The reply had been sent by the solicitors to the London and Counties Medical Protection Society and had denied the allegations, mentioning that a Mrs. Mott had already complained to the Council and the Penal Cases Committee had found no case to answer. Actually, said Mr. Darcy, it was not Mrs. Mott who had complained but her sister, who had had no business to interfere. On Feb. 18th, 1935, Mrs. Mott had visited the surgery with her sister to inquire about rumours that she had received a large sum of money from the doctor for some purpose in connexion with the arbitration proceedings. She had had a cold reception, and next day had had a letter from his solicitors asking her to discuss any matter with them and not with the doctor. Mrs. Mott had replied at once, and perhaps indiscreetly, using very strong language.

Mr. W. J. Mott testified to his statutory declaration and produced a medical certificate that one of his

witnesses was unable to attend. He said he had been married 24 years and had three children. He had never seen Dr. Woodward until the previous day but the children had been on the panel of Dr. Woodward's former partner. The son's name had been removed from the panel at the request of Dr. Woodward in May, 1935, but witness had not understood why. "Words" with his wife had ensued and, in consequence of what she then said about the respondent, witness had written to the doctor and made a complaint to the Council.

Cross-examined, he agreed that his son Gordon had joined respondent's panel in January, 1935. The complaint of adultery and visiting ended with December, 1934. His daughter had been a panel patient of the partner and from time to time had been attended by respondent; she did not live with him. He knew nothing more about professional attendance on her in 1934. He had pressed his wife considerably to find why Gordon had been struck off Dr. Woodward's panel. He knew nothing of the complaint brought by his wife's sister; he had learned of it about the time he had made his own complaint. His wife had told him she had committed adultery with the doctor, but he had not mentioned adultery in his angry letter to the doctor. She had been "absolutely furious" with Dr. Woodward. Up to that time he had had no suspicions of his wife. In the previous year he had been to Mr. Watson, a solicitor, to try to find out about the arbitration case and what statement his wife had made. He had heard that allegations about his wife and respondent formed part of the arbitration case; his wife had asked if she might make a statement saying that Dr. Woodward had only called there by mistake, looking for Linda, and was not otherwise calling there. Later, he had got to know that suggestions of adultery with the partner were being made, but he had not consulted Mr. Watson about this or known of it at the time. He had, he admitted, asked Mr. Watson if he could take slander proceedings against the partner if the allegations proved untrue; but he had not asked if he could take divorce proceedings against him. He had treated the story of adultery with the partner as a joke. He did not know yet what had been said in the arbitration statements.

Re-examined, he agreed that his wife had told him a number of lies.

In reply to Mr. H. L. Eason, he said that at the material time no member of his family living in his house was a patient of Dr. Woodward's.

Mrs. Elizabeth Mott said that she had gone to the surgery in August, 1933, about Linda and had seen respondent, as his partner was ill. Respondent had known she was Linda's mother. She had gone again three weeks later for a bottle of medicine for Linda, at the afternoon surgery hour. He had kissed her, pulled her on his knee, and had connexion with her. She had become afraid but he had told her to stick to him and say what he told her to say. She had visited him dozens of times at the Billingham surgery in the evening; he had hung his overcoat on the door to cover the keyhole. He had sent messages by men and a little girl. In February, 1935, she and her sister had gone to the surgery in consequence of rumours and she had said: "This is my sister. Will you tell her I didn't get £300 for keeping my mouth shut?"

Cross-examined by Mr. Macfarlane, she said she said no more at that interview. She denied that she had committed adultery with the partner, but admitted that she had declared in writing that she

had done so, maintaining that respondent had told her to do so and assured her there never would be arbitration proceedings. She would not have sworn to this in oral evidence. She had not said at the county court that she wanted to "down" the partner. She admitted writing the letter to respondent in which she said: "Mr. Mott and neighbours say you have been with me, and I will. When you upset me you do it to the wrong one." She had gone to Mr. Watson to try to reopen the arbitration case because she objected to detectives inquiring about this letter. Money had never been mentioned in Mr. Watson's office. Certainly, she had been very excited. Mr. Watson had said: "What is your figure, Mrs. Mott?" She had said she was going straight to the partner. She had not accused any other doctors in the Stockton area of having intercourse with her. Her daughter Linda had never gone with her to see respondent during the pregnancy, or at any time before the baby was born in August, 1933. Respondent did not take his holidays in September; he was at the surgery. He had asked her to call again; he did not say why but she could guess. "If a man asks a lady to call again, she *can* guess, can't she?" This was the second time she had seen him, in the surgery, and nothing familiar had been said or done. Next time, intercourse took place in the Stockton surgery, in the basement of the partner's house. It was possible to see into the surgery from the area steps; there was no frosted glass. While intercourse took place there, two patients had been waiting in the adjoining waiting-room, in the afternoon. She had not been there longer than ten minutes in all. The next time the partner had entered through the communicating door from the house and again there had been patients waiting. The partner had said "sorry" and gone out again. After that, respondent had suggested coming to her home in the mornings, coming by car with a chauffeur four or five times. There was no patient of his in the house. She had another doctor. The neighbours had thought it very odd and she had told them the doctor came on Mr. Mott's business. Linda's baby had had a facial naevus but she had never been to the surgery with Linda about it; nor had he and she ever talked of the baby. In her statement she had emphatically denied any improper behaviour on respondent's part, but she had only signed it because he asked her to as a friend. She had written it and he had told her what to put. A large part of it was untrue. Mrs. Collins was willing to oblige witness by saying she had seen intercourse take place, though in fact she had not been there at all. Mrs. Woodward had never accompanied the doctor on his visits. Intercourse had sometimes taken place standing up at the desk and sometimes on the floor.

In reply to the legal assessor, Mr. Macfarlane explained the arbitration case. Respondent had been junior partner and there had been three surgeries. Differences had arisen from financial matters irrelevant to this case and from the charges of immorality in a professional respect made by Mrs. Mott against the partner. Respondent in April, 1934, had claimed arbitration with a view to dissolving the partnership. The partner had made cross-charges of slander against respondent in saying he (the partner) was unfit to look after patients, his prescriptions were no good, and he was going with women. In June and November further cross-charges of financial irregularities were added. The case was to be heard in December, 1934, but had been settled by counsel before hearing, and all allegations had been withdrawn. By this time Dr. Woodward had come to

doubt some of the evidence which previously he had believed to be true. Mrs. Mott had repeatedly come to the surgery to pass on bits of gossip about the arbitration allegations, and had asked the solicitor not to write to her as she did not want her husband to know.

Mrs. Alice Collins testified to having waited for Mrs. Mott outside the surgery on several occasions. In January, 1935, she had told respondent to behave himself with Mrs. Mott. He had asked, "Do you believe all she says?" and witness had said "Yes." She had seen his car go to Mrs. Mott's house and been there when he had called.

Cross-examined, she denied that Mrs. Mott was dissatisfied with the result of the arbitration and admitted telling the solicitor that the partner had committed adultery with Mrs. Mott twice in her presence but on the second occasion she had been careful not to look. These statements were all lies. In answer to the legal assessor she said that Mrs. Mott had suggested that she should concoct the story about the partner for the arbitration proceedings.

Mrs. Hilda Nicholls, sister of Mrs. Mott, said she had complained to the Council in 1935, and the committee had found the charge groundless. She confirmed her sister's account of the visit to the surgery in January, 1935, and of the visit to Mr. Watson.

After deliberation in camera, without calling on counsel, the President announced that the facts alleged had not been found proved.

#### CONSIDERATION OF THE CURRICULUM

The final report of the Curriculum Committee on the best means of improving the training of medical students was presented to the Council and after discussion at three morning sessions was finally adopted without much change. An interim report<sup>1</sup> had been presented a year ago, on which the licensing bodies and medical schools were asked to give their observations; and a second interim report<sup>2</sup> was laid before the Council last November dealing with these observations, and was also circulated to the licensing and teaching bodies. Observations were made by the Minister of Health, the special committee on medical education appointed by the B.M.A., and the council of the section of radiology of the Royal Society of Medicine, and a memorandum was received from the General Council of the Trade Union Congress. The final report was drafted after considering all these opinions.

#### ADMISSION TO THE CURRICULUM

There was general, though not unanimous, agreement (said the Committee) with the opinion that students should not enter upon the medical curriculum proper before the beginning of the term in which they attain the age of 18 years, and the Committee recommended that the present minimum age of 17 years should be altered. It also considered that the Council would be justified in inviting the licensing bodies to decide either to require registration of medical students or to encourage it officially. The Committee agreed with the widely expressed opinion that the general education of the student should not cease at too early an age, and consequently recommended that at the pre-registration examination, which at present consists of scientific subjects, one or two subjects of general education should be taken at a standard higher than that of the preliminary

<sup>1</sup> THE LANCET, 1935, i, 1403.

<sup>2</sup> Ibid., 1935, ii, 1425.

examination. As, however, this rule would impose great practical difficulty on students who enter universities, university colleges, or medical schools before receiving instruction in pre-registration scientific subjects, the report recommended that it should not apply to such students.

#### PRE-CLINICAL STUDIES

The existing resolutions provide that a minimum period of three years shall in every case be available for study after the student has completed his professional examinations in anatomy and physiology. Several licensing bodies, the Committee reported, hold their professional examinations at the end of the fifth term, and the sixth term is often occupied by a course of instruction in clinical methods and physical signs which students must attend before they can be appointed clerks or dressers. Such courses are also commonly held before admission to clinical appointments by licensing bodies which hold their professional examinations at the end of the sixth term. The Committee expressed the opinion that such courses, while valuable and necessary if no such instruction has been given, have not effected an association between the professional scientific subjects and the clinical subjects, or removed the block between the two divisions of the medical curriculum proper. It accordingly recommended that the period of study of the professional scientific subjects should be two years, and that throughout the second year instruction should be given designed to effect the association which is desirable between the subjects of the two periods. In outlining the methods which it recommended, the Committee made clear by the form of the draft resolutions that it did not intend that instruction and examination in systematic medicine and pathology should be given at this period. In laying down what the courses in human anatomy and human physiology should include, it recommended that instruction should be given in the elements of clinical examination, including physical signs, the use of the stethoscope, ophthalmoscope, and similar instruments, and the examination of body fluids; normal reactions of the body to injury and infection as an introduction to general pathology and bacteriology; and an introduction to pharmacology. This instruction should illustrate that given in anatomy and physiology and introduce later studies. It is to be arranged jointly by the teachers of anatomy and physiology and the teachers of the clinical subjects throughout the second year, and the amount of time given to it should be approximately one-third of the total time available in that year.

#### PERIOD OF CLINICAL STUDIES

Some licensing bodies had expressed the view that residence in hospital was unnecessary where ample clinical material was available. The Committee, however, thought that experience could be gained during residence which would not otherwise be regularly obtainable. The resolution concerning the midwifery course had been amended to specify more clearly the nature of the certificate of attendance on cases of labour which should be given to students. There was no change in the number of cases which should be attended—viz., twenty, of which the first five at least should be attended in the lying-in hospital or ward.

#### DR. TIDY INTRODUCES THE REPORT

Dr. H. LETHEBY TIDY, chairman of the Curriculum Committee, moved that the report be received and

entered on the minutes. The Committee had, he said, interpreted its terms of reference widely, and where it had decided that some alteration should be made in the Medical Acts it had not hesitated to lay its views before the Council. General or normal health was now regarded as one of the most important aims of the medical profession, and the Committee considered that throughout the whole period of study the students' attention should be directed to the importance of the measures by which they could assess or maintain normal health, and the principles and practice of the prevention of disease. Speaking of the length of the curriculum and the belief that it was overloaded, Dr. Tidy remarked that in the medical schools at which a considerable proportion of the students qualified the present length of the curriculum was five years. It could therefore clearly be completed by students who were below the standard of supermen. The proposed changes should not require any increase in length. On the other hand, it had been argued that the curriculum was overloaded with unnecessary subjects, and the question was, what were those subjects. As medicine progressed, some subjects receded in importance and others advanced. It was, however, difficult to name subjects that could be omitted. When pressure was brought to bear on the Committee it was always for the insertion of a new subject, never for the dropping of an old one. Many people were glad to welcome a reduction in the time spent on someone else's subject.

There had, said Dr. Tidy, been a wide demand from the profession and the public for an increase in the standard of general education. If there were really more qualified doctors than the public needed, it was reasonable that the standard of entry should be raised to eliminate the weakest. There actually appeared to be a need for a rise in the standard. The present admission examination, however, was passed at school at 16½ years or earlier, and if the standard were raised these young students would be intensively crammed and the quality of the candidates would not be improved. The better plan was to aim at prolonging the general education, and the Committee proposed to require a higher standard in some subjects of general education taken at the same time as chemistry and physics in the pre-registration days, except for those who took chemistry and physics after leaving school. No doubt this left a loophole, but schoolmasters would probably not be anxious to avoid this reasonable requirement.

#### SIR HENRY BRACKENBURY SUPPORTS IT

SIR HENRY BRACKENBURY, seconding the motion, said that the new proposals, speaking generally, recognised a new outlook on medicine. The introduction of such subjects as genetics, psychology, and methods of maintaining health was a step in the direction desired by nearly everybody engaged in medical work. He retained, however, serious doubt whether the two ends of the curriculum would be as good as they ought to be. At the beginning he doubted whether the Committee was going as far as it should. There was probably no serious opposition to the view that not only the general education but also the preliminary scientific studies should be advanced farther than the previous minimum. How far, depended on the Council's conception of what medicine included. They had clearly advanced farther than the idea of medicine as a study of certain pathological processes. Sir Henry defined the science of medicine as the practical application to the human

sphere of the sciences of life. If the medical student were entering a profession which was to be the leading spirit in guiding humanity to complete mental and bodily health, he must have a higher degree of preparation than most other students. Sir Henry still considered that biology ought to be a pre-registration subject, and expressed anxiety about the whole of the two years between 16 and 18. If in certain fundamental directions the mind was not trained at 18 years of age, he said, it never would be trained. The Council must therefore pay great attention to the actual content of the training at the time the student entered upon the medical curriculum proper.

#### DISCUSSION IN THE COUNCIL

A long debate followed, every section of the report being debated separately, including an appendix which showed the new draft resolutions with the proposed alterations marked by a marginal rule.—Dr. E. P. CATHCART wished to abolish completely the training in chemistry and physics in schools for those students who were going on to medicine.—Mr. L. P. GAMGEE thought that instruction in the sciences should be started early and continued without a break.—Dr. DAVID WATERSTON desired to see a further extension of clinical studies. He strongly deprecated the proposal to make the recommendations for pre-registration examinations general all over the country until the Council had ensured that it was within the power of the licensing bodies to adopt the curriculum.

Dr. J. W. BONE remarked that the Committee had introduced a large number of new subjects into the curriculum, many of them of extreme importance. Moreover, the content of the old subjects had been materially increased. There was great danger that the Council would be challenged for putting too many requirements into the new rules. The present curriculum was overloaded, and therefore the proposed curriculum was doubly overloaded. Portions of the old curriculum should have been jettisoned if new matter must be introduced.

Dr. E. K. LE FLEMING warned the Council against losing sight of the wood for the trees. He was still conscious of having learned many things as a student which had helped him to pass his examinations but not to do anything else. The object of the curriculum should be to send out into the country men well equipped to practise general medicine and surgery. Nowhere in the curriculum was this aim suggested. Each specialty and the method of teaching it was well thought out, and great progress had been made in the linking of specialties together, but nowhere did the draft express the idea that the medical curriculum should be devoted to turning out good general practitioners. It had taken the Council 20 years to realise the importance of the National Health Insurance Acts and the obligations which they put upon the panel doctor. Midwifery was likely to pass wholly into the control of the local authorities and become institutionalised, and the political and social problems which had brought this condition about might be traced to inadequate instruction of students in former years. This had been due to the fact that the teachers had not been familiar with the conditions under which the general practitioner would have to carry out the work.

Mr. R. J. JOHNSTONE retorted that all the midwifery teachers whom he knew had ample experience, not only of the conditions in which midwifery was being practised in every class, but also of the practice of difficult midwifery under the same conditions

as those in which the general practitioner practised ordinary midwifery.

Mr. A. W. SHEEN suggested that the debate had served the useful purpose of stirring up the anatomists and physiologists. Teachers of clinical subjects had constantly found that they had to teach anatomy and physiology which the students should already have known. The most important suggestion in the report was the new interlocking of the second-year professional and scientific subjects with the clinical period. He agreed with the principle of applied culture. Life was short, and the education of a doctor could be directed without neglecting the cultural aspect. There were other important factors apart from the curriculum, such as the selection of students, place where they were taught, the provision of teaching, and the choice of teacher. Vaccination should be included with immunisation as a general subject and not given a place by itself. The curriculum would not be overloaded, especially if the students were prevented from wasting their time in operating theatres.

Mr. H. L. EASON said that the University of London could not agree to the raising of the age of entry to 18. Its matriculation examination admitted to every other faculty as well as that of medicine, and the student who had matriculated was entitled to take up his studies. To make an exception of the medical student would be impracticable, and a hardship to poor parents whose anxiety was that their son should earn as soon as possible. He also feared that the present medical graduate was losing sight of the three main branches of medicine. No less than 19 specialties were mentioned by name as essential. If only a fortnight were given to each of them they would occupy the best part of a year to the detriment of the study of the three main branches. He hoped that the inclusion of specialties would be left to the licensing bodies.

#### THE REPORT ACCEPTED

Dr. TIDY, in reply, reminded the Council that efficient doctors were produced under the present resolutions. The modern medical graduate was the best there had ever been, but the Council's duty was, if possible, to turn out a better one. It was untrue that the new resolutions would add a year to the present curriculum. If they had that effect, the licensing bodies were not carrying out the present resolutions. Overloading did not come from the resolutions but from over-teaching.

The report was received and entered on the minutes, and the draft curriculum table was discussed in detail. Textual amendments were made, and Dr. Tidy accepted an amendment by Mr. Eason, on behalf of the Association of Anæsthetists, deleting the requirement that the student should administer ten anæsthetics and substituting the requirement of "a course of theoretical and practical instruction in the administration of anæsthetics." Sir Henry Brackenbury could not persuade the Council to make biology a pre-registration subject. He also moved a long amendment to ensure that the student should: (1) have passed his general schools or matriculation examination and afterwards his examination in chemistry and physics as at present required; (2) continue his general education during the first two years of the curriculum; and (3) study biology seriously during those two years. This amendment was seconded by Dr. Sydney Smith, but after considerable debate it was rejected. The Council, however, amended the heading "Pre-registration Examinations" to "Pre-registration Requirements."

## PUBLIC HEALTH CONGRESS IN EDINBURGH

(FROM OUR SCOTTISH CORRESPONDENT)

THE Lord Provost presided at the joint Congress of the Royal Institute of Public Health and the Institute of Hygiene, held in Edinburgh from May 26th-30th, and in his opening address gave the views of a layman on the problems of rheumatism. After the inaugural meeting the congress divided into sections.

### STATE MEDICINE AND INDUSTRIAL HYGIENE

Sir THOMAS OLIVER, in opening this section with an address on the Foes of Industrial Hygiene, referred to the importance of fatigue in relation to accidents, and dealt with the harmful effects of emanations from radio-active bodies, and of dust containing substances such as white lead. He related how, by the use of sesquisulphide of phosphorus, the manufacture of lucifer matches had ceased to be regarded as a dangerous trade.—Dr. A. MASSEY (Coventry) spoke of the scientific selection of employees. He emphasised the necessity for health education of the workers concomitantly with other measures, and agreed with Sir Thomas Oliver that fatigue was often a precursor of accidents, as of mental and physical illness.—Dr. G. E. OATES (Paddington) read a paper on the Housing Act, 1935.—Dr. E. K. MACDONALD (Leicester) spoke on the Place of the Medical Officer of Health in the Administration of the Municipal Hospital. Far too little use he thought had been made of the facilities afforded under Section 13 of the Local Government Act of 1929.—Dr. CHALMERS WATSON (Edinburgh) read a paper on the Clamant Call for Changes in Medical Education, and at the close of the discussion a resolution was adopted by the meeting to the effect that the medical curriculum should include more specific training in preventive medicine, and urging the General Medical Council to revise the courses accordingly.—Dr. C. WHITE (Port of London) gave an account of the detection of faulty canned foods.—Dr. F. E. CHESTER-WILLIAMS (Bradford), speaking on Public Authorities and Cancer, urged the provision of more and better facilities for the treatment and care of cancer patients in all stages of the disease.

### WOMEN AND CHILDREN AND THE PUBLIC HEALTH

Prof. JAMES YOUNG, taking as the subject of his address the Rôle of the General Practitioner in Obstetric Practice, suggested that there would be increasing openings for those with special training and qualifications as consultants and specialists under the municipal schemes, and referred to the directions in which the general practitioner might find his greatest usefulness in the future.—Dr. JAMES DUNLÓP (Glasgow) spoke in favour of domiciliary midwifery, with a doctor in attendance at every confinement, and Dr. J. A. STEPHEN (Aberdeen) set but the conditions necessary for a satisfactory midwifery service.

Dr. MARGARET BALFOUR dealt with statistics as to the amount of money available for food among the poorer classes, and showed that there was much need for the provision of suitable nourishment for expectant mothers.—Dr. G. W. THEOBALD (London) considered the physical condition of the nation, and suggested that the toxæmias of pregnancy provided a key by means of which many of the problems

concerning nutrition could be unlocked. Not only must a sufficient sum per caput be available for the purchase of food, but the population must be re-educated in its dietary habits. The problem was twofold—cultural and economic. The physician, he remarked, was not a politician, but he himself could not escape from the conviction that something was radically wrong with a system which admitted of poverty in the midst of plenty.

Dame LOUISE MCILROY in her presidential address on Sociological and Medical Aspects of Abortion spoke against the widening of legal facilities for the practice of abortion and dealt with the social conditions which had led to the present propaganda in that direction. Suggesting remedies for the present state of affairs, she said that birth control was the lesser of the two evils, but child bearing should be looked on as a valuable contribution to the State and made as safe and easy as possible. Conditions of life must be adapted to motherhood and proper provision made for the mother.—Anæmia of Pregnant Women of the Working Class in Aberdeen was the subject of a paper by Dr. H. W. FULLERTON and Prof. L. S. P. DAVIDSON (Aberdeen). In their investigations it had been found that anæmia was very common in infants between 9 months and 2 years, and in women of the reproductive age in the poorer classes. They considered a deficiency in iron-rich foods, such as animal protein and vegetables, to be the cause of the anæmia.

Prof. A. J. BALLANTYNE (Glasgow), speaking on present-day problems of eyesight in school-children, deprecated the practice of discouraging higher study, or the choice of a professional career, solely on the presence of high myopia. The greatest wrong that could be inflicted on the high myope was to curtail his education. He urged that ophthalmic examination should begin before the present commencement of school life.

### TUBERCULOSIS

Dr. L. S. T. BURRELL in a presidential address dealt with susceptibility to tuberculosis at various ages and the protection conferred by a mild infection. Although a mild infection did confer some slight if variable protection, a massive infection would produce the disease in the tuberculin reactor as well as in the non-reactor. The greatest source of infection was always the sputum-positive patient.—Dr. P. M. D'ARCY HART (London) referred to the spread of tuberculosis which followed the introduction of the disease into virgin soil in native races, as was seen among the Senegalese troops in Europe in 1914-1918. Such an outbreak might, he feared, occur in Abyssinia unless care was taken about the living conditions of natives in proximity to Italians.—Dr. GEOFFREY TODD (Midhurst) said that collapse therapy had added some years of expectation to life in patients with tuberculosis. But successful treatment still depended much on the patient's confidence in his doctor and in the institution where he was being treated.—Dr. ANDREW MORLAND (London) spoke of the risk taken by tuberculous patients in giving up a sedentary occupation for a strenuous outdoor job, and the wear and tear involved in travelling to and from work the extra distance to have the benefit of fresh air. He advocated adequate midday meals and guidance for the patient how he should spend his leisure hours.—Dr. C. D. S. AGASSIZ (London) spoke on pulmonary tuberculosis in children, and Dr. GEORGE H. DAY (Mundesley) on the part played by the general practitioner in the treatment of tuberculosis.



## RHEUMATISM

Dr. F. J. POYNTON, president of the section dealing with Rheumatism and Allied Diseases, opened a discussion on the Treatment of Chronic Rheumatism. In the same section Dr. C. W. BUCKLEY (Buxton) read a paper on the Spa, and Dr. W. S. C. COPEMAN and Mr. T. J. O'REILLY (London) spoke on the work of the British Red Cross Clinic for Rheumatism.—In a paper on Rheumatic Heart Disease in Childhood, Dr. H. L. WALLACE (Edinburgh) laid stress on the high incidence of rheumatic disease in childhood. He considered that the child suffering from rheumatic heart disease was the victim of wanton neglect on the part of the community. He had found that 25 per cent. of all rheumatic children died from heart disease before they left school, while a further 30 per cent. were crippled by heart disease for the remaining part of their lives. The ideals to be aimed at were two—the easing of the burden which had to be borne by the cardiac cripple, and the prevention of rheumatic heart disease occurring at all.

## MEDICINE AND THE LAW

## The Burden of Proving Insanity

IN *Sodeman v. the King* (on May 28th) the Judicial Committee of the Privy Council declined a somewhat optimistic invitation from Australia to vary the legal rules of the criminal responsibility of the insane. The prisoner was convicted of murdering a girl aged 6½ years in circumstances of brutality. He took her for a ride on a bicycle, strangled her, tied up her body in a curious way, stuffed some of her clothing into her mouth, and left her for dead. He had committed three similar murders, all characterised by identical method. His appeal from the death sentence was rejected by the full court of the State of Victoria, and the High Court of Australia refused him leave to appeal to the Privy Council. His application to the Privy Council last week for special leave to appeal was one of a kind which the Judicial Committee in Downing-street does not welcome. The judges of that supreme tribunal do not regard themselves as a Court of Criminal Appeal; they refuse to re-hear cases without the advantage of having seen the witnesses; the grounds on which they interfere in criminal proceedings are severely limited.

The appellant's complaint was that the trial judge had misdirected the jury as to the burden of proof; he had also directed them on delusions, whereas the accused had no delusions but merely a mind which could not resist doing these meaningless acts. His counsel pressed for the enlargement of the "rules in *McNaghten's case*"; he desired to engraft the further rule that, where a man knew that he was doing what was wrong, he might none the less be insane if he was caused to do the act by an irresistible impulse produced by disease. Counsel had to admit that English decisions do not go so far; but he urged that, since some earlier dicta suggested that such an additional rule might exist, this was a good opportunity for settling the point uniformly for the whole Empire. The Lord Chancellor, in dismissing the petition, answered that such a course would result in different standards being set up in England and the Dominions; the decisions of the Court of Criminal Appeal in England (e.g., *Rex v. Flavell* and *Rex v. Kopsch*) would remain unaltered. Lord Hailsham added a few words on the alleged misdirection at the trial with regard to onus of proof. The trial judge had apparently told the jury that the Crown had to prove its case beyond reasonable doubt, but that

the burden of proof in the case of insanity rested on the accused. *Sodeman's* counsel argued that the jury might have wrongly understood that the burden on the accused was as heavy as the burden on the Crown. Lord Hailsham observed that the burden of proving insanity on the part of the defence was not so onerous as the burden of proof resting on the Crown. It was no higher than the burden which rested on plaintiff or defendant in civil proceedings. The courts below were agreed that the language of the trial judge was not such as to be misunderstood by the jury or as to be capable of misleading them. The Judicial Committee would therefore not exercise the "very exceptional jurisdiction" reserved to it in criminal cases.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

## A HOSPITALS ASSOCIATION FOR IRELAND

ON the occasion of the recent sweepstakes draw on behalf of the hospitals of the Irish Free State a meeting was held of representatives of nearly all the hospitals in the Irish Free State and some in Northern Ireland for the purpose of founding an Irish Hospitals Association. In the report of the Hospitals Commission attention was drawn to the need for such an organisation in order to encourage coöperation between the several hospitals. Dr. G. J. Moorhead presided at the meeting which was held at the Royal College of Surgeons on May 25th, and he consented to accept the presidency of the new association. The choice is a fortunate one, for to many years' experience as a hospital physician he is able to add a considerable experience as a hospital governor. Dr. J. P. Brennan was appointed honorary secretary, and a small provisional committee was appointed to frame a draft constitution and report to a second meeting of hospital representatives to be held in the autumn. It is intended that the membership of the association should be open both to institutions and to individual governors or members of medical staffs, and to rate-supported institutions as well as to voluntary hospitals. The provisional committee contains several public representatives as well as governors of voluntary hospitals and members of honorary staffs.

## THE CAMBRIDGE DIPLOMA IN RADIOLOGY

THE diploma in medical radiology and electrology is the only one granted in Cambridge that can be obtained by persons who have not resided or taken courses in the University. It was established in 1919 for a period of five years, and it has been prolonged from time to time on the ground that there was no other satisfactory alternative. It appears that 397 candidates have obtained the Cambridge diploma since its inception, while the total for all the other diplomas in medical radiology is less than 80, and the general board of the University are of the opinion that as long as this diploma is granted under the present conditions there is little likelihood of any other diploma in the subject becoming successfully established. In order that facilities for the lectures, practical instruction, and examinations may be provided elsewhere, they have decided not to continue the present arrangements indefinitely. Allowing enough time for plans to be made that will carry on the traditions and standards of the Cambridge diploma, the board have recommended that this shall no longer be given after October, 1941.

## PARLIAMENTARY INTELLIGENCE

### EDUCATION BILL: PROPOSED MEDICAL INSPECTION

In the House of Commons on May 26th, during consideration of the Education Bill on report, Mr. EDE moved an amendment to ensure that an employment certificate should be granted to the intended employer of a child if the issuing authority (the local education authority) were satisfied, after consultation with the local committee for juvenile employment, if any, and after consideration by the medical officer of the health and physical condition of the child, that the employment would be beneficial to the child. A similar amendment was, he said, inserted in committee of the Scottish Education Bill, making it a requirement that the consideration of the health and physical well-being of the child should be undertaken by the medical officer. If the clause were left as vague as it now stood, it would be possible for the consideration to be purely perfunctory. His amendment would ensure that expert evidence would be available for the committee advising the local authority.—Mr. COVE seconded the amendment.—Mr. OLIVER STANLEY, President of the Board of Education, said that he had every sympathy with the desire to see that the medical facts in each case were properly considered, but the amendment would give local authorities no powers that they did not already possess. Any authority could tell its medical officer exactly what part he had to take in the consideration of these exemptions. They had to assume that local authorities were anxious to carry out their duties properly. The school medical history, as it was now kept, after the recent Circular of the Board of Education with a view to co-operation with the Juvenile Employment Committee, would in the majority of cases give the local authority the information that it required. It contained specific reference to the suitability of a child for certain categories of employment, and a good many of the questions which the local authority might ask would be covered by the existing machinery. In any case, where there might be doubt, the school medical service was at the disposal of the authority, and he felt that the matter might be left there.—The amendment was negatived by 238 votes to 121.

Mr. MORGAN JONES moved an amendment limiting the hours of work of exempted children to not more than 40 a week, and providing that they should not be before 8 A.M. nor after 6 P.M. He said that the revelations of Sir John Orr had recently directed attention to the very serious condition of the children of the country, both in schools and elsewhere, and in particular to the physical condition of those children. For children of 14 to 15, eight o'clock was sufficiently early to be at work and six o'clock sufficiently late. How could young people avail themselves of opportunities for physical recreation unless their hours of work finished, at least, at six?—Sir PERCY HARRIS seconded the amendment.—Sir DONALD SOMERVELL, Attorney General, said it was open to a local authority to set a standard even higher than that set in the amendment, if it so desired, in the case of any particular child or group of children. On the other hand, it would be quite wrong, once the House had approved the principle of exemptions for beneficial employment, to introduce a rigid provision with regard to hours of work which would rule out of consideration certain employments which might well be beneficial, but in which the hours of work would be greater than 40 per week. The Government had promised to bring in during the next year, a Factory Bill, laying down the hours of work for children from 14 to 18, or whatever ages the House might decide. Local authorities might be trusted properly to administer the Bill. They were given a direct pointer by the House to consider hours of work as

one of the factors which must be taken into account. The Factory Bill would be the proper measure in which to consider hours of work. The Factory Bill would be discussed in the House before the present Bill came into operation.—Mr. R. J. TAYLOR said that the two-shift system was being worked in the North of England and the little boys would go to work in the mines till one or two o'clock in the morning.—The amendment was negatived by 220 votes to 126.

Mr. STANLEY secured agreement for an amendment to ensure that an employer should allow facilities to properly authorised officers of local education authorities to carry out inspections. This would enable the authority to satisfy itself that the employment had not, by reason of any change in the conditions of the employment or, for any other reasons, ceased to be beneficial to the child.

Mr. ORR-EWING moved an amendment to ensure that before granting a certificate exempting a child from school attendance for six months or longer, the issuing authority should require an undertaking from the parent or guardian of the child that a medical certificate would be produced reporting on the health of the child during the fourth month of employment. He said that the amendment supplied the means by which the local authority could ascertain whether the employment for the child had or had not been beneficial. A child who had received a certificate of exemption from school, and had gone into employment, might suffer a state of semi ill-health owing to the novelty of the situation having worn off by something like the fourth month, when the natural condition of the child would become apparent. If the employment was to last for a longer time than six months, which one might call the exempted period, the fourth month would be about the right time for the medical test to be made to ascertain if the child had suffered any ill-health because of the employment. He would have liked the child to be medically examined at school at the same time as the children who had not been exempted were being medically examined, so that some fair comparison could be made. Under the terms of the financial resolution that unfortunately could not be done. Anyone who had had experience of the employment of children in industry must be aware of many cases in which a normally healthy child had found its way into a type of employment which had affected either its body or its mind adversely. In such cases it would be greatly to the benefit of the child if it could be removed from that particular employment.—Lieut.-Commander AGNEW seconded the amendment.—Mr. STANLEY said that while he fully sympathised with the object of the amendment the method it proposed was unworkable. It put the obligation on the parent to get a certificate from the doctor, but they could not expect a parent, who would receive no reimbursement for his expenditure, to get a thorough examination of a child. The sort of certificate which the parent would obtain under such a system would hardly be worth the paper it was written on. He agreed that they ought to follow up these children, and not merely decide that the employment was suitable for their health at the beginning. He had already taken the proper step at the moment by inserting a provision in the undertaking to give access to any properly constituted authority for the purpose of inspection. They might, at a later stage, discuss with local authorities how an eye could be kept on the future health of these children and what steps could be taken if it became apparent that a particular job was proving detrimental to health. There was the further promise that the age of National Health Insurance would be lowered.—The amendment was by leave withdrawn.

On May 27th the Bill was read the third time.

## NOTES ON CURRENT TOPICS

## Adjournment for Whitsuntide

BOTH Houses of Parliament adjourned on Friday, May 29th, for the Whitsuntide recess. The House of Lords will reassemble on June 11th and the House of Commons on June 9th.

## Vivisection of Dogs

In the House of Commons on May 28th Mr. RADFORD presented a petition signed by more than 6000 citizens of Manchester praying the House to pass a Bill to prohibit the vivisection of dogs.

## Bronchitis and Tuberculosis in Wales

In reply to questions put to him by Mr. JAMES GRIFFITHS, the Minister of Health gave the mortality-rates from bronchitis and tuberculosis in the year 1935 in certain administrative counties of Wales, along with comparative rates for England and Wales.—The following is the answer:—

BRONCHITIS, 1935		TUBERCULOSIS (ALL FORMS), 1935	
Mortality (provisional) per million living			
England and Wales ..	388	England and Wales ..	718
Carmarthen .. ..	362	Carmarthen .. ..	955
Glamorgan .. ..	577	Pembroke .. ..	1022
Monmouth .. ..	498	Glamorgan .. ..	893
Brecknock .. ..	397	Monmouth .. ..	825
		Brecknock .. ..	812
		Cardigan .. ..	1283

## Family Budgets

In the House of Commons on May 28th Mr. ASTOR asked the Minister of Labour whether he was now in a position to state the names of the members of the committee which was to advise on the methods to be adopted in the collection by means of family budgets of information as to working-class expenditure.—In reply Mr. E. BROWN stated that the following have been appointed to be a committee to advise the Minister of Labour as to the methods to be adopted in the collection of information by means of family budgets, showing the approximate average weekly expenditure of working-class families on the items which should be taken into account in the construction of index numbers, designed to measure the percentage changes from month to month in the cost of maintaining a present-day standard of living:—

Mr. F. W. Leggett, C.B., Principal Assistant Secretary, Ministry of Labour (chairman); Mr. J. N. Beckett, Assistant Secretary, Ministry of Health; Mr. F. J. Blake, O.B.E., J.P., Past President of the National Chamber of Trade; Prof. A. L. Bowley, Sc.D., F.B.A., Professor of Statistics, University of London; Mr. H. Crow, O.B.E., Principal, Scottish Office; Mrs. W. Y. Darling, wife of Councillor W. Y. Darling, Edinburgh; Mrs. C. S. Ganley, J.P., L.C.C., a member of the Management Committee of the London Co-operative Society; Mr. J. Hallsworth, representing the Trades Union Congress General Council; Dr. J. M. Hamill, O.B.E., M.D., D.Sc., Senior Medical Officer, Ministry of Health; Mr. C. T. Houghton, Assistant Secretary, Minister of Agriculture and Fisheries; Mr. W. A. B. Iliff, M.B.E., Assistant Secretary, Ministry of Labour, Northern Ireland; Mr. D. Caradog Jones, M.A., Lecturer in Social Statistics, University of Liverpool, and Director of the Social Survey of Merseyside; Mr. Kenelm Kerr, O.B.E., representing the National Confederation of Employers' Organisations; Mr. E. C. Ramsbottom, O.B.E., Director of Statistics, Ministry of Labour. The Secretary to the Committee would be Mr. J. G. Cannell, Ministry of Labour, Queen Anne's Chambers, Broadway, Westminster, S.W.1.

## HOUSE OF COMMONS

WEDNESDAY, MAY 27TH

## Food-supply in War Time

Captain GUNSTON asked the Minister for the Coördination of Defence how the problem of food-supply in time

of war was to be divided between the subcommittee of the Committee of Imperial Defence and Sir William Beveridge's subcommittee.—Sir T. INSKIP replied: The subcommittee which has been appointed under my chairmanship is examining all aspects of our food-supply in time of emergency. They include, for example, home production, the protection of shipping, security in ports, distribution and transport questions, and reserve stocks. The reference to Sir William Beveridge's subcommittee is limited at the present stage to the consideration of arrangements for rationing the supply to the individual consumer in case of necessity, and of the preparatory steps which might be taken to enable such arrangements to be brought into force as quickly as possible.

## Decline in Milk Consumption

Mr. ALEXANDER asked the Minister of Agriculture whether he was aware of the decline in the consumption of liquid milk in three out of the four months of 1936 for which figures were available, and that, but for the fact that there were 29 days in February this year, the figures for the complete four months would show a heavy decline in liquid consumption for milk compared to 1935; and to what extent this decline was due to the higher retail prices for milk on account of the successive increases in contract prices.—Mr. RAMSBOTHAM, Parliamentary Secretary to the Ministry of Agriculture, replied: After making allowance for the extra day in February this year, sales of milk by wholesale for liquid consumption in the first four months of 1936 show a decline of approximately one million gallons, or about half of one per cent. compared with the corresponding period in 1935. As to the last part of the question, the minimum appropriate retail prices were the same this year as last.

## Drug Addicts

Mr. ARTHUR HENDERSON asked the Home Secretary whether his attention had been called to the report of the opium section of the League of Nations, stating that there were 30,000 confirmed drug addicts in this country; and whether he could make a statement on the matter.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: My right hon. friend's attention has been drawn to a statement in the press that there are 30,000 drug addicts in this country. This statement is wholly unfounded. It purports to be based on a report of the opium section of the League of Nations Secretariat, but I am informed that this report contained no such statement. I may add that, according to the information available in the Home Office, the number of addicts known to the authorities does not exceed 700.

Mr. HENDERSON: Could the hon. gentleman give the House any information as to whether the traffic is on the increase or otherwise?

Mr. LLOYD: Our information is that such traffic in this country is very small indeed, and in any case is confined to London; and even there it is very small.

## Cancer Mortality

Mr. LAMBERT asked the Minister of Health the average mortality from cancer for each decennial period since 1850, and the mortality for the last five available years respectively.—Sir KINGSLEY WOOD replied: The standardised mortality-rates per million persons in England and Wales from cancer for the periods specified in the question are as follows:—

Year.	Mortality-rates per million.	Year.	Mortality-rates per million.
1851-60 .. ..	326	1921-30 .. ..	991
1861-70 .. ..	396	1930 .. ..	1003
1871-80 .. ..	484	1931 .. ..	998
1881-90 .. ..	610	1932 .. ..	1001
1891-1900 .. ..	767	1933 .. ..	997
1901-10 .. ..	867	1934 .. ..	1003
1911-20 .. ..	928		

THURSDAY, MAY 28TH

## Diphtheria Immunisation

Mr. SEXTON asked the Minister of Health whether he was satisfied that inoculation against diphtheria was such a proved success as to warrant advising compulsory

use.—Sir KINGSLEY WOOD replied: I am satisfied that artificial immunisation against diphtheria is based on sound scientific principles, and has proved of value, but I should not be prepared to advise that its use should be made compulsory.

#### Health Conditions in Schools

Viscountess ASTOR asked the President of the Board of Education, in view of the importance of the welfare of school-children of school premises having good ventilation, heating, water-supply, sanitation, and playgrounds, he would cause a survey to be made of all school premises in county areas, in order to furnish information as to the number of school premises, provided and non-provided, respectively, in which unsatisfactory conditions obtained in any or all of the following respects: supply of water for drinking or for lavatory purposes; sanitary arrangements and cloakrooms; lighting, natural and artificial; ventilation; playgrounds; and damp walls and other structural disrepair.—Mr. OLIVER STANLEY replied: The development of reorganisation, to which the Board have called attention in Circular 1444, will during the next two years necessitate a survey of school premises from the point of view of the part which they are to play in the schemes for their districts. A survey of this nature will, I hope, achieve all the results the noble lady has in mind.

#### Puerperal Fever: Quarantine of Midwives

Mr. SEXTON asked the Minister of Health whether he was satisfied that the period of quarantine enforced on a midwife after attending a case of puerperal fever was long enough to ensure safety in attending succeeding cases.—Sir KINGSLEY WOOD replied: The period of suspension in these cases is that laid down in the rules made by the Central Midwives Board, and I have no reason to suppose that it is insufficient.

#### Rehousing Accommodation

Mr. DAVID ADAMS asked the Minister of Health whether he proposed to issue a publication, with typical plans of large houses containing four and five bedrooms, for the assistance of local authorities in connexion with their statutory duty to provide suitable alternative accommodation under the terms of the Housing Act, 1935, for large families at present living under overcrowded conditions.—Sir KINGSLEY WOOD replied: The question raised by the hon. Member is at present under consideration. In the meantime, my department have type plans of large houses which are available for the guidance of local authorities.

#### Mental Hospital, Barnsley: Maintenance Charges

Mr. PORTS asked the Minister of Health the statutory authority under which the Barnsley magistrates had recently made an order requiring a man to contribute towards the support of his married daughter who happened to be an inmate of a mental institution, and who was also supported by her husband.—Sir KINGSLEY WOOD replied: I presume that the magistrates' order was made under the authority of Section 19 (2) of the Poor Law Act, 1930. That subsection enables public assistance authorities to obtain, on complaint to a petty sessional court, orders of maintenance upon the relations liable to maintain a poor person, and the father is included, by Section 14 of the Act, among the relations so liable.

#### The League and Red Cross Organisations

Mr. MANDER asked the Secretary of State for Foreign Affairs, in view of the fact that the members of the International Red Cross committee were entirely of Swiss nationality, he would ask the council of the League of Nations to discuss how far it was desirable for the League to recognise as genuinely international a body so constituted, having particular regard to Article 25 of the Covenant, under which reference was made to the League's relations with the Red Cross organisations.—Viscount CRANBORNE, Under-Secretary for Foreign Affairs, replied: While my information is that the hon. Member is correct

in stating that the International Red Cross Committee is entirely composed of Swiss citizens, I understand that the status and functions of that body, as defined in Article 7 of the statutes of the International Red Cross organisation, make it clear that it is an independent institution having its own statute and particular functions. This position is no doubt well recognised by other members of the League, and I do not therefore think that action by H.M. Government such as is suggested is required.

#### Prison Warder and Blood Transfusion

Mr. THURTLÉ asked the Home Secretary whether he was now in a position to say anything regarding the case of Warder J. Jelly, of Wandsworth prison.—Sir J. SIMON replied: On the morning of a day on which this officer was due to perform duty as a trade instructor he stated that he had undertaken to attend at St. James's Hospital to give a blood transfusion and applied for leave to be absent from duty from 11 to 12 for this purpose. His application was made without previous warning, and as the absence without notice of an officer detailed for essential duties seriously disorganises the arrangements for the custody and employment of prisoners, he was told that he was not entitled to commit himself to an engagement during his hours of duty. The governor explained the position to the hospital authorities by telephone, and on learning that it would be difficult to obtain a substitute at short notice the governor agreed, as an exceptional case, to allow Officer Jelly to absent himself from duty in order to attend at the hour named. The officer, on being so informed, then refused to go, but I understand he subsequently attended the hospital during the dinner hour. On the following day he addressed to the Prison Commissioners a letter of protest couched in such terms that they could only regard it as insubordinate and as indicating that the officer did not appreciate his special responsibilities as trade instructor. In view of the terms of this letter the Commissioners decided that he should no longer be employed as trade instructor, but should revert to discipline duty. The officer has since been interviewed at his own request by a Commissioner and an Assistant Commissioner of prisons; but after reviewing the matter in the light of his representations the Commissioners have found no reason to modify their original decision.

#### INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED  
MAY 23RD, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1868; diphtheria, 920; enteric fever, 36; pneumonia (primary or influenzal), 909; puerperal fever, 39; puerperal pyrexia, 129; cerebro-spinal fever, 22; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 2; dysentery, 16; ophthalmia neonatorum, 100. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 29th was 5344, which included: Scarlet fever, 1055; diphtheria, 1251; measles, 1738; whooping-cough, 611; puerperal fever, 21 mothers (plus 13 babies); encephalitis lethargica, 285; poliomyelitis, 1. At St. Margaret's Hospital there were 30 babies (plus 13 mothers) with ophthalmia neonatorum.

*Deaths.*—In 122 great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 48 (23) from measles, 3 (1) from scarlet fever, 32 (11) from whooping-cough, 25 (0) from diphtheria, 46 (17) from diarrhoea and enteritis under two years, and 40 (8) from influenza. The figures in parentheses are those for London itself.

No great town reported more than 2 deaths from measles. There were 7 deaths from whooping-cough at Liverpool, 3 at Birmingham. Deaths from diphtheria were reported from 20 great towns, not more than 2 from any. The only fatal case of typhoid was at Cardiff.

The number of stillbirths notified during the week was 291 (corresponding to a rate of 42 per 1000 total births), including 42 in London.

## OBITUARY

**THOMAS ARTHUR HUGHES, M.D., Sc.D. Dub.,  
F.R.C.P. Lond.,  
LIEUT.-COLONEL, I.M.S.**

Colonel Hughes's many friends in India and this country will have read with deep regret the announcement of his death at an English sanatorium on May 23rd. He had been in poor health for the past few years but had refused to give up his work until it became physically impossible for him to carry on any longer. Owing to a severe exacerbation of his lung trouble he was compelled to take leave about two months ago.

Thomas Arthur Hughes was born in 1884 in Co. Armagh, a son of the late Mr. P. Hughes. He was educated at Blackrock School and Trinity College, Dublin, where he won many prizes, and on qualifying M.B., B.Ch. in 1909 he became assistant in the physiological department. He entered the Indian Medical Service in July, 1910, and took the D.P.H. in the following year. Three years later he became captain and acted as medical officer of the 24th Punjabis, gaining the experience which led him to write on the nature of pulmonary tuberculosis and of cirrhosis of the liver as seen in the Punjab. He served in the European War of 1914-18, and in 1920 he was appointed to the chair of physiology at King Edward Medical College, Lahore, and four years later professor of clinical medicine and medical superintendent of the Mayo Hospital. Shortly before he left India he was appointed to the post of principal and professor of medicine.

Sir John Megaw writes: "Although Hughes had a very high reputation as a physician, his leanings were chiefly towards medical research and he made valuable contributions to the *Indian Journal of Medical Research* on pulmonary tuberculosis in adult punjabis as well as on cirrhosis of the liver and diseases of the heart. He was a man of attractive personality and high ideals. He neglected opportunities of making money by private practice but never spared himself when attending to his hospital patients, teaching his students, or carrying out a piece of research. His premature death was undoubtedly due to his high sense of duty."

Colonel Hughes leaves a widow, who was with him throughout his illness, and two children—a boy of 10 and a girl of 5.

**JOHN THOMAS HEWETSON, M.D. Edin.,  
F.R.C.S. Eng., F.C.O.G.**

Dr. Hewetson, whose death took place on May 19th, was born at Hornsby Gate, near Carlisle, in 1872, and educated at Edinburgh University and London, taking the degree of M.B. at Edinburgh, and subsequently becoming M.D., F.R.C.S., and F.C.O.G. He commenced his private practice in Coventry, but did not remain long in general practice, and whilst still resident in Coventry he commenced research work at the General Hospital, Birmingham. He was a man of outstanding ability and came under the eye of Sir Gilbert Barling, who invited him to become his assistant, and thus started for him what was a fine experience in general surgery before he specialised in the branch of surgery to which he later devoted his life. He was appointed assistant obstetric officer at the General Hospital in April, 1903, and held the appointment for five years until he resigned in 1908. In 1907 he joined the honorary staff of the Maternity Hospital and in 1908 he accepted a similar appointment at the Women's hospital at

Sparkhill. From 1933 to the time of his death he was chairman of the Medical Board at the Women's hospital and senior surgeon.

A colleague writes: "A great surgeon and a master of his art, cool-headed, he was able to exercise remarkable self-control and was never ruffled in the operating theatre, where he treated everyone with courtesy, tact, and consideration. These qualities, allied to his personal charm, endeared him to all with whom he came in contact. His hospital work was always his first consideration and he never allowed his remunerative practice to interfere with the very extensive amount of work he did in an honorary capacity at the hospitals. He was beloved by all, particularly those best able to see and appreciate his great services to humanity. Although he did a colossal amount of work, his organisation was such that he was invariably on time for all his appointments—a rare quality in one so fully occupied.

"He was a great lover of sport, particularly football and cricket, and a practical supporter. He was a member of the Committee of the Warwickshire County Cricket Club from 1922 to 1926, from which latter date he has been a vice-president of the club."

**FREDERICK DENYS CREW, M.B. Camb.**

Dr. Frederick Crew, who died on May 25th, succeeded his father Dr. John Crew in practice at Higham Ferrers some 20 years ago, the family connexion with the practice being therefore a very long one. He was educated at Felsted, proceeded to Cambridge, and received his medical education at Guy's Hospital, where he graduated in 1906; shortly afterwards he went into partnership with his father, whom later he succeeded as medical officer for the borough of Higham Ferrers. During the war as an officer in the R.A.M.C. he served for a year in Mesopotamia, and he took a close interest in ambulance work, lecturing for the St. John Ambulance Association. He was only 57 years at the time of his death, which followed a short illness. He leaves a widow and two sons.

**THE LATE PROF. FRIEDRICH KRAUS**

EIGHT years ago when Friedrich Kraus reached his seventieth birthday the German medical press contained graphic sketches of a man who was recognised by his colleagues everywhere as the outstanding medical genius of his time. One of these<sup>1</sup> was from the pen of Prof. G. v. Bergmann. His recent death has brought us the following appreciation from Prof. J. Plesch, another of his co-workers.

"I see him," Prof. Plesch writes, "his enormous head with its clever forehead covered by a crumpled felt hat, a smile irradiating the whole of the broad reddish face, his long beard roving over his large paunch, his square stumpy-fingered hands, like those of the most productive thinkers—standing at the door of the Charité, when he was called in 1903 to the directorship of the foremost clinic in Germany. . . He irradiated a natural dignity which was entirely lacking in sternness, and nothing but goodwill beamed from his little pig-like eyes. He was an amiable conversationalist, interested in everything with an unlimited scope due to comprehensive knowledge. Yet he had a receptive talent, but not of that sponge-like variety which absorbs ideas only to return them, when pressed, practically unchanged. His mind was receptive to everything, and he received and absorbed information and ideas in such a way that when he

<sup>1</sup> Deut. med. Woch., 1923, liv., 859.

reproduced them his brain had moulded them into forms so different that they hardly showed a trace of their origin. His mind was in fact synthetic rather than analytic. Such was Friedrich Kraus as I knew him.

"Kraus was born in Austria at Bodenbach in 1858—the best vintage year of German clinicians, for it produced not only Kraus, but Krehl, Müller, and von Noorden. His father was a poor pensioner who died of a progressive paralysis; in spite of this handicap, throughout his long life Kraus was nevertheless physically and psychically unaffected. He presented himself to the world in a 'breech posture,' and used to say that he had maintained this attitude consistently throughout his life. His students days were spent at the University of Prague, where he lived in the hospital whose damp walls are responsible for the polyarthritis which he developed in his hands and feet while still in early youth. He never lost this deformity which so impaired his dexterity that he could hardly percuss.

"Thanks to his early studies in biochemistry and physiological anatomy at Prague, Kraus was well prepared to enter the clinic of Kahler, who later became a neurologist and, working with Charcot in Paris, in due course summoned Kraus to be his assistant. At this time Kraus's clinical knowledge was not great, but Kahler personally directed his early and necessarily simple clinical investigations. Two years later Kahler obtained a professorship in Vienna and took Kraus with him. In less than a year, however, Kahler died of cancer of the tongue, and at the early age of 28 Kraus had to take over his clinical teaching work. In spite of his youth he was considered as a possible successor to the chair of Skoda and Bamberger in Vienna. Though he was unsuccessful in the competition, it was a compensation to become chief physician in the famous Rudolf Hospital, where he remained for five years until he was promoted to a chair at the University of Graz, which he held until 1903. On the death of Karl Gerhardt in Berlin, Althoff—that reformer of the German universities—took the bold step of including after the names of L. Krehl and F. Müller that of the still young Kraus as one of the nominees for the vacant chair. Kraus was appointed, and continued his work as a leading teacher and professor of the German physicians until 1929, when he became emeritus. He was, for about fifteen years, chairman of the Berlin Medical Society, and his good-natured, pointed, and spirited comments were always eagerly awaited at the meetings. Empiricism had little place in the scientific method by which he built up his clinic. His attitude was experimental, and therefore largely based on positive facts. He was vividly interested in every new method and system that developed during this period when thought and methods in medicine, as in all the sciences, were undergoing far-reaching changes.

"Kraus was not one of those clinicians who, in the minds of his successors, would remain associated with one specific idea or method. This did not and does not mean that he was ever unstable, unsound, or incapable of making a deep impression upon his pupils and collaborators. On the contrary his spirit and his attitude of mind will long remain effective in medicine through the thousands of those who were privileged to work with him and under his tutelage. He did much pioneer work and carried out many new investigations which heightened the reputation of the clinic. Immediately upon their discovery he realised the great possibilities which lay in the medical use of X rays, and his clinic was the first in the world to have a fully equipped X ray laboratory attached to it. From this it naturally followed that his pupils were amongst the first to carry out important radiological investigations. Kraus also early introduced Einthoven's electrocardiograph into his clinic, and with his pupils he explored the new field of knowledge which this opened up. Such men as Schaudinn, Wassermann, and Ehrlich were delighted to come to his clinic; Pappenheim developed

here the hæmatology of Ehrlich, and, when psychoanalysis had not even aroused its earliest antagonisms, Kraus made Freud and Jung welcome. Many celebrated biochemists worked in his laboratory: it was Kraus who early recognised the great clinical importance of Haldane's and Zunz's work on gas-metabolism, and he was the first clinician to use their methods, in the work by which he is best known, 'Fatigue as a Measure of the Constitution.' It may truly be said that under the guidance of this master some of the most important devices in many branches of medicine as we know it to-day made their earliest and perhaps most significant progress.

"It is almost impossible adequately to record the full tale of the many different activities which were influenced by his spirit during his fifty years as teacher and research worker. However, when it is remembered that the true scientific development of modern medical knowledge took place in his lifetime, and that he was alive to and interested in all that was going on around him, it is more possible to form a general idea of the immensity of his brain, and the greatness of his achievement. It is then not surprising that he never became one-sided in spite of the intensive character of his medical knowledge. With the development of his clinic and the increasing sphere of his influence, he became as it were a stronger and stronger focus which collected rays emanating from each and every source. It was only natural for such a man to turn from the pathological, anatomical, morphological, and topical mode of thought to the physiological-pathological, to the functional diagnosis. At the end of his life he gave us a sublimation of his thought, which was at the same time his apologia, in his 'Syzygiology, the Pathology of the Person,' containing ideas which have influenced and directed medical thought in the past and will do so in the future.

"Except for the arthritis already referred to, he was never really ill in his life, although he never took a holiday—not even a Sunday; neither did he take any exercise—not even so much as a daily walk. His whole life was devoted to his professional duties and to medical research, until at last he had the misfortune to break his leg, became decubital, and died of sepsis. He was not only a great teacher, he was also a great doctor, and not the least factor in making him so was the nobility of his character. His personality in the sick-room had a tonic effect, and gave him an enormous psychological influence over the patient. He was the most consulted physician of his time on the continent of Europe, but he treated 'the prince as a peasant, and the peasant as a prince.' His manner was gentle and modest, but nothing could equal his pride when, as the representative of professional knowledge, he spoke ex cathedra. His pupils are to be found all over the world to-day, among them being many British doctors who came to sit at his feet in Berlin."

**JOINT TUBERCULOSIS COUNCIL: REPORTS OF COMMITTEES.**—At a recent meeting of this council a report of the pneumothorax committee was discussed and adopted for presentation to the Medical Research Council. The committee agreed to report again on the extended reference: "To investigate and report on the results of artificial pneumothorax and how these may be improved." Dr. C. O. Hawthorne made a verbal report on behalf of the milk committee. The new order on milk designation, coming into force on June 1st, recognised tuberculin-tested milk and pasteurised milk. The other grade was accredited milk, or Grade A under another name; "the name," he said, "continues to reassure the public, although by no admitted standard can milk so labelled be regarded as safe." A recent inquiry by the People's League of Health had shown that, while to the majority of children in elementary schools pasteurised milk was being supplied, a substantial minority was receiving unprotected milk—i.e., raw milk of Grade A. Hence the continuing need for educational efforts to enable the public to distinguish between safe milk and milk which claimed merely to be clean.



## CORRESPONDENCE

## "ALLEGED DYE DERMATITIS"

To the Editor of THE LANCET

SIR,—I have received a pamphlet through the post entitled Interim Report on Alleged Dye Dermatitis Position. It relates that a committee representing colour makers and users has met ten times and collected a large amount of information and has decided to try and find a case which would enable them to obtain a Court of Appeal decision on idiosyncrasy not being included in the term "reasonably fit" of the Sales and Goods Act, 1893. It has been estimated this would cost £3000, which it is proposed to spread over the dye using and making interests. Three dermatologists, one in London, one in Leeds, and one in Manchester, have been "recommended" by this committee. It is also reported that "it has also been suggested that one firm of solicitors should be appointed to handle all cases, but this suggestion is strongly objected to in many quarters." The Alleged Dye Dermatitis Committee should, they say, be given authority and financial backing to fight any suitable case which is reported to it, and it should endeavour to get its point of view distributed to the professions by means of journals such as *The Lancet* and the *Analyst*.

It is a little difficult to appreciate this communication at its full value. I conceive it possible that dermatologists apparently committed in advance to a fixed outlook on "alleged dye dermatitis" would find difficulty in convincing a court of their entire freedom from bias in their approach to any case. My three colleagues will no doubt share my regret that the distribution of the £3000 is not to fall with impartiality upon all practising dermatologists. I am sure they themselves are not party to the suggestion that their other colleagues are less wide awake to the problems of idiosyncrasy. I would not suggest their cognisance of this pamphlet. It is well that skin specialists who are in a position to sign certificates of dye dermatitis should know what they may be up against. I have no doubt they will, as in the past, deal with each case on its merits according to their knowledge and experience.

It is stimulating to know that any one of us in practice may, without prevision, sign the test certificate on which will rest the case on which the Court of Appeal may hear our cross-examination on idiosyncrasy in all its bearings.

I am, Sir, yours faithfully,

Harley-street, W., May 29th. W. J. O'DONOVAN.

## AIR MINISTRY AND VENEREAL DISEASE

To the Editor of THE LANCET

SIR,—In these days, when a large reserve of civilian pilots is desirable, everything possible should be done to encourage young men to take out flying certificates and to renew their private pilot's licence. Yet heading 6 (b) of the Air Ministry's medical renewal examination (C.A. Form 61) puts the question: "Has suffered from venereal disease?" Now, as a venereologist, I have had several patients who very greatly object to this question. They express the opinion, which I think is sound, that if since the last medical examination for their flying licence they have contracted venereal disease and have completely recovered, so that no clinical or pathological signs of infection remain, they should not be required to put on record that they have had venereal disease. This question has prevented more than one young

man from renewing his licence. During 1917, when at home after becoming a casualty, I was in charge of an officers' V.D. hospital. Nearly three-quarters of my patients were officers of the Royal Flying Corps and several were most distinguished officers of that most distinguished corps—Mars and Venus were ever closely associated. As soon as clinical symptoms and often (in the case of syphilis) before pathological symptoms had cleared up they were returned to their squadrons. In my opinion question 6 (b) is unnecessary and should be deleted.

I am, Sir, yours faithfully,

H. WANSEY BAYLY.

Late acting Lt.-Col., R.A.M.C.(T).  
Harley-street, W., May 29th.

## PROGRESS IN RADIOTHERAPY

To the Editor of THE LANCET

SIR,—On page 1228 of your last issue Dr. Schiller, referring to the radiological treatment of carcinoma of the cervix, says "Improvement in X ray or radium therapy is not possible with ordinary apparatus, which to-day is at its maximum efficiency. An improvement of radiotherapy might be obtained only by applying stronger or more efficient rays." It is, perhaps, worth while mentioning that advances in radiological treatment are more dependent upon the ideas and methods of radiologists than they are upon the mechanical efficiency of any apparatus. One would have liked to think that the conception, that only by applying stronger radiation would better results be obtained, was relegated to the past. Does Dr. Schiller think that the fundamental observations gleaned during the last few years at the Strangeways Laboratory on "optimum intensities" have no bearing on future practice, or that the search for methods of rendering tumours more sensitive to radiation is not as much warranted as indulgence in stronger and stronger radiation?

I am, Sir, yours faithfully,

Barnato Joel Laboratories, May 29th. SIDNEY RUSS.

## BADGES FOR DOCTORS' CARS

To the Editor of THE LANCET

SIR,—During last month the secretary of the National Motorists Association, Mr. Charlton Elliott, addressed a circular letter to the medical profession on the subject of a special badge to be affixed to the motor cars of doctors. That letter contains a paragraph purporting to describe an interview with me, which I quote below:—

"Dr. Anderson, Secretary to the B.M.A., agreed with the Association's suggestion that, if it is found that the scheme is working satisfactorily on these lines, they would be pleased to consider giving official recognition at a later date, but they would, for the present, have to confirm in the *Medical Journal* the stand they had adopted in the past when this question had been put forward by medical men themselves, many of whom will have noted that THE LANCET, the same week, announced their approval of the scheme."

This is an entirely inaccurate account of what took place. In March last a statement appeared in a Sunday newspaper that a circular dealing with the issue of Red Cross motor car signs to doctors "will be issued through the British Medical Association." Exception was taken by me to this misleading statement, and in response to my protest the acting editor informed me that the statement was made on the authority of Mr. Charlton Elliott. Mr. Elliott subsequently came to see me on March 19th, and I

interviewed him in the presence of the Deputy Medical Secretary. At this interview it was made plain to Mr. Elliott that the British Medical Association had, after careful consideration, rejected the proposal that special badges should be supplied or approved for use on doctors' motor cars. Indeed, Mr. Elliott stated that if the British Medical Association was unfavourable to such a proposal it would be dropped. This represents the full substance of the interview, and the suggestion in Mr. Elliott's letter that I indicated that approval might be regarded as merely delayed is completely unfounded.

On April 4th Mr. Elliott sent me a copy of the badge which it was proposed to issue to doctors. In reply I wrote as follows:—

"I have no observations to make upon the design. As I explained at our interview the medical profession has no desire to have a special badge for doctors' motor cars."

This letter eliminates any possibility of misunderstanding as to the attitude of the British Medical Association, and I accordingly deemed it my duty to publish the true facts lest members of the medical profession should be misled by this circular letter.

I am, Sir, yours faithfully,

G. C. ANDERSON,  
Medical Secretary, B.M.A.

B.M.A. House, Tavistock-square, W.C., June 3rd.

## FOTHERGILL TESTIMONIAL FUND

THE following is the sixth list of subscribers to the testimonial to Dr. E. Rowland Fothergill received in response to the letter published in the *British Medical Journal* and *The Lancet* of Jan. 18th.

Amount previously acknowledged, £1466 17s.  
Wiltshire Panel Committee, £25; S. D. Bhabba (London), £1; Reading Panel Committee, £5 5s.; Stoke-on-Trent Panel Committee, £10 10s.; H. C. Bristowe (Bristol), £1 1s.; Wakefield Panel Committee, £2 2s.; H. Newsome (near Bristol), 5s.; N. Flower (Yeovil), 10s. 6d.; R. St. J. Kemm (Cheddar), 10s.; Drs. Cameron, Collins, and Pearce (Taunton), £1 1s.; J. Evans (Knowle), 5s.; E. B. Hinde (Norwich), £1 1s.; Annie Hyatt (Shepton Mallett), 5s.; East Riding of Yorkshire Panel Committee, £10 10s.; H. R. Unwin (Yeovil), J. E. Seales (Radstock), and B. A. Crook (Tisbury), each 5s.; Brighton Public Medical Service, £10 10s.; K. J. Atkinson (Halstead), 5s.; W. A. Gornall (Nailsea), £1 1s.; E. M. Redman (Bristol) and J. M. Dupont (Frome), each 5s.; Doncaster Local Medical and Panel Committee, £1 1s.; Smethwick Medical Society, £3 3s.; E. G. D. Pineo (Langford), 5s.; Rochdale Panel Committee, £10; Sheffield Panel Committee, £40; Croydon Panel Committee, £5 5s.; East Ham Panel Committee, £8 6s. 6d.; Warrington Local Medical and Panel Committee and Southend Local Medical and Panel Committee, each £5 5s.; G. Pollock (London), 10s. 6d. Total £1619 16s.

In accordance with the decision conveyed in the previous announcement the Fund has now been closed.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. J. C. Souter to *President* for Medical Dept., Admiralty.

Surg. Lt. J. Lees to *Effingham*.

A. G. K. Heberlein entered as Surg. Lt. (D) for short service and appt. to *Victory* for R.N. Hospl., Haslar, for course of instruction.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdr. R. Hall to *Royal Sovereign*.

Surg. Lts. to be Surg. Lt.-Comdrs: R. Cormack and M. Godwin.

### ARMY MEDICAL SERVICES

Cols. N. E. Dunkerton, D.S.O., late R.A.M.C., and P. J. Hanafin, D.S.O., late R.A.M.C., retire on ret. pay.

Lt.-Cols. J. E. Ellcome, from R.A.M.C., and H. H. Blake, O.B.E., from R.A.M.C., to be Cols.

### ROYAL ARMY MEDICAL CORPS

Majs. E. F. W. Grellier and G. D. Jameson to be Lt.-Cols. Short Service Commissions: Lts. (on prob.) restd. to the estab.: D. Wright, and C. P. Stevens; Lts. (on prob.) confirmed in their rank: J. McN. Lockie, and J. H. Caverhill; Lt. (on prob.) F. J. Hebb resigns his commission.

### ROYAL AIR FORCE

Wing Comdr. A. F. Rook to Central Medical Establishment, London, for duty as consultant in medicine.

Squadron Leaders J. Magner to R.A.F. Hospital, Cranwell, for duty as medical officer; R. G. Freeman to R.A.F. Depôt, Uxbridge, for duty as medical officer.

The undermentioned are granted short service commissions as Flying Offrs. and to Medical Training Depôt, Halton: J. R. R. Jenkins, V. D. Jones, R. M. Outfin, J. H. Neal, R. H. Pratt, D. G. Smith, S. G. Gordon, J. C. Bowe, G. P. Jones, and J. G. Rountree.

Flying Offr. F. Courtin ceases to be seconded to the Royal Victoria and West Hants Hospital.

### DEATHS IN THE SERVICES

Lt.-Col. WILLIAM CAMPBELL, who died on May 24th at Walton-on-the-Hill in his 86th year, was born in Edinburgh, where he obtained his medical degree in 1872. He took a commission in the Army in September, 1874, and was surgeon to the Scots Guards in 1881 and surgeon major to the Grenadier Guards in November, 1887, reaching the rank of surgeon Lt.-col. in 1894. He served in Egypt in 1882 and retired in June, 1897.

## Appointments

EVANS, K. A., L.R.C.P. Irel., has been appointed First Assistant Resident Medical Officer at Birch Hill Hospital, Rochdale, and Medical Officer in Charge of Antenatal and Postnatal Clinics.

GAVIN, F. W., M.D. Edin, D.P.H., Medical Officer for Penrith Urban and Rural areas.

HARRISON, J. G., L.R.C.P. Edin., Senior Resident Medical Officer at the City Hospital, Chester.

MOODIE, WILLIAM, M.D. St. And., F.R.C.P. Lond., D.P.M., Assistant Physician in the Department of Psychological Disorders in Children at University College Hospital.

London Homœopathic Hospital.—The following appointments are announced:—

HUGHES, D. M., M.B., F.R.C.S., Hon. Consulting Surgeon;

BARRY, GERALDINE, M.S. Lond., F.R.C.S. Eng., Hon. Surgeon; and

DODD, HAROLD, Ch.M. Liverp., F.R.C.S. Eng., Hon. Assistant Surgeon.

## Births, Marriages, and Deaths

### BIRTHS

BUTLER.—On May 24th, at Sutherland-avenue, W., the wife of Dr. Eric N. Butler, of a son.

DAY.—On May 22nd, at Chapel Field East, Norwich, the wife of Dr. George Day, of a son.

HOSFORD.—On May 27th, at Stormont-road, Highgate, the wife of R. W. P. Hosford, F.R.C.S. Eng., of a daughter.

JAQUES.—On May 24th, at Burnham, Buckinghamshire, the wife of Harold M. Jaques, M.R.C.S. Eng., of a son.

MCKINSTRY.—On May 23rd, at Gunterstone-road, W., the wife of Dr. W. K. McKinstry, of a daughter.

MOWAT.—On May 24th, at Kampala, Uganda, the wife of Allan Mowat, F.R.C.S. Edin., of a daughter.

TANNER.—On May 30th, at Newton Abbot, the wife of Guy M. Tanner, M.B. Camb., of a son.

WORTHINGTON.—On May 22nd, at Warwick, the wife of Dr. C. L. Worthington, of a daughter.

### MARRIAGES

SLOT—LEWIS.—On May 29th, Gerald Slot, M.D. Lond., to Mary Lewis, of 2 Wellington House, Regent's Park, N.W., daughter of the late Mr. and Mrs. J. A. Munton, of Idle, Yorkshire.

### DEATHS

BOLUS.—On May 26th, suddenly, at Queensberry House, Richmond, Surrey, Harry Boulcott Bolus, M.D. Camb., aged 68.

CAVERS.—On May 26th, Francis Cavers, D.Sc. Lond., M.R.C.S. Eng., of Knobworth, Herts.

CRAIK.—On May 23rd, at St. Albans-road, Watford, John George Craik, M.B. Glasg.

DONKIN.—On May 30th, Charles Donkin, M.D. Durh., of Bexhill-on-Sea, aged 81.

LAWS.—On May 26th, at Kings Langley, William George Laws, M.B. Edin., F.R.C.S. Eng., formerly of Nottingham, in his 75th year.

## MEDICAL NEWS

### University of Oxford

The following have been elected members of the committee of management of the new institute of experimental psychology: Sir Farquhar Buzzard, Mr. H. H. Price, Dr. R. S. Creed, and Mr. G. D. H. Cole.

### University of Cambridge

On May 30th the following degrees were conferred:

*M.D.*—W. A. Bourne, C. J. M. Dawkins, W. H. Poole, and H. H. Swift.

*M.B., B.Chir.*—H. S. Sharp.

*M.B.*—W. M. L. Owen, C. G. Pantin, J. H. Patterson, and E. G. Pyne.

*B.Chir.*—K. O. Black, J. R. Bodington, A. B. R. Finn, and E. O. C. Grattan.

### Society of Apothecaries of London

The following candidates have satisfied the examiners for the Mastery of Midwifery:—

Monica M. M. M. Fisher, A. L. Gilbey, G. P. Goodwin, Gwynedd Hugh-Jones, Margaret J. T. Leitch, Dorothy Makepeace, M. Y. Paget, and J. H. Spence.

### Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on June 1st, with Prof. Archibald Young, the president, in the chair, the following were admitted to the fellowship: William Beattie, John Fleming, William Ian Gordon, Ronald Guthrie Lendrum, and James Wallace Macfarlane (Glasgow), Joseph Charles Pinch (Canada), David Ross (Maybole), and Archibald McLellan Wright Thomson (Glasgow).

### Queen's University, Belfast

On July 10th the honorary degree of LL.D. will be conferred on Prof. D. J. Coffey, president of University College, Dublin, and the honorary degree of D.Sc. on Dr. T. H. Milroy, emeritus professor of physiology in the University.

### Macalister Lecture

On Thursday, June 25th, at 9 P.M., at the National Temperance Hospital, Hampstead-road, London, N.W., Sir Francis Fremantle, M.P., will deliver the annual Macalister lecture. His subject will be A Doctor in Parliament.

### Sussex Medical and Dental Golfing Society

The spring meeting of this society will be held on Sunday, June 14th, at the West Sussex golf club, Pulborough. The hon. secretary's address is 16, The Drive, Hove, 3.

### Ex-Services Welfare Society

A conference has been arranged by this society to be held at the Hyde Park Hotel, London, on July 3rd with Dr. Edward Mapother in the chair. The subject for discussion will be some of the sequels of war stress. Further information may be had from the secretary of the society, 51, Victoria-street, London, S.W.1.

### Indian Medical Service

The annual dinner will be held at the Trocadero Restaurant, London, on Wednesday, June 17th, at 7.15 P.M., when Major-General Sir Robert McCarrison, C.I.E., will preside. Officers can arrange to sit near their friends, as separate tables to seat eight will be provided. Tickets from the joint hon. secretary, Sir Thomas Carey Evans, Hammersmith Hospital, Ducane-road, London, W.12.

### International Hospital Association

A national council of this association has been set up in this country which includes three representatives of every association interested nationally in any aspect of hospital service. Associate members, of whom there is a growing body in Great Britain, will also be represented on the council. The British Medical Association, the British Hospitals Association, the British Hospitals Contributory Schemes Association, the College of Nursing, the Royal Institute of British Architects, the Incorporated Association of Hospital Officers, the National Association of Local Government Officers, and the Pharmaceutical Society of Great Britain have already expressed their desire to become members.

THE deaths are announced this week of two prominent English medical workers in China. John Howard Wright, the well-known medical missionary, died at Tientsin on May 30th, and Dr. Agnes Livingstone-Learmonth, C.B.E., of the Yenching University, Peiping, on May 10th.

Dr. James McLauchlan Johnston has been appointed a deputy commissioner of the Board of Control for Scotland.

### King's College Hospital

The King has granted his patronage to this hospital.

### St. Mark's Hospital, London

Lord Harewood will lay the foundation-stone of the nurses' home of this hospital on Thursday, June 11th, at 2.30 P.M. A balance of £38,500 is still required to open the home free of debt. It provides accommodation for 50 nurses and 27 maids. During 1935 the hospital admitted more patients than in any previous year of its history, yet the waiting-list is greater than ever.

## Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

### SOCIETIES

**MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.**  
THURSDAY, June 11th.—8.30 P.M. (11, Chandos-street, W.), Symposium on Psychotherapy in General Practice.

**RESEARCH DEFENCE SOCIETY.**  
TUESDAY, June 9th.—3 P.M. (London School of Hygiene, Keppel-street, W.C.), Sir Malcolm Watson: Manson, Ross, and Reed, Pioneers in Research on Tropical Diseases. (Stephen Paget Lecture.)

**ASSOCIATION OF CLINICAL PATHOLOGISTS.**  
SATURDAY, June 13th.—9.45 A.M. (17, Stonegate-street, York), Mr. E. J. King, Ph.D.: Phosphatase as a Test of Hepatic Function. Dr. F. S. Fowweather: Some Observations on the van den Bergh Reaction. Dr. Alan Moncrieff: Jaundice in Children. Dr. A. F. S. Sladden: Two Anomalous Cases of Icteric Tinge. Dr. Howard Collier: "Lead Action" as a Clinical Entity and as a Problem of Clinical Pathology. Dr. King and Mr. G. A. D. Haslewood, Ph.D.: Improvements in the Estimation of Bilirubin. Dr. S. C. Dyke: Adenomatosis of the Liver.

**SOUTH-WEST LONDON MEDICAL SOCIETY.**  
WEDNESDAY, June 10th.—9 P.M. (Bolingbroke Hospital, Wandsworth Common), Sir Lenthal Cheate: The Relationship of Experimental Pathology to Human Carcinoma. (Bolingbroke Lecture.)

**BRITISH ASSOCIATION OF RADIOLOGISTS.**  
FRIDAY, June 12th, and SATURDAY.—Annual General Meeting at Manchester Royal Infirmary.

**PADDINGTON MEDICAL SOCIETY.**  
TUESDAY, June 9th.—9 P.M. (Great Western Royal Hotel, W.), Dr. A. Baldie: Prospect and Retrospect. (Presidential Address.)

**BIOCHEMICAL SOCIETY.**  
FRIDAY, June 12th.—2.30 P.M. (Marischal College, Aberdeen), Short Communications.

### LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

**ROYAL COLLEGE OF PHYSICIANS, Edinburgh.**  
MONDAY, June 8th, and TUESDAY.—5 P.M., Sir Thomas Lewis, F.R.S.: Symptoms and Signs of Embolism in the Limbs with Special Reference to Pain. (Alexander Gibson Lecture.)

**CHADWICK TRUST LECTURE.**  
THURSDAY, June 11th.—5 P.M. (Chelsea Physic Garden, Swan Walk, S.W.), Sir William Willcox: Plant Pharmacology and Medical Practice.

**BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.**

MONDAY, June 8th.—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Mr. Bright Banister: Fibromyoma of Uterus.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).

THURSDAY.—2 P.M., Dr. Chassar Moir: Operative Obstetrics. 3 P.M., Dr. R. A. Young: Non-tuberculous Pulmonary Diseases.

FRIDAY.—2.15 P.M., Dr. A. A. Davis: Gynaecological Pathology.

Daily, from 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetrical and gynaecological clinics or operations, and refresher course.

**FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**

MONDAY, June 8th, to SUNDAY, June 14th.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. Afternoon M.R.C.P. course in neurology and psycho-

- pathology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues. and Thurs., at 8 P.M., clinical and pathological M.R.C.P. course.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. All-day course in gynaecology.—ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W. Thurs., 8.30 P.M., Dr. Roland T. de Hellebranth (New Jersey, U.S.A.): The Present-day Treatment, in the United States, of Gastric and Duodenal Ulcers (open to non-members).—CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C. Sat. and Sun., course in obstetrics.—Courses are open only to members.
- HOSPITAL FOR SICK CHILDREN**, Great Ormond-st., W.C. WEDNESDAY, June 10th.—2 P.M., Mr. Twistington Higgins: Intussusception, Volvulus, and Mesenteric Anomalies. 3 P.M., Dr. A. Signy: Food Poisoning. Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.
- INSTITUTE OF CHILD PSYCHOLOGY**. WEDNESDAY, June 10th.—6.15 P.M. (Friends House, Euston-road, N.W.), Prof. R. J. S. McDowall: Some Aspects of Environment and Character. 8.15 P.M., Dr. Margaret Lowenfeld: Function of Thought in Creation of Character.
- SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION**. WEDNESDAY, June 10th.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.), Dr. C. E. Lakin: Demonstration of Medical Cases.
- UNIVERSITY OF BIRMINGHAM**. TUESDAY, June 9th.—3.30 P.M. (General Hospital), Mr. Stirk Adam: The Treatment of Otitis Media and its Complications. FRIDAY, June 12th.—3.30 P.M. (Queen's Hospital), Mr. Hugh Donovan: Recent Advances in the Treatment of Diseases of the Male Genital System.
- MANCHESTER ROYAL INFIRMARY**. TUESDAY, June 9th.—4.15 P.M., Mr. J. P. Buckley: Some Observations on the Surgery of the Gall-bladder. FRIDAY.—4.15 P.M., Mr. D. M. Sutherland: Demonstration of Surgical Cases.
- ANCOATS HOSPITAL, MANCHESTER**. THURSDAY, June 11th.—4.15 P.M., Dr. W. J. S. Reid: Neurasthenia.
- 
- ## Vacancies
- For further information refer to the advertisement columns*
- Accrington, Victoria Hospital**.—H.S. £150.  
**Albert Dock Hospital, Connaught-road, E.**—Res. M.O. At rate of £110.  
**Ashton-under-Lyme, District Infirmary**.—Res. Surg. O. Also H.S. At rate of £200 and £150 respectively.  
**Barking Borough**.—Asst. M.O.H. and Asst. School M.O. £600.  
**Barnsley, Beckett Hospital and Dispensary**.—H.P. £200.  
**Bedford County Hospital**.—First H.S. At rate of £155.  
**Belfast, Royal Maternity Hospital**.—Res. H.S. At rate of £100.  
**Birmingham and Midland Hospital for Women**.—H.S. At rate of £100.  
**Birmingham City Education Committee**.—Asst. School M.O. £500.  
**Birmingham, Selly Oak Hospital**.—Res. Surgeon. £700. Pathologist. £750. Also Radiologist. £800.  
**Blackburn County Borough**.—Asst. Dentist. £450.  
**Bolton Infirmary**.—H.S. £125.  
**Bradford, Royal Eye and Ear Hospital**.—H.S. £160.  
**Bristol General Hospital**.—Two H.P.'s, three H.S.'s, Res. Obstet. O., H.S. to Spec. Depts. At rate of £80. Also Cas. H.S. At rate of £100.  
**Bristol Royal Infirmary**.—Sen. Res. M.O. £200.  
**Bristol, Southmead Municipal General Hospital**.—Jun. Asst. Res. M.O. At rate of £200.  
**Burnley, Municipal General Hospital**.—Jun. Res. M.O. £150.  
**Burton-on-Trent General Infirmary**.—H.S. £150.  
**Cambridge, Addenbrooke's Hospital**.—Res. Anaesthetist and Emergency Officer. At rate of £130.  
**Cardiff, University College of South Wales and Monmouthshire**.—Lecturer in Experimental Physiology. £750.  
**Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.**—Third Res. H.S. At rate of £75. Also Hon. Assts. in Out-patient Dept.  
**Chester City (Public Assistance) Hospital**.—Jun. Res. M.O. £200  
**City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.**—Surg. and Med. Regs. £225 and £175 respectively. Also Asst. Radiologist.  
**Colchester, Essex County Hospital**.—H.P. £150.  
**Connaught Hospital, Wallhamston, E.**—H.S. and Cas. O. Each at rate of £100. Hon. Physician. Also Sen. Res. M.O. and H.P. At rate of £150 and £100 respectively.  
**Doncaster Royal Infirmary**.—H.P. At rate of £175.  
**Dreadnought Hospital, Greenwich, S.E.**—Receiving Room Officer. Also H.P. At rate of £200 and £110 respectively.  
**Dunedin, N.Z., Olago Hospital**.—Radiotherapist. £800.  
**Edmonton Urban District Council**.—Asst. M.O.H. and Asst. School M.O. £550.  
**Elizabeth Garrett Anderson Hospital, Euston-road, N.W.**—H.P., three H.S.'s, and Obstet. Surgeon. Each at rate of £50.  
**Haliyar Royal Infirmary**.—Third H.S. At rate of £150.  
**Hammersmith Hospital, Ducane-road, W.**—Asst. Radiologist. £700.  
**Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.**—H.S. At rate of £100.  
**Holt, Norfolk, Kelting Sanatorium**.—Second Asst. Res. M.O. £350.  
**Hospital for Sick Children, Great Ormond-street, W.C.**—Cas. M.O. £175. Ophth. Surgeon. Also Res. Aural Reg. £150.  
**Hospital for Tropical Diseases, Gordon-street, W.C.**—H.P. At rate of £120.  
**Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.** Res. H.P. At rate of £100.  
**Huddersfield, St. Luke's Hospital**.—Res. M.O. £200.  
**Hull, Municipal Maternity Home and Infants' Hospital, Hedon-road**.—Sen. Res. M.O. £450.  
**Hull and Sculcoates Dispensary**.—Res. M.O. £500.  
**Ilford, King George Hospital**.—Res. Cas. O. and Surg. Reg., Res. Med. Reg. Each £150. Two Res. H.S.'s. Each £100.  
**Ipswich, East Suffolk and Ipswich Hospital**.—H.S. £144.  
**Kent County Council**.—Asst. for Tuber. Administration. £900. Also Asst. for Hospital Administration. £800.  
**Kettering and District General Hospital**.—Second Res. M.O. At rate of £125.  
**Kidderminster and District General Hospital**.—H.S. £150.  
**Leeds University**.—Lecturer in Biochemistry. Also Lecturer in Physiology. Each £500.  
**Leicester City Mental Hospital, Humberstone**.—Sen. Asst. M.O. £700.  
**Liverpool, David Lewis Northern Hospital**.—H.S. to Spec. Depts. At rate of £80.  
**Liverpool Hahnemann Hospital, Hope-street**.—Res. M.O. At rate of £120.  
**Liverpool Sanatorium, Delamere Forest, Frodsham**.—Second Asst. to Med. Supt. £250.  
**Liverpool, Smithdown-road Hospital**.—Res. Asst. M.O. £200.  
**Liverpool University**.—Supervisor of Dental Mechanics and Dental Prosthetics. £750.  
**London County Council**.—M.O. (Grade I.). £350. Asst. M.O.'s (Grade II.). Each £250. Also Temp. Dist. M.O. At rate of £235.  
**London University**.—Examinerships.  
**Maidstone, West Kent General Hospital**.—H.S. £175.  
**Manchester, Ancoats Hospital**.—Res. Surg. O. £200. Also Combined H.S. (Aural) and H.P. post. At rate of £100.  
**Manchester, Christie Hospital and Holt Radium Institute, Withington**.—Res. Surg. O. At rate of £150.  
**Manchester, Hulme Dispensary**.—Res. M.O. £250.  
**Manchester, St. Mary's Hospital**.—Four H.S.'s for Special Depts. Each at rate of £50.  
**Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W.**—Res. M.O. £100.  
**Monmouthshire County Council**.—Asst. M.O. £500.  
**National Hospital for Diseases of the Nervous System, Queen-square, W.C.**—Registrar. £300.  
**National Temperance Hospital, Hampstead-road, N.W.**—Res. M.O. At rate of £175. Cas. O. and H.S. At rate of £120. and £100 respectively. Also Surg. Reg. 40 guineas.  
**New Zealand, Wellington Hospital Board**.—Asst. Supt., Medical. £1000.  
**Nottingham General Hospital**.—H.S. At rate of £150.  
**Nottingham Hospital for Women**.—H.S. At rate of £150.  
**Paris-Hertford British Hospital**.—Res. M.O. £150.  
**Plymouth, Prince of Wales's Hospital, Greenbank-road**.—Res. Anaesthetist and H.S. At rate of £120.  
**Portsmouth and Southern Counties Eye and Ear Hospital**.—Hon. Asst. Ophth. Surgeon, Hon. Anaesthetist. Also H.S. At rate of £120.  
**Preston and County of Lancaster Royal Infirmary**.—Cas. H.S. £150.  
**Princess Elizabeth of York Hospital for Children, Shadwell, E.**—Cas. O., H.P., and H.S. Each at rate of £125.  
**Prison Service**.—M.O., Class II. £525.  
**Queen's Hospital for Children, Hackney-road, E.**—Asst. M.O. At rate of £200. Also H.S. and Cas. O. Each at rate of £100.  
**Queen Mary's Hospital for the East End, Stratford, E.**—Radio-ologist. £350.  
**Reading, Royal Berkshire Hospital**.—Hon. Asst. Anaesthetist.  
**Royal Cancer Hospital, Fulham-road, S.W.**—Sen. Asst. Radio-ologist. £350.  
**Royal Northern Hospital, Holloway, N.**—H.S. At rate of £70.  
**St. Bartholomew's Hospital, E.C.**—Asst. Physician to Children's Dept. Also Asst. Surgeon.  
**St. Mark's Hospital for Cancer, &c., City-road, E.C.**—H.S. At rate of £65.  
**St. Peter's Hospital for Stone, &c., Henrietta-street, W.C.**—Clin. Assts. to Hon. Staff.  
**Salford Royal Hospital**.—Res. Surg. O. £200. Also two H.S.'s. Each at rate of £125.  
**Salvation Army Mothers' Hospital, Lower Clapton-road, E.**—Hon. Obstet. Surgeon. Also Hon. Clin. Asst.  
**Shrewsbury, Royal Salop Infirmary**.—Res. Surg. O. £250.  
**Southampton, Isolation Hospital and Sanatorium**.—Jun. Res. M.O. £200.  
**Southampton, Royal South Hants and Southampton Hospital**.—H.S. to Ear, Nose, and Throat Dept., and Res. Anaesthetist. At rate of £150.  
**Southend Municipal Hospital**.—Asst. M.O. (Grade 2). £325.  
**Southend-on-Sea General Hospital**.—Med. Reg. and R.M.O. £300.  
**Stafford, Prestwood Sanatorium**.—Jun. Asst. M.O. At rate of £300.  
**Surrey County Council, Reigate Institution**.—Med. Supt. £900. Also Res. Asst. M.O. At rate of £375.  
**Truro, Royal Cornwall Infirmary**.—Hon. Surgeon.  
**West London Hospital, Hammersmith-road, W.**—Med. Reg. to Children's Dept. £100. Also two H.S.'s, H.P., Res. Cas. O., and Res. Anaesthetist. Each at rate of £100.  
**West Malling, Kent, Leybourne Grange Colony for Mental Defectives**.—Asst. Res. M.O. £350.  
**Westminster Hospital, Broad Sanctuary, S.W.**—Two Radio-ologists.  
**West Sussex County Council**.—M.O.H. £340. Also M.O.H. for Horsham Urban District, &c. £460.  
**Wolverhampton Education Committee**.—Asst. M.O. £600.  
**Wolverhampton Royal Hospital**.—H.S. At rate of £100.  
**Worksop, Victoria Hospital**.—Jun. Res. £120.
- The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Lanchester, Co. Durham.

## NOTES, COMMENTS, AND ABSTRACTS

## SOME PSYCHOLOGICAL FACTORS IN SICKNESS ABSENTEEISM \*

BY THOMAS M. LING, B.M. Oxon., M.R.C.P. Lond.

MEDICAL OFFICER, JOSEPH LUCAS LTD., BIRMINGHAM

*(Concluded from p. 1276)*

## Obsessional Manifestations

Although the majority of the psychoneuroses that go to swell the sickness figures of the country are examples of the anxiety state, mention must be made of the obsessional cases, especially as these are more particularly liable to occur among more educated people and those in administrative positions. One of the best descriptions is to be found in "The Nervous Temperament,"<sup>3</sup> where Prof. Culpin outlines the condition as follows:—

"The sufferer says he is forced to think certain thoughts—which may be emotionally unpleasing, apparently futile or abstractly speculative, while recognising them as irrational. The penalty of fighting against them, even when that is possible, is great stress."

James<sup>7</sup> describes the state as a "gnawing craving urgency" and the symptoms are called obsessional: "they rarely display their mental state; they believe strongly in the power and importance of self-control, which they exercise consciously in various directions. They tend to overwork, and give the impression of taking the line of greatest resistance. When a breakdown comes, it is usually ascribed to overwork, though the overwork itself is a symptom and not the cause of the state. They may be over-conscientious either in general or merely with regard to some particular situation."

In my experience it is very rare to find the obsessional state alone among those in employment, and there is nearly always an admixture of anxiety symptoms as well. The following case illustrates a typical example:—

A sorting clerk, aged 22, was frequently ill for a few days at a time with "rheumatism" and dysmenorrhœa. She was the elder of two children and as a child had been under observation intermittently at a leading children's hospital for rheumatism and early cardiac involvement. The home life was fairly happy, although she had a strong antipathy to her father. There had been no rheumatic pains for eight years until she had started work twelve months previously. Further inquiry elicited the fact that the "rheumatism" was always in the sacro-iliac region and only came on when she got "all upset." Actually the pain was identical with the low back pain associated with the dysmenorrhœa. It appeared that she became "upset" as a result of thinking she would go mad and that this feeling came on when there was any rush of work. She kept feeling that she had put two invoices in an envelope instead of one and then wanted to retrieve the envelope to rectify the mistake. As would be expected the same problem presented itself at home: after locking up at night, she always had to go back to make sure that she had really done it. There was marked claustrophobia. "I feel all shut in in a crowd and can't go in a bus; it is the same in a cinema; I can only sit at the end of the row, as otherwise I feel so sick I have to go out." She counts things over and over again, especially houses in a street. Physical examination showed a faint impurity of the apical first sound with no detectable cardiac enlargement and an excellent response to exercise. No other stigmata of rheumatism were found and the general physique was excellent.

In this case the outstanding feature is the marked obsessional symptoms, and when they become incapacitating the patient develops a severe "rheumatic" pain, which

is, of course, an acceptable manifestation to her sub-conscious mind and incidentally one that secured for her a considerable amount of attention during her childhood. The patient was reassured that she was not going mad and was given some understanding regarding the prevalence of obsessional symptoms among the normal population. On learning that she was really just like many people as regards her modes of thinking, the relief was quite dramatic; she still suffers somewhat from dysmenorrhœa, although she has not lost any more time and has had no further "rheumatic" pains during the last four months.

## Extent of Psychoneurotic Illness

Prof. Culpin and Dr. May Smith<sup>3</sup> found significant degrees of neuroticism in approximately 30 per cent. of over 1000 clerical and factory workers, but of not a sufficient degree to incapacitate them from holding their place in the industrial structure. Dr. Halliday,<sup>8</sup> a regional medical officer under the Insurance Act in the Glasgow area, has recently published a most valuable paper which summarises the results of examining 1000 consecutive cases of panel patients who have been absent for more than twelve weeks under the N.H.I. As he points out:—

"The Act had been in operation for twenty years before a survey was made of the reasons for incapacity given by insurance practitioners on the medical certificates. In Scotland, in 1932, the Department of Health issued its first report on the subject. This dealt with the sickness statistics for the insured population for the year from July 1st, 1930, to June 30th, 1931. It was followed by similar surveys for the corresponding annual periods of 1932 and 1933. What information do they contain about the reason for incapacity? Averaging the figures for the three years under survey, the group of "respiratory diseases" occupied first place, being responsible for 42 per cent. of all incapacities. Tying for second place came "rheumatism" and diseases of the digestive system, each providing 10-11 per cent.; violence and skin affections were next, each providing 8-9 per cent. What part is played by the psychoneuroses? A very small part according to the reports—not more than 2 per cent.—and this figure is made up by including such cases as "cardiac debility" and "tachycardia." This picture of the overwhelming predominance of organic disease conflicted with the impression I had found while acting as a medical referee under the Insurance Act. . . . Many of these patients were unfit to work, but the reason for their defective function was, in my opinion, not organic but psychological."

As a result of this inquiry Dr. Halliday has shown that one-third of these patients were disabled primarily by a psychoneurotic condition and that minor associated physical disorders were not in any way the cause of their absenteeism. His figures do not reflect the incidence of psychoneurosis among all the patients examined, but only its occurrence when it acted as the reason for incapacity. A somewhat comparable inquiry was carried out in 1930 among industrial workers in the United States by Dr. C. P. McCord.<sup>9</sup> He investigated a large group of train despatchers, who sit at desks wearing a telephone receiver over one ear and receive as many as 200 items per hour for record or a decision that may involve life and death for train passengers or crews. There is thus present a constant source of fear and McCord found that 82 per cent. of these train operatives showed cardiac disturbances, of a type comparable to the "soldier's heart" or D.A.H. that arose in such large numbers under comparable conditions during the late war.

In view of the importance of the subject, I have analysed the case records of 200 consecutive cases of sick employees, who have been seen either on their return to work after sick leave or who have been referred for an opinion owing to prolonged absence. It should be realised that the policy of the organisation towards their sick employees is a generous one.

\* Paper read before the Association of Industrial Medical Officers at the London School of Hygiene and Tropical Medicine on March 27th, 1936.

The staff receive full pay, while in the case of workers the N.H.I. money is augmented from a special fund, the amount being dependant on the individual's social conditions in each case. In no instance is a worker discharged from the company on account of illness. Naturally the diagnosis varies widely and such indefinite terms as "gastritis," "respiratory catarrh," and "anaemia" are frequently found. The relative unimportance of the actual diagnosis placed on the certificate has been referred to by Culpin,<sup>3</sup> Howe,<sup>4</sup> Ross,<sup>5</sup> Halliday,<sup>6</sup> and Lockhart.<sup>7</sup> The latter has summed up the situation appropriately:—

"These stereotyped descriptions of highly complicated processes are, with few exceptions, valueless to the student of social problems. The certificates deal largely with symptoms or symptom-complexes, to which orthodox labels have been given. They are merely evidence that a person is ill and is entitled to sick benefit."

Most panel practitioners, with whom the matter has been discussed, agree with this, but unfortunately the patient is the unwitting victim of a bureaucratic and medical subterfuge as the presence of a certified "disease" provides him with just the honourable but regressive escape that he is seeking, to protect him from having to deal with the situation in an appropriate manner. Owing to the totally inadequate training in the subject given to the average practitioner, the latter tends to react to the situation in a comparable way, and emphasises the organic symptom as a protective mechanism against his own ignorance of mental processes.

Perhaps one of the most significant facts is the extent to which the "diagnoses" on the sick notes are in reality monosyllabic descriptions of one or other manifestations of the anxiety state; "tachycardia," "gastritis," "rheumatic chill," and "abdominal pain" reappear with monotonous regularity, but in my experience even an organic label, such as "bronchitis" or "tonsillitis," fails not infrequently to manifest any of the physical signs so assiduously learnt and memorised by the student, and masks an underlying emotional disharmony.

#### An Assessment of Incapacity

In the survey referred to above the degree of psychoneurotic symptoms has been ascertained and an assessment made of the extent to which they are incapacitating the patients from following their normal course of employment. The cases have been allotted to one of the following three groups:—

*Group 1: A recognised physical disorder.*—Forty-one per cent. of the cases that have come under observation, either on their return to work or as a result of prolonged absence, fall into this group. The following case illustrates the chief characteristics of those included under this heading:—

A woman, 23 years of age, the eldest of four children, had been away for two weeks as a result of tonsillitis and had been in bed for one week. During her illness she had marked dysphagia and swelling of the cervical glands, and when seen there was still some infection of the anterior pillars. She volunteered the information that she was glad to be back at work; "it's so much nicer with the rest of the crowd, they are all so friendly." During her leisure she goes to cinemas with her boy and goes cycling with the club. Does not get worried; always feels fresh in the morning; rather likes noise. When asked how she felt if sent for by the foreman she replied: "Oh, I don't mind; he's a good scout and I do my best, so why worry?"

This is a case of a well-adjusted happy individual, who is able to feel comfortable both with herself and with her fellow-workers. There are no complaints about noise or supervision, the two outstanding factors upon which so many workers tend to project their own disharmonies.

*Group 2: Definite psychoneurotic symptoms* complicating and prolonging absence due to a recognised "organic" disease; 32 per cent. of the

cases fall into this group, of which the following is a typical example:—

A woman, aged 27, had been away for nine months with heart disease, which was attributed to frequent attacks of influenza. There was an indefinite history of rheumatism as a child with irregular attacks of growing pains. She was the fourth of six children and had been living with an uncle for some years. She was perfectly well until May, 1935, when she was transferred, against her wishes, from one factory to another. At the end of June, 1935, she went to bed with an attack of influenza characterised by general lassitude, headaches, and pains in the arms, and remained in bed until November. She had been engaged for two years and by the summer of 1935 the young man was getting impatient on their getting married, which the woman was very loth to do. As she expressed it: "Of course, if I had not got ill I should be married by now; it was worrying me for months and I could not sleep." In addition she gave a history of marked fear of the dark and claustrophobia, with generalised anxiety if she ever had to go in buses.

When seen she had evidence of well-compensated mitral incompetence with an excellent response to exercise. She stated that she did not yet feel well enough to work, as she "kept on getting so worried over everything." Her domestic situation was discussed briefly and it was obvious that she was lacking courage to break off her engagement and she was consequently given some help and reassurance on the subject. A week later she returned to say that she now felt perfectly well and quite fit to return to work; she had solved her problem by breaking off her engagement and since then has kept perfectly well.

This is a case showing an admixture of organic disease in the shape of a rheumatic carditis undoubtedly prolonged by an associated emotional condition.

*Group 3.*—Cases where the manifestations are essentially emotional in origin and the individuals either state that they are away on account of "nerves" or complain of disharmony in various systems of the body without clinical evidence of pathological change; 27 per cent. of the cases away for more than two weeks are under this heading, and the following case illustrates the chief points at issue:—

A man, aged 20, was seen as he had been away for three weeks with "palpitation." He gave a history of generalised fear and worry for the last three months. Further inquiry elicited the fact that he was the only son of a man who had shell-shock during the war and had been unable to work ever since. The home atmosphere had always been one of apprehension and the boy was deeply attached to both parents. Two years previously he had married against his parents' wishes and his married life had been fraught with many difficulties. He kept wanting to return home and a month before he went "ill" he was separated from his wife and he returned to his parents' home.

The physical examination was essentially negative and his inner disharmony was manifested by numerous complaints about his heart, although his cardiovascular system was clinically normal.

As would be expected in this case, the individual was dissatisfied with his work and decided to seek employment elsewhere. Admittedly the demarcation between the various groups is somewhat arbitrary, as the diagnosis of a psychoneurosis is arrived at, as in other causes of incapacity, by a combination of many points of medical evidence, no one of which is typically diagnostic of anything in particular, but which, in combination, lead to a judgment of causes as sound as in organic disease.

#### The Remedy

Here then is a major problem, social, economic, and medical, that is yearly becoming more pressing and is of equal interest to those who are responsible for training doctors and to those, like ourselves, whose duty is primarily towards the patient, his environment, and his occupation. It is generally agreed that the seeds of adult neuroticism are sown in the



first few years of life and in this connexion the problem is comparable to the prevention of crippling among children and young adults. Correct feeding and the prevention of rickets is all-important and is indicated for all children; in the same way good mental health for all children is just as attainable, and I believe that the next 30 years will witness as great a development along these lines as the present century has evidenced in the prevention of crippling. When adolescence is reached the problems of the rapid changes of advancing maturity demand our help and guidance; day continuation schools, as empowered by the Hadow Act, should be a much bigger feature of industry than they have yet become, and the teaching of a sound biological approach to life and its situations should be an integral part of the curriculum.

On the medical side a complete reorientation of viewpoint is required, and this must be started in the formative years of the medical student's life. He must be taught to view the patient as a living integrated whole and in relation to his home circumstances and his occupation. As Sir Walter Langdon-Brown<sup>10</sup> points out it must be realised "that the boundaries of medicine are contemporaneous with life. Medicine touches life at every point." It is generally asserted that the development of scientific methods of investigation, radiological, pathological, and biochemical, which have of necessity to be centralised in hospitals and clinics, has robbed the general practice of medicine of much of its interest and that many family doctors are just "sign-posts" to the specialists and technical experts. Such an attitude seems most regrettable, but actually the situation is a real opportunity for the regeneration of the practice of medicine along broader and more productive lines. The practitioner has a unique opportunity to investigate and assess the various environmental and social factors mentioned previously, and this privilege is especially opportune among those intimately concerned with the industrial setting. We have an opportunity of observing the effect of seed on soil, and even more important, of improving the soil and at the same time of moving the growing seed to the most suitable soil for its own constitution.

Our approach to the patient must be essentially biological and all aspects of the case, physical, emotional, and environmental, must be brought forward and the relative importance of each factor assessed in determining the aetiology of the condition and the appropriate treatment. Though not infrequently one meets with cases for whom one can do comparatively little, either because the mental calibre is inherently too poor to mould towards a better condition, or because they are the victims of an environment from which they neither can escape nor to which they can adjust, nevertheless it is certain that the majority of people can be helped very appreciably. To not a few, the mere fact that the sufferer finds a sympathetic and understanding listener who does not laugh at him or tell him that there is nothing the matter with him, is a source of very real comfort and is sufficient help to enable him to face his problems on a more realistic basis, and to take a more roseate view of the future. Where facilities occur for some suitable adjustment to be made in the type or conditions of employment, there is an added therapeutic weapon of very real value and one that we in this room are especially in a position to utilise to the full. Quite apart from a change of occupation, it frequently happens that the neurosis has been precipitated by a conflict of personalities and in such cases it is often possible to give the person in authority some understanding of the situation and suggestions for remedying it.

There is no value in a vague eclecticism or a dilettante recognition of the psychological factor in disease, but once it is realised that every patient is an individual suffering from "dis-ease," due to a number of contributory factors, both physical and mental, and worthy of our help, irrespective of the extent and objectivity of the underlying patho-

logy, a new viewpoint in medicine is opened up. This aspect, frequently referred to as the Neo-Hippocratic approach, is in reality a return to Hellenic medicine from the materialism of the last century, and Plato in the *Dialogues*<sup>11</sup> epitomises the situation for us in the words that he attributes to Socrates: "And, therefore, if the head and body are to be well you must begin by curing the soul," that is the first thing . . . and he who taught me the cure and the charm added a special direction "Let no one," he said, "persuade you to cure the head until he has given his soul to be cured, for this is the greatest error, that physicians separate the soul from the body."

## REFERENCES

7. James, W.: *Principles of Psychology*, London, 1890, vol. ii., p. 542.
8. Halliday, J. L.: *Brit. Med. Jour.*, Suppl., March 9th, 1935, p. 86.
9. Lockhart, L. P.: *THE LANCET*, 1934, i., 825.
10. Langdon-Brown, Sir W.: *Brit. Med. Jour.*, Suppl., March 16th, 1935, p. 93.
11. Cassidy, Sir M.: *Brit. Med. Jour.*, 1934, i., 45.

## A JEWISH MEDICAL CENTRE

At a time when the problems of Palestine have been forced on the attention of the British public it is interesting to hear of a large scheme of medical development now being undertaken by the Jewish authorities. As we reported last March, Dr. J. J. Golub, of New York, was asked to act as consultant in planning a new medical centre to be built on Mount Scopus, Jerusalem, beside the Hebrew University. He informs us that the Hadassah and the American Jewish Physicians' Committee in New York have obtained land, are raising the funds, and have drawn plans for this new medical centre that will equal, in standards of medical care and possibilities in medical education and research, the best of such institutions in America and Europe. It will consist of six buildings, namely: (a) a main hospital building (about 260 beds); (b) a maternity building; (c) a professional and administrative building for the X ray and radium institute, operating rooms, and the general administration; (d) an out-patient department; (e) the Henrietta Szold school of nursing; and (f) the Nathan Ratnoff medical school. The group will be known as the Rothschild-Hadassah University Hospital and the Medical School.

"Wherever Jews live in large numbers," Dr. Golub says, "one often hears questions as to whether Jewish health agencies supported by Jews and serving Jews are needed; as to whether a medical school under Jewish auspices should be established. In so far as these questions concern Palestine, they have been answered clearly and definitely, since the plans, the building programme, and affiliation arrangements between Hadassah and the Hebrew University have been agreed upon and approved by all persons concerned, and have been endorsed and supported by thinking leaders of Jewish life in Palestine and elsewhere." The new medical centre will further medical education by providing hospital clinical appointments, and university recognition of the best qualified in the profession. It will create opportunities for scores of German Jewish refugee physicians who seek a new home in Palestine, and it will have about 20 places for interns. Palestinian girls will be trained as nurses with a curriculum covering three years. The medical school building, it is stated, will contain facilities for research on cancer, hormones, parasitology, bacteriology, physiological chemistry and pathology. Patients' wards will be no larger than of six beds each for adults, and eight beds for children, with adjoining smaller wards of two and three beds. Single rooms are provided for acutely sick patients, for isolation of patients with contagious diseases, and also for private patients.

The work of construction will begin on July 1st, and it is hoped that the centre will be a model institution for the East. The architect is Mr. Erich Mendelsohn.

### COMFREY

COMFREY is a forgotten "wort" and Dr. Macalister in an engaging little book<sup>1</sup> gives the results of his investigations into this ancient remedy. It was known to the Turks and Saracens as "wound wort," and for centuries was held in high repute by the medical profession.

Dr. Macalister's interest in comfrey was aroused by reading a paper in THE LANCET of 1896 by Prof. W. Thompson, and he then began a careful investigation and was stimulated to carry out numerous experiments in the clinical material at his disposal. He gives the results of these experiments which prove that the mucilaginous infusion of the powdered root has a distinct and undeniably beneficial effect on the healing of serious and intractable ulcers.

Dr. Titherly was able to isolate a crystalline solid, allantoin, from the root of comfrey and this substance was found on experiment to have a certain definite therapeutic action. It is primarily a cell proliferant and it has in addition the power to produce rapidly a frank leucocytosis. When applied in solution to ulcers or when injected into the bulb or stem or plants the results are obvious to the naked eye. Its value in the treatment of pneumonia and peptic ulcer is less easy of demonstration, but the reader will find some interesting speculations in regard to this aspect of its therapeutic action.

From ancient times comfrey has been known and used as a curative agent, and even to-day the country people have faith in comfrey as a healer. Dr. Macalister has shown in this interesting communication the reason for this faith.

### LETTERMANN'S FOOT SUPPORTS

ACCORDING to a report by Dr. W. Bennewitz from the surgical hospital at Wuppertal-Unterbarren, where the foot supports introduced by Dr. A. Lettermann of Berlin have been in use for eighteen months, they are of positive value in many deformities of the foot. Moreover, they have been used with success as a prophylaxis after fractures of the leg have been taken out of plaster-of-Paris. The support is made of a substance which becomes soft when heated, and when plastic is placed in the shoe. When the patient walks about the substance gets squeezed into the hollows of the foot and within ten to twenty minutes hardens to make an accurately fitting support. The support to the arch of the foot is of course not quite as rigid as that of a metal support, but can replace it for most purposes. Apart from actual deformity these supports are claimed to have application in some forms of functional insufficiency. They are distributed in this country by Messrs. Allen and Hanburys Ltd., who supply a booklet setting out the principles of application with extracts from medical reports.

### NEW PREPARATIONS

**CROOKES' SUPER-D OIL.**—The Crookes Laboratories (British Colloids Ltd., Park Royal, N.W.10) offer under this name a standardised natural liver oil of very high potency derived from fishes of the scombridæ family. The vitamin-A content is stated to be 48,000 international units per gramme, and the vitamin-D content 50,000 I.U.—"as much as 500 times the amount of vitamin D as is contained in an average cod-liver oil." The manufacturers refer to recent observations showing that natural vitamin D is not the same substance as calciferol (irradiated ergosterol), being free from toxic substances and effective in smaller quantities. The dosage of Crookes' Super-D oil suggested for rickets is 5000-6000 I.U.

<sup>1</sup> Narrative of an Investigation Concerning an Ancient Medicinal Remedy and its Modern Utilities. By Charles J. Macalister, M.D. Edin., F.R.C.P. Lond., Honorary Consulting Physician, Royal Southern Hospital, Liverpool. London: John Bale Sons and Danielsson Ltd. 1936. Pp. 60. 2s. 6d.

of vitamin D daily, and the convenience of the preparation lies in its high concentration. It is sold in 5 c.cm. vials, with dropper, and each drop is estimated at 1350 I.U. of vitamin D and 1700 of vitamin A. It is also to be had in capsules of 8000 and 10,000 units respectively. Mention is made of the use of vitamin D in massive doses for hay-fever, asthma, and arthritis.

**ACRIFLAVINE B.D. (Intravenous).**—In THE LANCET of Feb. 8th last E. W. Assinder reported good results from the use of intravenous acriflavine as a urinary antiseptic in nearly 5000 cases of acute gonorrhœa. The supplies of acriflavine available in 1932-34 were unsatisfactory because they often caused damage to the liver, shown by jaundice; but in June of last year Imperial Chemical Industries Ltd. produced "an acriflavine which is apparently non-toxic." This is now issued by the British Drug Houses Ltd. (London, N.1) as Acriflavine B.D. (Intravenous). Apart from gonorrhœa Assinder found acriflavine valuable in *B. coli* infections of the urinary tract.

**TRANCUSALVE** is an ointment that has been produced by Transcutan Ltd., Leeds, for painful conditions such as fibrositis, gout, and arthritis. It is stated to contain salicylates, ethereal oils, kieselguhr, and concentrates of certain spa waters, in a lanolin base. The ointment can be thickly smeared over the affected part and may therefore be applied when there is much tenderness. It is supplied in collapsible tubes.

**A GLARE SHIELD FOR SPECTACLES.**—Theodore Hamblin Ltd. (15, Wigmore-street, London, W.1) have improved the Klippon Glare Shield introduced last summer. It consists of two moulded discs of non-inflammable material; an elastic band unites the discs, and its tension is enough for them to grip the frame of any pair of spectacles, to which the device can be fitted in a few seconds. The appearance is then similar to that of ordinary sun-glasses. The shield is cheap, very light, and can be folded into a small purse when not in use. It is produced in three tints: No. 1 is bluish and corresponds to the standard London Smoke No. 3; No. 2 is greenish-yellow and has the same effect on the ultra-violet spectrum as Ficuzal 4; and No. 3 is grey, similar to Crookes' B.2.

Under the title "Medical Products of Precision," Messrs. EVANS SONS LESCHER AND WEBB LTD. (56, Hanover-street, Liverpool) issue a handbook describing the more important of the preparations manufactured at Evans' Biological Institute, Runcom. Among these are standardised sera, vaccines, organo-therapeutic products, and colloidal and other solutions. A supplementary announcement is made about the latest of the Hepatex series of liver extracts, Neo-hepatex, which is recommended for intravenous or intramuscular injection in pernicious anæmia.

**FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.**—Week-end courses will be held in fevers at the Park Hospital (June 20th and 21st); surgery at the Prince of Wales's General Hospital (June 27th and 28th); children's diseases at the Princess Elizabeth of York Hospital (July 4th and 5th); heart and lungs at the Victoria Park Hospital (July 11th and 12th). An all-day course in proctology will be given at St. Mark's Hospital (July 6th to 11th); an afternoon course in dermatology at the Blackfriars Skin Hospital (July 13th to 25th); and a fortnight's course in urology at the All Saint's Hospital (July 13th to August 1st). On Thursday, June 11th, at 8.30 p.m. at the Royal Society of Medicine, Dr. Roland de Hellebranth, of New Jersey, U.S.A., will lecture on the present-day treatment, in the United States, of gastric and duodenal ulcers. All members of the medical profession are invited to be present. Further information about the courses may be had from the secretary of the fellowship, 1, Wimpole-street, London, W.

## ADDRESSES AND ORIGINAL ARTICLES

## ENLARGEMENT OF THE HEART\*

BY JOHN PARKINSON, M.D., F.R.C.P. Lond.

PHYSICIAN TO THE CARDIAC DEPARTMENT OF THE LONDON HOSPITAL; PHYSICIAN TO THE NATIONAL HOSPITAL FOR DISEASES OF THE HEART

ENLARGEMENT of the heart touches so many problems in cardiology that it will be impossible to do more than refer to a number of them in two lectures, and it will be necessary to exercise a preference for problems which have come under my own notice. My plan is to take first the methods of examination; then the normal heart and its displacements and fixations; and lastly to speak of dilatation and hypertrophy in general. In the second lecture my main thesis will be that enlargement of the several components of the heart can now be identified by radiology and that it is no longer sufficient to speak of general enlargement alone. There are cardiac affections, notably angina pectoris, where the heart is commonly of normal size and shape; but usually, and often from its beginning, a cardiac lesion is associated with enlargement. For concise information on the history of cardiac enlargement and its physical signs, I would naturally refer you to the Harveian Oration of 1928, by our true knight of learning Sir Humphry Rolleston.<sup>91</sup>

## Methods of Studying Cardiac Enlargement

## THE PERCUSSION METHOD

For 175 years the clinical method of percussion has been in use; in general changing little, though variations in its application have been many. Throughout the relative values of light and heavy percussion in mapping superficial and deep areas of cardiac dullness have been disputed, and not yet has agreement been reached. Such a subjective method must yield a diversity of individual convictions on the correct method of its performance. It is no surprise to find that the area of normal cardiac dullness varies considerably with the authority on clinical methods. Indeed, as a rebuke to dogmatism, these were once collected by Moritz and superimposed to display the varieties of cardiac outlines favoured by famous authorities.<sup>95</sup>

The difficulties inherent in percussion have been glossed over in an amazing way. The stout and the emphysematous are admittedly exempt. A method which disfranchises a majority of women because of their mammary development belongs to the last century and presses for its relegation to that pre-X ray period. The nipple line in men is fairly constant and an indispensable guide, but the mid-clavicular line is difficult to apply and especially in women; it is exact enough at the clavicle, but nothing less than a plumb-line will give it exactness near the apex-beat where we need to use it. Surely it is better to measure outwards from the midline to the apex, and in men to use the nipple line in confirming the position of the apex-beat, an accessory to percussion by no means negligible.

The personal factor in such a subjective method as percussion is enormous and most authorities have felt it incumbent upon them to warn us of the fact. Students, from my time to this, find it almost impossible to avoid percussing preconceived or

dictated ideas into the cardiac outline. They have now ceased to retain the requisite faith in cardiac percussion, and begin to resent the continued insistence on its values in certain quarters. Surely the time has come to revise our opinion of this primitive expedient which has outgrown its usefulness, and to require in the candidate some working knowledge of the radiological method as applied to disease of the heart and great vessels.

The inaccuracy of percussion is inseparable from a method which is indirect and inferential; and this is now generally admitted. No longer shall we tell of the professor who by knocking at the front door could find out who was in the drawing-room. Taking only the right limit of cardiac dullness, Samuel Gee says "in truth . . . not very trustworthy."<sup>42</sup> The transverse diameter on percussion over the convex surface of the chest is in excess of the real transverse diameter on orthodiagraphic projection, and the discrepancy grows when a heart is much enlarged.

The limitations of percussion in cardiac mensuration are best exposed by furnishing examples of the potentialities of X rays. This I hope to show. The need for supporting evidence on enlargement is testified by the increased reliance placed in recent years upon the position of the apex-beat. This is all to the good of diagnosis, and a healthy sign of discontent with percussion methods; but although the apex-beat gives good information about the left border of the heart,<sup>108</sup> it is misleading where there is displacement from any cause. Besides, the apex-beat is not always palpable, and it may seem to be farther out than it really is when there is tachycardia. Moreover, it is now rightly claimed that enlargement of the left ventricle may be assumed if there is clinical evidence of continued hypertension or of aortic incompetence, and that similarly the right auricle will be enlarged if there is distension of the veins of the neck with other signs of congestive heart failure. Thus there is ample scope for thorough clinical observation as a contributory means of inferring or even postulating enlargement.

As a final effort to resuscitate a dying method which is packed with fallacies and imperfections, there have been attempts to square the results of percussion with those of radiology, but they have led to nothing. Percussion had to serve in the past, and it may still serve as a crude expedient in certain cases, but the best proof that it is to be extruded from our important and growing number of clinical and laboratory methods is the fact that it is sterile. The tokens of sterility are upon it. Nothing has been added to medical knowledge or progress through cardiac percussion since the beginning of this century, and in the light of X rays it will shrink into obsolescence.

## THE RADIOLOGICAL METHOD

It was at the close of the last century that X rays were discovered, and their application to the heart was not long delayed. This can well be judged from the remarkable amount of information on the subject of radiology of the thoracic organs to be found in Holzknicht's book<sup>49</sup> published so long ago as 1901. Radioscopy (or fluoroscopy) was used, as well as radiography, though there was a time when they fell largely into disuse owing to fear of X ray effects on the operator. Happily these are now avoidable and avoided. No organ is so well placed for X ray inspection as the heart. It is surrounded by translucent lung, and by rotation of the patient it can be viewed from every angle. Instead of the outline of a cardiac

AA

\* The first Lumleian lecture for 1936 delivered before the Royal College of Physicians of London on March 17th. The second lecture will appear in THE LANCET next week.

superficies obtained mediately by percussion, we see immediately the volume of the heart and the totality of its vascular extensions; and meantime we are watching the contractions of its constituent parts. Here is no single avenue of approach but approach from open country on all sides. We obtain the composite picture of a sum of cardiac aspects, a system of perspectives. X rays tell us literally everything that percussion can tell us and tell it more amply and precisely. "More faithful witnesses are eyes than ears." Its scope goes far beyond the dreams of the past masters or artists of percussion. The superiority and clinical worth of radiology is indisputable; it is as useful as the electrocardiograph and a necessary complement to it. We should be quite indifferent whether it is to be classed as clinical or laboratory, classical or modern, if only it implements our inquiries and facilitates a comprehensive and accurate diagnosis. It cannot or ought not now to be said that it is not readily available; it is available for a trivial surgical or dental defect, so why not to reveal a heart in its fullness?

The chief objection appears to be the fear of restricting the medical student's training in physical methods of a literally handy sort. Training in observation is without doubt an integral and all-important thing; but the more would this be advantaged were it concentrated on inspection, palpation, and auscultation, and were percussion derogated in favour of a more effective X ray inspection. It is as if we lamented the employment of the sphygmomanometer because less stress need now be laid on judgment of tension by feeling the pulse. It has always been permitted to teach students our disbeliefs as well as our beliefs.

#### The Normal Heart Size: Cardiometry

By an enlarged heart, in the clinical sense, is meant a heart which has exceeded the physiological limits of size. It follows that in deciding the question of enlargement, it is of some importance to know what the physiological limits of size are. We may express the absolute size of the heart in terms of weight or volume, but neither can be measured directly during life. Anatomical data are available<sup>102 7</sup> which show that the weight of the heart in health varies within wide limits, but keeps parallel with body-weight. Thus, if the mean heart-weight in men is taken as 300 g., the average heart-weight varies between 215 and 392 g. for body-weights of 50 to 90 kg.—i.e., it almost doubles its weight (Smith). There is no direct relation between heart-weight and stature, nor, according to Smith, between heart-weight and age, as used to be thought. What we require for clinical purposes is not the absolute heart size, but the heart size in relation to bodily size. In radiology, the main difficulty lies in the impossibility of measuring directly the volume of the heart. A measurement made in a single plane such as the width of the heart—i.e., transverse diameter—is no true index of heart volume because the transverse diameter (T.D.) is so much influenced by the position and inclination of the heart in the chest. Thus a short thickset man will have a wider T.D. than a tall slender man of similar body-weight and presumably of similar heart-weight.

The average transverse diameter in healthy adults (orthodiagram in erect posture) varies from 10 to 12.5 cm. according to body-weight, but in any given weight group the maximum and minimum values may differ by several centimetres. The transverse diameter has a limited use to express the full width of the heart shadow in a given patient, and for

comparative measurement in the same patient. Similarly the cardiothoracic ratio—the ratio between the transverse diameter of the heart and the internal diameter of the chest at its base—does often approximate to a figure of 50 per cent. in health, but it is unsafe as a guide to whether a heart is slightly enlarged or not.

The investigations of Bedford and Treadgold<sup>9</sup> in this country and of Eyster and others in America have shown that the cardiac transverse diameter can be more closely correlated with bodily size if height as well as weight is taken into account. The tables constructed by Hodges and Eyster<sup>47</sup> for predicting transverse diameter (or area) from weight and height probably represent the most scientific method of deciding the physiological mean heart size for any given person. Attempts have even been made to estimate the cardiac volume from measurements made in two planes, and Rohrer's method<sup>90</sup> as confirmed and amplified by Kahlstorf<sup>53</sup> appears to give reasonably accurate results.

Cardiometry is so complicated, and so full of pitfalls, that it is scarcely adapted to routine clinical use, though it will always be needed for comparative measurements in the same person and for research purposes. Meanwhile one can form a sound opinion of heart size from simple screen examination without measurements, for radioscopy has the advantage of permitting inspection of the heart from every angle, and estimation by the eye of its size in various planes.

#### The Position of the Heart and its Displacement

The position of the normal heart in the chest varies within wide limits. In general it is expected that about one-third of the projected cardiac area lies to the right of the midline of the body, and two-thirds to the left of it. The heart is moored at its base by the great vessels entering and leaving it—i.e., by the venous mesocardium and the arterial mesocardium (Keith). This fact is well appreciated when the pericardium is opened and the hand grips and moves the heart about on the universal joint formed by the vascular attachments, especially the pulmonary veins, which have to be severed before greater movement is possible. Section of the aorta, venæ cavæ, and pulmonary artery then allows complete excision of the heart. This fixation especially to the pulmonary vessels reminds us of Keith's dictum that "the lungs in all their movements carry their pump with them"<sup>55</sup> Further, that other respiratory organ, the diaphragm, is seen to be of prime importance in deciding the lie of the heart. The axis of the heart may be found at almost any angle between horizontal and vertical. The right ventricle rests lightly on the diaphragm, and the distended lungs keep the heart in place. Any change in position of the heart with respiration has a profound effect on the projected outline of the heart as seen by radioscopy. The heart is no simple geometrical figure, but an irregular cone with its apex passing forwards and downwards to the left. It is this complicated solid, of which we see by radioscopy a silhouette—a section at its greatest diameter in the coronal plane. No wonder there are such variations in the size and shape of the projected outline; indeed, their extent has provoked a certain pessimism in those ambitious for precision in the measurement of an organ so visually accessible as the heart.

The diaphragm appears to be the greatest factor in deciding the position of the heart in health (Fig. 1). The short stout individual with a short wide chest and high diaphragm has a heart tilted upwards and

to the left; the tall thin individual with a long narrow chest and a low diaphragm has a heart swung in towards the middle line. The heart of the one looks large and horizontal; of the other small and vertical. Rotation of the heart on its own axis may also be operative, certainly it can be in mitral stenosis. Consideration of the big difference between the position, shape, and apparent size of the heart in deep inspiration and in expiration will leave no doubt that a substantial variation in shape and apparent size is to be expected in health.<sup>28</sup> There are also distinct differences between records obtained with the subject in the horizontal and in the vertical position, again dependent partly upon the diaphragm; but observations are now usually made with the patient

the heart because the apex-beat is noticeable and about the nipple line or even a trifle beyond. Almost every doctor is aware how important it is to settle the question, for a cardiac defect in youth has greater significance than in the old. The suspicion this apex-beat arouses has been mentioned by Sir Thomas Lewis.<sup>70</sup> It is generally the only doubtful sign, and if there have been symptoms they have been trifling or incidental. The pulmonary second sound may be accentuated, probably from displacement, but murmurs are absent.

For some years I was worried about such an obtusive apex-beat until I happened to notice that these children had often a slight scoliosis of the common type, that is with dorsal convexity to the

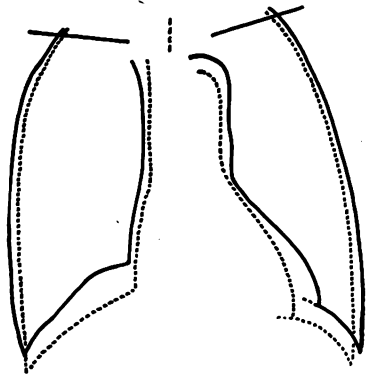


FIG. 1.—Displacement of heart upwards and to the left. Pregnancy, ninth month (continuous line); two months later (dotted line).

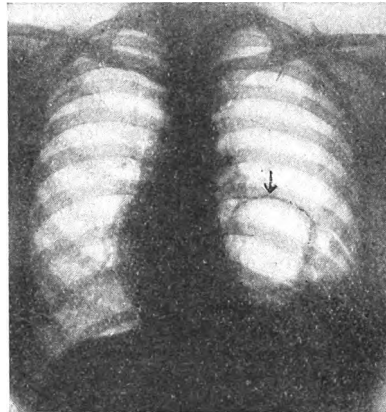


FIG. 2.—Displacement of heart to right by high position (eventration) of the diaphragm.

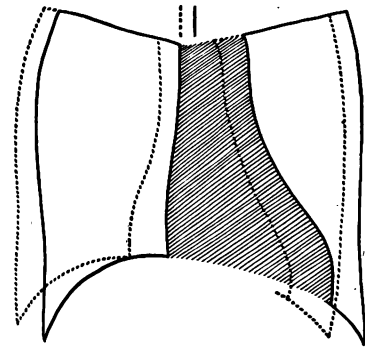


FIG. 3.—Displacement of heart to the left by right dorsal scoliosis (shaded portion). Corrected by rotation 10° to the right (dotted line).

standing or sitting, and rightly so for the comfort of a cardiac patient.

In children the diaphragm is relatively high, and the heart looks proportionately large and rounded in a relatively small chest. The manubrio-xiphoid junction is a useful guide to the natural level of the top of the diaphragm in the neutral phase.<sup>6</sup>

The diaphragm is placed high whenever there is undue distension of the abdomen as in obesity or ascites. Then with gas inflating the stomach or colon, it is especially the left dome of the diaphragm which rises like a recording gauge as it carries with it the heart. The usual displacement is upwards and outwards so that the heart seems larger. A less usual displacement, towards the right side, may be produced by a large diaphragmatic hernia. Different in pathology, and less rare, is the eventration or high position (or elevation) of the left dome of the diaphragm which is encountered now and then on routine radiology of the heart. The dome is not broken, and it moves with respiration (and not always badly), but the differentiation from unilateral paralysis or even from true hernia of the diaphragm may require all the technical skill of a radiologist. I have seen this condition with cardiac displacement to the right (Fig. 2), with and without symptoms. As in the common condition of a normal diaphragm with much gas in stomach or colon below it, I find the patient, strangely enough, often denying any knowledge of what flatulence or palpitation may be.

#### Slight Scoliosis a Common Source of Apparent Enlargement

It is a common experience to find that a school child is suspected of having slight enlargement of

right. It was first noticed on radiology, for the heart lies a trifle too far to the left so that perhaps four-fifths of the cardiac shadow instead of two-thirds lies on the left of the midline. Confirmation was obtained by rotating the subject a few degrees to the right when the heart appeared much as one would expect in health, placed normally as regards the middle of the chest, and not at all enlarged (Figs. 3 and 4). In other words, this positional correction removed an illusion of disease. Other features of the uncorrected position are slight accentuation of the aortic knuckle, of the pulmonary arc, as well as of the left ventricle, the three constituents of the left border. When this cause for a displaced apex-beat is suspected, and it should be when the cardiac history is negative and it is the only sign, recourse to radiology will show the appearances here described and examination of the back a slight scoliosis. Owing to rotation of the vertebræ the line of the bodies is more deformed than the line of the spinous processes, so that X rays show the condition to be worse than one would expect from inspection of the back.

Now the radiological changes in the heart from considerable scoliosis have often been described, but it seems to me more important to draw attention to these minor grades which, I am convinced, often explain an erroneous diagnosis of slight enlargement in children of school age. Once recognised as a unimportant and trivial displacement, no further attention need be drawn to the heart in these young subjects; and the school medical officer, nowadays so rightly unwilling to stop games without good reason, can accept this assurance.

In the past it has often happened that this deceptive apex-beat has been attributed to real enlargement



indicating a cardiac lesion, and the stigma has followed a healthy subject perhaps for a lifetime.

Fifty years ago, a young Irish doctor joined the Navy just escaping rejection as the apex-beat was a little out of place. Subsequently doctors used to assign him an hypertrophied or a dilated heart. To-day this man is aged 73 and plays golf without symptoms. The apex-beat is still noticeable, but X rays show a spinal curve to the right and a slight displacement of the heart to the left without enlargement. A glance at the patient's back shows moderate scoliosis with dorsal convexity to the right.

Positional changes of the heart in high grades of scoliosis are known, but not, perhaps, sufficiently

for the acute infarct-pericarditis in healing may initiate a chronic adhesive pericarditis; and 6.2 per cent. of Smith and Willius's<sup>104</sup> cases of adherent pericarditis were ascribed to this.<sup>79</sup>

There appears to be no cardiac enlargement from uncomplicated adhesive pericarditis and when found it is referable to the associated cardiac disease. Calcification of some degree is found post mortem in a certain proportion (about 10 per cent.) of cases of adhesive pericarditis and is considered later.

(2) *Constrictive pericarditis*.—Chronic adhesive pericarditis may cause a constriction of the heart, especially affecting the auricles and, most important

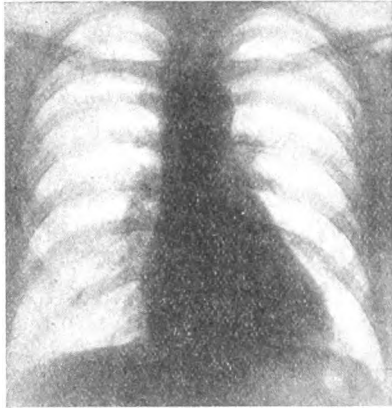


FIG. 4.—Common displacement of heart from slight scoliosis often leading to suspicion of cardiac enlargement.

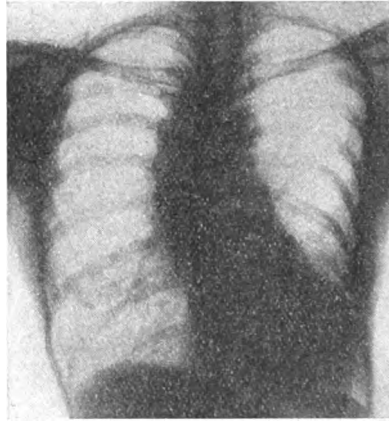


FIG. 5.—Considerable displacement of heart from scoliosis; apex in left axilla. Superficial resemblance of dorsal curvature to an aneurysm.

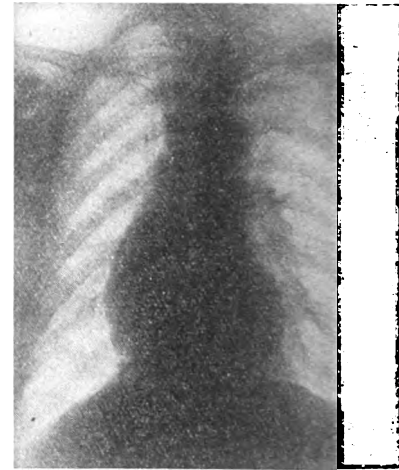


FIG. 6.—Displacement of heart to the right—a partial dextrocardia—from scoliosis of the rarer type—i.e., left dorsal convexity.

well known.<sup>98</sup> It was very difficult to credit with a sound heart a woman of 56 showing the X ray picture reproduced in Fig. 5, but her freedom from symptoms and any other sign and a complete investigation in hospital proved that actually she had.

Scoliotic displacement of the heart to the *right* has not the same clinical interest because it is produced by the rarer type of scoliosis, that with dorsal convexity to the left, and because it will scarcely be discovered except by radiology. None the less it is a real source of displacement; and in a recent case it was so pronounced that I took it for an acquired dextrocardia which, in a sense, it was (Fig. 6).

A similar instance, though less pronounced, was a man of 26 who, in 1916, was examined at the Heart Hospital and was rejected for the war because X rays showed the heart displaced to the right as I have been able to confirm from the original notes. This year, twenty years later, I examined him for an illness unrelated to cardiac enlargement, and found that he still showed that cardiac displacement which had for its cause a scoliosis with dorsal convexity to the left.

#### Adherent Pericardium

Four forms of adherent pericardium may be considered.

(1) *Adhesive pericarditis* (non-constrictive).—Obliteration of the sac, partial or complete, is often symptomless and no more than a chance post-mortem finding. In fewer than half the cases so discovered is there any associated cardiac disease.<sup>104</sup> Among these must nowadays be included coronary thrombosis,

of all, the superior and inferior venæ cavæ. Constrictive can only be fairly applied to the chronic process, for although there must be a compressive factor in gross pericardial effusion, the other factors—infected and myocardial—sufficiently obtrude to mask it. The result of chronic constriction is no ordinary heart disease, enlargement, or failure, though from such it has to be distinguished, but a special group of symptoms and signs which were clearly presented to us in London last year by Dr. Paul White in his St. Cyres lecture on chronic constrictive pericarditis (Pick's disease) treated by pericardial resection<sup>116</sup> which was so much appreciated in this country. He said that heart disease itself is a rare association, and that rheumatism has so little a place in its aetiology that the presence of mitral stenosis excludes it. It is a state of *congestion without cardiac failure*. A mechanical obstructive problem, one affecting the inflow of blood to the heart, requires surgical treatment (true cardiolysis, not mere thoracotomy); and further successes as those he already describes would go far to confirm the pathology. No doubt there are mixed cases, where the myocardium is also affected; for example, auricular fibrillation was present in 4 of his 15 cases, and 6 of 17 cases collected by Schur<sup>95</sup> from a different standpoint. The need for strict choice of patients likely to benefit from surgery is apparent, though White says that "the commonly expressed fear that constricting adhesions once removed may reform has proved entirely groundless."

Of his 15 cases, the heart shadow on X ray examination was normal in size in 7, slightly enlarged in 5,



and moderately enlarged in 3 only. As stated, none had mitral stenosis, and of three patients with enlargement of the left auricle (X ray) two had auricular fibrillation. It is because too much attention has been directed to alleged pathognomonic but uncertain signs and too little to the total clinical picture, that the condition has so seldom been recognised.<sup>112</sup>

(3) *Calcified pericardium*.—Although formerly looked upon as a distinct rarity, calcification of the pericardium is more frequent and diagnostically more important than was thought. It was found in 10.4 per cent. of Smith and Willius's series<sup>104</sup> of adherent pericardium, and in 10 per cent. of William Evans's series which is to be mentioned later. It is important because it can now so readily be seen in life with X rays, and because its presence affords a proof of adhesive pericarditis as certain as one could wish. It can be missed on radioscapy or on routine films, but with appropriate technique it can be made obvious either in the anterior or oblique positions.

Yet calcification per se, this conclusive evidence of considerable and long-standing adhesive pericarditis, is commonly found to produce no symptoms of cardiac inadequacy and no enlargement, or no more than could be explained by the superimposition of a much thickened pericardium. I was first impressed by these facts in meeting Vilvandré's patient<sup>111</sup> who was a good walker and free from any but her gastric symptoms.

On the other hand, constrictive pericarditis which is producing symptoms is also often accompanied by calcification as would be expected. It was present, for instance, in 6 of White's 15 cases.

In 1920 I admitted to the cardiac department of the London Hospital a man of 25 who complained of epigastric fullness and was found to have slight enlargement of the liver and a palpable spleen. At that time no cause was found for these signs and he went to live in Canada and did not return until 1930, ten years later, when I saw him suffering from dyspnoea and oedema with enlargement of the liver and spleen as before, but more pronounced. Fortunately on screening I saw the dense shadows of a calcified pericardium (Fig. 7). From 1930 to 1932 he had persistent ascites and oedema though salyrgan often gave him relief. He died in 1932 and Dr. Evan Bedford procured a necropsy. The heart was scarcely enlarged and a thick shell of calcification enclosed it. This was probably a case which earlier in its course might have been considered suitable for cardiolysis on the lines discussed by White.<sup>116</sup>

(4) *Mediastino-pericarditis*.—In my time, a candidate for a final medical examination asked for the causes of greatest cardiac enlargement was expected to reply aortic stenosis, aortic incompetence, and adherent pericardium. It was understood that with the last, external adhesions (mediastino-pericarditis) might be necessary. I do not know how it is to-day, but I could not now agree with this answer. It is now certain that adherent pericardium is seldom a cause for enlargement at all, even if so complete and considerable as to be calcified. External adhesions of any moment are so rare that they are unworthy of the attention they have curiously attracted in the past. As Wenckebach<sup>114</sup> showed, they may disturb respiration as much as they hamper the heart. In Smith and Willius's series, among 8912 necropsies were 144 cases of adherent pericardium. Among them 12 showed fairly extensive adhesions to surrounding structures, and of these, only 3 were uncomplicated—i.e., unassociated with valvular or other heart disease.

Dr. William Evans has kindly abstracted for me

figures on the incidence of adherent pericardium as a cause of cardiac enlargement from the records of the pathological department of the London Hospital by courtesy of Prof. H. M. Turnbull.

In a series of 10,000 consecutive necropsies in which the heart was examined, fibrous adhesions between the visceral and parietal layers of the pericardium had obliterated the pericardial space in 83 cases. Calcification of the pericardium was present in 8 of these, but it was only a prominent feature in 2, while in the remaining 6 it was present as scattered plaques. Extrapericardial adhesions were only described once, and even in this instance they were not extensive. Although it is unlikely that extrapericardial adhesions were absent in each of the other 82 cases, it is improbable that they formed a noticeable feature in any.

Attention was paid to the weight of the heart and to the condition of the valves and heart chambers. If the weight exceeded 12 oz. in the female or 13 oz. in the male, or if hypertrophy of the heart chambers had been described at necropsy, cardiac enlargement was assumed to be present.

In 34 of the 83 cases the heart showed no abnormality; it was not enlarged and the valves were healthy. Cardiac enlargement of varying extent was present in the remaining 49 cases. In 3 of these, enlargement of the right ventricle had followed chronic lung disease, and in another 3 the left ventricle was enlarged from hypertension. In the remaining 43 cases, rheumatic valvular disease involving the mitral, aortic, and often the tricuspid valves, accounted for the presence of cardiac hypertrophy both in its extent and distribution. In each individual case Dr. Evans formed the opinion that the cardiac hypertrophy was wholly due to the valvular lesion and that the presence of adhesive pericarditis was in no wise a contributory factor.

Whenever considerable or gross enlargement of the heart has been found on clinical examination without causal hypertension or aortic incompetence, we have in the past too readily attributed it to adherent pericardium. We have entertained the diagnosis of adherent pericardium too often, and of grossly enlarged auricles with fibrillation too seldom; though the frequency with which aortic valvular disease is a participant or sufficient cause of cardiac enlargement has not been exaggerated. When a high grade of mitral stenosis is present, and auricular fibrillation supervenes, the collapsing pulse and the diastolic murmur of aortic incompetence frequently disappear. It seems to me likely that some of the cases, now increasingly reported, of aneurysmal dilatation of the left auricle in mitral stenosis may have erroneously been ascribed to concurrent adhesions. Crighton Bramwell<sup>17</sup> noted and tabulated the incidence of pericardial adhesions in reported cases of aneurysmal dilatation of the left auricle, but examined and rejected the evidence that they are an important factor in determining it.

#### Dilatation of the Heart

Acute dilatation has gradually lost its original significance in a clinical sense, and is now a superfluous term in so far that it is never now maintained that heart failure is due to acute dilatation or synonymous with it. It should be strictly dissociated from any clinical features, whether symptoms or signs, which have been supposed to indicate or coincide with it. It will be an excellent thing if we abandon even in our terminology the idea that clinically the heart can dilate like a balloon in a few minutes or a few hours and thereby induce an abrupt and grave attack akin to heart failure. There is no reason why a sinister meaning should be attached to a change in size; and to reach any agreed and profitable conception, size must be clearly separated

from symptoms. Once "acute dilatation" is out of the way as a clinical term, we may proceed to inquire whether as a simple fact the heart is capable of acute dilatation or acute distension, or, as we might almost now say, rapid enlargement. Admittedly, the heart, even the healthy heart, can and often does dilate. Thus after an extrasystole which fails to eject the usual amount of blood from the ventricle, the heart is overfilled and dilates so much that by radioscopy it can be seen to halt and then to swell. This accounts for the large volume of the returning or subsequent radial beat. Another example of the possibility of dilatation is Müller's experiment where at the end of normal expiration the breath is held and an extreme effort is made to inspire against obstruction. This increases the negative intrapleural pressure with a resultant temporary "acute dilatation" though a harmless one, and it can be confirmed by teleradiogram.<sup>26</sup> Apart from such almost physiological but rapid changes in the heart volume, the question has been definitely raised,<sup>48</sup> is there such a thing as an acute temporary dilatation of the normal heart? Without attempting a full answer, we may consider certain cognate subjects bearing upon it.

(1) "Acute dilatation" from a particular act of exertion appeals more to the lay than to the medical mind. Medical opinion is now firmly opposed to the idea that the healthy heart in a healthy man can be injured by physical strain. Many have been keenly watching, as Mackenzie did but without success, for a patient with a disability acquired solely in this way. Usually, the alleged cause is trivial or impossible; often symptoms began some hours (even a day or so) after the exertion which is blamed; though, as Mackenzie used to say, the heart does not remember. There is remarkable agreement that the heart is often a trifle smaller (or at least narrower) after exercise than before. To take an example, McCrea, Eyster, and Meek,<sup>77</sup> spared no pains in the care with which they recorded the effect of exercise on diastolic heart size, and concluded that such variation as the heart undergoes during exertion is slight, that its size may remain unchanged or increase or decrease slightly. It is evident that there may be temporary adjustments; but the immediate effect of exercise on the heart's volume is insignificant, and this applies even where the test exercise has been extreme and prolonged.

Leaving the question of the immediate effect, it might be that the effect of prolonged and recurrent exertion would be to produce enlargement of the heart. Here we have at our disposal in the literature regular series of direct observations made upon athletes which have appeared in various countries, in this country by Crighton Bramwell and Ellis.<sup>18</sup> The heart of an athlete may be somewhat larger than the average in relation to body-weight in particular forms of sport of which swimming, wrestling, and cycling may be mentioned. Such enlargement is not to be regarded as abnormal, rather may it be counted supernormal, as, for instance, in successful Marathon runners.

The ultimate effects of persistent devotion to athletics is a matter of perhaps even greater interest. The crews of the first twenty-four Oxford and Cambridge boat races up to 1869 were followed up by Morgan, and he found that there was little appreciable difference in the mortality from heart disease among them when compared with men of a corresponding age.<sup>82</sup> So far as I know, no one has published any satisfying series of soldiers proved to have permanent cardiac injury as a result of physical strain

in war. The "soldier's heart" was not enlarged, though the accompanying tachycardia often gave the illusive impression of enlargement at the apex-beat.

(2) *Paroxysmal tachycardia* has often been cited as a good example of acute dilatation, or, as we had better say, rapid enlargement of the heart. It is nature's own experiment not only on cardiac enlargement, but on pure myocardial failure; and it was partly from his observations on the failure resulting from prolonged tachycardia that Mackenzie disliked the idea of back pressure as it used to be taught. In most subjects the heart is sound, but liable to sudden bouts of extreme tachycardia. Although it has been said that enlargement quickly occurs—e.g., some hours after an attack begins—I have been unable to confirm this in a few such cases examined by X ray. Yet there is no doubt that with persistence of a paroxysm there may be enlargement of the heart with evidence of cardiac failure in all its stages. The earlier observations of Dietlen<sup>29</sup> and others<sup>67</sup> have been fully confirmed. Some time ago I had the opportunity of watching the development of enlargement in a patient whose attack lasted under observation for 21 days. By that time there was some enlargement, though not extreme, but the cardiac silhouette was obscured by pulmonary congestion and small bilateral hydrothorax.

Similar conclusions apply also to paroxysms of, or the onset of, auricular fibrillation and flutter. I have not recorded any rapid enlargement within a few hours or even days of the onset in cases I have observed. As the condition begins to derange the circulation, then we begin to see the effect on size also. It is rather the length of time taken to produce demonstrable enlargement than the rapidity with which it occurs that has impressed me (Fig. 8); see also.<sup>39</sup> It can easily be shown that the enlargement of the left auricle in mitral stenosis is not a sudden occurrence, for it can be followed in its gradual enlargement over years (Fig. 9).

(3) The rapidity of the enlargement which may take place in the course of acute *cardiac rheumatism* is of perennial interest and importance, though its degree and frequency are far from being known. Confusion with a pericardial exudate aside, the part played by a previous attack and early mitral stenosis is always difficult to exclude or appraise when judging enlargement from myocarditis alone. Thus cases become important which are proved post mortem to have no endocarditis although they have died from severe carditis.

Such have been collected and discussed by Garber,<sup>41</sup> who found in the literature 17 cases in which the diagnosis of rheumatic carditis was found at autopsy and in which apparently all the heart valves were free from endocarditis. He adds an additional case, and another has recently been reported in an interesting paper by Bland, Paul White, and Duckett Jones.<sup>14</sup> Incidentally, these workers also discuss the occurrence of a mid-diastolic murmur at the apex in rheumatic cases where mitral stenosis was absent and where the cause of it could only be ventricular dilatation. The mitral valve in Bach and Keith's important case<sup>4</sup> was not stenosed, yet the left auricle was very large.

No one can doubt the rarity of this rheumatic carditis without endocarditis, so the original problem remains: how to exclude the effects of previous valvulitis or active valvular disease in deciding the presence of rapid enlargement during an attack of rheumatism. As indicated, percussion and the position of the apex-beat under these circumstances afford uncertain evidence. What is required is radiographic evidence that the average patient in a first

attack of rheumatism with the heart affected does, in fact, show early enlargement from acute myocarditis. That evidence appears to be still wanting, and until it is forthcoming we must be content with the clinical data which are adequate for the purpose of a relevant diagnosis.

Many other infections besides rheumatism have been said to cause acute cardiac dilatation, but generally the statement has been founded on a combination of unreliable physical signs in the presence of a heavy infection. But radiological studies have not yet shown that in these various infections, such as pneumonia and diphtheria, actual

upon the height of the diaphragm, and in failure it is a real bar to a ready judgment on increase or decrease in size. Probably it is the chief factor in producing that outward displacement and recession of the apex-beat which as students we had to watch in the course of failure and recovery. No longer can this apex-positioning be accepted as clinical proof of enlargement. Again, the frequency of hydrothorax in failure is scarcely appreciated until such patients are examined radiologically by routine when they come to hospital in failure; indeed hydrothorax may have a profound effect upon the apparent size of the heart or may swamp the heart almost completely.

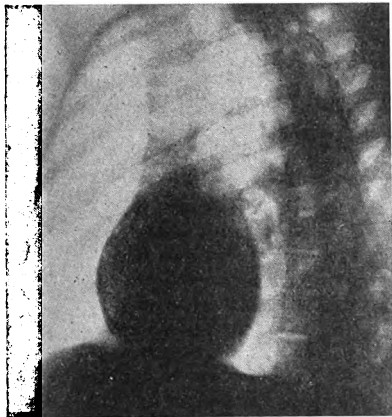


FIG. 7.—Calcification of pericardium. Left (II) oblique position.

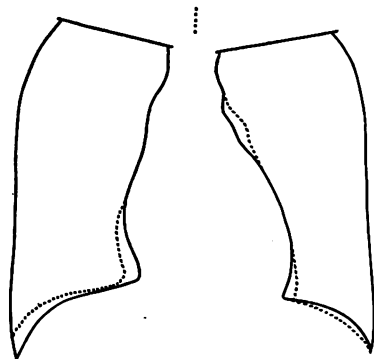


FIG. 8.—Mitral stenosis. Outline of telerradiogram, anterior view. Dotted line: five years later and after auricular fibrillation for one year.

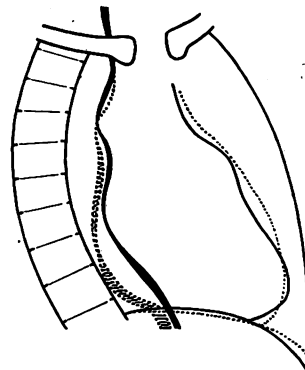


FIG. 9.—Mitral stenosis. Outline of telerradiogram, right (I) oblique position. Barium in oesophagus shows slight enlargement of left auricle (continuous line), and greater enlargement five years later (dotted line). Same patient as Fig. 8.

dilatation of the heart occurs in any material proportion. In pneumonia we are fortunate in having the results of a recent detailed study by radiological means in the work of Davies, Hodgson, and Whitby,<sup>27</sup> carried out with the support of the Royal College of Physicians. They kept close watch for changes in the heart, but in the whole series of 119 cases found only 3 patients in whom there was any definite change in its size. In these 3 cases, too, there were no clinical symptoms suggestive of cardiac disability, and all had a relative bradycardia. It is unnecessary to view such a bradycardia as an indication of a myocardial defect as it is too common a finding in normal convalescence, both from infections and from parturition, indeed many have looked upon it as a favourable sign. Besides, bradycardia itself is a sufficient cause for a slight increase in heart size as Rösler<sup>28</sup> confirmed.

(4) The remaining condition which has to be considered from this standpoint of rapid enlargement is that which may occur with acute *congestive heart failure*. At once I must admit that even with radiological aid it is no easy matter to decide. The first difficulty is that it is so rare for a heart of normal size to fail at all, though Nemet and Gross<sup>24</sup> found that out of 89 cases of failure there were 3 in which the heart post mortem was found to be free of hypertrophy—i.e., of normal weight, which is of course not the same thing as normal volume. We must assume, therefore, that the heart in failure is enlarged. The other great difficulty is the fact—which is not yet sufficiently realised—that one of the early effects of failure is raising of the diaphragm from hepatic and other abdominal distension inseparable apparently from failure of this kind. We have seen how much the position and apparent size of the heart depend

Friedman and Strauss<sup>40</sup> studied 21 cases of cardiac failure by X ray methods during recovery and found that there was no change in size in 35 per cent., a decrease in all diameters in 35 per cent., and a decrease in one border only, generally the right, in 30 per cent.

For some years Dr. Bedford and I have collected from time to time orthodiagrams or telerradiograms of patients before and during failure, or during failure and afterwards, to see what happens to the heart size, and we have found nothing to support the old notion that anything in the nature of an acute dilatation occurs with ordinary heart failure. The difficulties have been indicated, but we are satisfied that rapid change in size is always slight if it can be demonstrated at all. With the clinical sign of venous engorgement in the neck, one would expect to find by X ray distension of the superior vena cava and of the right auricle, and this is probably the main alteration which does take place in the outline of the heart in simple failure. This is but a fragmentary statement about the radiology of heart failure where pulmonary congestion often dominates the situation. Such enlargement of the heart as does occur in failure is mostly from congestion, producing the so-called mitralisation of the heart. In failure there is change in shape and position rather than change in size (Figs. 10 and 11).

### Hypertrophy

It will be evident that I am not so placed that I can with any profit to you inquire far into the physiological and pathological theories and views about hypertrophy and the mechanism of its production. The opinion which has prevailed and still prevails is that hypertrophy is a response to increased demand—

a work-hypertrophy. Starling showed that dilatation is an essential physiological adjustment to increased work. Hypertrophy may then follow to meet a persistent demand on the heart.

From time to time other causes are advanced, and Sir Thomas Lewis,<sup>69</sup> from his early but unsurpassed examination of the relative weights of the ventricles, formed the opinion that mechanical factors are by

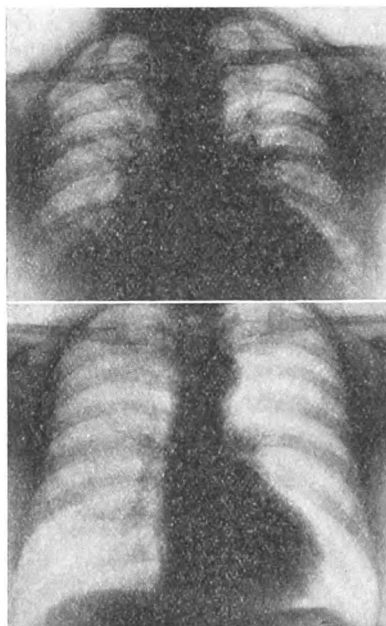


FIG. 10 (above).—Hypertension. Congestive failure. Note raised diaphragm, horizontal heart, congestion of hilar vessels.

FIG. 11.—Same patient. Recovery from congestive failure. Note descent of diaphragm, more vertical heart, absence of hilar congestion.

no means the only important causes of hypertrophy; and Cotton's work<sup>25</sup> supported it. Toxic substances are said directly to stimulate the heart muscle-fibres to hypertrophy,<sup>105 106 86</sup> and prolonged thyroid feeding to lead to hypertrophy.<sup>118</sup> Lewis and Drury,<sup>71</sup> from their observations on arteriovenous aneurysm and the enlargement of the heart which accompanies it, suggested that diminished coronary flow and under-nutrition might be the cause of enlargement,

not only in that condition, but also in others such as severe anæmia and narrowed coronaries. Some experimental support for this attitude has been produced.<sup>100</sup> Wiggers<sup>117</sup> feels that there is no evidence that changes in quality or quantity of blood-supply, or the presence of toxic or infectious agents, can themselves induce muscle growth, but probably do so by disturbing function and leading to increased diastolic length. This hæmic or toxic origin of hypertrophy is not merely of academic interest, for it has recently gained prominence among those interested in the question of cardiac hypertrophy in coronary lesions. Willius and Smith<sup>119</sup> examined the hypotheses and favour that of increased work, as do Nemet and Gross.<sup>84</sup>

Assuming that for the most part hypertrophy is a response to increased work, let us see where the change in muscle mass or bulk occurs to meet the demand. Karsner and his co-workers<sup>54</sup> confirm by accurate study the belief that it is due probably to hypertrophy of the individual muscle-fibres without an increase in the number of fibres. All fibres tend to approximate to the larger size, and they suggest that when all or nearly all the fibres have attained the maximum, further hypertrophy or compensatory development is impossible. This raises the pertinent question of what else does or can limit the response by hypertrophy. It has been said that a limited blood-supply may do so (but see Lewis and Drury<sup>71</sup>); Russow<sup>84</sup> says that undoubtedly the

supervention of functional disabilities such as auricular fibrillation may so act.

In a clinical sense, hypertrophy is a life-saving and beneficial process; almost one might say that the heart enlarges as it ought to do under adverse circumstances. A good example of physiological hypertrophy is the increase in the relative size of the left ventricle after birth, for the child is born with right and left ventricles of the same wall thickness. The blacksmith's arm and the athlete's heart are admirable examples of purposive adjustments.

When the weight of the heart exceeds about 300 g. in a man and 250 g. in a woman, the limits of normality are approached. Ready figures in use in England as a limit of normal weight would be 11 oz. (or 330 g.) in men and 10 oz. (300 g.) in women. Weighing of the ventricles of the heart separately<sup>69</sup> and exacter measures of the size of the auricles will be needed as a regular pathological routine if radiological findings in life are in future to be properly correlated at death. Of course, weight is easier to estimate than volume if only because of post-mortem changes, but volume mensuration would be invaluable. Paul White<sup>115</sup> has made some trenchant remarks on the limited value of post-mortem tables of heart weights which are so often the end-results of completed disease.

Although under favourable circumstances one might regard hypertrophy as a responsive strengthening of the heart, as e.g., in the overloading of hypertension, yet in practice this is seldom true, and for two reasons: first, associated disease in the coronary arteries with consequent lesions of the myocardium, old or recent or both; second, the persistence or increase of the peripheral obstruction which initiated the enlargement.

#### THE INFLOW AND OUTFLOW TRACTS IN CARDIAC DILATATION AND HYPERTROPHY

In 1930 Kirch<sup>58</sup> published a full statement of his findings and views upon ventricular hypertrophy, and in 1934<sup>59</sup> he published some further observations and reference to experimental work in support. His earlier papers on the subject may also be consulted.<sup>60 61</sup>

His researches were conducted by exact weighing of the separate chambers and septa of hypertrophied hearts by Müller's method, and also by linear measurements of the chambers. By these means facts were assembled not only on the weight, but on the volumes of the chambers, the ventricles in particular. Apart from normal controls, the hearts of patients with non-valvular heart disease alone were studied, mostly pulmonary heart disease (for right ventricle) and hypertension (for left ventricle). He found that, taking a single ventricle, the process of dilatation (and hypertrophy) always began in a particular portion of it, and only later was the rest of the ventricle implicated. So he distinguished in each ventricle two separate functional portions, and called them the inflow and the outflow tracts.

Taking the right ventricle, which illustrates his views best and has been most fully worked out, the inflow tract extends from the tricuspid orifice to the apex and comprises the posterior wall of the right ventricle and septum adjoining. The outflow tract extends from the apex to the pulmonary orifice and comprises the anterior wall of the right ventricle and adjoining septum. Every dilatation (and hypertrophy) begins in the outflow tract and is characterised by lengthening of the outflow moiety of the ventricle. This lengthening of the anterior portion of the right ventricle is betrayed by prominence of the conus—i.e., the far end of the outflow tract. There is also some favorotation of the heart on its long axis.

When the inflow tract is affected, and it is never affected until later when the outflow tract has acquired its characteristic change, it is a widening or broadening of the inflow portion of the ventricle which occurs. In other words, late stages of hypertrophy and dilatation of the right ventricle involve the posterior and apical portions, and the ventricle broadens. It is only with the supervention of chronic congestive failure that the right auricle and eventually the left ventricle will show consequent change.

These principles are applicable also to dilatation and hypertrophy of the left ventricle, where lengthening of the outflow tract with early change in the sub-aortic region is described, though it is less easily demonstrated than in the right ventricle.

It will be a long time before these detailed studies find their correct place in pathology, though they seem important and likely to stimulate progress. It is doubtful, however, whether Kirch is right in trying to adjust Moritz's "tonogenic" and "myogenic" conceptions to these pathological findings of an outflow and an inflow tract. From a radiological standpoint, they do seem to explain in fair measure the changes we have found—e.g., in emphysema. The bearing of Kirch's research on radiocardiology has already been noticed by certain workers, Kudisch<sup>64</sup> Zdzansky,<sup>120</sup> and especially Nemet and Schwedel.<sup>65</sup>

In my next lecture I hope to speak on clinical enlargement chiefly as it affects the separate chambers of the heart.

## THE TREATMENT OF ANORECTAL WOUNDS\*

BY W. B. GABRIEL, M.S. Lond., F.R.C.S. Eng.

SURGEON TO ST. MARK'S HOSPITAL AND THE ROYAL NORTHERN HOSPITAL, LONDON

In the surgery of the lower rectum and anal canal difficulties have to be contended with which render primary suture of wounds unusually liable to failure. The difficulty in sterilising the anal skin, the risk of subsequent faecal contamination, the movements of the sphincter, and the poor vascularity of the subcutaneous tissues all tend to spoil the results of aseptic surgery. In practice it is seldom advisable to attempt primary suture of wounds in the anal region unless they fall short of the anal margin and the anal canal. The commonest indications for primary suture occur after excision of the coccyx for cure of coccydynia, and excision of postanal dermoid fistulæ.

A great saving of time is effected by a successful suture of these wounds when compared with the time taken for healing by granulation; dermoid fistulæ are suitable for excision and suture if they are free from active suppuration and if the sinuses are in the middle line. In suturing these wounds a few deep sutures must be placed with the object of obliterating the depth of the wound, and are tied over a roll of gauze after suturing the skin with interrupted mattress sutures. Buried catgut ligatures should be avoided, any hæmorrhage being stopped by forcipressure or twisting. A firm dressing is applied over the anchored dressing and is kept in position by transverse strips of Elastoplast. The bowels are subsequently kept confined for six or seven days and the sutures are removed between the sixth and eighth day in order to prevent them

cutting through and producing stitch sinuses. A recent case has been that of a man aged 26 with a dermoid fistula presenting three or four sinuses. It was excised and sutured; the wound healed by primary union, and he was discharged from hospital on the fifteenth post-operative day. Healing by granulation would have taken at least five weeks.

I have found by experience that primary suture is not likely to be successful if secondary openings have formed at a little distance left or right of the middle line; in these cases so much skin must be excised in order to remove the lesion completely that the wound cannot be sutured except under tension, and it invariably breaks down.

Primary suture is also required in the treatment of certain tumours in this region. Anal lipomata are suitable for enucleation and suture of the resulting wounds. I have excised a sacrococcygeal chordoma the size of an orange, and the resulting deep wound was closed by primary suture over an anchored dressing; it healed cleanly.

In operations for anal fistulæ primary suture is now seldom attempted. The only type for which suture could be contemplated is the short direct fistula; this usually arises in the anal canal and after primary suture there is a considerable risk of infection and breaking down at the anal extremity of the wound; if this takes place the patient is left with an ulcer at the anal margin which is unlikely to heal until it is drained externally. In order to save the disappointment and delay of such a setback the method of incision and laying open of fistulæ is now universally adopted.

### HEALING OF ANAL WOUNDS

Healing by granulation is the only certain method of obtaining sound healing of wounds extending into the anal canal. In order to procure consistently good results in this region of the body the surgeon must set out deliberately to leave open wounds of such a shape and size that healing by granulation will take place, and he must be prepared to organise and supervise the after-treatment with this end in view. An anal wound cannot be considered to be finished from a surgical point of view until it is healed and has been proved to be capable of withstanding the ordinary stress and strain of active life.

A wound in the anal canal must be drained externally, and if the resulting wound be considered to be partly internal—i.e., that part which is within the grasp of the sphincter muscles—and partly external, it is invariably found that the internal part heals more slowly than the external part. This is particularly true of wounds in the middle line, whether anterior or posterior to the anus, and is due partly to the squeezing up effect of the external sphincter which tends to prevent proper drainage of the anal extremity of the wound, and partly to the increased tendency of the soft parts externally to fall together.

Drainage of an anal wound is made effective by *cutting away skin* and this is really the basis of all rectal operations. The anal skin is very lax; it is liable to become swollen either from œdema or from underlying congestion or thrombosis of the anal veins, and with experience one learns that excision of a certain amount of skin is essential for maintaining drainage, and it is also one of the best ways for sparing the patient post-operative pain.

In order to provide more adequate external drainage than would be given by a linear or oval wound, which would require plugging to keep it open, it is customary to aim at leaving a racket-shaped or

\* Address given to the Manchester Surgical Society on Jan. 21st.



triangular wound, the broadest part of the wound being external to the anal margin. This principle of excising skin is applied with advantage in almost every anal operation; its greatest value is seen in the case of abscesses, anal fissures, and fistulæ. Any form of anorectal abscess which points externally is well treated by excision of the entire skin covering it—the so-called scalping operation. Care is taken not to cut the external sphincter and complete drainage is given so that as a rule all the anal abscesses, and at least half the ischio-rectal abscesses, heal without a second-stage operation.

In the case of anal fissures and fistulæ the area of the external wound must vary according to the particular case, but as a working rule it may be said that the deeper the fissure and the more difficult the fistula on account of deep tracks or submucous pockets, the more adequate must be the external drainage. The cutting back of a fistula wound into healthy tissues is commonly known as "Salmon's back-cut" and is still the basis of most fistula operations. It may be of interest to repeat the words of a visitor to St. Mark's Hospital in 1857, two years before Salmon, the founder of the hospital, retired: "One of the features which must strike a looker-on at St. Mark's is the very great freedom with which the knife is employed. In the operations for fistula and for fissure Mr. Salmon makes very free and deep incisions; and, indeed, his rule in the former of cutting the base of the sinus as well as the sphincter, necessarily involves an extent of incision at least three times that usually employed." This tendency to make large external wounds has been handed down from one generation of surgeons at St. Mark's Hospital to another, and this is good presumptive evidence that the method is a sound and practical one for these difficult cases.

#### USE OF TANNIC ACID

Granted that an anal wound is made of the requisite size and shape, it must be maintained so after operation; if by some mischance the wound margins fall together so that the external surfaces adhere, the area of external drainage may be greatly reduced in size within a few days. As has already been mentioned, this is particularly liable to happen with midline wounds. Premature external healing of the wound is likely to result in incomplete healing; there are two ways in which this tendency can be minimised.

1. *Cauterising or coagulating the wound surfaces.*—This can be done with the actual cautery or diathermy electrode or by application of strong nitric acid. A better method, and one of which I believe this is the first report, is by the application to the wound, at the conclusion of the operation, of a strong solution of tannic acid. A 20 per cent. solution of tannic acid in 1 in 1000 flavine was introduced by Wilson,<sup>1</sup> of Edinburgh, for the treatment of burns, and an even stronger solution of tannic acid, 40 per cent. in flavine, has been used in the Royal Northern Hospital for the same purpose. A single application to a burn produces a firm coagulum, and it has proved most satisfactory in the treatment of burns generally. It occurred to me that this might prove to be very useful for rectal work. When a fissure or fistula wound has been made at operation, hæmostasis is effected by forcipressure, and then the tannic acid solution (40 per cent. in flavine) is applied for perhaps two minutes on gauze swabs; a brownish-yellow surface coagulation is soon produced. The operation is completed in the usual way by injection

of sterile vaseline into the lower rectum and insertion of a tube and a gauze dressing moistened in Dettol lotion ( $\frac{1}{2}$  oz. to 1 pint). I have done this for more than 50 fissure and fistula cases and am convinced of its value; not only do the wounds keep flat but the patients tend to have less pain than formerly, and the dressings come off quite easily on the third day leaving a flat wound of the same shape and size as when the operation was completed.

2. The other way in which the risk of premature and therefore incomplete healing may be minimised is by *insertion of a firm flat dressing* at the time of operation, and keeping it in position until the third day. In this way the skin margins are kept back; when the dressing is changed down to the surface of the wound on the third day and subsequently, it is usually easy to keep the outer part of the wound flat. If, unfortunately, the original dressing is inserted insecurely or comes out prematurely when the tube is removed, it is often difficult to reintroduce a dressing so advantageously as at the operation.

Some writers have decried the insertion of gauze dressings into the anus, but in the treatment of fissures, fistulæ, hæmorrhoids, or any condition where a wound is left at the anal margin, I consider that a moist gauze dressing properly tucked in, with a firm pad of gauze and wool retained by a T-bandage, is essential for correct healing.

#### MANAGEMENT OF THE EXTERNAL SPHINCTER

It is often advisable to stretch the external sphincter at the beginning of, or in the course of, a rectal operation; pre-operative spasm of the sphincter is one important indication, and another indication is often afforded, after administration of a low spinal anæsthetic, by noting that the sphincter has failed to relax properly; this is usually due to a fibrous infiltration of the contracted sphincter. A sphincter of this type may be restored to normal by a careful stretching, but often, as in the course of operations for chronic fissure, the subcutaneous portion of the external sphincter needs incision.

The stretching of a sphincter has been alleged by some authorities to cause severe post-operative pain. This has not been my experience. I think possibly the results vary according to the anæsthesia employed. If a light general anæsthetic is used it is difficult to stretch a sphincter; it has to be done quickly, forcibly, and probably incompletely, whereas if a low spinal is given three to five minutes can well be taken up in a careful and graduated stretching until four fingers are readily introduced. The stretching effect should be chiefly posteriorly and tight fibres should be ruptured here rather than anteriorly.

If a tight sphincter is well stretched the patient is likely to be free from post-operative spasm and involuntary contractions of the muscle, which are not only painful in themselves but render the subsequent dressings difficult and painful. A relaxed sphincter means comfort, and as an alternative to stretching, in certain nervous subjects with pre-operative sphincter spasm, one of the oil-soluble anæsthetics may be employed (such as A.B.A., B.A.B.A.N., Procaine or Percaine in oil<sup>2</sup>) in addition to the main anæsthetic (general or low spinal) which may have been selected. When the patient has been placed in the lithotomy position ready for the

<sup>1</sup> These are solutions of local anæsthetics in sterilised almond oil; the use of oil as a solvent serves to delay absorption and to prolong the anæsthetic effect. The first three solutions mentioned contain anæsthesin or butesin in addition to which B.A.B.A.N. (Martindale) contains 1 per cent. of basic novocain, and procaine (Allen and Hanburys Ltd.) contains 1.5 per cent. of procaine base. The percaine in oil is a 0.5 per cent. solution and contains also 1 per cent. of phenol.

<sup>2</sup> Wilson, W. C.: Edin. Med. Jour., 1935, xlii., 177.



operation, as a first step 5-10 c.cm. of the oil-soluble anæsthetic is injected into the sphincter under aseptic conditions through a median puncture about one inch posterior to the anus.

It is often necessary to divide the subcutaneous portion of the external sphincter. In every case of anal fissure which has reached the chronicity which calls for operation, this portion of the sphincter must be divided and stretched. This can be done in any anal quadrant with impunity, and according to the incidence of anal fissures is most commonly required posteriorly, less often anteriorly or laterally.

A deeper incision of the external sphincter ani is rendered necessary in certain cases of anorectal abscesses and fistulæ which arise in the anal canal, and for these the important principle of the two-stage operation with use of the silk ligature is recommended. Infection may begin in a crypt, abrasion, or an intramuscular gland, and usually extends out between the superficial and deep portions of the external sphincter. The most acute abscess of this type is the deep postrectal in which the infection extends back from the posterior part of the anal canal and then begins to spread laterally beneath the anococcygeal raphe into each ischio-rectal fossa. When an acute abscess of this sort is drained it is manifest that, on account of its depth, a considerable portion of the external sphincter will need division. On no account should the muscle be divided in the acute stage. If a probe-pointed director is passed through an internal opening high up posteriorly, a stout silk ligature (No. 8 or 12) is passed through the opening on a silver probe or aneurysm needle and is knotted loosely round the contained muscle. The ligature serves to mark the opening and to fix the sphincter muscle by causing it to adhere to the lateral margins of the wound. Two weeks later, under local anæsthesia, the sphincter is incised with scissors and the ligature cut out; sometimes on account of the height of the internal opening it is advisable to cut through the contained muscle in two successive stages. Complete drainage is thus effected and control is not impaired, for the sphincter becomes adherent to the margins of the wound before it is cut across, and later on, as healing progresses, the muscle-fibres become approximated as the scar contracts.

This principle of the two-stage operation is of the utmost importance and deserves wide recognition. It is suitable also for certain cases of anorectal fistulæ with an internal opening between the superficial and deep portions of the external sphincter. If the case is of the anterior horseshoe or semi-horseshoe type with a central track passing deep to a considerable portion of the external sphincter, a two-stage operation is usually imperative in view of the risk of causing incontinence by immediate division of the muscle; with a posterior track the risk is not so great, but even so no harm can ever be done by carrying out the operation in two stages. The time required for healing depends on the area of the wound made for drainage, and is not altered by whether the sphincter is divided at the first or a later operation. Caution is required, therefore, and if there is any doubt the operator can always be sure that the decision to carry out the operation in two stages is not likely to be wrong.

#### POST-OPERATIVE MANAGEMENT OF ANORECTAL WOUNDS

A satisfactory routine for the average rectal case is to have the bowels moved by an olive oil and gruel enema on the third morning after operation. The

importance of leaving the original gauze dressing until then has been mentioned; the gauze is removed by gentle traction on the third morning, assisted by irrigation with a dilute peroxide lotion from a douche can. This is done most easily when the patient is placed on his left side on the edge of his bed, with a mackintosh sheet underneath him leading into a bucket. In very nervous subjects Evipan anæsthesia may be used for this first dressing.

The average rectal patient is allowed to have a hot bath twice a day from the third day onwards, which together with the twice daily irrigation and dressing forms an important part of the after-treatment. The hot bath encourages drainage, and the warmth may help the granulation of wounds, and probably relieves sphincter spasm. In theory it might seem ideal to carry out less frequent dressings as in the Orr method, but in the case of the rectum the two important requirements for the wounds, immobilisation and asepsis, cannot be achieved. It would be difficult to keep the dressings reasonably clean, and there is no guarantee that a gauze dressing, put in after operation, will remain in perfect position from one day to another. The twice daily dressing with mechanical cleansing of the wound by a stream of warm lotion is comforting for the patient, provided that the dressing is done gently and capably. The organisation of rectal dressings on these lines is easy in a special hospital, but it can be done equally well with scattered rectal cases in a general hospital or a nursing-home. The nurses in charge of such cases soon learn to take the requisite trouble, which is rewarded by seeing the smooth progress of healing and by the patient's appreciation of diminishing pain with each dressing.

Two details are worthy of mention:

(1) The majority of cases with anal wounds which are healing by granulation, even if the sphincter has been well relaxed at the time of operation, will tend to develop a spasm or contraction of the sphincter unless steps are taken to counteract this. The passage of a finger every day would no doubt prevent this tendency, but it is difficult for a busy surgeon to do this with regularity, and a better and more uniform dilatation is achieved by the use of the St. Mark's Hospital dilator: the outer end of this dilator has a diameter of one inch. In cases of anal fissure this dilator is passed on the fourth post-operative day, lubricated with a zinc and castor oil cream, and it is passed subsequently by the surgeon, resident, sister, or nurse each morning and evening in the course of the dressings. In many cases of anal fistula the dilator is passed with advantage on the fifth or sixth day, and the same remark applies in the treatment after hæmorrhoidectomy.

I regard the regular use of this dilator as being a most valuable item in the after-treatment; its passage from an early date certainly saves the patient a great deal of pain and ensures smooth healing of the anal extremity of the wound.

(2) The method of inserting the actual gauze dressing is important. With the buttocks well retracted, a corner of folded gauze moistened or lubricated with whatever lotion or ointment may be selected, is tucked with sinus forceps into the anal canal, the external part of the gauze being arranged over the surface of the wound. This should be referred to as a flat dressing, and is not to be considered a plugging, which word gives a totally incorrect idea of the dressing.

There are many other points in connexion with anorectal wounds which I have not touched upon;

for instance, the importance of obtaining tissue for section in all cases of doubtful ætiology and also in inflammatory conditions in order to detect cases of tuberculous infection; the use of ultra-violet light to stimulate healing of wounds, and the occasional use of skin-grafting in certain abscess or fistula cases where an unusually large external wound has had to be made for drainage.

As a general rule, however, one of the objects in view is to delay the healing of wounds external to the anus in order to ensure proper healing of their inner extremities; it is this fact which renders the surgery of this part of the body rather tiresome, and it is well described by the old saying "slow but sure." The lessons of rectal surgery are, I think, worthy of attention, and a man who learns how to open a large ischiorectal abscess and bring the case to a successful conclusion is probably well equipped to deal efficiently with an acute abscess in any other part or tissue of the body. It is instructive to observe that a wound can heal by granulation and yet leave a linear scar, which after the lapse of some months becomes almost indistinguishable from one that has healed by primary union.

### THE INITIAL STATE PRINCIPLE AND ITS IMPORTANCE IN PHYSIOLOGY AND PATHOLOGY

BY S. LEITES, M.D.

PROFESSOR OF PATHOLOGICAL PHYSIOLOGY IN THE INSTITUTE FOR  
POSTGRADUATE MEDICAL INSTRUCTION AND THE INSTITUTE  
OF EXPERIMENTAL MEDICINE, KHARKOFF, U.S.S.R.

UNTIL recently the reaction of an organism to a given stimulus was considered to depend on the intensity of the stimulus and its specific nature. It is, however, obvious that the state of the reacting object and of its environment must also play their parts in determining the quantity and quality of the reaction. These indeed are sometimes even more important than that played by the stimulus itself.

Rössle has demonstrated a condition which he has called "pathergy" in which the application of a stimulus leaves the organism in a state in which it is unduly susceptible to subsequent stimuli of a different kind: for example, in some cases of Graves's (Basedow's) disease, tachycardia persists even after the secretion of the thyroid gland has become normal; and a rabbit which is given intravenously a non-lethal dose of cholera vibrio will die if, on the next day, it is given an injection of ordinarily harmless saprophytes. This led Moro and Keller to the conception of a state of "parallergy" in which an allergic state, produced by specific sensitisation, predisposes the body to react to non-specific stimuli. This form of pathergy is seen in the child who develops a positive tuberculin reaction after small-pox vaccination, and Rössle suggests that encephalitis, arteritis, nephritis, and other complications of contagious diseases may be explained in the same way.

Obviously the pathergic state is a much more important factor in the response to a stimulus than is the stimulus itself. True the pathergy was originally due to a stimulus, but once established it alters the reaction to subsequent stimuli, which, in their turn, condition its future development.

How are we to judge, in any particular case, which is of chief importance—stimulus or receptor? Experimentally we may find that a given stimulus always produces the same reaction and that the latter changes

when the stimulus is varied. In these circumstances it is the stimulus that is "dominant." Alternatively we may find differing responses to equal stimuli, and here the chief part must be played by the reacting object. When the character of the stimulus is the most important factor in the interaction of stimulus and object the character of the reaction is determined by its intensity or "dose." But when the reacting substratum of the object is more important, search must be made for another indicator which will be a function of the object. A helpful suggestion as to where we are to look for such an indicator is provided by Wilder's "law of initial value" (Ausgangswertgesetz).

#### THE LAW OF INITIAL VALUE

Wilder showed that the responses of the pulse and blood pressure of a given person to a given dose of adrenaline and atropine vary inversely with the pulse-rate and blood pressure at the time of the injection. The quicker the pulse and the higher the blood pressure to start with, the less they are affected by the introduction of a fixed dose of the drugs. When the initial value of the blood pressure is high enough, the response may even be negative instead of positive—i.e., adrenaline produces a vagotonic rather than sympathicotonic response. From this Wilder deduced a regular interdependence between the initial value of the blood pressure (or pulse-rate) and the character of their reaction to stimuli. Developing this idea, he points out that since the initial value may depend on the state of both divisions of the vegetative nervous system, the effect will depend on how far one of these is already excited. If there is already great hypertony the influence of a stimulant drug is reduced and may become paradoxical and sedative. Thus in bradycardia due to vagus overaction we may find a weak, or even negative, response to pilocarpine and an increased response to adrenaline and atropine. As Wilder puts it, the more intense the function of a vegetative organ, the weaker is its capacity for being excited by stimuli and the stronger its reaction to depressing factors. Smirnoff's concept of the "functional tendency," a factor which determines the reactivity of the vegetative nervous system to endogenous and exogenous stimuli, is in perfect harmony with Wilder's principle. Strong reflexes, he finds, indicate depressed tone in the centres under investigation.

This law of initial value has been demonstrated in operation in many different circumstances, by Wilder and also in our own investigations. For example it has been shown that the effect of adrenaline is greater after removal of the suprarenals—probably because of the low initial value of the blood pressure. On the other hand, old people with high blood pressure react poorly to the same drug. Both adrenaline and ergotoxine cause tonic contraction of the isolated uterus; but if they are applied one after the other (the perfusion fluid being renewed so that the two do not act together) the second either will not exert its specific influence or will produce the paradoxical effect of Langecker. A second injection of pituitary extract given a certain time after the first unit produces a less effect, because the initial value is raised by the first injection. The diuretic effect of pituitrin also varies: in diabetes insipidus it reduces the flow of urine whereas in reflex anuria it increases it. Similarly, parathormone raises the blood calcium in tetany, when the initial value is low, and depresses a level artificially raised by the intravenous injection of calcium. Thyroxine raises the basal metabolism in myxœdema but not in Graves's disease, where

it may even lower it; and it is worth noting that iodine used in Graves's disease will usually prove helpful for eight days or so, until the metabolic rate has reached a certain level, after which it begins to act in an opposite sense.

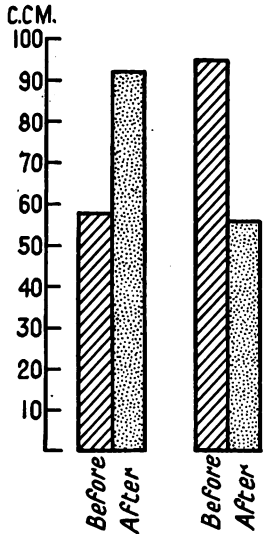


FIG. 1.—Effect of doses of linseed oil on the bile secretion of dogs. The response (shown by the stippled areas) is greater if secretion during the previous 12 hours (shaded areas) has been small.

seen that this is greatest if the flow during the previous 12 hours has been comparatively small. The same effect is obtained using other stimuli—e.g., peptone (Fig. 2). Failure to allow for variations in the initial state of the bile secretion is probably one of the causes of the contradiction in published data concerning the effect of alimentary stimuli upon this function. Changes in the chemical composition of the bile—e.g., cholesterin content—after taking food may also depend on its initial composition. Thus we

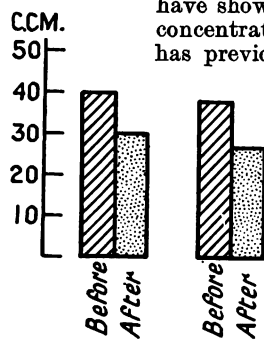


FIG. 2.—Effect of peptone on bile secretion of dogs, showing maximal response when previous secretion has been lowest.

large number of diseases. Thus ingestion of oil in cases of hepatic disorder causes hypocholesterinæmia whereas in normal persons, or during convalescence, it leads to an excess of cholesterin in the blood (Leites and Golbitz-Katschan). When studying the pathology of fat metabolism in diabetes we (Leites, Sorkin, and Agaletzkaia) established in some cases that the behaviour of the neutral fat, and of the ketone bodies, was related to their initial value (Table I). It will be seen that, in the case illustrated, when the initial value of the fat and ketones was normal a

dose of fat (75 g. of butter) increased the neutral fat and decreased the ketones; but with the same patient on an Adlersberg-Porges diet (containing the minimum of fats) the same dose lowered the fat content and raised the ketones of the blood, since the initial value of the fat was high and that of the ketones was low.

The observations I have cited make it clear, I hope, that the law of initial value has general applica-

TABLE I

Effect of a dose of 75 g. of butter on the neutral fat and ketone bodies of a patient on an ordinary diet (A) and of the same patient on a diet poor in fats (B).

Patient.	Neutral fat mg. per 100 c.cm.			Ketone bodies mg. per 100 c.cm.		
	Before.	3 hrs. after.	6 hrs. after.	Before.	3 hrs. after.	6 hrs. after.
A	51	106	112	60	63	32.5
B	171	163	104	6	12	12

tions to physiology and pathology, and that it does something to explain the reaction of an object to a given stimulus, to which I referred at the beginning of this paper. Nevertheless it cannot be applied without reservations. The bare numeral of the initial value does not always adequately represent its quantitative character, and before we proceed to argue from the "initial value" we must ascertain how far it really corresponds, in the given case, to the initial state; for in one and the same initial states there can be different initial values and vice versa. That is why I consider it preferable to speak not of the "law of initial value" but of the "principle of the initial state," endeavouring to discover in every case the relation of this state to the indicator of the initial value.

THE INITIAL STATE

Such an indicator can be of assistance only if we are sure that the stimulus is acting purely on the object whose state it indicates. Now in diabetes as well as in myxœdema we may observe a high level of neutral fat in the blood. In diabetes, following the law of initial value, this level is reduced by ingestion of fat; yet in myxœdema it is increased (Leites, Sorkin, and Agaletzkaia). The reason of this is that in diabetes the high fat content of the blood is due to fat being transported from its depôts to the liver (because of diminution of hepatic glycogen) whereas in myxœdema it is due to disturbances in fat breakdown. In diabetes ingestion of fat fills the liver, reduces its transport from the depôts, and so lowers the fat content of the blood stream; but in myxœdema there is no reason why it should do so since it in no way affects the processes of fat combustion. Thus in diabetes we have an example of a stimulus acting on the object whose state is indicated

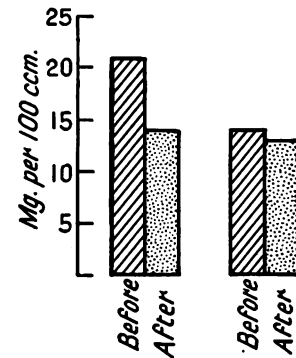


FIG. 3.—Effect of peptone on the cholesterin content of bile, showing a decrease when this was previously high. There is little change when it was previously low.

by the initial value; whereas in myxœdema we have not.

There is also another particular in which Wilder's law of initial value requires modification. According to him the paradoxical reaction is to be expected only if the functional activity of the reacting organ is high. Our experience, and published records, show, however, that such a reaction may be obtained also when its activity is much depressed. The excitability of a vegetative organ may be greatly lessened, and even inverted, by exhaustion of its energies by previous activity or by disease.

Analysis of the conditions under which the principle of the initial state does and does not apply makes it possible to recognise the conditions underlying the responses. The exceptions to the rule may be due first to variation in the reactions and secondly to compensatory processes. The presence or absence of compensatory processes determines, in fact, whether the principle of the initial state shall or shall not manifest itself. This statement is amply borne out by work on the physiopathology of the fat and lipid metabolism in various endocrine disorders.

A typical example is shown in the case of a patient who was admitted suffering from uncompensated diabetes. The blood-sugar was 208 mg. per 100 c.cm., and there were large quantities of sugar and acetone in the urine. A meal containing 75 g. of butter gave the results shown in Table II.

TABLE II

*Effect of a meal of 75 g. of butter on the metabolism of a diabetic before and after compensation*

	Neutral fat mg. per 100 c.cm.				Ketone bodies mg. per 100 c.cm.				Sugar in urine.	Acetone in urine.
	Before meal.	3 hrs. after.	6 hrs. after.	9 hrs. after.	Before meal.	3 hrs. after.	6 hrs. after.	9 hrs. after.		
March 10th.	130	102	114	208	65	83	82	80	3.4%	++
April 14th.	243	147	133	120	21	18	24	20	0	0

Although the initial values of the neutral fat and ketone bodies were relatively high they rose nine hours after the meal. Whereas it may be that in other cases, in which the diabetes was compensated, a decline in the ketone bodies was produced by the fatty meal. This patient was suitably treated by diet and insulin, and his diabetes was eventually compensated—i.e., the fasting blood-sugar level became lower and the acetone and sugar disappeared from the urine. His reaction to a butter meal was now, although the initial level of the neutral fat was still considerable, higher than it had been before: 243 mg. After the meal it sank rapidly and by the ninth hour it had reached 120 mg.; the ketone bodies did not rise. This was a paradoxical reaction.

The effect of a glucose meal provides another example of the working of the law. When the blood-sugar is artificially raised by the administration of glucose, and a glucose meal is then given, the blood-sugar will not be increased further, because the islets of Langerhans have been stimulated by the earlier administration of glucose (effect of Staub-Traugott). In diabetes, however, although the initial value of the blood-sugar is high, the islets do not compensate, and therefore a glucose meal will raise the blood-sugar.

## CONCLUSION

It is possible, therefore, to formulate the principle of the initial state as follows. If the reactive capacity of the vegetative system is altered in such a way that

it reacts weakly to a stimulant and strongly to a depressant, the state of the system must be the paramount factor in determining the reaction to stimulus. It is possible to deduce from this alteration the character of the initial state of the system—i.e., whether its excitability is high or low—and also to form an estimate of the extent to which the system is compensated and the possibility of accommodation.

The practical importance of the principle is therefore considerable. It allows a definite interpretation to be given to many series of phenomena, and in particular to the phasic action of certain stimuli. The alternation of phase in the action of hormones, drugs, nutritive stimuli, and many other agents may be due to the fact that the first stage of their action changes the initial state of the vegetative system, so that the second stage of the action produces an opposite reaction. But the second phase itself brings about another change in the initial state, so that the next reaction is more analogous to the first. For instance, a glucose meal will produce hyperglycæmia but will also change the initial state of the islets, so that hypoglycæmia is gradually induced. This condition, however, stimulates the suprarenal glands and, by changing their initial state, brings about a fresh hyperglycæmic state. The similar alternation of states of hyper- and hypo-lipæmia and ketonæmia after a fatty meal is probably due to the alteration in the initial states of the liver, the pituitary gland, and the thyroid which each of the phases provokes.

Recognition of the principle must modify many current views of pathology. A patient with bradycardia may sometimes be "vagotonic" in the sense indicated by Eppinger and Hess—that is, he must have a weak or even a paradoxical action to adrenaline. According to the initial state principle, however, it is quite possible that a patient with bradycardia who reacts strongly to adrenaline may none the less be "vagotonic" too. In fact, the strong reaction to adrenaline actually indicates a high degree of vagal excitation. Kylin, observing that in essential hypertonia the adrenaline action is weakened and "vagotonic," regards this disease as a "vagotonic" syndrome. But if the principle of the initial state is applied, the essential hypertonia may be regarded as indicating a high degree of sympathetic excitation, which, of course, reduces sensitiveness to adrenaline.

The principle of the initial state should give valuable assistance in various fields of medicine, and in suitable cases assist the correct assessment of the processes at work.

## REFERENCES

- Leites, S.: *Klin. Woch.*, 1934, *xiii.*, 1056; *Ann. de physiol.*, 1935, *xi.*, 125.  
 Leites and Odinow, A.: *Biochem. Zeits.*, 1935, *colxxxii.*, 345.  
 Leites and Golbitz-Katschan, Z.: *Zeits. f. d. ges. exp. Med.*, 1930, *lxxii.*, 690.  
 Leites and Jussin, W.: *Arch. f. exp. Path. and Pharm.*, 1933, *clxxx.*, 365.  
 Leites, Sorokin, E., and Agaletzkaia, A.: *Klin. Woch.*, 1934, *xiii.*, 1272; *Zeits. f. klin. Med.*, 1935, *cxviii.*, 407.  
 Leites, Jussin, and Wodinsky, M.: *Zeits. f. d. ges. exp. Med.*, 1932, *lxxx.*, 713; 1933, *xc.*, 378.  
 Rössle, R.: *Klin. Woch.*, 1933, *xii.*, 574.  
 Smirnow, A. I.: *Klinitsch. Med.*, 1933, *vol. xiii.* (Russ.)  
 Wilder, J.: *Klin. Woch.*, 1931, *x.*, 1889.

WEST LONDON HOSPITAL.—Presiding over the annual meeting of this institution on May 21st, Prince Arthur of Connaught said that the Silver Jubilee extensions were now practically complete. The extensions include new casualty, X ray, and pathological departments. All but £4000 of the necessary money has been received.

## THE PROBLEM OF REPAIR AND REGENERATION OF THE SEMILUNAR CARTILAGES

BY A. G. TIMBRELL FISHER, M.C., M.B., Ch.B. Brist.,  
F.R.C.S. Eng.

HON. ORTHOPÆDIC SURGEON TO THE ST. JOHN CLINIC AND  
INSTITUTE OF PHYSICAL MEDICINE, LONDON, ETC.;  
FORMERLY HUNTERIAN PROFESSOR OF THE ROYAL  
COLLEGE OF SURGEONS OF ENGLAND

SOME years ago I carried out an experimental investigation into the repair of fractures of the semilunar cartilages of the knee-joint. By injection methods it was found that the peripheral portions of the menisci were well supplied with blood-vessels partly derived from the delicate layer of synovial membrane which extends for a short distance over the extreme peripheral part of the cartilage. No vessels could, however, be traced in the inner or concave portions of the semilunar cartilages, and it appears on clinical and experimental grounds that the central portions of the semilunar cartilages are poorly nourished. Experiments on animals showed that incisions in the more central parts of the semilunar cartilages remained unhealed indefinitely but that incisions in the peripheral area were repaired by fibrous tissue after a considerable lapse of time. This experimental work has since been confirmed by various workers.

### REPAIR

The nutrition of the semilunar cartilages is of considerable clinical significance. It is probable that many minor injuries of the semilunar cartilages, particularly small longitudinal tears involving the convex edge, may heal by fibrous tissue, and sometimes evidence of such healing can be seen in cartilages that subsequently have to be removed owing to some further injury. Such cases may remain free from symptoms after manipulation (if locking exists) and appropriate after-treatment. Experience teaches, however, that most lesions of the semilunar cartilages are much more serious, and that in the great majority manipulative replacement combined with special after-treatment is merely of temporary benefit. The long period of complete rest formerly advocated after manipulative replacement of the torn and misplaced cartilage appears for physiological reasons to be useless in materially bringing about repair of the fractured cartilage, and the enforced rest may have troublesome sequelæ in the form of adhesions and muscular wasting. Taking into regard these facts and also the satisfactory results of operation in experienced hands, the question arises: Is it worth while to adopt conservative measures when the lesion is clearly of a severe nature? The answer appears to be that no hard-and-fast rule is possible, and that each case has to be considered from many different aspects before a decision is made.

In persons whose livelihood is at stake, as in many professional footballers, I believe that early removal of the torn cartilage is the wisest policy. Occasionally the player carries on quite well for a variable period after conservative treatment, but recurrence is, in my experience, almost certain; moreover, the playing of such a strenuous game while a torn cartilage is still present in the knee is apt to lead to osteoarthritic changes.

### REGENERATION

So far the healing of injuries of the semilunar cartilages and the clinical implications have been briefly considered. The equally interesting and important problem of regeneration of the semilunar cartilage after removal will now be discussed. One is often asked by patients if anything takes the place of the semilunar cartilage after removal, and why the knee is not permanently weakened by the operation. This is a problem of absorbing interest and concerning which our knowledge is at present immature. It must have fallen to the lot of many orthopædic surgeons to reoperate upon knees for recurrence of symptoms after a previous operation "elsewhere." This experience has befallen me several times. It is often very difficult to ascertain the state of affairs at the original operation, but at the second operation I have often found a structure resembling the semilunar cartilage and presenting various types of lesion, and I have hitherto assumed that in such cases incomplete removal had previously been practised. Some surgeons, for example, remove only the detached central portion of a bucket-handle lesion leaving the peripheral portion in situ. At a second operation by another surgeon for some other condition such as loose body, this peripheral portion might easily, in the absence of adequate details concerning the first operation, be considered a case of regeneration of a semilunar cartilage.

In the second edition of my monograph on internal derangements of the knee-joint (1933) I expressed the opinion that no case could be made out for regeneration of the semilunar unless an experienced surgeon, having carefully removed the cartilage, finds at a second operation that a structure resembling the semilunar has been reconstituted. A short time after making this statement two cases of apparent regeneration of a semilunar cartilage came under my personal observation.

### CASE RECORDS

CASE 1.—A professional football player was brought to me in November, 1929, and gave the following history. Three years previously an operation was performed upon the right knee for "removal of internal semilunar cartilage." In October, 1929, while playing football, he received a severe blow on the outer side of the right thigh while the right foot was planted firmly on the ground; the thigh was apparently rotated violently inwards upon the fixed leg. There was severe pain, a fairly convincing history of mechanical locking, and, subsequently, a large synovial effusion. Pain and weakness of the knee had persisted in spite of physical treatment.

On examination, synovial effusion of moderate degree was present and tenderness over the external semilunar cartilage. Flexion was painful, restricted, and associated with the click or snap so often present with a semilunar cartilage lesion. Operation was performed by me one week later and a complete bucket-handle lesion of the external semilunar cartilage was found. The whole of the torn cartilage was very carefully removed with the exception of the extreme posterior portion. Progress was uneventful and the knee functioned perfectly for three seasons.

On Nov. 18th, 1933, while playing football, his right knee was injured in a very similar manner to the previous occasion. Mechanical locking again occurred. X ray examination revealed some degree of lipping of the outer margin of the tibial condyle, and two loose bodies, one in front of the tibial spine and another at the back and outer side. It was considered that the symptoms were due to the loose bodies and operation was performed on Dec. 19th, 1933. The joint was opened through a curved incision over the antero-external aspect and a dense fibrous structure exactly similar in naked-eye appearances to the external semilunar cartilage and presenting a

longitudinal (bucket-handle) fracture was noted. It is of considerable interest to note that at the first operation, three years before, a similar type of lesion of the external semilunar cartilage was found to be present. The major portion of the regenerated and refractured cartilage and also the loose bodies were removed. No microscopical examination was made in this case.

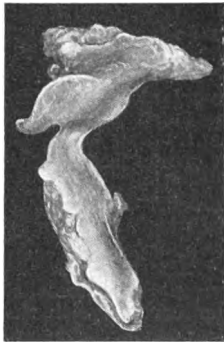
CASE 2.—A professional football player severely twisted his left knee on Christmas Day, 1928. Severe pain was experienced on both inner and outer aspects of the joint but apparently there was no mechanical locking; a large synovial effusion ensued. He abstained from playing for ten weeks but every attempt to resume was accompanied by pain on both inner and outer aspects of the joint, and by synovial effusion.

On examination, May 13th, 1929, there was slight effusion in the left knee and slight limitation of full flexion of the left knee associated with pain. There was a well-marked click or snap on the outer side of the joint on flexion and also tenderness over the external semilunar cartilage and wasting of the quadriceps extensor cruris. The X ray showed an osteophyte growing from the inner surface of the internal tibial condyle. The case was clearly of a complex nature and it was considered that the symptoms referred to the inner side of the joint were probably due to interference with the action of the tendons of the sartorius gracilis and semitendinosus from the presence of the osteophyte, and that the symptoms referred to the outer side were due to a lesion of the external semilunar cartilage.

Operation upon the left knee was performed on June 25th, 1929. The osteophyte on the inner side was first removed by the chisel through a small internal incision. A separate incision was next made on the outer side of the joint and the condition of the external semilunar cartilage investigated. An oblique fracture at the junction of the middle and posterior thirds was discovered and the cartilage completely removed. Blood-stained synovial effusion was present and a few melon-seed bodies. The joint was closed after irrigation with normal saline solution.

Subsequent progress was uneventful and he resumed playing in the autumn and continued normally until March, 1934, when during a game he received a fresh injury to the left knee, which was severely rotated. A painful mechanical block to complete extension supervened immediately, followed by synovial effusion of moderate degree. On examination a few days later, synovial effusion was marked. There was a slight mechanical restriction to complete extension and localised tenderness over the middle of the external lateral ligament where also some structure (? cartilaginous) could be palpated and rolled under the examining finger. X rays showed a faint shadow which it was thought might be a loose body in the postero-external compartment of the joint.

A second operation was performed on March 24th, 1934. I used my semilunar skin flap on the outer side of the joint, which was opened by capsular incisions anterior and posterior to external lateral ligament. It was at once apparent that the symptoms were caused by a lesion of a regenerated external semilunar cartilage. This lesion was of the bucket-handle type but affecting the posterior part of the semilunar. The "handle" lay wedged between the external condyles of the tibia and femur where from its position it caused a mechanical block to complete extension and calcification had occurred in this portion, accounting thus for the shadow seen on X ray examination. The movable body felt beneath the external lateral ligament was the outer or peripheral portion of the bucket-handle. Only the anterior part of this is shown in the Figure; it had the normal attachments



CASE 2.—Regenerated external semilunar cartilage. Above = anterior; below = posterior.

wedged between the external condyles of the tibia and femur where from its position it caused a mechanical block to complete extension and calcification had occurred in this portion, accounting thus for the shadow seen on X ray examination. The movable body felt beneath the external lateral ligament was the outer or peripheral portion of the bucket-handle. Only the anterior part of this is shown in the Figure; it had the normal attachments

but was about half the width of the normal cartilage and its inner portion was thin and semitransparent.

Just as one swallow does not make a summer, so is it impossible to establish a fact of considerable importance by experience gained from two clinical cases. This short paper is contributed with the hope that it may stimulate discussion among other surgeons who have special experience in knee operations.

Dr. L. W. Proger, the pathological curator of the Royal College of Surgeons, has kindly examined microscopic sections of the regenerated semilunar cartilage, but excluding the area of calcification, and reports that these show nothing but dense fibrous tissue.

#### BIBLIOGRAPHY

- Burman, M. S., and Sutro, C. J.: A Study of the Degenerative Changes of the Menisci of the Knee-joint, and the Clinical Significance thereof. Reference to healing in fractured cartilage on p. 848. Jour. Bone and Joint Surg., 1933, xv., 335.
- Cattaneo, F.: Recurrent Fracture of Meniscus with Blockage; Meniscectomy, Boll. d. spec. Med.-Chir., 1929, iii., 31.
- Dieterich, H.: Die Regeneration des Meniscus, Deut. Zeits. f. Chir., 1931, ccxxx., 251.
- Fiorini, E.: Sulla rigenerazione dei menischi articolari, Chir. d. org. di movimento, 1932-33, xvii., 350.
- Fisher, A. G. Timbrell: Internal Derangements of the Knee-joint, 2nd ed., London, 1933.
- Friedrich, H.: Über Meniscusregeneration, Zentrabl. f. Chirurgie, 1930, lvii., 2534.
- Gibson, A.: Regeneration of the Internal Semilunar Cartilage After Operation, Brit. Jour. Surg., 1931-32, xix., 392.
- Goldenberg, R. R.: Refracture of a Regenerated Internal Semilunar Cartilage, Jour. Bone and Joint Surg., 1935, xvii., 1954.
- King, D.: The Healing of Semilunar Cartilages (Experimental), *ibid.*, 1936, xviii., 333.
- Leul, E.: New Experiments on the Regeneration of the Semilunar Cartilages, Arch. di Ortop., 1934, l., 1083.
- Lukjanov, G., and Pokrovski, S.: Intra-articular Changes After the Removal of the Semilunar Cartilages, Jour. Sovrem. Chir., 1929, iv., 946 (abstract, Jour. Bone and Joint Surgery, 1930, xii., 984).
- Mandl, F.: Regeneration des menschlichen Kniegelenkswischenknorpels, Zentrabl. f. Chir., 1929, lvi., 3265 (abstract, Surg., Gyn., and Obst., 1930, li., 147 Suppl.).
- Mandl, F.: Weitere Beobachtungen zur Regeneration des Meniscus, Zentrabl. f. Chir., 1935, lxii., 694.
- Möller, W.: Luxation eines nach Exstirpation neugebildeten Kniegelenkswischenknorpels, *ibid.*, 1930, lvii., 2790.
- Masmonteil, F.: Longitudinal Fracture of Internal Meniscus with Spontaneous Regeneration at Expense of Basal Part—Surgical therapy of a case, Bull. et mém. Soc. de chirurgiens de Paris, 1934, xxvi., 663.
- Pfah, B.: Zur Blutgefäßversorgung der Menisci und Kreuzbänder, Deut. Zeits. f. Chir., 1927, ccv., 258.
- Same author: Zur Gefäßversorgung der Menisci, Zentrabl. f. Chir., 1928, lv., 731.
- Strangeways, T. S. P.: Observations on the Nutrition of Articular Cartilage, Brit. Med. Jour., 1920, i., 661.

## HISTIDINE IN THE TREATMENT OF GASTRIC AND DUODENAL ULCER

By R. H. GARDINER, M.B. Oxon.

LATE HOUSE SURGEON AT THE GRIMSBY AND DISTRICT HOSPITAL

DURING the months August–December, 1935, twelve consecutive cases of gastric and duodenal ulcer admitted to the Grimsby and District Hospital were submitted to a new routine treatment in order to test the value of histidine as a curative agent.

#### TREATMENT

On admission, if radiography with barium meal, and if a fractional test-meal, in conjunction with the gastric history and symptoms, pointed to the presence of an ulcer, the histidine treatment was carried out as follows:—

A light solid diet with meals at the usual time was given. Patients were encouraged to take exercise on the ward balcony daily, and they were not confined to bed, being allowed up in the ward. Smoking in moderation was not prohibited.

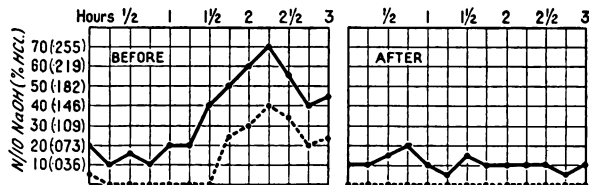
Daily intramuscular injections of 5 c.cm. of Larostidin were given into the buttocks, 25 injections being given in all. Small doses of alkalis were prescribed at the beginning of the course when there was pain after meals, but were rarely necessary after the tenth day. At the end of the course control radiograms and fractional test-



HISTORY, DIAGNOSIS, AND RESULTS OF HISTIDINE TREATMENT

No.	Age.	Date of admission: symptoms.	Findings.	Condition at end of treatment.	Condition on April 1st, 1936.
1	40	August 12th, 1935: Pain 2 hrs. after food, severe at night; anæmia.	Duodenal ulcer.	Cured.	No pain; very fit indeed.
2	32	Nov. 25th: Persistent "gastric" trouble for years, with treatment; very little freedom.	Gastric ulcer; very high gastric acidity.	Complete relief.	1 mth.'s freedom, but pain has returned.
3	43	August 12th: Very severe epigastric pain for 10 wks., typical of gastric ulcer.	Large gastric ulcer on lesser curvature.	No symptoms except for occasional water-brash. Ulcer still found in radiograms.	Very fit; eats anything. No indigestion or pain.
4	69	Oct. 17th: Years of gastric trouble with loss of weight, and pain 2½ hrs. after food.	Duodenal ulcer.	Much better.	Pain returned 1 wk. ago but not so severe as before.
5	32	August 8th: "Acute indigestion" 6 mths., with pain 2 hrs. after food.	Pyloric ulcer; high gastric acidity with climbing curve in test-meal.	Cured, but high resting acidity remained.	..
6	27	Dec. 16th: Severe pain 20 mins. after food, with acid eructations. Anæmic.	Gastric ulcer.	Symptoms cured.	No further trouble.
7	45	Oct. 15th: Pain 4 hrs. after food. Melaena.	Duodenal ulcer.	Symptoms cured.	..
8	43	Dec. 16th: Persistent pain after food; sudden onset and melaena.	"Hour-glass" stomach; high acidity with climbing curve. Pyloric ulcer.	Better.	..
9	38	Nov. 25th: 8 yrs., symptoms of duodenal ulcer.	Duodenal ulcer with high acidity.	Cured.	Gained 1st. in weight. No further trouble.
10	50	Sept. 30th: Years of epigastric pain, always ½ hr. after food; two hæmatemeses.	Pyloric ulcer; high climbing curve, gastric acidity.	Better.	Pain now as bad as ever.
11	49	Sept. 2nd: Pain ¼ hr. after food, with persistent nausea.	Gastric ulcer.	Symptoms cured; ulcer not seen in radiograms.	Very fit indeed.
12	68	Nov. 12th: Admitted as emergency with hæmatemesis; long history of gastric trouble.	Gastric ulcer; hæmatemesis treated on usual lines, followed by larostidin; very high gastric acidity.	Symptoms cured; gain in weight.	No further trouble.

meals were repeated. All the patients treated were men of the labouring class. The whole course averaged a month. The series of 12 cases are recorded in the Table, with a brief history, the diagnosis, and the results obtained; the Figure shows the typical fall in gastric acidity.



Effect of histidine on gastric acidity.

RESULTS

Symptomatic relief was obtained in all cases, and there was an invariable fall in gastric acidity. Of 9 cases followed up 6 were fit and well after 4-6 months, whilst in 3 there had been a return of symptoms.

ADVANTAGES

Compared with the ordinary medical treatment for ulcers—namely, four weeks in bed on a graduated diet—the new treatment has the following advantages. It is far more congenial to the patient whose only inconvenience is the daily injection. There is no irksome diet of ten days of citrated milk and a graduated diet with prolonged confinement in bed. The treatment is also far simpler, with less trouble to the nursing staff, and the time taken is slightly less than the diet treatment.

CONCLUSIONS

Results obtained in the series show at least a temporary loss of symptoms comparable with those

obtained by ordinary medical treatment. It is doubtful if histidine has any healing effect on the ulcer directly, its action probably being a reduction in gastric acidity and a lowering of gastric motility. The ulcer has therefore a chance to heal, as the irritative factors are removed with a consequent loss of symptoms. Although not actually confined to bed the patients were not performing the heavy work to which they were accustomed and this also no doubt aided recovery.

There are distinct possibilities for this form of treatment, particularly among sedentary workers. An ambulatory treatment of ulcer could be carried out while they perform their usual daily routine, thus avoiding in many cases the loss of time of an enforced rest of over a month. The course of injections can be repeated if there should be an exacerbation.

Compared with the dietetic method, the cost of treating ulcers on the above lines was found to be about the same or a little less, since the average time taken in hospital was shorter, which helped to balance the cost of the larostidin. To the patient, however, it was a saving, for a normal life could be entered upon as soon as the course was finished, without the necessity of a convalescence period.

It does not seem possible that a lasting cure is to be obtained from histidine as from any other form of medical treatment for chronic ulcer similar to those in the cases recorded, but it is a form of treatment which I found gave satisfaction to both patient and physician.

I wish to record my thanks to Dr. J. W. Brown, honorary physician to the Grimsby and District Hospital, for permission to publish these cases admitted under his care.

## WEIGHT OF THYROID GLAND AND ATHERO-SCLEROSIS

BY NIELS P. DUNGAL, M.D.

PROFESSOR OF PATHOLOGY, UNIVERSITY OF REYKJAVIK, ICELAND

WORKING as pathologist in Iceland I have been struck by two things which apparently were different from what I had seen on the continent (in Austria and Denmark): (1) the small size of the thyroid gland; and (2) the rarity of athero-sclerosis. During the past year I have weighed most of our thyroid glands in order to obtain knowledge of its average weight in healthy Icelandic persons.

According to Thomas<sup>1</sup> the thyroid gland weighs 3 g. at birth, decreases during the first year of life to weigh 2 g. after twelve months, but has regained its initial weight of 3 g. at 3 years. From this age it increases in weight by 1 g. per year until 25 years, and in the following 10 years by 3 g. Wegelin<sup>2</sup> finds the weight of the thyroid almost constant from 20-50 years, Jaffé<sup>3</sup> also. In order to determine the normal weight for grown-up people in Iceland I have taken the average weight of thyroid glands in this age-period. Our findings are as follows:—

	Average weight of thyroid gland in grammes.
20 females, aged 20-50 years .. ..	11.3
14 males, " " " " " " " " " " .. ..	14.9
57 males and females above 20 years of age .. ..	13.3

The numbers are not great, but they reflect no doubt correctly the state of affairs in Iceland. Among 14 males the smallest gland weighed 7 g., the biggest 24, one 12, and one 13, but all the others 14-16 g. In the women the smallest gland at this age-period was 7 g., the biggest 19 g.; of 20 glands six were below 10 g. In the 61 bodies above 20 years from whom the glands were weighed we found four above 40 g., all in females. Two had Graves's disease (54 and 57 years), the two others were 47 and 67 years of age. These glands were evidently abnormal and not included in the above survey. In three we found glands weighing 21-27 g., one female and two males, one of them a foreigner. In all the other 54 who were 20-70 years of age the thyroid gland was below 20 g.

### COMPARISON WITH OTHER COUNTRIES

It is interesting to compare our figures with those of other countries:—

	Average weight of thyroid gland in grammes.
Germany (Vierordt <sup>4</sup> ) .. ..	33.8
(Orth, <sup>5</sup> Berlin) .. ..	30-60
(Weibgen, <sup>6</sup> Bavaria) .. ..	37.2
(Hück, <sup>7</sup> Kiel and Rostock) .. ..	20-25
Italy (Castaldi, <sup>8</sup> Florence) .. ..	20-25
Switzerland (Rössle, <sup>9</sup> Berne) .. ..	37-55
( " " Basle) .. ..	25-30
Belgium (Thomas, <sup>1</sup> Ghent) .. ..	20-27
France (Guiart, <sup>10</sup> Letulle <sup>11</sup> ) .. ..	24-25
U.S.A. (Jaffé, <sup>3</sup> Chicago) Whites .. ..	28
♂	♀
England* .. .. 20.5 g.	19.4 g.
Japan (Horisawa <sup>12</sup> ) .. .. 17.5 g.	15.3 g.
Iceland .. .. 14.9 g.	11.3 g.
	12.8

Wegelin attributes the smallness of the thyroids in Japanese to their relatively small body-weight, but

\* I am greatly indebted to Prof. Turnbull, London Hospital, for permission to publish figures collected from his post-mortem protocols, where the weights of different organs are carefully recorded. These figures are from the 1934 protocol, being the average weights of 52 females and 78 males between 20 and 50 years (4 cases of Graves's disease and 13 glands above 40 g. in this age-period being omitted).

this argument is not valid for Icelanders, who are, according to Hannesson's<sup>25</sup> measurements, among the tallest people of Europe.

The question arises which of the above-mentioned figures are to be regarded as "normal" for the thyroid gland. It is evident that Vierordt,<sup>4</sup> in his "Daten und Tabellen," has adopted too high a standard, and most authors now agree that 20-25 g. should be regarded as the average normal weight for grown-up persons. Then the figures from Japan and Iceland would be too low and one might expect symptoms of dysthyreosis among these nations. As to Iceland, signs of this are unknown, and basal metabolism is on much the same level as in other countries. The fact that we have two cases of Graves's disease among 286 autopsies might point to a tendency to hyperthyroidism, but our figures are too small yet to permit a judgment on that point.

### FACTORS INFLUENCING SIZE OF THYROID

We know that the goitre districts in Europe, North America, Asia, and Africa are practically all in the inner parts of the continents (in England, Derbyshire). Although the problem of aetiology is still a matter of controversy, the theory of iodine deficiency, advanced by Chatin<sup>13</sup> 80 years ago, seems to be better founded than any other. The exact investigations of v. Fellenberg<sup>14</sup> on the iodine-content of food and drinking-water in the goitre-free La Chaux de Fonds, in comparison with the conditions in the goitrous Signau in Emmenthal showed the far greater iodine intake in the goitre-free La Chaux de Fonds. McClendon and Hathaway have shown the inverse relation in North America between goitre and iodine in food and drink, and Hercus, Benson, and Carter<sup>15</sup> have demonstrated the relationship between iodine in soil, plants, and animals, the iodine content of human food being chiefly dependent on the soil from which the population is indirectly nourished. The introduction of iodine admixture to the salt in goitrous districts has given good results, and the evidence is already becoming overwhelming that iodine deficiency plays the foremost rôle among the causal factors of endemic goitre.

Although iodine deficiency is the most important causal factor in goitre, other factors may also influence the size of the thyroid gland. Thus Sahovic and Frajnd<sup>16</sup> observed that rabbits fed on cabbage and potatoes developed a bigger and heavier thyroid and showed less increase in weight than those fed on ordinary food, and Webster<sup>17</sup> came to the same result, that cabbage contains a goitrogenous substance, probably a cyanure.

The theory of iodine deficiency conforms well with our findings in Iceland, where iodine intake seems to be unusually great. Iodine is chiefly contained in the sea, and we know that sea-plants and fish are the richest sources of iodine in human food. Icelanders, and particularly the inhabitants of Reykjavik, whence our material is chiefly derived, are great fish-eaters, and as all the population of the country lives along the coast, within 50 miles from the sea, the air must contain relatively much iodine. The New Zealand investigators have confirmed Chatin's findings, that igneous rocks are richer in iodine than sedimentary rocks, and as soil rich in alkaline earth carbonates is particularly active in this respect, the Iceland soil is probably rich in iodine, being alkaline and of volcanic origin.

According to McClendon<sup>18</sup> the Japanese are great consumers of iodine rich seaweeds, and he attributes to that fact the low weight of their thyroids and the absence of goitres. Seaweed was up to this century

eaten in various parts of Iceland, but its consumption has practically ceased now, so that it cannot be alleged to be of importance in this connexion here. The drinking-water in Reykjavik is exceptionally pure spring water, containing minimal amounts of mineral salts and is practically sterile. Cabbage consumption is minimal compared with other European countries and potato consumption similar if not slightly less than on the continent.

These factors might be of some influence, although fish-eating is probably the all-important factor. Nicolaysen and Lunde, investigating iodine in urine among Norwegians, found people who had one to three fish-meals a week excreting almost double the amount found by those who took no fish.

**ATHERO-SCLEROSIS**

Another thing which is striking when autopsies here are compared with what one sees on the continent is the rarity of athero-sclerosis. I have tried to compare our findings with those of other pathologists, but such comparison involves a considerable difficulty, as atheromatosis (= lipoid infiltration) and athero-sclerosis (= lipoid infiltration + calcification) are not always clearly distinguished. In our cases we have noted as atheromatosis lipoid thickenings of the intima and as athero-sclerosis where hard, calcareous patches were found. From our records I find the following figures on changes in aorta:—

Age.	Athero-sclerosis.	Athero-matosis.	No changes (smooth aorta).	Not noted.	Per cent. athero-sclerosis.	
					(a)	(b)
30-39	1	1	16	20	11.0	5.3
40-49	2	1	19	26	13.7	6.3
50-59	6	1	15	19	31.8	17.1
60-69	9	2	11	12	50.0	32.4
70-79	14	—	1	5	93.0	70.0
80-89	3	—	—	3	—	—

The true percentage must lie somewhere between those in columns (a) and (b) in which the "not noted" cases are excluded and included respectively.

For comparison the findings of atheromatosis in fallen soldiers by Mönckeberg<sup>19</sup>:—

Years of age.	Showing athero-sclerosis.		
	Cases.	Number.	Per cent.
Under 20	.. .. 14	.... 5	.... 36
" 25	.. .. 45	.... 34	.... 76
" 30	.. .. 20	.... 18	.... 90
" 35	.. .. 15	.... 12	.... 80
" 40	.. .. 16	.... 16	.... 100
" 45	.. .. 1	.... 1	.... 100

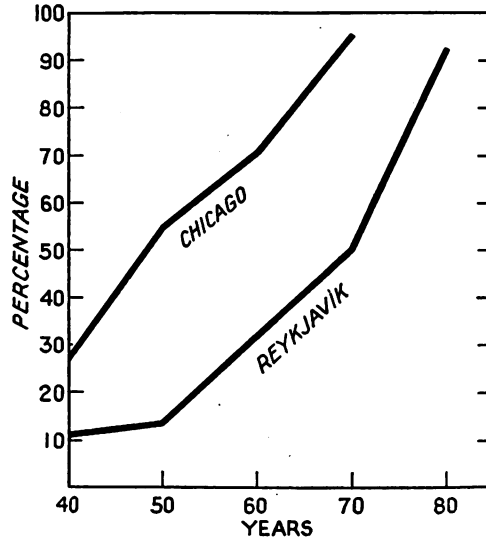
Aschoff adds that other pathologists have found similar figures. Rosenthal<sup>20</sup> studied athero-sclerosis of aorta in 500 autopsies in Chicago in white and coloured persons. The negroes showed higher figures of sclerosis than the whites. As this author has divided his cases into three groups, (1) those with smooth aortas, (2) slight athero-sclerosis, and (3) severe athero-sclerosis, his findings are comparable with ours. The following Graph shows athero-sclerosis found by him in 306 whites and our findings, whereby our higher figures are taken (from column (a)).

This graph shows the great difference between athero-sclerosis in Iceland and Chicago, and, as above mentioned, the figures for other countries do not appear to be lower than those for Chicago. It must be noted that in most of our cases, up to 70 years of age, the sclerosis found is only slight, or a few calcareous patches in the aorta.

**DISCUSSION**

Although our material is not yet great, it is evident that the Icelandic population has (1) an unusually

small thyroid gland, and (2) an unusually low rate of athero-sclerosis of the aorta. Athero-sclerosis of other arteries is also relatively rare. The question arises whether there is a causative relationship between the small thyroid and the low sclerosis-rate. Experimentally athero-sclerosis can be produced, in rabbits, by injection of adrenaline (Josué<sup>21</sup>) and by feeding with irradiated ergosterol (vitamin D). Liebig<sup>22</sup>



Percentage of athero-sclerosis found post mortem at various ages in Chicago (Rosenthal) and Reykjavik (Dungal).

administered diodol to rabbits during the feeding with cholesterol and thereby prevented or diminished atheromatosis in aorta and liver. Binet<sup>23</sup> has shown that potassium iodide and albumin-iodine have the same effect. Murata<sup>24</sup> has shown that atheromatosis may be prevented in rabbits by feeding thyroid gland substance. On the other hand, Pusch has shown that arterio-sclerosis is four times as frequent with goitres as with non-goitrous glands.

Probably the explanation for these conditions in Iceland is the abundance of iodine in our food, particularly the fish, which is consumed in relatively great amounts, but partly also by the iodine in air and soil which in all probability is great. In this connexion it may be mentioned that the Icelandic people ranges high in physical and mental powers. The question then arises whether the normal weight of the thyroid gland is not lower than that generally accepted, and whether a low degree of iodine deficiency is not more widespread than we think it is.

**SUMMARY**

The weight of the thyroid gland in Icelanders between 20-50 years of age is for males 14.9 g. and for females 11.3 g. Average weight for 57 persons over 20 years of age was 13.3 g. Athero-sclerosis in the population is unusually rare, and it is probable that abundance of iodine in food, soil, and air is the cause of both these phenomena.

**REFERENCES**

1. Thomas, F.: Compt. rend. Soc. de biol., 1933, cxii., 217.
2. Wegelin, C.: Henke-Lubarsch, Handbuch der speziellen pathologischen Anatomie, 1926, viii., 15.
3. Jaffé, R. H.: Arch. of Path., 1930, x., 887.
4. Vierordt, H.: Daten und Tabellen, Jena, 1893 (ref. Wegelin loc. cit.).
5. Orth, J.: Lehrbuch der speziellen pathologischen Anatomie, Berlin, 1887, i. (ref. Wegelin loc. cit.).

(Continued at foot of next page)

## CLINICAL AND LABORATORY NOTES

**SUBCUTANEOUS EMPHYSEMA  
OCCURRING SPONTANEOUSLY IN A CASE OF  
PULMONARY TUBERCULOSIS**

BY BRIAN C. THOMPSON, M.D. Camb.

ASSISTANT TUBERCULOSIS OFFICER, DURHAM COUNTY  
COUNCIL

THE patient is a man aged 37, known to have been suffering from pulmonary tuberculosis since an initial hæmoptysis in 1930. He has twice been in sanatoria, and when last discharged in July, 1935, had extensive, rather chronic involvement of the upper halves of both lungs, with a large cavity in the right apex and tubercle bacilli in his sputum. His condition tended to deteriorate about the beginning of 1936, when he steadily lost weight and complained of abdominal symptoms.

At 1 A.M. on April 3rd, while sitting by the fire, he was seized by a pain in the right side and a "freezing" sensation which caught his breath. He felt ill and went to bed, and about an hour later became conscious of a fullness in the neck, which by daylight had become so pronounced that he thought he had "caught the mumps." He called in his private doctor, who found that the swollen tissues gave on palpation the crackling sensation characteristic of subcutaneous emphysema.

I was not at once informed of the condition and did not see the patient until April 8th, when the emphysema had reached its maximum. The bloated appearance of the patient was most striking, and crepitus was elicited over an area extending from both sides of the face as far as the temples, over both sides of the neck anteriorly to the second rib on the left and to the costal margin on the right, posteriorly to the angle of the scapula on the right, including the axilla and upper six inches of the right arm. There were no physical signs of pneumothorax and the patient seemed fairly comfortable. From that time the infiltrating air began to subside, leaving the neck first and the right side of the thorax last. On April 21st no crepitation could be felt and the patient expressed himself "fitter than ever since leaving the sanatorium." The X ray appearances at this time showed no striking changes from a previous film taken a year before. There was no sign of any pneumothorax. Now,

about six weeks later, the patient is clinically in about the same condition that he was nine months ago. His alarming experience has left no obvious ill-effect. He himself believes that it has done him good.

Spontaneous subcutaneous emphysema, as distinct from the interstitial emphysema which may occur following external trauma, surgical operations (especially tonsillectomy<sup>1</sup>), and the induction of artificial pneumothorax,<sup>2</sup> is a not infrequent complication of parturition<sup>3</sup> and of acute respiratory disease. It was found in 11 out of 1701 cases of influenzal bronchopneumonia during the 1918-19 epidemic,<sup>4</sup> and has from time to time been reported in connexion with bronchial asthma,<sup>5</sup> pulmonary emphysema, and acute pneumonia, particularly during childhood,<sup>6</sup> often with a fatal termination.

As a complication of pulmonary tuberculosis it is said by Fishberg<sup>7</sup> to be "very rare." It was first described in this connexion in 1919 by Chifoliau,<sup>8</sup> and only three subsequent cases appear to have been reported, by Pick<sup>9</sup> in 1925, by Meade and Stafford<sup>10</sup> in 1930, and by Dobbie in this journal last February.<sup>11</sup> In Chifoliau's case, air was liberated into the subcutaneous tissues from a superficial cavity adherent to the chest wall, and from thence spread over the thorax. Dobbie's case and Pick's case were clinically similar to that at present under discussion; in the former dyspepsia proved fatal 58 hours from onset. The case of Meade and Stafford was preceded or accompanied by the formation of a spontaneous pneumothorax on the left side; this was relieved by thoracotomy, after which the subcutaneous emphysema spread so widely and so embarrassed the patient that it became necessary to release the air by multiple skin incisions, which was followed by tardy recovery.

Theoretically, there are two possible routes by which air may pass from the lung to the subcutaneous tissues:—

(1) Intrapleural, through a breach in the visceral pleura and subsequent perforation of the parietal pleura from the pneumothorax so formed. An extravasation through adhesions between the pleurae, as in Chifoliau's case, is not, strictly speaking, intrapleural.

(2) Extrapleural, in which air escapes from the lung along the course of the blood-vessels to the posterior mediastinum and from thence to the superior mediastinum, to appear first in the lower part of the neck. This route was demonstrated by Berkeley and Coffin<sup>4</sup> at autopsy on several of their cases of broncho-pneumonia. At the peripheral lung border they found ruptured emphysematous bullæ, from which "air streaks" led through the vessel sheaths; on squeezing the lung under water with the pleura intact, bubbles of air appeared profusely at the hilum.

Spontaneous subcutaneous emphysema arises in the majority of cases probably by the extrapleural route; this can explain satisfactorily most cases due to non-tuberculous disease and also Pick's and Dobbie's cases. Meade and Stafford suggested that in their case the air escaped both intra- and extrapleurally, that the pneumothorax restrained by pressure any further passage of air to the hilum, and that relief of this pressure by thoracotomy allowed the extrapleural leakage to proceed.

In the present case, widespread tuberculosis in both lungs must have caused subpleural erosion at some point. Instead of perforating the pleura, the formation of a spontaneous pneumothorax, the air passed by vessel sheaths to the mediastinum, and thence to the subcutaneous tissues of the neck. Heal-

PROF. DUNGAL: *References*

(Continued from previous page)

6. Weibgen, K.: Zur Morphologie der Schilddrüse des Menschen, Münch. med. Abhandl., 1891, No. 14 (ref. Wegelin loc. cit.).
7. Hück: Deut. Zeits. f. Chir., 1922, p. 174 (ref. Wegelin loc. cit.).
8. Castaldi, L.: Arch. ital. di anat. e di embriol., 1922, p. 18 (ref. Wegelin loc. cit.).
9. Rösle, von R., and Roulet, F.: Mass und Zahl in der Pathologie, 1932, vol. v.
10. Guiart: Thèse de Paris, 1896 (ref. Jaffé loc. cit.).
11. Letulle, M.: Anatomie Pathologique, 1931, iii., 2149.
12. Quoted by Wegelin loc. cit.
13. Quoted by Harington, C. R.: The Thyroid Gland, London, 1933.
14. Ditto ditto ditto
15. Ditto ditto ditto
16. Sahovic, K., and Frajnd, K.: Compt. rend. Soc. de biol., 1934, cxv., 869.
17. Webster: Endocrinology, 1932, p. 16 (ref. Sahovic and Frajnd loc. cit.).
18. McClendon, J. F.: Münch. med. Woch., 1933, lxxx., 1039.
19. Quoted from Aschoff, L.: Vorträge über Pathologie, Jena, 1925, p. 69.
20. Rosenthal, S. R.: Arch. of Path., 1934, xviii., 473, 660.
21. Josué: Presse méd., 1903 (ref. Jores in Henke-Lubarsch, Vol. II.).
22. Liebig, H.: Arch. f. exp. Path. u. Pharm., 1934, clxxv., 409.
23. Binet, L., &c.: Leçons de physiologie médico-chirurgicale, Paris, 1935.
24. Murata: Path. Soc. Japan, 1920, p. 105 (ref. Aschoff loc. cit.).
25. Hansson, G.: Körpermasse und Körperproportionen der Isländer, Reykjavik, 1925.

ing of the ruptured surface and absorption of extravasated air resulted in recovery within three weeks.

## REFERENCES

1. McCready, P. B.: *Arch. of Otolaryng.*, 1935, **xxii**, 331.
2. Selby, H.: *Brit. Med. Jour.*, 1932, **ii**, 734.
3. Hobbs, F. B.: *Ibid.*, 1930, **i**, 950.
4. Berkeley, H. B., and Coffen, T. H.: *Jour. Amer. Med. Assoc.*, 1919, **lxxii**, 535.
5. Davidson, F. C.: *THE LANCET*, 1935, **i**, 547.
6. Tilley, J. B.: *Newcastle Med. Jour.*, 1930, **xi**, 88.
7. Fishberg, M.: *Pulmonary Tuberculosis*, Philadelphia, 1932, **vol. ii**, p. 171.
8. Chifoliau, P.: *Progrès méd.*, 1919, **xxxiv**, 140.
9. Pick, E.: *Wien. klin. Woch.*, 1925, **xxxvii**, 508.
10. Meade, R. H., and Stafford, F. B.: *Amer. Rev. Tuberc.*, 1930, **xxi**, 579.
11. Dobbie, D. N.: *THE LANCET*, Feb. 15th, 1936, p. 365.

## TORSION OF THE VERMIFORM APPENDIX ASSOCIATED WITH PREGNANCY

BY GERALD FLATLEY, M.B. Belf.

RESIDENT MEDICAL OFFICER IN THE MATERNITY DEPARTMENT,  
MILE END HOSPITAL, LONDON

ON mechanical grounds alone, from its position and structure, the vermiform appendix appears to lend itself to torsion. The condition is, however, exceedingly rare, and a careful search reveals only a single case reported in English—that described by McFadden<sup>1</sup> in 1926. In neither English nor continental medical literature have I been able to trace its occurrence during pregnancy. In view of this, the following case-note may be of interest.

A primigravida, aged 22, was admitted to Mile End Hospital on Feb. 11th, 1936, with the history that she had been awakened 38 hours before by very severe periumbilical pain. She had vomited several times without relief. The pain was still present, had not radiated, and

<sup>1</sup>McFadden, G. D. F.: *Brit. Med. Jour.*, 1926, **ii**, 1223.

at the time of admission was but slightly less severe than at onset.

*Examination.*—Well-nourished young adult. Pulse-rate 100. Temperature 100° F. Blood pressure 128/80 mm. Hg. Slight malar flush. Tongue very furred and dry. Nothing abnormal noted in thorax.

Abdomen: uterus 26 weeks' size—i.e., corresponding to the period of amenorrhœa. Left occipito-anterior presentation; head not fixed. Fœtal heart heard, the rate being 130. Great tenderness on either side of the umbilicus, right rather more than left, and associated with some rigidity of the right rectus.

*Diagnosis* appeared to rest between acute appendicitis and red degeneration in a small intramural fibroid.

A blood count by the Mile End Group Laboratory just before operation gave a white cell count of 18,000 per c.cm., of which 91.5 per cent. were polymorphonuclears, 6.5 per cent. lymphocytes, 1.5 per cent. monocytes, and 1.5 per cent. basophils. The Schilling hæmogram gave a toxic index of 0.7.

*Operation.*—Abdominal section was decided upon, and after premedication with morphine sulphate gr.  $\frac{1}{4}$  and hyoscine hydrobromide gr. 1/100, a right lower paramedian incision was made under spinal anaesthesia (per-caine 14.2 c.cm.). The uterus was normal. The cæcum was brought into the wound and the appendix, pre-leal in position, was found to have become twisted through two and a half turns about a point half an inch from the proximal end. The distal portion of the appendix, 3 $\frac{1}{2}$  in. long, was gangrenous. The appendix then proceeded to unwind itself slowly without mechanical aid. Appendectomy was performed and the abdomen closed.

Microscopical investigation of the appendix by the L.C.C. Central Histological Laboratory showed "purulent peritonitis over a dilated, necrosed, and engorged appendix."

Despite intensive medication with sedatives, labour began and the patient delivered herself of a 27 weeks' miscarriage eleven days after operation. Convalescence thereafter was quite uneventful.

I am indebted to Dr. Alan Randle, superintendent of Mile End Hospital, for permission to publish this case.

## REVIEWS AND NOTICES OF BOOKS

### Treatment of Venereal Disease in General Practice

By THOMAS ANWYL-DAVIES, M.D., B.S., M.R.C.P. Lond., Director, L.C.C. Whitechapel Clinic; Consulting Venereologist to the L.C.C.; Lecturer in Venereal Diseases to London Hospital Medical College. London: John Bale, Sons and Danielsson Ltd. Pp. 202. 7s. 6d.

ONE of the disadvantages of increasing specialisation in medicine is the danger that the general practitioner may lose touch with modern methods of treatment in certain highly specialised branches, especially when, as in the case of venereal diseases, references to these subjects in current medical periodicals are relatively infrequent. This small and readable manual from an authoritative source should do much to counteract this tendency in relation to the treatment of these infections.

Dr. Anwyl-Davies has succeeded in compressing a remarkable amount of important matter into a limited space, and has presented facts in a clear and interesting way. The chapters dealing with the treatment of syphilis are particularly good. The various remedies are enumerated and discussed, and the methods of administration described. Principles of treatment, dangers, and precautions are well set out; and practical schemes of treatment adapted to the individual needs of patients and to the different stages of the disease are suggested. On the more

controversial subject of gonorrhœa description is wisely confined to the methods which the author himself favours, but in respect of these practical detail is not spared. The treatment of less common venereal infections is briefly summarised.

Certain blemishes detract from the general excellence of the work; among them is a tendency to the use of a loose terminology, especially in reference to pathological and metabolic processes. "Paralysis of the liver" is not a scientific or even an accurate description of the toxic effects of the arsenobenzenes upon the liver cells; and the statement that "alcohol . . . reduces the antigenic properties of the blood," even if it were correct, is hardly relevant to its context. Occasionally, too, the author's enthusiasm for some particular form of treatment outruns his discretion in recommending this treatment for general use. For example, however good may be the results obtained by experts, the practice of treating acute gonococcal cervicitis and salpingitis by the intra-uterine instillation of glycerin would be dangerous in unskilled hands. The statement that the dosage of non-detoxicated gonococcal vaccines varies from 5000 million organisms to a maximum of 80,000 millions is probably the result of a printer's error, but it might lead to unfortunate results if accepted and applied by the practitioner. Apart from such errors, which are very few in number, this book is a most welcome addition to the small number of practical manuals on this subject.

## Poverty and Health

By G. C. M. M'GONIGLE, M.D., D.Hy., D.P.H., and J. KIRBY, M.R.S.I. With a foreword by Sir F. GOWLAND HOPKINS, O.M. London: Victor Gollancz Ltd. 1936. Pp. 278. 6s.

It is right and necessary that medical men working in the distressed areas should make known their views on unemployment. Dr. M'Gonigle is medical officer for Stockton-on-Tees, and his book, written in collaboration with Mr. J. Kirby, is intended to bring the problem of malnutrition more urgently before profession and public. After pointing to the unsound physical condition of the population, as indicated by the unfitness of recruits to the Services, the authors turn to the state of the children and provide an interesting chapter on the examination of child welfare records. The essential part of the book, however, is based on Dr. M'Gonigle's well-known observations on a population removed from a slum area to a new housing estate. By this translation the rents of the families were increased by 4s. 4d. per week, thus reducing the margin available for food. To malnutrition is attributed the subsequent increase in the crude death-rate from 18.75 to 26.71, and "approximately a four-fold increase on a normal expected death-rate." The objection to this argument is that the findings are based on too small a sample. The population at risk was only 710, on which population the crude rates quoted show 13 and 19 actual deaths—figures which are insufficient for valid deductions. Incidentally the actual causes of death might well have been set out so that their relation to nutrition might be considered.

This reliance on small samples affects also other of the conclusions drawn. Thus comparisons are made of death-rates of employed and unemployed based on populations of 1564 and 1572. There are shown crude death-rates of 25.47 for unemployed and 17.1 for employed, and standardised rates of 29.29 and 21.01, and these latter are compared with expected rates of 8.75 and 8.53. Dr. M'Gonigle and Mr. Kirby may well refer to the figures as startling; but are they justified? For any validity the calculation needs to be made from a much wider basis. The conclusions have to be set against such a statement as the following, from the Registrar-General's Decennial Supplement England and Wales, 1931 (Part I.).

"The following comparative figures (Table P) indicate the relation of the recent experience in these sections to that disclosed by the 1921 investigation. It will be seen that in the Northumberland and Durham County Boroughs there has been a substantial improvement at all the ages shown in the table except at age 20 in the case of females. This is a matter of high importance as proving that the death-rates in the worst years of the economic depression and in an area ranking among those most severely hit by that depression exhibit no increase. On the contrary the mortality experience in this section is lighter than that disclosed by the previous decennial investigation, and on the analogy of the national experience there is reason to believe that if research were carried back sufficiently far it would be found that in the years 1930-32 the mortality experience of the County Boroughs of Northumberland and Durham was lighter than that of this area in any corresponding period in the present century."

Table 50 of the book sets out various income scales and corresponding death-rates as means of a four-year period. The figures show a variation of crude death-rate from 30.96 at 25s. to 35s. per week to 9.00 at 75s. or over per week, and a variation of standardised rates from 25.96 to 11.52. The populations in the five groups vary from 1187 to 132. The

population in the highest grade is 140, and the crude death-rate is 9.00, which represents 1.26 deaths per annum. We do not doubt the accuracy of these data, but it seems to us that, with so small a population observed over so short a time, it cannot be concluded that the observed numerical differences represent real differences in the mortality of the contrasted categories. The figures are suggestive, but the deductions must be tentative.

Less controversial are the chapters devoted to food and family budgets and expenditure. These show an intimate knowledge of social conditions and the detailed analysis of expenditure merits careful perusal. They are a revelation of how the poor live. The various necessary items of expenditure apart from food are given, and Tables 46 and 47 show food expenditure in ingredient value and in quantity. The main point brought out, and which has been elsewhere emphasised, is the shortage of protein, and no one can doubt the importance of laying stress on this, especially in relation to the growing organism. It may be noted, for example, that the weekly amount of fresh milk purchased per man-value in the lowest income group was only 0.55 pints; this may be related to C. M. Burns's investigation of the consumption of milk by 1000 families in County Durham which showed "the figures for whole milk purchased are appallingly low, ranging from 0.25 pints to 0.005 pints per head per day."

As we have said, the conditions of the distressed areas must somehow be brought home to the mind and conscience of the more favoured population. Too many of us have still a quite inadequate appreciation of the circumstances; Jarrow and Oxford-street are in different worlds. It is not surprising that the authors of this book, confronted by the problems presented in a district of heavy and continued unemployment, should be oppressed by their urgency; probably they could say with the Psalmist "The zeal of thine house hath eaten me up." But their deductions seem to us incompletely justified by their data. The book therefore should be read, but it should be read critically.

## The Operations of Surgery

By R. P. ROWLANDS, M.S., F.R.C.S., late Surgeon to Guy's Hospital; and PHILIP TURNER, B.Sc., M.S., F.R.C.S., Consulting Surgeon to the Hospital. Eighth edition. Vol. I. London: J. and A. Churchill Ltd. 1936. Pp. 1045. 36s.

HOWEVER skilful he may be the young surgeon must often be conscious of his lack of experience; not so much when performing an operation for the first time as in selecting the cases suitable for surgical treatment and avoiding the "wrong 'uns." It is in this respect that the advice of a senior colleague may be so helpful, and the most valuable attribute of "Rowlands and Turner" is that it provides a written substitute for the wise counsellor. In the final production of this volume Mr. Philip Turner has been deprived of the collaboration of Mr. R. P. Rowlands, who died while this eighth edition of the work was in course of preparation. He has been fortunate in obtaining the assistance of Mr. W. H. Ogilvie and Mr. Grant Massie, who have undertaken the revision of the chapters on the vertebral column and the lower extremity, and a determined effort has been made to maintain the high reputation so justly enjoyed by the earlier editions of "Jacobson." The sections of the book



which deal with the surgery of the limbs required very little revision, and the new matter added by Mr. Grant Massie on the lower extremity has been clearly set out, though it might have been an advantage to include rather more detail about the indications for the orthopædic operations, and fuller descriptions of those for various forms of talipes.

When bringing out another edition of a well-established text-book it must be hard to decide how much to keep of the old and how much to add of the new in surgery. For the most part Mr. Turner's decisions have been wise, and adequate accounts are given of plastic operations, recent experience of the use of radium in carcinoma of the tongue and of the breast, cervico-thoracic ganglionectomy, and the recognition and removal of tumours of the parathyroid gland. On the other hand, commonly accepted innovations in the surgery of cervical rib, ankylosis of the jaw, thyroglossal cysts, and the thyroid gland are omitted; the chapters on the brain and on the thorax are lamentably out of date; and it is high time that longitudinal incisions in the neck should be condemned in any but the most exceptional circumstances. Criticism must also be directed at the references to the literature which supply volume and page but no date. A large number of these references are very old, and it is essential that the reader should be able to distinguish them from the more recent ones. The book has been to so many surgeons a wise and trusted friend that those who are entrusted with maintaining its fine traditions have a special responsibility.

### A Manual of Physics

Fourth edition. By J. A. CROWTHER, Sc.D., F.Inst. P., Sometime Fellow of St. John's College, Cambridge; Professor of Physics in the University of Reading. London: Humphrey Milford, Oxford University Press. 1936. Pp. 585. 14s.

THIS manual, now in its fourth edition, has an established place in the presentation of elementary physics. The new features now incorporated lie for the most part in the electrical section where good accounts are given of methods of production of X rays and their physical properties, and of natural and artificial radio-activity. Prof. Crowther has found it necessary to enlarge the section on alternating current, and the result is a very readable and instructive account of electro-magnetic induction and the practical applications which have led to the devising of such a variety of different instruments. The book can be recommended without qualification; it is attractively written, comprehensive, and accurate.

### Introduction to Human Parasitology

Fifth edition. By ASA C. CHANDLER, M.S., Ph.D., Professor of Biology, Rice Institute, Houston, Texas. New York: John Wiley and Sons, Inc.; London: Chapman and Hall Ltd. 1936. Pp. 661. 25s.

THE scope of this book is wider than that of most works on human parasitology. The subject has been divided into three main sections, dealing respectively with protozoa, helminths, and arthropods. Within these sections the chapters have been arranged in a systematic manner, either from the standpoint of zoological classification or from that of effects on the host. While it has obviously not been the author's intention to give a complete account of

all the parasites dealt with, detailed descriptions and figures have been supplied where two important species have to be differentiated—e.g., between *E. histolytica* and *E. coli*, *T. solium* and *T. saginata*, and *X. cheopis* and *X. astia*. Additions made during the last few years to our knowledge of human parasitology have been numerous and important. Particularly extensive changes have been required in many chapters of this book, notably those dealing with spirochaetes, amœbæ, malaria, rickettsias, flukes, strongyloides, filariæ, and myiasis; and in many places complete rewriting and rearrangement have been necessary in order to give an adequate and well-coördinated presentation. Throughout the book special emphasis has been laid on the biological aspects of the subjects. Considerable space is devoted to life-cycles, epidemiological factors, and inter-relations of parasite and host. Specific and detailed directions for the treatment of the parasitic diseases have been excluded, but the underlying principles of treatment and prevention are discussed. Since it is difficult to go very far into such a vast subject as parasitology within the limits of one book, Prof. Chandler has included a list of the leading journals and standard works which cover the field. His enthusiastic outlook is refreshing. The book is well produced and clearly printed with numerous effective diagrams.

### Psychology and Religion

By DAVID FORSYTH, M.D., D.Sc. Lond., F.R.C.P., President of the Section of Psychiatry, Royal Society of Medicine; Consulting Physician to Charing Cross Hospital. London: Watts and Co. Pp. 221. 7s. 6d.

THE discussion of the conflict between science and religion has moved far since the days of Huxley. The earlier concentration on the historicity of the Bible, the testimony of the rocks as against the cosmology of Genesis has more or less ceased, at least outside fundamentalist circles. But with the challenge of anthropology and psycho-analysis the problem has assumed a new and more cultural guise. Religion could stand up to the theory of the evolution of the species, but the real test is whether it can stand firm when psychology and anthropology allege that man's moral and social nature evolves from lower to higher forms. The theory that man passes from a religious to an artistic-philosophic and thence to a scientific level of enlightenment was the view of Auguste Comte. But he did not have a Tylor and Frazer, a Westermarck and a Freud to give chapter, verse, and punctuation to support his views.

In this book Dr. Forsyth builds almost entirely on Freud's theories of the development of the child mind and his theory of social origins. No one will deny that Freud's œdipus complex has illuminated the dynamics of the mind and incidentally the origin of society and its usages. But while the Cyclopean family is even to Freud a speculative concept, it is not easy to accept the corollaries of this idea, as applied to human society and its institutions. Moreover, it is not logically sound to equate the imaginative ideas of simpler peoples with the illusory. Religious ideas and folk practices were the ways in which the simpler peoples dealt with the world and their own relations; it was in short their social science. It must be agreed, however, that the abundant use of magic and of some forms of religion is no longer serviceable to humanity and can be positively harmful; for example, its extension into patriotism can

have devastating international effects. Furthermore, Dr. Forsyth is not always up to date in his psycho-analytic data, and perhaps on this account he makes a simple process of what is now known to be a very complex one even in the child mind—i.e., magical thinking and its fructifying effects. Religion is shedding and will doubtless contrive to shed many of its primitive notions, and its anthropomorphisms. But there are some who will for epochs to come continue to feel awed by nature and moved by that "oceanic feeling" which Freud claims he has never felt.

### Cystoscopy and Urography

Second edition. By JAS. B. MACALPINE, F.R.C.S., Hon. Surgeon and Surgeon in charge of the Genito-urinary Department, Salford Royal Hospital, Manchester. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 478. 30s.

NINE years have elapsed since the first appearance of this book, and nine years is a long period in the history of urology. Many new methods of examination have been introduced, the most notable being excretion urography. These advances have necessitated the inclusion of three entirely new chapters dealing with excretion urography, pyeloscopy, and pelvic resorption. Of these the first is the most important, pelvic resorption being mainly of scientific interest, and pyeloscopy a method of examination which, though excellent in principle, is difficult in practice. As the author points out, the presence of a foreign body (the opaque fluid) in the ureter excites efforts at expulsion, and the appearance of the pelvis and calyces under these artificial conditions cannot be regarded as physiological. Moreover, few clinicians have the time or the experience necessary to interpret the constantly and quickly changing shadows seen on the fluorescent screen.

Mr. Macalpine writes clearly, and does not overload his text with theories or quotations from other authorities. His book is eminently practical, and with its help those who have limited experience of cystoscopy and cystoscopic methods will be able to improve their technique and increase their knowledge of cystoscopic conditions. The coloured plates are of a high order, so also are the reproductions of pyelograms illustrating the section on pyelography and excretion urography.

### Disease in Childhood: The First Year

*A Clinical Study.* By ROBERT S. FREW, M.D. Edin., F.R.C.P. Lond., Physician to the Hospital for Sick Children, Great Ormond-street. London: Macmillan and Co., Ltd. 1936. Pp. 669. 30s.

THE age-incidence of disease is a study which has hardly received the attention it deserves, and in reading the preface to Dr. Frew's work one is struck by the good fortune of a physician privileged to see all out-patients in age order for a period of seventeen years. Unfortunately, however, it soon becomes obvious that when the first year of life is subdivided into three age-periods even statistics based on 8823 consecutive cases under 12 years of age, provide a quite inadequate basis for discussion of any except the commonest disorders of childhood. Dr. Frew has not, in this book, supplemented his own experience to any considerable extent by quotations from recent medical literature. This is the more unfortu-

nate because his own views on pædiatric pathology are unconventional. He attributes many of the disorders of childhood, with the exception of tuberculous meningitis, to a condition which he calls "hyperphlebæmia." It would be wearisome to enumerate all the diseases, from laryngismus stridulus to early pulmonary fibrosis, and from cretinism to celiac disease, which he finds due directly or indirectly to this cause. "A bewildering array of clinical manifestations" seems, under the circumstances, a cautious understatement. With sledgehammer logic the author proceeds to apply an Alice-in-Wonderland system of pathology to treatment, with results such as the following: "If, when the baby is born, . . . he is suffering from 'white asphyxia,' the cord should be severed without ligaturing and bleeding promoted by every available means" (p. 144). Similarly after concluding that a failure of the ductus venosus to close at birth is the most likely explanation of "status lymphaticus" (with the cautious proviso that when the opportunity arises, this point will naturally be investigated with great interest), he says: "If this be the ætiology of the disease, then in cases where a thymic shadow is found, I imagine it will not be beyond the skill of the surgeon to ligature the ductus venosus under local anæsthesia before a general anæsthetic is administered" (p. 564). It is difficult under the circumstances to appreciate the few jewels that undoubtedly exist in a somewhat fantastic setting. The book is well printed and contains a number of excellent illustrations.

### Treatment of Fractures in General Practice

*Pocket Monographs on Practical Medicine.* Second edition. By W. H. OGILVIE, M.D., M.Ch., F.R.C.S. London: John Bale, Sons and Danielsson. 1936. Pp. 180. In two volumes. 2s. 6d. each volume.

WE welcome the second edition of these two small green volumes on fractures. It is an achievement to have compressed so much information into small compass and yet to have produced a text easy and pleasant to read. The first part of the work, which covers the 58 pages of Vol. I., is devoted to the general principles of fracture treatment. The enumeration of the headings and subheadings from page 21 onwards still seems to us somewhat unsatisfactory; in all other respects the meaning is clear and the description of methods of treatment concise and easy to follow. From the practitioner's point of view it is an advantage that Mr. Ogilvie describes only methods of proven value, the apparatus for which is readily available. For fractures of the upper limb, for example, the moulded plaster-of-Paris splint is described and illustrated. Skeletal traction is recommended in fractures of the lower limb, but methods of skin traction are also described, and the practitioner is advised to use these where the case is being nursed under less ideal conditions. It is interesting to find an account of a serviceable method of treatment by continuous traction of fractures of the neck of the femur; this is recommended for use in very feeble patients. The operation described for this fracture is by the Watson Jones modification of the Smith-Petersen's pin fixation. In general, however, open operation for fractures is properly relegated to a secondary position.

This excellent monograph is worthy of a place in the surgery of every practitioner and in the pocket of every student.

# THE LANCET

LONDON: SATURDAY, JUNE 13, 1936

## CARE FOR THE DEAF

ON Thursday the National Institute for the Deaf celebrated its silver jubilee with the opening by H.R.H. the Duke of YORK of new headquarters at 105, Gower-street, London, W.C.1. An appeal is being made by Lord CHARNWOOD, the president of the Institute, for larger support of a movement which during its 25 years of existence has proved the necessity of the objects for which it exists and justified the energy with which the officiate has laboured to overcome great difficulties. The first of those difficulties is the general apathy, due to lack of information, displayed by the public in regard to the position of the deaf in the community. Year by year at annual meetings of the Institute the case of the deaf has been brought forward with the intention to show how vastly the deaf can help themselves, if only they meet with help from their more fortunate brethren, and to illustrate how large is the range of activities along which the deaf can prove themselves valuable citizens, when the courtesy and patience necessary to bring about normal intercourse are extended to them. Reasoned advocacy along these lines has produced during the existence of the Institute practical results. Associations made up of representatives of deaf societies and of public authorities have been established in many areas, covering indeed England and Scotland, and similar centres it is to be hoped will soon be established in Wales and Northern Ireland. Such public and private movements have produced many beneficial results, among others the vital one of the placing of many deaf in employment. But the aims of the Institute cannot be fully realised till adequate provision is made for the training of the adolescent deaf, for their re-training when necessary, and also for the replacing in suitable work of adults who have become deaf through disease or accident. Lord CHARNWOOD, an untiring public servant, points out in his jubilee appeal that these developments will entail the strengthening of voluntary societies to fit them for larger responsibilities, while districts in which the interests of the deaf are still unrepresented by any society must be stimulated to play their part.

No special legislation exists to protect the interests of the deaf, apart from that which entitles deaf children to suitable education. Their cause has been the concern of the National Institute, a voluntary body, and of its affiliated associations and voluntary local societies. The Institute maintains three organisations for deaf women and working deaf boys, and acts as a clearing house for the work of the county associations. Its scope is largely administrative and will be found well set out in its publication "All About the Deaf."<sup>1</sup>

<sup>1</sup> London: The National Institute for the Deaf, 105, Gower-street, W.C.1. 1934. 1p. 122. 3s. 3d.

Here will be seen how the deaf are helped and how they may help themselves. And in this publication Lord CHARNWOOD draws the valuable if self-evident distinction between the case of those deafened through injury or disease and those born deaf, in whom the prevention of deafness has not to be considered. The only State inquiry into the conditions of the deaf made during the last 50 years was summarised in a report by the late Dr. EICHHOLZ in 1930. But this document, though embodying the result of the first investigation of the State into the needs of the deaf over school age, paid little attention to the needs of the deafened, who form a much larger class than the born deaf. The Institute desires to see the compulsory school age lowered to five years for children born deaf; for their investigations prove that, if speech is to be acquired by deaf-mutes in a way to fit them for playing their part in national life, it must be acquired young. Relegation of education until the age of seven is extremely unfortunate. Further an extension of suitable educational opportunities for school leavers is needed, while another just reform among the objects of the Institute is the granting of earlier old-age pensions to those who through deafness are unable to support themselves by their own labours. This would bring the treatment of the deaf into line with that of the blind, and to be deaf is as much a deprivation as to be blind. The sad case of the blind is spectacular; that of the deaf must go without public notice.

Other aims of the Institute, emphasised by Lord CHARNWOOD in his appeal, are, first, the maintenance for both sexes of hostels for the adolescent deaf similar to those for homeless deaf boys successfully established at Highbury; and, secondly, the establishment of homes to receive the adult deaf on the lines of the Institute's homes at Barrowford in Lancashire and Poolemead in Somerset. In these places the inmates are made happy through being able to communicate with one another and with the trained staffs; while to lessen the hardship of isolation—the heaviest burden which the deaf subject has to bear—the Institute has started lip-reading classes at its headquarters for the deafened generally. In these and other ways the headquarters of the Institute has become a clearing house for all matters connected with the deaf. In close touch with the principal deaf societies throughout the world, it has established with them a systematic exchange of the latest results of research into deaf problems of all kinds. Through a skilled staff and a medical committee of distinguished aurists; an executive committee on which are represented the regional associations, the London County Council, the associations of county councils, many municipal corporations and education committees, various local deaf societies, the National College of Teachers of the Deaf, and individual members of both Houses of Parliament, the Institute is in close touch with the Ministries of Education, Health, and Labour. It is thus able to combine research and organisation on a national scale with individual help to the deaf in all parts of the United Kingdom.

All this in 25 years. But much remains to be done. Probably there are some 40,000 deaf-and-dumb persons among us and perhaps two million seriously deaf. The helping of such a population is a gigantic task and at every step the Institute has been hampered in its efforts by lack of adequate funds. Its new headquarters, made necessary by the rapid growth of its services, should be freed from debt, and this burden now stands at £8000. But for the extension of its labours, if only along the lines already laid down, at least £50,000 is required. To find this sum the jubilee appeal approaches the public with confidence. It is after all a small sum that is asked for when compared with the benefits conferred on a section of society who especially deserve help from the community, if only because of the return which when helped they can make.

### MICE AND MEN

ALL who are interested in epidemiology and scientific medicine will welcome a report by GREENWOOD, BRADFORD HILL, TOPLEY, and WILSON, which has just been published by the Medical Research Council.<sup>1</sup> For nearly twenty years one or more of this team of statisticians and bacteriologists have been producing papers on the spread of epidemics under controlled conditions among herds of mice. In the present report they conveniently summarise the results of their previously published work and add some new observations, including an account of epidemics of the virus disease of mice known as ectromelia. It is possible here to mention only a few of the more important conclusions that are to be drawn from this continuous study of mouse infections. One of the most remarkable findings is that, although under certain conditions waves of mortality may be separated by quiescent periods, yet infection of a herd with *Bacillus aertrycke* (mouse typhoid) or *Pasteurella muriseptica* will never die out so long as fresh susceptible mice are added at intervals. The continuity of infection between separate epidemic waves is maintained by chronic infections among the more senior mice which have survived one or more waves of mortality. These survivors are nevertheless not permanently immune to the specific infection and will ultimately die of it if they remain in the infected herd. Their failure to establish a permanent immunity is somewhat unexpected in view of the usual assumption that repeated antigenic stimuli, natural or artificial, will always increase specific acquired immunity. In this connexion TOPLEY has shown that repeated injections of an *aertrycke* vaccine, after first raising the resistance of mice, are ultimately followed by a fall in the degree of resistance, as though the specific defence mechanism had been exhausted. If the mice entering an infected herd have previously been protected by inoculation their expectation of life is increased; but their artificial immunity—like that acquired by exposure—does not save them from eventually succumbing to the

specific infection. At the same time we must not allow the relative failure of "antityphoid" inoculation in mice to discourage the use of human anti-enteric vaccines; for, as the authors say, "neither war, nor the absence or breakdown of adequate sanitary control among a civilian population, is at all likely to produce conditions so severe as those to which our herds of mice are continually exposed." Hence it is the partial success in protecting mice that deserves chief emphasis. Nevertheless this work makes it easier to understand why we cannot hope ever to produce an absolute immunity against enteric diseases by inoculation alone and must always supplement it by adequate sanitary measures. The virus diseases present a rather different problem. In ectromelia, as one would expect from human epidemiological experience of viruses, a period of survival in an infected herd leads to immunity of a much higher order than is attained with the bacterial disease, mouse typhoid. In fact, mice which survive exposure to ectromelia for more than 65 days are found to have an expectation of life not very much less than that of normal uninfected control animals.

The authors of the report discuss whether the relatively greater resistance of the survivors of an epidemic is due to the selection of mice with a greater innate, or genetic, immunity or whether it is attributable to an acquired specific, or non-specific, resistance through contact and sublethal infection with the specific epidemic or other bacteria. Their experience leads them to favour specific acquired immunity as the most important factor, though others have also some weight in determining the length of survival in the infected herd. Thus a striking series of investigations revealed a class of mice that appeared to be immune to natural contact infection by virtue of some innate physiological peculiarity through which the bacilli were prevented from gaining access to their tissues. Such mice do not acquire a specific immunity; for when they are infected by parenteral injection of *B. aertrycke* they show themselves as susceptible as others. They present an interesting analogy to the children who do not catch diphtheria during years of close contact with carriers and cases and yet, despite this close contact, never develop diphtheria antitoxin in their blood, and are in addition very difficult to immunise artificially. The report also describes investigations showing that infectivity, the ease with which a parasitic microbe spreads from host to host, and virulence, the power of killing or injuring the host species, are separate characters which can vary independently, though as a rule highly virulent organisms are also more infectious than the average. Such bacteria, with a greater virulence and infectivity than ordinary endemic strains, may be termed epidemic strains. TOPLEY and GREENWOOD made an observation of fundamental biological significance when they were able to trace the evolution of an epidemic strain of *B. aertrycke* during an epidemic which had been initiated by a strain of ordinary virulence. The recent exacerbation in the prevalence and severity of diphtheria in certain localities is probably a

<sup>1</sup> Experimental Epidemiology. By M. Greenwood, A. B. Hill, W. W. C. Topley, and J. Wilson. Med. Research Council, Spec. Rep. Ser. No. 209. 1936. Pp. 204. 3s. 6d.

similar phenomenon, caused, in the first place, by the origin of epidemic strains of diphtheria bacilli—the so-called “gravis” and “intermediate” variants of *Corynebacterium diphtheriae*. The very nature of the problem makes it hard to obtain satisfactory evidence that differences in type of epidemic are in great part due to variation in the characters of the specific micro-organisms. L. T. WEBSTER, an American experimental epidemiologist of wide experience, has been so impressed by the negative results of his own investigations on this point that he is loth to admit that microbic variation plays any important part in the genesis of epidemics. It is therefore refreshing to hear TOPLEY and GREENWOOD and their colleagues boldly state that “variations in the character of a bacterial parasite may well be of decisive importance in the secular history of any epidemic disease.” Of course there is no implication in this statement that microbic variation is “a frequent concomitant of the evolution of a single epidemic wave.”

Assuming that bacteriophages are specific viral parasites of the corresponding bacteria, D'HERELLE and his followers' suggestion that human infections might be eradicated by the introduction of a suitable bacteriophage is not such a wild speculation as it may appear at first sight; it finds a parallel for example in the successful control of certain agricultural plant diseases by spreading the parasites of the pests themselves. So far, however, experimental epidemiology has produced no evidence in favour of the theory, and specific bacteriophages apparently have no influence on the course of a mouse-typhoid epidemic. In writing of this result TOPLEY and GREENWOOD cite the interesting “all or none” effect which was found by ANDREWES and ELFord, who working with a coli-phage mixture showed that there was no appreciable killing of the bacilli until the bacteriophage exceeded a certain concentration; but once this critical concentration of “phage” was reached the destruction of the colon bacilli was almost complete. Accordingly the failure to discover any effect of bacteriophages on mouse-typhoid epidemics does not necessarily mean that dramatic benefit might not follow the employment of other phages or other techniques. Negative results were also obtained in experiments planned to determine whether variation in the diet and its vitamin content would affect the mortality of infected herds of mice. These findings will cause surprise and disappointment among those who hope that the prevention of ill-health, including infectious diseases, mainly depends on raising the standard of diet and nutrition. But, so far as it has yet gone, experimental epidemiology supports the opinion of many field epidemiologists that diet is of little or no importance in determining the incidence or severity of epidemic diseases unless there is gross lack of vitamins, or frank starvation, among large sections of the population.

As is only to be expected, the investigations described in this report provide a model of the experimental and statistical technique involved in the analysis of herd diseases or epidemics. It

illustrates the caution and restraint that are required in interpreting the results of an experiment, the care needed in providing adequate controls, and the necessity of having a sufficient number of animals if, to quote the authors, the research worker is to avoid “basing conclusions upon data that will not bear their weight, and so adding further confusion to problems that are already obscured by a mass of ill-founded hypotheses.”

### THE BRITISH ASSOCIATION

BLACKPOOL has been chosen as the meeting-place of the British Association in September. It is a town whose civic authorities have made a successful study of modern amusement, and a scientific survey of Blackpool and of the Fylde, of which it is the centre, must have particular interest. The town has made remarkable experiments in street lighting and in the solution of the traffic problem which has baffled so many places which have the advantage of four points of the compass instead of three. Such a survey, which is now part of the Association's programme, will be an attractive number of a series which now includes York, Leicester, Aberdeen, and Norwich. The surveys of Leicester and Norfolk were in fact reprinted for educational use at the instance of the local authorities. Even a cursory examination of the programme for the Blackpool meeting suggests that the demand, especially vocal within the last two years, for the payment of more systematic attention to the bearings of scientific progress upon the welfare of the community, will be met this year. We do not yet know the precise content of Sir Josiah Stamp's presidential address on the evening of Sept. 9th, but as it will deal with the impact of science on society, we may be sure that it will include some of the economic and social problems which are troubling our minds. Since the centenary gathering in London in 1931 the annual meeting has never attracted less than two thousand enrolling members, apart from those who are drawn to one or other of its more popular items. The sectional transactions cover a large range of subjects, and this year for the first time a programme is indicated for those who would make an orderly study of scientific investigation in its bearing on the life of the community. Such communications, which are starred in the programme, include an address by Prof. Allan Ferguson on trends in modern physics, by Prof. J. C. Philip on the training of the chemist for the service of the community, by Brigadier H. S. L. Winterbotham on mapping of the colonial empire, by Prof. W. Cramp on the engineer and the nation, by Mr. J. Ramsbottom on the uses of fungi, and finally one by Prof. J. Hendrick on soil science in the twentieth century. Among the starred discussions are subjects such as economic problems affecting Lancashire, scientific problems of the poultry industry, road research and traffic problems, climate and health, social and cultural values of science, and, most appropriately, engineering problems of mass amusement. This closer coördination of work for the advancement of science is putting a severe strain on the economic position of the Association, and in the Five Years' Retrospect just issued it is pointed out that further endowment will be essential to consolidate the position it has attained at the close of its first century, and that expansion of membership and strengthening of financial foundations should be the object of all who would further its interests.

## ANNOTATIONS

## THE INITIAL STATE PRINCIPLE

It is a commonplace that a stimulus applied to a functional unit may evoke different results under different conditions. The experimental method eliminates difficulties due to the environment in so far as this can artificially be kept constant, but the immediate environment of a normally functioning organ is the rest of the body, and the experimenter can therefore never guarantee that the organ is more than approximately in the same state on different occasions. Most workers perform a "control" or dummy experiment in which the conditions are exactly the same as in the real experiment, with the exception that the stimulus is omitted. If the two experiments are run in parallel, the state of the organ in the control animal serves as a zero from which the response of the organ in the experimental animal can be measured. Only rarely is any interest evinced in the fluctuations of this zero; their existence is recognised purely in order that they may be fairly neglected in evaluating the response. On another page, Prof. S. Leites advances cogent reasons why these fluctuations should be regarded as of interest in themselves, and not merely as an experimental nuisance. Once the nature and "normal" magnitude of the response to a given stimulus have been determined, variations from the normal in individual cases should give information about the condition of the organ in question, if the relation between magnitude of response and the "zero state" is understood. This also seems a commonplace principle, and it is easy to cite instances, such as the sugar-tolerance test and renal functional tests, where it is used in practice. It is nevertheless true that a great deal more is known about the relations between all kinds of stimuli and their appropriate responses, than about the relations between the responses and the state of the organs which give rise to them. We take it for granted, for instance, that if an organ is in the same condition all the time the magnitude of the response varies as the strength of the stimulus. But if the response to the same stimulus varies from time to time, the most we can say is that the "condition" of the organ is also varying; no simple rule springs to the mind telling us just what alteration has taken place when the response increases or decreases. In certain cases we know from experience what has happened, but we have no general law.

The "initial state principle" of Prof. Leites represents an attempt to fill this gap, and recalls Weber's law of sensation. In its simplest form it states that the more excited an organ is to begin with, the less it will react to an exciting stimulus by increased activity, and the more readily will it react to a depressant by decreased activity. Prof. Leites points out various pitfalls which must be avoided in applying this principle, the chief of which is the temptation to employ a criterion of activity which is not strictly related to the stimulus. He points out its potential importance in investigating organs influenced in opposite senses by the sympathetic and parasympathetic systems respectively, in which a state of diminished activity may be due to overaction of one or underaction of the other. Numerous examples are given to illustrate the operation of the principle, but it must be stated that in one or two cases alternative explanations appear more likely, and the argument would have been

strengthened by their omission. Although it is not at present possible to accept without reserve any simple generalisation, there can be no doubt that the relation between response and initial state is a field of research which must be thoroughly explored in the near future. Perhaps the most exact investigation bearing on this point is that recently made by Prof. A. V. Hill and his co-workers<sup>1</sup> on the electrical excitation of nerve. They find that while the stimulus is rising to its full strength, the nerve is becoming less excitable, so that the adequacy of a stimulus depends not only on its ultimate strength, but upon the speed with which this is attained. Unless the stimulus rises more rapidly than the excitability of the nerve falls, it is ineffective. The mathematical expression of this relationship is by no means simple, and foreshadows difficulty in the treatment of systems where measurements cannot be made with the same degree of precision.

## PROGNOSIS IN CANCER OF THE BREAST

Nothing is more widely known about the prognosis of mammary cancer than that even after radical operation it is very much worse when there are axillary metastases. Dr. Channing Simmons<sup>2</sup> has found in a series that he has been studying that the average length of history when there was axillary involvement was six months, only three months more than the history of uncomplicated cases. This observation was contributed to a discussion on cancer of the breast held by the New England Surgical Society at Manchester, New Hampshire, and it is very significant. It means that, once carcinoma has appeared in the breast, it may be a matter only of weeks before it produces metastases. The prognosis of radical mastectomy is therefore entirely dependent upon early diagnosis, but, according to Dr. H. G. Jarvis, who opened the discussion, neither factor has shown definite progress in the last 15 years. Dr. Jarvis gave the figures for the Hartford Hospital. Out of a total of 320 cases, 266 (80 per cent.) were operable; 54 (20 per cent.) were inoperable, and at the end of five years all of these were known to be dead. Of the operable cases, 60 per cent. were dead and 40 per cent. alive. There was not a complete follow-up in the operable cases, only 82.5 per cent. having been traced. One contrast was significant; of 83 patients who had been operated on at a stage when cancer was limited to the breast, 42 were alive at the end of five years and without evidence of recurrence, whereas only 24 of 96 patients who had early metastases apparently limited to the axilla were alive and free of cancer five years after operation. So important does Jarvis consider early diagnosis that he believes that it is the responsibility of the surgeon to explore every case of tumour of the breast, even when the tumour is only suspected. Early and adequate treatment is not, however, the only factor in prognosis that Dr. Jarvis and the other speakers recognised. The pathologist at the Hartford Hospital has classed into three grades of malignancy 193 cases that have been followed for five years. In Grade I., that of lowest malignancy, 22 out of 23 patients without metastases were alive at the end of that time, and 5 out of 8 in those with metastases. Of 42 Grade II. patients without metastases, 28 were alive, but none with metastases had survived the five years. Grade III., the highest

<sup>1</sup> Proc. Roy. Soc. B., 1936, cxix., 305.

<sup>2</sup> New England Med. Jour., March 12th, 1936, p. 501.



degree of malignancy, was represented by 8 patients, none with metastases, of which 5 had survived for five years. In this series therefore the patient with a Grade I. carcinoma and no metastases had a more than 9 to 1 chance of living for five years. Grade I. cases with metastases had as good a chance of survival as those without metastases in either of the other grades—about 6 to 1. G. C. Wilkins and G. F. Dwinell quoted results from the Elliott Hospital. Of 62 patients whom they had traced since their operations during 1919–1930, 35 per cent. were now known to be well; 50 per cent. were “five year cures”; and 18 per cent. “ten year cures.” These two surgeons were convinced both of the inadequacy of clinical methods for diagnosing cancer in an early stage, and also of the importance of biopsy for every tumour of the breast. Pre-operative and post-operative radiation are employed by them as a routine, and they hope that the increased dosage now used will result in an improvement within the next five or ten years. Dr. Simmons, on the other hand, had employed pre-operative radiation in a series of cases and was not inclined to agree that it increased the prospects of cure. All the speakers preferred operation, whether combined with radiation or not, to radiation alone. They stressed how important it was that women should report any abnormality of the breast, and the responsibility that rested on the practitioner to countenance no delay in having the abnormality thoroughly investigated.

#### THE TRENDELBURG OPERATION FOR PULMONARY EMBOLISM

THE publication of a successful operation for embolism of the pulmonary artery by Valdoni<sup>1</sup> of the Alessandri clinic is of special interest, for this is the first successful operation of the kind in one of the Latin countries. Since Trendelenburg first performed the operation in 1908, it has been carried out successfully only in its country of origin and in Sweden (Kirschner 1, Meyer 4, Nystrom 2, Craaford 3).

Valdoni's patient was a man of 68 who was 14 days convalescent from an operation for a left inguinal hernia. While walking along a corridor he was seized by intense pain in the chest, fell to the floor and rapidly became unconscious. He was seen three minutes later and immediately removed to the operating theatre. In the Alessandri clinic a set of Trendelenburg instruments is kept in readiness, and seven minutes from the onset of the embolism the incision was made. The patient was deeply unconscious and anaesthesia was superfluous. The 2nd, 3rd, and 4th costal cartilages were removed, the pericardium incised, and the heart exposed. Irregular contractions of the organ were still present, and dilatation of the right heart and prominence of the pulmonary artery were apparent. The Trendelenburg sound was passed, a rubber tube introduced into the transverse sinus, and the pulmonary artery incised. There was a rush of dark-coloured blood with some fragments of clot. The embolus forceps were introduced and a 27 cm. clot was removed from the left branch of the pulmonary artery. At this point the patient stopped breathing and artificial respiration was begun. A second large clot was then removed from the right branch of the pulmonary artery and the incision closed by lateral application of the special Trendelenburg clamp. The heart now began to beat more strongly and normal respiration was resumed. The pulmonary artery was repaired by suture; it proved impossible to close the parietal pericardium, but the superficial wound was repaired in the usual way. Towards the end of the operation the patient began to regain consciousness. For some days there was evidence of a disordered cardiac action, but after a course of rest and digitalis he left hospital cured.

<sup>1</sup> Valdoni, P.: Policlinico, May 18th, 1936, p. 911.

Wustmann and Hallervorden<sup>2</sup> have recorded the experience of the Frey clinic with the operative treatment of pulmonary embolism during the last two years. In all, 6 cases were subjected to operation; it is worth noting that the diagnosis was correct in each case and that in one there had been a smaller embolus two days before the fatal attack. In 3 patients death had come very suddenly, and when the heart was exposed at operation all signs of cardiac action had ceased and attempts at revival proved fruitless. The 3 remaining patients, although the clot was removed and effective cardiac action restored, survived only for a limited period—36 hours was the maximum. In all 3 cases death resulted from failure of the central nervous system, which had suffered irreparable damage during the initial period of heart failure.

Of recent years some authorities have doubted the practical value of the Trendelenburg operation. There can indeed be few operations so open to reasoned and informed criticism. At the same time it should be remembered that the victim of a massive pulmonary embolism dies of heart failure, and, although only 11 patients have permanently survived after operation, in at least another 35 normal cardiovascular action has been restored. Success demands experience both in diagnosis and in operative technique, but given these it seems imperative that the operation should be attempted, for apart from its value to the individual patient each success is important as a demonstration of the possibilities latent in modern surgical technique.

#### HISTIDINE TREATMENT OF PEPTIC ULCER

THE experimental basis for the use of histidine in the treatment of peptic ulcer has been subjected to severe criticism. No one studying the original observations upon dogs could feel convinced that any amino-acid deficiency was actually present in these animals or that the ulcers produced were strictly comparable to the chronic ulcer of man. Hence the widespread employment of histidine has been chiefly founded, empirically, on its apparent power to relieve the symptoms of ulcer in man, as in the short series of cases reported by Dr. Gardiner on p. 1352 of our present issue. But now from America come reports of similar symptomatic improvement from the intramuscular injection of distilled water or saline. Sandweiss<sup>3</sup> giving a daily injection of 5 c.cm. of distilled water to 20 ulcer patients found that 12 became symptom-free (5 after the first injection) while corresponding improvement was noted in only about the same proportion of patients treated with histidine (22 out of 40). Martin<sup>4</sup> observed relief of symptoms in 3 out of 6 patients following saline injections. Even so few observations as these suggest that histidine can hardly exercise a specific effect upon the healing of peptic ulcer, and numerous other non-specific injections have for many years found warm supporters, Sandweiss mentioning as many as eleven. Nevertheless accounts of its beneficial effects continue to appear, and Martin and Sandweiss's papers allow some critical comparison of this method of treatment with the more orthodox diet and alkali régime to be made. On the whole their reports are not favourable. Thus Sandweiss, out of 67 patients, found that of those treated with histidine, 85 per cent. had recurrence of symptoms

<sup>2</sup> Wustmann, O., and Hallervorden, J.: *Deut. Zeits. f. Chir.*, 1935, cexlv., 472.

<sup>3</sup> Sandweiss, D. J.: *Jour. Amer. Med. Assoc.*, April 25th, 1936, p. 1452.

<sup>4</sup> Martin, K. A.: *Ibid.*, p. 1468.

within six months as against only 31 per cent. of those treated by diet and alkali. In the two treatments about the same proportion became symptom-free, but of 24 patients checked by radiography or operation after histidine treatment, not one showed disappearance of the ulcer deformity. Martin's results in two comparable series of ulcer patients are similar; thus of 32 patients watched for ten months after histidine treatment only 13 have had no recurrence, whilst 16 out of 40 patients treated by diet and alkali are still well after this time, 24 having had relapses. Acting largely upon Dr. Martin's report the Council on Pharmacy and Chemistry of the American Medical Association have postponed further consideration of the use of histidine "until adequate clinical evidence of its therapeutic value" is forthcoming. Their caution emphasises again the need for care in using histidine treatment at the expense of dietary principles that have had longer trial.

### OPERATION FOR AURAL VERTIGO

AURAL vertigo is fairly common, but its severity is extremely variable. In many patients the symptoms are not so serious as to interfere greatly with their mode of life and work; these will usually make satisfactory progress with reassurance combined with an occasional course of a mild sedative drug, and there is often a tendency towards spontaneous cure. But some, a minority, lose their morale and are prevented from working by the frequency and severity of the attacks. In such cases operation is justifiable, and intracranial section of the auditory nerve has been shown to lead to dramatic cessation of the vertigo. There is usually severe deafness on the side involved, so that the total loss of hearing which follows the operation is of little moment. In some patients, however, who suffer from Ménière's syndrome, there is no great deafness, and it is highly desirable to save the hearing. This is possible if the vestibular portion of the nerve is divided without damage to the cochlear fibres. Dr. K. G. McKenzie,<sup>1</sup> of Toronto, has now performed this operation on 12 patients; of these, 7 had such poor hearing on the affected side that it was of little importance to save the cochlear nerve, but in all of these such hearing as they had was not further impaired. Of the 5 with useful hearing, in 1 the cochlear nerve was unintentionally cut, and 1 died of wound infection which caused an extradural abscess compressing the cerebellum. In the remaining 3 cases the hearing was not made worse, and all 11 patients lost their attacks of vertigo. A little unsteadiness remained for a few weeks or months but this gradually disappeared, and the only relic of vertigo is a slight tendency, in a few cases, to fall towards the affected side when turning suddenly in the dark.

At operation, access is obtained through an opening over the cerebellum, made as high and as lateral as the lateral sinus and mastoid cells permit. The vestibular portion of the nerve lies above and behind the cochlear portion; a groove or line of cleavage is sometimes seen between the two, but there is no real septum. The vestibular fibres are larger and have a thicker medullary sheath than the cochlear fibres. McKenzie's method is to make a short incision into the centre of the nerve parallel to its fibres, to insert a blunt right-angled hook over the postero-superior half of the nerve which contains the vestibular fibres, and to cut down on to the hook with a

sharp knife. It is not necessary to isolate the facial nerve, which lies in front separated from the auditory nerve by the pars intermedia of Wrisberg, and in this respect the operation is easier than when the cochlear nerve, which lies closer to the facial, is divided as well. A further advantage is that it is usually possible to avoid a small artery which runs in the centre of the nerve, but which he has found to lie on the cochlear side of the longitudinal incision.

These cases of aural vertigo nearly always have unilateral deafness and tinnitus, or at least these symptoms are much more severe in one ear, so that there is no difficulty in deciding on which side to operate; in one of McKenzie's cases there was some doubt, but there has been no recurrence of the attacks after operation of the deaf ear. He has found the caloric response of no value as a lateralising sign; the reactions as a whole had a tendency to be sub-normal without definite difference between the two sides. The nystagmus, also, had no value in this respect, being sometimes to the sound, and sometimes to the affected side, while in one patient it varied in different attacks. Again, the direction in which objects appear to move was of no assistance; 7 of the 12 patients were unable to give any definite direction; in 3 the objects moved towards, and in 2 away from the side of the lesion. Most preferred to lie on the back, one would only lie on the affected ear, and one was equally emphatic that he could lie only on the good ear. The effect of vestibular section on tinnitus is interesting. Of the 12 patients, 1 died, 1 had a section of the entire nerve, and 1 had no tinnitus; of the remaining 9, 2 had complete cessation, 2 were unchanged, and in 5 tinnitus has much diminished. It may therefore be expected that this symptom will be alleviated after division of the vestibular nerve alone; it is noteworthy that a mild tinnitus has been found to persist in about half the cases treated by complete section of the auditory nerve. As would be expected, caloric response is usually absent after operation, but 2 of McKenzie's patients showed a slight reaction from the vertical canals, which suggests that it is not necessary to cut all the fibres of the vestibular nerve in order to cure the vertigo.

The operation described seems no more difficult than complete section of the auditory nerve, and apparently has several advantages over it, especially when useful hearing remains in the affected ear.

### THE B.P. ADDENDUM

ON the first of this month the eleventh edition of the Pharmacopœia of the U.S.A. came into force. It has been the aim of the British Pharmacopœia Commission to come into line as closely as may be with American practice in the draft for the B.P. Addendum which is now so far advanced that copies may be available in September next, although publication cannot take place before the following December. We have already enumerated<sup>1</sup> some of the more important drugs which are to be described in this Addendum, including five new antitoxic sera. At the meeting of the General Medical Council last month Sir Henry Dale presented a report from the Pharmacopœia Committee calling attention to the prolonged consideration which has been given to the inclusion of the newer remedies which are coming into general use. It was then agreed to reappoint in September, when their present term of office expires, the present eight members of the Commission and to reinforce its special knowledge of clinical thera-

<sup>1</sup> *Canad. Med. Assoc. Jour.*, April, 1936, p. 369.

<sup>2</sup> *THE LANCET*, April 4th, p. 793.

peutics and pharmaceutical chemistry by the addition of Prof. F. R. Fraser who served on the committee from 1928 to 1933 and of Mr. W. H. Linnell, Ph.D., director of the Pharmaceutical Society's chemical research laboratory. It is satisfactory to know that the Addendum is to appear this year. The prodigious gap between the issues of the Pharmacopœia of 1914 and 1932 led to some natural despondency about the way in which the G.M.C. was keeping the official drug list in touch with modern therapeutics, however closely it was observing its statutory duties. We may hope that the interval between successive pharmacopœias will never be more than ten years again.

### THE PRINCES IN THE TOWER

Prof. William Wright's Cavendish lecture drew a large audience to the West London Medico-Chirurgical Society on June 4th, and he kept them fascinated by his modern commentary on the tragic story of the Princes in the Tower. The two boys, Edward and Richard, were the sons of Edward IV., and after their father's death the elder (Edward V.) was seized by his uncle Gloucester (afterwards Richard III.), who lodged him in the Tower, ostensibly to be in readiness for his coronation. On June 16th, 1483, he was joined by his brother, the Duke of York, and neither was ever seen again outside the walls. A detailed account of their murder by Gloucester's agents, probably in August or September, 1483, was given by Sir Thomas More in his "Historie of Kyng Rycharde the Thirde" (1513), but its authenticity has been questioned and some have held that Henry VII. killed them after he came to the throne in 1485. A potential source of evidence was the group of bones discovered at the base of the White Tower in 1674 and buried in Westminster Abbey by Charles II.'s orders. These were examined by Prof. Wright in 1933 and he found that they were the bones of two children differing by two or three years in age as judged by the length of their bones. An attempt to fix the age of the elder more precisely was rewarded by the discovery of the second cervical vertebra: the tip of its odontoid process had not united, and from this it could be deduced that the child was less than 13 years old. Assuming its owner to be Edward V., who was born on Nov. 2nd, 1470, he must have died long before Henry VII.'s accession, and there is reason to accept Sir Thomas More's story that they were murdered at the ages of 12 and 10. That the bones are really those of the princes is supported by the situation in which they were discovered and by anatomical signs of consanguinity. These are (1) wormian bones of unusual size and almost identical shape in the lambdoid sutures of both crania, and (2) absence of the upper second premolars in the elder coupled with absence of the lower second deciduous molar in the younger. Absence of deciduous molars is exceedingly rare, and the findings suggest not only tooth-suppression in both children but tooth-suppression in the same regional plane.<sup>1</sup> A remarkable feature of the elder boy's facial skeleton was an extensive reddish-brown stain reaching from just below the orbits to the angles of the lower jaw—a finding consistent with death by suffocation. In Prof. Wright's opinion the evidence that the bones are those of the princes is as conclusive as could be desired and definitely more conclusive than could reasonably have been expected.

<sup>1</sup> The investigations are fully described by Mr. Lawrence Tanner and Prof. Wright in "Recent Investigations regarding the Fate of the Princes in the Tower," communicated to the Society of Antiquaries. *Archæologia*, vol. lxxxiv.

And if Sir Thomas More's story contains coincidences these are the coincidences of real life, not those of invention.

### DR. HURTLEY

MANY generations of students at St. Bartholomew's Hospital will learn with regret of the death of Mr. William Holdsworth Hurlley, D.Sc. He first came to the hospital in 1899 as assistant to Dr. Chattaway whom he succeeded as lecturer in 1906, becoming a reader in chemistry at London University in 1922. Hurlley was a teacher who took trouble in the preparation of his lectures and demonstrations with the result that they always fulfilled their purpose. He was a good organic chemist, and although his teaching hours were long he found time for research work, collaborating with the late Sir Archibald Garrod in papers on alkaptonuria and cystinuria. He did original work on the acetone bodies and bile acids, and his study of the estimation of iodine in the blood led to the development of a standard method. At the hospital Dr. Hurlley was beloved by all who came in contact with his courtesy, modesty, and honesty. Of a retiring disposition he rarely emerged from his laboratory, but he would spare unlimited time to anyone who sought his advice on chemical problems. During the last five years, although over the normal retiring age of 65, he reorganised the teaching of biochemistry for the second- and third-year students, and carried through all the arrangements for the new chemical laboratories at Charterhouse-square. He was due to retire at the end of the present session, but did not recover from an attack of pleurisy and bronchitis which befell him in April. He died in the hospital on June 2nd.

### THE DANGERS OF THE FEATHER PILLOW

THE risk of a baby suffocating itself in a soft pillow is often considered negligible, and many medical practitioners doubt the possibility of such an accident until they come across an actual example. A tragic case of this sort has lately been the subject of comment by the coroner for East Sussex. A baby of 3½ months was left in its perambulator and found dead with its head buried in a feather pillow. The coroner remarked on the danger of such pillows and also upon the amazing fact that a strong infant may fail to make the necessary movements to free its face. Yet books on the care of infants hardly mention pillows at all and in consulting the standard manuals for mothers one finds no warning in strong enough terms. Unfortunately it is seldom possible for newspaper reports to be certain about all the relevant facts of the case. In the first place the mentality of the infant is seldom mentioned, possibly in order to spare the parents' feelings; yet it is highly important. Medical men who would admit the possibility of self-suffocation by a mentally deficient child hesitate to believe that a normal strong baby can fail to save itself. If soft pillows are dangerous to normal infants, what about blankets and eiderdowns? It might be argued that it is hardly ever safe to leave a baby alone. On the other hand if the risk is only serious when the infant is mentally defective the responsibility of parents or nurses of normal babies is greatly reduced. Another point concerns the possibility of such deaths occurring among those who were formerly supposed to have "status lymphaticus." Certainly this term has been used at some of the inquests, and though it is no longer admissible we may still conceive that some

children are peculiarly susceptible to sudden death from trivial causes. It is interesting that the risk arising from feather pillows should be minimised while those of overlying are generally admitted: and it seems that overlaid babies often die without much protest. The coroner for East Sussex requested the practitioner who was called to the recent case to tell all his patients not to use feather pillows for young children. Substitutes include pillows filled with chaff or hard vegetable flock, or even no pillow at all. Clearly in the present state of knowledge the feather pillow should be barred; but, as already suggested, this knowledge may well be incomplete. It is hard to believe that a normally strong infant relinquishes its hold on life without some effort.

#### ARTIFICIAL RADIO-ACTIVITY

FRESH from her appointment as under-secretary for scientific research in the new French Ministry, Mme. Joliot-Curie last week gave an address in London on the synthesis of new radio-active elements. The occasion was a meeting at the Wigmore Hall of the Medical Association of the International Clinic at which Lord Lytton presided. Mme. Joliot-Curie began by resuming the results of recent research in atomic physics, which she described as an explosion of new knowledge, international in range. The term explosion may be applied also to the method employed, which is bombardment of normal matter by projectiles of atomic size. The explosion of the naturally occurring radio-active elements has supplied us with alpha and beta rays, and we have long been aware of the fast-moving electron of the discharge tube; but recent investigations have given us the neutron, the hydrogen nucleus or proton, and the positive electron. With these weapons the physicist has attacked the elements, subjecting each in turn to an atomic barrage, knowing that if enough projectiles are fired some hits must be scored. The results of such hits on the nucleus were at first found to be a disruption of the atom struck, with the production of other known elements; later, evidence was forthcoming in some experiments of unstable forms or isotopes of elements, which were of themselves radio-active. When the source of bombardment was removed in these cases, the activity of the treated material continued for a period in diminishing intensity according to the well-known law governing natural radio-activity. These new elements of laboratory manufacture are of such short life that they are unlikely to be found in nature. They have been identified by the use of a Wilson cloud chamber in which their ionising paths are photographed by the tracks of condensed water vapour. The quantities produced are small, so small indeed as to elude the tests of chemistry, but owing to rapid decay the intensity of radiation is by no means negligible. Mme. Joliot-Curie considered the possible medical application of these elements. They are, as she pointed out, of lower atomic weight than those occurring in nature; hence when introduced into the body by injection or absorption they will find their way by the normal chemical reactions to certain organs. Radio-activity may thus be applied selectively, and with agents whose activity is temporary. In support of these speculations she showed some photographs of sections of organs in which radio-activity had been naturally concentrated by biochemical action, the concentration being sufficient to record itself on a photographic plate. Mme. Joliot-Curie concluded by emphasising the contribution of many countries to the growing knowledge of the ultimate structure

of matter—a knowledge to which her illustrious mother's discovery provided the key. We may hope that the engrossing work of a new Cabinet department will not divert her energies too far from her own fruitful inquiries.

#### THE BASIS OF TROPICAL MEDICINE

IN delivering the Stephen Paget lecture of the Research Defence Society last Wednesday Sir Malcolm Watson began by speaking of the way in which Paget gave freely of his time and his money so that research for the cure and prevention of disease might proceed without obstruction. To illustrate the astonishing value of such research in saving life and reducing misery he recounted some of the achievements of tropical medicine, and described in vivid phrases the discoveries of Manson, Ross, and Walter Reed. To Manson he applied Stevenson's words: "Study and experiment, to some rare natures, is the unbroken pastime of a life," and he showed how tremendous an influence such an "enviable nature" may have upon his fellows and their environment. Ross carried on the torch of investigation, and "already we can claim to have saved a million lives and an incalculable amount of sickness" as a direct result of the researches of these two men. In Cuba Reed and his collaborators combined patient inquiry with unforgettable heroism; and some of them lived to see great results from their final proof that yellow fever is carried by a mosquito. To-day their work continues and experimental research on animals provides hope that we shall be able to prevent the spread of this disease into regions like Asia, where it is otherwise capable of spreading through dense populations "as if a fire ran through the prairies."

ON Monday next Prof. J. H. Stokes, of Philadelphia, will deliver the Prosser White oration of the St. John's Hospital Dermatological Society. His subject is the Control of Syphilis, and the meeting will be at 1, Wimpole-street, W., at 5 p.m.

**ROYAL MEDICAL BENEVOLENT FUND.**—At a recent meeting of the committee of this fund 19 new applicants were assisted and 34 grants were renewed to beneficiaries. In all £1346 was voted. The following particulars of a few cases helped indicate the kind of work undertaken:—

Widow, aged 40, of M.B. who died last year aged 39. Her husband had worked as a medical missionary in North China, and she was left with a capital of only £1300, and three children to educate and maintain. Fund voted £26 plus a special gift of £10. The Ladies' Guild will assist with education of children.

Daughter, aged 61, of M.R.C.S. who died in 1927. Her father practised for some 30 years and was much loved by the poor. She has a few pounds only of her own, and makes up her income by needlework; but of late her health has been giving way and she can no longer work eight hours a day at her needle which she has to do if she is to earn enough to keep herself alive. Fund voted £26.

Widow, aged 63, of M.D. who died in 1927. Since her husband's death the widow has endeavoured to support herself. Recently she has held housekeeper's positions, which now through ill-health she finds difficult to get and to hold, age and ill-health being against her. Income £51 per annum. Fund voted £26.

This is the centenary of the fund and a special appeal is being made for new subscribers to raise the annual income, by subscriptions and donations, to £20,000. From the present income of £14,000 allowances of £40 and £26 are made to medical practitioners and their dependants respectively. An appeal is also being made this year for special donations to create a fund from which larger grants can be voted to very urgent and distressing cases, and which may be used to help with the training of the widows and orphan sons and daughters of medical practitioners to enable them to be self-supporting. Cheques should be made payable to the hon. treasurer of the Fund, 11, Chandos-street, Cavendish-square, W.1.

## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### CIV.—PROGNOSIS OF HAND INFECTIONS

HAND infections fall into many different types, the prognosis of each of which must be considered separately. In the first place there are *variations in bacteriology*, the severity of the infection depending upon the organism. Infection of the hand of the surgeon or nurse from a prick during an operation or dressing on a patient suffering from streptococcal or pneumococcal septicæmia may be followed by grave illness and even death. On the other hand, infections with the staphylococcus are not usually dangerous to life.

In the second place there are *variations in the anatomical type of infection* which greatly modify the prognosis, and these will be discussed later. Similarly, *variations in treatment* will have a profound effect upon the course of the infection, and these will have to be considered seriatim. Nor is it out of place to consider prophylaxis in its relation to these infections.

#### Prophylaxis

Between 5 and 25 per cent. of all disabilities are due to infections of the hand, the proportion varying with the trade of the workman. Removal from one factory of minor causes of injuries (broken tins, baskets, nails, pins) reduced the incidence of injury to less than one-seventh of its previous figure. In another instance the use of tincture of iodine after all injuries reduced the incidence of infections by 38 per cent., and diminished the severity of those occurring. Hospitalisation of all cases were this possible would doubtless still further reduce morbidity. Industrial organisations should be urged to provide instruction and facilities for treatment.

#### Anatomical Types of Infection

The principal anatomical types of infections will now be considered.

##### SUBCUTICULAR WHITLOWS

Subcuticular whitlows are little more than infected blisters, and have the appearance of bullæ containing pus. The treatment of the ordinary case is to remove the raised cutis aseptically and apply spirit to the exposed area. During the first few days the edge may continue to "grow," but with further treatment the condition rapidly disappears within 5-7 days. A blister at the base of the finger which becomes infected is more serious, for, the skin being thick, there is a tendency for the pus to track into the subcutaneous tissues forming a "collar-stud" abscess and a whitlow of the second variety.

##### SUBCUTANEOUS WHITLOWS

These form the biggest group of hand infections. Owing to the density of the fibrous tissue in the pulp of the fingers, the fat is disposed in loculi, which upon infection become extremely tense. The pus ruptures from one loculus to the next, the condition spreading slowly and insidiously, until a considerable portion of the finger is involved. The danger of an expectant policy at this stage cannot be over-emphasised, and continued hot dressings merely serve to conceal the progress of the disease. If the infection begins in the distal phalanx the tension developed is sufficient to obstruct the blood-supply to the bone at an early date, leading to

necrosis followed by sequestrum formation, the basal epiphysis being spared longer than the rest of the bone. If the infection involves the proximal parts of the finger, pus may travel via the lumbrical muscle into the thenar or middle palmar space, leading to further complications and corresponding delay in recovery. Furthermore, a neglected subcutaneous whitlow may lead to infection of the tendon sheath, which is extremely grave, or to direct destruction of bone, which also prolongs and increases the incapacity.

For these reasons it is clear that the prognosis of a subcutaneous whitlow is directly related to the stage at which and the method by which the finger is treated. As soon as the condition is diagnosed on the five cardinal signs of suppuration, and long before fluctuation is evident, a free incision must be made under regional or general anæsthesia, with a tourniquet round the arm or the base of the finger. The incision should be placed laterally, and every infected loculus must be drained; horseshoe-shaped incisions over the tip should be avoided as the resulting scar is often unsatisfactory. Twenty-one days should see the finger practically healed. Delay in resolution means that the incision was not adequate, or that some complication has arisen. Palmar and thenar space infections resolve rapidly after appropriate incisions; tendon sheath and bone infections are discussed below.

##### THECAL WHITLOWS (TENOSYNOVITIS)

These may follow direct infection of the sheath as from a needle prick, or be the sequel to a neglected subcutaneous infection. In the thumb tendon, the infection rapidly passes up to the wrist region, and may then pass down the little finger or vice versa. In the index, middle, or ring fingers the infection may rupture into the thenar or middle palmar space. Profound septicæmia is also to be feared in tendon sheath infections, with all its dangers. Apart from these complications, the tendon itself tends to undergo necrosis at an early date, and later sloughs out completely, leading to complete loss of function of the finger. Bone involvement is also to be feared in neglected cases.

Long incisions along the line of the tendon have been advocated, but in my experience usually lead to prolapse and loss of the tendon, with a functionless finger which too often has to be amputated. Short lateral incisions draining the more dilated parts of the sheath opposite the flexures, with particular attention to the proximal cul-de-sac, may save the finger. In thumb and little finger infections, the common flexor sheath has to be drained above the wrist by lateral and medial incisions. A perfect functional result is sometimes seen, though this is very rare in spite of careful post-operative re-educative exercises. Much more frequently a stiff and possibly deformed finger is the outcome, if indeed it is saved at all. The period of incapacity may be from two weeks to several months, and permanent incapacity is not unlikely.

##### SUBPERIOSTEAL WHITLOWS (OSTEOMYELITIS)

These may be extensions from any of the foregoing varieties, the result of a compound fracture, or in rare cases, of a blood-stream infection. The disease itself does not produce a high state of toxæmia as is common with osteomyelitis of larger bones, and is

not in itself dangerous to life. Except in metastatic infections and in rare primary infections of bone immediate operation is not called for, assuming that drainage has already been provided. The infection is of a chronic order and one has to wait for the natural processes of sequestrum formation, which may take many months to complete. Nothing is gained by premature interference.

Deformity is to be expected from loss of bone, although new bone may form to an amazing extent, while in cases where the joint surfaces have been involved bony ankylosis is usual. A stiff straight finger is a nuisance to a working man, who may beg for amputation. If the hand has been maintained

in the "position of function," wrist dorsiflexed, fingers partly flexed, the deformity is less noticeable and less inconvenient, for a considerable amount of movement is usually preserved at the metacarpophalangeal joints. Suppurative arthritis of the proximal interphalangeal joint is a definite indication for early amputation, for otherwise after many weeks of suppuration a stiff finger will be the inevitable result. Most patients prefer to accept a reduction in morbidity at the expense of the loss of the digit.

NILS ECKHOFF, M.S., F.R.C.S.,  
Assistant Surgeon, Guy's Hospital.

(To be continued)

## SPECIAL ARTICLES

### THE FATE OF A POPULATION OF WOMEN MEDICAL STUDENTS

By M. H. KETTLE, M.R.C.S. Eng.

BETWEEN the years 1916 and 1924 inclusive St. Mary's Hospital Medical School was open to women as well as to men students. Their admission arose from the circumstance that during the war the London School of Medicine for Women (L.S.M.W.) sought relief from the congestion of clinical students at the Royal Free Hospital, while St. Mary's, in common with other London medical schools, was suffering financially and otherwise from their lack. Later, women were accepted, not only for hospital training, but for the whole medical course at St. Mary's until in 1924 for reasons which, it was officially stated, had nothing to do with the efficiency, industry, or conduct of the women students, the decision was taken to admit no more of them.

Altogether, 255 women entered St. Mary's during the nine years.<sup>1</sup> Of these, 222 came for the clinical course only, 210 from the L.S.M.W., and 12 from elsewhere (e.g., Oxford or Cambridge); 2 did some pre-clinical work at St. Mary's, and 31 entered St. Mary's for the whole medical course. The students from the L.S.M.W. were in no way selected; they were asked to indicate which of the two hospitals open to them they would prefer to attend, and as far as possible their wishes were met.<sup>2</sup> It seemed likely that an analysis of the subsequent careers of those women who qualified from St. Mary's and of their distribution through various branches of the profession would be of interest, since they provide a complete though small population. They may or may not be a fair sample of all women who entered the profession during the same period, but there is no reason to regard them as atypical. The tables set out below were compiled from the answers to a questionnaire issued on behalf of the St. Mary's Hospital Medical Women's Association in May, 1934, to all the qualified women who could be traced. They were asked to state (a) name and address, (b) qualifications and diplomas, (c) jobs done since qualifying, (d) present professional work, if any, and (e) whether married; they were also (f) given an opportunity, which 88 of them took, to comment on

women's work in medicine. Question (e) was later supplemented by a query, addressed to those known to be married, about children, in order to ascertain, if possible, to what extent a decision to drop professional work was influenced by the ties of a family.

#### Proportion of Women Qualified

Interest centres first on the proportion of the 255 entrants who achieved qualification. It emerged (Tables I.A and I.B) that 230 (90.2 per cent.) of the

TABLE I.A.—Proportion Qualified

	Alive.	Dead.	Total.
Number of women—			
Qualified .. ..	220	10	230 (90.2%)
Unqualified .. ..	21*	4	25 (9.8%)
Number who attended hospital .. ..	241	14	255 (100.0%)

\* 12 of these are known to be married.

TABLE I.B.—Sources of Information

Unqualified women—			
Records of St. Mary's Hospital Medical School and private information .. ..	..	..	25
Qualified women—			
Replies to questionnaire .. ..	..	..	203
Books of reference, including past and present medical registers, medical directories, and hospital calendars .. ..	..	..	27 = 255

entrants became doctors. This is a creditable percentage, but it must be remembered that most of them had already passed two out of the three professional examinations on admission to St. Mary's.

Of the 25 (9.8 per cent.) who did not qualify, 4 died as students; of the rest, assumed to be alive, 12 are known to be married, some of them giving marriage as a reason for withdrawal. Most of the withdrawals seem to have been during the first or second clinical years.

#### Qualifications Obtained.—Higher Degrees and Diplomas

Table II.A shows that while 212 women took the Conjoint Board diploma, 77, or more than a third of this number, took a degree also; 15 women took a degree only; 2 took the L.S.A. only; and 1 the L.D.S. only.

Table II.B shows higher degrees and diplomas. Higher degrees in arts and science were ignored because usually there was no indication whether these had been obtained before medicine was even contemplated as a career, but at least one

<sup>1</sup> Three of them, previously enrolled, did not actually begin work until 1925.

<sup>2</sup> Of the first batch to enter St. Mary's, in May, 1916, 4 had already spent one of their clinical years at the Royal Free Hospital and 8 had recently passed the second professional examination. Subsequent batches of students had had no previous hospital experience.



D.Sc. and one M.Sc. can legitimately be claimed and one general practitioner has become a barrister-at-law. One M.R.C.P. was awarded on published research work, and one F.R.C.S. Eng. is held by a woman who had already gained the university medal in her London M.D. The M.C.O.G. had only recently been established at the time the questionnaire was issued, which may account for the fact that only one holds this diploma.

TABLE II.A.—Qualifications Obtained

Qualification.	No. and per cent.
L.D.S. only .. .. .	1 (0.4)
L.S.A. only .. .. .	2 (0.9)
L.R.C.P., M.R.C.S. (1 with L.D.S.) ..	135 (58.7)
M.B., B.S.* .. .. .	15 (6.5)
L.R.C.P., M.R.C.S.; M.B., B.S.* ..	77 (33.5)
	230 (100.0)

TABLE II.B.—Higher Degrees and Diplomas

	No. and per cent.		No. and per cent.
M.D.* .. .. .	21 (9.1)	D.T.M. & H.* ..	7 (3.1)
M.R.C.P. .. .. .	3 (1.3)	D.P.M.* .. .. .	6 (2.6)
M.S. .. .. .	1 (0.4)	D.M.R.E. ....	3 (1.3)
F.R.C.S. (Eng. 5, Edin. 2) ..	7 (3.1)	D.O.M.S. ....	5 (2.2)
M.C.O.G. .. .. .	1 (0.4)	D.L.O. ....	1 (0.4)
D.P.H. .. .. .	26 (11.3)		81 (35.2)

\* For simplicity, all degrees are included as M.B., B.S., though a few women qualified from universities with a different designation—e.g., M.B., B.Chir. Similarly all diplomas of tropical medicine (i.e., D.T.M. Liverp.) are included as D.T.M. & H., and the category D.P.M. includes a diploma of psychology gained at Geneva. All but three of the M.D.'s are M.D. Lond.

How Many are Working ?

From Table III.A it is seen that of the 230 women who qualified 99 (43.0 per cent.) married and 127 (55.2 per cent.) remained single, the civil state of the

TABLE III.A.—Numbers Working

—	Work-ing.	Light work.	Not under-taking professional work at present.	No state-ment.	Dead.	Total.
Single.	111	1	7	1	7	127 (55.2%)
No statement re marriage.	2	..	..	2	..	4 (1.7%)
Married, with-out children.	19	3	8	1	..	31 (13.5%)
Married, with children.	26	10	19	2	..	57 (24.8%)
Married. No statement about children.	1	..	3	4	3	11 (4.8%)
—	159 (69.2%)	14 (6.1%)	37 (16.1%)	10 (4.3%)	10 (4.3%)	230 (100.0%)

TABLE III.B

—	Working.	Not undertaking professional work at present.	Total.
Single.	112 (94.1%)	7 (5.9%)	119 (100%)
Married, without children.	22 (73.3%)	8 (26.7%)	30 (100%)
Married, with children.	36 (65.4%)	19 (34.6%)	55 (100%)
—	170 (83.3%)	34 (16.7%)	204 (100%)

remaining 4 (1.8 per cent.) being unknown. Of the single women 111 are working, 1 is doing light work,

7 are for various reasons not undertaking professional work at present,<sup>3</sup> and 7 are dead. Of the 96 living married women 46 are working, 13 are doing light work, and 30 are not undertaking professional work at present. The present occupation of the remaining 7 is unknown.

The proportion of married women without children who continue professional work is greater than that of married women with children, but only slightly (Table III.A). This is shown more clearly in Table III.B, which is derived from Table III.A by excluding the qualified women who are dead (10) and those about whom no information is available in respect of either marriage, present work, or children (16). This leaves 204 women: 119 single, of whom 112 (94.1 per cent.) are working; 30 married without children, of whom 22 (73.3 per cent.) are working; and 55 with children, of whom 36 (65.4 per cent. are working.

No attempt has been made to estimate the fertility-rate, but excluding adopted (3) and step-children the number of children produced of whom records are available is 117.

Distribution Through the Profession

Table IV.A is an attempt to get a cross-section of the distribution of the qualified women in different branches of the profession at the time of the inquiry, without reference to posts previously held or to future

TABLE IV.A.—Showing Present (1934-35) Distribution of the 230 Qualified Women

	No. and per cent.
1. In general practice, at home or abroad ..	87 (37.8)
2. Specialists (consultant, academic, or research) ..	32 (13.9)
3. Full-time hospital posts (resident) .. .. .	11 (4.8)
4. Full-time public service and public health posts	12 (5.2)
5. Government service abroad (including W.M.S. of India) .. .. .	5 (2.2)
6. Mission service, at home or abroad .. .. .	8 (3.5)
7. Medical officer to commercial firm .. .. .	1 (0.4)
8. Dentists .. .. .	2 (0.9)
9. Light work (welfare clinics or other part-time work) .. .. .	14 (6.1)
10. Not undertaking professional work at present ..	37 (16.1)
11. Occupation unknown .. .. .	11 (4.8)
12. Dead .. .. .	10 (4.3)
	230 (100.0)

prospects. No account was taken of the (very few) cases where a change was contemplated—e.g., from general practitioner to anaesthetist—or likely to be enforced—e.g., dismissal from a public health appointment on marriage. The group most affected by this rigid interpretation of the information provided is that of “not undertaking professional work at present.” Those whose part-time occupations may not depend directly on the possession of a medical qualification, such as lecturing on physiology or hygiene to school-children, welfare societies, or girls’ clubs, or dispensing, are categorised as “not undertaking professional work at present.” Women who say they do “occasional locums” for their husbands are also placed in this group, which, moreover, may be unduly swollen by the inclusion, besides those definitely on the retired list, of single women who are looking for a practice after several years abroad, such as a professor of medicine at the Lady Hardinge Medical College, India, recently retired; or are taking a long holiday, for example one who after five years as medical superintendent of a mental hospital is now breeding schnautzers in the Antipodes; and

<sup>3</sup> For explanation of the categories “light work” and “not undertaking professional work at present” see below.

of married women who propose to resume work when their children are older. That this may be no mere aspiration can be deduced from the fact that one who entered in 1917 and married in 1918 (4 children) resumed her studies after 10 years, qualified in 1933, and is now engaged on productive honorary research work.

1. *General practitioners.*—Unfortunately no inquiry was made whether a practitioner had acquired her practice by purchase or by putting up a plate, or was working as principal, partner, or assistant. Though several gave this information spontaneously, there are too many who did not particularise to make possible valid deductions from the replies. At least 12 are known to be in partnership with their husbands, 2 with their fathers, and 1 with a brother. From the comments in response to Question (f) it is clear that some firms of three or four women partners have been established; the acquisition of a new partner seems mostly to have been followed by a corresponding increase in the gross earnings.

*Practitioners with hospital appointments.*—Group 2 in Table IV.A was confined to those who, as far as could be ascertained, do no general practice. Many of those grouped as general practitioners in Group 1 who are attached to the honorary staff of their local hospitals in the capacity of physician, surgeon, psychiatrist, anaesthetist, and so forth, have acquired in varying degree a consultant status in the district. For example, one practitioner (F.R.C.S.Eng.) is attached to a general hospital as a surgeon; one spends half her time as assistant pathologist to a women's hospital; one holds the appointment of radium officer to a large general hospital; one is on the staff of a hospital for mental and nervous disorders and her practice is becoming specialised in this direction.

TABLE IV.B.—*Distribution of General Practitioners*

G.P.'s in provinces.	G.P.'s in London.	G.P.'s abroad.	G.P.'s now in practice.
57 (65.5%)	25 (28.7%)	5 (5.8%)	87* (100%)

\* Of these, 27 are on the staff of their local hospital, in an honorary capacity or with an honorarium.

Table IV.B shows the number of general practitioners working in London (25), the provinces (57), and abroad (5). Of the total number of general practitioners now working, 27 (nearly one-third) are on the staffs of hospitals.

2. *Specialists. (consultant, academic, and research).*—Of the specialists enumerated in Table IV.C many are on the honorary staff of more than one hospital, some of the posts not having previously

TABLE IV.C.—*Specialists (Consultant, Academic, or Research)*

Physician .. .. .	1	Radiologist .. .. .	1
Surgeon .. .. .	2	Physiologist .. .. .	2
Gynaecologist .. .. .	1	Pathologist .. .. .	4
Anaesthetist .. .. .	5	Research worker .. .. .	4
Physiotherapist .. .. .	2	Medical journalist .. .. .	2
Ophthalmologist .. .. .	4		
Psychotherapist .. .. .	4		32

been filled by a woman—e.g., that of ophthalmic surgeon to a London teaching hospital and of surgeon to the premier British ophthalmic hospital. University posts held range from teacher (2), demonstrator (2), lecturer (2) to reader (1). These do not include a lectureship in physiology at a physical training

college or one in hygiene at a provincial university (which latter is held by a general practitioner). Of the research workers one is on the permanent staff of the Medical Research Council and is the author of important monographs. At least two others in this group of specialists have published successful books and original contributions of permanent value have been made by several of the women to special and general medical journals, one of which has a St. Mary's woman as an assistant editor. Of the two general surgeons one has a special interest in orthopaedics; the other has won distinction not only in professional but also in public life, being a prominent member of the L.C.C.

3. *Full-time hospital posts (resident).*—The list of specialists detailed in Table IV.C is perhaps improperly diminished by the exclusion of those who hold, or held at the time of the inquiry, responsible resident appointments. These 11 women include, for example, a resident physician at a large municipal hospital in the provinces; a resident medical officer at a mental hospital; and a resident medical officer at a private hospital for surgical tuberculosis.

4. *Full-time public service and public health posts.*—In this category of 12 women are grouped, besides assistant medical officers of health and school medical officers, two important civil servants—i.e., a medical inspector of factories under the Home Office (who has been allowed to keep her appointment after marriage) and a medical officer to Holloway Prison.

5–12. These categories in Table IV.A are self-explanatory. One of the five in Group 5 is the second St. Mary's woman to be appointed professor of medicine at the Lady Hardinge College, India.

### Post-graduate Experience and Previous Appointments

The cross-section of the distribution of the qualified women in 1934–35 set out in Table IV. takes no account of posts held or work done before that date, or of the ways in which the experience was gained which enabled the present post or success in general practice to be obtained.

TABLE V.A.—*Resident Posts Previously Held (H.P., H.S., &c.)*

St. Mary's.	Elsewhere.	Not known to have held a resident post.	Total.
94 (40.9%)	51 (22.2%)	85 (36.9%)	230 (100%)

TABLE V.B.—*Resident Posts Held by G.P.'s*

Those who had held resident post.	Those who had not.	G.P.'s (past and present).
73 (66.4%)	37 (33.6%)	110 (100%)

TABLE V.C.—*Total Number of Resident Posts Held*

St. Mary's.	Elsewhere.	Total.	Number of women who have held them.	Average number of posts held by each woman.
151	190	341	145	2.35

*Resident posts.*—In this connexion it is of interest to see (Table V.A) that of the 230 qualified women as many as 145 (63.1 per cent.) held one or

more resident posts before engaging in the branch of medicine that was later to absorb them. Of these 94 obtained posts at St. Mary's (and often elsewhere as well) and 51 obtained posts as residents only at other hospitals. Of the 110 women who have been engaged in general practice 73 had previously held resident posts in hospitals (Table V.B). Few of the 145 women who held resident appointments were content to apply for one only; some held as many as five or six in succession, not counting of course in this category the more permanent senior resident posts in general mental or special hospitals now held by 11 women (see Table IV.A Group 3). The average number of resident posts held by each of the 145 women works out to 2.35 (Table V.C).

*Other "learning" posts.*—At least 6 of the women have held one of the post-graduate research studentships available in the various departments of the Pathological Institute at St. Mary's, 8 have held registrarships (one at St. Mary's) and of course a very large number have gained experience as clinical assistants. Many still work at hospitals in this capacity while engaged in practice. The general impression given by study of the replies to the questionnaire is that whatever branch of work has been adopted considerable trouble has been taken to ensure adequate equipment for the responsibilities it entails.

#### Comments Made on Women's Work in Medicine

Eighty-eight of the women responded to the question "Would you care to make any comments on women's work in medicine, including income prospects?" The most striking feature of the comments is the emphasis laid on the scope for women in general practice, and this did not come only from those who were themselves doing this work. Several note that prejudice against women practitioners is fast disappearing and remark upon the friendly and helpful attitude of male colleagues. General practice is held on all sides to offer an interesting if strenuous life; but there are warnings against its adoption by those who are not physically strong, or on whom continuous domestic demands are likely to be made. One says: "The great mistake that many women G.P.'s commit is to make medicine a secondary interest to running a husband and family, or running clinics and school inspections."

Town practice is regarded as more suited to women than country practice, and some comment on the success which is likely to attend a man and woman practising together. "In my one case," says a partner in such a practice, "the income is difficult to judge, as the N.H.I. and other club cheques are paid jointly, but my private receipts often equal or exceed my husband's."

The financial returns from general practice appear to be satisfactory on the whole. Several who bought small nuclei, or put up a plate, record substantial annual increases in income, and others who bought established practices have taken in partners as the work has developed after a preliminary drop. The general impression is that it takes about five years to establish a practice as a sound profit-making concern, and that during these years a good deal of unpaid work will have to be done; an income derived from other sources is therefore essential, or some capital to be used as income during this period.

\* Of these 87 are still so engaged (see Table IV. A; the rest have either specialised, retired temporarily or permanently, or are dead.

Some women note that working-class patients go to women more readily than do well-to-do ones; others record a contrary experience. One or two of those in consulting practice appear to have prospered exceedingly, but for the most part consultants and specialists have said little about the financial aspect of their work. The tendency for increasing numbers of women to specialise in gynaecology was deplored by several observers, whose remarks must be taken to apply to women in general, since it is noteworthy that only one St. Mary's woman is a specialist in gynaecology in the sense that she does no general practice at all. It is a matter of comment that women practitioners tend to attract gynaecological and pædiatric cases, and that specialisation in these branches is often developed from and associated with a general practice. Some emphasise the need for more women in psychological medicine in view of their special suitability for this work. The public health services are recommended by several as affording good prospects; others note that though the L.C.C. and other municipal authorities offer openings in the lower grades of the service women still find it difficult to get promotion to the higher grades. Some express regret at the prejudice against married women in the public health services. In this connexion it is of interest that though only 10 St. Mary's women are at present working as full-time assistant medical officers of health or school medical officers 10 others have at one time held such posts, of whom 7 are now married.

In the Government services at home and abroad salary and conditions seem on the whole to give satisfaction, except where prejudice exists against married women.

Some who are working in Colonial or Dominion medical mission services stress the wide field of opportunity for those fitted for very hard work under conditions which may be difficult; in the mission services women are urgently needed, and those who plead for recruits to join in this work evidently find ample compensation for the slender financial rewards in the interest and variety of their activities.

A few extracts from the comments made are set out below:—

"Very old people seem to prefer women doctors."—  
 "Much valuable voluntary work is available for a married medical woman. . . . By doing voluntary work for some time for a Home I have induced the organisation to create a post now filled by a salaried doctor."—"It may be that men who consult women doctors do so because they are used to being doctored by their mothers."—"Children appear to be less frightened of women school medical officers than they are of men."—"Life here suits me down to the ground. I have a nice little house complete with dog and cat, some extremely good friends, my people within 20 miles, a car, lovely country all round, and I get on well with most of my patients though of course one gets exasperated with some for not paying."—"I know nothing about conditions of medical practice in the British Isles. In the more advanced tribes among whom I am now working (in the Belgian Congo) the natives come just as readily to a woman as to a man! . . . Among the more backward tribes a medical woman has far greater difficulties in getting patients than a man owing to the contempt and disdain with which women are regarded by the men and to the fact that the women more or less accept this, getting their own back at times by foul language or by starving their husbands."—"Women dental surgeons still somewhat of a novelty but a good living is to be made in dentistry."—"Women sometimes postpone going to a man if an extensive examination is needed."—"There seems to be increased confidence in medical women as obstetricians. I find that having three young children has increased rather than lessened my practice."—"In my opinion

medicine offers the best career at present open to women, married or otherwise, whether from the point of view of status or that of rewards, material and moral. A daughter of mine is about to enter the profession."

The general impression gained from the comments is that most of those who contributed to them are assured that medicine provides ample opportunities, in one or other of its branches, for women. It would seem that work is being done under conditions which are, for the most part, individually satisfactory, and that no one seeking congenial work has failed to find it.

I would like to thank Mrs. M. Cotton, M.B., Mrs. H. Davenport, M.R.C.S., Dr. Dorothy Fenwick, and Mr. Vernon, assistant secretary of St. Mary's Hospital Medical School, for their great help in the task of collecting these figures, and Mr. E. Cheeseman, of the department of epidemiology and vital statistics of the London School of Hygiene and Tropical Medicine, for assistance in the statistical tabulation.

## GENERAL MEDICAL COUNCIL

SUMMER SESSION, MAY 26-29TH, 1936

### A Question of Canvassing

*The Case of Salvatore Donadelli*, formerly registered as of Cavasso Nuovo, Udine, Italy, and now registered as of Hanbury-road, Pontypool, Mon, M.D., U.Padua, 1917, who had been summoned to appear before the Council on the following charge:—

(1) That you have behaved improperly and in a manner unbecoming a registered medical practitioner to the following patients of the practice of Thomas John McAllen, a registered medical practitioner by whom you were employed as an assistant: (*dates and names specified in five cases, witnesses A.-E.*).

(2) That after you had ceased to be employed as an assistant by the said Thomas John McAllen you canvassed for the purpose of obtaining patients in respect of a practice as a registered medical practitioner which you proposed to carry on, and in particular canvassed: (*dates and names specified in nine cases, witnesses E.-M.*); of whom all except one (*witness M.*), who was a patient of Joseph Ferguson Blaine, a registered medical practitioner, were patients of the said Thomas John McAllen.

(3) That for the purpose of obtaining for your own advantage moneys which you were not entitled to obtain while you were employed as an assistant by the said Thomas John McAllen, and/or of procuring patients of the practice of the said Thomas John McAllen to become patients of the practice as a registered medical practitioner which you proposed to carry on, you depreciated the professional skill, knowledge, and services of the said Thomas John McAllen, and in particular by doing so (*five occasions specified witnesses N., O., and some of the previous*); all of whom were patients of the said Thomas John McAllen.

(4) That for the purpose of obtaining moneys for your own advantage, and/or of inducing the patient to become a patient of the practice as a registered medical practitioner which you proposed to carry on, you depreciated the services given by Arthur Carveth Johnson, a registered medical practitioner acting under a scheme for the treatment of tuberculosis by a public authority, in advising Mrs. P. to enter an institution for such treatment, and endeavoured to persuade her to make payments to you for medicines to be supplied by you as an alternative form of treatment.

(5) That during the time you were employed as an assistant by the said Thomas John McAllen, you made false and malicious accusations of negligence against the said Thomas John McAllen to Mr. and Mrs. Q., patients of the said Thomas John McAllen, in respect of his treatment of the brother of the said Mr. Q., with a view to your

own advantage and/or in order to prejudice the said patients against the said Thomas John McAllen.

And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainant was Mr. Thomas John McAllen, M.B., B.S. 1907, R.U. Irel.

Dr. Donadelli attended, accompanied by Mr. Ifor Lloyd, counsel, instructed by Messrs. Davis, Lloyds and Wilson of Newport.

The complainant was represented by Mr. T. Carthew, K.C., and Mr. A. A. Pereira, counsel, instructed by Messrs. Bytheway and Son.

On the first day of the session the Council's solicitor read a letter from respondent's solicitors begging for an adjournment as Dr. Donadelli had only heard of the charge on April 29th when he was on holiday in Italy. He had returned on May 4th, and next day had written to the Medical Defence Union asking for assistance, but this had been refused as both parties were members. Only on May 13th had he learned that postponement would be opposed by complainant. He had not been idle but it had been impossible properly to prepare the case in the remaining time. Moreover, he had absolutely no English money. He was prepared to undertake not to practise in Pontypool before the hearing of the case. Mr. Carthew opposed the application, which was refused. On the third day it was urged again by Mr. Ifor Lloyd, counsel, and again refused. Opening the case on the fourth day, Mr. Carthew explained that complainant had had occasion to warn Dr. Donadelli, while he was assistant, never to see female patients alone.

#### WITNESSES FOR THE COMPLAINANT

WITNESS (Miss A.) testified that on or about May 30th last respondent had visited her mother. She had asked for advice and he had insisted she should undress and lie on the bed. He had pulled her knickers down, put his finger into her private parts, and asked if she felt pain or pleasure. He had mentioned that he was the same age as she was and had a wife who was away. She had reported the matter, and later respondent had called and asked her to deny her former statement; this she had refused to do.

Cross-examined by Mr. Lloyd, she said she lived with her parents. She could not say how long the doctor had been in the house. She might have mentioned pain in the lower abdomen as well as the sweating of which she had chiefly complained. There was no couch in the sitting-room. She had not undressed beyond loosening her corsets. She had not known he was going to examine her. He did not speak English very well and she had had some difficulty in understanding him. She had told respondent she did not accuse him of assaulting her, and had agreed to see complainant, whom she had told she did not want to make any complaint.

In reply to the President she said this occasion was the first time she had seen respondent.

WITNESS (Mrs. B.) said that her mother-in-law and herself had long been patients of complainant. Dr. Donadelli had attended them about a year ago as assistant. She was suffering from a hæmorrhage after operation and was never free from pain. Each time respondent had visited her mother-in-law he had suggested examining her and she at last consented. He had pulled the curtains and examined her in bed. He had asked if her husband gave her any sensation and said he would try and give her one. He had told her she ought not to have any more children and offered to tell her how to prevent

it. She had complained to complainant and respondent had called and reproached her, saying he only did what all foreign doctors did. About Christmas-time he had called again and said he was sorry for her as she was not being properly treated.

In cross-examination she said he had asked her how she was, while visiting her mother-in-law. She had had lower abdominal pain. The window of the bedroom opened on to the street but she did not think people could see in. She did not agree that her mother-in-law was in the doorway the whole time; she was in the kitchen armchair and the door was shut. Nor had her mother-in-law fetched soap and water; she was too old. The doctor had not used a torch or implement. She had resented his examination. She had been examined there before but not in that way. She had told him she had pain on intercourse when he asked, but had not volunteered it. She had not complained until July because she did not like to. Dr. Donadelli had attended her later, but she had sent for Dr. McAllen and had not been examined by Dr. Donadelli. She had gone to the surgery about Christmas and had consulted him about her heart. She had thought another doctor was hiding something from her about her heart and so had gone to respondent.

In reply to Mr. H. L. Eason she said she had complained to Dr. McAllen in July on her own initiative; no one had spoken to her about it.

Mr. Carthew proved the serious illness of Mrs. C. and Mr. Lloyd objected to the reading of her statutory declaration in her absence. The President ruled that it be not read.

WITNESS (Mrs. D.) said she could just write her name but could not read. She recalled sending for Dr. McAllen and being visited by Dr. Donadelli. Next visit she had said she felt no better and he had said he would examine her. She was on her bed and he put his finger in her private parts and moved it up and down and then asked if she wanted a man. She had pulled the clothes over her and had later told her husband. A couple of days later he had called again and she would not speak to him. In March, 1936, he had called to question her about complaining.

Cross-examined, she agreed that she had been in bed ill with internal pains in the lower abdomen when she had sent for the doctor. She was 61 years of age and had had a good deal of experience of doctors. The respondent had not had any flash lamp. He had used his fingers and that was the indecent behaviour she complained of; no other doctor had ever done such a thing to her. She had been very disgusted.

WITNESS (Mrs. E.) said respondent had wanted to examine her, but she had refused. He had often suggested that the doors should be locked and had said she was thin because she did not go with her husband. He had urged her to have special treatments. Later he had told her he had left Dr. McAllen and started on his own and had asked if she and her husband would give their panel cards to him.

In cross-examination she said she and her husband had been pretty friendly with Dr. Donadelli. Respondent had never assaulted her in any way. He had often been in and out of the house and had treated her for diabetes, and told her to weigh herself. He had suggested hospital, but she had refused to go at first and he had suggested injections at home and given her tablets, for which she had never paid. After March she had had to go to hospital.

Dr. E. W. Bone elicited the explanation that Mrs. E. was a club patient.

WITNESS (Mrs. F.) testified that respondent had attended her and her husband while he was assistant to Dr. McAllen. Later he had called and asked them to transfer to him as he was setting up for himself.

Cross-examined she agreed she had been very friendly with Dr. Donadelli and was not surprised that he had called to say good-bye. She knew he had been living in Dr. McAllen's house but she had not asked him where he was going to live or what he was going to do. Her husband had been present but had not inquired about a panel. She knew nothing about his practice.

WITNESS (Mrs. G.), examined by Mr. Pereira, said that respondent had called on her as assistant and offered her special treatments from Italy. He had supplied tablets for which she or Mrs. F. had paid; they had done no good. He had told her that Dr. McAllen was very skinny and would skin all his patients. Later, he had said he was setting up himself and would not skin his patients nor charge them so much. He had asked for the panel cards.

Cross-examined, she said she had had rheumatism for years and had had many bottles from Dr. McAllen; these had done her good. She was quite satisfied with the result, though she still had the rheumatism. She had not asked Dr. Donadelli for new medicine or said her present medicines had not done her good. He had told her about cachets from Italy and he had got them without her asking. Respondent knew she was not on the panel, but had asked her and Mrs. F. for panel cards.

Dr. Bone inquired about the panel cards of the family and she said that her husband was on Dr. McAllen's panel but her elder daughter was on another doctor's. When respondent had asked for their panel cards she had thought he meant Mr. G.'s and Mrs. N.'s.

WITNESS (Mrs. H.) testified that Dr. Donadelli had called and said he had left Dr. McAllen and was looking for patients and would call any time of the day or night and would attend regularly. He had said he would call again to see her husband.

In cross-examination she said respondent had attended her as Dr. McAllen's assistant. He had not called to say good-bye and she had not asked where he was living or what he was going to do. Dr. McAllen had called on her and asked her to make the statement. He had not discussed Dr. Donadelli except to ask if he had been there.

In reply to members of the Council, she said respondent "as good as" asked her to become his patient by telling her his plans and directing her to his surgery.

WITNESS (Mrs. J.) said respondent had told her he was finished with Dr. McAllen, was on his own, and was taking panel patients, and that he would call at any time and regularly.

Cross-examined, she said he had been attending her little boy as assistant; he had not called to say good-bye. She had not asked questions but he had volunteered statements. He had never come again. When she had visited the surgery in March Dr. McAllen had asked if Dr. Donadelli had invited her to become his patient.

WITNESS (Mr. K.) said respondent had attended his wife as assistant. On March 13th he had called and invited them to become his patients.

Cross-examined, he said his wife had had three visits from the doctor and on March 13th he had not exactly come to say good-bye. There had been no discussion whatever about panel cards.

In reply to Dr. Bone witness said he had been out of work for six years and had not required medical attention. He had been on Dr. Blaine's panel. His wife had been attended by Dr. McAllen as the parish doctor. Respondent did not know their circumstances.

WITNESS (Mr. L.) said his son had been attended by Dr. McAllen and his assistant. Dr. Donadelli had offered injections from Italy, saying that Italian medicine was much more advanced. He had asked money for it. He had said all the stuff in Dr. McAllen's surgery was not worth twopence. Witness had refused the treatment for fear Dr. McAllen would subsequently have nothing to do with them. Later, respondent had called and said he had finished with Dr. McAllen and could see patients at another address.

Cross-examined, he said he had asked Dr. McAllen, his panel doctor, to call and he had done so and advised hot water treatment and a lotion; and later some ointment. He had been quite satisfied with the treatment. The disease had begun in November and the child had had it five years before. He did not remember respondent saying the boy had acidosis and needed something beyond local applications. Witness was accustomed to getting his medicines from the surgery and respondent had said the injections would not be found in the surgery and Dr. McAllen would not agree with them because they were too expensive.

WITNESS (Mr. M.) testified that he lived with his mother and was a patient of Dr. Blaine but Dr. McAllen was his mother's and his brothers' doctor, and Dr. Donadelli had attended his mother as assistant. He had called at the shop and announced that he was taking panel and private patients on his own. Witness had said he did not think Dr. McAllen charged his mother anything. Respondent had said he was very cheap, and would charge 3s. 6d. a quarter for a husband, wife, and child.

WITNESS (Mrs. N.) said she had been present every time respondent had called on Mrs. G. and corroborated that witness. He had supplied medicine to her daughter and had been paid for that and also by Mrs. G. He had said Dr. McAllen had nothing in his surgery that would do her any good but that he could get medicine from Italy that would cure her. Mrs. G. had been in great pain but had been quite satisfied with Dr. McAllen's treatment. Her daughter had not exactly asked him for medicine for her child but had said the little girl was ill and he had offered to get medicine from Italy. Her daughter had said it did not matter what it cost if the child got well, and he had supplied six bottles for 9s.

WITNESS (Mr. O.) testified that Dr. McAllen had attended his family for over 17 years. Dr. Donadelli had called to see him, as he had sciatica, and had said the medicine was no good and was only crushed aspirin and had offered better medicine but said it would cost money. Witness had decided he could not afford the £1 asked.

Cross-examined, he said he had been away from work for ten weeks with sciatica. Dr. McAllen had sent him two bottles at the beginning of his illness. He had wanted to get back to work but had not told Dr. Donadelli he wanted another medicine to

get him well faster. He had been in pain for about a week at that time. The doctor had told witness to put a £1 postal order in a plain envelope with a 1½d. stamp, in order to send it away somewhere.

In reply to Dr. Bone, he said his panel doctor was Dr. Blaine, and Dr. McAllen was his works doctor, whom he paid through the poundage system. He had seen Dr. McAllen at the surgery and got the medicine there.

#### COMPLAINANT EXAMINED

Dr. McALLEN said he had a large panel and private practice and was parish doctor and doctor to the urban district authority. As a result of complaints, he had given Dr. Donadelli notice. Later he had heard many complaints of canvassing and improper behaviour. He had himself seen Dr. Donadelli's plate up at Blaenavon, about 5½ miles from the centre of Pontypool. When he had first received the complaints he had been asked by his other assistant to give Dr. Donadelli another chance because the continental outlook was so different and what would be regarded as improper conduct here would be disregarded in Italy. Witness had made him promise not to examine another female patient alone. This promise he had kept. He had had no right to receive cash; most of the practice money came from the works and the rest from six-monthly accounts.

Cross-examined, he said respondent had himself asked for six weeks' probation at the beginning of his engagement on April 25th, 1935. He spoke English very well for a man who had only been two years in the country. The first complaints had been made a few weeks after engagement, within the probationary period. He had not the faintest idea how many patients Dr. Donadelli saw in a day; it might be thirty in a morning. The practice was an extensive working-class one. He himself had never found any kind of examination embarrassing. His other assistant had lived on the continent as a student. He could not say if there was more stiffness and reticence in this country than abroad. Despite the complaints, he had kept respondent on as a result of the other assistant's explanations. He had not regarded the matter as merely gossip. There had been no more complaints until after respondent had left. He had given notice on Feb. 11th and dismissed Dr. Donadelli summarily on Feb. 24th because he had been getting money from patients. None of those who had appeared at the hearing had complained before this notice. Respondent had been given at that time the name of one patient from whom he was said to have demanded money. In the agreement, witness was to pay respondent £75 a year for the use of his car. When notice was given witness had told him not to use the car for the last month; but this had not been just to save paying the allowance. Mr. L. had told his story between 9.30 and 11.30 on Feb. 24th. About 12.15 witness had seen respondent and said he was not to use his own car for the afternoon visits but to be driven to the end of the town in witness's car and to walk back. He had not dismissed him because he had used his own car in defiance of orders. He had never heard of Dr. Donadelli's war wound. He was not aware that he had no right to stop the car allowance as it was part of the contract. He had heard Mr. L. testify that he had not complained till the 29th, but still maintained that he had dismissed Dr. Donadelli because of Mr. L.'s report on Monday the 24th. He had, he admitted, gone round asking about complaints of canvassing. He and Dr. Donadelli



had disagreed about the treatment of patients from time to time. He had never insisted that prescriptions must be limited to drugs in the surgery. He had never seen a plate of Dr. Donadelli's in Pontypool. He did not know that he had been assistant and had tried to buy a practice in Blaenavon.

In reply to the legal assessor he said he had stopped the car allowance because respondent had claimed to have visited three patients whom he had never seen; witness had therefore sent his own chauffeur with him.

In reply to Dr. Bone and other members, he explained the poundage system and that it included supply of medicines. His dispensary was adequately equipped. He did not say he ought to have received the money himself; his case was that no money ought to have been taken from those patients and that was the cause of the dismissal. He agreed that the examining doctor was the best judge of the need for vaginal examinations and that patients sometimes objected to quite proper examinations.

No evidence having been offered on the last two charges, they were dropped.

#### RESPONDENT EXAMINED

Dr. DONADELLI said he had never committed any impropriety with any patient. Miss A. had complained of sweating and pain in the lower abdomen and back, and had asked him to examine her. She had undressed and he had examined the heart, the abdomen, and then the vagina with an illuminated speculum. He considered the examination necessary. He had asked if she felt pain—not pleasure. He had never discussed his wife and family. She had made no protest at the time. Dr. McAllen had later told him to go and investigate a complaint she had made. She had said she would herself go to Dr. McAllen and explain that she made no accusation of assault. Mrs. B. had been suffering severe lower abdominal pain and hæmorrhage and had asked him to examine her, as she was getting no better. He had examined her on a couch, with the mother-in-law in the room. She had complained of dyspareunia and he had examined her with his fingers and a torch. He had advised her to avoid intercourse until she recovered and had advised disinfectant douches. She had asked whether it would be harmful for her to have children and he had advised against it. She had shown no resentment. Later on she had visited him privately, saying she did not trust the hospital or other assistant but trusted him. Mrs. D. had been in bed with pain in the abdomen and back when he saw her. He had examined her vagina with speculum and torch. He had seen both her and Mrs. B. many times after. He had not asked her if she wanted a man. He had advised douching. Mrs. E. he had only examined once, and that in the presence of a friend. He was friendly with the members of the household and had visited often; he had never suggested locking the doors. He had advised insulin; she had refused to go to hospital. He had given her two boxes of anticoman tablets; there were no such tablets in the surgery, and he got them free as samples from the manufacturers. Neither she nor anyone else had paid for the tablets. Mrs. E. had known quite well that he was not opening a surgery in Pontypool; her husband had recommended him to a vacant club practice a little way off. She had sent a friend of hers to witness, but he had refused to see her because she lived in Pontypool. When Dr. McAllen dismissed him he had found a bedroom to live in but had had no surgery there. It was not true that he had asked Mrs. F. for panel cards. It

had never been his intention to stay in Pontypool and he had tried the area around. He had visited a number of patients to say good-bye in a friendly way and they had asked him his plans. At that time he had no practice at all. There was a practice in the market at Blaenavon and he was negotiating for its purchase, and meanwhile practising there. The people of Pontypool would never go to Blaenavon for a doctor. It would have been useless for panel patients to transfer in March as the month's notice would have had to be given at the end of February. For the boy with dermatitis he had suggested calcium injections, which he had known only in Italy. The father had asked if he could get them at the surgery; witness had replied that he could not, and they were expensive. He had seen Mr. L. on a Monday (24th), the day he was dismissed, and had not called next day. He had seen Mrs. N.'s granddaughter who was having medicine from Cardiff. He had recommended a medicine he had used in Italy and she had asked him to send for it and asked the price. He had sent for it from Italy and had made no profit. It was not available in Pontypool. Mrs. G. had tried various medicines from the surgery without benefit and she had asked him to find something else for her. He had got cachets for her from Italy; they contained benzoate of soda, coramine, and other substances. To Mr. O. he had first said that Dr. McAllen wanted him to use only medicines in the surgery and nothing else, but as these were doing no good he had mentioned certain injections which could be obtained from a Newcastle chemist. He had intended the patient to send the money direct, and had never meant to handle it himself at all, but the patient had decided against the treatment.

Cross-examined by Mr. Carthew, he admitted that he had called on over a hundred patients to say good-bye. He knew that the women paid Dr. McAllen through contracts. He had told Dr. McAllen that the medicines in the surgery were insufficient, but had not told him he was taking money from patients for medicines. He did not think it was a grossly improper thing to do. Dr. McAllen had wanted to get him deported. He had no receipts because his family had bought the drugs for him in Italy.

Witness answered questions by members of the Council about his visits to patients and said he had lived in Pontypool from Feb. 25th to April 2nd or 3rd.

#### COUNCIL'S DECISION

After brief deliberation in camera the President announced that the Council would confine its attention to charges 2 and 3. Mr. Lloyd addressed it on behalf of his client, and Mr. Carthew spoke briefly. After a short period of deliberation the President announced that eight of the nine items of charge 2, and four of the five items of charge 3, had been found proved, and the Registrar had been directed to erase Dr. Donadelli's name from the Register.

ROYAL SAMARITAN HOSPITAL FOR WOMEN, GLASGOW.—A new wing, for paying patients, at this hospital was opened on May 28th by Sir John Stirling Maxwell. The accommodation in the new wing consists of two wards of 12 beds each, and six rooms with single beds. The single rooms are intended for serious cases, and no difference is to be made in the charge for a bed in the single rooms and a bed in the wards. Through the Outram Press Fund, every bed is fitted with wireless. The fees are graded from eight guineas in the first week to three guineas in the fourth and succeeding weeks.

## MEDICINE AND THE LAW

### Damages Against Surgeon

THE judgment of Mr. Justice Finlay in *Dryden v. Stewart and the Surrey County Council* (see THE LANCET, April 25th, p. 969) will satisfy neither the patient nor the surgeon. Mrs. Dryden alleged that plugging was negligently left in her body after an operation. She claimed damages both against Dr. John Stewart, who had performed the operation, and against the county council in whose hospital she was treated and by whose nurses she was attended. The judge thinks that she exaggerated her story but did not go so far as to invent it; he has held that the plugging was inserted at the time of the operation and he can see no other explanation than that the surgeon inserted it and afterwards forgot that it was there. The judge awards £250 damages against Dr. Stewart; but, as he dismisses Mrs. Dryden's claim against the county council with costs, she may have to pay much more than she will receive. The judgment is of great importance to hospital committees as it may deter similar claims in future. First, however, we must deal with the case against the surgeon.

Mrs. Dryden was married in March, 1934. In the following August she became pregnant and in November had an accident which caused a miscarriage. The placenta remained in, and her regular medical attendant, Dr. Keble, advised her to go into the county council's hospital at Epsom. Here the placenta was removed by Dr. Stewart; the operation was followed by a douching, and Mrs. Dryden went home after about a week in hospital. Dr. Keble saw her on her return: she then complained of soreness, bruising, pain, and a discharge. Two days later, as she found it impossible to douche herself, Dr. Keble examined her and extracted what the judge referred to as a "black evil-smelling sausage of surgical gauze," tightly packed and extremely foul. Dr. Keble's evidence was that the state of this compressed and offensive mass was consistent with its having been inserted in the body nine days before—i.e., at the date of the operation. Three days later Mrs. Dryden went into the Kingston Hospital: here further plugging was removed by one of the sisters. She left hospital, returned to it in December, and in January, 1935, went back to work and had been at work ever since but complained of pain. The plaintiff's case was that she contracted pyelitis and cystitis and that the pyelitis might recur. The judge dealt carefully with the medical practice of plugging as discussed in the medical evidence. It was clearly proper, he said, to plug in the case of excessive bleeding, either actual or apprehended. Some surgeons always plugged; others, especially the younger members of the profession, did not do so habitually. Dr. Stewart, said the judge, was perfectly definite that he did not plug in this case; there was certainly no reference to plugging in the chart or records; all persons present said they saw no plugging used. But it was clear that plugging had been taken out as described by Dr. Keble. If Dr. Stewart did not insert it, the patient herself must have done so. Mr. Justice Finlay, while not favourably impressed with some of Mrs. Dryden's evidence and while of opinion that she displayed an undoubted animus against the nurses in the Epsom Hospital, did not think she was putting forward a deliberately false case—"and that, and nothing but that, is what she was doing if she put this plugging

in herself." He did not see what motive she would have had in plugging herself and, though he bore in mind the evidence of Mr. Hedley (to which he gave great weight) that women can and sometimes do plug themselves, the difficulties of holding that Mrs. Dryden did so seemed to be insuperable. "I feel constrained to find that the defendant doctor did put in this plugging and then by an unfortunate lapse of memory forgot it." It was reasonably established that the pyelitis and cystitis were due to the presence of the foreign body and that in any future pregnancy there would be more risk of them. Mrs. Dryden had made a good recovery and had substantially been well since her return to health. For her pain and suffering, and for the possibility of future trouble, £250 was, in the judge's view, a proper sum to award.

In the case against the Surrey County Council there were questions of law as well as of fact. The judge reviewed the well-known decisions (including *Hillyer v. St. Bartholomew's Hospital*) and adopted the language lately used by *Horridge, J., in Strange-ways-Lesmere v. Clayton*. The committee of a hospital contracts with a patient that they will provide a hospital, that is, an appropriate building suitable for the purpose, with a domestic staff which they will control; they also contract that they will employ or engage competent doctors and competent nurses, but they do not undertake to be responsible for the way in which the doctors or nurses perform their duties. Those duties, Mr. Justice Horridge had said, are the duties of skilled people; the actions of doctors and nurses cannot be controlled by members of a hospital committee who do not pretend the knowledge or ability to perform those duties themselves. Even if the nurses at Epsom had been proved guilty of negligence, it would (said Mr. Justice Finlay) be negligence in carrying out their skilled duty as nurses and it would not be negligence for which the county council could be responsible. Mrs. Dryden had alleged that the hospital staff was incompetent and the ward understaffed. The judge rejected these statements. There were 54 beds in the ward with one staff sister, one staff nurse, and five well-advanced probationers; the mere presence of probationers was no evidence of negligence. Patients might not receive in a ward the same individual attention as a rich person may pay for in his own home. The judge accepted the evidence of one of the sisters that the nurses, though busy, were not overworked. Although Mrs. Dryden said she complained of a black, foul-smelling discharge on her first return from the hospital, Dr. Keble had not detected it till he extracted the gauze. The nurses could not be held negligent for not having discovered what the hospital doctors did not observe and Dr. Keble did not at first detect. Plaintiff's counsel conceded that there was nothing to fix the nurses with knowledge that the plugging was in; they could therefore have had no duty to remove it.

One other point may be mentioned. There was an argument over the appropriate order against Mrs. Dryden for the costs of the county council. The latter body had the advantage of the Public Authorities' Protection Act, which apparently would mean that she would have to pay its costs as between solicitor and client, a much heavier liability than the ordinary scale of taxed costs. Mrs. Dryden's counsel asked the judge to deprive the county council of costs because it had refused, in the earlier stages of the litigation, to allow her lawyers to interview the nurses at its hospital. This refusal, it was argued, was

bound to inflame suspicions and to encourage the plaintiff in pursuing her rights. Mr. Justice Finlay thought that, if the county council had made a mistake in refusing to allow the nurses to be interviewed, it was not such a mistake as would justify him in depriving the county council of costs or in loading these costs on to Dr. Stewart. The claim against the county council failed on the law as well as on the facts; the allegations of negligence against the defendant doctor were different from those against the defendant county council, so that it was not fair to saddle Dr. Stewart with the whole bill. A stay of execution against Dr. Stewart was granted on the usual terms that he gave notice of appeal within 14 days and brought the money into court. There may thus be further judicial discussion of the case against the surgeon. On the case against a county council, as the body responsible for a hospital, more will be heard when the House of Lords at length completes the hearing in *Marshall v. Lindsey County Council*.

### Dangerous Treatment of Rheumatoid Arthritis

At an inquest held last week by the Birmingham city coroner, death was apparently attributable to the too continuous use of gorun, prescribed as a remedy for rheumatoid arthritis. The deceased, a woman of 50, had suffered acutely for several years and was obliged to use crutches. A friend recommended treatment by Dr. H. Jacobson, a German doctor in Golders Green, who had made a successful cure. Dr. Jacobson saw the patient in the presence of her own medical attendant and, after examining her, recommended the drug. Her medical attendant obtained it from his usual chemists; after a properly cautious inquiry from them and from consultants, he was assured that it was harmless. He injected the drug twice a week until he found the patient's skin turning yellow. He was unaware that the preparation contained atophan; had he known this he would have realised that the treatment should be intermittent and not continuous. Post-mortem examination indicated acute yellow atrophy and necrosis of the liver. Among the witnesses who gave evidence before the coroner, Prof. P. C. P. Cloake of Birmingham University described gorun as a mixture of three drugs, one of them being atophan. It was a valuable remedy but must be given intermittently. The later literature issued with the drug contained a note as to the method of administration: the witness thought the warning inadequate. Dr. Jacobson, who was questioned through an interpreter, told the coroner that he was responsible for the formula of gorun which he had used for many years in Germany and had introduced into England in 1923. It contained 1 per cent. of atophan. Asked by the coroner why the warning note had not appeared in the literature issued to the deceased's medical attendant on the purchase of the drug, Dr. Jacobson said the note was added after a fatality in England a few years ago. He thought he had told the deceased's doctor that the doses should be intermittent. Another witness stated that medical practitioners might have difficulty in recognising atophan under the name phenyl-quinolin-carboxylic acid which appeared in the formula on the box. The coroner recorded a verdict of death by misadventure. He observed that the drug had been administered in good faith after consultation with the author of the formula and with the supplying chemists. The coroner had no hesitation in saying that in future the distributors ought to supply much more explicit instructions,

especially if the treatment was likely to be prolonged in chronic cases.

On one point of general procedure there was a difference of opinion between the coroner and Prof. Cloake. The latter had held a post-mortem examination at the hospital and propounded the view that an inquest was unnecessary. The coroner asked him whether he knew of any substitute for an inquest which would be likely to obtain the same amount of publicity for facts which ought to be known. The medical attendant of the deceased had been unaware that he was administering a drug which contained atophan. Prof. Cloake answered that the proper nomenclature and disclosure of the ingredients of a preparation were a legal question; the law had apparently been complied with. The coroner did not go so far as to charge the professor with obstructing the inquest or tampering with the evidence. He was, however, clear that this was a "coroner's case" and not one for a private post-mortem examination without facilities for the attendance of relatives. Prof. Cloake continued to dispute the point and denied the right of the coroner to express such opinions to a witness. Without taking sides in this controversy on procedure, we can all unite in advocating full notice of any dangerous property in drugs which, however beneficent, are unfamiliar. If treatment is dangerous unless intermittent, the instructions should say so.

### Conviction of Murder by Weed-killer

Charlotte Bryant was convicted at Dorchester assizes last week on the charge of having murdered her husband by administering arsenic to him. The deceased, a cowman, died in Sherborne Hospital on Dec. 22nd last. The Crown asked the jury to believe that he had at least two other illnesses and that all three were due to arsenical poisoning. The evidence of Dr. Roche Lynch established the cause of death. He found the organs of the deceased in a pinkish and inflamed state, and they were remarkably well preserved six days after death. He discovered arsenic in every organ he examined; he estimated that the body contained 4.09 grains of arsenic. The presence of arsenic in the finger-nails, to the amount of 33 parts per million, supported the view that the illnesses of August and December were attacks of acute arsenical poisoning. The witness could not speak as to arsenical poisoning in relation to the illness of the previous May. Mr. Justice MacKinnon told the jury that it was almost impossible that Bryant could have administered the arsenic to himself. No sane human being, having endured the agony of one attack, would subject himself to another. The poisoning might be accidental but the accident would have had to happen a second and third time. If the arsenic was neither self-administered nor accidentally swallowed, it must have been given him by somebody else: Mrs. Bryant was the only person (except for her children) who was living in the house during each of her husband's three illnesses in May, August, and December of last year. A possible motive was her intimacy with a witness named Parsons to whom she was said to have spoken of the prospect of her widowhood and remarriage. A tin of weed-killer was suggested as the source of the poisoning. Nobody could give evidence of Mrs. Bryant having bought arsenic or weed-killer, but a battered tin was found which a tin-box manufacturer stated was similar to the tins made by his firm for a weed-killer company. Dr. Roche Lynch analysed scrapings from this tin and found 58,000 parts of arsenic per million. He also examined sifted ashes

from under the copper; in these he found 149 parts of arsenic per million though coal ashes normally contained no higher proportion than 50 parts.

The defence was able to emphasise the absence of direct evidence. Both in May and August a doctor was called in by Mrs. Bryant to attend her husband in his attacks of illness. The doctor, "the very

man of whom a murderess would have the greatest fear," was again summoned when the third illness occurred last December. This fact, and the failure to prove the purchase of weed-killer by Mrs. Bryant, were strong arguments in favour of her innocence. The jury, consisting of men only, found her guilty after deliberating for an hour.

## PANEL AND CONTRACT PRACTICE

### An Unrecognised Surgery

A PRACTITIONER who had a surgery for insurance and private patients, the existence of which he had not divulged to the insurance committee, has received a reminder that such things are not done. He has been on the medical list since 1913 and until 1926 he had two addresses at which treatment for insured persons was provided. During that year he applied for the committee's consent to the employment of an assistant and, as is usual, the surgeries were inspected when their condition was "such as not to meet with approval." The practitioner said his landlord had failed to have the branch surgery renovated, and he was not prepared himself to spend money on it; so with the approval of the committee the branch surgery was deleted from the medical list. From 1926 until last March the committee had no knowledge that the branch surgery was being used, but on the latter date, as a result of information received, a visit was paid to this surgery when it was found that the practitioner's assistant was conducting insurance practice there. The medical service subcommittee were satisfied on investigation that insurance medical practice was resumed at the branch surgery within a short time after its discontinuance had been notified; in fact, the practitioner did not seek to establish that it had ever been discontinued. The practitioner admitted he was ashamed of the condition of the surgery. He had, he said, done his best to discourage insurance practice at the surgery, and for a time had exhibited a notice requesting patients to attend at his principal surgery, but circumstances had been too strong for him; there was a certain amount of private practice at the branch surgery, with which he had been associated for 30 years, and he had retained the premises for sentimental as well as for business reasons. The subcommittee reported that the question they had to consider was not so much the propriety of the practitioner having a surgery in such an unclean condition—described elsewhere as squalid—as his having carried on practice at a surgery which he had notified the committee had been relinquished. The conditions under which this practice had been carried on were in their opinion such as to bring the insurance medical service into disrepute. The insurance committee has suggested to the Minister a fine of £50. It would have been much cheaper to put the surgery in decent condition.

### Trouble Over a Strangulated Hernia

The sister of a deceased insured person complained of the way her brother had been treated by Dr. A and his assistant Dr. B. The patient had suffered for some years from the effects of hemiplegia and had frequently attended at Dr. A's branch surgery in order to obtain treatment which usually consisted in the provision of liquid paraffin. On March 17th he was not as well as usual, complaining of weakness in the legs, and constipation, and was seen by Dr. B. On March 21st Dr. B was again sent for and found similar symptoms, slightly more marked, but no

cause for alarm. A hernia from which the man had suffered for some years was examined and found to be easily reducible. On the following evening the patient was not so well and at about 9 P.M. attempts were made to secure the attendance of Dr. A or Dr. B, but neither was available immediately. Eventually Dr. C was called in at about 10.15 P.M., but he could find no symptoms but weakness and flatulence, and noted the hernia which was still reducible. He did not take a serious view of the case and gave merely a placebo. About half an hour later Dr. A called and formed the opinion that the trouble might be of a cerebral character—particularly having regard to the previous history and to the fact that he found the patient's pupils did not react to light. He too examined the hernia, which he found large, but reducible, and having learned of the treatment prescribed by Dr. C he contented himself by suggesting hot fomentations if there should be any pain in the hernia, and said he would arrange for Dr. B, who had been treating the patient, to call next morning. Dr. B was called from his morning surgery to see the patient next day about 10 o'clock and found him suffering from a badly strangulated hernia and said the only chance, which he described as one in a thousand, of saving the patient was an immediate operation in hospital. He accordingly issued a request for admission to a local hospital but on arrival there about noon it was found impossible to operate and death ensued about an hour and a half later. The sister's contention was that the patient should either have been sent earlier to hospital or else, in view of the fact that death was apparently inevitable, that he should not have been sent at all.

The medical service subcommittee pointed out that between the morning of Saturday and the evening of Sunday three different medical practitioners examined the patient and could find nothing suggesting the possibility of the development of the trouble which actually caused his death. They thought Dr. B was right in advising removal to hospital on the Monday morning. He knew it was extremely unlikely that anything could prevent an early and fatal termination of the illness, and had he refrained from sending the patient to hospital he might quite well have been accused of having failed to avail himself of the only possible chance, however remote, of prolonging the insured person's life. But it is doubtful whether the sister will be really satisfied with this perfectly proper decision.

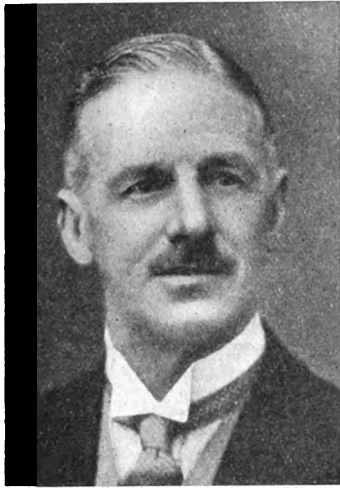
LONDON HOSPITAL.—At the quarterly court of governors of this hospital on June 3rd, Sir William Goschen, the chairman, said that the progress of the £80,000 appeal was disappointing. So far only £17,679 has been received and promised. It had also proved impossible to proceed with the scheme for the provision of pay-beds for those of moderate means as the response to the appeal for this object had amounted to £16,000, including the late Lord Woolavington's gift of £10,000. A further £5000 is needed before a start can be made.

## OBITUARY

**HAMILTON GLELLAND MARR, C.B., M.D.,  
F.R.F.P.S. Glasg.**

THE sudden death of Dr. Hamilton Marr came as a shock to his many friends. He appeared to be in his usual health and was tending some flowers in his garden in Edinburgh when he was seized with a heart attack and died within a few minutes. Dr. Marr retired only last October from the office of senior medical commissioner of the General Board of Control for Scotland, and had hoped that rest from his official duties would allow him to devote his time to scientific and literary writing.

Born in Govan in 1870, the son of Hamilton Marr of Mauchline, Ayrshire, he was educated at Glasgow High School and at Glasgow University, where he graduated in medicine at the age of 22. From the outset of his medical career he was attracted to the study of mental and nervous disorders, and after spending a few years as assistant physician in the Crichton Royal Institution, Dumfries, and the Glasgow District



DR. MARR

*[Photograph by Bacon & Sons]*

Asylum, Woodilee, Lenzie, he was appointed superintendent of the latter institution in 1901. He became lecturer in psychological medicine in St. Mungo's Medical College, Glasgow, and extramural lecturer in mental diseases in the University, and his lectures attracted many students, not a few of whom fell under his influence and afterwards looked upon him as guide, counsellor, and friend. He was appointed H.M. medical commissioner in lunacy for Scotland in 1910, and subsequently senior medical commissioner for the General Board of Control. Both as medical superintendent and as commissioner his work was characterised by ceaseless energy and scientific enthusiasm which brought him the respect of his students and the esteem of his colleagues. During the late war he served as specialist in mental diseases to the troops in Malta and later as consultant in nervous and mental diseases to the Scottish Command; he held honorary rank in the R.A.M.C. as lieutenant-colonel.

In 1927-28 Dr. Marr was president of the Royal Medico-Psychological Association and gave an address entitled Dante and Rabelais, an Account of Two Medieval Physicians, with a summary of their philosophy. Two years ago, when he delivered the James Watson lectures before the Royal Faculty of Physicians and Surgeons of Glasgow, he took as his subject Madness in Literature and Life. His publications included "Psychoses of the War" and many articles on insanity and mental deficiency. "Throughout his whole career," writes a medical friend, "he was a keen searcher after truth. He travelled extensively abroad and was a student of French and

Italian literature. In long striving to improve the conditions of asylum administration in Scotland he did not always see eye to eye with his colleagues, but he was definite in his opinions and his work was characterised by sincerity."

Dr. Marr was created C.B. in 1932. He is survived by his wife, who is a daughter of the late Mr. John Mitchell, rector of Elgin Academy, and by a son and daughter.

Dr. JOHN HOWARD WRIGHT, whose death from typhoid on May 30th at Tientsin was announced in our last issue, went out to China for the London Missionary Society in November, 1922. He was educated at King Edward's School, Birmingham, and Edinburgh University, taking his medical degree in 1921. He was stationed first at Siaochang and at Tsangchow where he was in charge of the Roberts Memorial Hospital. On his transference to Tientsin he did fine work in developing and increasing the equipment of the Mackenzie Memorial Hospital there, which now has a staff of 3 Chinese doctors and 39 nurses, and last year treated 1725 in-patients and 27,875 out-patients. Dr. Wright married Miss Margaret Burnett Aitken, of Edinburgh, and leaves his widow with two children. He was in his 40th year.

Dr. ALBERT ERNEST COPE, who died in London on June 5th at the age of 68, was well known as public vaccinator for the City of Westminster and hon. secretary of the Association of Public Vaccinators. Born at Chesterfield, the son of Rev. Thomas J. Cope, he was educated at Mansfield and Hull, qualifying in medicine at Newcastle in 1889. After holding a resident appointment at the Royal Infirmary he came south to be R.M.O. at the Westminster Dispensary and remained in practice in the borough throughout his life.

Dr. ERNEST WOODHEAD BLACKBURN was the younger of two medical sons of Dr. John Blackburn, sometime mayor of Barnsley, who have maintained the tradition of general practice in that town for 75 years. He took a first class in natural science at Oxford before his clinical study at St. Bartholomew's Hospital, from which he qualified in 1895. Before returning north he was resident at the Radcliffe Infirmary, Oxford, and demonstrator of pharmacology in the University museum. In the following year, when the borough police force was established in Barnsley, Dr. Blackburn was appointed surgeon to it and he only resigned the appointment a few weeks ago. For many years he was also surgeon to the Beckett Hospital. He died on May 25th at the age of 68.

**AN ADDITIONAL TELEPHONE SERVICE.**—At a dinner of the Head Postmasters' Association held at Cardiff on May 29th Major Tryon, the Postmaster-General, said he proposed shortly to introduce a new service as an experiment in Liverpool. The subscriber would be able to inform the telephone exchange that he would be absent for a certain period and ask that callers should be given a brief message such as the reason for his absence and the time of his return. The telephone exchange would also keep a note of the telephone numbers of those who called the subscriber and to whom his message was given. The charge for the new service would be 6d. for each occasion up to 24 hours, and there would also be a contract rate. The proposed medical telephone exchange at Johannesburg described in THE LANCET of May 23rd (p. 1217) shows how this idea may be specially adapted for the medical profession, but the more general scheme to be tested in Liverpool should also prove of value.

## CORRESPONDENCE

## THE STORAGE OF BLOOD FOR TRANSFUSION

To the Editor of THE LANCET

SIR,—Your leading article last week marks the initiation of interest in the employment of cadaveric blood in western medicine; as you say, research in this subject is overdue. On the other hand preserved blood from "universal" donors was employed by a number of surgeons during the war, myself among them. From the latter part of 1917 onward, performance of blood transfusion prior to amputation of a limb was a routine measure, which reduced the mortality-rate for amputation of the thigh by over 14 per cent. in the base hospital of which I had surgical charge. It will be realised that the reservoir of donors was of variable capacity; for this reason, following the experience of Captain Robertson, of the Massachusetts General Base Hospital, American Army, a supply of citrated preserved blood was kept at hand continually; actually the stock was not allowed to fall below six Winchester quarts. As no cold-storage facilities were available, 10 minims of chloroform were added to the Winchester as preservative, and the blood decanted for use; the sterility was controlled by weekly examinations. To the best of my recollection our experience tallied with that of Robertson, that the preserved blood was valid for use up to 28 days; no incompatibilities, or reactions more severe than those met with in recently citrated blood, were encountered.

Specimens of blood which had been preserved for two months were sent, I think, to Prof. L. E. Bayliss for examination: he wrote that these appeared to have developed an excess of a toxin of the histamine group, but that some histamine was present in all

citrated blood. For this reason, whole blood, uncitrated, and given via the paraffin-coated tube, was normally employed. I had records of over 400 cases thus transfused; and have often felt that the credit of the introduction and spread of transfusion in the British Army was not given where it belonged—viz., to Mr. D. W. Crile, nephew of his famous uncle, who popularised it in the base hospitals in the Étapes area as early as 1915.

I am, Sir, yours faithfully,

Sunderland, June 4th. W. GRANT WAUGH.

## DISEASES OF THE PERIPHERAL ARTERIES

To the Editor of THE LANCET

SIR,—The recent review (May 2nd, p. 1012) of my book, "The Diagnosis and Treatment of Diseases of the Peripheral Arteries," prompts me to offer the opinion that the reviewer has evidently been guilty of one or more amputations in thrombo-angiitis obliterans, which I so heartily condemn. My efforts to establish the conservative therapy of this disease in America have apparently not been felt in England as yet. However, having already successfully overcome these stages of opposition in America, I feel sure that it will be only a matter of time when a conservative attitude toward these diseases will be forthcoming in our English colleagues.

I am, Sir, yours faithfully,

New York, May 29th. SAUL S. SAMUELS.

\*\*\* Our review questioned how far conservatism can be carried in the patient's interests. The point at which severe suffering is best ended—even at the cost of a mutilating operation—must be left to individual judgment based on a knowledge of end-results. We hope Dr. Samuels will provide further information about the subsequent efficiency of the limbs he has saved from amputation.—ED. L.

## PUBLIC HEALTH

## The Cost of Syphilis in an Urban Community

IN times of economic depression communities as well as individuals have to look to their bank balances and consider whether and where expenditure can be reduced, and whether the money they spend can be put to more effective use. The public health services are no exception to the rule, though it may be a difficult, if not impossible, task to measure their value to the community in terms of pounds, shillings, and pence, especially with regard to particular items: what does ill-health cost the community? how much of it is preventable and at what expense? One item in this account has been recently made the basis of a study<sup>1</sup> carried out in Baltimore by Drs. W. C. Thompson, W. A. Brumfield, and Lucile Caldwell of the syphilis division of the medical clinic, Johns Hopkins Hospital. The authors' object was to obtain an accurate estimate of the cost of syphilis in a representative American community, and to see whether the amount spent is adequate to deal with the existing problem, and so allocated as to provide "the combination of maximum benefit for the infected patient and maximum protection for the public health."

The investigation was carried out by an analysis of the clinical records of hospitalised patients and by means of cost data of hospital treatment, ambulatory

clinics, serologic laboratories, and cost of drugs in the year 1933. Patients privately treated were ignored. In Baltimore, with a population of about 828,000, they report that some 9000 new syphilitic patients are discovered yearly, of whom about 4000 have early syphilis and 5000 have late syphilis. The total *direct* cost of that burden in 1933 they assess roughly at \$170,000, or, in other words, each new syphilitic patient is responsible for the charitable expenditure of more than \$18 per year. A study of the age-distribution of the hospital patients showed that nearly three-quarters of them were under the age of 50; as 74 per cent. of the hospital costs were for cardiovascular and neurosyphilis, which usually lead to prolonged invalidism, the authors conclude with reason that most of these patients, in the prime of life, are permanently removed from the possibility of self-support and form an annual charge.

On the other hand the sum available for ambulatory clinics they regard as quite inadequate and for many patients they find no treatment at all is available. They urge that if that sum were substantially increased much of the cost of hospital care would be obviated, since the late sequelæ of the disease would be prevented and fresh infections reduced. They thus reach the undeniable conclusion that "only by a reduction in the incidence of syphilis can the total expenditure be reduced," and the reasonable though, perhaps, less certain corollary that "only by the

<sup>1</sup> Amer. Jour. Syph., May, 1936, p. 243.



provision of adequate ambulatory clinics can the incidence of syphilis be reduced." In general, they believe that health departments give to the venereal diseases far less attention than they deserve, both from the patient's and the community's point of view.

### INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED  
MAY 30TH, 1936

**Notifications.**—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1795; diphtheria, 879; enteric fever, 46; pneumonia (primary or influenzal), 806; puerperal fever, 42; puerperal pyrexia, 106; cerebro-spinal fever, 22; poliomyelitis, 7; encephalitis lethargica, 12; dysentery, 26; ophthalmia neonatorum, 104. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 5th was 5031, which included: Scarlet fever, 1061; diphtheria, 756; measles, 1944; whooping-cough, 566; puerperal fever, 16 mothers (plus 11 babies); encephalitis lethargica, 284; poliomyelitis, 1. At St. Margaret's Hospital there were 27 babies (plus 15 mothers) with ophthalmia neonatorum.

**Deaths.**—In 122 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 47 (18) from measles, 5 (0) from scarlet fever, 32 (6) from whooping-cough, 32 (5) from diphtheria, 40 (11) from diarrhoea and enteritis under two years, and 31 (8) from influenza. The figures in parentheses are those for London itself.

Southampton, Hull, and Birmingham each reported 3 deaths from measles, no other great town more than 2. Birmingham had 4 fatal cases of whooping-cough, Liverpool 3. Deaths from diphtheria were reported from 19 great towns, 4 from Sheffield, 3 from Bradford.

The number of stillbirths notified during the week was 290 (corresponding to a rate of 40 per 1000 total births), including 51 in London.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Lts. C. Ommaney-Davis and A. Long to be Surg. Lt.-Comdrs.

S. J. Atkinson, H. Bradley-Watson, and E. C. Jenet to be Surg. Lts. (D).

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Capt. J. B. Ronaldson, V.D., K.H.P., to *Pembroke* for R.N.B.

Surg. Lt.-Comdr. A. H. Shelswell to *Drake* for R.N.B.

Surg. Lt. F. W. Baskerville to *Vimy*.

### ROYAL ARMY MEDICAL CORPS

Lt.-Col. C. Scaife retires on ret. pay.

Maj. S. J. A. H. Walshe, D.S.O., to be Lt.-Col.

Temp. Capt. N. W. Walmsley relinquishes his commn. and retains the rank of Capt. (Substituted for notification in the *Gazette* of Dec. 11th, 1918.)

Short Serv. Commissions: Lt. R. Phillipson to be Capt., and J. A. MacDougall, J. C. A. Marchand, and K. H. Foster to be Lts. (on prob.).

### REGULAR ARMY RESERVE OF OFFICERS

Lt.-Col. J. E. M. Boyd, M.C., and Maj. D. de C. O'Grady, D.S.O., having attained the age limit of liability to recall, cease to belong to the Res. of Off.

### ARMY DENTAL CORPS

Cpts. to be Maj. : C. E. Day and W. McAndrew.

Short Service Commissions: Lts. (on prob.) confirmed in their rank: C. W. Upton, J. H. Sherwen, B. E. French, W. F. O'Carroll, R. J. Godfrey, R. Edwards, and A. F. Town.

### TERRITORIAL ARMY

Capt. D. H. Clarke having attained the age limit relinquishes his commn. and retains his rank.

General List: Capt. M. L. Sutcliffe to be Maj.; B. B. Hosford (late Cadet, Highgate Sch. Contgt., Jun. Div., O.T.C.) to be Lt.; and Lt. J. W. E. Webster to be Capt.

### ROYAL AIR FORCE

Flying Offrs. R. C. O'Grady and E. W. R. Fairley to Medical Training Depôt, Halton, on appointment to short service commissions.

*Dental Branch.*—Flying Offr. S. Hill to Home Aircraft Depôt, Henlow.

### AUXILIARY AIR FORCE

T. McM. Boyle is granted a commission as Flying Officer, No. 609 (West Riding) (Bomber) Squadron.

### INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: G. A. Khan, H. H. Elliot, M.B.E., M.C., and D. Clyde.

The undermentioned officers have vacated apts. in India:—

*A.D.M.S.*: Col. N. Low, D.S.O., O.B.E., *V.H.S.*, Brit. Serv.

*D.A.D.P.*: Maj. F. G. A. Smyth, R.A.M.C.

*D.A.D.H.*: Maj. D. G. Chevne, O.B.E., M.C., R.A.M.C.

The undermentioned apts. have been made in India:—

*D.A.D.P.*: Lt.-Col. J. B. A. Wigmore, R.A.M.C.

*D.A.D.H.*: Capt. K. F. Alford, I.M.S.

The undermentioned officers have assumed new appointments in India: Col. W. E. R. Williams, I.M.S., O.B.E., as Assistant Director of Medical Services, Lucknow District; Lt.-Col. H. G. Winter, M.C., R.A.M.C., to Rawalpindi District staff; and Lt.-Col. R. B. Price, D.S.O., R.A.M.C., to Southern Command Headquarters.

Lt. (on prob.) W. J. Young is secd. while holding an aapt. at St. Bartholomew's Hospital, London.

Capt. J. N. Vasudeva relinquishes his temp. commn.

The grant of the rank of Capt. to Capt. Antonelli Saldanha is cancelled.

*Indian Medical Department.*—Lts. (Sen. Asst. Surgs.) to be Cpts. (Sen. Asst. Surgs.): H. A. Young, G. R. Aitkins, A. W. Hazle, F. B. A. Braganza, C. Lobo, E. J. Creais, and J. W. Traynor.

Asst. Surgs. (1st Cl.) to be Lts. (Sen. Asst. Surgs.): R. L. Dunn, W. A. Beer, E. A. Eates, G. U. Oakley, J. J. F. Dunn, A. J. Raphael, C. W. E. Frederick, and C. W. E. Peters.

Majs. (Sen. Asst. Surgs.) L. A. Francis and G. V. Aitkins to retire.

### COLONIAL MEDICAL SERVICE

Dr. D. M. Blomfield and Dr. B. P. Harris have been appointed Medical Officers, Kenya.

H. A. Gilkes, M.C., M.D. (Medical Officer, Northern Rhodesia), becomes Deputy Director of Medical Services, Trinidad.

**NEW END HOSPITAL, HAMPSTEAD.**—The hospitals and medical services committee have submitted to the London County Council four schemes for the improvement of the Council's hospitals. One of the schemes is the erection of a new nurses' home at New End Hospital and the adaptation of an existing building for staff accommodation at a total cost of some £43,500.

**ROYAL EAST SUSSEX HOSPITAL.**—Improvement of the hospital services of the country as part of a memorial to King George was stressed at the annual meeting of the governors of this hospital at Hastings on June 3rd. This institution has been greatly extended in recent years, and when the new theatres and consulting-rooms have been finished, 17 private wards are to be provided for which an appeal will be made. The ninety-seventh annual report gave the number of in-patients during the year as 1805, and the number of out-patients, including casualties, as 12,288, with a total of 74,989 attendances. Road casualties accounted for 96 cases. These involved a cost to the hospital of £889 but only £269 was received in return. There was an excess of expenditure over income of £3860.

## SCOTLAND

(FROM OUR OWN CORRESPONDENT)

## EMBOLISM IN THE LIMBS

Sir Thomas Lewis, F.R.S., delivered the George Alexander Gibson lectures of the Royal College of Physicians of Edinburgh last Monday and Tuesday. His title was Symptoms and Signs of Embolism in the Limbs with Special Reference to Pain. He began by describing the changes which develop in a limb after complete occlusion of the blood-supply with a tourniquet. The limb immediately becomes slightly pale; then a stage of cyanosis develops; and this in turn is followed by reappearance of pallor, which increases. The temperature of the limb falls slowly. If the muscles of the limb are kept at rest there is little or no pain; but if they are exercised, severe pain develops in those that are being used. This pain is due to an accumulation of products of metabolism and disappears in two or three seconds if the circulation is re-established. The blood which restores the circulation must be oxygenated if it is to bring relief. When the limb is kept at rest after occlusion of the blood-supply the first disturbance noticed is that there is some loss of the sense of touch at the finger-tips. This analgesia slowly spreads up the limb from the periphery, at the rate of about 5 cm. per minute. True anaesthesia to light touch develops in the same way, and with it position-sense becomes lost. Muscular power disappears also at this stage. In the upper extremity the small muscles of the hand are first affected; the extensors of the wrist then become weak, and finally the flexors lose power. The ability to appreciate pain and temperature is lost at a later stage. Examination of limbs that have been amputated shows that the pilomotor response is preserved even longer. Sir Thomas Lewis has been able to prove that the effect on the nerves is caused neither by an effect on the end-organs, nor by pressure on the nerve, but by loss of the blood-supply to the nerve. The longest nerves to the ends of the extremities are the most vulnerable, as they also appear to be in cases of peripheral neuritis.

In his second lecture Sir Thomas discussed the cause of the pain which occurs in clinical cases of embolism of the main arteries of the limbs. He explained that the theory commonly accepted was that the pain arises at the moment the vessel is blocked and is due to some local effect on the wall of the artery. This explanation, he believes, cannot be accepted. Numbness and paralysis of the affected limb are often present, it is observed, by the time pain appears, and the site at which the pain is felt is often distal to the position of the embolus. Obstruction of the abdominal aorta, for example, first causes coldness and numbness in the legs and later paralysis and pain felt in the legs, not in the abdomen. Re-establishment of the circulation by operative removal of an embolus at once relieves pain in the limb just as it was relieved, in the experiments, by removal of the tourniquet. The lecturer referred to a case in which an embolus was dislodged from the axillary artery and settled at the lower end of the brachial artery. This event gave complete relief from pain in the arm, though the radial pulse did not return. The blockage of a blood-vessel in the brain or lungs causes no pain, but if a vessel is blocked in a muscular organ, such as the heart or gut, pain is a striking feature of the disturbance

produced. Sir Thomas Lewis concluded, therefore, that the pain caused by embolism of a large artery to a limb develops at an interval after the blockage, and is always associated with ischaemia of the tissues of the limb. The tissue primarily concerned in the production of this pain is, in all probability, the muscles.

## A NEW DERMATOLOGICAL DEPARTMENT

On June 5th Sir Norman Walker opened the new dermatological and venereal diseases department of the Edinburgh Royal Infirmary. The building, which has cost £40,000, has five floors and a basement. The venereal diseases department occupies the lower three floors, while the third and fourth floor form the skin department. Included in the building is provision for 38 in-patients in the venereal diseases section and 46 in-patients in the skin diseases section. Sir Norman Walker said that John Hughes Bennett, who became professor of physiology in 1848, was the first to teach dermatology in Edinburgh. Beds were first set aside for skin disease in the Infirmary in 1891 and the opening of the new eye department in 1905 enabled cases of skin diseases to be admitted to Ward 2. He considered that the new department was the best in the country. Besides the 46 beds available, there are also 90 for diseases of the skin at the Western General Hospital.

## PARIS

(FROM OUR OWN CORRESPONDENT)

## OUTBREAKS OF PINK DISEASE

A RECENT communication by Dr. Rocaz of Bordeaux to the French Academy of Medicine seems to indicate that infantile acrodynia has lately been quite common in the South West of France. Since he reported his first case in 1926 he has observed 68 similar cases himself, and has been informed of 90 others observed by colleagues about whose diagnoses there could be no doubt. If to these 158 cases be added other known cases that Dr. Rocaz has been unable to check and the doubtless numerous cases escaping recognition, the total must run into several hundreds. The geographical distribution suggests that there are several more or less dense centres of this disease, in each of which some 20 to 30 cases have been observed. Other minor centres have been responsible for some 10 cases each. The distribution of the disease would seem to correspond to that of other diseases conveyed by carriers; and in two of the main centres, infantile acrodynia seemed to follow the course of important waterways. Most of the children were aged 1-3 years, and there were few cases above the age of 6. The sexes were equally involved, and the distribution of the cases throughout the different seasons of the year was most irregular. It may perhaps be significant that the centres in which this disease was most common were also those which have suffered much from other neurotropic diseases such as encephalitis and poliomyelitis. The occurrence of more than one case in the same family suggested infection; in one family, a brother and a sister developed typical infantile acrodynia at the same time. In another family one child developed and recovered from acrodynia that overtook another child 20 months later, born in the interval. In a third family, a child developed the disease 3 months after having been in contact with a cousin who was suffering from it.

In the presence of similar events recorded by other observers, Dr. Rocaz is of the opinion that this cannot be explained away as a mere coincidence.

#### PARAMEDICAL ASPECTS OF HANDWRITING

Dr. Camille Streletski has just published a book entitled "Précis de Graphologie Pratique" (Paris, 1936). Its 381 pages contain some 500 specimens of handwriting whose most characteristic features and "true inwardness," as Ibsen used to call it, are commented on by the author in an objective and critical spirit. The investigations of Charles Richet and others have done much to rehabilitate graphology as a science, rather than a game with which to amuse cynics in a court of law. Dr. Streletski's contribution to the subject is as serious as it can be, and in addi-

tion to many original observations, his book contains much evidence of a careful study of the work of his predecessors. Considerable space is devoted to grapho-pathology, a subject in which neurologists and psychiatrists may be expected to be particularly interested. One of the most arresting chapters is entitled "Le film graphologique." Here the author traces the modifications imposed on the handwriting of one and the same person by internal and external changes as he grows older; and one of the most notable subjects chosen for this very, very slow motion film is Dr. Alexandre Guéniot, specimens of whose handwriting from the age of 25 to that of 100 are reproduced. In the course of this work, the author traces the influence of disease and other factors, internal and external, on the handwriting.

## PARLIAMENTARY INTELLIGENCE

### NOTES ON CURRENT TOPICS

#### Reassembly after Whitsuntide

THE House of Commons reassembled on Tuesday, June 9th, after the Whitsuntide recess.

#### Importation of Scientific Apparatus

On June 9th, in the House of Commons, the Finance Bill was considered in Committee. On Clause 5 (which continues Part I. of the Safeguarding of Industries Act, 1921, for a further period of ten years from August 19th, 1936) Mr. THURTLÉ moved an amendment to the subsection which provides for the importation of certain scientific apparatus free of duty provided that the Board of Trade are satisfied that such goods are not likely to be made in this country within a reasonable time, or in sufficient quantities. The amendment provided that the Board of Trade must also be satisfied that such goods are not likely to be available in this country "at a reasonable price."—Mr. G. GRIFFITHS, who seconded the amendment, said that hardship was caused to diabetic patients by the 33½ per cent. duty on hypodermic needles.—Dr. BURGIN, Parliamentary Secretary to the Board of Trade, in reply, said that the section did not apply to hypodermic needles, but was to enable high-priced scientific instruments to be brought into the country free of duty. In the case of such instruments, which would probably be ordered singly, he questioned whether it was possible to define "a reasonable price."—Sir FRANCIS ACLAND said that until a few months ago a first-rate British hypodermic needle made of rustless steel could not be obtained, and if the needle were not rustless the expense of obtaining fresh needles was considerable. There were now two sorts of British needle. We had beaten the foreign needle on merits, and he could not believe that the British manufacturers, having succeeded in making first-class goods, would wish to rely on a high duty.—The amendment was negatived by 192 votes to 131.

### HOUSE OF COMMONS

TUESDAY, JUNE 9TH

#### Destruction of Human Food

Mr. MATHERS asked the Secretary of State for Scotland whether he would give particulars of any instances brought to his notice during the last 12 months of food of any description fit for human consumption having been destroyed; whether he would state the reasons in each case for the destruction; whether action was taken under his authority before or since the food was destroyed; and whether it was his intention to seek any further powers he might have found necessary to prevent such waste.—Sir GODFREY COLLINS replied: According to the information possessed by the Scottish Departments con-

cerned the position in Scotland for the year ended May 31st, 1936, is as follows: Approximately 1200 tons of herrings and 50 tons of other fish were destroyed at ports in Scotland. These amounts represent less than ¼ per cent. of the total landings in Scotland—namely, 275,000 tons. The principal reasons were that supply was in excess of market demand and that the fish was of poor quality. There was also a small quantity of milk which could not be utilised economically on non-school days. I am not aware of any other instances. I have no authority to take any action in the matter.

Mr. WILSON asked the President of the Board of Trade if he would state the cases brought to his notice in which during the last 12 months food of any description fit for human consumption had been destroyed, and in each case the reason for the destruction; the action taken by the department, either before the destruction or since; and whether it was intended to take further powers to prevent such destruction.—Mr. RUNCIMAN replied: No such cases have been brought to my notice beyond those mentioned by my right hon. friend the Secretary of State for Scotland in the answer he has given to-day, to which I cannot usefully add.

#### Reduction of Working Hours

Mr. TOM SMITH asked the Minister of Labour if he had any further information to give the House regarding his discussions with employers of labour on the question of a reduction of working hours.—Lieut.-Colonel MURHEAD replied: No further meetings have taken place since those referred to in the reply given on May 21st. As a result, however, of my right hon. friend's meeting with representatives of the distributive trade the organisations agreed to appoint representatives with whom the department could consult for the further examination of the position with regard to wages, hours, and working conditions in those trades, and communications have been received from other organisations who wish to be associated with these discussions. As pointed out in the previous reply, the principal effect of the discussions has been to cause closer attention to be given to the question relating to absorption of more workpeople into employment, but my right hon. friend proposes to have a report prepared on the discussions for the information of those interested.

#### Experiments on a Dog

Sir ROBERT GOWER asked the Minister of Agriculture what was the nature of the research work begun in the United States of America and continued in this country on a dog permitted to be quarantined at the Royal Maternity and Women's Hospital, Glasgow, during the past year; by whom such research work was conducted; the time of its duration; and whether any pain or suffering was caused to the dog.—Sir JOHN SIMON, Home Secretary, replied that no experiment had been made on the dog since its arrival in the United Kingdom. As Sir Robert Gower was aware, he had no jurisdiction in regard to experiments performed outside the United Kingdom.

## MEDICAL NEWS

### University of Oxford

On June 6th the degree of D.M. was conferred on J. N. O'Reilly. At a convocation on June 24th it will be proposed to confer the honorary degree of D.Sc. on Dr. E. D. Adrian, F.R.S., fellow of Trinity College, Cambridge, and Foulerton professor of the Royal Society.

### University of London

A university readership in physics is to be established which will be tenable at the Royal Cancer Hospital. The regulations for the academic post-graduate diploma in dietetics have been approved and copies may be had from the academic registrar.

Lord Dawson has been reappointed to the senate as representative of the faculty of medicine, and Prof. T. B. Johnston has been appointed representative of the general medical schools.

Mr. R. Davies-Colley and Mr. C. Jennings Marshall have been appointed as examiners in surgery for this year, and Prof. E. D. Telford and Mr. G. T. Mullally as examiners for the M.S. examination in July to fill the vacancies caused by the resignation of Mr. E. K. Martin and Mr. P. H. Mitchiner.

At recent examinations the following candidates were successful:—

#### THIRD EXAMINATION FOR M.B., B.S.

J. C. B. Bone, Middlesex (*a, b, c*, university medal); E. P. Clarke (*d*), St. Bart.'s; C. J. Cobbe (*a*), St. Thomas's; A. L. Craddock (*a*), London; R. S. Ellis-Brown (*d*), Guy's; Joyce M. George (*c*), King's Coll.; Sholem Glaser (*b*), London; C. A. Lillcrap (*a*), Guy's; Mary H. Robbins (*d*) and Eileen D. M. Wilson (*e*), Roy. Free.

(*a*) distinguished in medicine, (*b*) distinguished in pathology, (*d*) distinguished in surgery, (*e*) distinguished in obstetrics and gynaecology.

Ruth M. Addison, Roy. Free; Charles Anderson, St. Bart.'s; G. A. Armstrong, Westminster; H. R. Arthur, St. Thomas's; R. A. J. Asher, London; Mary Barber, Roy. Free; H. H. F. Barns, Univ. Coll.; H. L. W. Beach, St. Bart.'s; B. E. Blair, St. Thomas's; Kathleen E. Burnell, Roy. Free; Henry Caplin, London; H. B. C. Carter-Locke, St. Thomas's; Anny M. Cusack, Univ. Coll.; Thomas Denness, St. Thomas's; E. W. Dunkley, London; A. G. Edwards and G. J. Evans, Guy's; H. D. Fairman, London; J. E. Giesen, Guy's; R. M. Glass, Westminster; Philip Glazer, King's Coll.; Margaret M. Hanford, Roy. Free; H. R. S. Harley, Guy's; Jack Hartsilver, St. Bart.'s; C. E. W. Hoar, Westminster; C. D. Holdstock, London; K. F. Hulbert and A. C. Jones, Middlesex; W. W. Jones, Guy's; A. C. Kanaar, St. Bart.'s; G. H. W. Keates, Guy's; L. M. Kelly, St. Thomas's; H. M. Kelsey, Guy's; F. B. Kiernander, St. Thomas's; F. J. D. Knights, Middlesex; J. H. Lawrence, Univ. Coll.; W. D. F. Lytle, St. Thomas's; J. McA. McArthur, Guy's; J. R. M. Martin, St. Bart.'s; Elizabeth M. Morgan, Roy. Free; E. G. Murphy, Univ. Coll.; Lucy M. B. Nelson, Roy. Free; R. J. Niven, St. Thomas's; K. L. G. Nobbs, St. Mary's; H. A. Oatley, Univ. Coll.; J. D. Ogilvie and W. A. Oliver, St. Bart.'s; John Pemberton, Univ. Coll.; Marjorie L. Penwill, Dorothy J. Perkins, Lena F. G. Priestman, and Grace E. Reed, Roy. Free; J. C. Roberts, St. Bart.'s; Irene H. Rogers, King's Coll.; Eric Sayle, Guy's; Mary Scott, Roy. Free; D. J. Sheehan, St. Bart.'s; W. E. Springford, Charing Cross; W. J. Stokes, London; C. H. Tanner, Univ. Coll., Cardiff; R. N. Tattersall, Univ. of Leeds; Frank Taylor, Guy's; G. R. Taylor, St. Bart.'s; H. C. Thomas, London; R. C. Tudway and Winifred J. Wadge, Univ. Coll.; Alan Wardale and H. F. West, King's Coll.; and Donald Wilson and C. A. Young, St. Mary's.

### University of Wales

At recent examinations the following candidates were successful in obtaining the tuberculous diseases diploma:—

S. N. Ahmed, Pranartharhihara Arunachalam, S. M. Basu, L. R. Dongrey, E. F. Drum, John Duffy, J. K. Feeney, M. A. Hai, D. V. G. Muthu, B. R. Patel, A. K. Shariff, and M. P. Sinha.

### University of Dublin

Dr. O'Donel Thornley Dodwell Browne has been elected to the King's professorship of midwifery in the School of Physic, Trinity College, Dublin, to fill the vacancy left by the resignation of Dr. T. Henry Wilson. Dr. Browne is a medical graduate of the University of Dublin and a fellow of the Royal College of Physicians of Ireland.

### Cambridge Graduates' Medical Club

The annual dinner of this club will be held at King's College, Cambridge, on Friday, June 26th, at 7.30 p.m. Mr. W. H. C. Romanis, vice-president, will take the chair, and the hon. secretaries may be addressed at 1, Park-square West, London, W. 1.

Prof. Charles Singer will deliver the eleventh Fison lecture in the medical school of Guy's Hospital on Thursday, June 18th, at 5 p.m. He will speak on Magic and Medicine in Early England.

### British Social Hygiene Council

Sir Kingsley Wood, the Minister of Health, is to address the annual meeting of the British Social Hygiene Council in the London School of Hygiene and Tropical Medicine, Keppel-street, at 2.45 p.m. on Wednesday, June 17th. All interested are invited.

### Elizabeth Garrett Anderson Hospital

The centenary of the birth of the founder of this hospital formed the occasion of a special visit by its first president, the Duchess of Kent, following a luncheon in the board room to which Sir Alan Anderson and Dr. Louisa Garrett Anderson were invited. Brief speeches were made by Lady Robertson, chairman of the hospital, and Lady Barrett, M.D., who said that 6000 women doctors were now practising in this country. She drew attention to the value of the work being done by medical women and to the wide range of their activities.

### Nurseries for the Children of the Unemployed

Lord Eustace Percy, M.P., formerly president of the Board of Education, opened the extension of the Save the Children Fund's emergency open-air nursery for children of the unemployed at North Shields on June 10th. The extension makes accommodation available for 80 children, aged two to five, instead of 40 as at present. Plans for an additional nursery for another 80 children at the east end of the town and for a nursery at Hebburn-on-Tyne have been passed by the Board. Progress is also reported in regard to other efforts of the fund in providing these nurseries for the children of the unemployed. In South Wales, the possibility of extending the nursery at Merthyr Tydfil is under consideration; and at Hoxton application has been made to the London County Council for recognition of the nursery as it is the only one of the kind in the neighbourhood. Of the 10 emergency open-air nurseries established by the fund during the past ten years, 9 have been recognised by the Board of Education for grant, and their chief medical officer, in his last annual report, gave special commendation to the fund's work in this realm.

## Vacancies

For further information refer to the advertisement columns

Albert Dock Hospital, Connaught-road, E.—Res. M.O., at rate of £110.

Ashton-under-Lyne.—Res. Surg. O. and H.S., at rate of £200 and £150 respectively.

Battersea General Hospital, Battersea Park, S.W.—H.S. and H.P., at rate of £130 and £120 respectively.

Bedford County Hospital.—First H.S., at rate of £155.

Belfast, Royal Maternity Hospital.—Res. H.S., at rate of £100.

Belgrave Hospital for Children, Clapham-road, S.W.—Second H.P., at rate of £100.

Birmingham City Education Committee.—Asst. School M.O., £500.

Birmingham City, P.H. Dept.—Two Res. Asst. M.O.'s, each £400.

Birmingham Selly Oak Hospital.—Res. Surgeon, £700. Pathologist, £750. Also Radiologist, £800.

Blackburn Royal Infirmary.—Res. H.P., £175.

Bolton Infirmary.—H.S., £125.

Bootle General Hospital.—H.S. or Cns. O., at rate of £150.

Bradford, Royal Eye and Ear Hospital.—H.S., £160.

Brecon County.—Asst. M.O., £500.

Brighton, New Sussex Hospital for Women, Windlesham-road.—H.S., £100.

Brighton, Royal Sussex County Hospital.—Cas. H.S., £120.

Bristol General Hospital.—Two H.P.'s, three H.S.'s, Res. Obstet. O., H.S. to Spec. Depts., at rate of £80. Also Cns. H.S., at rate of £100.

Burton-on-Trent General Infirmary.—H.S., £150.

Cardiff, Llanough Hospital.—Sen. Res. Surg. O., £450.

Chesterfield and North Derbyshire Royal Hospital.—H.S. to Ear, Nose, and Throat Depts., at rate of £150.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Asst. Radiologist.

Colchester, Essex County Hospital.—Asst. H.S., £120.

Connaught Hospital, Walthamstow, E.—H.S., at rate of £100.

Croydon County Borough.—Asst. M.O.H. and Asst. School M.O., £500.

Derby, Derbyshire Royal Infirmary.—Gynaecological H.S. and Emergency Anaesthetist, £150.

Derbyshire Education Committee.—Asst. School M.O., £600.

Doncaster Royal Infirmary.—H.P., at rate of £175.

Dorset County Council.—Clin. Tub. O., £750.

- Dover, Royal Victoria Hospital.**—Res. M.O., £180.  
**Dreadnought Hospital, Greenwich.**—H.P., at rate of £110.  
**Eaking, King Edward Memorial Hospital.**—Sen. Asst. Res. M.O., at rate of £200.  
**Elizabeth Garrett Anderson Hospital, Euston-road, N.W.**—Hon. Asst. Phys.  
**Great Yarmouth General Hospital.**—H.S., at rate of £140.  
**Halifax Royal Infirmary.**—Third H.S., at rate of £150.  
**Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.**—H.S., at rate of £100.  
**Hastings, Royal East Sussex Hospital.**—Jun. H.S. and Temp. H.S., at rate of £150 and £200 respectively.  
**Hospital for Sick Children, Great Ormond-street, W.C.**—Cas. M.O., £175. Also Res. Aural Reg., £150.  
**Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.**—Res. H.P., at rate of £100.  
**Huddersfield, St. Luke's Hospital.**—Res. M.O., £200.  
**Hull and Sculcoates Dispensary.**—Res. M.O., £500.  
**Ilford, King George Hospital.**—Hon. Asst. Dermatologist, Cas. O. and Surg. Reg., Res. Med. Reg., each £150. Also two H.S.'s, each £100.  
**Indian Medical Service.**—Commissions.  
**Ipswich, East Suffolk and Ipswich Hospital.**—H.S. to the Asst. Surgeons and H.S. to Senior Surgeon, each £144.  
**Ipsworth, West Middlesex County Hospital.**—Asst. M.O., £400.  
**Kent County Council.**—Asst. for Tuber Administration, £900. Also Asst. for Hospital Administration, £800.  
**Kettering and District General Hospital.**—Second Res. M.O., at rate of £125.  
**Kidderminster and District General Hospital.**—H.S., £150.  
**Leeds University.**—Lecturer in Biochemistry and Lecturer in Physiology, each £500.  
**Lingfield Epileptic Colony.**—Asst. M.O., £300.  
**Liverpool, Alder Hey Children's Hospital.**—Res. Asst. M.O., £200.  
**Liverpool Sanatorium, Delamere Forest, Frodsham.**—Second Asst. to Med. Supt., £250.  
**Liverpool Stanley Hospital.**—H.S., at rate of £100.  
**Liverpool, Women's Hospital.**—H.S., at rate of £100.  
**London County Council.**—Asst. Physicist, £450.  
**London Hospital, E.**—First Asst. and Reg. to Children's Dept., £300.  
**London Lock Hospital, Dean-street, W.**—Surg. Reg., £100.  
**London University.**—Examinerships.  
**Maidstone, Kent County Ophthalmic and Aural Hospital.**—H.S., at rate of £200.  
**Manchester, Ancoats Hospital.**—Res. Surg. O., £200.  
**Manchester, Monsall Hospital for Infectious Diseases.**—Jun. M.O., at rate of £250.  
**Manchester Royal Infirmary.**—Cardiographic Registrar and Res. Clin. Pathologist, each £150.  
**Manor House Hospital, Golders Green, N.W.**—Jun. M.O., £200.  
**Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W.**—Res. M.O., £100.  
**Metropolitan Hospital, Kingsland-road, E.**—M.O. for Jewish Out-patients, £100.  
**Middlesbrough, North Riding Infirmary.**—Third H.S., at rate of £125.  
**Middlesex Colony for Mental Defectives, Harper-lane, Shenley.**—Second Asst. M.O., £460.  
**Miller General Hospital, Greenwich, S.E.**—H.S., at rate of £100.  
**National Hospital for Diseases of the Nervous System, Queen-square, W.C.**—Registrar, £200.  
**National Temperance Hospital, Hampstead-road, N.W.**—Res. M.O., at rate of £175. Cas. O. and H.S., at rate of £120 and £100 respectively. Also Surg. Reg., 40 guineas.  
**Newcastle-upon-Tyne Royal Victoria Infirmary.**—Res. H.P.'s and H.S.'s, each at rate of £50. Also two H.S.'s for Leazes Hospital, each at rate of £100. Also two Anaesthetists, each at rate of £200.  
**New Zealand, Wellington Hospital Board.**—Asst. Supt., Medical, £1000.  
**Northampton General Hospital.**—Secretary-Superintendent, £600.  
**North Riding of Yorkshire County Council.**—Asst. School M.O., £500.  
**Nottingham City.**—Asst. Tuber. O., £500.  
**Nottingham City Education Committee.**—Jun. Asst. School M.O., £500.  
**Nottingham City Hospital.**—Res. Surg. O., £350.  
**Nottingham Hospital for Women.**—H.S., at rate of £150.  
**Oldham Royal Infirmary.**—H.S., Cas. O., and H.P., each at rate of £175.  
**Plymouth City General Hospital.**—Jun. Asst. M.O., £250.  
**Plymouth, Prince of Wales's Hospital, Greenbank-road.**—Res. Anaesthetist and H.S., at rate of £120.  
**Portsmouth and Southern Counties Eye and Ear Hospital.**—H.S., at rate of £120.  
**Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.**—H.S., at rate of £120-£150.  
**Prison Service.**—M.O., Class II., £525.  
**Public Dispensary, 122, Drury-lane, W.C.**—Res. M.O., £150.  
**Queen's Hospital for Children, Hackney-road, E.**—Res. M.O., at rate of £200. Also H.S. and Cas. O., each at rate of £100.  
**Queen Mary's Hospital for the East End, Stratford, E.**—Radio-ologist, £350. Also Cas. and Out-patient O., at rate of £150.  
**Reading, Royal Berkshire Hospital.**—Three H.S.'s and Cas. O., each at rate of £125. Also Hon. Asst. Anaesthetist.  
**Rochester, St. Bartholomew's Hospital.**—H.P. and Cas. and Orthopaedic H.S., each at rate of £175.  
**Royal Army Dental Corps.**—Dental Surgeons.  
**Royal Cancer Hospital, Fulham-road, S.W.**—Sen. Asst. Radio-ologist, £350.  
**Royal Chest Hospital, City-road, E.C.**—Hon. Physician.  
**Royal College of Surgeons of England.**—Examiner in Anatomy.  
**Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.**—Hon. Asst. Aural Surgeon.  
**St. Andrews University.**—Chair of Midwifery and Gynaecology.  
**Scotland Department of Health.**—Regional M.O., £800.  
**Sheffield, Jessop Hospital for Women.**—H.S., at rate of £100.  
**Southampton, Royal South Hants and Southampton Hospital.**—H.S. to Ear, Nose, and Throat Dept. and Res. Anaesthetist, at rate of £150.  
**Southeast-on-Sea General Hospital.**—Med. Reg. and R.M.O., £300.  
**Southern Rhodesia Medical Service.**—Two Government M.O.'s, £600.  
**Stafford, Cheddleton Mental Hospital, near Leek.**—Asst. M.O., £600.  
**Stafford, Prestwood Sanatorium.**—Jun. Asst. M.O., at rate of £300.  
**Stoke-on-Trent, North Staffordshire Royal Infirmary.**—H.S., at rate of £150.  
**Surrey County Council, Reigate Institution.**—Med. Supt., £900. Also Res. Asst. M.O., at rate of £375.  
**University College Hospital, Gower-street, W.C.**—Bilton Pollard Fellowship, £650. Also Hon. Asst. Radiologist to National Dental Hospital.  
**West Bromwich, Hallam Hospital.**—H.P., at rate of £200.  
**West London Hospital, Hammersmith-road, W.**—Pathologist, £750. Med. Reg. to Children's Dept., £100. Also two H.S.'s, H.P., Res. Cas. O., and Res. Anaesthetist, each at rate of £100.  
**West Malling, Kent, Leybourne Grange Colony for Mental Defectives.**—Asst. Res. M.O., £350.  
**Westminster Hospital, Broad Sanctuary, S.W.**—House Anaesthetist, at rate of £100. Also Hon. Anaesthetist.  
**West Sussex County Council.**—M.O.H., £340. Also M.O.H. for Horsham Urban District, &c., £460.  
**Wigan, Royal Albert Edward Infirmary and Dispensary.**—H.S., at rate of £150.  
**Wilkesden General Hospital, Harlesden-road, N.W.**—Hon. Clin. Asst. to Skin Dept. Also Res. Cas. O., at rate of £100.  
**Winchester, Royal Hampshire County Hospital.**—Res. Surg. O. and H.P., at rate of £200 and £125 respectively.  
**Windsor, King Edward VII. Hospital.**—Two H.S.'s, each £100.  
**Wolverhampton Education Committee.**—Asst. M.O., £600.  
**Wolverhampton Royal Hospital.**—Asst. Res. M.O., at rate of £100.  
**Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.**—H.S., at rate of £100.  
**Worcester Royal Infirmary.**—H.S., £160.  
**Workshop, Victoria Hospital.**—Jun. Res., £120.  
**York County Hospital.**—Res. Anaesthetist and Asst. H.S., £150.
- The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Oldham West (Lancashire), Hemel Hempstead (Hertford), Whithorn (Wigtownshire), Kenilworth (Warwickshire), Dalbeattie (Kirkcudbrightshire), and Marple (Cheshire).

## Births, Marriages, and Deaths

### BIRTHS

- CARDELL.**—On June 3rd, at Weymouth-street, W., the wife of J. D. Magor Cardell, F.R.C.S. Eng., of a daughter.  
**JOHNSTON.**—On May 31st, at Edinburgh, the wife of Dr. D. Scott Johnston, Gold Coast, West Africa, of a daughter.  
**JORY.**—On June 3rd, at Hightgate, the wife of Norman Jory, F.R.C.S. Eng., of a daughter.  
**MEYER.**—On June 3rd, at Devonshire-place, the wife of Dr. Peter F. Meyer, of a son.  
**PURSER.**—On May 31st, at Devonshire-place, W., the wife of Dr. J. A. Purser, of a son.  
**RANSOME WALLIS.**—On May 31st, the wife of Dr. R. Ransome Wallis, of Marsden, of a daughter.  
**SCOTT.**—On June 3rd, at Hook, Hampshire, the wife of Dr. Rupert H. Scott, of a son.

### MARRIAGES

- CAIGER-SMITH—GRANGER-EVANS.**—On June 3rd, at St. Peter's, Belsize Park, Oliver Caiger-Smith, M.R.C.S. Eng., to Janet Maxwell Granger-Evans, second daughter of the late John W. Evans, F.R.S., and of Dr. Granger-Evans.  
**KNOWLES—TREEBY.**—On June 3rd, Thomas Knowles, M.D. Edin., late of Christchurch, Hampshire, to Janet, widow of Alfred Treeby, J.P., of Whitehayes, Christchurch.  
**MAXWELL—EVANS.**—On June 4th, at St. Bartholomew the Great, Smithfield, James Maxwell M.D., F.R.C.P. Lond., to Elizabeth Nan Evans.

### DEATHS

- AIRD.**—On June 7th, at Hove, Thomas Wilson Aird, M.D. Durh., M.R.C.S. Eng., late of Wallington, in his 86th year.  
**COPE.**—On June 5th, Albert Ernest Cope, M.D. Durh., D.P.H., late of Westminster, aged 68.  
**LIVINGSTONE-LEARMONTH.**—On May 30th, at Yenching University, Peiping, Agnes M. Livingstone-Learmonth, C.B.E., M.B. Edin., wife of Dr. Basil L. Livingstone-Learmonth.  
**MANNING.**—On May 30th, at Swindon, Ernest John Manning, M.R.C.S. Eng.  
**MARTIN.**—On June 5th, suddenly, at Cheltenham, John L. Martin, M.B. Edin., formerly of Chelmsford, aged 67.  
**MORRIS.**—On June 2nd, at Cullompton, Devon, Lt.-Col. Charles Reade Monroe Morris, D.S.O., R.A.M.C.  
**POWELL.**—On June 8th, at Wolfcholt, Ilfley, Oxford, Colonel John Powell, M.B., B.Ch., B.A.O. Dub., D.S.O., late R.A.M.C.  
**ROBINSON.**—On June 4th, at Cannington, Bridgewater, George Burton Robinson, M.B. Durh., L.R.C.P. Lond., aged 67.  
**ROBINSON.**—On June 3rd, suddenly, at Colwyn Bay, Frederick William Robinson, M.D. Aberd., F.R.C.S. Eng., formerly of Huddersfield.  
**STEIN.**—On May 31st, at Hampstead, N.W., Dr. Charles Guthrie Stein, M.B. Edin., aged 81.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

## NOTES, COMMENTS, AND ABSTRACTS

## THE LAW OF ABORTION

## Germany

THE German Eugenic Law of July 14th, 1933, which came into force on the first day of 1934, contained a clause (§ 14) prohibiting sterilisation except as carried out under this law (and of course, castration) unless performed by a doctor in accordance with the recognised principles of medical practice in order to avert serious danger to the life or health of the person concerned and with that person's consent. The revised Eugenic Law of June 26th, 1935, applied this prohibition explicitly also to the artificial termination of pregnancy. In order that any doubt about the exact interpretation of the clause might be set at rest the Ministers of the Interior and of Justice issued jointly three weeks later (July 18th) the so-called Fourth Injunction which amplifies and explains this section of the law for the benefit of the medical practitioner whose duty it will be to carry out its provisions. The injunction may be summarised as follows.

## THE FOURTH INJUNCTION

Sterilisation or abortion for medical reasons, i.e., in the interest of the mother's health, must only be carried out if a specially constituted tribunal has pronounced it to be necessary. When urgency is great, abortion is allowed without previous consent, and consent is excused when in operating for disease of the sex organs sterilisation cannot be avoided.

The Minister of the Interior will set up medical courts for the purpose of considering applications for sterilisation or abortion on grounds of health. Each court is to be under the direction of a president appointed by the Minister, who will select the other members, as far as possible in rotation, from a panel of approved medical practitioners. A doctor is not permitted to refuse to serve, but may be excused on urgent grounds (e.g., of health) by the president; if dissatisfied with the latter's decision he has a right of appeal, in the last resort, to the Minister. Only practitioners of Aryan extraction are eligible for the panel. No fee is payable for service, but members are entitled to claim their expenses according to a scale laid down by the Minister. No doctor may adjudicate on a case referred by him to the court—a rule which may be waived at the discretion of the president if it is impossible otherwise to obtain a sufficient number of members. If the president of the court has proposed a case for decision, a deputy must preside in his stead when this case is dealt with.

Each case must be referred to the court by the patient's own doctor, who must be of approved status, i.e., authorised to practise in Germany. Application is in writing on a special form setting forth the grounds on which the petition is based. Petitions for sterilisation or abortion on social grounds will not be entertained, and are forbidden; petitions on eugenic grounds are not to be addressed to the court but directly to the proper medical authority. Both the application itself and the decision of the court must be based on the principles embodied in directions issued by the Minister of the Interior in conformity with the general consensus of medical opinion.

Before any operation for sterilisation or abortion is carried out, the consent of the woman must be obtained. If possible this should be done before the application is submitted to the court. If the woman's mental condition is such that she is incapable of giving consent, it may be given by her legal representative or guardian; or if she has none by a representative nominated for the purpose by the local authority. Consent may be excused only in extreme urgency.

The application is sent by post or brought by the patient to the court and received by the president, who appoints two members of the panel to deal with it. The names of the examiners are communicated to the patient who attends for examination by each independently at an appointed time. To obviate the possibility of collusion, neither examiner must communicate with his colleague or with the patient's own doctor until he has formed his opinion on the case and conveyed it to the president. Judgment is pronounced by the president on the results of these two independent examinations. If they agree he is bound to pronounce accordingly; if they differ he examines the case himself and gives the casting vote, or in case of difficulty he may call in a consultant to assist him. When the court has reached a decision it is communicated by the president to the patient's medical attendant, whose duty it is to inform the patient.

The patient is required to pay a fee, in order to cover the running expenses of the scheme, according to a scale to be fixed by the Minister. Any surplus that may remain after all expenses have been paid will be devoted to medical charities, i.e., the relief of necessitous doctors or their dependants.

Sterilisation or abortion may only be carried out in an institution, public or private, the choice of which is left to the patient. Abortion may be carried out in the patient's home if removal to an institution is likely to endanger her life or seriously injure her health. In general the operation may not be performed by any of the medical men who have adjudicated upon the case, but exceptions to this rule may be made at the discretion of the president. The surgeon shall be chosen by the patient's doctor, and the fees of both shall be settled in the ordinary way by the patient.

The doctor or midwife in attendance (or failing these, any person, not a relation of the patient or member of her household, present at the time) is pledged to notify the public health authority within three days of all cases of spontaneous abortion and premature labour up to the 32nd week of pregnancy. In the case of induced abortions authorised by the special courts, the surgeon performing the operation must also notify the court within three days of the operation. Failure to notify abortion is punishable by a fine.

If abortion and sterilisation are both deemed necessary for medical reasons in the same case, the Minister's wish is that they should be carried out if possible at one and the same time in order to avoid multiplication of operations. Any patient requiring repeated Cæsarean section should, in general, be sterilised at the time of the second operation.

Any person who performs a sterilising operation or induces abortion without proper authorisation shall be punished by imprisonment.

## A TREATISE ON MEDICAL INDICATIONS

One of the most important clauses of the injunction is that which makes the Minister of the Interior responsible for laying down the guiding principles upon which all applications for sterilisation and abortion, as well as the decisions of the medical tribunals, are to be based. The directions of the Minister are to correspond with the accepted principles of medical science, and he has entrusted the task of formulating the medical indications for sterilisation and abortion to the new official body, the *Reichsärztekammer*. The fruits of its labours have now been published in the form of an official handbook,<sup>1</sup> issued under the editorship of Dr. Hans Stadler. This publication, which contains the text of the Fourth Injunction, explanatory notes, and a series of articles covering the whole field of medical

<sup>1</sup> Richtlinien für Schwangerschaftsunterbrechung und Unfruchtbarmachung aus gesundheitlichen Gründen. Munich: J. F. Lehmann. 1936. Pp. 180. RM.3.75.



indications for sterilisation and abortion, is intended to ensure uniformity of practice. It does not deal with the legal aspects of the injunction, which are included in another authorised handbook.<sup>2</sup> Each of the medical sections is written by an expert, and the subjects dealt with, in order, are the toxæmias of pregnancy, cardiac diseases, pulmonary tuberculosis, other medical conditions (renal disease, blood diseases, &c.), gynaecological diseases, mental and nervous diseases, surgical conditions (malignant growths, &c.), diseases of the ear and throat, eye and skin. A section is devoted to the value of radiology in assisting the medical examiner to form an opinion as to the desirability or otherwise of interference. The articles are illustrated by numerous plates and diagrams, and together constitute a clear and useful summary of the present-day views regarding therapeutic abortion and sterilisation. The book is not intended to be final; it is pointed out that in respect of certain conditions (e.g., the toxæmias of pregnancy) opinion has not yet crystallised, and the results of further research and observations must be awaited before dogmatic statements can be made. The door is thus left open for such revision of the work as future advances in knowledge may render necessary.

No instructions are given in this manual as to the technique to be adopted in performing sterilisation or abortion, for this is done in the commentary. An appendix however is added concerning the use of radiation (X rays and radium) for producing sterility. This is expressly forbidden except where the woman is over 38 years of age, where the state of her health renders any operation dangerous, or where other pathological conditions exist for which radiotherapy is the appropriate treatment. These methods of sterilisation may only be carried out by practitioners and in institutions recognised for this purpose by the Minister, who will also determine the scale of fees to be charged. All cases so treated must be followed up and the results reported to the medical authority.

The book is prefaced by a request to all practitioners to assist the authorities in keeping it up to date by reporting their own experiences in practice.

### England

It is a little significant that the German views on therapeutic abortion should have become available just at the same time as the report<sup>3</sup> of the special committee set up by the council of the British Medical Association, at the request of the representative body, to consider the medical aspects of abortion. In this report the term abortion is defined as expulsion of the foetus before the age of viability (28 weeks). Its frequency is difficult to ascertain, but in this country 16 to 20 per cent. of all pregnancies are believed to terminate in abortion, and there is evidence that in the majority of cases it is artificially induced. Abortion contributes largely to the general maternal mortality and morbidity, especially in criminal cases.

### THE LAW FORBIDS ABORTION

The law unequivocally forbids the induction of abortion in any circumstances whatever; it contains no saving clause to justify a medical practitioner in performing therapeutic abortion. On the other hand, the interpretation of the law is less rigid. Lord Riddell, in addressing a joint meeting of the Medico-Legal Society and the section of obstetrics and gynaecology of the Royal Society of Medicine (Jan. 21st, 1917), stated that a practitioner "will not be liable to conviction if he honestly believes that what he does is required to save the mother's life or health." Apart from conviction, however, the present state of the law renders a doctor liable to indictment with its attendant publicity which may prove almost equally

damaging to his professional reputation, and the committee concludes that the whole question needs to be examined with the object of clarifying the doctor's position in relation to the law, which should at least contain an explicit statement of the principles governing justifiable abortion. Further to safeguard the practitioner the committee would like careful consideration to be given to the proposal that abortion must only be carried out with the approval of two independent medical men; in its opinion the acceptance of this proposal would be one of the greatest boons that could be conferred on the medical profession.

### INDICATIONS, MEDICAL AND ECONOMIC

Pregnancy may be artificially terminated either to benefit the mother or to prevent the birth of hereditarily diseased offspring. In the opinion of the committee, the maternal indications are at present not sufficiently well defined, and it suggests that more uniform standards are highly desirable. With this object in view an attempt has been made to formulate the medical indications for terminating pregnancy. It is not suggested that the classification is final, but it is intended to form a basis for further discussion. As regards eugenic abortion, the committee is of opinion that the procedure should be considered when there is reasonable certainty that serious hereditary disease will be transmitted to the child.

Induction of abortion for social and economic reasons, of which poverty is the chief, is widely prevalent, and is associated with a relatively high mortality-rate, owing chiefly to the fact that it is often practised by unskilled persons under surgically unclean conditions, with consequent risk of sepsis. The committee has no doubt that the legalisation of abortion under certain conditions for non-medical reasons would go far to solve the problem of criminal abortion, but admits that this is a matter for consideration by the community as a whole and not by the medical profession alone.

It will be seen that the German and English proposals follow closely similar lines; the working of the German law may be expected to furnish valuable information as to the probable effects of legalising abortion in England.

### Russia

In Russia the law of abortion is tending towards a restriction of the liberty enjoyed during the last 15 years. On May 26th was issued by the Soviet Government the draft of a new law which will prohibit abortion on health grounds, except where the life or health of a woman is endangered by pregnancy. The penalty suggested for illegal abortion is imprisonment up to two years for a medical practitioner, up to three years for an unqualified operator. There would also be a penalty of two years' imprisonment for any person who compels a woman to undergo an operation for abortion. The consenting woman would pay for a first offence by public censure and for a subsequent offence by a fine up to 300 roubles. The Soviet Union Year Book Press Service, to whom we owe this information, says that the measure has not yet become law, as is generally supposed. It is still a draft, presented to the masses for their consideration, to be passed or amended in accordance with the consensus of public opinion. The Service adds: "When the Soviet Government passed a decree in 1920 granting women the right to abortion it was then regarded as a temporary measure, permissible only so long as the then prevailing economic conditions made the upbringing of children difficult. The position is quite otherwise now. With the increasing prosperity, not only of industrial workers, but of the collective farm peasantry, Soviet women have nothing to fear from larger families. Moreover, the practice of abortion has been found to be injurious to their health. Judging by the numerous letters pouring into the Soviet newspapers and the reports of discussions on the measure in factories and on

<sup>2</sup> Gütt, Rüdln, and Ruttko: Kommentar zum Gesetz zur Verhütung erbkranken Nachwuchses. Second edition. 1936. Same publisher. RM.6.

<sup>3</sup> Brit. Med. Jour., April 25th, 1936, Suppl. p. 231.

collective farms, the draft of the new law is being favourably received. A few objections are voiced now and then in the press. Some women argue that the measure is too sweeping, that abortions should not be entirely prohibited, but should be allowed in exceptional cases, such as when a woman engages in a long course of study."

The proposed measure is not confined to the limitation of abortion. It contains a number of proposals designed to protect mothers and children, such as increased grants for maternity, allowances for families of over seven, provision of 43,000 more beds in maternity homes, extension of the kindergarten system, and the tightening up of regulations for divorce and payment of alimony.

#### DIARIES OF LITERARY PATIENTS

In the view of Dr. Macdonald Critchley,<sup>1</sup> the symptomatology of text-books makes dull reading. He prefers the subjective descriptions of men of letters and quotes from "La Doulou," by Alphonse Daudet, who suffered from tabes dorsalis. Daudet's account of his sufferings is macabre in the extreme. He writes of lightning pains as "great tracks of flame slashing and lighting up my carcass. . . . The torment of the spiked boot. Rats with sharpened teeth gnawing my toes." The girdle sensation is described as "The cuirass . . . actual armour, cruelly clasping my loins with steel buckles, and tongues of burning coal, sharp as needles. . . ." Daudet realised that the fear of pain is often worse than the pain itself. "It is bearable and yet I cannot endure it. It is the terror of it. . . ." And the egotism of the sick man is well expressed: "Pain is always fresh for him who suffers it, and banal for the onlookers. All get used to it except I." At Lamalou, in Nérès, where he underwent a cure, he comments with grim humour on his fellow-sufferers. "The professor . . . I see him putting one foot in front of another, as flat as can be, and staggering; on ice." Finally there is his cynical gibe at the profession: "The doctors are building in Lamalou. They have faith—and what black hats!" That vivid notes by a skilled writer bring home to readers the nature of the subjective aspect of diseases is not to be disputed. No one could fail to be moved, for example, by Barbellion's disease. But whether such gruesome stuff contributes materially to our knowledge of any disease is a different matter.

#### A LITHOTOMY INSTRUMENT TABLE

Mr. J. LYLE CAMERON, F.R.C.S. Eng., writes: A lithotomy instrument table has been made for me by Messrs. John Bell and Croyden, London, W., similar in design to the Mayo model. It is constructed like a bedside table, rests on three ball-bearing castors, and is adjustable in height from 24-40 in. to suit the convenience of the surgeon. The tray is 30 in. long and limited to a width of 9 in. so as not to obstruct the surgeon's access to the field of operation when it is placed transversely in front of him. This table is especially designed to facilitate all operations performed in the lithotomy position, such as those on the vulva, vagina, and rectum. Furthermore, it affords a very convenient left hand instrument tray if placed across the patient's chest, behind the anaesthetist's screen, when the Trendelenburg position is employed.

<sup>1</sup> The Symptomatology of Tabes (as illustrated by the diary of Alphonse Daudet). K.C.H. Gazette, April, 1936.

**BUCHANAN HOSPITAL, ST. LEONARDS.**—On June 6th the new nurses' home at this hospital was opened by Lady Willingdon. It has been erected at a cost of £5700, and much of the furniture has been given by friends of the institution. It will accommodate 26 nurses and 2 sisters.

## Appointments

**BARR, BESSIE, M.B. Glasg.**, has been appointed Resident Anaesthetist at the Stobhill Hospital, Glasgow.  
**HOWELL, T. E., M.R.C.S. Eng.**, Pathologist to the Evelina Hospital, London.  
**SHARP, B. BUCKLEY, M.D., M.R.C.P. Lond.**, Hon. Consulting Physician to Acton Hospital.  
 Certifying Surgeon under the Factory and Workshop Acts:  
**Dr. W. HUNT** (Carlton District, Notts).

## Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

### SOCIETIES

**ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**  
 TUESDAY, June 16th.—5.30 P.M. General Meeting of Fellows.

#### THURSDAY.

**Dermatology.** 5 P.M. (Cases at 4 P.M.) Dr. H. MacCormac: 1. Ultra-violet Light—Modified Technique. 2. Mycosis Fungoides. Dr. Hugh Gordon: 3. Acantosis Nigricans. Dr. J. D. Rolleston: 4. Mongolian Blue Patch.

#### FRIDAY.

**Obstetrics and Gynaecology.** 3 P.M. Dr. A. Stewart Wilson: Two Cases of Full-time Ectopic Pregnancy Delivered, One by the Vaginal Route, and One Abdominally. Prof. J. M. Munro Kerr: Some Points in the Technique of Caesarean Section. Dr. W. M. Feldman: Natural or Physiological Contraception.

### EUGENICS SOCIETY.

TUESDAY, June 16th.—5.15 P.M. (Rooms of the Linnean Society, Burlington House, Piccadilly), Mr. R. B. Cattell: Is National Intelligence Declining?

### ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.

THURSDAY, June 18th.—8.15 P.M., Annual General Meeting, 8.30 P.M., Dr. Cecil J. Hackett: Boomerang Legs and Yaws in Australian Aborigines.

### ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

MONDAY, June 15th.—5 P.M. (1, Wimpole-street, W.), Prof. John H. Stokes (Philadelphia): The Control of Syphilis: A Critical Examination of Some of its Problems. (Prosser White Oration.)

### LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

#### INSTITUTE OF CHILD PSYCHOLOGY, 26, Warwick-avenue, W.

WEDNESDAY, June 17th.—6.15 P.M., Prof. H. R. Hamley: Character and Education. 8.15 P.M., Mr. H. W. S. Wright: Character and Citizenship.

#### BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY, June 15th.—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Mr. Victor Bonney: Carcinoma of Uterus.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).

THURSDAY.—11.30 A.M., Col. L. W. Harrison: The Treatment of Syphilis. 2 P.M., Prof. J. C. Windeyer (Sydney): Diagnosis and Treatment of Some Common Obstetrical Abnormalities. 3 P.M., Dr. R. A. Young: Non-tuberculous Pulmonary Diseases.

FRIDAY.—2.15 P.M., Dr. A. A. Davis: Gynaecological Pathology.

Daily, 10 A.M. to 4 P.M., Medical clinics, surgical clinics or operations, obstetrics and gynaecological clinics or operations, and refresher course.

#### SOUTH-WEST POST-GRADUATE ASSOCIATION.

WEDNESDAY, June 17th.—3 P.M., Visit to Glaxo Laboratories, Greenford, Middlesex.

#### FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, June 15th, to SUNDAY, June 21st.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. Afternoon M.R.C.P. course in neurology and psychopathology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues. and Thurs., 8 P.M., clinical and pathological M.R.C.P. course.—BROMPTON HOSPITAL, S.W. Afternoon M.R.C.P. course in chest diseases.—PARK HOSPITAL, Hither Green, S.E. Sat. and Sun., course in infectious diseases.—Courses are open only to members.

#### HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

WEDNESDAY, June 17th.—2 P.M., Dr. Donald Paterson: Abdominal Tuberculosis. 3 P.M., Dr. A. Signy: Milk as a Vehicle of Infection.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

#### UNIVERSITY OF BIRMINGHAM.

TUESDAY, June 16th.—3.30 P.M. (General Hospital), Dr. T. L. Hardy: The Diagnosis and Treatment of Functional Disorders of the Colon.

FRIDAY.—3.30 P.M. (Queen's Hospital), Dr. A. V. Neale: Demonstration of Surgical Cases.

#### MANCHESTER ROYAL INFIRMARY.

TUESDAY, June 16th.—4.15 P.M., Dr. T. H. Oliver: Recent Views on the Pituitary.

## ADDRESSES AND ORIGINAL ARTICLES

## ENLARGEMENT OF THE HEART\*

BY JOHN PARKINSON, M.D., F.R.C.P. Lond.

PHYSICIAN TO THE CARDIAC DEPARTMENT OF THE LONDON HOSPITAL; PHYSICIAN TO THE NATIONAL HOSPITAL FOR DISEASES OF THE HEART

CLINICAL and post-mortem study in close and happy comradeship has led to the use in practical medicine of those very pathological terms, dilatation and hypertrophy, which we have been considering. Yet it is of doubtful benefit to borrow them for use in the wards, where it must be admitted there is difficulty enough in determining the simple fact of enlargement. So I suggest that the term enlargement is preferable and sufficient. In a general sense, however, it is not now sufficient; for by radiology it becomes our duty and privilege to identify particular enlargement of the component parts of the heart—i.e., its various chambers—and the channels by which it fills and discharges. It used to be sufficient to say that a pulse was irregular, now such a statement would be unhelpful unless we specify what kind of irregularity is present. And so from radiocardiology we must ask for more than a revelation of enlargement. It must be definitive and inform us of its site, its development, and its extent. Some have gone further, and wish to see in the form of the heart under certain conditions, and its type of contraction, a means of judging the "tonic" or "atonic" state of the heart. From this by easy paths even spurious terms such as a "flabby heart" have been coined again for radiological circulation. Radiology must keep within the law; it must be open to correction by anatomy, physiology and pathology, and by well-informed clinical medicine.

Before proceeding to enumerate causes of clinical enlargement, one may draw attention to certain practical points of interest. Apart from X rays, the apex-beat is undoubtedly the most useful and convenient sign despite its limitations being so patent. Although a systolic murmur at the apex does often accompany enlargement (dilatation) and result from it, it is so common and its origin is so mixed that it cannot be reckoned a sign of enlargement. The electrocardiogram is often of considerable value where it gives clear evidence of right or of left preponderance, and a large or bifid auricular (P) wave may focus attention upon the size of the auricles. In cardiac hypertrophy from hypertension, the left ventricle is especially hypertrophied, but the right ventricle is often affected to a certain extent. Unless notice is taken of this gap in our knowledge, an observer with X rays may be biased and tend to visualise his ideas into the cardiac shadow exactly as I fear that preconceived ideas often biased the percussor. It has been a good custom to collect all the signs first and from these to build a structure upon which an unprejudiced diagnosis may be reached; and radiological signs should be enlisted to follow the same rule and not to usurp the function of diagnosis.

Sporadically the idea survives that the heart gets larger and larger as age advances, but in the absence of that common cause for it, hypertension, enlargement is not a necessary accompaniment even of great age.<sup>102</sup> I have a collection of radio-

cardiograms of men over 80 which present no enlargement, though the heart is seen to lie more transversely on the diaphragm than in the average adult despite the fact that the diaphragm is often low (Fig. 12). It is quite possible, as Assmann<sup>3</sup> thinks, that this is due to lengthening of the thoracic aorta forcing down the base of the heart from which it arises.

The pertinent question in these days is not merely whether the heart is enlarged or not, but which part of it is enlarged, for enlargement is localised and characteristic in many and varied cardiac lesions. Further, these localised changes in the particular chambers of the heart can be recognised in their early stages and not merely in those late stages which come too quickly into the domain of the pathologist. Following this plan I propose to discuss enlargement of the left auricle, the left ventricle, the right auricle, the right ventricle, in this order, and to take examples of those diseases which particularly affect the chamber under consideration.

## Left Auricle

The left auricle might, from its anatomical relations, almost be called the posterior auricle, for it lies against the oesophagus and descending aorta which keep it from the spine. The left auricle is not visible from the front, excepting a tiny portion of the left auricular appendage which adheres to the left border just below the pulmonary artery. It is beyond the reach of percussion, but X rays in the right (I) oblique position show it well, and its posterior border is conveniently outlined by barium in the oesophagus. This important method has now come into current use, for after the presystolic murmur it is the most certain sign of mitral stenosis. Some may be tempted, as I have been, too easily to accept a gentle curve of the posterior border as evidence of enlargement of the left auricle; but the normal variations in this curve are sufficient to render care necessary. It is the abruptness of the displacement of the barium stream as well as its degree which is characteristic; and often the barium is held up in triangular form at the upper end of the left auricle before slowly passing this obstruction in a thinner stream (Fig. 13).

It is becoming important to learn what may be the causes, apart from mitral stenosis, of this demonstrable enlargement. In any patient with auricular fibrillation which has lasted long enough, the left auricle may show change in this direction (Fig. 14). In complete heart-block it often looks prominent. Great difficulty sometimes arises where the left ventricle is greatly enlarged and where the left auricle is simply pushed backwards by it. In such a case the barium convexity is often long and pronounced, though not placed so high or displaced so brusquely as with the special auricular enlargement of mitral stenosis.

The recognition of gross (or aneurysmal) dilatation of the left auricle in mitral stenosis has been often reported in recent years and we find it more common than is usually thought. It should be emphasised, however, that among patients with mitral stenosis may be found every grade of left auricular enlargement from that which is doubtful (and then one should say so) to that which has been labelled aneurysmal dilatation. Curiously enough, not only does the left auricle lie posteriorly so that almost nothing of it is seen from the front, but when it enlarges it nearly always enlarges to the *right* so that it begins to appear on the right border of the heart at a little higher level than the right auricle, the border of

\* The second Lumleian lecture for 1936 delivered before the Royal College of Physicians of London on March 19th. The first lecture appeared last week.

which it gradually passes (Fig. 15), if the clinical course happens to extend over years. As you know, the most extreme enlargement allows extension of the left auricle to the right axilla where it has even been tapped as if it were a right pleural effusion (Fig. 16). It possesses clinical features of great interest, such as the moderate symptoms which may accompany a heart so hugely dilated, a clinical contrast with the patient so ill with a comparable ventricular enlargement as from hypertension.

### Left Ventricle

As the left border of the heart when seen from the front is formed by the left ventricle, enlargement is often easy to recognise, and displacements are the

trophy of the heart, chiefly though not exclusively of the left ventricle, but there is also hypertrophy of the media of the muscular arteries, and this should form an integral part of the criteria of enlargement from hypertension.

Coarctation (congenital stenosis) of the aorta is worth remembering as a rare cause for enlargement of the left ventricle, with hypertension affecting only the upper part of the body.<sup>36</sup>

Even where it is most expected as in aortic incompetence or hypertension, one may not assume that radiological evidence of enlargement will invariably be found; such retention of normal size against odds is a cardiac event which may some day be found to possess clinical interest and significance.

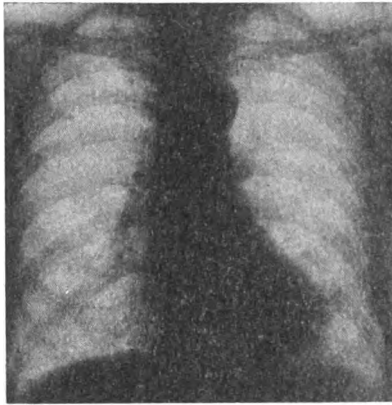


FIG. 12.—Normal heart, anterior view. Healthy man aged 93.

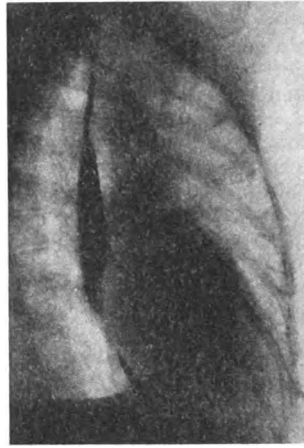


FIG. 13.—Mitral stenosis. Teleradiogram, right (I) oblique position. Barium in the oesophagus passes over the aorta (aortic bed) and is then held up by the enlarged left auricle which projects into the posterior mediastinum.

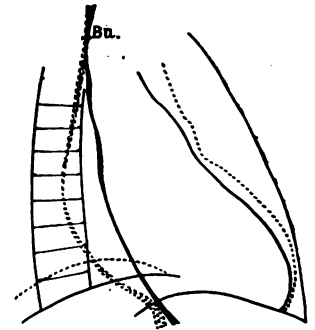


FIG. 14.—Auricular fibrillation without mitral stenosis. Enlargement of left auricle outlined by barium in the oesophagus (continuous line), and greater enlargement six years later (dotted line).

chief source of difficulty and a familiar one. In health, the apparent size of the left ventricle depends much upon the height of the diaphragm. Right ventricular hypertrophy, whether from extreme pulmonary disease or from congenital lesions, can displace the left border of the heart outwards and simulate enlargement of the left ventricle.

The causes of left ventricular enlargement are familiar; aortic stenosis, whether rheumatic or atheromatous, gives a picture very like that of aortic incompetence, though seldom is the heart so large, and with the latter there is more pulsation both in the heart and in the aorta. It may at once be asked whether X rays help in the separation of rheumatic from syphilitic aortic incompetence, the two common varieties of aortic leak. The distinction can only be drawn by establishing a coincident and characteristic change in the aorta, either an aneurysm or such a degree of dilatation or pouching as could not be simulated by the dynamic dilatation of the ascending aorta in free rheumatic aortic incompetence (Figs. 17 and 18). Cardiac enlargement from syphilis, in the absence of aortic incompetence, is a rare occurrence.

The other common cause is hypertension, which even now is scarcely appreciated at its full value as a source of cardiac enlargement. In the absence of valvular disease there is nothing like hypertension for compelling cardiac enlargement. The term cardiovascular hypertrophy was introduced by Turnbull<sup>109</sup> for the anatomical counterpart of clinical hypertension. There is not only hyper-

Cardiac aneurysm has been the subject of numerous pathological reports for generations, and in his well-documented study in 1903, Dr. Donald Hall<sup>45</sup> took the modern view that it is rarely syphilitic, and almost always due to coronary atheroma. Now that coronary thrombosis has become a frequent clinical diagnosis, it would not be surprising if cardiac aneurysm were to follow suit, for X rays make it possible to see the aneurysmal bulge in a fair proportion of cases. As you know, it is the apical portion of the left ventricle which is most often affected, and this lies within our radioscopic vision. Most typical is a localised promontory even to angulation on the left border of the heart seen from in front (Fig. 19). In one such case, however, necropsy showed me that the prominence mistaken for a cardiac aneurysm was, in fact, the apex of the heart lifted by the aneurysm itself which lay upon the diaphragm. In the right (I) oblique position, I have seen an aneurysm fill the anterior lung space at its lower part and prevent the normal illumination of this part of the space even during deep inspiration. It will be apparent that an extensive aneurysm may simulate very closely an ordinary hypertrophy of the left ventricle; and this was so in one patient where necropsy revealed an extensive aneurysm involving the lower half of the left ventricle. Once I saw a line of calcium in this region, almost parallel and just internal to the left border, permitting the diagnosis of calcified aneurysm which was confirmed. The almost constant thrombosis within a cardiac aneurysm brings additional clinical risks.

### The Size of the Heart after Coronary Thrombosis

Coronary thrombosis is so clear a proof of coronary atheroma that it may serve as a basis for studying enlargement in coronary disease.

Hypertension is by far the most frequent and important cause of the enlargement which is often seen. So true is this that even with normal blood pressure at the time of examination, past hypertension should be held responsible for left ventricular enlargement unless aortic stenosis or some other known cause explains it; or there is in the history good evidence to the contrary. But when a patient is known to have had normal blood pressure for years prior to the attack, or when enlargement begins to develop after it (still without raised blood pressure), then the interesting question arises as to whether or not coronary disease itself causes enlargement.

Evidence has been collected that hypertrophy may be produced by interference with the proper blood-supply of the myocardium. If that is so, there is theoretically no reason why the same result should not follow coronary obstruction. Cardiac enlargement is known to occur in experimental<sup>38</sup> and clinical<sup>5</sup> anæmia; in cases where an anomalous coronary artery arises from the coronary sinus<sup>22 13</sup>; and in deficient coronary flow.<sup>100 71</sup>

That coronary disease is actually a cause of hypertrophy has not been conclusively proved. *Experi-*

excluded, and where the hypertrophy was ascribed to coronary disease alone. But their results have been criticised and it does seem likely that hypertension had operated in some of their cases. *Clinical* evidence controlled by X rays is scanty and it is largely negative. Horine and Weiss<sup>51</sup> report 20 cases in which enlargement did not supervene during periods averaging four years after the attack.

In the last few months Dr. J. H. Palmer has investigated and will shortly publish a series of 200 patients who have been under my observation for extended periods following coronary thrombosis and where there were X ray records. The evidence of enlargement has been judged by radioscopy and by inspection of teleradiograms. The average period elapsing between the attack and the last X ray examination was about three years; 40 cases were examined at intervals during more than five years.

Among the whole 200 cases of coronary thrombosis were found 128 (64 per cent.) in which the heart was enlarged. There was every reason to think that hypertension was the predominant or single cause of enlargement in 106 (82·8 per cent.) of these 128 cases. In 4 cases (3·1 per cent.) there were associated but incidental factors which were accepted as causative. In 7 cases (5·5 per cent.) the cause for the cardiac enlargement could not be ascertained, though both factors of hypertension and coronary sclerosis may have been at work.

By process of exclusion we found that coronary

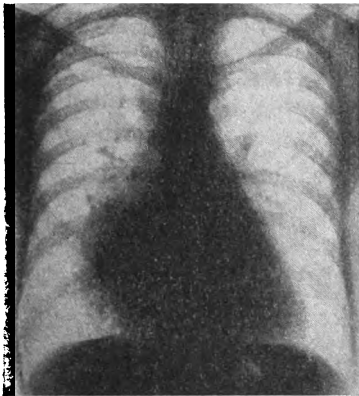


FIG. 15.—Mitral stenosis. Teleradiogram, anterior view. The left border is straight from aortic knuckle to apex from filling out by the pulmonary artery and the conus. The bulge on the right border is caused by enlargement of the left auricle to the right and behind the right auricle.

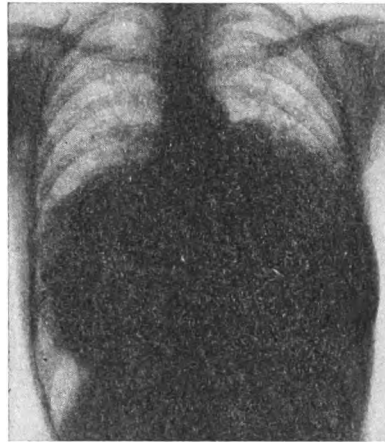


FIG. 16.—Aneurysmal dilatation of left auricle. Mitral stenosis. Auricular fibrillation. Post-mortem control. Teleradiogram, anterior view. In the right side of the thorax the left auricle extends to the right axilla.

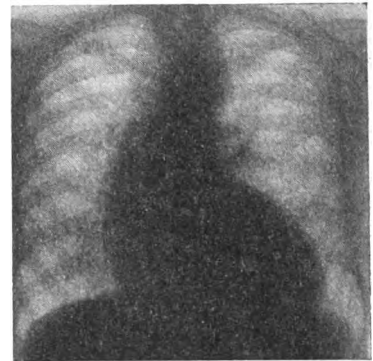


FIG. 17.—Rheumatic aortic incompetence. Teleradiogram, anterior view. The left ventricle is enlarged as shown by extension of the left border of the left and increased convexity of it. The ascending aorta is unduly prominent (dynamic dilatation).

mental evidence is contradictory.<sup>101 107</sup> *Pathological* evidence is complicated by the notorious difficulty of excluding the possibility of hypertension. Nemet and Gross<sup>84</sup> found it difficult to believe that coronary sclerosis is an important factor in the development of hypertrophy, and Bell and Clawson<sup>10</sup> went so far as to state that such a conception is physiologically unsound. Lisa and Ring<sup>72</sup> were unable to estimate the importance of coronary disease as a factor in causing hypertrophy; Nathanson<sup>83</sup> could find no relation between the degree of fibrosis and the size of the heart. Miller and Weiss<sup>80</sup> published a series showing no gross hypertrophy. On the other hand, Bartels and Smith<sup>8</sup> reported 37 cases with necropsy and previously had reported two others<sup>103</sup> in which all known causes of enlargement, including hypertension, were believed to have been satisfactorily

thrombosis was the sole factor in producing enlargement in 4 patients—i.e., 3·1 per cent. Each of these was known to have had normal blood pressure prior to the attack, and hearts of normal size when the attack occurred. To these 4 patients should be added 4 others (3·1 per cent.) in whom cardiac aneurysm was diagnosed by X ray, one confirmed by necropsy. No figures of their blood pressure before the attack are available, but it was not raised subsequent to the attack. A further addition of 3 patients (2·4 per cent.) who showed a bundle branch lesion might be made, for this is fair evidence of coronary disease, and in two it arose after the attack. If in these last three groups the enlargement was directly the result of coronary thrombosis, we have a grand total of 11 (8·6 per cent.) where we believe that cardiac infarction was the single cause of enlargement.



### Right Auricle

The right auricle is as clearly visible from in front as is the left ventricle. Tricuspid stenosis is so very rare compared with mitral stenosis that we do not expect often to see much enlargement of the right auricle. The effects of auricular fibrillation are shown in course of time by enlargement of both auricles. If there is tricuspid incompetence either from valvulitis or more usually from enlargement of the right ventricle late in mitral disease, some enlargement of the right auricle is a natural sequence.<sup>30 50</sup> This is to be seen also in late stages of pulmonary disease, but the rarity of auricular fibrillation in failure from this cause makes right auricular (and also left auricular) enlargement late or little pronounced. In congenital defects of the auricular septum the right auricle is enlarged to an extreme degree, especially where with it there is coexistent mitral stenosis—Lutembacher's disease.<sup>74 78</sup> It is well, where the increased prominence of the right auricle is found, to look for increased breadth of the vascular pedicle from distension of the superior vena cava, which clinically we should expect in association with distended veins in the neck.

It will be agreed that isolated dilatation of the right auricle is most exceptional. For this reason I am fortunate in being able to show records of such a case, thanks to the courtesy of Dr. Cotton. A man

astinum can actually appear as a shadow behind the right auricle and going beyond it (Fig. 21). Once I saw a doubtful shadow in this region which proved to be that rarity a low œsophageal pouch (Fig. 22). This is similar to a figure published by Berg,<sup>11</sup> where the intruding shadow was a para-œsophageal hernia.

### Right Ventricle

There was once much controversy, and a great heresy as Dr. Graham Steell says in his book, about the nature of the pulsation in the second left interspace, for it was thought to be due to pulsation of the left auricle, although it is only the appendix of the left auricle that comes to the front, a part of the chamber least likely to become dilated and often found plugged with clot. The pulsation is now accepted as due to the pulmonary artery and the conus (or infundibulum) of the right ventricle, one or both of these. The conus has acquired a new importance as part of the right ventricle, simply because it becomes radioscopically visible on the left border as the only portion of the right ventricle which can be seen from the front. Fortunately, in addition, the right ventricle forms part of the cardiac outline when the subject is turned well to the right, the left (II) oblique position, about 60°.

The causes of right ventricular enlargement include chronic pulmonary disease, many congenital malformations—e.g., Fallot's tetralogy—and late

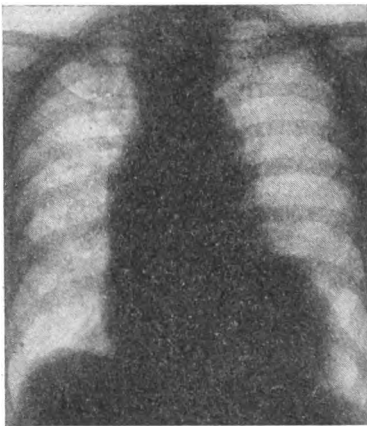


FIG. 18.—Syphilitic aortic incompetence. Teleradiogram, anterior view. The left border is rounded and extends to the left (large left ventricle). The ascending aorta is not only prominent but irregular in outline, and on the left the aortic knuckle is large and merges in the descending aorta.

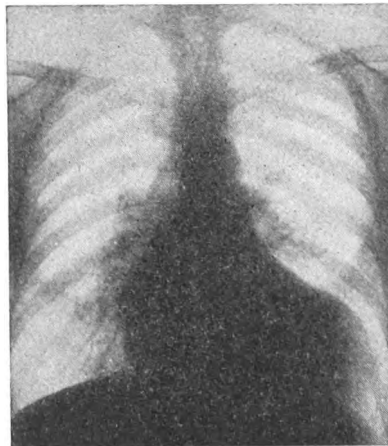


FIG. 19.—Aneurysm of heart. Post-mortem control. Teleradiogram, anterior view. Angulation on left border.

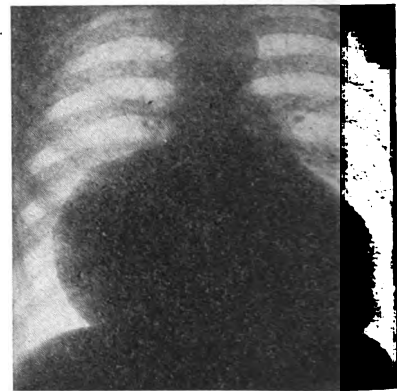


FIG. 20.—Aneurysmal dilatation of right auricle. Post-mortem control. Cause undiscovered. Teleradiogram, anterior view.

of 39 suffered an illness like coronary thrombosis two years before he came to hospital with cardiac dyspnoea, when a most unusual enlargement of the heart was noted (Fig. 20). Necropsy showed absence of valvular disease, and an aneurysmal dilatation of the right auricle, but no evidence of coronary thrombosis affecting the auricular branches.

There are certain simulations of right auricular enlargement, and Bordet<sup>16</sup> points out that enlargement either of the left ventricle or of the right ventricle may displace the right auricle as a whole to the right, and give a false impression of right auricular enlargement. An aneurysm of the ascending aorta may lie so low on the right of the cardiac shadow (even reaching the diaphragm) that it hides the right auricle. More surprising still is the arteriosclerotic aorta which in its tortuous descent in the medi-

stages of congestive failure from almost every cause. In the beri-beri heart, enlargement affects especially the right auricle and right ventricle.

I will expand these remarks on the right ventricle to include some observations which Dr. Clifford Hoyle and I have undertaken in the last two years in the cardiac department of the London Hospital.

### Pulmonary Causes of Right Ventricular Enlargement

#### EMPHYSEMA

When a patient suffers from chronic bronchitis and emphysema, it is often hard to tell to what extent, if any, the heart is secondarily affected and is contributing to his troubles. The symptoms have much in common, dyspnoea being paramount; and



the arts of percussion, palpitation, and auscultation are of little service in deciding the point. Under these difficulties we are driven to search for some newer method of investigating the heart if we believe that judgment on enlargement will be of value. If it were not, then we should have to rely solely upon signs of heart failure, which are less distinctive in a patient often orthopneic from pulmonary disease. Enlargement of the liver with œdema of the legs would naturally settle the question. Still, it would be well for us to be able to recognise that the heart is involved before the patient reaches so late a stage, which in this form of heart failure is seldom less than the terminal stage.

Until recent years the literature on the heart in emphysema, taking a common form of pulmonary

mechanically produces a comparable destruction of a large part of the finer vascular branches in the lungs. However this may be, the agreed essential factor is a raised tension in the pulmonary circuit—a hypertension of the lesser circulation comparable with the hypertension of the greater circulation which is so mighty a cause of left ventricular enlargement.

The frequency of cardiac enlargement in emphysema is far greater than the incidence of heart failure from this cause might lead us to expect. There is no doubt that associated cardiac disease, hypertension especially, is not only often combined but is also the more powerful cause of failure and death. Many are of an age when they are liable to myocardial disease, and electrocardiographic evidence of

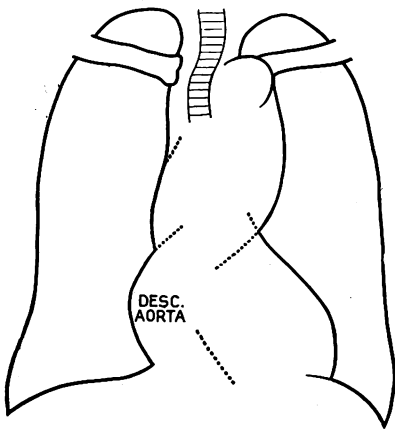


FIG. 21.—Arteriosclerosis. Tortuous aorta, forming right border of "cardiac" outline (from teleradiogram, anterior view).

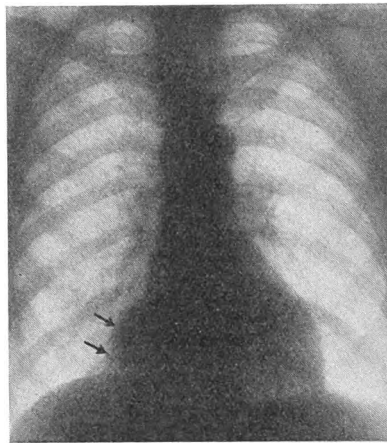


FIG. 22.—[Esophageal] pouch (lower end), simulating enlargement of right auricle. Teleradiogram, anterior view. The shadow on the right was identified after ingestion of barium.

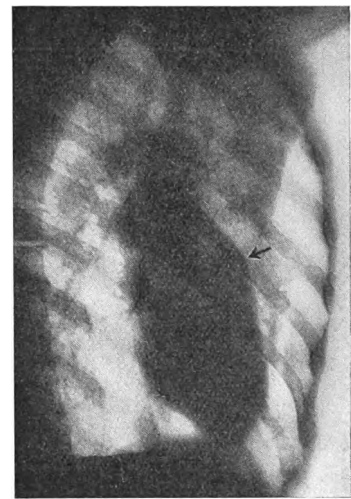


FIG. 23.—Emphysema. Enlarged conus of right ventricle. Teleradiogram, right (l) oblique position.

disease, consisted chiefly of pathological reports describing enlargement of the right chambers, and later of the pulmonary artery. The differences of opinion have centred upon the relative frequency of cardiac involvement, the unilateral or bilateral effect upon the heart chambers, and the possibilities of cardiac failure directly due to right-sided enlargement from this and similar lung disease. The ultimate cause for pulmonary hypertension and cardiac change may be one or more of three recognised histological changes. First, destruction of the lung tissue with the finer pulmonary vessels, which is inseparable from emphysema and characteristic of it. Secondly, sclerosis of the finer branches of the pulmonary artery and later of its stem. Thirdly, endarteritis of the pulmonary arteries. Though no one doubts that these last two are occasionally reflected in the right ventricle, neither has been often enough reported on good authority to account for the large proportion of cases of emphysema which do show evidence of right ventricular enlargement or pulmonary artery dilatation, or of both. For this reason I cannot help thinking that the over-distension and eventual destruction of the alveoli and larger elements of lung tissue with their fine vascular content is amply sufficient to embarrass the right ventricle and to provoke a hypertrophic response. Supporting evidence is the fact that right heart changes are chiefly or only seen in chronic pulmonary tuberculosis when there is extensive fibrosis which

it may be present; some die of pulmonary complications proper. Though heart failure from pure emphysema is uncommon, no pathologist seems to doubt that some degree of enlargement of the heart in emphysema is common.

*Radiological Changes in Emphysema.*—Many writers have thought that, far from being enlarged, the heart is smaller than the normal. The small cardiac shadow (the genesis of this belief) is due to the low position of the diaphragm with consequent swinging of the heart towards the middle line together with some rotation of the heart on its long axis in a counter-clockwise direction.<sup>96</sup> Such is the drop-like or ribbon-like heart in its simplest form, though it is occasionally seen in a normal person of slight build and long thorax as well as in a small proportion of tuberculous and emphysematous patients.

Dietlen was one of the first to describe the heart changes in emphysema,<sup>28 29</sup> mentioning a blunting of the right cardiophrenic angle due to participation of the right ventricle in the right border, prominence of the pulmonary artery and of the conus (infundibulum) of the right ventricle. He knew that when the left ventricle was normal there would not necessarily be an increase in the apparent size of the heart shadow. Partly for this reason and partly influenced by the frequency of associated cardiovascular lesions, a number of observers have found difficulty in discovering enlargement among emphysematous subjects.<sup>2 62 89</sup> Some previously doubtful

now admit that the heart is affected in the majority of patients with emphysema.<sup>63</sup> Even Vaquez and Bordet<sup>110</sup> are surprised at the infrequency of change even in very chronic cases, and when present found it was of the "sabot" type or at least there was an increased transverse diameter from the enlarged right ventricle. Even more advanced, and each with failure, were the group of cases described so ably by Lutembacher under the title of "Terminal tricuspid syndrome in chronic lesions of the lung."<sup>73</sup> Here also the heart was characterised by gross enlargement of the right ventricle and prominence of the pulmonary arc. Assmann<sup>3</sup> affirms that fairly regularly a hypertrophy of the right ventricle is present in emphysema.

Dr. Clifford Hoyle and I have been interested in

heart were rarely seen. It is not that cardiac enlargement is absent, as some have supposed, but that the signs of right ventricular enlargement are different and elusive, being not nearly so patent as the signs of left ventricular enlargement to which ordinary physical signs are so largely directed. If in addition the left ventricle is enlarged, it is nearly always explained by hypertension past or present, or else by a myocardial factor.

Right ventricular enlargement is most commonly shown by undue prominence of its conus as seen from the front or far better as seen in the right oblique (I) position (Fig. 23). The pathological and experimental evidence from Kirch, already discussed, points to the conus or far end of the outflow tract of the right ventricle as the seat of the first change

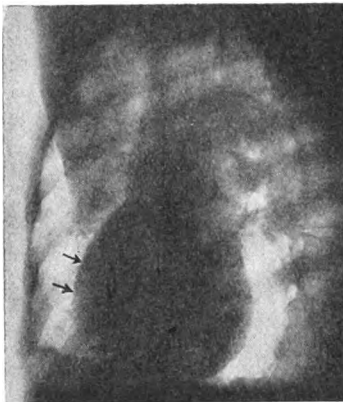


FIG. 24.—Emphysema. Enlarged right ventricle. Teleradiogram, left (II) oblique position. Note also dense left pulmonary artery crossing below arch of aorta.

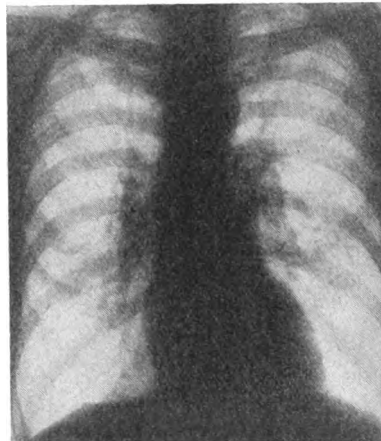


FIG. 25.—Emphysema. Prominence of pulmonary artery (middle arc), and prominence of both its branches. Teleradiogram, anterior view. Post-mortem control.

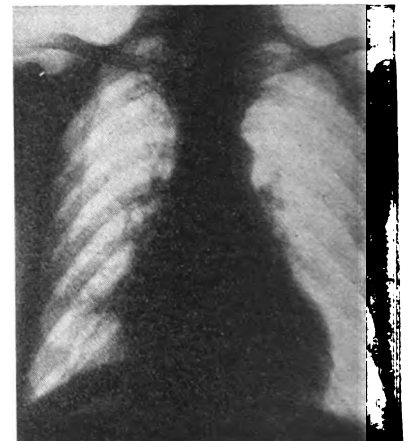


FIG. 26.—Goitre. Auricular fibrillation. General enlargement of the heart (ham-shaped). Teleradiogram, anterior view.

this subject, and have collected some evidence during the last two years of the changes in the size and shape of the heart in emphysema. We have had at our disposal about 75 cases where emphysema was undoubted, though we like others found repeatedly that the coexistence of hypertension and of other cardiovascular disease complicated the inquiry. It is admitted that pure cases of so-called emphysema heart are not frequent, and that failure from this single cause is infrequent. On the other hand, it was established that slight changes in the size or form of the heart were present in a large proportion, perhaps in half the cases of unselected and consecutive emphysema. Some of the simpler current measurements of the heart's size were tried, but they proved inapplicable to right ventricular enlargement which was what we sought to measure. The cardiothoracic ratio is invalidated by the excessive width of the chest in emphysema. The simple transverse diameter was found to be so little affected that it was useless as a measure of the right ventricular enlargement which was demonstrable in the conal prominence and other signs about to be described. Recently Binhold<sup>12</sup> has applied Kahlstorf's method<sup>53</sup> of volumetric measurement which is based not only on the surface area of the orthodiagram but also on the depth of the heart, to a series of emphysematous patients and found that the heart volume lay at the upper limit of normal and sometimes exceeded it.

The small drop-like heart and the large "sabot"

when resistance rises in the pulmonary circulation. The right ventricle lengthens rather than widens, and this is often missed if one looks for a widening of the transverse diameter of the heart from the front in emphysema.<sup>64 85 120</sup>

This prominence of the conus is commoner and more pronounced than enlargement of the body of the right ventricle. The indications of the latter are said to be a blunting of the right cardiophrenic angle from the appearance there of a right ventricular element in addition to the right auricle.<sup>29 81</sup> This is hardly established, but workers with kymography will probably settle the question in time. Certain it is that the body of the right ventricle is better seen with the subject in the left (II) oblique position, rotated to about 60°, when the lower right (or ventral) border of the heart is formed by that chamber (Fig. 24). At a smaller angle of rotation, as confirmed recently by valuable researches by Laubry and his co-workers,<sup>66</sup> the right auricle forms the limit of the cardiac shadow. Though there is much normal variation in this large curve, in emphysema it is often so large and rounded that no doubt can be felt that it represents enlargement of the body of the right ventricle.

The next radiological feature of the emphysema heart is the prominence of the pulmonary artery in the anterior view (Fig. 25) and the dilatation of its branches. The large drooping branches of the pulmonary artery as seen from the front have been said to look like a moustache. There is both increased

width and increased density of these shadows which need no longer be confounded with non-vascular or bronchial changes. In the left (II) oblique, the left pulmonary artery can easily be followed in a normal film, but in emphysema its size and density are excessive (Fig. 24).

In clinical medicine there is no better example of pure right ventricular hypertrophy than that which occurs in an advanced and uncomplicated case of pulmonary emphysema. In pulmonary hypertension from emphysema there is not the special involvement of the left auricle which modifies the picture so greatly in mitral stenosis, nor the presence of auricular fibrillation which in itself is quite capable of altering the size and form of the auricles at least, and maybe in time of the ventricles.

We leave our study of the heart in emphysema with the feeling that the analogy between pulmonary hypertension in its effect upon the right ventricle, and arterial hypertension in its effect upon the left ventricle, is a correct and considerable one. The emphysematous patient is liable to broncho-pneumonia and other such risks, and he is old enough to have some degree of coronary disease as well; but he is spared the disadvantages and the earlier failure of fibrillation. Compared with him, the hypertensive patient has his cerebral risks, and he is still more often the subject of coronary disease. As regards fibrillation, though this is not the rule with hypertension even in its final stage, it is met more commonly than in pulmonary heart disease. Sclerosis of the pulmonary artery and its branches is the appropriate result or concomitant of pulmonary hypertension, and greatly modifies the occasional case, though not nearly so often as general and local arteriosclerosis alters the course and consequences of arterial hypertension.

Although I have spoken freely of right ventricular in contrast to left ventricular enlargement, when it comes to failure I feel that while the separation into right heart failure and left heart failure will help us to a better understanding of the factors in operation, it will not alter the fact that patients actually in a state of congestive heart failure are very much alike. Indeed, I think that there is more difference between a congestive failure with fibrillation and one without, than there is between what is distinguished as right heart failure and left heart failure.

#### TUBERCULOSIS

In chronic pulmonary tuberculosis the heart often looks small though it is not smaller than normal except with bodily wasting. The idea that its smallness is a hypoplasia which disposes to tubercle is not now strongly held. Where there is much fibrosis, the changes in the right ventricle and pulmonary artery described under emphysema will sometimes be found. As a factor contributing to the symptoms, the displacement and distortion of the heart should be taken into account.<sup>23 20</sup> In a series of 120 cases of pulmonary tuberculosis, Hirsch<sup>46</sup> found right ventricular hypertrophy in 35 per cent., and it appeared to be correlated with the extent of pleural and pulmonary fibrosis. There are also good pathological studies by Brown<sup>19</sup> and by Mayer.<sup>76</sup> Early orthodiagraphic measurements were made by Achelis<sup>1</sup> and later X ray studies have been made by King and Hansen.<sup>57</sup> An extensive thesis on the subject with a good bibliography and references to the X ray appearances has been written by Godel.<sup>43</sup>

A general conclusion would be that the heart in pulmonary tuberculosis is enlarged only from other associated causes, or that it is a right-sided enlargement from fibrotic or emphysematous change in the

lung tissue involving the pulmonary circuit. The fact should be considered by those who wish to see in toxæmia, whether general or even trivial and focal, an excuse for what is really an ill-considered or a fanciful diagnosis of "a slightly enlarged heart" or "a slightly dilated heart." The heart in advanced tuberculosis after years of tachycardia and mixed infections of all kinds with pyrexia presents no enlargement. Examples of heart failure, even under these conditions, are the rarest.

#### PNEUMOCOONIOSIS

Pulmonary heart disease is not rare in pneumoconiosis, and Dyson<sup>31</sup> found evidence of it in 18 of 127 cases where there was reason to expect pulmonary obstruction. He has also given a description of the radiological changes in 5 cases<sup>32</sup> which are comparable with those which Hoyle and I have found in emphysema.

#### Spinal and Thoracic Deformities and their Effect upon the Heart Size

Apart from the slight and the great displacement produced by scoliosis and kyphoscoliosis, these deformities have long been known to be capable of causing actual cardiac enlargement. Historical references have been quoted in the papers by Boas,<sup>15</sup> Edeiken,<sup>33</sup> and Rösler.<sup>32</sup> Most observers have stressed the involvement of the right side of the heart, and believe this follows obstruction in the pulmonary circulation from emphysema or from the considerable compression of the lung in the deformed thorax (hunchback's heart). Needless to say, lung complications are frequent; and there is reason for thinking that the effect upon the lungs is essentially more important than any primary effect upon the heart, which is difficult to understand unless there is actual compression of it. None the less, some of the largest hearts on record have been described and presumably correctly interpreted in this condition, though it is hard to believe they are anything but rare if kyphoscoliosis is the only cause in operation. As would be anticipated, a variety of peculiar patterns have followed the extremes of angular kyphosis of tuberculous origin, such as the case of acute angulation of the aortic arch recorded by Carey Coombs,<sup>34</sup> and cases described by Finley.<sup>37</sup>

The radiological evidence of enlargement in such a misshapen chest has to be accepted with great reserve, and anyway it has less importance if we admit how rarely these heart conditions are seen nowadays either clinically or pathologically. The radiology of the heart in thoracic deformities has especially been studied by Rösler.<sup>32</sup> Incidentally, just as a curvature to the right near the stem of the heart may superficially resemble an aneurysm, so may the rarer curve to the left simulate a prominence of the pulmonary artery. The funnel chest has some interest, though even when extreme it may not be accompanied by any cardiac or pulmonary disorder.<sup>34</sup> It is a potent cause of heart displacement to the left, for there may even be no room for the heart between the depressed sternum and the spine. In modern times extreme angular deformity from tubercle, which used to provide curious heart affections, is happily seldom seen.

#### Pulmonary Artery

Although anatomically not a chamber of the heart, the stem of the pulmonary artery is so distinct and important a part of the cardiac outline that it must at least be mentioned in considering heart size. Besides, the branches of the pulmonary artery are seen to such advantage and profit in so many cardiac

diseases that they merit full attention. No one can deny that the entry of the pulmonary artery into an important place in clinical cardiology in recent years has been as much due to radiology as to pathology.

The pulmonary arc may be simulated in displacement of the heart to the left by any cause, including localised pleural adhesions. Once, Dr. Bedford and I found a pulsating swelling of the middle arc and at first thought it to be an aneurysm of the pulmonary artery. Further X ray examination made us revise our opinion and later at necropsy it was found to be an aneurysm of the ascending aorta which had invaded the natural territory of the pulmonary artery and eventually perforated into the conus.

Of congenital malformations with clinical interest should be mentioned patent ductus arteriosus and auricular and ventricular septal defects. Of acquired lesions, there is simple distension of the pulmonary artery in mitral stenosis, congestive failure, and (sometimes early) the goitre heart. Disease of the pulmonary artery itself include atheroma, both senile and secondary to mitral stenosis or congenital defects, and the rare syphilitic lesion. When the finer branches of the pulmonary artery are affected, or at least when there is pulmonary hypertension, the pulmonary artery enlarges in chronic pulmonary disease, and if the lesion is syphilitic, Ayerza's disease in its most typical form may result. An aneurysmal dilatation of the pulmonary artery is far more often associated with a congenital defect than with syphilis.†

#### Enlargement of the Whole Heart

This is well seen in combined lesions such as mitral stenosis with aortic incompetence or stenosis, or less often with incidental hypertension. In the severest forms of rheumatic carditis we have seen that the heart may enlarge as a whole. In the advanced stages of congestive heart failure from whatever cause there is general enlargement of all chambers; and incidentally the lack of visible pulsation in the heart under these circumstances may be striking.

The heart affected by goitre is sometimes found enlarged, though years may pass before it is demonstrable. Whenever auricular fibrillation supervenes, as so often it does, enlargement can be expected. Some years ago Dr. Cookson and I<sup>87</sup> published a series of observations on the size and shape of the heart in goitre and gave examples of the early change characterised by prominence of the pulmonary artery; of the middle stage with moderate enlargement of the whole heart, supposed to be ham-shaped (Fig. 26); and of the final stages with congestive heart failure with further enlargement and prominent signs of pulmonary congestion. Later, Dr. Hoyle and I drew attention to a frequent association we termed thyrotoxic hypertension,<sup>88</sup> which naturally modifies the radiological picture. Since then the pathological evidence about enlargement from this cause has been strengthened<sup>89</sup> and careful cardiometric observations in life have been carried out.<sup>75</sup> No longer need other cardiac causes be requisitioned to explain the enlargement which can and often does result from thyrotoxicosis alone.

If time permitted I would refer to the general enlargement of the heart which follows an arteriovenous aneurysm and which may largely disappear after operation. The considerable enlargement which sometimes occurs in myxœdema has often been

reported, recently by Campbell and Suzman,<sup>11</sup> and also occasionally in severe and chronic anæmia where the cardiac enlargement resembles that seen with goitre.

When a considerable enlargement of the heart is encountered and no single cause or combination of causes seems sufficient to account for it, we should consider a past hypertension, or else a latent mitral stenosis for the characteristic murmur is sometimes lacking over a long period. Similarly, an unusual combination of congenital defects may account for such a difficult problem. Occasionally a tumour mass or a collection of fluid such as a mediastinal pleural effusion or a pericardial cyst will give difficulty, or even an unusual extension of an aortic aneurysm. There is such a condition as acute isolated myocarditis,<sup>97 99</sup> and cases of "idiopathic" hypertrophy are published from time to time,<sup>113 68</sup> most often in children.<sup>65</sup>

#### Prognosis and Cardiac Enlargement

There is much truth in the statement that the larger the heart the worse the prognosis, though it could seldom be applied strictly to an individual patient. It assumes, often correctly, that enlargement is a fair index of the severity of the myocardial lesion and of the liability to failure. We cannot expect much from either time or treatment when the left ventricle is gross. Auricular enlargement is borne better and longer than ventricular. Increase in size being almost inseparable from particular lesions, in these it may also be said that relative to the lesion the smaller the heart the better the prognosis, for smallness is a fair measure of comparative myocardial health. Grant,<sup>44</sup> from his valuable analysis of after-histories for ten years of 1000 men suffering from heart disease, concluded that the grade of enlargement, with that of failure, provides the most satisfactory basis for prognosis.

Another statement might be made, with reserve, that the heart once enlarged is always enlarged. It is undoubtedly true of the average patient with valvular disease or hypertension, for it is nearly always a slow but steady development of enlargement which is recorded by consecutive X ray examinations over years. The volume of a heart chamber indicates not only the stress to which it is subject and the state of its walls, but also its disposition to intracardiac thrombosis which notoriously adds gravity to the prognosis. In most cases of coronary thrombosis a mural thrombus is found post mortem in the left ventricle. In most cases of auricular fibrillation there are thrombi in the auricles. Treatment by quinidine does furnish one clear example of the possibility of the *prevention* of enlargement. Whenever a patient is seen shortly after the onset of auricular fibrillation, and it is the only sign found, it is our bounden duty to stop this arrhythmia by quinidine (possible, as a rule), not only to prevent the ensuing enlargement but also to avoid the consequent formation of intracardiac thrombi. Dr. Maurice Campbell (personal communication) from a recent analysis of patients treated with quinidine concludes that in deciding whether it is indicated or not, the duration of fibrillation and the size of the heart have almost equal importance. The prevention of enlargement is also brought into prominence by the wonderful effects of partial thyroidectomy in preventing or limiting an increase in heart size in goitre, though contrary to expectation it seldom reduces it.

The communication of the results of radiology to a cardiac patient is fraught with risk of misconstruc-

† On the pathology of the vessels of the pulmonary circulation, the several papers by Bronner in the Archives of Internal Medicine during 1935 may be consulted.

tion. Ignorance of a doctor's meaning can easily induce fear in the mind of a patient, and it is rather the place of a good physician to cast out fear. The best plan is to look upon X ray findings as a physical sign which does not or should not interest the patient except as a means of a fuller diagnosis. The worst of all is to mention enlargement to a patient and his friends when this is doubtful or absent. With a moderate grade of enlargement which conforms with the disease in question, a reassuring note may be sounded. When enlargement is absent the fact should be stressed as a good sign. If we cannot say something encouraging from the X ray examination, it is better to say nothing. The knowledge acquired from a routine X ray examination of the heart is as likely to influence the prognosis favourably as unfavourably. It is unwise to confront a patient with X ray findings as if they implied an added burden of sorts. Few outside the profession are able to visualise or to apprehend without fear what we might mean by saying that the heart is enlarged. In this respect I agree with a charming old lady who said: "Like most of your patients I suppose, I rather prefer to live in a fool's paradise." At least as Dr. Hutchison says<sup>52</sup> it is not every patient who is fit to be told the whole truth about his disease.

### Conclusion

Radiology can contribute to direct and exact knowledge in almost every variety of cardiac disease. Let us hope that our younger physicians will not be dilatory in working this field; for we in England are not in this respect yet in step with other countries. Though some will doubtless exaggerate its importance, it will steadily find its proper level among modern means of diagnosis. It is natural to regard with suspicion anything unfamiliar, and it is our duty to scrutinise any new method; but let not this defer our acquaintance with radiology of the heart—a novelty no longer. The modern physician will have his diagnostic powers extended and refined by adding radiology to his scheme of examination; he will supplement traditional methods by direct inspection of the internal organs.

In this office it is for me to express a considered opinion about enlargement of the heart and the means of its ascertainment. Cardiology is now an important and integral branch of general medicine, nothing more and nothing less. It will advance and develop beyond a post-mortem pathology which is static. By radiocardiology we shall reach a more vital anatomy and physiology, and—earlier in disease—a dynamic pathology of the living heart.

In the preparation of these two lectures I have to acknowledge the generous help I have received. I am grateful to Prof. H. M. Turnbull and Dr. W. W. Woods of the pathological department of the London Hospital; to Dr. William Evans, Dr. Clifford Hoyle, Dr. W. A. R. Thomson, Dr. J. H. Palmer, and others including my old friend, Dr. John Grimshaw of Birkenhead. Dr. Evan Bedford has been my constant collaborator.

### REFERENCES

- Achelis, W.: *Deut. Arch. f. klin. Med.*, 1911, civ., 353.
- Alexander, H. L., Luten, D., and Kountz, W. B.: *Jour. Amer. Med. Assoc.*, 1927, lxxxviii., 882.
- Assmann, H.: *Die klinische Röntgendiagnostik der inneren Erkrankungen*, 5th ed., Berlin, 1934.
- Bach, F., and Keith, T. S.: *THE LANCET*, 1929, ii., 766.
- Ball, D.: *Amer. Heart Jour.*, 1931, vi., 517.
- Barclay, A. E.: *The Digestive Tract*, Cambridge, 1933.
- Bardeen, C. R.: *Amer. Jour. Anat.*, 1918, xxiii., 423.
- Bartels, E. C., and Smith, H. L.: *Amer. Jour. Med. Sci.*, 1932, clxxxiv., 452.
- Bedford, D. E., and Treadgold, H. A.: *THE LANCET*, 1931, ii., 836.
- Bell, E. T., and Clawson, B. J.: *Arch. of Path.*, 1928, v., 939.
- Berg, H. H.: *Röntgenpraxis*, 1931, iii., 443.
- Binhold, H.: *Zeits. f. Kreislauf.*, 1935, xxvii., 146.
- Bland, E. F., White, P. D., and Garland, J.: *Amer. Heart Jour.*, 1933, viii., 787.
- Bland, E. F., White, P. D., and Jones, T. Duckett: *Ibid.*, 1935, x., 995.
- Boas, E. P.: *Amer. Jour. Med. Sci.*, 1923, clxvi., 89.
- Bordet, E.: *La Dilatation du Cœur*, Paris, 1926.
- Bramwell, J. Crighton: *Quart. Jour. Med.*, 1928, xxi., 187.
- Bramwell, J. Crighton, and Ellis, R.: *Ibid.*, 1931, xxiv., 329.
- Brown, L.: *Amer. Jour. Med. Sci.*, 1908, cxxxvi., 819.
- Brumfiel, D. M.: *Amer. Rev. Tuberc.*, 1933, xxviii., 317.
- Campbell, M., and Suzman, S. S.: *Guy's Hosp. Rep.*, 1934, lxxxiv., 281.
- Carrington, G. L., and Krumbhaar, E. B.: *Amer. Jour. Dis. Child.*, 1924, xxvii., 449.
- Clayson, C.: *Edin. Med. Jour.*, 1931, xxxix., 121.
- Coombs, C. F.: *Brit. Jour. Surg.*, 1930, xviii., 326.
- Cotton, T. F.: *Heart*, 1915-17, vi., 217.
- Crowden, G. P., and Harris, H. A.: *Brit. Med. Jour.*, 1929, i., 439.
- Davies, D. T., Hodgson, H. Graham, and Whitby, L. E. H.: *THE LANCET*, 1935, i., 919.
- Dietlen, H.: *Münch. med. Woch.*, 1908, lv., 1770.
- Same author: *Herz und Gefässe im Röntgenbild*, Leipzig, 1923.
- Dressler, W., and Fischer, R.: *Klin. Woch.*, 1929, viii., 1267, 1316.
- Dyson, J. M.: *Amer. Heart Jour.*, 1934, ix., 764.
- Same author: *Amer. Jour. Med. Sci.*, 1933, clxxxvi., 165.
- Edeiken, J.: *Ibid.*, p. 99.
- Edeiken, J., and Wolfarth, C. C.: *Ibid.*, 1932, clxxxiv., 445.
- Edens, E.: *Die Krankheiten des Herzens und der Gefässe*, Berlin, 1929, Abb. 34.
- Evans, W.: *Quart. Jour. Med.*, 1933, n.s. ii., 1.
- Finley, F. G.: *Canad. Med. Assoc. Jour.*, 1921, xi., 719.
- Forman, M. B., and Daniels, A. L.: *Proc. Soc. Exper. Biol. and Med.*, 1930-31, xxviii., 479.
- Friedlander, R. D., and Levine, S. A.: *New England Jour. Med.*, 1934, cxxi., 624.
- Friedman, J. C., and Strauss, S.: *Arch. Internal Med.*, 1923, xxxii., 601.
- Garber, C. Z.: *Amer. Jour. Path.*, 1933, ix., 443.
- Gee, S.: *Auscultation and Percussion*, 5th ed., London, 1907.
- Godel, R.: *Thèse de Paris*, 1928.
- Grant, R. T.: *Heart*, 1933, xvi., 275.
- Hall, Donald: *Edin. Med. Jour.*, 1903, xiv., 322.
- Hirsch, C.: *Deut. Arch. f. klin. Med.*, 1900, lxviii., 321.
- Hodges, F. J., and Eyster, J. A. E.: *Arch. Internal Med.*, 1926, xxxvii., 707.
- Hoffmann, A.: *Verhandl. d. Congr. f. inn. Med.*, Wiesbaden, 1902, p. 308.
- Holzkecht, G.: *Die röntgenologische Diagnostik der Erkrankungen der Brusteingeweide*, Hamburg, 1901.
- Holzmann, M.: *Fortschr. a. d. Geb. d. Röntgenstrahlen*, 1932, xvi., 14.
- Horing, E. F., and Weiss, M. M.: *Amer. Jour. Med. Sci.*, 1935, clxxxix., 858.
- Hutchison, R.: *Some Principles of Diagnosis, Prognosis, and Treatment*, London, 1928.
- Kahlstorf, A.: *Fortschr. a. d. Geb. d. Röntgenstrahlen*, 1932, xiv., 123.
- Karsner, H. T., Saphir, O., and Todd, T. W.: *Amer. Jour. Path.*, 1925, i., 351.
- Keith, Arthur: *THE LANCET*, 1904, i., 556.
- Keplar, E. J., and Barnes, A. R.: *Amer. Heart Jour.*, 1932, viii., 102.
- King, F. W., and Hansen, O. S.: *Amer. Rev. Tuberc.*, 1930, xxii., 310.
- Kirch, E.: *Klin. Woch.*, 1930, ix., 769, 817.
- Same author: *Virchows Arch.*, 1933, cxcii., 682.
- Same author: *Würzburg Abhandl.*, 1925, N.F. ii., 73.
- Same author: *Münch. med. Woch.*, 1927, lxxiv., 90.
- Kountz, W. B., Alexander, H. L., and Dowell, D.: *Jour. Amer. Med. Assoc.*, 1929, xciii., 1369.
- Kountz, W. B., Alexander, H. L., and Prinzmetal, M.: *Amer. Heart Jour.*, 1936, xi., 163.
- Kudisch, B. M.: *Fortschr. a. d. Geb. d. Röntgenstrahlen*, 1932, xvi., 527.
- Kugel, M. A., and Stoloff, E. G.: *Amer. Jour. Dis. Child.*, 1933, xlv., 828.
- Laubry, Ch., Cotterot, P., Routier, D., and Heim de Balsac, R.: *Jour. de radiol. et d'électrol.*, 1935, xix., 193, 561, 700.
- Levine, S. A., and Golden, R.: *Arch. Internal Med.*, 1922, xxix., 836.
- Lovy, R. L., and Russelot, L. M.: *Amer. Heart Jour.*, 1933, ix., 178.
- Lewis, Thomas: *Heart*, 1913-14, v., 367.
- Same author: *Discases of the Heart*, London, 1933, p. 109, Fig. 21.
- Lewis, Thomas, and Drury, A. N.: *Heart*, 1923, x., 301.
- Lisa, J. R., and Ring, A.: *Arch. Internal Med.*, 1932, l., 131.
- Lutembacher, R.: *Arch. mal. du cœur*, 1916, ix., 141.
- Same author: *Ibid.*, p. 237.
- Marcolies, E. R., and Wood, F. C.: *Jour. Clin. Invest.*, 1935, xiv., 483.
- Mayer, A.: *Berlin klin. Woch.*, 1920, lvii., 1193.
- McCrea, F. D., Eyster, J. A. E., and Meek, W. J.: *Amer. Jour. Physiol.*, 1928, lxxxiii., 678.
- McGinn, S., and White, P. D.: *Amer. Heart Jour.*, 1933, ix., 1.
- Middleton, W. S.: *Minnesota Med.*, 1935, xviii., 710.
- Miller, H. R., and Weiss, M. M.: *Arch. Internal Med.*, 1928, xliii., 74.

(Continued at foot of next page)

## ACUTE TOXÆMIA OF BURNS

### EXTRACT OF SUPRARENAL CORTEX IN TREATMENT

By W. C. WILSON, M.B., F.R.C.S. Edin.\*

HON. SURGEON OF THE ROYAL HOSPITAL FOR SICK CHILDREN,  
EDINBURGH, AND LECTURER IN APPLIED PHYSIOLOGY  
IN THE UNIVERSITY OF EDINBURGH

G. D. ROWLEY, M.B. Edin.

AND

N. A. GRAY, M.B. Edin

(From the Royal Hospital for Sick Children, and the  
Department of Surgery, University of Edinburgh)

In this paper we record what seems to us a therapeutic measure of considerable promise for the treatment of one of the very dangerous early stages in the course of an extensive burn. The report is based on results in three cases only; we make no claim therefore to an established advance in treatment. Nevertheless our observations may be considered of value since circumstances permitted a very full investigation of the course in two of the patients and thus a comparison was possible with the course in a large number of cases similarly studied under strictly comparable conditions. Our object is to bring the method to the notice of others, in order that, while further clinical and experimental tests are proceeding, it may be generally available for trial and, as seems probable, for the saving of life.

#### Cause of Death in Burns

A brief reference is necessary to the results of an investigation into the cause of death in burns which has been carried out by one of us (W. C. W.) and others for several years past. The full details of the investigation will be published at an early date; some results have, however, been reported in previous papers<sup>1,2</sup> in which will be found a description of the clinical course and of the features of acute toxæmia.

Acute toxæmia, though only an occasional occurrence under present-day treatment of burns by

\* In receipt of a part-time grant from the Medical Research Council.

tannic acid, is still an important cause of death after extensive superficial burns and particularly in injuries affecting young children, in whom the clinical picture is characteristic and the illness often fulminating. The account given of the cases treated in this investigation will suffice for a description of the main symptoms and signs. It may be added that there is no characteristic change in the blood which can serve as a sure criterion of acute toxæmia and no constantly available method of assessment more accurate than observation of the signs of a failing circulation. This phase begins at any time between 6 and 50 hours after injury, and in severe cases death supervenes usually about 70 hours.

The only characteristic pathological change is severe necrosis and degeneration of the liver cells; the change is practically constant in cases which die between 50 and 100 hours, but may also be found in a proportion of those which survive for longer periods. As regards causation, it is practically certain that acute toxæmia is produced by the action of circulating toxins which have been formed by autolysis of injured tissue in the burned area. Increased concentration of the blood, early bacterial infection, and changes in blood chemistry are inconstant, and they are not essential causes of toxæmia.

The principles of treatment for most cases in the series studied were immediate coagulation of the burned area by a strong solution of tannic acid and, when necessary, maintenance of a normal blood-pressure level by intravenous infusion of gum saline. Our experience of treatment, however, includes not only various modifications of the tannic acid method but also other forms of local application; in general measures it embraces continuous as well as repeated intravenous infusions of normal saline, gum and dextrose saline, and also intravenous alkali. The point we wish to emphasise is that up to the present time, if acute toxæmia has developed in a severe or fulminating form, it has invariably proved fatal. Intravenous infusions may produce immediate but very evanescent benefit, and spontaneous improvement even for short periods of a few hours is rare.

In adults the manifestations of acute toxæmia are less prominent and less dramatic than in children. Typical features are vomiting, rise of temperature and pulse-rate, and mental changes such as anxiety, delirium, apathy, or stupor. Although death within 100 hours is the usual outcome of severe toxæmia,

#### DR. PARKINSON: REFERENCES

(Continued from previous page)

81. Moog, O.: Fortschr. a. d. Geb. d. Röntgenstrahlen, 1924, xxxii., 83.
82. Morgan, J. E.: University Oars, London, 1873.
83. Nathanson, M. H.: Amer. Jour. Med. Sci., 1925, clxx., 240.
84. Nemet, G., and Gross, H.: Amer. Heart Jour., 1935, x., 643.
85. Nemet, G., and Schwedel, J. G.: Ibid., 1932, vii., 566.
86. Pal, J.: Klin. Woch., 1935, xiv., 116.
87. Parkinson, J., and Cookson, S. H.: Quart. Jour. Med., 1931, xxiv., 499.
88. Parkinson, J., and Hoyle, C.: THE LANCET, 1934, ii., 913.
89. Podkaminsky, N. A.: Fortschr. a. d. Geb. d. Röntgenstrahlen, 1929, xl., 1020.
90. Rohrer, F.: Ibid., 1916-17, xxiv., 285.
91. Rolleston, Humphry: Cardiovascular Diseases since Harvey's Discovery, the Harveian Oration of the Royal College of Physicians, Cambridge, 1928.
92. Rösler, H.: Dcut. Arch. f. klin. Med., 1929, clxiv., 365.
93. Same author: Fortschr. a. d. Geb. d. Röntgenstrahlen, 1929, xl., 519.
94. Russow, E.: Zeits. f. Kreislauf, 1936, xxviii., 41.
95. Schur, M.: Ergbn. d. inn. Med., 1934, xlvii., 548.
96. Schwarz, G.: Die Röntgenuntersuchung des Herzens und der grossen Gefässe, Leipzig, 1911, Fig. 19.
97. Scott, R. W., and Saphir, O.: Amer. Heart Jr., 1929, v., 129.
98. Sigler, L. H.: Ibid., 1932, vii., 388.
99. Simon, M. A., and Wolpow, S.: Arch. Internal Med., 1935, lvi., 1136.
100. Smith, F. M., Miller, G. H., and Gabor, V. C.: Ibid., 1926, xxxviii., 109.
101. Smith, F. N.: Ibid., 1918, xxii., 8.
102. Smith, H. L.: Amer. Heart Jour., 1928, iv., 79.
103. Smith, H. L., and Bartels, E. C.: Jour. Amer. Med. Assoc., 1932, xcvi., 1072.
104. Smith, H. L., and Willius, F. A.: Arch. Internal Med., 1932, l., 171.
105. Stewart, H. A.: Jour. Exper. Med., 1911, xiii., 187.
106. Same author: Jour. Bact. and Path., 1912, xvii., 64.
107. Sutton, D. C., and Davis, M. D.: Arch. Internal Med., 1931, xlviii., 1118.
108. Treadgold, H. A., and Burton, H. L.: THE LANCET, 1932, i., 277.
109. Turnbull, H. M.: Quart. Jour. Med., 1915, viii., 204.
110. Vaquez, H., and Bordet, E.: Radiologie du Cœur et des Vaisseaux de la Base, Paris, 1928.
111. Vilvandré, G. E.: THE LANCET, 1930, i., 564.
112. Volhard, F., and Schmeiden, V.: Klin. Woch., 1923, xxi., 5.
113. Walsler, J.: La Myocardie, Paris, 1925.
114. Wenckebach, K. F.: THE LANCET, 1907, i., 63.
115. White, Paul D.: Heart Disease, New York, 1931.
116. Same author: THE LANCET, 1935, ii., 539, 597.
117. Wiggers, C. J.: Circulation in Health and Disease, Philadelphia, 1923.
118. Same author: Physiology in Health and Disease, London, 1935.
119. Willius, F. A., and Smith, H. L.: Amer. Heart Jour., 1934, x., 190.
120. Zdansky, E.: Wien klin. Woch., 1933, xlvi., 432.



some adults survive beyond the first week only to succumb under the added load of bacterial infection, or, in certain instances when infection is very slight, as a result of severe liver damage. It is therefore more difficult in adults to forecast the outcome or to judge the value of therapy.

### Clinical Report

Three cases are reported in which Eucortone, an extract of suprarenal cortex, was used as an adjuvant measure in the treatment of severe established acute toxæmia. The features specially studied were changes in the circulation, blood concentration, blood chemistry, and bacterial growth. The study was most complete in Cases 1 and 3; in Case 2 the opportunities for investigation were unavoidably restricted. It is proposed to describe only salient points of the course in each case.

#### CASE 1

Male, aged 3 2/12 years. Two hours before admission he was scalded by boiling water, the lesions involving about 20 per cent. of the total body surface.

*Treatment.*—Under nitrous oxide, oxygen, and ether anaesthesia the burned area was cleansed and 20 per cent. tannic acid and 1 per cent. gentian-violet were applied to the raw surface.

*Course.*—No shock was present on admission and no secondary shock developed. The first sign of toxæmia—vomiting of altered blood—appeared at 15 hours after injury. At 22 hours toxæmia became severe. The pulse-rate and rectal temperature rose rapidly; the systolic blood pressure remained unaltered but the pulse pressure decreased; there was marked restlessness combined with apathy. The skin became pallid, mottled, and cold; the lips, cheeks, and ears became ashen-grey, the eyes sunken, and the pupils dilated. In spite of reapplication of tannic acid on three occasions and intravenous infusion of gum saline at 43 hours the condition rapidly deteriorated. By 45 hours the heart-rate had reached 200 per minute and the signs of impending death were evident.

At 45 hours subcutaneous injections of eucortone were begun. After an initial injection of 0.5 c.cm., doses of 1 c.cm. were given 4-hourly. At about 30 mins. after the first injection of 1 c.cm. a distinct change was remarked. The skin had become warm, the areas of erythema around the tanned portions, previously obscured by pallor, had reappeared, the lips and ears were pink, and other signs of an active circulation in the capillaries of skin and mucous membranes were obvious. In addition the mental state of intense irritability, distress, and partial stupor had been replaced by one of quiet yet attentive restfulness. The injections were discontinued between 52 and 64 hours; the condition became again serious towards the end of the period, but improvement followed readministration of the extract which was carried on to 110 hours. By 82 hours all toxic signs and symptoms had disappeared, except that the temperature remained moderately elevated; the heart-rate had decreased to 120 per minute. There was no further recrudescence of toxæmia and the subsequent course was uneventful. The lesions were entirely healed by the thirty-fourth day.

Investigation revealed no noteworthy change in blood chemistry or blood concentration during toxæmia or subsequently during administration of eucortone. No organisms were found in cultures from the burned area up to 72 hours. A leucocyte count of 20,000 per c.mm. on admission decreased steadily to 6000 by 104 hours. The only change found in the blood after the injections of extract were begun was an increase in the sedimentation-rate (2 mm. to 27 mm.), which subsequently remained rapid.

*Comment.*—We have no doubt, judging from experience of similar cases, that acute toxæmia in this case would, but for the action of the extract, have proved fatal within a few hours. The beneficial effect was confirmed by withholding the extract for a period of 8 hours. The necessity for continued administration was established; here a total of

13.5 c.cm. was given, which was equivalent to 405 grammes of cortex. The course in this case suggested that formation or absorption of toxic principles from the burned area ceased at about 100 hours after injury, and showed that any damage suffered by important structures during the toxæmia had not been irreparable.

#### CASE 2

Female, aged 5. Thirty minutes before admission she sustained burns by fire, involving about 30 per cent. of the body surface.

*Treatment.*—The areas were cleansed under anaesthesia and 5 per cent. tannic acid was applied at intervals by spray.

*Course.*—The child remained restless in spite of sedatives. Toxæmia began at 13 hours with vomiting, which thereafter was frequent and repeated. At 15 hours the blood pressure was 60/40, the skin cold, pallid, and cyanosed, the pulse rapid and thready, the temperature raised, and delirium marked. By 24 hours the blood-pressure level had fallen so low that no accurate estimate could be made, and the condition was extremely grave.

Eucortone was injected every four hours in 0.5 c.cm. doses from 24 to 60 hours and in 1 c.cm. doses from 60 to 90 hours. No intravenous infusions were given throughout. At about one hour after the first injection the toxic manifestations began to recede and had entirely disappeared by 90 hours. Coincident with improvement in the peripheral circulation the blood pressure rose; the rise was steady and sustained. Some elevation of temperature, signs of bronchitis, and mild bacterial infection were the only abnormal features of the subsequent course.

*Comment.*—In this case the pronounced fall in blood pressure—an inconstant but particularly ominous event during acute toxæmia—provided a valuable additional index of the effects of therapy. Eucortone produced steady regression of well-established acute toxæmia. A total of 12 c.cm. was used, equivalent to 360 grammes of cortex.

#### CASE 3

Male, aged 49 years. One and a half hours before admission he sustained burns by fire which involved 25 per cent. of the body surface and in parts had penetrated deeply.

*Treatment* was as in Case 1. No intravenous infusion before the eleventh day.

*Course.*—There was no shock at 6 hours. He came under observation at 18 hours; a mild degree of secondary shock was present which passed off at 29 hours. The onset of acute toxæmia was at 32 hours; the rectal temperature and pulse-rate rose and vomiting of altered blood recurred at short intervals. At 41 hours he was cyanosed, irrational, vomiting every few minutes, and becoming exhausted by continuous hiccough. Alterations in blood chemistry were insignificant and the blood pressure remained at a normal level. There was, however, a conspicuous rise in corpuscular content of both capillary and venous blood.

Eucortone was injected in 2 c.cm. doses, at first 2-hourly, later hourly, from 41 to 87 hours and was followed by steady improvement. Vomiting stopped at 53 hours; hiccough, however, continued, though only at intervals and in milder form, till 93 hours. The pulse-rate and temperature fell; the skin developed a pink flush and the blood showed a gradual dilution. During this period a total amount was injected which was equivalent to 4020 grammes of cortex (a concentrated extract was used for part of the time).

On the eighth day signs of intoxication reappeared and again eucortone proved beneficial. On the eleventh day, when sloughs were beginning to separate in deeply burned portions, delirium, prostration, and incontinence of urine developed, which we were inclined, on the basis of previous experience, to ascribe to liver damage, although investigation yielded no evidence of this. Eucortone, injected hourly, certainly produced little obvious change at this stage and accordingly other methods were adopted.

Bacterial infection was certainly not in evidence before

the eighth day and was not gross at any subsequent time. The ultimate result was recovery.

*Comment.*—As already mentioned assessment of acute toxæmia is much more difficult in adults than in children. In this case, however, the degree of intoxication was such that we should not ordinarily have expected survival for more than 100 hours, and the conditions afforded a sufficiently severe test for the extract since no other measures, such as intravenous infusion, were employed to counteract a high blood concentration. The evidence of benefit from the use of the extract was clear. Events in the later stages of the course, however, suggested the question, to which an answer cannot meantime be given, whether toxic principles might injure the liver although coincidental effects on the circulatory and other mechanisms were controlled by extract therapy.

### Discussion

In the three cases quoted above acute toxæmia of burns had developed in a very severe form, and, in fact, a fatal issue within a short time could have been predicted in two of them with almost complete certainty. In our experience of these conditions recovery under any methods of treatment previously employed has not occurred. With every confidence we attribute the recovery in these cases to the administration of the extract of suprarenal cortex.

In 1920 Dale<sup>3</sup> found that previous removal of the suprarenal glands greatly enhanced the sensitivity of cats to the toxic action of histamine. Subsequently much evidence has accumulated from animal experiment of decreased resistance to many forms of intoxication after complete ablation of the suprarenals, and, since the production of active extracts of the cortex by Swingle and Piffner<sup>4</sup> and others, it has been possible to show that the loss of resistance is probably due to deficiency of cortex; the resistance of animals after suprarenalectomy to toxic agents can be raised significantly by administration of cortical extract.<sup>5</sup> In man cortical extract has been employed in a few instances in the treatment of bacterial infections and toxicosis; so far as we are aware no reports are available of its use in burns.†

Regarding the mode of action of suprarenal cortex extract in combating acute toxæmia of burns we have little positive information. Our observations indicate that it results in an increased efficiency of the circulatory mechanism. The only alterations found in the blood of burned individuals during extract therapy were in the sedimentation-rate, and (once) in corpuscular content. There is no satisfactory evidence that acute toxæmia of burns produces a functional insufficiency of the suprarenal glands; changes in blood chemistry during the toxic phase of burns, though in certain instances they bear some resemblance to changes after suprarenalectomy, are irregular and frequently insignificant. Moreover, pathological studies have revealed little evidence of damage to the suprarenals; indeed we were so influenced by the absence of this evidence that we postponed the trial of the cortical extract in acute toxæmia for several years. Further investigation on the action of the extract is required, and mere speculation without basis of fact would be fruitless.

On the grounds of our limited experience of extract therapy we might venture to make tentative suggestions for treatment. Suprarenal cortical extract should be considered as an adjuvant measure, and

not as a substitute for proved and recognised preventive treatment, in acute toxæmia of burns and also possibly, as future trial may show, in the stage of circulatory collapse which we call "secondary shock." We regard as essential, however, the employment of local and general measures<sup>1, 6</sup> which have been designed especially to combat secondary shock and to minimise acute toxæmia and sepsis. In the present state of our knowledge it would be unwise to assume that exhibition of the extract will annul completely all effects of toxæmia, and therefore some precaution against liver damage is advisable. We have evidence that continuous intravenous infusion of dextrose saline from an early stage of extensive and severe burns may mitigate the injury to the liver cells. The quantities of extract required for maintenance of circulatory efficiency are evidently considerable. Of the concentrated extract now available (Allen and Hanburys Ltd.) 1 c.cm. every 2 hours from the onset of acute toxæmia will suffice for a child, while for an adult 2 c.cm. or more every hour are necessary. Injections should be continued till 100 hours after injury and should be renewed if toxic manifestations reappear. (1 c.cm. of this extract is equivalent to 75 grammes of cortex.)

Case 2 was under the charge of Mr. J. C. Anderson, assistant surgeon at the Royal Hospital, Sheffield, and Case 3 under the charge of Mr. A. Pirie Watson, surgeon at the Leith Hospital. We are greatly indebted to them for permission to publish the reports. It is a particular pleasure to record our appreciation of the nursing skill in the care of burns of Nurse A. K. Smith, Royal Hospital for Sick Children, Edinburgh.

### REFERENCES

1. Wilson, W. C.: Report on the Medical Treatment of Men Burned in Colliery Explosions, London, 1933.
2. Same author: *Edin. Med. Jour.* 1935, *xlii*, 177.
3. Dale, H. H.: *Brit. Jour. Exp. Path.*, 1920, *i*, 103.
4. Swingle, W. W., and Piffner, J. J.: *Amer. Jour. Physiol.*, 1931, *xciv*, 130.
5. Hartmann, F. A., and Merle Scott, W. J.: *Jour. Exp. Med.*, 1932, *lv*, 63.
6. Wilson, W. C.: *Practitioner*, 1936, *cxxvii*, 394.

## THE EFFECT OF OÖPHORECTOMY AND SPLENECTOMY ON CANCER OF THE BREAST AND UTERUS

BY PETER PATERSON, M.B., F.R.F.P.S. Glasg.

EMERITUS PROFESSOR, ST. MUNGO CHAIR OF SURGERY, UNIVERSITY OF GLASGOW; CONSULTING SURGEON, GLASGOW ROYAL INFIRMARY

It is fairly generally recognised that in cancer two factors have to be considered to explain the unlimited multiplication of the cells with secondary spread to other parts—namely, an abnormal stimulation of the cells of the parts primarily involved, and a medium in which these can grow. The latter seems to me by far the more important, and I believe that there exists a condition conducive to the onset of the disease and persisting throughout its course. If such a state were absent, either the tumour would never begin or it would remain local, because cells transferred to other parts of the body would perish in their new surroundings.

Local irritation, of a more or less trivial character, may be the exciting cause in some cases, but there are many others in which no local irritant can be found; and, on the other hand, there are individuals who have been exposed for years to a definite local irritation and yet have remained free from the disease. Innumerable investigations have been made to find

† In a personal communication to one of us Mr. Harold Dodd states that he has used the extract in burns with benefit.

if, and what, changes take place in the tissues and metabolism of the infected person, and though many differences between the healthy and the diseased have been described, none has been recognised as being the definite underlying cause; in fact many of these may only be the result of the presence of the tumour. I am not in a position to offer an opinion as to what that change is, but I believe it does exist and further, that it may, in exceptional cases, be only temporary, since a considerable number of cases are on record in which malignant tumours have disappeared spontaneously. To these the two following may be added.

#### SPONTANEOUS RECOVERIES FROM SARCOMA AND CANCER

CASE 1.—Twenty-five years ago I removed a chronically inflamed appendix from a young woman. A normal convalescence followed, but a year later she again consulted me complaining of vague pains in the right iliac fossa. Palpation showed the presence of a slightly tender mass about the size of the fist in the region of the caecum. I again operated and found a tumour involving the whole caecum which was fixed to the iliac fossa and irremovable. A small piece was excised for microscopical examination and the wound closed. The tissue removed was submitted to the late Prof. J. H. Teacher, who reported that the tumour was a spindle-celled sarcoma. As a result of damaging the caecal wall an abscess formed and discharging through the wound, remained open for several weeks. The only pathogenic organism found in the pus was the *Bacillus coli*. Growth was now rapid and in a few months the tumour filled the greater part of the right side of the abdomen, reaching from the liver to the pelvis; it extended almost to the middle line in front, and halfway down the thigh. At this stage the patient's condition was very poor and there was much emaciation. Then, for no obvious reason, the mass began to shrink, and it continued to do so till it disappeared. To-day the patient is alive and well.

CASE 2.—The second patient is a woman on whom, 18 years ago, I performed a laparotomy for a carcinoma of the stomach. As there were secondary nodules in the liver, nothing further was done except to close the abdominal wound, and yet this patient is to-day apparently quite well. The diagnosis in this case was also confirmed by microscopical examination of a gland removed at the operation.

In these cases either the tumour cells stopped growing because of some change in the cells themselves; or the resistance of the tissues had been so raised, either by addition or subtraction, they were able to overcome the abnormal growth.

#### OÖPHORECTOMY AND SPLENECTOMY

Recently attention has been directed to the endocrine glands as possibly having some influence on the onset and course of these tumours. Before the important place that endocrines take in metabolism was appreciated, the late Sir George Beatson held the opinion that the ovaries took some part in the aetiology and course of this class of tumour, and recent investigations seem to support his contention. Acting in that belief, he performed a double oöphorectomy on two patients suffering from cancer, but without arresting the course of the disease.

The high degree of immunity presented by the spleen to cancer, either primary or secondary, has not escaped the notice of those who have been trying to find something that would have a beneficial influence on the course of the disease once it had become established and many attempts, in which I have shared, have been made to control its progress by injections of various forms of splenic extract. The extract I used was prepared for me by Dr. D. P. Cuthbertson, late of the biochemical department of

the Glasgow Royal Infirmary, by a method similar to that employed in the preparation of insulin. The conclusion I came to as a result of these injections was that growth was stimulated, and the larger the dose, the more rapidly did it advance. If these observations were correct, the question now arose, would removal of the spleen have any influence on the disease? I resolved to try, if a suitable case presented itself.

CASE 3.—In May, 1931, a woman, aged 41, came under my care in the Royal Infirmary who, two years previously, had had her uterus and both ovaries removed for an adenocarcinoma of the uterus. When I saw her she had a tumour in the pelvis which had invaded the rectum on the one side and the bladder on the other. There was a discharge of blood, pus, and mucus from the rectum with considerable pain during defaecation. Micturition was frequent, about once every two hours, and was painful. The urine contained pus and blood, the latter quite visible to the eye. Rectal palpation revealed a fixed ulcerating mass in the anterior wall of the rectum. Cystoscopic examination showed a large irregular ulcerating tumour towards the base of the bladder with phosphatic deposits scattered over the surface of the growth. Pain was so severe she required narcotics to get sleep and secondary anaemia was well marked.

A left inguinal colostomy was performed and at the same time the spleen was removed. Intra-abdominal palpation revealed an extensive glandular infection. Six weeks later she was given daily injections of fairly large doses (4 c.cm.) of splenic extract. These injections were continued for six weeks. At the end of that time the condition was worse. The rectal ulcer was larger; the blood in the urine was sufficient to make it blood-red and her appetite had almost disappeared. The dose of extract was then reduced to 1 c.cm. daily and continued for two months. At the end of that time she began to improve; rectal pain was less and blood in the urine could only be found by reagents. She could sleep without narcotics; appetite was better and she began to gain weight. Improvement was slow but steady till at the end of a year no trace of the disease could be found in the rectum, pelvis, or bladder, a cystoscopic examination of which showed a smooth whitish patch where the tumour had been situated. I still see her occasionally, and at present, nearly four years after the disappearance of the disease, there is no evidence of a recurrence; she feels quite well and has gained 3 st. in weight.

Subsequently, splenectomy was performed in several patients who were suffering from inoperable cancer. A few of these had no other treatment; others were exposed to deep X ray therapy, whilst others had injections of splenic extract in various doses; but in all of them the disease ran its course, so that evidently the result obtained in the first case was not due to splenectomy alone. In nearly every one of these cases the spleen was more or less adherent to some of the surrounding structures, probably as the result of perisplenitis, though nothing abnormal could be found in the spleen itself on microscopical examination.

It was next decided to remove both ovaries and spleen in a patient who had an inoperable carcinoma, if such could be found who would consent to the operation.

CASE 4.—In July, 1935, a woman, aged 46, presented herself at the Infirmary with a cancer of the right breast which she had known to be present for at least a year. She was emaciated and her appetite was only fair; she had very little pain. The breast, which was not large, was infiltrated with a hard nodular mass and was firmly fixed to the chest wall. A chain of enlarged glands, each about the size of a cherry, extended along the anterior axillary wall into the apex of the axilla, and there were several hard red nodules in the skin over the breast and also in the skin of the chest wall in the immediate neighbourhood, showing a widespread lymphatic involvement.

After explaining to her what the double operation meant, and having obtained her consent, I removed the spleen and both ovaries on July 24th, and also one of the glands for examination. The pathologist reported that the gland was infiltrated with adenocarcinoma. Apart from the removal of spleen and ovaries no other treatment has been given. The disease appeared to remain stationary for about four months and then commenced to improve. When I last saw her at the middle of May—i.e., about ten months after operation—the enlarged axillary glands were no longer palpable, the cutaneous nodules had all disappeared, and the breast was a shrivelled fibrous mass. There was in fact no sign of active disease, and the patient had gained a stone in weight.

I can offer no explanation as to what metabolic changes take place as a result of double oöphorectomy with splenectomy; that belongs to the province of the biochemist and physiologist. But apparently the removal of either ovaries or spleen does not influence the course of the cancer, nor does removal of the spleen alone make patients immune from it. McNee, for example, mentions two cases in which cancer of the buccal cavity has appeared three years after splenectomy.<sup>1</sup>

It is known that after removal of the spleen its functions, so far as they are related to the cellular elements of the blood, are taken up by other structures, especially the bone-marrow, and it is thought to take some part in preventing septic infection; but beyond that we are ignorant. Even its structure is a subject in which there are differences of opinion. Like the other ductless glands, it may secrete a hormone, but if such does exist, it is probably of minor importance in the general metabolism, since its removal does not prevent good health; but the same is true of the ovary, which undoubtedly has an internal secretion. Perhaps there is an inter-relationship between the two glands, or they may act on other endocrines through that distributing centre, the pituitary.

The cases here submitted are far too few to serve as basis for general conclusions; and from circumstances beyond my control I am no longer in a position to continue the investigation. But few though they are, they may possibly serve as a guide to other workers in this field.

## COUNTER-IRRITATION BY ULTRA-VIOLET LIGHT

By ALBERT EIDINOW, M.B. Lond.

HONORARY CONSULTING PHYSICIAN IN CHARGE OF THE LIGHT  
DEPARTMENT AT THE RADIUM INSTITUTE AND AT THE  
ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL  
MEDICINE, LONDON

COUNTER-IRRITATION is an ancient method of therapy. Discovery in chemistry or physics has evolved many new methods; innumerable chemical reagents are now recognised for their action as rubefacients or vesicants. Physical agents producing heat, electricity, or friction are also used.

The ultra-violet rays that cause erythema of the skin can be successfully employed for counter-irritation. Wave-lengths shorter than 3000 Angstrom units applied to the normal white skin cause erythema after a latent period of 4-6 hours. The dosage and technique of irradiation controls the degree of skin reaction that results. This can be varied so as to cause a mild erythema or a definite or severe blistering of the skin. Ultra-violet irradiation is therefore

excellent for counter-irritation, as the rays can be directly applied to any area and the degree of reaction can be accurately defined and controlled. With the chemical and other counter-irritants, this is not always possible in practice; the strength of drugs such as mustard is difficult to regulate and often their application has to be repeated until the desired skin reaction is obtained.

### THE REACTION

The classical pharmacological studies of the action of irritant agents on the skin describe general, local, and special reflex effects on the body. Naturally the severity of the reaction varies with the strength of the irritant applied.

The general effect of counter-irritants follows immediately; stimulation of the sensory nerves causes mild contraction of the blood-vessels in the splanchnic area, with rise of blood pressure, accentuation of heart-beat and of respiration. The sudden application of a severe irritant may cause sufficient damage to produce the signs and symptoms of surgical shock with fatal collapse.

The local effect may be a mild redness of the skin due to dilatation of blood-vessels at the site of application; a sensation of warmth and anaesthesia is felt. The exudation of plasma and lymph and transudation of fluid through the skin tissues causes signs of oedema, blistering, or even pustulation and necrosis, with symptoms of local discomfort, pain, and irritation.

The special reflex reaction is still a problem of much interest and recognised importance. Little progress has been made since the days of Head and Mackenzie. Reflex stimulation of viscera by trophic nerves, far remote from the site of application of irritant but connected by nervous channels, may explain many of those intricate cases that have successful and immediate relief from pain. At times counter-irritation to an area of skin clears up mysteries of what lies in the remote depths of the body. This is constantly observed, but the therapeutic action is still unexplained.

Skin erythema appears about 4 hours after ultra-violet irradiation; a maximum reaction results about 48 hours later and this erythema may persist for 3 or even up to 12 days, with intensive dosage. With still increased intensity of radiation, oedema and blistering are produced; this effect may be obtained by increasing the strength of the ultra-violet rays emitted by the source of light, by diminishing the distance between the skin and the source of rays, or by increasing the length of exposure. The dose of rays can be accurately determined and expressed in terms of skin erythema doses; usually from 6-10 skin erythema doses are applied for counter-irritation therapy. Following the erythema, oedema, and blistering of the skin, there is drying and desquamation. Pigmentation finally results. The dilatation of the skin capillaries in an area of irradiated skin persists for many months; this phenomenon can be clearly demonstrated, for if 1 c.cm. of histamine phosphate solution, containing 0.003 g. of histamine base is injected subcutaneously an intense erythematous blush appears 10-15 mins. later in the irradiated skin; the surrounding area does not show any visible change.

The erythema and blistering reaction of the irradiated skin is painful and uncomfortable. This is a very serious complication, for the symptoms are often so severe and unpleasant that the patient becomes greatly distressed and has to go to bed.

<sup>1</sup> McNee, J. W.: THE LANCET, 1931, i., 1011.

Special dressings for the blistered skin area and sedative medicines are necessary. Fortunately this painful reaction can be checked and at times successfully avoided. Directly after irradiation, adhesive Elastoplast strapping is applied to the irradiated skin and the surrounding area. This greatly diminishes the painful symptoms, but in no way alters the reaction. The strapping is kept on and left undisturbed for 14 days; it is then removed and the irradiated skin is exposed, revealing a reddish-brown moist area. Pigmentation varying in colour from a pale to a dark brown will finally develop. The relief of the painful symptoms obtained by the application of strapping is indeed most remarkable, for by this means it is possible to apply 10-12 times the normal skin erythema dose of ultra-violet rays to an area of normal white skin without unduly disturbing the patient. Intensive erythema, œdema, and exudation must develop in the protected skin area. The strapping remains comfortably in position and when it is removed 14 days later the desquamated skin is shed simultaneously. It is necessary to explain emphatically to the patient that the strapping must not be disturbed for 14 days. If this skin area is still painful, infra-red rays can be applied, two or three times a week, to this region, the strapping being left undisturbed.

#### METHOD OF APPLICATION

The area of skin selected for ultra-violet irradiation is mapped out carefully with a dermatograph pencil. The time and distance factors of dosage are also indicated by writing on the skin, so that accurate information will be directly available at the time of treatment. The surrounding skin area is protected from the rays of the lamp by a covering of pieces of crêpe paper attached by strips of adhesive plaster or strapping. Towels or other simple means of protection may be employed. The irradiated area is accurately exposed according to the prescribed formula. Usually a skin area measuring roughly 12 by 10 in. is exposed. A quartz air-cooled mercury-vapour lamp operated by a current of 2.5 amperes and 140 volts between the electrodes is switched on. At a distance of 12 in. between the quartz burner and the skin area, an exposure for 20 mins., equivalent to ten normal erythema skin doses, is applied. This irradiated skin area and the surrounding skin margin extending for 1-2 in. is immediately covered by overlapping strips of adhesive plaster 2-2½ in. in width. The dermatograph pencil marks are removed. The patient is instructed to leave this plaster undisturbed for 14 days. During this period it may be necessary to report for further consultation or for further treatment such as the application of infra-red rays 2-3 times a week. If infra-red and luminous irradiation are necessary the rays are applied to the selected area but the strapping is not disturbed.

Some patients complain of some discomfort during the second or third day, others complain of itching of the skin on the seventh to ninth day. Usually these symptoms are of no serious consequence and do not necessitate any special interference or local treatment. Two weeks following treatment the strips of strapping are removed, the skin area is cleansed with methylated ether or oil of eucalyptus. A moist red or a pigmented yellow-red area of skin is seen. Skin desquamation and a full exudative reaction has occurred beneath the plaster quite unknown to the patient. Further infra-red irradiation may be applied to this area, but local ultra-violet irradiation is contra-indicated as the area will

be highly resistant and immune to a further erythema reaction for some weeks. In hospital practice patients receiving local intensive ultra-violet irradiation are usually made to report seven days after treatment. If symptoms are present or the site of pain has now altered in its position, a further treatment to a new skin area may be prescribed.

#### INDICATIONS

The types of cases selected for treatment by this technique of intensive ultra-violet irradiation were those in which symptoms of acute pain were present (brachial and sciatic neuritis, lumbago, fibrositis, &c.); those in whom there was swelling of joints due to effusion of fluid; those with symptoms of asthma, with dyspnoea, and a definite history of frequent attacks of troublesome respiration.

*Acute pain.*—Painful symptoms due to cervical fibrositis, brachial neuritis, lumbar fibrositis, lumbago and sciatic neuritis were treated. Early cases with symptoms of sudden onset of acute pain and signs of rigidity and limited movement rarely visit the out-patient departments of hospitals and clinics. Usually they first consult local practitioners and are put to rest in bed and given medicinal treatment. Symptoms may completely subside within 5-7 days. It is difficult to assess the value of treatment in this one group, for though signs and symptoms clear up rapidly after local ultra-violet counter-irritation treatment and the success is attributed to the treatment many of these acute attacks of muscle and nerve inflammations may possibly clear up independent of treatment.

The cases in which the symptoms persist are the type commonly seen in hospitals. Those patients, who complain of pain in neck radiating to the shoulder and arm, were treated by the application of the rays of the air-cooled quartz mercury-vapour lamp, to an area of skin over the cervical area passing to the shoulder and arm. At a distance of 12 in. from the source of light the skin was irradiated for 20 mins. This was immediately covered with strips of elastoplast strapping. Infra-red rays were also applied three times a week to this area. Two weeks later the elastoplast strapping was removed and the area of red-brown coloured moist skin was exposed. As a rule pain was quickly relieved and the movements of shoulder were free or greatly improved. It was sometimes necessary that the infra-red irradiation should be continued three times a week for a further fortnight. At times patients stated that the symptoms in the shoulder had disappeared, but pain in arm or forearm was present. In these cases, intensive irradiation was applied to another skin area corresponding to the site of pain.

Lumbar pain was similarly treated but the painful and tender skin area of the back indicated by the patient was irradiated. Usually the size of the area was 10 by 12 in. In the successful cases relief of symptoms was reported after the first treatment.

Sciatic neuritis was treated by irradiation of the skin over the buttock and the skin of the back of the thigh. The results were satisfactory in about 60-70 per cent. of cases. In general, early cases in which symptoms were of a shorter duration responded most favourably. Local infra-red irradiation was always prescribed. At times the position of pain changed and was referred to the calf and outer side of the foot. Ultra-violet irradiation was never repeated over the same area of skin, but a new skin area over the back of the thigh or the calf was selected for further treatment after an interval of 14 days. Severe chronic sciatic neuritis of long duration with signs of muscle wasting and partial nerve paralysis needed longer treatment, with continued infra-red irradiation twice a week for 6-8 weeks. The counter-irritation always helped to relieve the acute painful symptoms.

*Swollen joints.*—Intensive local ultra-violet irradiation of the skin over swollen joints will at times reduce the degree of swelling and allow freer movement. Unhappily chronic and subacute infective arthritis does not respond as well or as consistently as traumatic arthritis. Naturally the most favourable cases are those following recent injury in which there is subacute synovitis with fluid

effusion. The conditions of monarticular arthritis deserve perseverance with this therapy. Ultra-violet irradiation hastens the absorption of fluid and resolution of inflammation.

*Asthma.*—It is very surprising to be able to record favourable results in isolated cases of chronic asthma. The patients selected at the clinic for this treatment were those who definitely expressed the severity of their symptoms. Long-standing asthma with signs of bronchitis and emphysema, giving a history of symptoms of urgent dyspnoea, was at times greatly relieved. All cases were treated by the same method. An intensive local application of ultra-violet rays was applied to an area (10 by 12 in.) of the skin of the back of the chest. The patients who responded favourably within the following 7-14 days and who stated that their symptoms were relieved were given a second treatment to the skin of the front of the chest. During the first 2-3 days following treatment coughing was more frequent and expectoration freer and more copious; dyspnoea was diminished and respiration improved. Clinically these patients have signs of chronic bronchitis and emphysema and therefore the value of treatment can only be assessed by the remarks of the patient, but these were favourable.

#### CONCLUSIONS

No argument or theory explaining these results will be expressed; a definite maximum counter-irritation reaction of the skin has been established by means of ultra-violet irradiation. The painful symptoms and discomfort usually following such measures have been greatly lessened by the immediate application of elastoplast strapping over and beyond the irradiated skin area. Total or partial relief of symptoms often follows treatment. The value of counter-irritation has already been well established, but the use of ultra-violet rays for this purpose affords a new and practical method of application, for any desired area of skin can be selected and the degree of skin reaction can be completely controlled at will.

### CHEMICAL CHANGES IN THE BLOOD IN ADDISON'S DISEASE AND THEIR ALTERATION IN RESPONSE TO TREATMENT

BY ERIC NEWMARCH ALLOTT, B.Sc., B.M. Oxon.,  
F.R.C.P. Lond.

PATHOLOGIST, LONDON COUNTY COUNCIL GROUP LABORATORY,  
LEWISHAM HOSPITAL, S.E.

RECENT developments in the treatment of Addison's disease date from 1926, when Baumann and Kurland<sup>1</sup> studied the effect of adrenalectomy on the electrolyte pattern of the blood in cats and rabbits, and Marine and Baumann<sup>2</sup> showed that the life of the adrenalectomised animals could be prolonged by the administration of sodium chloride. The first application of these results to human cases of Addison's disease was published by Loeb<sup>3</sup> in 1932.

Meanwhile, in 1930, Swingle and Piffner<sup>4</sup> had isolated a hormone from suprarenal cortex which was active in relieving symptoms of suprarenal insufficiency: numerous publications have confirmed the value of this in cases of experimental adrenal insufficiency, and in Addison's disease, though the exact position as regards its proper employment is at present not clear. Harrop, Weinstein, Soffer, and Trescher<sup>5</sup> state that cortical extract has no definite effect on hypotension or pigmentation and are not convinced that it has any effect on nutrition and weight. They stress that its principal

importance is in the treatment of relapse. Snell<sup>6</sup> also states that in the chronic phase of the disease no striking clinical effect is to be expected from the administration of cortical extract, and Rogoff<sup>7</sup> found that Eschatin was of no value in restoring suprarenalectomised cats, and suggests that improvements caused by its administration are due to the water and salt given along with it. Kendall<sup>8</sup> has separated two active fractions from an adrenal cortex extract, one of which produced results only when salt was given with it.

It seems therefore desirable at present that every opportunity should be taken to study cases of Addison's disease as fully as possible, and the following paper gives the results of the chemical findings in eight cases of Addison's disease. The patients were scattered in various hospitals, and it has not been possible to carry out the investigations in every case as fully and systematically as one would wish.

#### BLOOD CHEMICAL CHANGES IN SUPRARENAL INSUFFICIENCY

The characteristic blood changes in experimental suprarenal insufficiency consist of a fall in the sodium and chlorine content of the serum, a rise in the potassium and magnesium, a retention of nitrogen (high blood-urea and non-protein nitrogen), and increased concentration of the blood (high oxygen capacity and hæmatocrit values and high serum protein). These findings have been noted in rabbits and cats<sup>1</sup> and dogs (Loeb, Atchley, Benedict, and Leland<sup>9</sup>) but Levy Simpson, Dennison, and Korenchevsky<sup>10</sup> found serum chlorine normal in adrenalectomised rats.

In untreated cases of Addison's disease changes very similar to the above have been noted by Loeb, Harrop, and others, though Snell<sup>6</sup> states that during the chronic or stationary period of the disease the composition of the blood and electrolyte pattern

TABLE I

In this table and Table II. the figures without parentheses indicate mg. per 100 c.cm. serum, except for HCO<sub>3</sub> ( vols. per cent.) and total protein (g. per 100 c.cm.); figures in parentheses indicate milli-equivalents per litre of serum. (Values for protein calculated from sum of albumin and globulin, not shown in tables.)

FINDINGS ON ADMISSION				
Case.	Na.	K.	Cl.	Blood-urea.
Normal values	320 (139)	20 (5.0)	355 (100)	30
1	277 (120)	40.0 (10.0)	316 (89)	57*
2	283 (123)	26.0 (6.5)	330 (93)	76
3	255 (111)	22.5 (5.8)	308 (86.6)	46
4	251 (109)	23.5 (6.0)	294 (82.7)	56
5	295 (128.5)	24.8 (6.4)	354 (99.9)	77
6	262 (114)	21.7 (5.5)	305 (86)	60
7	266 (116)	35.6 (9.1)	295 (83)	160
8	265 (115.5)	21.3 (5.5)	—	60
FINDINGS IN CRISIS				
3	244 (106)	31.2 (8.0)	—	91
4	219 (95.5)	28.0 (7.2)	235 (66.2)	44†

\* Non-protein nitrogen.

† This value was so surprising that it was checked twice, with the same result.

are within normal limits. The rise in blood-urea seems the least constant of these changes. Levy Simpson<sup>11</sup> found blood-urea normal in 2 cases out of 6 and Rowntree<sup>12</sup> found it above 50 mg. per 100 c.cm. in only 4 out of 12 cases. In crisis the blood-urea is more constantly high, though even here there are exceptions (see Case 4). It has been possible to restore the blood composition of human sufferers



approximately to normal figures in many cases by treatment with sodium salts with or without cortical extract.

Of the cases described in this paper all showed to a greater or less extent these changes on first observation, as shown in Table I. Two of the patients went into crisis (Cases 3 and 4) while under observation, and the abnormality already present was greatly exaggerated under these circumstances; in crisis there is frequently a marked rise in the non-protein nitrogen, but in Case 4, which was fatal, the blood-urea actually fell.† Of the eight cases described in this paper, four (Nos. 1, 3, 5, and 6) were improved sufficiently to leave hospital; one (No. 4) died in crisis; one (No. 2) died on cessation of treatment with cortical extract; and two (Nos. 7 and 8) were not diagnosed with certainty before death, though in both cases the blood pressure and chemical findings made the diagnosis of adrenal insufficiency a very probable one. Of the four discharged one (No. 1) is untraced, two (Nos. 3 and 5) died a month after discharge, and one (No. 6) is still alive.

CASE REPORTS

**CASE 1.**—A man aged 36, a painter, was admitted to Charing Cross Hospital on Oct. 3rd, 1934, complaining of loss of appetite and languidness with vague onset in November, 1933, and becoming worse till June, 1934. There was nausea, but no vomiting; anorexia; never any diarrhoea. Pigmentation noticed in April, 1934, and got worse till July when he became "as black as a penny," then gradually better, more rapidly under treatment. Weight: 1933, 8 st. 7 lb.; June, 1934, 7 st. 2 lb.; October, 1934, 6 st. 7 lb.

*Examination.*—Generally dark; small areas of pigmentation on face, trunk, flexures and pressure points, and inside of mouth. Hand-grip weak; blood pressure, 86/65; otherwise normal. Radiography: no evidence of tuberculosis of lungs; no suprarenal shadows.

*Progress.*—While in hospital the patient continued to improve, irrespective of what treatment was given, and he was discharged feeling nearly fit for work on Nov. 20th, with instructions to continue with 10 grammes of salt daily. Subsequent efforts to trace him have failed.§

*Blood pressure.*—Varied between 70/50 and 95/60, but there was no sign of any alteration in response to cortical extract or salt.

*Chemical findings* (Table II.).—The serum sodium and chlorine remained low throughout, and showed no significant alteration, in spite of clinical improvement.

**CASE 2.**—A woman aged 51, in domestic work, was admitted to Hackney Hospital on Jan. 4th, 1935, complaining of headache, nausea, sickness, and pigmentation for a year; weakness for three weeks. She had been subject to attacks of headache and sickness all her life: these were worse during the last year. Pigmentation was noticed one year ago. No loss of weight noticed. Tired during last three weeks: extremely fatigued for last fortnight.

*Examination.*—Drowsy, retching, sweating. Uniform pigmentation of skin and mucosa of mouth; weak. Blood pressure 88/65. Arthritis of both knees. No other physical signs of disease. No radiographic evidence of tuberculosis; no definite suprarenal shadows.

*Progress.*—Treatment with Eucortone started on Jan. 21st: the patient was exceedingly weak before, but rapidly felt stronger and brighter under treatment. There was pyrexia up to 103° the day after the treatment began, but after this the temperature remained normal, with occasional rises to 99°, till the beginning of March, when diarrhoea commenced with pyrexia; these symptoms persisted till shortly before death, but no pathogenic organisms could be found as a cause. Blood pressure varied over a wide range, but there seemed a definite

rise of systolic pressure under cortical extract (Fig. 1). Treatment with salt was attempted from Feb. 21st, but the patient failed to keep all the salt down when given by mouth, and could not retain rectal saline; so the amount of salt was never really the full 15 g. per day. The improvement in the clinical condition under cortical extract was definite, but it was not considered justifiable on the grounds of expense to go on with 30 c.cm. of cortical extract daily, and cortical extract was stopped on March 28th. The patient slowly sank and died on April 12th. Permission could not be obtained for a post-mortem examination.

*Chemical findings* (Table II. and Fig. 1).—Under the enormous doses of cortical extract used there was very

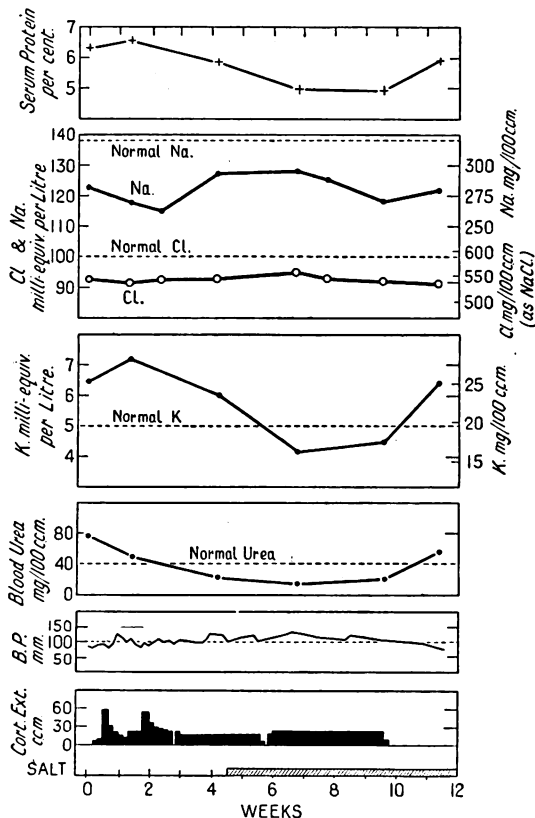


FIG. 1 (Case 2).—To show blood dilution and fall in potassium and urea with little change in sodium and chlorine in spite of massive doses of cortical extract. Note the rise in potassium, urea, and protein when cortical extract is omitted.

little tendency for the sodium and chlorine to return to normal. There was, however, evidence of retention of fluid in the blood shown by fall in plasma proteins from 6.55 to 4.96 per cent. under treatment: on cessation of administration of cortical extract, the potassium and urea rose again to pathological values, and plasma proteins rose to 5.9 per cent., indicating a loss of fluid from the blood.

**CASE 3.**—A woman aged 43, a housewife, was admitted to Charing Cross Hospital on March 30th, 1935, complaining of being run down since the shock of an accident to her son 18 months previously. Five weeks before admission she had diarrhoea and since then she had suffered from "wasting and anæmia."

*Examination.*—Poor condition. General pigmentation, most marked over pressure points, and pigmentation of mucous membrane of mouth. Blood pressure: 100/? as out-patient but 70/50 on admission to ward.

*Progress.*—From admission to April 30th she was treated with 5 c.cm. eschatin twice weekly, with some improvement, but on April 30th she rapidly sank and became drowsy and sick and lost her appetite, and the

† In Loeb, Atchley, Gutman, and Jillson's case<sup>11</sup> the non-protein nitrogen fell when the patient went into crisis.

§ The Registrar-General has kindly informed me that no record of this patient's death has been registered up to June 30th, 1935.

blood pressure fell to 55/?. She was rescued from crisis by intravenous administration of 6.5 c.cm. eschatin (all that was available at the time) and rectal salines, and then treated with cortical extract (10 c.cm. a day—subsequently reduced to 5 c.cm.) and salt (15 g. in capsules) daily. By May 22nd she had practically normal blood electrolytes and was feeling very well and putting on weight. Cortical extract was then stopped, the salt being continued. She continued to improve clinically, feeling stronger all the time but her blood gradually became abnormal, and on June 25th cortical extract (5 c.cm. alternate days) was recommenced. She was discharged from hospital, much improved, on July 9th, taking 15 g. salt daily and 5 c.cm. eschatin twice weekly, but died at home in crisis on the 30th. Blood pressure, apart from crisis, varied between 80/50 and 90/60 most of the time in hospital.

*Chemical findings* (Table II.).—By the use of salt and cortical extract a nearly normal blood picture was attained, but on cessation of cortical extract the potassium and urea gradually began to rise, followed by a fall in the sodium and chlorine. The addition of small doses of cortical extract gradually altered the blood composition towards normal, though normality had not quite been reached again before discharge.

CASE 4.—A man aged 35, a labourer, was admitted to St. Andrew's Hospital, Bow, on May 24th, 1935, complaining of lethargy, anorexia, and dyspnoea. He had never been really well since a partial thyroidectomy in 1919 for Graves's disease. For four years he had noticed increased pigmentation of skin, more marked in summer, his friends saying "he looked like a black man." For seven months he had had increasing lethargy, anorexia, and dyspnoea, much more during the last two months.

*Examination.*—General condition poor. Marked exophthalmos. Universal pigmentation of skin and buccal mucosa. Thyroid gland (L) large: scar of thyroidectomy on right side.

*Blood pressure* 105/80. No radiographic evidence of tuberculosis. No suprarenal shadows. Basal metabolic rate: minus 37 per cent.

*Progress.*—An oral suprarenal preparation was tried, but without improvement; on June 13th he went into crisis and died suddenly on the 14th.

*Post-mortem.*—No definite adrenals could be found: on right side a small cyst was found in the position of the suprarenal, but sections did not show any adrenal tissue.

*Chemical findings* (Table II.).—The blood on June 4th showed in a very marked degree the typical changes of the condition; blood taken in crisis on June 13th showed more exaggerated changes: the rise of hæmoglobin from 82 to 88 per cent. is evidence of blood concentration. In this case the blood-urea did not rise during crisis (cf. footnote (†) on page 1407).

CASE 5.—A coffee-stall keeper, aged 48, admitted to Charing Cross Hospital on May 18th, 1935, complaining of loss of energy and appetite, pigmentation, and loss of weight. Loss of energy noticed during last year, pigmentation had come on over same period. He had lost 2 st. in last fifteen months. Vomiting occurred once, three weeks before admission. Slight hæmoptysis once, some months before admission.

*Examination.*—Not particularly wasted; dark colour but no special distribution of pigment noticed. No definite pigmentation of buccal mucosa. Blood pressure on admission 106/80, but subsequently usually between 98/70 and 80/50. No other physical signs, except impaired percussion note at right apex. Radiography: no evidence of tuberculosis in chest; no suprarenal shadows. No tubercle bacilli found in sputum.

*Progress.*—After a control period of a week the patient was treated with eschatin, 5 c.cm. per day for one week; no significant change took place in the clinical condition during this period. After a further week, salt (15 g. a day) was given and on this treatment the patient began to feel stronger. He continued to gain strength, and was discharged feeling well on July 25th. He was instructed to continue taking 15 g. of salt a day. His weight on admission, 11 st. 10½ lb., fell to 11 st. 5½ lb. on June 9th, and then gradually increased again to 11 st. 10½ lb just before his discharge. He died at home on August 19th

from acute osteomyelitis of the jaw, though otherwise he had kept well.

*Chemical findings* (Table II.).—Here again the potassium and urea came down to normal before there was any change at all in the sodium. There was evidence of increase of blood volume, the hæmoglobin falling from 102 to 80 per cent.

CASE 6.—A woman aged 47, a housewife, was admitted to St. Alfege's Hospital on Jan. 8th, 1936, complaining of loss of appetite and pigmentation: for last two months she had been very easily tired and was unable to do housework. She had got darker since summer of 1935. No diarrhoea or vomiting; nausea first thing in the morning; anorexia during last 2-3 months. Loss of weight during same period.

*Examination.*—General pigmentation, most marked in flexures, elbows, axillæ, and particularly in popliteal regions; also over clavicles; not much pigmentation in mouth. Blood pressure 89/66. Otherwise normal. Radiography: calcified opacities at right base but no infiltration elsewhere; no suprarenal shadows.

*Progress.*—She was treated with 15 g. salt in capsules daily, from Jan. 11th, and rapidly began to feel stronger; her appetite much improved, and the improvement continued until discharge from hospital on 15 g. of salt daily on Feb. 15th. There was no striking alteration in pigmentation, though the patient and her husband both thought she was lighter in colour. Her weight had increased by 2½ lb. during the period in hospital.

*Chemical findings* (Table II.).—After a week's treatment with salt the serum had returned to nearly normal composition, except for a marked fall in serum protein from 6.6 to 5.2 per cent., indicating increase of blood volume. A fortnight later, sodium and chlorine remained nearly normal, and serum proteins had now risen to 6.1 per cent., suggesting synthesis of fresh protein.

Cases 7 and 8 are of interest because they were admitted to hospital for other complaints, and it was not until chemical examination of the blood had been carried out that the diagnosis was made. Case 7 was thought at first to be some form of neurotic vomiting and Case 8 was regarded as carcinoma of stomach. Case 7 showed no abnormal pigmentation, and in Case 8 the pigmentation was slight and unusual in distribution.

CASE 7.—The patient, a woman of 42, a housewife, was admitted to Lewisham Hospital on Jan. 17th, 1936, complaining of vomiting. For about five weeks she had taken almost no food. There was no diarrhoea. No note was made as to loss of weight.

*On examination* nothing abnormal was found except feeble heart sounds and a trace of albuminuria, but it was not until Jan. 29th that the blood pressure was measured and found to be only 60/40. The possibility of Addison's disease was considered, and a specimen of blood taken the same day showed the typical changes to a very marked degree: treatment with cortical extract and saline was started but the patient died on Jan. 30th. No pigmentation, except for large "freckles" on face and a small pigmented patch on right shin, was found; and the patient had had both of these as long as she could remember.

*Post-mortem examination* showed old calcified tuberculosis at the right apex, but no suggestion of any recent activity. The left suprarenal could not be found and the right was very doubtfully recognised as a small piece of tissue about 1.5 cm. across and 3 mm. thick. The kidneys (right 150 g.; left 130 g.) were very engorged, and capsule was slightly adherent; cortex was well defined and of normal thickness.

*Histological examination* (Dr. W. G. Barnard).—Right suprarenal: normal medulla, and chronic inflammatory infiltration of scanty remains of degenerate cortex; degenerate cortical adenomata. Left suprarenal: tissues round upper pole of left kidney showed a fragment of almost completely fibrotic cortex of adrenal. There was practically no normal cortex in the suprarenal sections, the recognisable cortical cells being all degenerate. Kidney: small foci of chronic inflammatory infiltration in cortex

TABLE II

—	Na.	K.	Ca.	Cl.	P.	HCO <sub>3</sub> .	NPN.	Total protein.	Urea.	Hb.	Remarks.
CASE 1 1934											
Oct. 15th	277 (120)	40.0 (10.0)	11.1 (5.5)	316 (89)	3.15 (1.9)	53.7 (24.1)	57	5.72 (13.7)	..	..	..
„ 25th	277 (120)	..	..	298 (84)	..	..	..	..	..	..	Oct. 23rd-30th: Eucortone 6 c.cm. daily.
„ 31st	271 (118)	24.0 (6.1)	11.1 (5.5)	319 (90)	..	58.5 (26.0)	31	5.65 (13.7)	..	..	..
Nov. 8th	271 (118)	..	..	316 (89)	..	..	..	..	..	..	Nov. 8th: Salt, 10 g. daily.
„ 14th	278 (121)	23.0 (5.9)	10.8 (5.4)	317 (89.4)	3.8 (2.2)	..	52	5.68 (13.7)	..	..	Salt continued.
„ 29th	276 (120)	..	..	..	..	..	..	..	..	..	Salt continued after discharge.
CASE 2 1935											
Jan. 19th	283 (123)	26.0 (6.5)	11.1 (5.5)	330 (93)	4.5 (2.6)	45.0 (20.2)	54	6.4 (15.1)	76	80	..
„ 28th	270 (118)	28.0 (7.2)	11.4 (5.7)	326 (92)	3.7 (2.1)	43.0 (19.3)	33	6.55 (16.0)	49	61	Jan. 20th: Eucortone started. For dosage see Fig. 1.
Feb. 6th	264 (115)	..	..	328 (92.5)	..	..	..	..	..	65	..
„ 19th	292 (127)	24.0 (6.0)	10.0 (5.6)	330 (93)	3.6 (2.1)	58.0 (26.0)	28	5.88 (13.8)	24	60	..
Mar. 8th	295 (128)	16.2 (4.2)	8.6 (4.3)	343 (95.7)	2.1 (1.2)	60.6 (27.2)	33	5.0 (11.7)	18	50	Feb. 21st: Salt added.
„ 15th	288 (125)	..	..	330 (93)	..	..	..	..	..	..	..
„ 28th	271 (118)	17.6 (4.5)	9.4 (4.7)	326 (92)	1.9 (1.1)	56.6 (25.4)	31	4.96 (11.4)	24	54	Mar. 28th: Eucortone stopped.
Apr. 8th	281 (122)	25.2 (6.4)	9.9 (5.0)	323 (91)	2.7 (1.6)	43.6 (19.6)	49	5.9 (13.2)	54	..	Apr. 12th: Died.
CASE 3											
Apr. 10th	255 (111)	22.5 (5.75)	..	308 (86.6)	..	..	..	..	46	..	..
May 1st	244 (106)	31.2 (8.0)	..	..	..	..	..	..	91	..	Severe crisis. Cortical extract + salt started.
„ 8th	267 (116)	19.8 (5.1)	..	312 (88)	..	..	..	..	24	..	..
„ 15th	300 (130.5)	18.3 (4.7)	..	365 (102.8)	..	..	..	..	30	..	..
„ 22nd	305 (132.5)	17.0 (4.35)	..	366 (103)	..	..	..	..	32	..	Cortical extract stopped. Salt continued.
„ 29th	302 (131.5)	22.4 (5.7)	..	365 (102.8)	..	..	..	..	35	..	..
June 11th	302 (131.5)	25.1 (6.4)	..	369 (104)	..	..	..	..	40	..	..
„ 25th	275 (119.5)	26.6 (6.8)	..	317 (89.4)	..	..	..	..	45	..	June 25th: Cortical extract (5 c.cm. alternate days) re-started; no change noted in clinical condition, when sodium fell to 275 mg. per 100 c.cm
July 9th	289 (125.5)	22.0 (5.6)	..	350 (98.5)	..	..	..	..	42	..	..
CASE 4											
June 4th	251 (109)	23.5 (6.0)	10.3 (5.15)	294 (82.7)	4.2 (2.4)	51.9 (23.3)	37	6.7 (15.3)	56	82	..
„ 13th	219 (95.5)	28.0 (7.2)	..	235 (66.2)	4.1 (2.4)	..	..	..	44	88	In crisis.
CASE 5											
May 22nd	295 (128.5)	24.8 (6.4)	10.4 (5.2)	354 (99.9)	3.35 (1.9)	54.6	50	6.5 (15.3)	77	102	..
„ 29th	299 (130)	..	..	351 (99)	..	..	..	..	68	..	..
June 11th	296 (128.7)	24.8 (6.4)	10.3 (5.2)	355 (100)	3.4 (1.9)	41.0 (18.4)	65	6.0 (14.2)	75	95	June 6th-11th: Eschatin 5 c.cm. daily.
„ 25th	296 (128.7)	19.8 (5.1)	10.8 (5.4)	365 (102.8)	4.0 (2.3)	41.5 (18.7)	43	6.67 (15.8)	48	88	June 12th to discharge, salt 15 g. daily.
July 9th	307 (133.5)	20.0 (5.1)	..	364 (102.5)	..	..	..	..	39	80	..
„ 24th	309 (134.2)	..	..	376 (106.1)	..	..	..	..	36	88	..
CASE 6 1936											
Jan. 10th*	262 (114)	21.7 (5.5)	10.3 (5.2)	305 (86)	5.1 (3.0)	47.0 (21.0)	55	6.57 (15.7)	66	90	..
„ 17th	303 (131.5)	16.0 (4.1)	..	365 (103)	..	..	24	5.17 (12.4)	24	66	Jan. 11th: Salt 15 g. daily.
Feb. 4th†	302 (131)	20.6 (5.3)	10.2 (5.1)	346 (97.5)	5.2 (3.0)	54.5 (24.5)	32	6.1 (14.6)	28	64	..
„ 21st	301 (131)	20.7 (5.3)	..	361 (101.6)	..	..	..	..	25	72	..
CASE 7											
Jan. 29th†	266 (116)	35.6 (9.1)	13.6 (6.8)	295 (83)	7.8 (4.5)	..	..	..	160	82	..
CASE 8 1935											
May 15th	265 (115.5)	21.3 (5.5)	..	..	..	..	..	..	60	..	..
CASE 8A											
Nov. 26th‡	309 (134.2)	..	8.2 (4.1)	355 (100)	3.0 (1.9)	59.5 (26.7)	25	6.8 (16.2)	22	..	..

\* Mg. 2.2 (1.8).

† Mg. 2.0 (1.7).

‡ Mg. 2.5 (2.1).

of greatly congested kidney. Dr. Barnard states that in his opinion the kidney lesions were very slight and very recent and unlikely to produce any symptoms.

*Chemical findings* (Table II.).—The most striking finding was the very high blood-urea (160 mg. per 100 c.cm.); this, in combination with the presence of casts and protein in the urine, made the diagnosis of uræmia a possible one. Against this diagnosis, the fall in the sodium was more marked than that in the chlorine, and the potassium was higher than usually met with in uræmia, although very high values are sometimes met with in this condition.

CASE 8.—A retired schoolmaster, aged 66, was admitted to Charing Cross Hospital on May 10th, 1935, complaining of loss of strength and weight for ten weeks. During the last six weeks he had been in bed suffering from anorexia and vomiting (but no diarrhoea), and had lost 1½ st. Neither he nor his wife had noticed any change in colour.

*Examination*.—A rather wasted elderly man: rather dark complexion, but not outside normal limits. There were patches of pigmentation over spines of each scapula and round the anus. No pigmentation in mouth and none noticed over flexures. No other abnormality except blood pressure of 80/60 on admission and 60/40 on May 23rd. The patient gradually sank and died on May 24th, in spite of treatment with cortical extract and saline.

*Post-mortem examination* revealed tuberculous scarring of upper lobes of both lungs. Both adrenals showed advanced tuberculous caseation, and there was a small patch of tuberculous infection in right kidney.

*Chemical findings* (Table II.).—The typical fall in sodium and rise in potassium and urea were found in this case.

#### CHEMICAL METHODS USED

All observations were made on venous blood collected anaerobically without stasis, and serum was separated without CO<sub>2</sub> loss, usually within 1½ hours after the blood was taken, and without exception within 3 hours.

*Na*.—Uranyl gravimetric method (Butler and Tutill).

*K*.—Cobaltinitrite precipitation, direct on serum (Kramer and Tisdall).||

*Ca*.—Precipitated as oxalate, and washed by Clark and Collip's method.

*Mg*.—Colorimetric, magnesium ammonium phosphate precipitate.

*Cl*.—Open Carius method (Van Slyke and Sendroy).

*P*.—Colorimetric using stannous chloride as reducing agent (Kuttner and Lichenstein).

*HCO<sub>3</sub>*.—CO<sub>2</sub> capacity method, using Van Slyke volumetric apparatus.

*Protein*.—Microkjeldahl (Howe).

*Urea*.—Colorimetric micro-urease (Archer and Robb).

#### CHANGES IN THE SERUM CONSTITUENTS ON TREATMENT

*Sodium*.—In all cases under first observation the sodium content of the serum was definitely below normal, and in three cases (Nos. 3, 5, and 6) out of four in which salt was given in adequate dosage it returned to more or less normal values on treatment with salt. In one case (No. 3) salt alone was unable to maintain the normal level, and small doses of cortical extract had to be employed (cf. Harrop, Soffer, Nicholson, and Strauss).<sup>15</sup> In two cases (Nos. 1 and 2) there was no appreciable alteration in the sodium under treatment with salt. In no case was the serum sodium altered significantly by treatment with cortical extract without added salt, though it should be pointed out that, with the exception of Case 2, none of the cases in the present series received more than 6 c.cm. cortical extract per day without salt. As has been pointed out by Stahl, Atchley, and Loeb<sup>16</sup> there is no correlation between

the fall in the serum sodium and the retention of nitrogen in the blood, though the two changes are frequently encountered simultaneously.

*Chlorine*.—In general, serum chlorine figures ran very closely parallel to the sodium figures though the fall in the sodium is usually more striking than the fall in the chlorine. Harrop, Soffer, Nicholson, and Strauss<sup>15</sup> have shown that if sodium salts other than the chloride are used in treatment it is possible to have a high sodium content with a low chlorine, and they suggest that hydration is governed more by the sodium ion than the chlorine ion. None of the patients in this series was treated with any salt of sodium other than the chloride.

The *potassium* content of serum in all untreated cases was above normal, and in general returned to normal before the sodium showed any alteration. Similarly, in Cases 2 and 3 on cessation of treatment with cortical extract the serum potassium rose before there was any sign of fall in the serum sodium.

The *calcium* was usually within normal limits, but in Case 2, where there was marked plasma dilution, it fell from 11.4 to 8.6 mg. per 100 c.cm. as the serum protein fell from 6.5 to 5.0 per cent. In Case 7 it was abnormally high.

*Magnesium* was not estimated in the majority of cases: in the two where it was, it was within normal limits. In the majority of reported cases no estimation of magnesium has been recorded, so it is not clear whether a marked rise of serum magnesium such as is observed in adrenalectomised animals is to be expected.

The serum *bicarbonate* tended to be on the low side of normal, though not very strikingly so. In three cases (Nos. 1, 2, and 6) it rose appreciably under treatment, and, in fact, in Case 2 what rise there was in serum sodium was entirely accounted for as bicarbonate, the serum chlorine being essentially unchanged. In this case also, the bicarbonate fell to a subnormal value when cortical extract was omitted.

*Inorganic phosphate* was normal except in Case 6, where it was rather high and remained high, and Case 7, where it was very high. In Case 2 it came down to quite low values under treatment with cortical extract, and rose again when specific treatment was omitted.

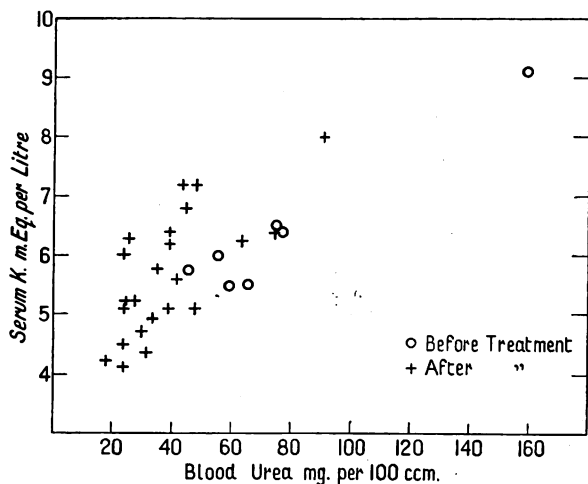
The change in *serum protein* was followed in five cases. In two of these (Nos. 2 and 6) there was evidence of marked plasma dilution under treatment, in the former with salt plus cortical extract, and in the latter with salt alone. In Cases 1 and 5 there was no marked change in serum protein under treatment with cortical extract or salt, although patients showed clinical improvement. It is of interest in this connexion that Brown and Roth<sup>17</sup> found the blood volume normal in nine cases of Addison's disease. Brown and Roth however, in one case which "improved markedly," found a rise in blood volume from 81 to 97 c.cm. per kg. Case 6 is of particular interest: the serum protein fell from 6.5 to 5.17 per cent. after one week's treatment with salt, and then increased again to 6.1 per cent. after a further 2½ weeks. As the hæmoglobin, which at first was 90 per cent., remained about the 65 per cent. level during this period, and the patient was gaining weight, this suggests a rapid synthesis of new serum protein.

In general the hæmoglobin values yield evidence of blood dilution similar to that given by the serum protein figures.

The blood-*urea* was above normal before treatment in all of the cases described in this paper, and

|| Watchorn and McCance<sup>14</sup> have shown that in normal blood there is no significant escape of potassium from the cells for about 7 hours: even with the low osmotic pressure of plasma in Addison's disease it seems unlikely that much change will take place in 3 hours.

returned to normal in Cases 1 and 2 with cortical extract alone, in Cases 5 and 6 with salt alone, and in Case 3 with salt plus cortical extract. In Cases 1 and 3 salt alone was not sufficient to keep the blood-urea within normal limits, but in Case 3 it began to return towards normal when small doses of cortical



## A NEW DYSTROPHY OF THE FIFTH FINGER

By A. ROBINSON THOMAS, B.Chir. Camb., D.M.R.E.  
SECOND ASSISTANT RADIOLOGIST AT ST. GEORGE'S HOSPITAL;  
RADIOLOGIST TO THE BELGRAVE HOSPITAL FOR CHILDREN,  
LONDON, AND TO THE CHILDREN'S HOSPITAL, LUTON

So much has been written, so much surmised, and so much elucidated about bone disease in recent years that one hesitates to add to the superabundant articles on this subject. Three recent and similar cases, however, have prompted me to describe and classify yet another bone dystrophy, which appears to affect only the terminal phalanx of the little finger.

This condition was first reported by Kirner<sup>1</sup>; Kohler,<sup>2</sup> in referring to it as an extraordinary case, says the cause of the condition is still unknown.

It is described by Kirner as an unusual appearance of the terminal phalanx of the fifth finger on either side occurring in a girl of 13, of healthy stock and with a normal childhood, whose mother had noticed a curvature of the terminal phalanges for about two months. The child was a pale, slender girl of ordinary mentality. The ends of her little fingers appeared curved, and also shorter than normal. The other phalanges were normal. Skiagrams of the affected fingers showed that on each side the epiphysis for the terminal phalanx was normal, while the shaft showed some loss of bone structure, sclerosis, and a curvature towards the palmar aspect.

A case with a similar radiological appearance is described by Brailsford<sup>3</sup> as an unusual but characteristic pathological change in the terminal phalanx of the fifth finger. A girl, aged 9, for twelve months had noticed swelling at the end of her little finger. The surgeon who examined the finger sent her to be radiographed with a provisional diagnosis of enchondroma. There was no evidence of injury.

### CASE REPORTS

In the last few months three cases of similar appearance have come to the writer's knowledge.

**CASE 1.**—A girl, aged 11, the mother's third child, all the other children being normal. She had a normal birth and no instruments were used. The mother noticed 8-9 months ago curving of the tips of the fifth fingers, but the child complained of no pain. There was no tenderness at this stage on physical examination. There was no history of any similar deformity in the family, and the remainder of the fingers and toes appeared to be normal.

The skiagrams showed an unusual appearance of the terminal phalanx of the fifth finger on each hand. There was sclerosis of the epiphysis together with

elongation and curvature of the shaft of the phalanx. The bone of the shaft had lost in some degree its normal structure.

**CASE 2.**—A girl, aged 12, one of a family of five, all of whom were alive and well. Her birth was normal and no instruments were used. She was fair, mentally alert, but perhaps rather small in size for her age. Her mother had noticed that the tips of the child's little fingers had been bent over for some time. About 10 days before the examination the child fell over while doing physical exercises at school and hurt her finger, and the mother brought her to hospital preparatory to making a case against the school authorities.

A skiagram of the fifth finger of the left hand showed that there was elongation and curving of the shaft of the terminal phalanx, the bone appearing to have lost, in some degree, its normal structure. The epiphysis did not appear to be involved. The remainder of the bones of the hands and feet showed no abnormality.

**CASE 3.**—A girl, aged 8 years, the fourth of the family, the others showing no abnormality. This child had been born a month prematurely, and was rather small for her age. Mentally she was definitely dull and had rather a mongoloid appearance. Her mother had noticed 4 years before that the tips of the little fingers were curving, and had drawn the school doctor's attention to this, but no further steps had been taken.

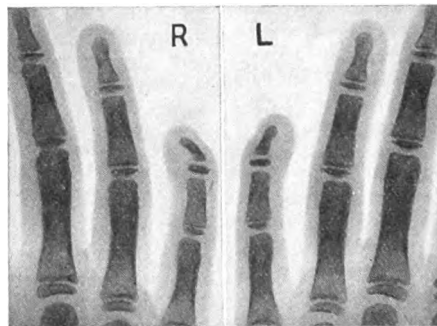
A skiagram showed a bilateral curving of the terminal phalanx of the fifth finger on either side, that on the right being most affected. There was definite loss of the normal bone structure of the shaft of each phalanx.

The epiphyses did not appear to be affected. The remainder of the fingers and toes were normal.

### DISCUSSION

The almost identical radiological appearance in these cases makes it probable that the ætiology in all of them is the same. Kohler reports that the nature of the condition is unknown, while Brailsford classifies it as a characteristic pathological change, but commits himself no further. After consideration and reflection, however, it seems probable that this lesion is due to an osteochondritis. In all the cases the shaft of the phalanx, in addition to being bent, shows a definite loss of its normal bone structure, while in one case the epiphysis is definitely sclerosed; osteochondritis is the only known condition which would fit in these appearances. The phalanx takes on the curved "taloned" effect because in its probable earlier state of osteoporosis it has been unduly affected by the action of the flexor muscles, which are stronger than the extensors, with a resultant palmar bowing. Furthermore, all the recorded cases have been of an age when osteochondritis is most common.

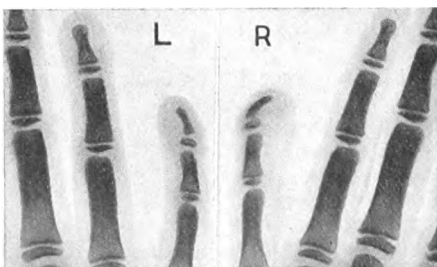
These cases have some medico-legal interest, for in at least one of them the mother of the patient had



CASE 1



CASE 2



CASE 3



intended to sue the authorities of the school, alleging that the unusual appearance of the child's finger was due to some accident that had happened in the gymnasium.

## SUMMARY

What is probably another manifestation of osteochondritis involving the terminal phalanx of the little finger is here described in 3 girls. All cases hitherto reported have appeared in female children aged 8-13. In 3 cases it was bilateral and in 2 unilateral.

## REFERENCES

1. Kirner, J.: Fortschr. a. d. Geb. d. Röntgen., 1927, xxxvi., 804.
2. Kohler, A.: Röntgenology, London, 1935, p. 19.
3. Brailsford, J. F.: Radiology of Bones and Joints, London, 1935, Chap. II.

## ABSCESS OF THE SPINAL CORD

By R. MILNES WALKER, M.S. Lond.

SURGEON TO THE ROYAL HOSPITAL, WOLVERHAMPTON; AND

S. C. DYKE, F.R.C.P. Lond.

PATHOLOGIST TO THE HOSPITAL

MOST writers on the subject of abscesses of the spinal cord have commented on the rarity of the condition. Woltman and Adson<sup>1</sup> made a searching review of articles on the subject in 1926, and were able to find records of only 29 cases; to these they added a further case of their own, and another has since been reported.<sup>2</sup>

The commonest causes of such an abscess were found by Woltman and Adson to be injuries or diseases of the spine, and chronic inflammatory diseases of the lungs. In one case it was associated with a meningocele which became infected, and in another there was a dermoid cyst over the cervical spine from which infection spread to the spinal cord. In only 2 cases is recovery recorded, in both the abscess being drained by operation; in the first the condition was associated with a fractured spine and a permanent paraplegia persisted, the lesion being in the twelfth dorsal region; Woltman and Adson's case, in which the abscess apparently resulted from suppuration at the site of a previous acute myelitis, made a complete functional recovery.

A girl, aged 3, was admitted to the Royal Hospital, Wolverhampton, on Oct. 29th, 1934, under Dr. J. H. Sheldon. There was a history of illness for the past 12 months, consisting of attacks of headache and vomiting. At first these attacks occurred at intervals of 2-3 weeks and lasted 12-24 hours, but during the previous month the attacks had become much more frequent, occurring nearly every other day. During these attacks she lost the use of her legs and her mother stated that she screamed with pain in her back when the pram was wheeled over rough stones; in between the attacks she was able to walk quite well. For the last week the headache had been more severe and persistent, the vomiting had occurred daily, and she complained of aching pains all over her body, and had quite lost the use of her legs. There was no aural discharge, and examination of the chest and abdomen was negative. There was no history of respiratory infection or disease of the ears, and she had been apparently quite well and normally developed until the onset of these attacks.

On admission her temperature was 101.4° F., pulse-rate 140, and respirations 32. She looked flushed and was somewhat wasted, the face having a drawn expression. There was much rigidity of the neck, the head being retracted, and a positive Kernig's sign. Any movement of the legs, which were spastic, appeared to cause her

considerable distress. The reflexes in the upper limbs were normal, but the knee- and ankle-jerks were increased, and a positive Babinski's sign was present on both sides. No sensory changes could be detected.

Lumbar puncture was performed and thick blood-stained fluid withdrawn. On microscopic examination this showed pus cells and morphological pneumococci; a diagnosis of pneumococcal meningitis was made and one of us (S. C. D.) was asked to see the patient with a view to treating her with serum. The history did not suggest the usual type of pneumococcal meningitis and the changes in the reflexes in the lower limbs were an unusual feature. Serum was withheld; subsequent investigation of the pneumococcus showed it to be of neither Type I. nor II., and the question of serum treatment was therefore allowed to lapse. A tentative diagnosis was made of abscess somewhere in the central nervous system.

At this stage the sister in charge of the ward drew attention to a small dimple over the lower lumbar vertebrae, with a single hair growing from it, which had previously escaped notice. The surrounding skin was still stained with the iodine applied in preparation for the lumbar puncture, and the dimple was difficult to see; a radiogram, however, showed spina bifida, the neural arches of the 4th and 5th lumbar vertebrae being incomplete.

On Nov. 1st lumbar puncture was repeated; 10 c.cm. of foul-smelling frankly purulent fluid were first obtained; as the needle was being withdrawn a further 4 c.cm. of fluid of quite different appearance flowed from it. This latter specimen was turbid but not frankly purulent, and odourless. Both specimens of fluid on culture gave a growth of pneumococci and coliform bacilli but the chemical examination revealed striking differences. Whereas the purulent foul-smelling fluid gave a protein content over 0.50 per cent. and chlorides to the extent of only 0.56 per cent., the turbid odourless fluid had only 0.2 per cent. protein and 0.67 per cent. chlorides. The differences between the two specimens appeared significant and gave rise to the impression that a localised collection of purulent fluid lying somewhere within the theca and requiring drainage had been tapped. Cisternal puncture was also performed on the same day and 4 c.cm. of turbid cerebro-spinal fluid was withdrawn; films of this showed pus cells and mixed organisms, and the cultures yielded pneumococci, staphylococci, and coliform bacilli. Lumbar puncture was performed repeatedly during the subsequent days but the general condition showed no improvement and it was decided to explore the vertebral canal.

On Nov. 7th, 1934, under general anaesthesia, the spinous process of the 3rd lumbar vertebra and portions of the laminae of the 3rd, 4th, and 5th were removed. A thick fibrotic stalk was seen to spread down from the subcutaneous tissues to the dura mater with which it was continuous, but this stalk appeared solid and it was not definitely ascertained whether it had any connexion with the small dimple of the skin. The dura, which was thickened and reddened, was incised; a small amount of turbid cerebro-spinal fluid escaped, but no pus was found such as had been aspirated previously, and the wound was therefore closed. A microscopic section across a portion of the fibrous stalk showed that it had a very small lumen, lined by squamous epithelium.

As was to be expected, no immediate improvement in the general condition followed the operation, but during the subsequent 3 weeks the temperature gradually subsided, and the pulse-rate dropped to the region of 120. The rigidity of the lower limbs, however, became more severe. Cisternal puncture was carried out on Nov. 13th, 20th, and 27th; the specimen on the latter date was still turbid but gave no growth on incubation. The cells were much fewer, being now 375 per c.mm., all pus cells. Lumbar puncture fluid on the same date yielded pneumococci and abundant pus cells, being definitely purulent. On Nov. 30th the patient's general condition was considerably improved, but the symptoms in the lower limbs continued. At no time during the illness did she have any incontinence of urine or faeces.

On Nov. 30th the spinal canal was again explored under a general anaesthetic. Before making the incision

a needle was inserted and thick pus withdrawn; the needle was left in situ and its track followed. On opening the dura the spinal cord appeared swollen and congested, and the needle was penetrating its substance, but on retracting the cord to one side it was found that the point of the needle did not project on the anterior surface. The needle was therefore withdrawn and the cord incised in the midline posteriorly. About 12 c.cm. of thick pus then escaped; this was lying in a cavity in the centre of the cord, the cavity being 1 cm. in diameter. It extended up the spinal cord beyond the limit of the incision in the dura, and a probe easily passed up a further 5 cm., the upper limit of the cavity not being reached. A small rubber drainage-tube was then inserted into the cavity in the spinal cord, and a corrugated rubber drain placed into the opening in the dura, these being brought out through the wound which was sutured above them.

After the operation there was slow but steady improvement in the general condition, but the spasticity of the lower limbs persisted. The wound continued to discharge pus and cerebro-spinal fluid for about 3 weeks, after which it rapidly closed to a small sinus.

On cisternal puncture on Dec. 26th, clear and colourless cerebro-spinal fluid was withdrawn; this yielded no pathogenic organisms, and only 15 cells per c.mm., these being all lymphocytes.

She was discharged from hospital on Jan. 25th, 1936, when there was still considerable spasticity of the lower limbs, but the wound in the back was completely healed except for a small superficial ulcer. At the time of leaving hospital she had been able to walk with assistance, but 3 months later the spasticity had entirely disappeared and she walked quite normally. The wound in the back was healed, and there were no abnormal physical signs. The wound broke down 9 months later and discharged some pus for a few days, after which it closed again and has since remained closed.

In April, 1936, she had no headaches, could enjoy herself playing with other children, and was mentally normal for her age.

#### DISCUSSION

In the case here recorded it is impossible to give a definite opinion on the cause of the abscess, but it seems probable that, associated with spina bifida, there was a sinus analogous to a coccygeal sinus but situated in the lumbar region, leading down to the dura, and that infection had spread by this route from the skin to the dura and spinal cord. A remarkable feature is the duration of the symptoms; it

seems probable that a localised infection of the meninges in the neighbourhood of the sinus had existed for at least a year before the onset of the symptoms for which the patient was admitted to hospital; these symptoms appear to have been associated with generalised spread of the meningeal inflammation.

At the first lumbar puncture on Nov. 1st the purulent fluid withdrawn showed only 0.56 per cent. of chloride; this represents a gross diminution. The turbid fluid withdrawn at the same puncture and which represented an actual sample of the free cerebro-spinal fluid showed chlorides to the extent of 0.67 per cent.; this was evidence of a separate source for these two samples. A level of 0.67 per cent. is near that usually met with early in a severe meningitis to which a fatal issue may be expected. On Nov. 28th, 3 weeks after the first operation, fluid withdrawn both by lumbar and cisternal puncture showed a level of 0.68 per cent. indicating that there had been no further advance in the inflammation of the meninges. On Dec. 28th, 4 weeks after the second operation when the general condition was improved, the chloride level was 0.71 per cent., and by Jan. 1st it had risen to 0.74; at this date except for a protein content of 0.180 per cent. the fluid was in all respects normal.

The chronicity of the meningitis is a point of interest, for the course was quite different from that ordinarily seen in pneumococcal meningitis. This may have been due either to the establishment of some degree of immunity by the patient or to relative avirulence of the organism; these aspects of the matter were not subjected to investigation. It should be emphasised that the whole picture both from the clinical and laboratory standpoints was entirely different from that met with in true pneumococcal meningitis; this case should not, therefore, be included among the very rare examples of recovery from that condition.

The thanks of the authors are due to Dr. J. H. Sheldon for access to the patient and to the records of the case.

#### REFERENCES

1. Woltman, H. W., and Adson, A. W.: *Brain*, 1926, *xlix.*, 193.
2. Abeshouse, B. S., and Bogorad, D. E.: *Urol. and Cut. Rev.*, 1935, *xxxix.*, 295.

## REVIEWS AND NOTICES OF BOOKS

### *Nouvelle pratique dermatologique*

By Drs. J. DARIER, R. SABOURAUD, H. GOUGEROT, G. MILIAN, L. M. PAUTRIER, P. RAVAUT, A. SÉZARY, and CLEMENT SIMON. Paris: Masson et Cie. 1936. In eight volumes. Inclusive price in advance, Fr.2000.

THIS treatise, of which five volumes have now been issued, is a most comprehensive and authoritative compilation. There are no less than 7350 pages of text in the volumes already published and a collection of illustrations in colour and half-tone reaching the immense total of 2425. The responsible editors, who constitute the directorate, are named above; to their number must be added a list of 80 contributors, each distinguished for original research or particular experience in the special subject allotted to him. An index is to follow in the eighth.

The first volume deals with cutaneous anatomy and physiology, general histology—profusely illustrated by A. Civatte from the well-known collection at the St. Louis Hospital—etiology, pathology, semiology,

diagnosis, and general therapy. The four authors in intimate collaboration here are Darier, Civatte, C. Flandin, and A. Tzanck. The last named is responsible for the article on aetiology, and according to Darier has formulated therein some new conceptions which are likely to influence the future development of our views on cutaneous reactions in general. There must be a more careful discrimination between what is meant by intolerance and intoxication. The two terms are frequently confused even by accepted authorities, some of whom appear moreover to have no clear conception of the difference between real and apparent causation, and are apt to overlook or ignore the multiplicity of factors usually operating in the production of even simple reactions. A brief glance at the table of causes on pp. 367–369 in which causes are divided into (a) "Efficientes," which we might perhaps translate as evocative, and (b) Pre-disposing, and their superimposition on pp. 466–469 in the form of a "Tableau Synoptique," will suggest how complex and contingent are modern conceptions of aetiology. An entirely new departure is the section

of 31 pages given to the examination of a patient suffering from a skin affection (pp. 554-585). The same ideas are here emphasised. Itching, for instance, is stated to be a symptom of *intolerance*; its absence, as in syphilis or tuberculosis, suggests *intoxication*. The meaning of pruritus and the help it can afford in the diagnosis of an obscure metabolic affection are analysed in the greatest detail and this section will repay careful study by any physician faced with an unusually difficult problem in dermatology.

The digestive apparatus from the tongue downwards, the gums and teeth, the mobility of the soft palate, the state of the lymph glands, the liver and pancreas may all have a bearing on the course or genesis of the affection studied. The examination of lungs and mediastinum and the kidneys and other organs by appropriate measures are all points which the physician is not likely to neglect, and a résumé of appropriate clinical laboratory investigations is given. All that is known on the association of the neuro-vegetative and endocrine systems in cutaneous disorders and diseases is also set out and this section demonstrates how extensive must be the equipment of the modern dermatologist. The volume ends with a dissertation on general therapy.

Vol. II., for which ten authors are responsible, begins with a profusely illustrated study of the diseases caused by animal parasites. The acari infesting the cat, dog, horse, and sheep differ both in their morphology and symptomatology from the human species and are separately considered. The chapters on ring-worm and the mycelial infections of the human skin are by Sabouraud, whose classical work "*Les Teignes*," published many years ago, has become the inspiration for those later studies of blasto- and sporo-trichosis, mycetoma (Madura foot), moniliasis, and other mycelial diseases which are here fully described and illustrated, mostly by the original investigators themselves. The concluding third of this volume is devoted to syphilis, and has been written by G. Milian. Of particular interest is the plea he makes, in his section on treatment, for the administration of larger doses of the salvarsan group. He bases his argument on the assumption that the lethal dose for a man of average weight is 10 grammes and that the injection of small doses at the relatively long interval of a week is the cause of most of the cases of so-called refractory or salvarsan-fast syphilis, and the other undesirable sequelæ occasionally met with.

Vol. III. carries the dissertation of syphilis to the later stages and discusses the regional varieties in complete detail. Stress is laid on the value of the CO<sub>2</sub> pencil treatment of leukoplakia of the tongue and cheeks—one of the most intractable of all luetic affections. It is suggested that a minimum of 1 minute exposure with a 1 pound pressure through a thin layer of gauze is an efficient dose. Every aspect of the disease, on which the author may be regarded as an authority worthy to succeed Fournier, is dealt with in the succeeding pages, which conclude with an article describing the various tropical varieties encountered in Asia and Africa. Pian—frambœsia or yaws—is next discussed, and studies on leishmaniasis and Delhi sore are well illustrated. The long treatise on cutaneous tuberculosis and tuberculides, by Pautrier, one of the most careful workers and authors in this domain, provides a most important contribution to the literature of the subject and one that will be widely studied and quoted. Preference is given to the tuberculous as opposed to the streptococcal and other theories

in the genesis of lupus erythematosus. Leprosy is also described in this volume. Milian has made himself responsible for the articles in Vol. IV. on the streptococoides, in which he includes impetigo, and the vexed ætiological question of the so-called acrodermatitis continua. Common associations of streptococcal infections, such as scabies and ringworm, are separately discussed and illustrated. Sabouraud gives an account of furunculosis and syccosis barbæ et generalisata under the heading of "*folliculites*," and reprints his well-known diagrams which did so much to establish an ordered classification among staphylococcal infections of the skin. The dermatoses due to ultramicroscopic and filtrable viruses include the common wart and its varieties, molluscum contagiosum, certain papillomata, and the herpetic group. These are discussed in detail and well illustrated under the combined authorship of Paul Ravaut and Marcel Ferrand. This section is followed by a useful contribution on the eruptive fevers, including "*fourth*" disease, a name first suggested by Dukes of Rugby in 1900, and to this day a somewhat doubtful entity (rubéole scarlatineuse). A most interesting section by Milian worthy of close study is that given to the drug eruptions, which nowadays are more often seen as new medicaments are introduced. Their variety has necessitated a complex tabulation according to the morphology of the lesions resulting. Thus we may have eczematous, urticarial, polymorphic-erythematous, erythematous-squamous, nodular, acneform, purpuric, and so forth—veritable equivalents and competitors both in number and variety of the dermatoses due to infective and metabolic causes. In view of its frequent incorporation in proprietary laxatives, phenolphthalein dermatitis receives special mention and illustration. Equally worthy of note are the arsenobenzol, thallium, and barbitone eruptions. The whole of this large section has been carefully compiled and generously illustrated, and is probably the most complete of its kind yet published.

In comparison with the detailed discussion of the foregoing, urticaria, one of the commonest and most troublesome of all skin manifestations, receives but scant consideration (C. Flandin and others, pp. 1-35, Vol. V.). Its treatment by specific and non-specific desensitisation, by injection of sodium thiosulphate (Ravaut) and calcium are duly tabulated. "*Eczema*" is retained as a nosological entity and is defined as a "*vesicular dermo-epidermal reaction which can be caused in predisposed subjects by numberless pathogenic factors habitually innocuous to the skin of a normal individual*" (A. Sézary and A. Horowitz). The various clinical forms are illustrated and discussed in detail, and a separate section is given to the eczema of infants. The "*eczematides*," a name first suggested by Darier to cover a group of eczema-like eruptions of erythematous-squamous type, such as our so-called "*flannel rash*"—a seborrhœic manifestation—are considered by Sézary in a separate chapter. The name is not much used outside France, and has so far not received general recognition as a separate entity. That much disputed condition dysidrosis of the hands and feet is also discussed in a separate chapter. The conclusions as regard its ætiology favour a mycelial origin, but are on the whole non-committal. Even this disease has not escaped the suspicion, so prevalent in France, of a congenital syphilitic basis (Milian). This volume also deals with the various forms of prurigo and pruritic diseases of uncertain causation. The chapter on Raynaud's syndrome by Nicolas and Ravaut will be studied with special interest in view of the

recent advances in its therapy by surgical means, periarterial sympathectomy, ganglionectomy, and so forth. The new disease, erythrocyanosis cruris puellarum, has been dignified with a special chapter, and its aetiology clarified so far as that is possible. The consideration of a large number of vascular abnormalities, including purpura, leg ulcers, gangrene, and conditions associated with blood diseases follow in detail. An extensive consideration of psychopathic dermatoses, newly classified by Clement Simon, merits special study as a sign of the times.

We await with keen interest the completion of this great work.

### Fluorescence Analysis in Ultra-violet Light

Second edition. By J. A. RADLEY, M.Sc., A.I.C., and JULIUS GRANT, Ph.D., M.Sc., F.I.C. London: Chapman and Hall Ltd. Pp. 326. 21s.

FLUORESCENCE analysis in ultra-violet light is by no means new, but it is only fairly recently that it has come into its own. Like most applications of physical method to other branches of science, it suffered at first from the unjustified optimism of those interested in it, but its practical value is now recognised. Moreover, there are now available light sources which emit ultra-violet light sufficient in quantity and quality for most purposes of fluorescence analysis.

This book opens with a theoretical account of electro-magnetic waves, embodying a useful chart which shows the range of radiations at present recognised. An account follows of the methods available for the production of ultra-violet light, as this relatively short range is mostly used as the exciting radiation in fluorescence analysis. Filters or other methods of isolating short ranges of wavelengths are then described. Most attention is given to the mercury arc as a source of light; other sources that are in some respects and in some circumstances more satisfactory are not so fully described. Measurement of intensity of radiation receives inadequate notice; it is admittedly a difficult branch of work but its importance should have been emphasised. Some definite expression of opinion by the authors on the methods available would have been welcome; the mere recapitulation of the results of others is not enough. Methods and technique are described at some length, but the short section dealing with microscopy is both inadequate and misleading. It is difficult to see how anyone starting fluorescence microscopy, and such work is becoming increasingly important, could regard the information provided as satisfactory even for an introduction, and in a future edition considerably more space ought to be allocated to this aspect of the subject. The book is well produced and illustrated.

### The Silver Fleece

An Autobiography. By ROBERT COLLIS. London: Thomas Nelson and Sons, Ltd. 1936. Pp. 290. 15s.

Dr. Collis is an Irishman still on the right side of forty who wears his heart on his sleeve. Born in Ireland, he was bred at an English public school which never succeeded in moulding him to that conventional pattern which has excited so much favourable and unfavourable criticism. Though just old enough to join the army during the war, he missed active service abroad, and his pacifism is founded not on personal experience of the horrors of war

but on the conviction that wars are terrible things and should not occur. He has played international "rugger," spent a year at Yale and, as a boy, saw at first hand something of the trouble in Ireland. Apart from these, his experiences have not been exceptional, but he contrives to make them interesting without being melodramatic, except perhaps when writing of sick children in hospitals. Dr. Collis is a mezzo-brow, neither high nor low. He writes unaffectedly, and one is left with the impression that few of his contemporaries could have made of their memoirs such good reading. The decorations, by T. G. Wilson, are an asset.

### Orthopædic Surgery

Second edition. By WALTER MERCER, M.B., Ch.B., F.R.C.S., F.R.S. Edin., Assistant Surgeon to the Royal Infirmary, Edinburgh. London: Edward Arnold and Co. 1936. Pp. 906. 40s.

IN its second edition this book is very much enlarged. It has some 200 extra pages and 37 additional illustrations. Mr. Mercer has added considerably to the part dealing with congenital deformities and has included two new chapters on circulatory disturbances of the extremities and manipulative surgery.

By far the best part of the book is the first which deals with congenital deformities and diseases of bone, including tubercle, though there are some important omissions, for example, of any picture of the Denis Browne splint for the treatment of congenital equino-varus. The section on bone tubercle is amply illustrated and contains a fair and concise résumé of recent work, including the important researches of Seddon and Butler on Pott's paraplegia. As a whole when the author deals with subjects of general surgical interest the book is good, but when he ceases to be a general surgeon with an orthopædic bent and speaks about pure orthopædics the balance is less sure. In his anxiety to include new matter he has failed to bring up to date some of the sections in the original, for instance the description of the treatment of pes cavus. The review of flat-foot, a subject of profound interest to orthopædic surgeons, is inadequate and no mention is made of the association of rigid flat-foot with focal sepsis.

In spite of these defects this book is undoubtedly a useful one for the third-year student. Mr. Mercer has taken so much trouble that it might almost be regarded as a dictionary of terms used by surgeons in connexion with bone, joint, muscle, circulatory, and nerve conditions. If it does not succeed in stimulating the interest of a student in orthopædic surgery, this is because it does not lay sufficient emphasis upon the general principles of orthopædic work or stress the differences in outlook between the orthopædic and general surgeon. The eradication of disease and the correction of deformity is not the main interest of the orthopædic surgeon. His chief concern is to restore or improve function. He may often advise against the correction of a deformity, or, conversely, in order to improve function he may actually create a deformity. It is this fascinating aspect of orthopædic surgery to which less than justice is done in this otherwise satisfactory book.

ONE FLAG DAY.—The possibility of one big flag day for all the London hospitals is under consideration. This would take the place of the 66 hospital flag days at present held every year in London and the suburbs.

# THE LANCET

LONDON: SATURDAY, JUNE 20, 1936

## BACTERIAL EVOLUTION

RELATIONSHIPS, more or less remote, between various species of bacteria have long been recognised, and schemes of classification have been introduced which seek to indicate something more than degrees of similarity or dissimilarity. The analysis of structure offers a very elementary separation of bacterial types; physiological characters, determined with varying degrees of crudity, have been the guides to the nicer differentiation of species. Mr. KNIGHT, in a monograph on Bacterial Nutrition,<sup>1</sup> has made an extensive survey of the more exactly determined physiology of bacteria, and has tried to coördinate his observations by the help of an evolutionary scheme for the schizomycetes. The first part of his report surveys the facts; the second is devoted to coördination of observation; and the third to the mechanism of nutritional variation.

Bacteria may be arranged in a scale of increasing complexity of nutritional requirements. At one end are organisms with a wide range of synthetic ability, capable of obtaining energy and materials for the synthesis of their protoplasm from the simplest chemical compounds; such are the photosynthetic bacteria, resembling the green plants in obtaining energy mainly from light, and certain chemosynthetic bacteria, whose production of energy depends entirely on the chemical reactions they initiate. Intermediate between these organisms, utilising inorganic matter, and the bacteria which derive energy by the breakdown of complex carbon compounds, are bacteria which absorb CO<sub>2</sub> or simple organic compounds for their carbon (oxidising hydrogen for the purpose), or utilise CO, CH<sub>4</sub>, or similar hydrocarbon as a source both of carbon and of energy. Next in the scale of complexity come organisms like *Bacterium coli* and *Pseudomonas pyocyanea*, requiring complex carbon compounds as source of energy and carbon, but assimilating nitrogen as NH<sub>3</sub> for the synthesis of their protoplasm. *Bact. typhosum*, *dysenteriae* Shiga, *paratyphosum* A, and *Proteus vulgaris* occur as "exacting strains," requiring amino-acids for their nitrogen, from which "non-exacting" strains, utilising NH<sub>3</sub>, can be derived. They form a link between types like *Bact. coli* and those (such as the acid-fast bacilli and the diphtheria bacillus) which cannot grow unless amino-acids are present as a nitrogen source. Even among the members of a single group, however, there are differences of nutritional requirements. The acid-fast bacilli, for example, are capable of arrangement in a special series which corresponds, as in the main

series, to a progressive restriction in utilisable sources of energy and food—viz., the saprophytic acid-fast bacilli which are least fastidious, the cold-blooded, avian, and finally the human types of tubercle bacillus. John's bacillus is the most fastidious, being apparently unable to synthesise a substance, essential for its growth, that is readily supplied by the Timothy grass bacillus and the human tubercle bacillus. The increasing complexity of nutritional requirements is associated with decreasing synthetic powers, which include the capacity to synthesise essential growth substances. These substances are analogous to the vitamins of animal metabolism. They have been prepared as potent concentrates by Mr. KNIGHT and his associates, and found essential for the growth of certain bacteria. They include (a) the "sporogenes" factor, synthesised, for example, by *Bact. aertrycke* and *Aspergillus versicolor*, found in yeasts and mammalian urine, and required already formed for the growth of *Clostridium sporogenes*, *botulinum*, and *welchii*; and (b) the "staphylococcus" factor, synthesised, for example, by *Pseudomonas pyocyanea* and *Vibrio cholerae*, and essential for the growth of staphylococci and *Bacillus anthracis*. At the upper end of the scale are organisms not yet grown in synthetic media of known composition, whose special requirements are supplied by chemically indeterminate mixtures like enriched nutrient broth. The group includes the influenza bacillus with its peculiar requirements of X and V factors, the brucella organism, the streptococci, pneumococci, the meningococcus, and the gonococcus.

The series arrived at by arranging the bacterial species as briefly described is claimed to be more than a merely static classification, similar to those put forward by FISCHER and ORLA-JENSEN; it represents an evolutionary series. Mr. KNIGHT bases his arguments on the following facts. In the course of world evolution, the simpler carbon and nitrogen compounds presumably developed first; and the bacteria that first arose would presumably be those capable of utilising NH<sub>3</sub> and CO<sub>2</sub>. This explanation is too teleological to be readily acceptable, for it assumes that the most likely form of life was that best suited to generally prevailing conditions; whereas the origin of a "living" chemical process, or the development of a more complex one, seems equally likely to have been the result of a peculiar, not a general, set of conditions, which could as readily give rise to protoplasm of limited synthetic abilities as one of wide. The evolutionary process may thus have been not a restriction of simple synthetic powers, but the acquisition of wider ones. But postulating organisms like the present-day CO<sub>2</sub>- and NH<sub>3</sub>-utilising forms as the primitive type, the series following them is linked dynamically by the occurrence of strains of the same species at different nutritional levels; by the experimental adaptation of strains to different nutritional requirements; and by the poor synthetic ability<sup>2</sup> of the

<sup>1</sup> Bacterial Nutrition. Material for a Comparative Physiology of Bacteria. By B. C. J. G. Knight, M.Sc. Med. Research Council, Spec. Rep. Ser. No. 210. London: H.M. Stationery Office. 1936. Pp. 182. 3s.

<sup>2</sup> In addition, analogous evolutionary series can be formed for certain protozoa, supported in this group of organisms by correlated changes in anatomical structure.

predominantly and exclusively parasitic forms. If parasitism is regarded as a late adaptation in evolution, the characters of parasites are presumably late adaptations; and it is unlikely, as Mr. KNIGHT says, that the majority of pathogenic bacteria appear by chance in the class of organisms whose nutrient requirements are not satisfied by simple synthetic media. In the course of his survey a correlation does in fact appear between pathogenicity and differences of nutrition. Even bacteria like *Bact. typhosum*, that can be trained to utilise simple compounds, are more fastidious when first isolated from the body of a host.

The most persuasive evidence lies in the varying requirements of strains of the same species, and the demonstration that bacteria can apparently produce new enzymic systems to cope with new substrates. But this flexibility is confined to comparatively small portions of the immense scale of nutritional evolution that Mr. KNIGHT sketches. There is, however, no evidence for postulating a more complex evolutionary series, though it is improbable that this progressive loss of wide synthetic ability, together with the late acquisition of special abilities, such as the synthesis of lysins and toxins, is necessarily a true picture of an evolutionary tree; there may be regressions and wide digressions with re-entrant paths that complicate the main series beyond recognition. But the simplified picture forms a valuable groundwork upon which to build a bacterial classification; for, by the very nature of the criteria upon which carefully investigated strains are admitted to it, it remains flexible and empirical, yet with an empiricism that rests on a reasonable, though limited hypothesis. In reaching his conclusions Mr. KNIGHT provides critical reviews of the gaseous requirements of bacteria and of the various methods of study of bacterial metabolism (especially the preparation of synthetic media), the differentiation of essential food substances from accessory food substances, and the technique of "training" bacteria to grow in simple media. Hence there is much in his report which will interest the general bacteriologist, though the scheme for the practical use of the evolutionary classification that is put forward is at present applicable only in laboratories devoted to the kind of work that the author has both reviewed and furthered.

### INSULIN IN SCHIZOPHRENIA

"I HAVE known four and twenty leaders of revolts," said OGNIBEN. It is not necessary to have lived as long as OGNIBEN to have known four and twenty treatments of schizophrenia. In any survey such as HINSIE'S or MÜLLER'S one finds a lengthy catalogue even for the last decade. There are few therapeutic discoveries or fashions in medicine that are not sooner or later tried out upon the schizophrenic, who must also suffer fresh applications of the old principle that terror and shock are good for the insane, especially the apathetic insane; the method of "emotion therapy" reported in a psychiatric journal in 1930 had some points in common with the whirling chairs and the trapdoors of earlier times. The

reported success of various ways of treating schizophrenia makes impressive reading until one observes that ten or fifteen years after their introduction they are discarded. Endocrine therapy of opposite sorts (thyroidectomy, for example, as well as thyroid medication); prolonged narcosis; infusion of all manner of drugs and sera into the blood stream; the production of aseptic meningitis, leucocytosis, controllable fever; high-frequency currents and other forms of physiotherapy; extirpation of dubiously septic foci; psychotherapy of many kinds—all have had their more or less ephemeral heyday. In the last year or two gold salts have been tried by some, the induction of epileptic convulsions and the injection of cerebrolysates and cerebrotoxins by others; still another innovator has been gouging out pieces of the frontal lobe. Schizophrenia is certainly not one of the diseases given over to therapeutic nihilism, whatever people and text-books may say. Nor is it one of the diseases about the cure of which it is wrong to be sceptical. Recovery or remission happens often enough in schizophrenia under non-adventurous care to explain some of the success of new methods and to warrant caution in acclaiming them.

There is one new method of treatment that differs from its predecessors in several particulars. First, it is more deadly. Day after day, of set purpose, the patient is put in danger of his life; the treatment is not being properly carried out unless grave risks are run. Secondly, it is supported by an eminent and reputable authority, Prof. PÖTZL, in whose clinic it has been worked out; he declares it superior in its cures to every other method. Thirdly, it is reported to produce over 70 per cent. of full remissions, an unusually high figure. The method, which consists in giving huge doses of insulin, up to 190 units, so that the patient becomes comatose, with twitchings, sweating, and sometimes glottic spasm, transitory hemiplegia or epileptic fits, has been elaborated in Vienna by Dr. MANFRED SAKEL<sup>1</sup> who had earlier used hypoglycæmic shock in the treatment of drug addictions. It may be useful to consider the three points mentioned above before the method is either rejected or experimented with in this country. Its lethal risks are not an essential objection to it, any more than they were to the malarial treatment of G.P.I., but they impose upon every doctor who proposes to try the method the duty of reading the literature carefully and himself staying by the patient continuously during the hours of the daily hypoglycæmia, ready to intervene if the collapse goes too far. Dr. SAKEL'S account of what may happen makes it clear that the responsibility is a heavy one and that it should not be delegated; moreover, the treatment should never be carried out without very skilful and special nursing. The second point need not be given undue weight, for Dr. J. BERZE,<sup>2</sup> the greatest authority on schizophrenia

<sup>1</sup>Neue Behandlung der Schizophrenie, Leipzig u. Wien, Porles, 1935; Wien. med. Woch., 1934, lxxxiv., 1211, 1265, 1299, 1326, 1353, 1383, 1401; 1935, lxxxv., 35, 68, 94, 121, 152, and 179.  
<sup>2</sup>Wien. med. Woch., 1933, lxxxiii., 1365.



in Vienna, has written an article which is strongly critical of this treatment; he thinks it may do as much harm as good. The third point, the high proportion of recoveries, has been justly criticised<sup>3</sup> on the ground that it is in the early cases that Dr. SAKEL reports his 70 per cent. of full remissions after treatment; we are not told what proportion of the advanced cases got better. Everybody knows how high is the percentage of recoveries in early cases of schizophrenia quite apart from special treatment. Nor does Dr. SAKEL say for how long the patients remained under his notice afterwards; temporary and deceptive remissions are nothing out of the ordinary in schizophrenia. He could not have assessed the prognosis beforehand, because in some of his cases treatment was begun on the first or second day after admission. There is nothing in the report of Dr. SAKEL, or of his Polish imitators, to indicate that the treatment is worthless, but neither is there much at present to recommend it.

### EPIDEMIOLOGY OF WHOOPING-COUGH

THE Registrar-General's reports show that in England and Wales the deaths attributed to whooping-cough in the last completed decade, 1921-30, were rather more numerous than those debited to measles, or to scarlet fever and diphtheria combined. In subsequent years the position has been rather more favourable—both relatively and absolutely—to whooping-cough, the yearly attribution of deaths in 1931-34 being, roughly, 2400 to that disease, 3100 to measles, 2900 to diphtheria, and 700 to scarlet fever. In spite of this reduction—perhaps temporary, for the epidemic swing of such diseases makes the rate over a short period of years unreliable—we still have a number of deaths that is far from negligible and the more to be deplored in being nearly entirely concentrated on the first five years of life. The ubiquity of the disease, combined with its generally low fatality-rate, tends to make the layman rather contemptuous of this so-called childish malady, though the medical profession is well aware of its dangers. Recent experiments with *Hæmophilus pertussis* vaccines suggest that prevention may lie in that direction.<sup>4</sup> Increased knowledge, still somewhat scanty, of the epidemiology of the disease, is also likely to assist towards that end. To that knowledge a useful contribution has been made by Dr. RALPH E. WHEELER, working for the Milbank Memorial Fund.<sup>5</sup>

During the last five years there has been, Dr. WHEELER records, an annual average of 5500 deaths from whooping-cough in the United States registration area, and it ranks among the outstanding causes of mortality among children in the first two years of life, a position clearly parallel with that of this country. To study its epidemiology a rural section of New York State, with a population of 5500 persons, was chosen and a careful record of communicable disease kept there

for three years. During that period 280 cases of whooping-cough (with no deaths) were registered, 260 of them being persons under 20 years of age, giving an attack rate of 46 per 1000 person-years of exposure at these ages. Only 6 of the 260 persons attacked at ages under 20 gave a history of previous attack, which indicates a high degree of immunity. Not many of the persons in this area had escaped the disease at one time or another, for at age 20 a remembered history of manifest whooping-cough attack was given by about 80 per cent. of them. From a detailed regional and chronological analysis of the cases it is concluded that some 12 per cent. could be classified as primary cases infected by sources which could only be surmised, 14 per cent. could be reasonably attributed to casual neighbourhood or "vicinal" contact, 23 per cent. to infection at school, and 51 per cent. were secondary cases in the home due to familial contact. The excessively high risk of infection within the home is shown by the fact that up to age 15 approximately 90 per cent. of the susceptibles—i.e., without a history of previous attack—succumbed on exposure to a case in the family. Secondary attack rates on susceptibles in attacked schools were considerably lower, being estimated at 41 per cent. at ages under 10 years and 15 per cent. at 10 years and over. On the other hand, Dr. WHEELER emphasises the fact that if the word *spread* be defined as distribution among households instead of among individuals in the community there is no doubt that school attendance in this rural area was responsible for more cases than any other influence. The disease did not become widely distributed except through school attendance.

Can any measures be applied to restrict infection in an attacked school and thus in the homes of the neighbourhood, where the pre-school child is particularly in need of protection? Dr. WHEELER puts forward a number of suggestions. A communicable disease history of each pupil should, he maintains, be recorded on entrance to school and brought frequently up to date. This would identify the susceptibles. Three possible experimental procedures might then be applied: (a) The dismissal from school for a few days of any susceptible child with a cough of the dry consecutive variety. The loss of school time—apart from other factors—through false alarms might be more than saved by a reduced incidence of whooping-cough. (b) The use of gauze masks by all susceptibles showing suspicious symptoms. (c) Inoculation, which in such an area as this might well be tried as a controlled experiment. But even effective preventive action could at the best, according to Dr. WHEELER's calculations, reduce the incidence by only about one-half. Had a perfect system of prophylaxis been applied in the schools of this area at the time of the survey it would have eliminated, he computes, 66 cases which were secondary to primary cases in the various attacked schools, and 75 cases secondary to the former in the households where they lived, or 133 of the total 280 cases recorded, for even if the attack was only postponed, some at least of

<sup>3</sup> Weygandt, W.: *Psychiatr.-Neur. Woch.*, 1935, xxxvii., 619; Lichter, Ch., et Lichter, N.: *Vol. Jubilaire en l'honneur de Parhon*, 1934, p. 281.

<sup>4</sup> See, for example, *Amer. Jour. Pub. Health*, 1936, xxvi., 8.

<sup>5</sup> *M.M.F. Quarterly*, October, 1935, p. 366; January and April, 1936, pp. 81 and 180.

the children's lives would be saved by this delay. This proportion is not to be despised. Certainly in such an area the school appears to be the most hopeful point of attack.

### BENEVOLENT HOSTS

ON Wednesday of last week many of the officers and subscribers of the Royal Medical Benevolent Fund were entertained by the Royal Society of Medicine. Sir Thomas Barlow, president of the Fund, assisted Dr. Robert Hutchison, president of the Society, in bidding the guests welcome, and not far off was Sir D'Arcy Power, chairman of the management committee of the Fund. They would be grudging guests who required more than the pleasure of the company of such hosts, but the reception was followed by a variety of entertainment which Sir Thomas Barlow described as unique in his experience. The sleight of hand was marvellous, and the transference of treasure may have been emblematic of the intention to charm handsome gifts from willing subscribers. Had this not been the object of the reception many of the guests might have felt uneasy at the

contrast between the comforts showered on them and the discomforts set out movingly in Sir Thomas Barlow's centenary record and appeal. "Many doctors who are zealous, unremitting and effective in the serious illnesses of poor people are very hardworked indeed. The expectancy of life of a busy practitioner amongst the poor is not a long one." The sentences are taken from this appeal which, with Sir Thomas's own starting contribution of £1000, has reached nearly £3000, but is still far remote from the £20,000 which it is hoped to raise from new subscribers, apart from the special donations wanted for urgent and distressing cases and especially for the training of orphans to be self-supporting. Dr. Hutchison, although as is proper in a host he made no appeal, did make it clear enough that the success of the centenary year would gladden Sir Thomas Barlow's heart and set a seal on his work. We commend his words to any whose names are not yet to be found in the list of subscribers for the year 1935, and remind those whose names are there to add the little more which would make all the difference to some individual case of hardship.

## ANNOTATIONS

### VIRUS-TUMOURS AND TAR

FACTS now coming to light concerning virus-tumours and chemically induced tumours in mammals and birds must cause us to consider more and more closely whether the gap between two schools of thought in cancer research is not an entirely imaginary one. The first definite evidence that carcinogenic chemicals and viruses might act in concert in causing tumours came from McIntosh's report<sup>1</sup> that three tar-induced sarcomata in fowls had proved transmissible in series with cell-free filtrates, the agent in the filtrates behaving like a virus. More recently, Parsons at the Royal Cancer Hospital has described a sarcoma accompanied by leukaemia in a mouse treated with a soluble dibenzanthracene compound; this, it is reported,<sup>2</sup> has been successfully filtered on four occasions.

Now comes more startling news from Peyton Rous's laboratory.<sup>3</sup> Rabbits tarred on the ear began to show hyperplasia and small warts in 1½-3 months. Ordinarily such warts regress if the tarring is stopped at this stage; to obtain cancers it is necessary to tar for a year or more and even then they will appear in only a minority of animals. Rous and Kidd took rabbits tarred for a short time and inoculated them intravenously with large amounts of filtrates of the Shope rabbit papilloma. After a fortnight, the normal incubation period of this virus, the growths in many rabbits underwent an extraordinary change, becoming discoid and infiltrative within a few days. Biopsies showed that numerous discrete, highly anaplastic carcinomas had appeared. Some of these developed on the basis of pre-existing tar warts, but others where none had been visible. In one instance an anaplastic cancer appeared within 22 days after the virus inoculation. The changes were progressive and usually led to the death of the rabbits within a few weeks. Rous and Kidd have failed to find any

previous record of fulminant carcinosis such as this, and nothing of the sort appeared in their numerous control animals.

It will be recalled that the Shope papilloma virus inoculated on to the skin of domestic rabbits produces warts which at first appear quite benign, but after some months may develop into metastasising epitheliomata.<sup>4</sup> The precancerous (papillomatous) period can be shortened in various ways, as by bacterial infection or injection of Scharlach R., but in the latest experiments it appears to have been abolished altogether. Few would have prophesied that the papilloma virus, which induces cancers only after several months, would, when combined with an agent having an even longer period of induction, let loose a fulminant carcinoma in a few weeks. The result is especially suggestive, since previous attempts to obtain tumours quickly by combining several chemical carcinogenic agents have failed. An attempt to interpret these findings would be premature, but it is clear that a field of research of enormous interest has been opened up.

### CORAMINE AS AN ANTIDOTE TO THE BARBITURATES

THE great efficacy of Coramine as a stimulant to respiration has been recognised for some years. It was recently discussed at a meeting of the section of therapeutics and pharmacology of the Royal Society of Medicine,<sup>5</sup> where, though a little doubt was thrown on its value, the majority expressed their faith in the drug, and some described excellent results obtained from its use in all conditions associated with shock and depressed circulatory and respiratory states. Anaesthetists have often used injections of the drug to improve the breathing when it has shown signs of failing or has actually stopped. This action of coramine has been taken advantage of especially in connexion with depression of respiration arising after

<sup>1</sup> McIntosh, J.: Brit. Jour. Exp. Path., 1933, xiv., 422.

<sup>2</sup> Parsons, L. D.: Brit. Emp. Cancer Campaign, Ann. Rep. for 1935, p. 17.

<sup>3</sup> Rous, P., and Kidd, J. G.: Science, 1936, lxxxiii., 468.

<sup>4</sup> Rous, P., and Beard, J. W.: Jour. Exp. Med., 1935, lxii., 523.

<sup>5</sup> THE LANCET, 1935, II., 1122.

the use of basal narcotics. An interesting series of clinical experiments is described<sup>6</sup> by Dr. P. G. Schube, which shows the remarkable power possessed by coramine of counteracting the effects of barbiturates. It is not merely the increased depth and frequency of respiration and improved circulation which follow the administration of coramine, but also the extraordinary cutting-short of the unconsciousness that had been induced by large amounts of barbiturate. The opportunity to test these results arose in the psychiatric clinic of the Boston State Hospital, the patients being all "mentally ill but physically normal." Tests were carried out on 84 patients, the controls receiving barbiturate but no coramine. In the other patients the coramine was given intravenously 5 c.cm. first, and if consciousness had not returned at the end of ten minutes another 5 c.cm. every ten minutes until the patient was conscious. It is stated that in each instance when coramine was injected "the state of unconsciousness was abolished, some persons having to receive more coramine than others to achieve this result." In the controls, unconsciousness lasted for hours longer than in those that had had coramine, in whom it was only a matter of minutes. It is notable that in all these patients the pulse-rate and volume were unaltered although respirations were increased both in rate and in depth. Some of the patients vomited after 10 c.cm. of coramine had been injected. There were no after-effects, and the author concludes that "coramine is an excellent drug to counteract effects produced by barbiturates."

#### MEGALOCYTTIC ANÆMIA IN BRITISH GUIANA

In 1904 Kennard described<sup>7</sup> an acute anæmia of a pernicious type affecting East Indians in British Guiana; it was seen in both sexes but was definitely more prevalent in pregnant women. This work received little notice for thirty years, but its accuracy has now been confirmed by Giglioli<sup>8</sup> in an important and detailed study of megalocytic anæmia in British Guiana. In a period of twenty months Giglioli found no less than 51 cases of megalocytic anæmia in an aggregate population of 4127 persons. It was commoner in females, the ratio among adults being 5.5 females to 1 male. The age-incidence varied from 11 to 44 years, the majority of the patients being between 17 and 30 years old. Among the women the most characteristic feature in the history was the occurrence of previous attacks in association with pregnancy. The symptomatology was similar to that of Addisonian pernicious anæmia except that nervous complications were not seen. Glossitis and stomatitis were frequent. Splenomegaly was considerably greater than that found in other forms of megalocytic anæmia or in local cases of malaria. The anæmia was usually severe, the red cells being as a rule below 2,500,000 per c.mm. The true colour-index was difficult to assess owing to the method of hæmoglobin estimation used, but Giglioli considers it was high in most of the cases. Red cell size as measured by halometer technique was increased. The indirect van den Bergh reaction was always higher than normal. The anæmia responded in a classical way to treatment either with liver extract or with Marmite. Pregnant women if appropriately treated rapidly recovered and went to term normally, delivering strong and healthy infants. All the males, though

they showed a greater tendency to relapse, also made good recoveries. Before its recognition and treatment this grave anæmia is thought to have been the main cause of maternal and neonatal mortality and stillbirth in the district under investigation, since over a third of the infant mortality during the last twenty years has been registered as due to prematurity and congenital debility—i.e., to maternal disease. Apart from its obvious social and economic importance, however, this study raises interesting problems for the hæmatologist. Discussing the ætiology of the anæmia and its relationship to the tropical megalocytic anæmia of India, Giglioli concludes that ankylostomiasis is not an ætiological factor. The local distribution does, however, seem to be related to that of malaria, and he believes therefore that malaria plays a part in the development of the anæmia. It is possible that the associated malaria may explain the constant finding of an indirect van den Bergh reaction above normal which appears to be a striking point of differentiation from the anæmia of a similar type in India. No data concerning the diet or gastric secretion are yet available. The fact that the anæmia responds so well to marmite suggests that a dietary deficiency, associated with the additional demands of pregnancy, has a good deal to do with its development.

#### VOLKMANN'S ISCHÆMIC CONTRACTURE

THE grave changes in muscle from impairment of blood-supply following on a fractured bone were first described by Rich. v. Volkmann (1830-89). Here this ischæmic contracture is most often seen as a complication of supracondylar fracture of the humerus in children. In considering its cause and treatment Meyerding<sup>1</sup> endeavours to define the responsibilities of the surgeon. Tight splinting of swollen elbows cannot be too severely criticised, and the danger of very acute flexion is well known, but it is not so generally recognised, he says, that it is possible for ischæmic paralysis to come on where no treatment at all has been given. The medico-legal importance of this is obvious: in fairness it is the first point that should be laid before a jury trying such a case in a court of law. The surgeon is wise who mentions the chance of ischæmic contracture before attending to any injury to the elbow-joint, especially if treatment has been delayed. Otherwise there is more than a possibility that all complications will be directly attributed to his treatment and to that alone. A few hours of impaired circulation is, after all, sufficient for damage of muscle. Restoration of the circulation in the limb should therefore be at least as anxious a care of the surgeon as the reduction of the fracture. Meyerding mentions in particular the repeated observation of the radial pulse and of the colour of the hand in the period following reduction. Severe pain is a danger signal; parents should be told of this, and also of the value of testing the active movements of fingers as evidence of good circulation in the hand. It is not always appreciated that even in cases treated early the effusion—and therefore the danger to the circulation of the limb—may develop after reduction. Meyerding found that there was malunion in 40 per cent. of cases of ischæmic contracture. He believes that often in the attempts to relieve pressure the bone ends again become displaced. He also suggests that patients with very swollen, cyanotic arms would be

<sup>6</sup> New Eng. Jour. Med., May 7th, 1936, p. 925.

<sup>7</sup> Kennard, C. P. (quoted by Giglioli): Brit. Guiana Med. Ann., 1904.

<sup>8</sup> Giglioli, G.: Report of the Surgeon-General of British Guiana, 1934, Appendix II. (B).

<sup>1</sup> Meyerding, H. W.: Jour. Amer. Med. Assoc., April 4th, 1936, p. 1139.

much more suitably treated in bed with the arm abducted than walking about with the arm dependent. Elevation of the elbow on pillows or the use of an aeroplane splint are both useful measures.

If the circulation is already impaired when the child first comes under observation, Meyerding advises treating the fracture as of secondary importance and leaving reduction until the pressure has been relieved. There is one criticism of this advice: the pressure may be largely a direct result of stretching the soft tissues over the sharp lower end of the humerus, and accurate reduction will relieve it. In a case of this nature the dangers to the patient and to the reputation of the surgeon are great, and consultation is often wise, because whether the decision is to watch the case (first removing all splints and bandages), to manipulate, or to remove clot and relieve pressure by open operation, there is a very good chance that the surgeon will bear the blame for any subsequent disability. Meyerding advises watching for about an hour, having removed all external pressure, with the elbow extended to more than a right angle and elevated. If the radial pulse is not restored and the swelling increases, he operates, incising freely over the hæmatoma and through the deep fascia. The bicipital fascia may be divided by an incision medial to the biceps tendon, and through this incision the artery is inspected to detect continued bleeding and the nerves are examined for damage. A Kirschner wire passed through the lower fragment he finds useful as an aid to reduction of the fracture.

In the fully developed deformity, Meyerding has obtained the best results by the gradual extension methods described by the late Sir Robert Jones. Wooden tongue depressors are used to splint the individual fingers, the length of the splints being increased as it becomes possible to extend the more proximal joints. Eventually the splints pass from the fingers up the back of the forearm. Active use of the joints is encouraged throughout. Open operation on the flexor tendons, with partial incision and stretching, has given some good results in bad cases, but in the presence of much degeneration of muscles and tendons shortening of the bones is advocated. Meyerding's paper is based on observations and records of 69 cases. He concludes that prevention is possible in many cases if the injury comes under treatment early, but that once the circulation is impaired to any extent, it may be impossible entirely to avert the danger, while in the presence of definite ischæmic contracture it is a mistake to expect very much from surgery.

#### A BINAURAL HEARING AID

For those deaf people who will consent to carry with them a box containing the apparatus, and are sufficiently deaf to need a powerful instrument, the valve-amplifier type of electric hearing aid is the most efficient. This apparatus reproduces sounds with great fidelity and over a wide range of tones, to which the smaller "portable" electric aids cannot attain, thus making speech far more intelligible. But all monaural aids are necessarily non-directional, and are accompanied by some reverberation which tends to confuse the hearing. These defects are not abolished merely by the use of two earphones, but it has been found by experiment that they can be surmounted by providing two entirely separate microphone-amplifier-earphone channels for the two ears. Amplivox Ltd., of 106, George-street, Portman-square, London, W.1, have produced such an instrument, in which the microphones, of

piezo-electric type, are placed at an angle of 90 degrees to each other and about 9 inches apart. The case contains six midget valves with H.T. and L.T. batteries and is wonderfully compact, for it measures only  $12 \times 3\frac{1}{2} \times 4\frac{1}{2}$  inches. The 2-volt accumulator gives 20 hours' service on a charge, and the dry H.T. battery has a life of about two months. The price of the instrument is 30 guineas. The directional effect is very noticeable at ordinary distances in a room; there is less confusion from reverberation, and a general improvement in naturalness as compared with the monaural instruments. It will be particularly useful in office and board-room to those severely deaf people who require the most natural reproduction of sound at present attainable, but it is a transportable rather than, in the ordinary sense of the word, a portable machine.

#### THE LISTER INSTITUTE

THE question whether an institute devoted to medical research should or should not be closely associated with a hospital is one which has long been and will long continue to be debated inconclusively whenever two or three doctors are gathered together. The main arguments used on either side are easy to construct. One contends that unless the staff are stimulated by contact with clinical material and by the requisitions made to them daily by physicians and surgeons their outlook will become academic and they may spend their lives studying problems which have no practical bearing; on the other side it is held that the work of the staff of a pathological institute attached to a hospital tends to become ancillary to that of the clinicians, whose demands on their time and attention are irresistible when made in the name of sick people. Such discussions seldom remain abstract; they usually degenerate into an animated game of attack and defence of institutes alleged to have become permanently unfruitful; of others whose recovery from lethargy dated from the clinical application of a discovery incidental to an unproductive line of work; of routine workers whose contribution to medical knowledge could only have been made as the outcome of hospital experience; and of occasions where the obstinate conservatism of the general practitioner was eventually justified by evidence rehabilitating a discredited remedy. In the end there is usually an admission that however fully the observational method is exploited in medical research there is still and will always be scope, even from the utilitarian point of view, for the institute where workers are free to pursue experimental investigations without direct relevance to patients, since none can know when any scrap of knowledge fitted to another will bear fruit. These reflections arise out of a study of this year's report of the governing body of the Lister Institute. Here is an organisation whose recent activities, to say nothing of the past, have had a profound effect on modern medicine; for example, the investigations into the morphology of viruses by the present director, Prof. J. C. G. Ledingham; the nutrition studies of Sir Charles Martin, Harriette Chick, E. M. Hume, and S. S. Zilva; the pioneer work on antigenic structure of bacteria by J. A. Arkwright and A. Felix; and the studies of phosphate metabolism and the calcification of animal tissues by R. Robison and his colleagues. There can be little doubt that at any rate in a town as large as London there is room for an institute in which the staff are quite unhampered by routine duties. When the need arises for coöperation with clinical colleagues,

as in the development of the work on the aetiology of rheumatism noted on p. 1435, it is easily secured. Meanwhile the Lister Institute and its younger sister, the National Institute for Medical Research, Hampstead, have a special function in enlisting the help of those trained in more exact sciences in the solution of medical problems.

### OCCUPATIONAL SELECTION

THE latest report<sup>1</sup> of the Industrial Health Research Board should be read in conjunction with the article by Squadron-Leader R. H. Stanbridge which appears on p. 1426 of our present issue. Both bear witness to the value of psychological tests in occupational selection. Squadron-Leader Stanbridge's work will no doubt be more easily comprehended by the general reader than that of the Industrial Health Research Board's investigators, since it is far less technical and concerns a more limited problem. But a comparison between them is of value, because they have employed similar tests; indeed, the same linguistic intelligence test—the National Institute of Industrial Psychology's group test 33—was used in both researches. In each, the value of this particular intelligence test was clearly confirmed, and in each the value of tests of mechanical aptitude (derived, it would seem, from tests devised by Dr. J. W. Cox, research fellow of the National Institute) was upheld. Neither research adds very greatly to information already available about mechanical aptitude, but the Board's investigators find themselves able to lend support to Dr. Cox's thesis that a specific mechanical aptitude exists independently of general intelligence, although functioning in conjunction with it. It is perhaps a little unfortunate that Mr. Farmer and Mr. Chambers chose to follow up their statement of this conclusion with the obscure generalisation that this mechanical factor "is involved in tests depending on manual or reasoned reactions to perceptual imagery."

The male workers who made up the fourteen groups tested by the Board's investigators varied in age between 14 and 38½, and there were 2731 of them altogether. Some were apprenticed to skilled types of engineering; some were engaged in simple upholstery work involving much repetition; some were employed in repetitive light casting; some were being taught to drive and repair heavy lorries and tanks; some were training for various manual trades; and some were being given instruction in visual and auditory signalling. From their study of this material Mr. Farmer and Mr. Chambers conclude: (1) Intelligence tests could with advantage be adopted in the selection of candidates for highly skilled work; or for work which may appear highly skilled to those likely to be employed, on account of their relatively low level of intelligence. (2) Intelligence tests appear to have no selective value where the occupation is of a routine type of a simple kind. (3) The argument that performance tests of intelligence are more appropriate than linguistic intelligence tests for vocational selection in low-grade groups is not supported by the data available. (4) The National Institute's form relations test appears to have considerable value as an aid in selecting candidates for occupations which involve visual perception of form in a static field, but it does not seem to be satisfactory for occupations which involve visual perception in a moving field. (5) The failure of certain tests which were chosen because they appeared to involve pro-

cesses involved in certain of the occupations dealt with serves as a warning to constructors and users of tests of this "analogous" type. Before selection tests are used for practical purposes their validity should be clearly established. (6) The evidence obtained from following the after-careers of certain of the skilled engineering groups is opposed to the frequently made suggestion that psychological tests have prognostic value only during the learning process. On the contrary, it shows that such tests correlate more closely with proficiency when maturity has been reached than with proficiency at the end of the learning period.

Squadron-Leader Stanbridge has provided us with an interesting set of data concerning approximately 1100 aircraft apprentices, between the ages of 15 and 17. His findings lead him to suggest with considerable confidence that the tests he found most valuable—the intelligence and mechanical tests—should be used as supplements to the ordinary scholastic examination which is given to applicants for Royal Air Force aircraft apprenticeships. His results do not encourage him to place any great trust in the "perseveration" test he employed. This conclusion seems to be in line with the general scepticism with which such bodies as the National Institute now tend to regard so-called perseveration tests. Vocational psychologists will read both the report and the article with lively appreciation. Some of them will perhaps feel a little envious of the opportunities in the Royal Air Force for carrying out research work of this kind.

### THE EXOPHTHALMOS OF GRAVES'S DISEASE

THERE is something peculiarly fascinating about the unsolved problem of the mechanism of exophthalmos in exophthalmic goitre. Dr. Russell Brain, who has been interested in it for years, devotes the greater part of a recent address, on Some Problems of Thyrotoxicosis,<sup>1</sup> to facts and speculations that bear on it. He regards a rise of pressure in the conical space behind the eyeball, bounded by the rectus muscles, as the probable immediate cause of the protrusion, and he attributes this pressure rise to contraction of strands of smooth muscle acting directly on the eyeball, and also indirectly by constricting the retro-ocular veins and causing their engorgement. He then looks for a stimulus which would make the orbital smooth muscle contract. It is not the sympathetic nerve-supply, for division of this is without effect on exophthalmos, nor is it the thyroid over-activity, for the most that thyroxine can be shown to do is to sensitise the smooth muscle or the nerve-endings to the action of certain drugs. But a number of workers have recently shown that the thyrotropic hormone of the pituitary will induce exophthalmos as well as hyperthyroidism in animals, and indeed will induce exophthalmos in thyroidectomised animals. "It is a tempting hypothesis," Dr. Brain writes, "that this . . . may be concerned in the pathogenesis of exophthalmic goitre," and most of us will be tempted with him. But in yielding, we must not dismiss the sympathetic too summarily, for the hormone produces its effect in animals only if the sympathetic is intact, and therefore presumably should act in man in some way through the sympathetic. Failure of cervical ganglionectomy to abolish established exophthalmos, however, does not necessarily upset this theory, for the common persistence of exophthalmos after the subsidence of hyperthyroidism has long suggested that the physiological

<sup>1</sup> The Prognostic Value of Some Psychological Tests. By E. Farmer and E. G. Chambers. Report No. 74. Pp. 41. 9d.

<sup>1</sup> London Hosp. Gaz., April-May, 1936, Clin. Suppl.

changes which evoke it are succeeded by irreversible anatomical changes—such as fat accumulation—which maintain it.

If exophthalmos is difficult to explain, external ophthalmoplegia associated with exophthalmic goitre is still more mysterious. It is uncommon. Dr. Brain attributes the first record of it to Dr. Francis Warner of the London Hospital in 1882, and he himself has collected 22 cases which he presented to last year's International Neurological Congress. Because he finds the ophthalmoplegic complication rather often in male patients and almost always in middle life, and because the accompanying hyperthyroidism is often mild and occasionally extinct, he regards the whole syndrome as distinct both from "primary" exophthalmic goitre and from so-called "toxic adenoma" of the thyroid. This is perhaps straining the argument rather far, but, since the ophthalmoplegia when it does occur is closely parallel to the exophthalmos both in its degree and in its incidence in one or both eyes, it may readily be conceded that both ophthalmoplegia and exophthalmos demand a causal explanation other than hyperthyroidism. The ophthalmoplegia need not be due to a central lesion; it may be a local lesion of the muscles or their nerves, produced like the exophthalmos by pressure changes in the vessels and fluid contents of the orbit. This brings us back to the pituitary hypothesis, and the animal experiments suggesting that thyrotropic hormone can act through the sympathetic on the orbital contents—clearly the most inviting point of attack for those who would investigate further the problem of the pathogenesis of exophthalmic goitre.

#### IONISATION FOR HAY-FEVER

ZINC ionisation as a method of relieving hay-fever came into prominence last Saturday when the newspapers announced that it has proved successful in 99 per cent. of cases treated at St. George's Hospital. The procedure is to pack the nasal cavities with cotton-wool or gauze soaked in zinc sulphate solution, insert electrodes into the nose, and then pass an electric current, through the solution, to an indifferent electrode applied to the forearm. The result aimed at is a shrunken mucous membrane which will be insensitive to pollen and other stimulants of rhinorrhœa. The steps taken to achieve this object are described in greater detail by Dr. Clive Shields, of the physiotherapy department at St. George's, in the May number of the *Practitioner*. Broadly speaking he follows the technique employed by Philip Franklin for many years,<sup>1</sup> but he packs the nose with  $\frac{1}{2}$ -inch ribbon gauze instead of cotton-wool and unless the nose is supersensitive uses 2 per cent. zinc sulphate solution rather than 1 per cent. The nose is previously sprayed with 2 per cent. cocaine, "as otherwise the treatment is extremely uncomfortable for the patient," and since there is usually much sneezing and rhinorrhœa 2-12 hours later a sedative is often advisable. Dr. Shields finds that most patients with seasonal hay-fever are free from attacks for about a year after three or four treatments. "Two prophylactic treatments should be given yearly for the next two years and may then be safely omitted. Some cases relapse, but it seems probable from cases observed since 1931 that the attacks respond to one or two further treatments." Mr. Franklin, with his longer experience, is not quite so confident, as will be seen from his letter on p. 1442. Though the use of ionisation for this purpose finds many advocates in the United States and is clearly worth a trial when a patient is seriously

disabled by hay-fever, it is evidently not appropriate for slight cases that can be relieved by simpler means. Dr. Shields thinks it useless to attempt the treatment in the presence of dental sepsis, infection of the paranasal sinuses, and obstruction to the nasal passages from organic causes such as deflected septum, enlarged turbinates, and polypi. But even if the patient is lucky enough to start with a clean sheet in these respects the final issue cannot, we understand, be foretold with complete confidence. A result which is certainly to be avoided is the inadvertent destruction of olfactory function, and with this in mind the patient should sit up, and not lie down, while the ionisation is in progress.

#### TISSUE CULTURE IN STUDY OF THE VITAMINS

A SOMEWHAT new approach to the study of vitamin deficiency was opened when Sir Robert McCarrison and G. Sankaran<sup>1</sup> at the nutrition research laboratories of the Indian Research Fund Association at Coonoor, noticed that cultures of embryonic tissues grew much better in plasma from normal animals than in plasma from fowls with beri-beri, suffering from deficiency of vitamin B<sub>1</sub>. The work has now been carried further by Sankaran in conjunction with McCarrison's successor at the laboratory, Dr. W. R. Aykroyd.<sup>2</sup> It is pointed out that the dietary of the beri-beri pigeons was deficient in vitamin A as well as in vitamin B<sub>1</sub>, and this time the growth of embryonic fowl spinal cord and rat cerebral tissue in plasma from fowls and rats suffering from vitamin-A deficiency has been investigated. Three types of plasma were examined: plasma from normally fed animals; plasma from animals on a basal diet deficient in vitamin A; and plasma from animals receiving the basal diet supplemented by cod-liver oil. Examination of the rate of growth of the cultures left no doubt that there was a real difference between the different types of serum. To eliminate all subjective influences, observers judged the cultures in ignorance of their nature. The cultures in deficient plasma always gave poor growth, while those in normal plasma gave good or occasionally medium growth. The plasma from animals on the deficient diet, supplemented, gave an intermediate result. This last observation is in accordance with general experience that the most perfect synthetic diet, "completely" supplemented, usually gives a biological result inferior to that given by a complete normal diet. The cause of the failure of the tissue implants in plasma from A-deficient animals was not established. It may well be that there was an actual deficiency of vitamin A in the serum. The possible relationship of these observations to E. Mellanby's suggestion<sup>3</sup> that the nerve lesions are the primary ones in vitamin-A deficiency, and the epithelial ones secondary, is of considerable interest.

<sup>1</sup> Indian Jour. Med. Research, 1933, **xxi**, 187; 1934, **xxii**, 67.

<sup>2</sup> Ibid., 1936, **xxiii**, 929.

<sup>3</sup> Jour. Path. and Bact., 1934, **xxxviii**, 391.

MEDICAL TOUR IN GERMANY.—In connexion with the Olympic games in Berlin a medical study tour of the universities and spas of Germany has been arranged. The party will leave Berlin on August 17th, arriving in Hamburg on the 30th, and visits will be paid to Dresden, Nuremberg, Rothenburg, Munich, Tübingen, Baden-Baden, Heidelberg, Bad Nauheim, and Wiesbaden. The party will sail down the Rhine from Biebrich to Coblenz, and then make its way by Cologne, Leverkusen, and Bremen to Hamburg. Further information may be had from the Deutsche Gesellschaft für ärztliche Studienreisen, Berlin, N.W.7, Robert Koch-Platz 7.

<sup>1</sup> Brit. Med. Jour., 1931, **i**, 1115.



## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### CIV.—PROGNOSIS OF HAND INFECTIONS

*(Concluded from p. 1370)*

#### Paronychia

This is a special variety of whitlow in which pus appears at the base of the nail. It is important to realise that the pus is primarily situated under the proximal part of the nail. For this reason a curved incision through the skin is useless, as it never reaches the site of the pus. The common operation of removal of the nail is likewise unsatisfactory, as there remains a flap of skin at the proximal end under which suppuration still continues, and healing is uncommon under six to eight weeks. A flap of skin must be turned back so as to expose the base of the nail, which is then removed with scissors, without sacrificing the exposed portion. The flap is held back with a strip of vaselined gauze (which does not obstruct drainage) until suppuration has ceased. Healing can be expected in ten to fourteen days.

#### Lymphangitis

Lymphangitis is readily diagnosed by the presence of diffuse oedematous swelling, with little or no local suppuration, but with red lines spreading up the arm, and early pain in and swelling of the lymph glands. A state of septicæmia is usually present and dominates the picture, and it is not uncommon for the patient to complain of malaise and fever without remembering a trivial injury to a finger. The illness may take one of the following courses:

1. The patient may pass into a state of profound septicæmia and die within 24 to 48 hours.
2. After a stormy septicæmic illness, with suppuration in the lymph glands and distant metastases, gradual recovery may ensue.
3. After a septicæmic stage and defervescence, local suppuration in the hand may require treatment.
4. After defervescence the condition may clear up entirely without suppuration.

Incision is definitely contra-indicated in the presence of lymphangitis, except late in the disease when local suppuration has established itself. The patient must be treated by absolute rest in bed on a splint, with massive hot compresses to the whole arm, and copious fluids by the mouth. The value of serum is problematical; nor has intravenous chemotherapy proved of great value. In fact the prognosis seems to depend much more upon the virulence of the particular organism in each case. The illness may last from a few days to many months, and while the hand usually recovers completely, permanent damage in distant parts may seriously handicap the patient.

#### Dorsal Infections.—Carbuncles and Boils

Dorsal infections are less common than infections in other areas of the hand, and are usually due to infected wounds in the neighbourhood of the knuckles. Particular attention should be drawn to the chronic nature of infections following injuries inflicted by teeth (as in street fighting) and those arising from the bites of dogs or cats. A chronic inflammation may last for weeks, even in the absence of gross suppuration. The ease with which the joints become involved in dorsal injuries is also noteworthy, as only a thin extensor expansion intervenes between the skin and the joint cavity. Suppuration in a

joint almost always leads to ankylosis, the inconvenience of which has already been stressed.

*Boils and carbuncles* may occur on the dorsum of the hand and fingers, as in any hairy parts. Resolution is the rule, when treated with cupping and ultra-violet light. Incision should rarely be necessary, and by avoiding it scarring and deformity are reduced to a minimum.

#### Effect of Infection on the Hand as a Whole

One of the most sinister effects of hand infections is the development of an insidious stiffness of the whole hand when only one part has been diseased. It is sometimes due to the patient's fear of movement, sometimes to prolonged and misapplied splinting, but it may occur in spite of every effort directed to maintain mobility. Persistent œdema is a potent cause. The stiffness may, moreover, take months to overcome, and in the more severe cases is a permanent disability.

It requires nice judgment to determine, in these as in all infections, the correct balance between rest and activity. Absolute rest is essential in the early stages of treatment, but as soon as the local condition is under proper control active and passive movements are to be encouraged. As suppuration diminishes hydrotherapy, radiation, massage, electrotherapy, and occupational movements are of supreme value in restoring function. The preservation of the "position of function" in the early stages assists materially in reducing the time required for this restoration.

#### Summary and Conclusions

An attempt has been made to indicate the course of each variety of hand infection, the prognosis under proper treatment, and the complications likely to ensue with improper treatment. The prognosis of paronychia, subcuticular and uncomplicated subcutaneous whitlows should be good, with full restoration of function. The prognosis of tendon sheath infections is usually bad, while bone involvement complicating any infection leads to permanent deformity and disability.

The ultimate prognosis must be considered not only from the point of view of subsidence of infection, but from the point of view of return to work and final function. The average period of incapacity from work was 6-8 weeks in a large series of cases, though this figure is somewhat inflated by those cases that have an abnormally long period of incapacity (1-2 years). Three to four weeks is a fair average. This does not take into account cases of permanent disability, nor the fact that the loss of a finger, or the loss of function of a finger frequently necessitates change of occupation, which is in itself a handicap especially to the working man. That the prognosis in general is capable of improvement cannot be doubted, for prophylaxis, early hospitalisation, carefully studied treatment and after-care should materially reduce the dangers of this common condition.

NILS ECKHOFF, M.S., F.R.C.S.,  
Assistant Surgeon, Guy's Hospital.

POSTER COMPETITION.—The Great Ormond-street Hospital announces a competition for a poster design to raise money for the reconstruction fund of the institution. Prizes will be £50, £20, and £5.

## SPECIAL ARTICLES

## THE OCCUPATIONAL SELECTION OF AIRCRAFT APPRENTICES OF THE ROYAL AIR FORCE\*

By R. H. STANBRIDGE, M.R.C.S. Eng., D.P.M.  
SQUADRON-LEADER, ROYAL AIR FORCE

THIS paper deals with the use of psychological tests in the selection of personnel. The object of the investigation, which began in 1932, was to find if it was possible to predetermine, more accurately than hitherto, whether a candidate is suitable for acceptance as an aircraft apprentice; and, if so, the nature of employment most appropriate to his abilities and character. Also to obtain a greater knowledge of him—as an individual—than can be got from the results of a written examination.

An aircraft apprentice is a boy who enters the Service between the ages of 15 and 17, is allocated immediately one or other of the trades in which there are vacancies, and undergoes a course of training at a training centre. The allocation of his trade is made in accordance with his parents' choice or his expressed desire, but this is of course subject to many factors, such as Service requirements and his placing at the scholastic examination prior to entry. The course of training is very thorough, lasting three years, and takes into consideration the requirements not only of the Service, but also of his eventual return to civil life. It was a matter of experience that such factors as those mentioned (the requirements of the Service, and parents' choice of trade) were not of themselves certain to prevent the placing of square pegs in round holes, and this was an additional reason for our endeavour to find some form of supplementary examination which would give more information about capacities and incapacities.

The factors operating to produce misfits are many, amongst them being:—

- (1) Lack of prior knowledge of the requirements and nature of various trades, and of Service life generally.
- (2) The inability of the individual to adapt himself to the demands of the Service.
- (3) The fact that a low place in the entry examination may result in all vacancies in the desired trades being filled before the boy's turn comes.
- (4) The degree of national unemployment, tending to cause boys with no leanings towards the Service to join it.

The effects of unsuitable selection are obvious. They may be summed up as maladaptation to life, and they manifest themselves in such ways as slowness to learn, insubordinate or undisciplined behaviour, and symptoms and signs of worry like neuroses and abnormal conduct. The cost of training an aircraft apprentice is considerable, and it is important to ensure that the State gets the best, or at least a reasonably good, return for this expenditure. Apart from the immediate advantage to the State and to the Service we also have to consider the making of a good citizen who on return to civil life will be fitted to take a worthy place in his selected trade, and—more even than this—the avoidance of unnecessary unhappiness and possibly disaffection.

\* Read before the United Services section of the Royal Society of Medicine on March 9th.

### GENERAL DESCRIPTION OF THE TESTS EMPLOYED

The method chosen for testing occupational aptitude was based on the principle that a man's behaviour is an expression of his personality as a whole, and that personality is compounded of intellect, temperament, and character. It was thought that much of the objection to psychological examinations may arise from a tendency to draw too many conclusions from the results of an isolated test, and that consequently a combination of psychological tests with a medical examination might take us a step forward. It was therefore decided to collect data for each individual in respect of the following attributes: physique, temperament, character, intelligence, mechanical ability (the actual performance of certain mechanical tests), and mechanical aptitude (answers to written theoretical questions). Then from such data (which were obtained as soon as possible after he had joined the Service) assessments and final classifications were to be made under definite headings such as:—

- (1) Poor types (should not have been accepted)—i.e., those likely to be backward or difficult or temperamentally unsuited to Service life.
- (2) Those likely to do well, potential cadets, fit for promotion, &c.
- (3) For further observation physically.
- (4) Should have been given a different trade.

A report giving the names under these headings was then to be forwarded to the command headquarters for filing\* until the entry had completed the three years' course, when the passing-out categories could be correlated with the original forecasts. The methods employed in this examination will now be explained.

A special record card was prepared to record the data. These are conveniently divided into two divisions: (1) the individual examination, and (2) the collective examinations.

### THE INDIVIDUAL EXAMINATION

*Interview.*—Each boy is interviewed alone in a room designed to make him feel at ease. He is asked for information under the following headings: name; number; age; trade; birthplace; father's occupation; position in family (with notes as to step-relations, if any); previous occupation and/or school; reason for joining the Service; hobbies; games; early medical history as to signs of nervous or abnormal tendencies; general physical and mental background; position in entrance examination; choice of trade; whose choice, whether it was changed, and, if so, whether voluntarily or as a result of his position in the order of merit in the ordinary entrance examinations; if voluntarily, the reasons for the change.

*Physical Examination.*—Height, weight, chest expansion, dynamometer reading, condition of tonsils, heart, and lungs, 40 mm. test, assessment of psychological type, and measurements for the Wertheimer index.

The dynamometer consists of a scale with a handle attached and connected with a base upon which the boy stands, grasping the handle, to which he gives an upward pull from a slightly forward-inclined position. A reading is given which indicates the combined power of lumbar, abdominal, and shoulder muscles; a mean of three pulls is taken, and this

value, divided by the body-weight, gives an index figure. The height of the handle is adjusted for each boy so as to standardise the reading.

The 40 mm. test is the standard used in the Royal Air Force as an endurance test. A column of mercury has to be sustained in an open U tube at a level of 40 mm. for as long as possible, the pulse-rate being recorded in five-second periods before and throughout the test.

**Assessment of Psychological Type.**—As is well known, Kretschmer has attempted to correlate physique with character. His principle is that on the one hand the tall, thin, so-called "tubular" man tends to be an introvert and in mental illness to show a particular type of reaction known as schizophrenic (asthenic); whilst the shorter, thickly set more "rounded" type tends to have an extravert temperament and in mental illness to show the manic-depressive reaction type (pyknic). He places a third group midway between these two extremes (athletic). This classification has the disadvantage of depending on the examiner's personal opinion, and Wertheimer has given a more scientific method of measuring physique by which the leg length and then the transverse and sagittal diameters of the chest and the trunk length is measured. By a special formula using the leg lengths as the numerator and the others as the denominator the ratio between the cubic capacity of the trunk and the cubic capacity of the limbs and head and neck is given. The result is a number and the low numbers indicate those of the "rounded" type of physique, the high numbers those at the "tubular" end.

We appreciated that the relationship between physique and personality had not been sufficiently proved to give by itself a measure of temperament, and that there were many factors complicating the issue, but it was thought worth while to include data

considered that if one was asked which were the two abilities of outstanding importance in successful apprenticeship in the Halton workshops the answer would be "the ability to construct from a model and also to read from a plan." The test given is designed to pick out these two abilities. The boy is shown a model which has been

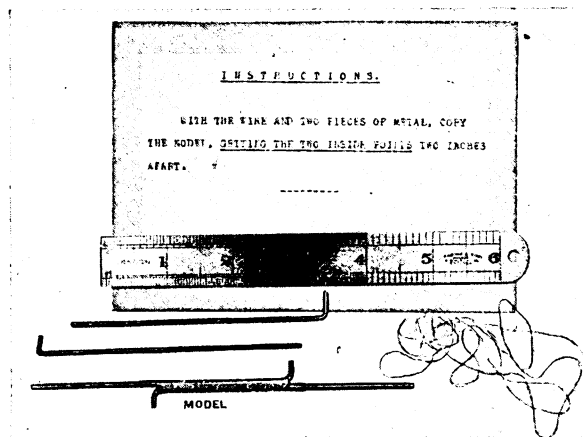


FIG. 2.—Cranwell wiring test. "With the wire and two pieces of metal, copy the model, getting the two inside points two inches apart."

sectioned and from this section has to build up the complete model with the parts supplied (Fig. 1). This has to be done in 1½ minutes and marks are given on the following performance scale:—

No combination ..	0	4 combinations ..	4
1 " " ..	1	Complete combination ..	5
2 combinations ..	2	Complete combination and	
3 " " ..	3	inside 1½ minutes ..	6

**TEST 2.**—This is termed the Cranwell test, and was designed by a similar process as a result of observing the essentials required in successful apprenticeship at Cranwell where instrument-making and wireless telegraphy are taught. This work calls particularly for the ability of fine finger manipulation and for extreme accuracy, and the test consists in copying a model provided by wiring together two pieces of metal the points of which have to be a certain distance apart (Fig. 2). This has to be done in 3 minutes and is marked on the following set scale for wiring, accuracy, and effectiveness.

ACTUAL WIRING			
On one piece but bad ..	..	..	0
" " good ..	..	..	1
On both but bad (not tight) ..	..	..	2
" (tight but not close wiring) ..	..	..	3
" (tight but fair wiring) ..	..	..	4
" good (tight, no gaps) ..	..	..	5
Good and inside 2 minutes ..	..	..	6

ACCURACY OF MEASUREMENT				
Outside 3/16 ..	..	0	Within 1/16 ..	3
Within 3/16 ..	..	1	Accurate ..	4
" 2/16 ..	..	2		

**TEST 3** is made with the McDougall-Schuster dotting apparatus, and consists in dotting, with a pencil, holes in an irregular pattern on a revolving disc. It was included as a sensori-motor reaction type test.

This completes the individual part of the examination.

**THE COLLECTIVE EXAMINATION**

In the collective examination any number may be examined at one time. Three tests are given.

1. **Intelligence Test.**—This is the Group 33 standard test, used for adults over the age of 15, which was devised by the National Institute of Psychology. In it there are five tests ranging from a simple test in which pairs of words have to be marked as having the same, opposite, or unknown meaning, to the last test which consists of a number of reasoning problems.

The following examples indicate the nature of the

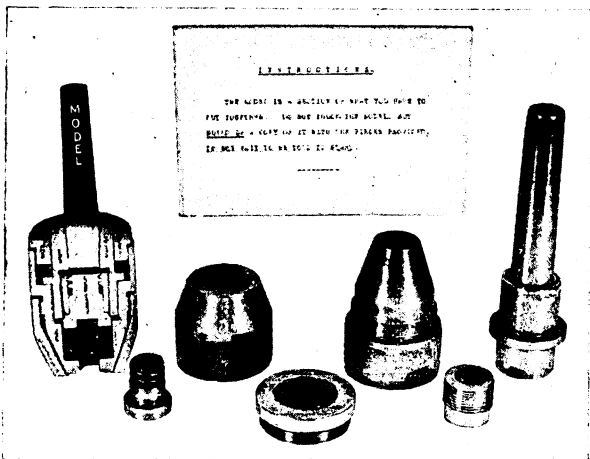


FIG. 1.—The Halton chuck test. The instructions are: "The model is a section of what you have to put together. Do not touch the model, but build up a copy of it with the pieces provided. Do not wait to be told to start."

obtained from the adolescent boy under these headings, which might, taken with the examination as a whole, throw further light upon this subject.

**Mechanical Ability.**—Under this heading there are three special tests, two of which are for the measurement of mechanical ability and the third is a sensori-motor test.

**TEST 1.**—This is termed the Halton test, and it was devised at Halton as the result of observing the nature of the work required in the workshops where the trades of engine fitter and aeroplane rigger are taught. It was

test, but are generally simpler than those which confront the candidate.

I. *Opposites.* (Time allowed, 3 minutes.)—Fifty pairs of words are given and the candidate (by underlining) has to say whether they have similar, opposite, or unknown meanings. The simple examples are :—

Rich	Poor	SAME	OPPOSITE	UNKNOWN
Big	Large	SAME	OPPOSITE	UNKNOWN

II. *Analogies.* (3 minutes.)—Twenty-five sentences are to be completed by underlining the appropriate word in the next line. Thus :—

GOOD is to BAD as WHITE is to—CLEAN, BLACK, WICKED, RED.  
BAKER is to BREAD as TAILOR is to—Tailoress, Cake, Man, Clothes.

III. *Mixed sentences.* (3 minutes.)—There are thirty sentences in which the words are mixed up. The candidate must decide on their proper order and indicate whether the statement is true or false. Examples :—

a roses odour pleasant have TRUE FALSE UNKNOWN  
freezes water hot when TRUE FALSE UNKNOWN

IV. *Completing sentences.* (Twenty questions: 10 minutes.)—The task is to underline the word, phrase, or number that makes the best sense, wherever there are three printed one above the other. (The underlining in these examples is left to the reader.)

Monday and Tuesday are years of the week.  
January months  
Autumn days

The man fell off his bicycle and cured his arm.  
climbed of and broke changed

V. *Reasoning.* (10 minutes.)—Eighteen assorted problems.

This test is designed to measure general mental ability and is a scientific method of estimating inborn capacity. An intelligence test of this sort has the advantage that it cannot be crammed for; the conditions are exactly the same for all candidates; and it consists in different tests designed to bring out native intelligence. No writing is required. It is not suggested that it takes the place of a scholastic test of general knowledge, but rather that it provides a more accurate method of grading candidates from whom a selection is required for a particular purpose.

2. *Mechanical Aptitude Test.*—In this test there are thirteen mechanical problems, ranging from one which consists in arranging some toothed wheels, and connecting-rods and pins, to make a cog revolve in a given direction, to one which involves the estimation of where a given point on a lever will be when an eccentric, which is attached to a shaft connected with the lever, has been given half a turn. As in the intelligence test, no writing is necessary. Alternative answers are printed and it is only necessary to underline the correct one. This has the advantage of standardising these tests and eliminating differences due to speed of writing, &c.

3. *Perseveration Test.*—This was considered to be the most promising of the tests for the assessment of character. The scientific estimation of character is a very difficult problem; but it is certain that there are many variable factors, both conscious and unconscious, in the observer and in the observed which may adversely affect the accuracy of personal assessments and which tend to be affected by personal bias. It would appear that the road to greater fairness and consistency lies in the direction of some set form of test common to all candidates. The test used is based upon the principle of setting up a habit and then breaking it. This is done by giving a set piece of transcription which is to be written as quickly as possible for a definite period, and then repeated for three more periods of the same length of time but with certain variations introduced in

each of the last three periods. Thus every *e* has to be turned into an *a*, and vice versa; or a *q* has to be introduced after every *e*; or every letter in every word has to be doubled. This test is based upon work done by Pinard who claimed that it enables an empirical assessment of character to be made. He maintained, for example, that both extreme perseverators and non-perseverators tend to lack perseverance and self-control, and to be unreliable and difficult, whilst the moderate perseverator tends to be considerate, self-controlled, and reliable.

COLLATING THE DATA

This concludes my brief and general description of the actual tests used and the principles upon which they rest. The results are recorded on the front of the record card. This side of the card necessarily consists mainly of numbers, because one object of this scheme is to eliminate the personal factor of the examiner so far as is possible, and that the tests should be common to each candidate and marked by a number depending upon performance timed by a stop-watch, and judged by a set scale of marks.

The next step is to interpret these numbers in terms of poor, below average, average, above average, and exceptional, so that an assessment may be made

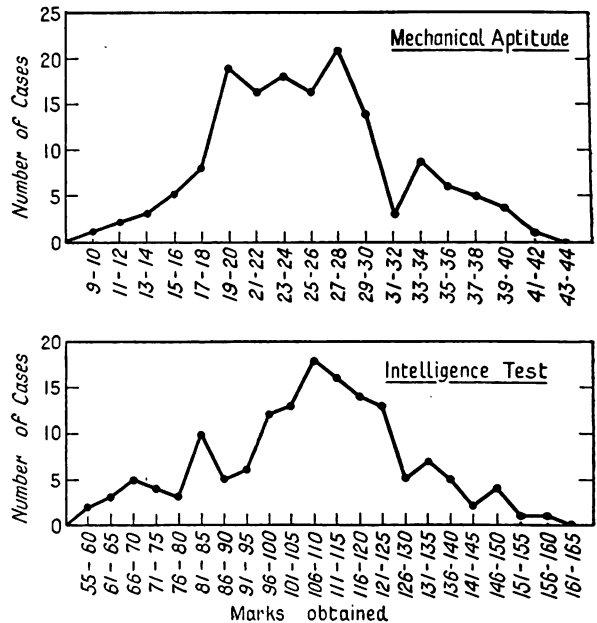


FIG. 3.—Marks obtained in mechanical aptitude and intelligence tests, showing curves approximating to normal frequency curves. For mechanical aptitude the mean is 25.3 marks and the average 19-30; for intelligence the mean is 106.3 and the average 95-124.

on the back of the card for easy reference. This is done by plotting out performance marks against the number of boys scoring each mark in each entry, and the result is, broadly speaking, a normal frequency curve, with equal falls above and below a general average (Fig. 3). The production of such a curve in the results of marking these tests is an indication of the soundness of the method adopted.

We are now, therefore, prepared to turn over our record card and consider the assessment of these results. The headings under which these are made are as follows :—

*Physical.*—Based upon the psychological type, physical index, 40 mm. test, and any special physical characteristics. It has been possible as a result of data obtained

to suggest a grading scheme which may assist in the selection of athletes and in the regulation of their training.

*Character.*—Based upon the early history and background, body type, temperament assessment, and perseverance test.

*Mechanical ability* = (Halton, Cranwell, and dotting tests). *Mechanical aptitude* = The thirteen mechanical problems in the paper test. *Intelligence* = The five tests in the paper. Under each of these headings the numbers already obtained are transposed into categories derived from the graphs (Fig. 3).

*Trade most suited for.*—Based mainly upon hobbies; reason for joining the Service and reason for wanting a particular trade; and performance in the special tests.

*Leadership qualities.*—Based upon a review of all the facts.

*Tendencies.*—(a) Physical. (b) Temperamental.

Such *general indications* as, for example, that further observations on medical grounds is needed, or that it is considered possible that the boy may break down and develop neurotic symptoms, are noted here.

After considering the whole of the above information the candidate is placed in one of the following categories, different colours for each category being painted at the foot of the card for easy reference:—

- (1) Those who should do well, and suited for promotion or for cadetships.
- (2) Those who are unlikely to do well, may be difficult or backward due either to inability to learn a trade, or temperamentally unsuited for Service life.
- (3) Those who should have had a different trade.
- (4) Those needing further observation on physical grounds.

This completes the forecast, and the rest of the card is left for the recording later of his actual progress in his squadron, schools, and workshops, together with any special performance on the playing fields, or any special activity. This last section of the card records the marks scored in examinations for practical and theoretical work in workshops, and in schools, and the final trade category awarded him in his final passing-out examination conducted in workshops by the Trade Test Board. Distinctions such as the special award of a prize, or recommendation for cadetship, are also noted.

#### RESULTS

So much for the general outline of the principles and methods of this investigation. What can be said of the result of it all?

Since September, 1932, a total of some 1100 examinations have been made, and two complete entries of apprentices—namely, those joining in September, 1932, and in January, 1933—have completed their three-year courses and have passed out as trained mechanics to appointments in squadrons, &c. The Medical Research Council has therefore been able to make a statistical analysis of the results in connexion with these two entries. I do not propose to go into this in detail, but it is possible to summarise the conclusions briefly.

The method was to take the three main groups of assessments given under the headings: (A) those noted to do well, including potential cadets; (B) those noted as being unlikely to do well, including those considered unsuitable for the Service; and (C) others; and to compare them with the three passing-out ranks of: (1) cadets and leading aircraftmen (L.A.C.'s); (2) A.C.1's; and (3) A.C.2's and cases discharged from the Service as being unsuitable. It was found that Class A (likely to do well) contained three times as many cadets and L.A.C.'s as would be expected by chance, and contained no A.C.2's or discharges. Also that Class B (unlikely to do well) contained no cadets or L.A.C.'s, but

over twice as many A.C.2's and discharges as would be expected by chance. Moreover, this general tendency was consistent in the two entries, and by averaging these and stating the facts numerically, it is deduced that every thousand boys selected by this method would contain at the end of their training 10 more cadets and L.A.C.'s, 12 more A.C.1's, and 22 fewer A.C.2's and failures than would be the case if the boys were selected in the usual manner. This indicates a raising of the standard throughout.

To state these results in a different manner the Medical Research Council say: "This final assessment has a significant relationship with passing-out which may be illustrated by the following facts. In the September, 1932, entry, 138 boys were trained, and of these 14 became cadets and L.A.C.'s. If these boys had been chosen by this assessment, only 123 boys would have been trained to yield the same number of cadets and L.A.C.'s. In other words, there would have been a saving of 10.9 per cent. in the number of boys trained. Similarly in the January, 1933, entry there would have been a saving of 9.1 per cent. in the number of boys trained. On the average therefore, as judged by these two entries, a saving of 10 per cent. could be effected in the number of boys to be trained in order to yield the same number of boys of the highest rank as are yielded by the usual method of selection.

"Of the tests themselves, intelligence, mechanical aptitude, and mechanical ability were found to be the most valuable, and these combined with the entrance examinations gave a closer relationship with trade proficiency as measured by the final trade test than did the entrance examination alone. These results are statistically significant and have been yielded consistently, so that by all the available evidence there is every reason for putting them into practice and supplementing the entrance examination by these tests. This combined method of selection should pick out a set of boys with an increased number of the higher ranks at the end of their training, and decreased number of failures and unsatisfactory apprentices."

These conclusions are reached as a result of the statistical analysis of the relationship between the assessments made from tests and the actual final performance of the two entries some three years later. The foregoing may be referred to as "positive" results, but some of the "negative" results are interesting. By negative results I mean those tests which have been found not to correlate significantly with the passing out result. Thomas Huxley said "the benefits of Science are derived more from the methods than the product thereof"; in any event these negative results certainly have to be considered.

No relationship was found between the 40 mm. test, nor the physical type classification, nor the dotting test, and the passing-out category. The relationship between the character assessments and passing-out showed that none of those assessed as being "unreliable and lacking in perseverance" became cadets or L.A.C.'s, whilst none of those assessed as being "practical" became A.C.2 or were discharged as inefficient. Whether this assessment is capable of being rendered more significant by some modification of the tests involved is uncertain. The perseverance test alone did not show any relationship with passing-out rank.

As regards the interrelationship between one test and another it was found that there was a significant relationship between the mechanical aptitude test and the intelligence, mechanical ability, and dotting tests. Also that there was a relationship

just significant between the physical type and the 40 mm. mercury test due to the facts that (a) none of the "rounded" type (pyknic) were "below average" in the 40 mm. test, and (b) more of the middle type (athletic) are "below average" than would be expected by chance. The tests which inter-correlated in this way were the intelligence, mechanical aptitude, mechanical ability, perseverance, dotting, and entrance examinations, and there was no significant interrelationship other than those noted above.

There are one or two further observations to make. One intention of this examination was to attempt to assist the executive branch in a practical manner in selection and training of personnel. It has been possible to do this whilst the examination was in progress and independently of any statistical proof as to results.

For example, the question of selection of cadets is a very important one both for the Command and for the Service generally. A certain number of names are submitted from each entry, by the Air Officer Commanding, to the Air Ministry as being suitable to proceed to the Royal Air Force Cadet College, Cranwell, to undergo training to become commissioned pilot officers. Six names have been submitted in this way from each of the two entries which have passed out, and which have already been referred to. Whilst these numbers are too small to be treated statistically as a separate class, it is of interest to show that in the case of the September, 1932, entry, five of the six selected were classed previously as having leadership qualities, and as being potential cadets (the sixth being given a practical assessment above the average). Of the six recommended of the January, 1933, entry, four previously were classed as being potential cadets, and as having leadership qualities, and one as likely to do well, and the sixth was given a good practical assessment.

A further example of the uses to which this examination has been put is that it has been found possible to assist the instructors and commanding officers in the backward or difficult cases, particularly in the sort of case where a boy was backward and it was not known whether this was due to inability to learn or to some temperamental difficulty. About 80 special examinations and reports have been made in these cases.

The physical tests employed have been used by trainers to assist them in grading certain athletes, particularly cross-country runners and tug-of-war teams. About 100 examinations of this sort have been carried out.

#### THE VALUE OF VOCATIONAL TESTS

A recent publication ("The Examination of Examinations") has shaken the confidence of many in the present form of scholastic examination, but it is often asked: "What is there to take its place?" So far as the entrance examination for Royal Air Force apprentices is concerned, I suggest that the answer is given here. It is: supplement the scholastic examination by other tests such as those described. (And it may be observed that such tests hold good for selection for any mechanical employment, and are easily adaptable to the requirements of any particular trade.)

Psychological tests have been compared with thermometers in that they fittingly replace fallible judgment by objective data, and will give constant readings regardless of who uses them. Tests of the sort described in this paper have corresponding advantages over existing methods of personal selec-

tion and examination. For example, their exact worth can be measured by mathematical methods; they require no writing, they contain no trick items; they have a standardised procedure and method of marking; no preliminary "swotting" can help; each question admits of only one correct response; specific abilities and capacities may be measured. If I may use the jargon of the financial columns, I do not know whether shareholders will consider that prospects of dividends such as those outlined here will merit a slight variation in capital distribution. But I suggest that psychological tests are to-day moving from the "speculative" into the "investment" category; indeed, the intelligence, mechanical aptitude, and two mechanical ability tests receive enough statistical support in this inquiry to be classed as "trustee stock."

I wish to thank the Air Officer Commanding, Halton Command, and his staff (particularly the principal education officer) for the kind assistance which has been given at every point, and also to thank the Industrial Health Research Board of the Medical Research Council, who have not only provided some of the tests, marked some of them, and carried out the statistical treatment of the whole examination, but also by their general co-operation have made this investigation possible.

## PARIS

(FROM OUR OWN CORRESPONDENT)

### DECLINE OF BREAST-FEEDING IN THE COUNTRY

THE recent appointment by the Academy of Medicine of a commission to investigate the decline of breast-feeding in France is largely due to the disturbing information collected by Dr. Lesage and Dr. Cruveilhier. They addressed themselves to medical practitioners in the country districts and in towns with a population of less than 5000, and invited not only data but comments thereon. The response was generous, and some 800 doctors answered. The burden of their replies was that faulty infant feeding in the country was the most important factor in the infant mortality, and was traceable to the abandonment of breast-feeding. In Normandy the few mothers who still suckle their babies are not farm workers but factory hands whose employers presumably make special arrangements for them. In another area it is calculated that only 5-10 per cent. of the mothers give their babies the breast, and when they do so it is only for two or three months. A general practitioner with an experience of ten years in his district had not known of a single case of breast-feeding by a farm worker. The explanations offered for this state of affairs by the medical profession are remarkably varied. Some see in it "a sort of moral crisis which rages among the peasants." Others find the mother of to-day anxious to enjoy the privileges she learnt to enjoy during the late war. The alleged fear of women to "compromise their aesthetics" is also mentioned as a factor in the case. They are accused of sacrificing breast-feeding to outings, the cinema, the motor-car, and the bicycle. Then there is the overwork for women on farms whence the male labourer has fled. The mothers have, in fact, so little time for eating and sleeping that there is none left for breast-feeding, and the fact that it is commoner in the winter, when there is comparatively little to be done in the fields, than in the summer seems to support this view. Dr. Lesage and Dr. Cruveilhier lay the blame in an evil concatenation of circumstances rather than on any inherent wickedness, beyond the ordinary, in women.



## TOO SUCCESSFUL TREATMENT OF A SPRAINED ANKLE

A general practitioner in the North of France, having mastered the by no means complicated treatment of sprains by the injection of novocain into the painful area, was consulted one Saturday by a motor driver who had fallen off a motor lorry and sprained his ankle. He had been able to drive his lorry back to the garage without excessive pain, but after a few hours his sufferings had been such that he had had to seek his doctor, who found slight œdema of one ankle, in which there was lively pain on movement about the joint. A sprain was diagnosed and a certificate to this effect was signed by the doctor with a view to insurance benefit. He then injected novocain locally, having learnt of Prof. René Leriche of Strasbourg what a remarkably effective procedure this is. A few minutes later the patient was no longer a patient—he could walk without pain. Next day, Sunday, he walked about freely, and on Monday morning he returned to work. But the doctor's account was not honoured by its recipient, an insurance society. The refusal to pay was backed by the intimation that the alleged sprain was apocryphal, that there had, assuredly, been no accident, and that its fictitious victim had been seen about on the day of the "accident," walking with perfect freedom. Under these circumstances the doctor's claim for a reward for his successful treatment could not be met, and he must be thankful if he escaped a charge of conspiracy to defraud the insurance society. The matter was referred to Prof. Leriche who willingly testified to the apparently almost miraculous effects of his treatment, and who warned insurance societies that if therapeutic successes were to be the signal for refusals to pay for them, the inducements to enjoy them might wane to the point of their not being wanted by the insured. He also remarked on the lack of psychological insight shown by the insurance society in question, for it is characteristic of the true malingeringer that his ailments are refractory to treatment, not that they vanish into thin air in response to a single injection. And if insurance societies persist in their error the insured will prefer the combination of pain and stiffness with compensation to prompt recovery without it. It is wonderful how tolerable the discomforts of a sprained ankle can become if they are mitigated by insurance funds and relaxation by one's own fireside.

## TYPHOID FEVER IN FRANCE

In the *Revue d'Hygiène* for May, Prof. G. Dubreuil of Bordeaux reviews the causes of the high typhoid rate in France, and of the measures most likely to reduce it. In 1906 there were 14 notified deaths from typhoid fever per 100,000 inhabitants, and in 1932 the corresponding figure had been reduced to 3.8. But France still enjoys an unenviable reputation in this respect when compared with several other countries, her 3.8 per 100,000 in 1932 comparing badly with 1.2 for Germany in the same year and 6 for England in 1933. An instructive feature of Dubreuil's study is his charting of the different French administrative areas according to the level of their typhoid death-rates. This geographical survey throws into lurid relief the coastal districts, apart from occasional water-borne epidemics, the disease seems to be more or less permanently settled in certain well-defined areas, and the most important of these areas are to be found on the Atlantic and Mediterranean seaboard. The predilection of typhoid fever for the coast is reflected in the mortality returns of the large towns on the coast and inland respectively. Thus Toulon and Bordeaux in the period

1926-31 had typhoid mortalities of 18.2 and 17.4 respectively per 100,000, whereas the corresponding figure for Lyons was 5.6, and for Rheims only 1.9. In France the urban typhoid death-rate is higher than the rural death-rate from the same cause, although urbanisation may often be said to be synonymous with a comparatively pure drinking-water. The explanation of this phenomenon is probably to be found in large part in the comparatively important consumption of shell-fish in the towns. This explanation would also account for the preference shown by the typhoid bacillus for the coastal districts. Man has become fussy over uncooked and unwashed fruit and vegetables, but he remains loyal to uncooked shell-fish; there seems to be veritable desecration in the cooking of an oyster. Dubreuil's remedy for this state of affairs is largely administrative and educational; all concerned with the shell-fish industry should be taught to take the necessary precautions and be weaned of the notion that their hygienically unhampered means of livelihood must be maintained regardless of the welfare of the rest of the community. He concludes with a statement casting doubt on the efficacy of antityphoid inoculation, as at present practised, against infection through shell-fish.

## BUDAPEST

(FROM OUR OWN CORRESPONDENT)

## THE PREVENTION OF VENEREAL DISEASE

THE Teleia Society, founded in Hungary in 1893 by Profs. Feleky, Temesváry, and Török, claims to have been the first of its kind in Europe. Initially consisting only of an out-patient clinic offering free treatment for venereal disease, it has been stimulated by the great increase in these diseases after the late war to establish dispensaries in several towns and to introduce widespread and effective propaganda throughout the country. Dr. Aladár Emödi, chief physician of the society, has arranged a display of instructive films, which was attended by 150,000 of the public; 500,000 postcards and pamphlets have been distributed among patients. A monthly journal has a circulation of 3000-5000, and 17 booklets have been published. Other antivenereal work is being done by the National Social Insurance Institute and other similar organisations, and the Stephanie National Association helps to provide dispensaries. Much propaganda is spread by the Institute and Museum of Social Hygiene, by frequent exhibitions held in Budapest and in the country, and also by Sunday lectures in the museum. All these measures show that the prevention of venereal diseases is very well supported in Hungary notwithstanding the very grave economical position of the country.

## PUBLIC HEALTH IN THE ECONOMIC CRISIS

Dr. Georg Gortvay, director of the Institute and Museum of Social Hygiene, in an elaborate study, has established the fact that the worst period of the economic crisis, 1928-34, resulted in a greatly reduced consumption of staple foods. The reduction in wheat was 13.3 per cent., in potatoes 8.3, sugar 3.0, meat 18.2, and in milk 30.8 per cent. The annual consumption per head in wheat and rye was 253 kilos, potatoes 150 kg., sugar 9 kg., meat 16 k.g., and in milk 14.4 litres (3.2 gallons). The fall in the consumption of staple articles went hand in hand with the deterioration of earning conditions as well as with the increase in the financial burden of the public. The agricultural

wages fell during this period by 40 per cent. It is a distressing symptom and characteristic of the social position of agricultural labourers that their daily food allowance was 12-14 fillér (a penny), when we consider that this small sum is not the equivalent of even a kilogramme of bread, and a labourer needs at least half a kilo a day. Dr. Gortvay established that the nutrition of the rural population is poor in vitamins, and that this is related to the spread of tuberculosis. His investigations show therefore that in relation to the work performed the nutrition is lacking in quantity as well as in quality.

But the nutrition of the rural child population is also deficient. It was established from the analysis of 2600 urban and 2900 rural school-children, that in the country food is monotonous and badly selected; vegetables are absent in the diet of 19 per cent. of the urban and 37 per cent. of the rural children. One would expect the contrary, but the peasants are forced, by the good prices that they get, to sell their vegetables in the town markets. Meat was lacking from the diet of 15 and 31 per cent. of the children in town and country respectively. Another investigation revealed that the rural child has to be satisfied with only one dish at lunch and dinner, usually of potatoes, bean soup, cooked vegetables, or farinaceous food. For breakfast he has a cup of milk, coffee, or tea, a piece of stale bread, or nothing at all; there are again no two-course breakfasts. Industrial labourers spend on food on an average 45 per cent. of their income. Among unemployed workmen, the daily food quota dwindles in direct proportion with the number in the family. Hand in hand with the deterioration in nutrition goes the increase in gastro-intestinal disease. During the period 1928-34 the medical officers of health at Budapest reported a 145 per cent. rise of patients requiring free treatment.

#### CASE OF GENERALISED PYODERMIA CURED WITH X RAYS

Dr. Haas, senior physician in Csakova, Banat, describes the case of a secondary school student, aged 15, who fell ill with scarlet fever. Although the disease was very severe from the beginning no complications at first emerged. When skin desquamation began, however, there was intense itching, which, on account of the neuropathic constitution of the boy, produced exaggerated scratching. Erythematous and bullous rashes and purulent vesicles appeared, which spread over the whole skin in a few days and displayed the uncommon but characteristic picture of impetiginous eczema and generalised pyoderma. All the drugs that are reputed to be effective in such cases proved futile. The boy had gradually rising fever and became very ill. In the last resort they applied X ray irradiation, which brought a surprisingly quick and prompt healing.

Haas irradiated the anterior and posterior surfaces of the body at two sittings. He used a filter of 1 mm., the dose being 15 erythema doses. The intolerable itching, which caused sleeplessness, ceased after the lapse of 24 hours. Since then Haas has applied small doses of X rays to all kinds of pyogenic dermatoses and to furunculosis, and the results have been just as reassuring.

#### SALVARSAN TOLERANCE IN EARLY CHILDHOOD

L. Dobszay and A. Bános have found in previous experiments that if infants are given an arsenobenzol preparation intravenously in exactly proportionate doses the arsenic curve of the blood differs from that of adults. In infants about 40 per cent. more arsenic leaves the circulation within the first half hour than

in adults. Searching for the cause of this they found that the final elimination of arsenic is identical in both groups, and therefore they had to assume that the arsenic surplus disappears only into the tissues. It may be that diffusion, or the mechanism regulating diffusion, is increased, or that the absorptive power of the tissues is relatively greater in children. The former could not be proved, although very careful tests were made. Nothing therefore remains, say Dobszay and Bános, but to accept the cause of the above difference as a difference in the cumulative power of the tissues, the more so as their investigations proved that the reticulo-endothelial system of infants accumulates the arsenobenzols much more vigorously than in adults, in whom this process is much slower, and it is this that explains the greater tolerance.

#### NICOTINE POISONING IN AN INFANT

Dr. Irene Greiner has reported a case of nicotine poisoning in a baby of three weeks, the vehicle being the mother's milk, for her daily tobacco consumption amounted to 35-40 cigarettes. The prominent symptoms of the intoxication were restlessness and sleeplessness, very frequent vomiting, severe colic, loss of appetite, and pallor. The animal experiments of Hatscher and Crosby, and numerous tests on lactating women, have revealed that the mammary gland can excrete nicotine. From this it is concluded that it is wise for mothers to give up smoking during lactation, or at least considerably to curtail it.

The lecturers and professors of the Budapest University arranged a well-attended post-graduate course for a fortnight in May. The lectures were held in Hungarian, German, and French. The Hungarian Government allowed to those attending the course a 50 per cent. reduction on all the State railways.

## UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

#### THE SPRING CONFERENCES

MOST important of medical and scientific conferences to the practising physician is the annual meeting of the American Medical Association. It was held this year at Kansas City and of the 6824 doctors who registered their attendance more than one-third came from the contiguous States of Missouri and Kansas. It is estimated that double the number of registrants were present in the auditorium to hear welcoming speeches from the governors of these two States.

The address of the retiring president to the House of Delegates and that read for the incoming president, whose serious illness prevented his attendance, alike reflected the complacency of the leaders of the profession in this country at the conservation of the status-quo or, to use the words of the retiring president, Dr. James S. McLester, "the preservation, unimpaired, of established methods of practice, methods by which American medicine has reached its present pre-eminent position." The president for this year, in his tour of the country during which he has spoken before some 8000 physicians, has found that the majority of these are "pleased and gratified to hear that the aim of the American Medical Association is to preserve the individual private practice of medicine, with free and open competition among physicians and the maintenance of personal relationship of doctor and patient." Yet beneath this complacency and self-gratulation there are certain symptoms of inquietude. Dr. McLester pointed

out that the disaster which has overtaken our colleagues in England, as elsewhere in Europe, came "at the end of a long series of other so-called social reforms," and that the control by government in this insidious manner of the practice of medicine "once established has never been relaxed." The train of events, the so-called social reforms, which preceded the *krankenkassen* system in Germany and the panel system in England, is already well started in this country, he pointed out, naming as terrible examples the provisions of the Social Security Act for maternal welfare and for old age pensions. "Will the politicians of the near future," he asked, "anxious to carry government subsidies still further, extend their control, as politicians have already done elsewhere, to medical care?" Now the Social Security Act is the product of a Democratic administration. The Governor of Kansas, on the other hand, is at present the prime favourite for nomination as presidential candidate on the Republican ticket. He showed keen political insight and was rewarded with a stirring political ovation when he declared: "Medicine will not willingly be made the servile instrument of politicians or the instrument of domineering bureaucrats."

It would be entirely unjust to leave the impression that the Kansas City meeting had not also its scientific aspect. In the section on tuberculosis Dr. James Alexander Miller attributed the decline in tuberculosis mortality largely to the development of racial immunity. In other sections were described a new method of removing hitherto inaccessible brain tumours, a new use for "artificial fever" in the treatment of chorea, the use of helium in the treatment of asthma, and so on. A popular educational feature was Dr. De Lee's moving picture of the forceps operation.

Members of the American Psychiatric Association had a short journey from Kansas City to their own convention in St. Louis. They assembled there 1800 strong. Dr. C. O. Cheney, the retiring president, effectually "debunked" the popular theory that insanity results from the stress and strain of modern life. This doctrine he showed was advanced as early as 1734. The new president of the Association is Dr. Macfie Campbell who has been for long a leader in the mental hygiene movement.

The American Laryngological, Rhinological, and Otolological Society met at the end of May in Denver, Colorado. Bronchoscopists went from Denver to Detroit for the ninth annual meeting of the American Bronchoscopic Society. No less than seven national associations in different medical specialties are to meet this month.

Important announcements of medical research are not always heard for the first time, however, at physicians' meetings. The American Chemical Society which also met in Kansas City this spring again challenged the propriety of substituting purified derivatives for the original cod-liver oil. Just as this oil was found to contain vitamin D as well as vitamin A, and to be of value for its content in A as well as for its supply of D, so now there is evidence of other important nutritive constituents which have not yet been isolated. The possibility of purifying waters that contain fluoride and cause "mottled enamel" on so many American teeth by the use of aluminium hydroxide is another chemical contribution of importance to public health.

#### THE NATIONAL LEAGUE OF THE TUBERCULOUS

Some 50,000 cases of advanced pulmonary tuberculosis are discharged from our sanatoria each year

Their subsequent fate has aroused hitherto very little interest beyond that of the statisticians who calculate that 52 per cent. of them suffer a relapse and die within two years. No serious attempt is made by any governmental authority to provide working conditions adapted to the working capacity of these discharged patients or to lessen in any other way the probability of relapse and death. Private efforts, such as the work of the Altroschop in New York, though gallant and successful, are small in scope and pitifully few. The challenge of this grave social need has now been taken up by the tuberculous themselves, who have formed a National League of the Tuberculous with headquarters at Woolsey Station, Astoria, New York. Membership dues are \$1 per annum which includes subscription to the official organ *The Voice of the Tuberculous*. The League will air the grievances and protect the interests of all who are handicapped with this disease and will urge two specific solutions: (1) the provision of pensions under the Security Act; and (2) the provision of village settlements. The origin of the League is explained in the first number of the *Voice* as follows:—

"Outside organizations, no matter how well-meaning they may be, are an affliction rather than an aid to the tuberculous. Professional sympathizers capitalize on the misfortunes and hardships of the tuberculous in order to raise funds. Their sob-stories and tear-jerking publicity increase hypochondria and the unhealthy and morbid fear of tuberculosis. Whoever has been touched by the disease finds himself stigmatized and marked for exile. He is unemployable because of pity. Employers are afraid he will break down again and become a liability. Fellow workers are afraid they will catch 'consumption' from his presence. And our charitable organizations give him the choice of starvation or the poor farm.

"The tuberculous have learned that their only true friends are their fellow victims. Their only hope for aid in rehabilitation and a normal life is to join hands in a cooperative effort to help each other without depending upon charity or pity. And with this single-minded purpose of forming a national union for cooperative self-help, The National League of the Tuberculous has been organized."

The organisers while nourishing this admirable spirit of independence and self-help are nevertheless willing to accept contributions from well-wishers of their movement.

## MEDICINE AND THE LAW

### Trespass for Want of Patient's Consent

Mr. Justice Swift's decision last week in *O'Shea v. Moyce and Donston* was a reminder of the risks of operation without the patient's specific consent. The surgeon may often rely upon the understanding, normally an implied condition of the legal relationship of the parties, that the patient gives implied consent to all such actions as professional skill and judgment may deem necessary. It may be possible to obtain beforehand a definite authority in writing for the performance of some named operation; but precise knowledge is not always available and emergencies may occur. An unauthorised operation is technically an assault or trespass. The practitioner runs a risk of a claim for damages.

In Miss O'Shea's case last week it was alleged that a dentist had extracted teeth without permission. She had a broken tooth which disfigured her mouth; it seemed likely that other dental treatment was needed. Her panel doctor examined her mouth and certified that she ought to see a dentist. The defendant dentist recommended that all her 16 upper teeth and two of the lower teeth should be extracted.

According to the judge's findings, Miss O'Shea was upset by this information. She asked whether she really need lose all these teeth and was told that, while they were not all bad and while some could be saved, she would have to come back later and have all the fuss and bother over again unless she had them all out now. She was persuaded, said the judge, by this mention of future fuss and bother and she attended at the defendant's surgery. On the first occasion ten upper teeth were extracted while she was under gas. When she recovered consciousness she complained that another tooth was still aching; the dentist thereupon extracted one more; he told her that further teeth were still to be removed. At the end of this first visit, said the judge, nothing had happened to which Miss O'Shea had not assented. But afterwards she said that, though one or two teeth might have needed stopping or taking out, the wholesale clearance was quite unnecessary. She had accepted his advice but the advice was negligent. A week later she paid her second visit for the removal of the teeth not previously extracted. On this occasion, Mr. Justice Swift held, no fresh advice was given her and no fresh consent obtained; the remaining teeth in the upper jaw and the two teeth in the lower jaw were to be taken out. But when she recovered consciousness, she found that all the teeth on the right side of the lower jaw had been removed. For this, in the opinion of the court, there was no justification. There had been ample opportunity for the dentist to come to the conclusion that all these teeth should come out. He could have asked the patient or her mother before giving the gas; he could have waited till the patient recovered consciousness. "To go and take out all those teeth without a word and without asking permission" his Lordship considered to be a trespass such as entitled Miss O'Shea to damages. The patient told her mother and they went back to the dentist who explained that the teeth had been pyorrhetic. The judge accepted the evidence given on behalf of the plaintiff that Miss O'Shea's mouth had shown no signs of pyorrhœa. He considered she had been improperly advised about her upper teeth and had suffered a trespass in the removal of her lower teeth without her consent. He gave judgment in her favour for £250.

The legal doctrine of the patient's implied consent, therefore, did not cover the case of professional treatment involving pain and permanent disability. It was the practitioner's duty to furnish the patient with information of the proposed action and with the opportunity to give or refuse consent. Mr. Justice Swift's decision suggests that in dental practice no such emergency is likely to arise as would relieve the practitioner of his duty to obtain the patient's consent beforehand. The dentist who assumes that he has been given a free hand to do his best may find that the law regards him merely as a trespasser.

#### What is Lysol Soap?

How much lysol should there be in a substance sold as "lysol soap"? In *Stott v. Green and Stott v. Henshaw* last month the Salford stipendiary had refused to convict the retailer of "medicated lysol soap" which contained only 0.1 per cent. of lysol. Proceedings had been taken under Section 2 (1) of the Merchandise Marks Act, 1887, and the city analyst had given evidence that the soap, to justify its description, ought to contain at least 2 per cent. of lysol. The retailer contended that the soap was honestly compounded and did contain some, though only a minute amount of, lysol. The magistrate held

that he had no power to fix a standard; if he had the power, he would have fixed 1 per cent. On appeal to the High Court the Lord Chief Justice said the magistrate was wrong in thinking that there could be no conviction so long as the soap contained any trace of lysol. The case was sent back to the magistrate with a direction to find that the offence was proved.

In *Dryden v. Stewart and the Surrey County Council* on which Mr. Justice Finlay gave judgment last week (see p. 1378) Dr. John Stewart had the assistance of the London and Counties Medical Protection Society.

## LISTER INSTITUTE OF PREVENTIVE MEDICINE

UNDER the general control of Prof. J. C. G. Ledingham, F.R.S., who is also director of one of the four main departments of the Institute, some 30 workers are engaged in medical research at the Lister Institute. The department of bacteriology, serology, and experimental pathology absorbs 17, including 1 in the division of protozoology and 4 in the division of nutrition; in the department of biochemistry Prof. R. Robison, F.R.S., has 6 colleagues; Dr. G. F. Petrie, bacteriologist in charge of the department for the preparation of therapeutic sera (at Elstree), has 3; and Dr. D. McLean, also at Elstree, is solely responsible for the department for the preparation and study of vaccine lymph. Apart from these members of the staff the hospitality of the Institute is given to many holders of research scholarships and voluntary workers.

In the annual report of the governing body an account is given of the varied investigations now in progress in all these departments. A few of them are summarised below.

#### STUDIES ON VIRUSES

During the past five years considerable attention has been paid by workers on virus problems at this Institute to fundamental studies on the elementary bodies which are generally believed to constitute the sole effective ætiological agents in all virus diseases. The fact that these bodies can now, by various procedures, be separated from crude virus-containing material in a state of comparative purity has greatly facilitated the study of their ætiological relationships and even in those virus diseases such as chicken-pox and herpes zoster, that so far have defied attempts to secure their transmission to laboratory animals, it has been possible by serological analysis, particularly agglutination experiments with highly concentrated suspensions, to demonstrate not only an ætiological connexion between the elementary body and the virus disease but also in some cases to explore the nature of the affinities, sometimes quite unexpected, between one virus and another.

The antigenic structure of the virus of *vaccinia* has been under investigation by Dr. M. H. Salaman (Beit Memorial Research Fellow) since October, 1935. Prof. Ledingham, in collaboration with Dr. W. E. Gye, of the National Institute for Medical Research, reported in 1935 the results of experiments which indicated that the filtrable tumour-exciting agents of the Rous and Fujinami fowl sarcomata were probably particulate in nature. Dr. C. R. Amies has obtained further evidence that points to the same conclusion.

Microscopical examination of actively tumour-

exciting, fowl protein-free suspensions by the method of dark-ground illumination reveals the presence of numberless particles of slightly varying size. Further investigations of the properties of purified tumour-exciting suspensions are in progress.

Prof. Ledingham has for some time been engaged in a study of the relationship between the filtrable viruses of *rabbit myxomatosis* (Sanarelli, 1898) and *rabbit fibroma* (Shope, 1932), in view of Shope's observation that rabbits which had recovered from the fibroma were to a high degree protected against the fatal issue that almost invariably follows the inoculation of the virus of myxomatosis.

Studies on acute rheumatism started by Dr. Amies and his colleagues, Drs. Schlesinger and Signy, which pointed very strongly to a *virus agent in acute rheumatic fever*, are now being carried on by Dr. G. H. Eagles with the assistance of Dr. P. R. Evans and of Mr. A. G. Timbrell Fisher, whose operative procedure in the treatment of rheumatoid arthritis gives access to abnormal synovial tissue. They find that pericardial and pleural exudates and joint fluids from acute rheumatic fever, and joint fluids and synovial membrane from acute rheumatoid arthritis have yielded suspensions of bodies which are indistinguishable from elementary bodies demonstrable in similar suspensions from recognised virus diseases. Serological studies are being undertaken to support observational evidence and it is hoped thus to confirm the findings in acute rheumatic fever, to establish a possible virus aetiology in rheumatoid arthritis, and to investigate the possibility of a relationship between acute rheumatic fever and acute and subacute rheumatoid arthritis by cross-agglutination tests.

Dr. E. Weston Hurst has completed a study of the course of infection with *equine encephalomyelitis* virus. Unlike many neurotropic viruses, this virus does not reach the central nervous system by way of the peripheral nerves: during its circulation in the blood stream it may sometimes be detected on the nasal mucosa, whence, apparently, it reaches the brain by the perineural lymphatics of the olfactory nerve. Such a mode of infection of the nervous system was previously unsuspected, except, of course, when viruses are introduced directly into the nose; in nature the equine encephalomyelitis virus is one of a group transmitted by biting insects.

The investigation undertaken by Dr. Eagles in collaboration with the Danish State Serum Institute, Copenhagen, into the neutralising value of samples of serum from cases of *poliomyelitis* at different periods following recovery from the disease has been completed and the results obtained will shortly be published.

Samples of pooled serum from paralytic cases taken on an average of 29 days after recovery showed a low titre of protecting antibody. From non-paralytic cases taken about the same period a slightly higher value was obtained. In these cases sera from patients belonging to blood-group "B" were tested in one pool. This pool was shown to have a very high titre of protecting antibody. A pooled serum from abortive cases taken 13 days after recovery also showed a very high level of protective antibody. Cases tested at a later date—approximately four months after the onset of the meningitic state—showed on the whole a considerably lower titre of protective antibody. While it is impossible to generalise on a limited number of tests it would seem that considerable variation in antibody production occurs amongst individuals following recovery and that the highest titres are to be expected early in convalescence.

It would be of great value in such investigations

if there were available a dried standard convalescent serum for assessing comparative value of sera tested by neutralisation experiments in monkeys.

Dr. E. Klieneberger (Jenner Memorial Research Student) has continued her work on *pleuropneumonia-like organisms* as symbionts of certain bacteria.

#### SEROLOGICAL STUDIES

Serological studies on the antigenic constitution, virulence, and immunising properties of bacteria are being pursued. Dr. A. Felix, with Miss R. M. Pitt and with the collaboration of Captain S. S. Bhatnagar (I.M.S.), has continued the investigation of the "Vi" antigens of *S. typhi* and of other salmonella species. The method of immunising horses for the preparation of *therapeutic antityphoid serum* has recently been simplified by the use of alcohol-treated suspensions containing both the "Vi" and the "O" antigens, since the "Vi" antibody elaborated in response to immunisation with alcohol-treated suspensions is as potent in protective action as that resulting from immunisation with the "natural" "Vi" antigen contained in the live virulent bacilli. With the recognition of the special importance of "Vi" antigen in antityphoid immunity, the study of methods of vaccine preparation which should leave this antigen intact and as effective as possible becomes desirable. Dr. H. Schütze has demonstrated by experiments with mice that for prophylactic purposes the old-established method of heat-killing and phenol-preservation is as efficient as any of the alternatives he has tested.

#### ENDOCRINOLOGY.—PROTOZOLOGY

Dr. V. Korenchevsky, with the assistance of Mrs. M. H. Dennison and the voluntary coöperation of Dr. S. Levy-Simpson and Mrs. I. Brovsin, has continued to study the effects of the *sexual hormones* and of *adrenalectomy*. Joint experiments with Miss E. M. Hume on the effect of sexual hormones on vitamin-deficient rats and with Dr. J. M. Gulland on the gonadotropic hormones of the suprarenal cortex are also in progress. The coöperation with Prof. Ruzicka has been continued in the investigation of male sexual hormones.

Experiments are being made by Miss Muriel Robertson, D.Sc., with the aim of elucidating some of the principles underlying the *reactions of protozoa to various drugs* and poisonous substances. As a test object for this purpose, a ciliate (a glaucoma, probably *Glaucoma piriformis*) has been isolated in pure bacteria-free culture. This organism has been cultivated in standardised counted cultures and very regular results have been obtained. The reactions of glaucoma to inorganic arsenic ( $As_2O_3$ ) have been investigated for some months with the result that acclimatisation has not been found to take place as a consequence of cultivation in sublethal concentrations of the substance. In time-exposures to lethal concentrations there is a certain advantage in survival on the part of cultures previously exposed in this same type of experiment, but not on the part of strains which had previously been cultivated in non-lethal amounts of the substance. At present it seems likely that simple selection of the more viable individuals, rather than acclimatisation is the correct interpretation of the somewhat greater viability.

#### NUTRITION

A collective investigation is being arranged by the *vitamin-A* subcommittee, by means of which the results of spectrophotometric examination of certain

selected materials are to be compared with those derived from biological tests carried out in several different laboratories.

The anomalous behaviour of certain forms of *vitamin D*—e.g., irradiated ergosterol and cod-liver oil—when administered as antirachitic agents to certain species (e.g., poultry) has introduced a complication into the interpretation of vitamin-D standardisation, seeing that the vitamin-D standard is irradiated ergosterol and the usual biological tests are carried out on rats. The most probable explanation lies in the discovery by Windaus and others of the existence of more than one form of vitamin D, that in cod-liver oil being different from that present in irradiated ergosterol, and birds being relatively insensitive to the second form. Miss Hume has collected the existing scattered information in the literature upon this subject with a view to its publication.

It was demonstrated last year, on a laboratory scale, that it was possible to add synthetic *ascorbic acid* to fruits and vegetables before canning without incurring great losses in the vitamin during the processing. Under conditions resembling those employed in large-scale canning equally favourable results were obtained.

#### WORK ON THE VITAMIN-B COMPLEX

The relation of the two constituents of *vitamin B<sub>2</sub>* (flavin and vitamin B<sub>6</sub>) to the skin lesions occurring in rats deprived of this vitamin has been studied by Miss A. M. Copping, who has confirmed the conclusion of György that vitamin B<sub>6</sub> prevents the (a) symmetrical florid dermatitis ("rat pellagra") and flavin the (b) skin affection involving loss of hair without swelling, and an exudate of serous fluid from eyes and nostrils.

The discovery of the composite nature of vitamin B<sub>2</sub> has led to a reinvestigation of wheat, maize, and their milling products; Miss Copping has found them good sources of vitamin B<sub>6</sub>, but poor in flavin.

These results indicate that lack of vitamin B<sub>6</sub> cannot be connected with the aetiology of pellagra, since the maize diets on which populations suffering from endemic pellagra subsist are rich in this vitamin. There would seem to be a definite nutritive advantage in wheat over maize in the possession of a greater amount of flavin, seeing that the foodstuffs found by Goldberger and his colleagues to be preventive and curative of pellagra were those rich in flavin. Recent clinical trials reported from the United States have failed, however, to demonstrate any curative effect for pellagrins of administration of pure flavin.

Laboratory investigations have so far failed to explain the relative immunity from serious deficiency disease existing among populations whose staple diet is wheat and bread made from white flour, when these are compared with populations subsisting too exclusively on maize or rice, which are subject to pellagra and beri-beri respectively.

The content in these cereals of the B-vitamins has not shown differences large enough to account for the observed difference in nutritive value, although administration of these vitamins (in the form of yeast) has proved curative and preventive for both pellagra and beri-beri. It seemed possible that the use of yeast in the manufacture of bread from wheat might provide the clue. Miss M. H. Roscoe and Miss Copping, with the kind and generous co-operation of Dr. Kent-Jones, and of Messrs. Chitty, millers, of Dover, have procured special samples of wheat and white flour, and bread has been baked from these by different methods using varying amounts of a standard yeast.

The amount of the B-vitamins (B<sub>1</sub>, flavin, and B<sub>6</sub>)

in the various ingredients and in the finished breads is now being estimated, the aim being to determine what proportion of the vitamins in the finished product is derived from the added yeast and whether any synthesis takes place during the fermentation process.

#### ANTI-MENINGOCOCCUS SERUM

The therapeutic action of *anti-meningococcus serum* is being studied in the department for the study and preparation of therapeutic sera. The pathogenic action of the meningococcus is apparently due to the intracellular poison which is liberated in the course of the natural disease and which can be separated from the coccal bodies under experimental conditions.

Work carried out by Dr. Petrie has led to the conclusion that this toxic substance is not antigenic and that, therefore, the therapeutic efficacy of the serum cannot be ascribed to an anti-endotoxin and is probably wholly dependent upon an antibacterial mechanism. Formerly very large intraperitoneal doses of cocci were necessary in order to produce a fatal infection in mice and it was difficult to dissociate the pathogenic effects due to the endotoxin and to the coccal invasion. It now appears that some freshly isolated strains are highly virulent and that the virulence of other strains is enhanced by incorporating mucin prepared from the gastric mucous membrane of the pig in the dose of the coccal suspension which is injected into the mouse; the lethal dose may contain as few as 10–20 cocci. By this means it has been found possible to arrange protective experiments which show that immune-sera from the horse can neutralise the pathogenic effect of many multiples of the lethal dose of living cocci. The mode of action of the mucin is not understood but it may be presumed to involve protection of the coccus from the phagocytic cells of the host. Dr. Petrie has begun work on the factors which influence the virulence of the meningococcus while it is living under saprophytic conditions and while it is multiplying in the tissues of the experimental animal.

Fuller knowledge of the conditions that are requisite for maintaining the virulence of this micro-organism at a high level will simplify the application of methods of assaying the potency of anti-meningococcus serum.

#### INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 6TH, 1936

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1613; diphtheria, 709; enteric fever, 30; pneumonia (primary or influenzal), 679; puerperal fever, 35; puerperal pyrexia, 115; cerebrospinal fever, 16; acute poliomyelitis, 10; acute polio-encephalitis, 2; encephalitis lethargica, 2; continued fever, 1 (Tottenham); dysentery, 13; ophthalmia neonatorum, 76. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 12th was 4798, which included: Scarlet fever, 1057; diphtheria, 724; measles, 1780; whooping-cough, 533; puerperal fever, 15 mothers (plus 10 babies); encephalitis lethargica, 283; poliomyelitis, 2. At St. Margaret's Hospital there were 28 babies (plus 15 mothers) with ophthalmia neonatorum.

*Deaths.*—In 122 great towns, including London, there was no death from small-pox or enteric fever. 39 (11) from measles, 9 (3) from scarlet fever, 28 (7) from whooping-cough, 30 (4) from diphtheria, 36 (17) from diarrhoea and enteritis under two years, and 29 (6) from influenza. The figures in parentheses are those for London itself.

No great town reported more than 2 deaths from measles. Liverpool had 4 fatal cases of whooping-cough, Birmingham 3. Deaths from diphtheria were reported from 18 great towns; 5 from Hull, 3 from Liverpool.

The number of stillbirths notified during the week was 276 (corresponding to a rate of 45 per 1000 total births), including 53 in London.



## PANEL AND CONTRACT PRACTICE

## AN AMERICAN VIEW OF HEALTH INSURANCE

It is unfortunately true that many American writings designed to impart instruction on European health insurance systems contain errors of fact, and to this must be attributed the misconceptions of health insurance that are so prevalent in America. Such, for instance, as the belief that the English system is on the verge of bankruptcy; that it is detested by the insurance doctors, who would gladly be rid of it; and some other delusions strange enough to appeal to the sense of humour which, in spite of a widespread American belief to the contrary, is an important part of the English character. Such criticisms cannot, however, be brought against the latest American book on health insurance, Dr. I. S. Falk's "Security against Sickness."<sup>1</sup> Dr. Falk had exceptional qualifications for his task. He was in charge of the field work carried out by the Committee on the Costs of Medical Care during their five years' study of the conditions under which medical care is given, or not given, in the United States—the most complete study of the economics of medical practice ever undertaken—and he has made a special study of European health insurance both by an intensive scrutiny of documents and by personal visits to eight European countries. The result is a valuable book: informative, eminently readable, and marked by a critical acumen that inspires confidence in the author's judgment.

Dr. Falk approaches health insurance from the point of view from which it is generally regarded by students in America and other countries where it has not yet been introduced. In Europe health insurance began as something in the nature of a savings bank. Its aim was to provide money for disabled wage-earners. Medical care came later and long held a secondary position. With the advance of medical science, which not only increases the efficiency of medical treatment but makes it more expensive, it has become of primary importance, even from an economic point of view. The inquiries of the Committee on the Costs of Medical Care show that the cost of securing adequate medical treatment by private arrangements imposes an economic burden heavier than loss of earnings due to incapacity for work. Hence in the new countries health insurance is regarded chiefly as a means of providing medical care, and the payment of cash benefits during periods of incapacity as a function to be discharged by a separate authority or by the authority administering unemployment insurance. The health insurance system adopted last March by the legislature of British Columbia, the first British dominion to introduce compulsory health insurance, gives no cash benefits but is limited to the provision of medical care.

The changes in the German health insurance system made by the National Socialist government are duly set out in this book. The insurance societies (*Krankenkassen*) have been integrated as elements of a single system, and by an equalisation fund the serious inequalities in the benefits given by the various societies have been lessened if not removed. The administration of the societies has been transferred from the old management committee to a "leader," one for each society, appointed by the government,

who is assisted by an advisory board containing a doctor nominated by the local medical organisation. Thus, for the first time, the medical profession has secured representation on the bodies administering sickness insurance in Germany. The State contribution to the cost of the system has been discontinued, and the employer's contribution raised from one-third to one-half of the joint contribution of employer and employee. The sanatoria and other institutions and the preventive services of the *Krankenkassen* have been transferred to the invalidity insurance administration, and the *Hartmannbund* and other medical organisations have been dissolved and exclusive legal status has been given to a new medical body, the *Krankenkassenärztliche Vereinigung Deutschlands* (K.V.D.), which is under the supervision of the Ministry of Labour. Insurance practice can be undertaken only by members of the K.V.D., and "non-Aryans" are excluded from membership. Contracts for medical service are no longer made between the societies and individual doctors but are negotiated centrally between the insurance authorities and the K.V.D., which by its local branches distributes among the doctors of the various areas the sums available for medical remuneration.

Of special interest is the account given by Dr. Falk of the French method of medical remuneration, the *entente directe*, by which the doctor's fee for each "medical act" is paid by the patient, who is reimbursed part of the cost by his insurance society. The chief object of this method is to prevent undue calls upon the doctors' services, and it exercises an attraction on the medical profession in countries in which the adoption of compulsory health insurance seems on the way to become a matter of practical politics—in New Zealand, for instance, where the introduction of a health insurance scheme appears to be imminent. Dr. Falk's account of the method is not likely to encourage its adherents. In practice it requires a vast amount of official checks and safeguards, and it has not tended to enhance the prestige of the medical profession in the community. This is largely owing to the wide discrepancy between the fee schedule of the insurance societies and the fees charged by the doctors, which are based on the scale fixed by the local medical association. The patient is reimbursed by his society 80 per cent., not of the doctor's fee, but of the fee allowed for the service in the society's schedule, which is usually much lower. The schedule fee of the Paris societies for a day visit is 17 francs, but the minimum fee of the medical association is 30 francs, so that the patient's reimbursement (fr.13.60) forms only 45.3 per cent. of the fee actually paid. In French insurance practice there is still the barrier of a substantial fee interposed between doctor and patient. The method was adopted at the insistence of the doctors who, now that they have secured it, are not sure that it is what they really want. As Dr. Falk observes:

"By the victory of dictating the system of remuneration and of assuring all patients completely free choice of doctor the French doctors achieved stringent limitation of fees, a complex and cumbersome fee schedule, necessity for close administrative supervision, conflicts with the insurance authorities, and a considerable loss in public esteem. The confusion which has followed upon the Pyrrhic victory seems to have exceeded what occurred in Germany with salaries, per-capita payments and fee schedules, and is vastly in excess of what has been customary in Great Britain under per-capita payments."

<sup>1</sup> New York: Doubleday, Doran and Co. 1936. \$4.

It must be admitted that in some respects the British scheme emerges in an unfavourable light from Dr. Falk's comparative analysis. After 23 years it is still mainly concerned with the provision of cash benefits. Of the total expenditure only 38 per cent. is devoted to providing medical care, as against 60 per cent. in France, 69 per cent. in Germany, and no less than 80 per cent. in Denmark. Unlike most continental systems it provides small specialist or institutional treatment, no nursing, or laboratory aids to diagnosis; it does nothing for the dependants of the insured, and its maternity provisions are limited to a cash payment on confinement. But against these inadequacies must be set the inestimable

advantage that the system has from near the beginning been worked with the cordial co-operation of the medical profession, and in this respect it stands almost alone. Moreover, though it is true that as regards the range of medical benefit the system is where it was at its inception, great advances have been made in the health work of the local authorities—e.g., in providing treatment for tuberculosis and venereal diseases, and maternity and child welfare services; and the Local Government Act, 1929, has led to further important advances. All this is recognised in Dr. Falk's book, which may be studied with profit by all who, whether as doctors or administrators, are engaged in the working of national health insurance.

## PUBLIC HEALTH

### ISOLATION OF SCARLET FEVER IN THE HOME

BY DUNCAN FORBES, M.B.E., M.D., D.P.H.

MEDICAL OFFICER OF HEALTH FOR BRIGHTON

IN Brighton, since October, 1931, scarlet fever patients have been isolated at home if they could be nursed in a room by themselves or in a room with their mother in a separate bed. After a period of four years I think it worth while recording the results, although even now the numbers are small.

TABLE I

*A Contrast in the Numbers of Secondary and Return Cases following Home and Hospital Isolation*

Intervals in days after isolation of patient	Secondary cases.								Return cases.	Total and per cent.
	6	7	8-14	15-21	22-28	29-35	36-42	42+		
Nursed at home (892 cases).	2	3	16	3	3	1	1	..	5	34 (4%)
Removed to hospital (725 cases).	..	..	3	2	1	1	..	..	34	41 (5.5%)

TABLE II

*Non-immune School Contacts with Onsets 6 days or more after Notification*

—	Secondary cases.	Return cases.	Total.	Percentage of contacts infected.
892 cases nursed at home in contact with 354 children of school age.	15	3	18	5.0
725 cases removed to hospital in contact with 515 children of school age.	2	25	27	5.1

As shown in Table I. the result of home isolation, particularly in the first fortnight, compares very badly with that obtained by the removal of the patient to hospital. On the other hand, under the hospital conditions stated later in the paper, it would seem that the greater infectivity of patients discharged from hospital, as shown by the number of return cases, outweighs the excess of infections from home-nursed cases during the period of isolation.

A better appreciation of the position as to infectivity is gained from Table II., which shows a greater number of school-children at risk per family in the hospital-nursed group and an equal percentage of family reinfection

in each group. From this Table it appears that in the age-group 5-14 the chances of infection are about equal, whether or not the patient is removed to hospital. An analysis of Table I. shows that equal percentages of mothers are infected whether or not the child is removed to hospital, which is remarkable seeing that the mother is usually the nurse of the child isolated at home. The figures are too small, however, to justify any definite conclusion.

To make home isolation more efficient is difficult as the health officer cannot control family life; on the other hand, it is possible to avoid cross-infection in hospital by such methods as cubicle isolation, open-air nursing, and a strict isolation of the individual patient by a highly trained nursing staff. Whether or not this is worth while to save a 5 per cent. reinfection-rate in a mild disease such as scarlet fever is worthy of consideration.

*Saving obtained by home nursing.*—In Brighton in the years 1922-25 the removal-rate was 74 per cent., whilst in the years 1932-35 the removal-rate was 45 per cent. This meant an actual reduction of the number of patients removed to hospital in the latter period of 472. The average stay in hospital being five weeks, this meant a saving of 2360 weeks of hospital treatment. As the diminution in the number of hospital-nursed cases allowed us to nurse our tuberculous joint and other orthopaedic cases in a vacated ward I estimate the saving at some £1000 a year. It may be objected that I have not taken into account the loss of school attendance by the prolonged exclusion of the contacts of home-nursed cases. In Brighton there is no such loss as the rules for exclusion of contacts is the same—namely, until the Monday week following isolation either at home or in hospital. I can trace no school or other infections from this short exclusion of contacts with home-nursed cases.

TABLE III

*Intervals between the Discharge of Hospital-nursed Cases and the Onset of Return Cases*

Weeks.				Months.			Total.
0-1	1-	2-	3-	1-	2-	3+	
8	7	5	2	10	2	0	34

*Infectivity of the hospital-nursed cases.*—The nursing of patients in Brighton is in large wards of 14 beds where uncomplicated cases after three weeks in bed mix freely with each other. The absence of cubicle nursing and the free contact of the patients who are

up and about no doubt leads to continuous cross-infection and probably accounts for the high infectivity of the patient on discharge, an infectivity which often lasts over a long period, as is shown by Table III., and by the occasional occurrence of cases at school after the return of the discharged case four clear weeks after discharge (not two weeks as is usual).

#### CONCLUSIONS

In cases in which the patient can have a bedroom to himself home isolation is justified: (a) by the non-exposure of the patient to cross-infections and his relatively low infectivity at the end of the isolation period: (b) by the large saving in the cost of hospital isolation of the patients and the use for other purposes of the increased hospital accommodation made available.

### THE DISTRICT MEDICAL SERVICE UNDER THE POOR LAW

#### I

A CONTINUITY of principle may be observed in English poor-law legislation. The Poor Law Act, 1930, requires the council of every county and county borough "to set to work all such persons as have no means of maintaining themselves," but also "to provide such relief as may be necessary for the lame, impotent, old, blind and such other persons as are poor and not able to work." This differentiation between able-bodied and non-able-bodied extends as far back as an Act of 1388 under which differing treatment was laid down for "beggars impotent to serve" and "those able to serve or labour." The distinction is repeated in an Act of Henry VIII. which has reference to "every aged, poor and impotent person" and "every sturdy vagabond." The Poor Law Act of Elizabeth provided for the raising of money by the overseers, inter alia, "for relief of the lame, impotent, old, blind and such other among them being poor and unable to work" almost the wording of the Act of 1930.

Throughout this period, and until later, the relief was in respect of destitution and not sickness, and the various Acts of Parliament, including that of 1834, did not specifically provide for medical relief. The poor-law commissioners, reporting in 1840, said:—

"Previously to the passing of the Poor Law Amendment Act there existed no statute expressly authorising the parish authorities to provide medical relief for the poor. In the statute of Elizabeth no allusion to such relief is to be found and in the subsequent Acts of Parliament relating to the poor the legislature has been entirely silent on the subject. In the absence of any positive provisions medical aid has nevertheless been supplied to the poor, and, as might have been expected from the uncontrolled discretion of the parish officers of 15,000 districts, the arrangements for the purpose have been almost infinitely various."

The commissioners who reported in 1834 on the Administration and Operation of the Laws of the Relief of the Poor made scanty reference to medical relief, remarking as regards outdoor relief: "On the whole, however, medical assistance seems in general to be adequately supplied and economically, if we consider only the price and amount of attendance." Thus, though there was an absence of direct statutory provision, medical relief had become by 1834 an established practice to a wide extent, and in certain districts medical assistance is said to have been given to practically "the whole mass of the labouring population," such assistance being given under contract of the overseers with a local surgeon.

The recognition of a poor-law medical service is indicated by the terms of the letter addressed to the recently constituted boards of guardians by the commissioners on Jan. 31st, 1837, which stated: "The consideration of the Guardians, on their first day of meeting, will be bestowed on the arrangement of the districts for the administration of medical relief, and the appointments of the medical officers." The introduction of the term "district medical officer," and the first obligatory requirement to appoint fit persons to such office, appears to date from the General Order (Consolidated) 1847, while security of tenure was granted under the Medical Appointments Order, 1857.

#### II

The conditions prevailing in the poor-law medical service a century ago gave rise to considerable dissatisfaction. The matter is discussed in the report from the Select Committee (1838) on the Poor Law Amendment Act and in the report of the poor-law commissioners on the Continuance of the Poor Law Commission (1840). For the former evidence was taken from a number of medical witnesses, medical officers engaged in poor-law duties and others as Dr. Kay and Sir Astley Cooper, and it is of interest to recall that evidence was given on behalf of the British Medical Association, then in its infancy, by Dr. Farr who was a member of the council. For the latter report evidence was obtained from the assistant commissioners throughout the country to whom a questionnaire was submitted and a detailed memorandum was also received from the British Medical Association.

Dissatisfaction arose from various sources—undue size of districts, inadequacy of remuneration, the method of appointment, insufficient qualification. In several unions the practice prevailed of submitting the appointment, which was a yearly contract, to competitive tender, and it might go to the lowest bidder: apart from inherent objection to this system it caused grave dissatisfaction to the profession by encouraging the introduction of rivals who accepted the contract at a low figure in order to obtain a footing in the district. On this point Sir Astley Cooper said: "If a medical man comes into the district and says 'I will attend for £50 where the resident practitioner has offered to attend for £100' there can be nothing more horrible or more degrading to the profession or more injurious to the poor." On qualifications there was dissatisfaction as officers might be, and were, appointed who possessed no surgical diploma. Remuneration was evidently a thorny problem: it was provided by salary, by payment per case, or by a combination of these methods which allowed a salary for those on a permanent list and a payment per case for others: Dr. Farr estimated the average remuneration to be about 3s. 3½d. per case in the provinces and it was stated to be 1s. 5d. in the metropolis. The question of medical extras aroused comment, especially in regard to the payment per case under which system there might be motive for increasing the number of cases by encouraging applications for medical relief through "recommending extra sustenance in the form of meat, ale and wine." Passing reference is made to whole-time appointments which appear to have been first instituted in Leighton Buzzard where a salaried officer, prohibited from private practice, attended exclusively on the poor, including the workhouse appointment: this appears to have been the solitary instance but it impressed the poor-law commissioners as definitely advantageous.

Interest attaches to the memorandum submitted by the British Medical Association as a matter of history and in view of some recent developments in the district medical service. Apart from other matters the Association recommended two alternative plans for remuneration. The first was by fixed salary adjusted to the average number of cases and the average number constantly on the sick list, density of population, &c., "the average charge for one person constantly on the sick list (or for attending 365 days of illness) should be about £5 5s. 0d., or for each case of illness 7s. 6d." The second plan is of special interest as suggesting in 1839 an open choice method for the poor-law population. The memorandum reads:

1st. Let a list be formed of all legally qualified practitioners in the district or Union who have been in practice a given time (from three to five years) and who have resided in the district at least one year, who are willing to attend the paupers if called upon.

2nd. Let annual or half-yearly tickets be given to all the poor on the pauper list, or to those not on the pauper list, whom the Guardians may consider proper objects for medical relief. Let these tickets bear a certain value, according to the locality, &c.; let the poor deposit their tickets with the medical practitioner whom they shall select for their attendant. The acceptance of the ticket would guarantee his attendance for the year, or half-year, as the case might be, and he would be paid the amount of his tickets quarterly.

3rd. Or, a salary being fixed, as the amount of remuneration for any district, it might be divided according to the number of tickets each medical man might hold.

In cases where the Guardians might find it necessary to give a ticket for attendance to a person actually sick, as in the instances of those not belonging to the parish, the ticket should bear a higher value.

It is acknowledged that there are several strong objections to the above plan; it would greatly lessen the value of parochial appointments, and it is feared that, in districts where there were many medical men, the responsibility, by being so much divided, would be also lessened. Any plan of medical superintendence could not be so effectually carried out, and the registers of the cases of disease would not be so carefully attended to; still the plan is worthy of a trial.

This is an example of history repeating itself.

The Select Committee did not make very definite recommendations regarding medical service beyond the following resolution:

"That the administration of medical relief to the poor has been in many respects amended under the new law, but that there is still room for further improvement; that the medical districts, in some instances, seem to be inconveniently large; that they should be of such a size as to admit an easy access of the medical man to his patients; and that the remuneration should be such as to insure proper attention and the best medicines."

The report of the poor-law commissioners recommended a fixed remuneration such as would afford a payment per case of 6s. or 6s. 6d. for those on a permanent list and not exceeding 10s. for those not on such list, it being emphasised, however, that in the second category medical relief might be granted by way of loan which would encourage recipients to make prior arrangements by means of sick-clubs or friendly societies.

While it is of interest and advantage to recall this former history it must be remembered that there is little true analogy with present-day conditions; infectious disease was rife, but there were no isolation hospitals; tuberculosis was rife, but there were no sanatoria; the voluntary hospital system was but imperfectly developed, and treatment was almost entirely domiciliary.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE

Surg. Lt.-Comdrs. J. G. Maguire to *Adventure*, and F. W. Besley to *Victory* for R.N. Hospl., Haslar.

Surg. Lts. G. A. Lawson to *President* for three months' course, and G. S. Thomas to *Ganges* and for Shotley Sick Quarters.

Sir Gilbert Blane Gold Medals have been awarded to Surg. Capt. D. H. C. Given, R.N., retired, and Surg. Comdr. M. B. Macleod, R.N., Assistant to the Director-General in the Medical Department.

### ARMY MEDICAL SERVICES

Col. J. H. Campbell, D.S.O., late R.A.M.C., having attained the age for retirement, is placed on ret. pay.

Lt.-Col. and Bt. Col. R. M. Dickson, O.B.E., from R.A.M.C., to be Col.

Col. Dickson joined the R.A.M.C. in 1908 and was an acting lieutenant-colonel in 1919. His stations have included Glasgow, Lucknow, Ferozepore, Lahore, London, and Ceylon, where he is senior medical officer. He was in France from 1914.

### ROYAL ARMY MEDICAL CORPS

Lt.-Cols. A. H. Bond and S. J. A. H. Walshe, D.S.O., having attained the age for retirement, are placed on ret. pay.

Majs. to be Lt.-Cols.: J. Walker, M.C., S. Arnott, and T. L. Fraser, O.B.E.

Maj. C. P. Chambers and Capts. D. C. McC. Ettles and R. R. Leaning were successful in the examination (in written subjects) of officers with a view to promotion in the R.A.M.C.

### SUPPLEMENTARY RESERVE OF OFFICERS

Lt. G. F. E. Ramsden to be Capt.

### ARMY DENTAL CORPS

The War Office announces that applications are invited from dental surgeons for appointment to six commissions in the Army Dental Corps. Candidates selected will be required to present themselves in London for interview and physical examination about the middle of July next. They must be registered under the Dentists Acts or Medical Acts, and be not over the age of 28. In the first instance short-service commissions are for six years, at the end of which they may either retire with a gratuity of £1000 or apply for permanent commissions. Full particulars and form of application may be obtained from the Director, Army Dental Service, War Office, S.W.

### TERRITORIAL ARMY

Capt. C. D. Bruce to be Maj.

Capt. G. Green resigns his commn.

### ROYAL AIR FORCE

Wing Comdr. G. H. H. Maxwell to R.A.F. Station, Manston, for duty as medical officer.

Flight Lt. P. H. Perkins is promoted to the rank of Squadron Leader.

### DEATHS IN THE SERVICES

Fleet Surgeon ROBERT FREDERICK YEO, R.N. ret'd., who died on June 15th at Alverstoke, Hants, qualified L.R.C.P.I. in 1875 from Trinity College, Dublin. In the following March he entered the Navy as surgeon and had risen to the rank of fleet surgeon in 1896. During operations in Egypt in 1882 he received the approbation of the Admiralty. Later he became surgeon of Malta Hospital.

Colonel JOHN POWELL, D.S.O., late R.A.M.C., who died on June 8th at Iffley, Oxford, in his 60th year, was the son of Mr. John Clarke Powell of Dublin. He was educated at Cambridge and Trinity College, Dublin, qualifying in 1899, and entering the R.A.M.C. in the following year. In September, 1909, he was attached to the Egyptian Army for seven years. From 1914-18 he served in Egypt and France, was thrice mentioned in dispatches, and awarded the D.S.O. and other distinctions. He was an all-round sportsman, proficient at tennis, swimming, and shooting.

## CORRESPONDENCE

## PRONTOSIL IN STREPTOCOCCAL INFECTIONS

To the Editor of THE LANCET

SIR,—In view of the promising results reported in THE LANCET of June 6th it is very desirable to complete our clinical trial of Prontosil treatment in streptococcus-infected cases as quickly as possible; and subsequently—if laboratory tests seem to warrant it—to undertake a similar thorough trial with the related substance *p*-aminobenzenesulphonamide in a similar large group of puerperal fever cases, in order that the experience gained with both agents may become generally available without delay.

To this end we would ask for the coöperation of private doctors, hospitals, and public health authorities in sending to us puerperal fever cases which are known to be, or likely to be, infected by hæmolytic streptococci. Needless to say we do not want old-standing cases of parametritis, white leg, &c., nor do we suggest the removal of moribund cases to hospital. Acute early cases seem likely to benefit most by the treatment. To secure admission it is only necessary to communicate with the resident medical officer by telephone (Riverside 6081/2), giving a few particulars of the case.

I am, Sir, yours faithfully,

LEONARD COLEBROOK.

Bernhard Baron Memorial Research Laboratories,  
Queen Charlotte's Hospital, W., June 12th.

## EARLY AMPUTATION FOR SEVERE INJURY

To the Editor of THE LANCET

SIR,—With reference to an annotation under this heading in your issue of May 30th (p. 1249), it was at a meeting attended by many members of the R.A.M.C. that Prof. A. K. Henry, head of the surgical unit at the Egyptian Faculty of Medicine, Cairo (Kasr-el-Ainy Hospital), formulated his preliminary ideas and results. Unfortunately, owing to a crowded programme, there was no time to prolong the discussion or emphasise the revolution these ideas should cause in the practice of advanced dressing stations, field ambulances, and first-line casualty clearing stations. Abdulsamie's paper gives a very clear description of the ideal treatment and I maintain that the case for "immediate" amputation is proved.

Your call for further observations is certainly well timed, and I hope that officers of the fighting services will be able to give their views and opinions. At the commencement of the last war I was with the French VIIIth Army and I was greatly hampered by the official attitude that an amputated patient was an expense to the State. I am happy to remember that with the British forces no consideration of future pensions was allowed to interfere with our practice; but with the vastly accelerated means of transport in late years I am afraid there may be a danger of trusting to rapid evacuation of severely wounded instead of immediate attention, that is "amputation," to the severe crushes in the first-line units.

I am, Sir, yours faithfully,

H. STIVEN,

Retd. Lieut.-Col., R.A.M.C.

Demerdache Hospital, Cairo, June 9th.

## THE PHANTASY OF MURDER

To the Editor of THE LANCET

SIR,—I understand that the murderer of a woman in a Clapham flat has had his appeal dismissed and as this matter is no longer sub judice it is permissible to draw attention to a fact that has long been

neglected. This man made a confession of having committed another murder three years ago, but was acquitted. This acting a phantasy of murder indicates the future murderer but it is treated by the judicial authorities with off-handedness.

This is by no means the first case in which a murderer has made a false confession and has had it disregarded by the police but has proceeded to commit a real murder. Some years ago a young man confessed to the police in Dartford that he had killed a boy. His confession was found to be false and he was discharged and told not to be so foolish. A few days later he took a knife and with it killed a girl on Dartford Heath. I have recently pointed out that this false confession of murder is an early symptom of schizophrenia (Clin. Jour., May, 1936), but there is little opportunity to confirm this belief. I would suggest, however, that the matter is proved sufficiently for all persons making false confessions of murder to be recommended by the judicial authorities for medical examination by a trained psychiatrist. If this is done some unfortunates may avoid being murdered and some schizophrenics avoid hanging.

I am, Sir, yours faithfully,

Harley-street, W., June 16th.

CLIFFORD ALLEN.

## AVITAMINOSES

To the Editor of THE LANCET

SIR,—In a recent paper<sup>1</sup> Loewenthal, working in Uganda on cases of vitamin-A deficiency, summarises the signs and symptoms which have so far been ascribed to this deficiency, and divides them into those which he accepts and those of which he is doubtful, as follows:—

## ACCEPTED

*Eye manifestations.*—Xerophthalmia; keratomalacia; night-blindness.

*Skin manifestations.*—Harsh dryness of the skin, with tendency to papular eruption. Nails lose lustre and become striated and brittle.

## DOUBTFUL

- |                             |                         |
|-----------------------------|-------------------------|
| 1. "Neuritis."              | 5. General infections.  |
| 2. "Sore mouth"; perlèche.  | 6. Cutaneous sepsis.    |
| 3. "Itchy" scrotum.         | 7. Changes in the hair. |
| 4. Diarrhoea and dysentery. |                         |

With regard to the first three of the "doubtful" group, a paper by Pallister and myself<sup>2</sup> proves fairly conclusively, if not absolutely, that they are due to a deficiency of the P-P (pellagra-preventive) factor; it is significant that Loewenthal states that it is now generally believed that perlèche is due partially to an attack by fungus on the mouth, while Pallister and I found similar evidence of fungus attacking the scrotal skin in some of our cases and that a fungicide such as Whitfield's ointment was of value in treatment. Fungus in these cases seems to me to play a similar part to that of sun exposure in pellagra, having an excessive effect on the skin of those people who have deficiency of the P-P factor in their food. The diarrhoea and dysentery so long associated with pellagra may well be, as far as my experience of a few cases of characteristic pellagra in Malaya goes, causative factors in producing pellagra rather than effects of pellagra. If these arguments can be confirmed, then pellagra throughout the world may be finally accepted as due to deficiency

<sup>1</sup>Loewenthal, L. J. A.: Ann. Trop. Med., 1935, xxix., 467.

<sup>2</sup>Landon, J. V., and Pallister, R. A.: Trans. Roy. Soc. Trop. Med. and Hyg., 1935, xxix., 121.

of the P-P factor, and the disease we have described in Malaya may be accepted in turn as pellagra. I have not in Malaya seen any evidence that Loewenthal's "doubtful signs," Nos. 5, 6, and 7, are due to deficiency either of vitamin A or the P-P factors specifically.

Whether the name vitamin B<sub>2</sub>, vitamin G, or P-P factor is used seems not to matter at present if one recognises that a chemical substance present in yeast, and present in many protein foods, which survives autoclaving, will cure these pellagrous conditions in their early stages, and that in all communities that subsist chiefly on carbohydrate food a reasonable amount of protein food containing the P-P factor is required to balance, possibly to detoxicate, the carbohydrate. The biochemists may wish to confine the term vitamin B<sub>2</sub> to a particular chemical in food necessary for the growth of rats, or to subdivide it, or may even wish to discard it altogether; it is for that reason that I have used the name P-P factor in this letter.

I may mention here the other chemical substance, stated to be present in autoclaved yeast, which was found somewhat successful by Lucy Wills<sup>3</sup> in treating tropical macrocytic anæmia; personally, I have not found yeast or Marmite alone very beneficial in tropical macrocytic anæmia in Malaya. I believe that the treatment of the many factors concerned in the causation of such anæmia, certainly including malnutrition, is essential. It is of significance that the involvement of the central nervous system which may occur in macrocytic anæmias closely resembles that seen in cases of deficiency of the P-P factor; and nutritional peripheral neuritis, or beri-beri, may prove to be a closely related nervous disease so that the vitamin-B complex may ultimately be united in a whole once more.

I am, Sir, yours faithfully,

J. V. LANDOR.

General Hospital, Singapore, May 21st.

#### COMPLETE TRANSPOSITION OF THE VISCERA

To the Editor of THE LANCET

SIR,—I am anxious to obtain information about this condition, which I believe to be inherited as a Mendelian recessive, and shall be much obliged if anyone who sees a case will send me the following data. Are the parents blood relations or not? If they are blood relations, are they first cousins, and, if not first cousins, what is their exact relationship? I should also like to know the number and sex of the normal brothers and sisters, the sex of the patient, whether the parents are normal, and whether there is a history of a previous case in the family.

I am, Sir, yours faithfully,

E. A. COCKAYNE.

91A, Harley-street, London, W., June 11th.

#### AN OLD MEDICAL BENEVOLENT SOCIETY

To the Editor of THE LANCET

SIR,—Every medical man and woman is in sympathy with the work of the Royal Medical Benevolent Fund which completes its centenary this year and is the senior medical charity in this country. I should like, if I may, to bring to the notice of your readers an even older benevolent medical society which is not a charity but a provident association, the members of which insure themselves against ever needing the help of the Royal

Fund. The Essex and Herts Benevolent Medical Society was instituted in 1786 and has the Marquess of Salisbury as president. It is available for medical men residing in the two contiguous counties and is intended primarily for the assistance of widows and orphans; if from sickness, infirmity, or other unavoidable misfortune a member becomes totally incapacitated he can petition the court of the district in which he resides, and such cases have been generously helped. It astonishes me how few medical residents in Essex and Hertfordshire have taken advantage of the comfort it must be to many of them to feel that if they are taken their widows and children will have such consideration—and for the trifling subscription of one guinea a year.

I am, Sir, yours faithfully,

F. L. NICHOLLS.

Fulbourn, near Cambridge, June 11th.

#### GASTRO-ENTEROSTOMY IN INFANCY: TWENTY YEARS AFTER

To the Editor of THE LANCET

SIR,—In 1918 notes were published<sup>1</sup> of a case of Gastro-enterostomy at six weeks for Pyloric Stenosis; the patient recovered, and a few days ago he called to see me, now a man in his twentieth year. I did not make any clinical examination, but he stated that he was in perfect health, and to all appearances this is true. He is 6 feet in height and weighs 13 stone. I suggested to him that he should have an X ray examination of the stomach, as I wondered whether the pylorus had resumed its function, or whether the stomach still emptied through the stoma made at operation. From the report of the radiologist, Dr. H. Franklyn, it seems that stomach contents still pass entirely through the stoma. Gastro-enterostomy, for congenital pyloric obstruction, has now been superseded by a simpler operation. It is probable that not many persons are alive who have grown up from infancy with this condition, and I thought it would be of interest to report the progress of this case after so many years.

I am, Sir, yours faithfully,

Bradford, June 15th.

T. JASON WOOD.

#### ZINC IONISATION FOR HAY-FEVER

To the Editor of THE LANCET

SIR,—I read with some surprise the report in the lay press of a new 99 per cent. cure for hay-fever by intranasal ionisation, emanating from one of the London centres of medical education. I have been using the treatment there referred to since 1925, described my method first in the *British Medical Journal* in June, 1931, and reported a further series of results in 91 cases in April, 1932, in the same place, bearing out my original hopeful prognosis. In March, 1935, in an article in the *Medical Press and Circular*, I pointed out that in 5 per cent. of cases successfully treated in one year, there was failure in the succeeding year. Much depended on the selection of cases and the varying intensity of the symptoms from year to year. In my own experience of 600 cases personally treated I can claim but 60 per cent. "relief"; and though this is of considerable value to the patient, it is only relief, not, except on the rarest occasion, a permanent cure.

I am, Sir, yours faithfully,

PHILIP FRANKLIN.

Weymouth-street, W., June 16th.

<sup>3</sup> Brit. Med. Jour., 1931, i., 1059.

<sup>1</sup> THE LANCET, 1918, i., 804.



## PARLIAMENTARY INTELLIGENCE

### THE MIDWIVES BILL IN COMMITTEE

ON June 11th the Midwives Bill was further considered by Standing Committee C. of the House of Commons.

#### Compensation

On Clause 5 (Compensation to midwives ceasing or required to cease practice) an amendment by Sir KINGSLEY WOOD extending the provision of the clause to midwives who during 1935 gave notice of intention to practise was agreed to.—The MINISTER further moved a series of amendments designed to deal with the question of compensation paid to a midwife by a local authority. As drafted, he said that the clause provided that compensation payable to a midwife should be calculated with reference to her net emoluments during her period of work in the area of the authority up to a maximum of three years. The amendments were designed to secure that the calculation should be on the basis of the midwife's average net emoluments during a period up to three years in whatever area she might have worked. In as much as the local authority to whom the midwife surrendered her certificate would pay her the whole of her compensation, arrangements would be made by which such local authority could recover the appropriate proportion of such compensation due from other local authorities in whose areas the midwife might be working at the time her certificate was surrendered.—The amendments were agreed to.

Captain ELLISTON moved an amendment, the object of which was to allow a midwife to select either a three-year or a five-year period as the basis for the payment of her compensation.—Mr. SHAKESPEARE thought they ought to trust local authorities to act in a reasonable spirit.—Sir F. FREMANTLE urged the Minister to approach this question sympathetically. There was a danger, he said, that if the elderly midwives could not be assured of adequate compensation they would be compelled to carry on their work.—Sir KINGSLEY WOOD promised to look into the matter before the report stage.

Mr. PETHERICK moved an amendment providing that if any midwife was aggrieved by the refusal of an authority to pay her compensation under the clause, or by the amount of the compensation paid, she might appeal to the Minister whose decision should be final, or alternatively to a county court in accordance with the rules of court.—Sir KINGSLEY WOOD said he hoped the committee would not allow an alternative appeal but would decide in favour either of the Minister or the county court.—This amendment was withdrawn.—Mr. LUNN then moved an amendment providing that the appeal should be to the Minister whose decision should be final, which was agreed to.

Mr. KEELING said in the Bill as drafted midwives who retired voluntarily, or were required to retire from practice, were referred to as having been "removed from the roll." He did not think that such a phrase, which was ordinarily used in connexion with punishment for misconduct, should be employed in this connexion. Secondly, he thought it was desirable that there should be a potential reserve of trained midwives which could be drawn on in case of emergency, and such a reserve might be found among the retired midwives.—Mr. SHAKESPEARE said the Government did not anticipate any danger of a shortage of midwives.—Sir F. FREMANTLE thought it was a pity during the experimental stage of the Act to make a final decision and remove all these women from the roll.—Sir KINGSLEY WOOD said that where compensation had been paid for loss of office, if the person compensated returned to work the compensation paid would have to be returned. He did not anticipate that in any large number of cases under this Bill compensation would be paid back.—

Captain ELLISTON said that it was unfair that these retired midwives should be shut out permanently from working in their profession. The midwives felt strongly on the subject.—The amendment was withdrawn.

On the question that Clause 5 stand part of the Bill,

Mr. BATEY urged the Minister to reconsider the question of the word "net" in the case of midwives' annual emoluments. He thought they should simply take a three years' average.—Mr. M. BEAUMONT said that the Minister could not drop the word "net" because it was in the financial resolution. If the word "net" were taken out it would impose a charge. The term "net" meant the takings with all possible outgoings removed.—Sir KINGSLEY WOOD said in putting the word "net" in the Bill he was carrying out the suggestion of the Joint Midwifery Council. He did not think any serious difficulty would arise. When the Bill had passed he would lay down the general lines on which the authorities should work under this clause.

#### Prohibition of Unqualified Persons

On Clause 6 Mr. BATEY moved an amendment to exclude from the clause the exemption given to nurses registered under the Nurses Registration Act, 1919. He knew women, he said, who had been acting most successfully as maternity nurses for the past 20 years, but they had not bothered to register under the 1919 Act. This clause would take away their living.—Mr. SHAKESPEARE said the suggestion went contrary to the opinion expressed both by the Departmental Committee and by the Joint Midwifery Council. Those bodies were unanimous in stating that one of the great causes of mischief in the nursing of women in childbirth was the practice which had grown up in certain parts of the country of employing absolutely unqualified women in attendance during the ten days of the confinement. Doctors did not like the system, but it had never been found possible to abolish it. This clause was vital to the Bill. What it said was that no unqualified woman should attend a woman as a maternity nurse. As to exemption under the Nurses Registration Act he thought sufficient time had elapsed for the list to be fairly comprehensive.—Sir F. FREMANTLE said they had to recognise that there were not enough trained midwives to go round, especially in the more scattered areas of the country. It was therefore essential to allow the latitude given under this clause to registered nurses.—The amendment was rejected.

Mr. SHAKESPEARE said the intention of the clause was that a doctor should be able to employ nurses with general qualifications, and therefore he moved an amendment to limit the exemption under the clause to those nurses appearing on the general part of the Nursing Register. He also moved a consequential amendment dealing with the special case of institutions run by local authorities or others, and under this amendment discretion would be left to the medical officers in charge of the particular institution. The institutions affected by the amendment comprised any nursing home registered under the Nursing Homes Registration Act, 1927, or exempt from the operation of that Act under Section 6 thereof.—The amendments were agreed to and Clause 6 as amended was ordered to stand part of the Bill.

On the Second Schedule, Mr. SHAKESPEARE moved an amendment to enable a midwife who was practising in two or three areas to surrender her certificate to one local authority who would pay her compensation, and then the other authorities would make proportionate contributions according to the amount of work which the midwife had done in their respective areas.—The amendment was agreed to.

The committee stage being concluded the Bill as amended was ordered to be reported to the House.

## NOTES ON CURRENT TOPICS

## Importation of Scientific Apparatus

In the House of Commons on June 10th on Clause 8 of the Finance Bill Mr. MACLAREN moved an amendment to take away from the Import Duties Advisory Committee the discretionary powers as to the admission into this country of goods intended to be used in scientific research or for the purpose of advancing any branch of learning or art. The amendment, he said, was consistent with the idea of the clause which laid down that the exempted goods were not intended to be sold. These articles were not imported to compete against the production of anybody else. They were for the advancement of the intelligence of the community and therefore there should be no discretionary power left to any advisory committee.—Mr. SILVERMAN in supporting the amendment cited the case of a refugee with a German medical qualification, who was prevented under the existing régime in his own country from pursuing his professional activities there. He was allowed to come here with a temporary visa which, unless it was extended, would expire next week. When he entered this country six months ago he brought with him certain instruments about which he was quite properly challenged by the Customs authorities. He asked if he had to pay duty on them, and was told that he could bring them in provided he deposited a sufficient amount to cover the eventual duty if it was to be levied. He agreed to do so and deposited £150. That was six months ago, but the authorities had not yet made up their minds whether duty was leviable or not.—Mr. CHAMBERLAIN, Chancellor of the Exchequer, said that the effect of the amendment would be that an importer having established to the satisfaction of the Advisory Committee that he had fulfilled the two conditions under the clause would at once be able to demand the right of importation of these articles free of duty. That would be inconsistent with the provisions of the Import Duties Act and the duties which were laid upon the Advisory Committee in considering any application made to them. If the amendment were carried many articles which would fulfil the two conditions could be imported free of duty, although they could equally well be made at home. That would be contrary to the spirit of the Act.—Mr. A. BEVAN said that in this very special market it surely should be possible for people to buy scientific instruments where they wished. It was not desirable that they should hand over a monopoly for the making of scientific instruments to anyone in this country. It was a good thing that the makers of instruments here should have to compete with manufacturers in other parts of the world in order that our own scientific progress might be kept abreast of the rest of the world.—Mr. BENSON said that in the case of certain drugs, particularly organic drugs, the products of two firms might so far as could be ascertained be identical in quality, yet it might be known that they had quite different physical and theoretical effects. If an experimenter in this country decided that he wanted to experiment with a German drug, or if he felt that the German drug gave a better result, he would go to the Advisory Committee and ask for permission to import, explaining that the drug was for purely scientific investigation, and then under the second part of their instructions they would have to decide whether the importation was expedient. It was ridiculous to suggest that the Advisory Committee were capable of coming to a decision on matters of scientific experiment with the accuracy and precision that an experimenter could exercise.—After further debate the amendment was negatived by 217 votes to 135.

## River Pollution and Public Health

In the House of Lords on June 11th Lord GAINFORD moved the second reading of the Public Health (Drainage of Trade Premises) Bill. He said that the

principle of the Bill was to improve the purity of the streams and rivers of this country. It was based on the recommendations of a Joint Advisory Committee appointed in 1930 by the Ministry of Health. That committee recommended, first of all, that the local sanitary authorities in the country should take and dispose of trade effluents. They also recommended that traders should have a right to discharge their effluents into the sewers of the local sanitary authorities; that there should be regulations for the preliminary treatment of these effluents where necessary; that they should provide separate sewers, if necessary; and that the local sanitary authorities should have the right of access to traders' premises in order to inspect the effluents in regard to the poisonous matters which might have to be taken into their sewers. Further, they recommended that certain poisonous effluents should be excluded; that riparian interests should be protected, and that the Ministry of Health should have power to interfere where it was thought necessary in the interests of various authorities. Those recommendations had practically all been accepted in the provisions of this Bill. Examination of the recommendations had been made by a great number of parties interested in the purity of our rivers, including the Society of Medical Officers of Health, and all of the bodies consulted had agreed to them. The Ministry of Health had been consulted also as well as the Ministry of Agriculture and Fisheries, the Federation of British Industries, the County Councils Association, the Urban and Rural District Councils Association, and the Association of Municipal Corporations. He hoped that before the committee stage there might also be consultations with the London County Council and the Standing Joint Committee of the Metropolitan Borough Councils so that they might have their support in addition to that of the other bodies he had mentioned. By the passage into law of this Bill they would do something to improve the condition of the water-supply as well as to improve amenities.

Lord RITCHIE OF DUNDEE said he was afraid if this Bill passed unamended it would not have the effect desired. He was speaking on behalf of the dock and harbour authorities, many of whom were vitally concerned with questions relating to the purification of their waters and with obstructions caused to navigation through sewage effluents falling into those waters. The Port of London Authority had been gravely concerned for years at the condition of the water in the Thames. The difficulties which were very great would be increased under this Bill.—Lord MELCHETT said he thought that the measure was designed to improve existing conditions, and he hoped that it would receive a second reading.—The Earl of LISTOWEL said the London County Council was as anxious as anyone else to preserve the purity of streams and tidal waters, and welcomed the principle embodied in the Bill.—Viscount GAGE said the Government's attitude towards the Bill was one of sympathy, and they were glad to see the degree of unanimity which had been reached. Some further safeguards might be necessary on the committee stage.

The Bill was read a second time.

## QUESTION TIME

WEDNESDAY, JUNE 10TH

## Fire Prevention in Hospitals and Institutions

Mr. KELLY asked the Minister of Health whether recommendations had been made to hospitals and other institutions as to the prevention of and protection from fire; and whether any committee of experts had been appointed to deal with these dangers.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: No general recommendations have been issued by my Department, but attention is drawn to the importance of this matter when plans of buildings are being considered, or otherwise as occasion arises. My right hon. friend is not aware that any committee of

experts has been appointed to deal with safeguards against fires at institutions.

Mr. KELLY asked the President of the Board of Education whether he had received reports as to school buildings and their protection from fire; and what steps had been taken to issue recommendations on fire prevention to all schools, public and private.—Mr. OLIVER STANLEY replied: If in the course of inspection H.M. inspectors find that the safeguards against fire are inadequate the attention of the school authorities is called to the matter. The Home Office handbook, "Fire Precautions in Schools," has been brought to the notice of local education authorities and the governors and managers of schools recognised by the Board in the Board's Circular 1446, dated Jan. 20th, 1936.

#### Motor Driving Tests

Mr. McENTEE asked the Minister of Transport the number of men and women examined for the driving test up to the last available date; and the number that had failed.—Mr. HORE-BELISHA replied: Up to and including May 30th, 316,886 persons have been examined, of whom 57,594 failed to satisfy the examiners. From May 6th, 1935, since when separate records for men and women have been kept, to May 30th, 1936, the figures are:

Men examined	.. 234,827	Failed	.. 41,083 (17.4%)
Women "	.. 55,248	"	.. 14,094 (25.5%)

#### Wheat Reserve for War Emergency

Mr. LIDDALL asked the Minister for the Co-ordination of Defence what steps had been taken to build up in this country a reserve of wheat sufficiently large to meet any contingencies likely to arise in the event of war.—Sir T. INSKIP replied: The question of a sufficient wheat reserve will be considered by the committee which is now engaged in examining the whole subject of food supplies in time of war. At the present time, including the balance of the home crop, the wheat in public granaries and millers' stores, and flour in the hands of millers, bakers, and retailers, the effective stock of wheat and flour in this country is understood to be about equal to three months' consumption. This figure does not include wheat normally on passage, which might amount to a further month's consumption.

THURSDAY, JUNE 11TH

#### Surveys of Overcrowded Housing Conditions

Mr. GRAHAM WHITE asked the Minister of Health if the survey of overcrowded conditions, as defined by the Housing Act, 1935, had been completed; and if he could give some indication of the number of houses overcrowded and the number of persons concerned.—Sir KINGSLEY WOOD replied: Up to June 1st 1024 local authorities had submitted reports. The reports show that 6,431,464 houses were inspected, of which 247,884 were found to be overcrowded. These reports include 55 county boroughs, in which 1,902,149 houses were inspected and 71,600 were found to be overcrowded. Up to June 10th reports have been received from 1272 local authorities out of a total of 1536. These reports show that 7,893,399 houses were inspected, and 296,738 were found to be overcrowded, an average of 3.8 per cent. The reports received include most of the large centres of population and I do not think that the results are likely to be substantially affected when the outstanding reports which I have urged local authorities to submit forthwith are received.

#### Health Visitors and the Pre-School Child

Mr. JOEL asked the Minister of Health whether it was his intention that, in connexion with the visiting by health visitors of all children under the age of five who did not attend school, such visitation would affect all classes of the community; and, if not, how the scope of such visits would be limited.—Sir KINGSLEY WOOD replied: I have recently issued a circular on this subject. The question of visiting in any particular case is one within the discretion of the local authority, who will naturally take account of the extent to which to their knowledge the health of the child is already supervised.

#### Destruction of Human Food

Mr. WILSON asked the Minister of Health the cases brought to his notice in which, during the last 12 months,

food of any description fit for human consumption had been destroyed and, in each case, the reason for the destruction and the action taken by the department, either before the destruction or since; and whether it was intended to take further powers to prevent such destruction.—Sir KINGSLEY WOOD replied: No such cases have been brought to my notice as having occurred in England or Wales, and I do not consider that it is necessary to take steps to obtain further powers in the matter.

#### Midwifery Bill for Scotland

Mr. LEONARD asked the Secretary of State for Scotland if he proposed to present to Parliament a Midwifery Bill for Scotland; and, if so, when he would introduce it.—Lieut.-Colonel COLVILLE, Under-Secretary of State for Scotland, replied: Yes, Sir. It is the intention of my right hon. friend to introduce a Bill this session, but he is not yet able to announce a definite date. As the hon. Member is aware, the Scottish problem differs both in nature and extent from that in England, and in framing proposals my right hon. friend has thought it expedient to secure the fullest measure of agreement with local authorities and other interests concerned. Consultations to that end are actively proceeding.

#### Committee on Scottish Health Services

Mr. LEONARD asked the Secretary of State for Scotland when the report of the Committee on Scottish Health Services would be available.—Lieut.-Colonel COLVILLE replied: I understand that the report of the Committee on Scottish Health Services will probably be submitted to my right hon. friend by the end of this month. Publication will follow immediately the report is received.

MONDAY, JUNE 15TH

#### Destruction of Human Food

Mr. WILSON asked the Minister of Agriculture if he would state the cases brought to his notice in which, during the last 12 months, food of any description fit for human consumption had been destroyed, and in each case the reason for the destruction and the action taken by the department either before the destruction or since; and whether it was intended to take further powers to prevent such destruction.—Mr. ELLIOT replied: The only such cases that have been brought to my notice relate to certain heavy landings of highly perishable fish which the port markets were unable to absorb. The quantities of fish thrown back into the sea were about 4 or 5 tons of pilchards in November of last year, and about 60 tons of herrings in August and September of last year and in May of this year. The absence of the Italian market was mainly responsible for the destruction of the pilchards. As regards the steps which might be taken to deal with occasional landings of herrings surplus to the capacity of the markets, I would refer the hon. Member to the answer I gave on June 11th. As these cases occur only very exceptionally, the quantities involved in those I have mentioned amounting to not more than 0.01 per cent. of the landings of wet fish by British fishing vessels in England and Wales for the last 12 months, I do not think it would be possible to provide against them by legislation.

#### Physique of Recruits for Defence Services

Mr. EMMOTT asked the Prime Minister what percentage of the applicants to the recruiting offices last year were refused on the grounds that they were not physically fit; and what steps the Government proposed to take to raise the present level of the physique of the nation.—Mr. BALDWIN replied: The percentage for England, Scotland, and Wales is approximately 35. As regards the last part of the question, I would refer my hon. friend to Circular 1445 issued by the Board of Education in January last, from which he will see that in addition to giving close attention to the various health services, such as the School Medical Service and the Maternal and Child Welfare Service, it is the Government's policy to promote the development of physical education for children of school age and for persons no longer attending school.

Viscountess ASTOR asked the Prime Minister to bear in mind that children who attended nursery schools were

5 lb. heavier and were taller than other pupils entering the elementary schools, and that the latter were physically defective; and that the only way to put this right was through a proper system of open-air nursery schools.

Mr. JOHNSTON asked if the right hon. gentleman was aware that in addition to the 35 per cent. of recruits rejected as physically unfit, another 30 per cent. were rejected later as medically unfit. As there was genuine agreement on all sides of the House that something ought to be done to improve the nutrition of the people, would the Prime Minister provide an opportunity for discussing the matter?

Mr. BALDWIN said that if the question was raised it would be discussed. This was a matter which the Government now had in hand.

#### Nutritive Values of Foods

Mr. LENNOX-BOYD asked the Minister of Health whether he had any statement to make on the fact, quantitative and qualitative, in relation to the diet of the people, or any proposals to effect changes therein which might appear desirable in the light of modern advances in the knowledge of nutrition.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: These questions have been referred to the Advisory Committee on Nutrition. As regards the facts the committee have reported that the available data are insufficient and have recommended the collection of further particulars. The committee have, however, recently stressed the importance of milk as a food.

Mr. SANDYS asked the Minister of Health the present average daily consumption per head of milk; and, in view of the conclusions of the recent report of the Advisory Committee on Nutrition, what steps he proposed to take further to increase it.—Mr. SHAKESPEARE replied: The present daily consumption of liquid milk in this country is estimated at slightly less than half a pint per head. The Government accept the views expressed by the advisory committee as to the high value of milk as a food, and schemes for the provision of milk, either free or at

cheap rates, to mothers and children are now in operation. The Government will give consideration to the further development of these schemes, but this must await the general review of milk policy which will take place when the report of the Milk Reorganisation Commission is available.

Replying to Miss Horsbrugh, Mr. Shakespeare said that he fancied it was the fact that the half-pint per head included the milk supplied in schools.

TUESDAY, JUNE 16TH

#### Dietaries in Scottish Prisons

Mr. JOHNSTON asked the Secretary of State for Scotland whether he would give for each of the five rates of dietaries in use in Scottish prisons the approximate cost of the food supplied to the prisoners per day; and what steps, if any, he proposed to take to ensure that the law-abiding working classes should be at least as well fed as the inmates of prisons, whose diet was prescribed by the regulations approved in June, 1931, and amended in August, 1932, and March, 1933.—Sir GODFREY COLLINS replied: The approximate wholesale cost of the ingredients of the items in the Dietary Rates per person per day in 1935 is as follows:—

Rate I.	.. ..	4½d.	Rate IV.	.. ..	6½d.
" II.	.. ..	5d.	" V.	.. ..	8½d.
" III.	.. ..	5½d.			

The costs would, of course, be higher if the ingredients had to be purchased at retail prices. In view of these figures I am unable to accept the suggestion made in the last part of the question.

Mr. JOHNSTON asked if the right hon. gentleman had not been assured by his medical advisers in charge of these prisons that the prison population were better fed after a period in prison than they were when they entered.

Sir G. COLLINS said that not only was the dietary better, but the regular life they led and the work they did had some bearing on this point.

## MEDICAL NEWS

### University of Cambridge

The general board propose to establish a post of assistant director of research in medicine. The holder will work at Addenbrooke's Hospital and the laboratories of the university under the direction of the regius professor of physic. If the appointment is made it will be for an initial period of three years at £700 a year.

On June 12th the following degrees were conferred:—

M.D.—Charles Hill.

M.B., B.Chir.—H. F. Anderson, D. N. Matthews, and J. D. M. Jones

M.B.—C. A. Dowling.

B.Chir.—E. M. Darmady.

### Royal College of Surgeons of England

A meeting of the council was held on June 11th, with Sir Cuthbert Wallace, the president, in the chair. Prof. Einar Key, of Stockholm, was admitted an hon. fellow of the College, and the honorary college medal was presented to Dr. J. A. Murray, F.R.S. Mr. R. M. Vick was re-elected to the court of examiners, Mr. W. Sampson Handley was reappointed as representative of the College on the court of governors of the University of Sheffield, and Dr. John Beattie was appointed as representative on the British National Human Heredity Committee. The Hallett prize was awarded to Kenneth William Starr of the University of Sydney, and the Sir Gilbert Blane medals to Surgeon Captain D. H. C. Given and to Surgeon Commander M. B. Macleod.

Diplomas of fellowship were granted to the following:—

A. S. Wesson, M.R.C.P. Lond., Univ. Coll.; D. C. Price, M.B. Lond., St. Bart.'s; Jean M. Dollar, M.B. Lond., Royal Free; G. S. Seed, M.B. Leeds, St. Bart.'s and Guy's; N. S. I. Narasimhan, L.R.C.P. Lond., Madras and Guy's; A. G. Williams, M.B. Wales, St. Bart.'s; E. R. G. Passe, L.R.C.P. Lond., St. Thomas's; R. H. Young, M.B. Camb., St. Thomas's; C. F. Evans, L.R.C.P. Lond., Melb. and Edin.; K. H. C. Hester, M.B. Lond., Guy's; L. W. Lauste, M.B. Lond., St. Thomas's; A. L. Kenyon, M.B. Manch.; O. J. Vaughan-Jackson, B.M. Oxon., London; J. R. Blackburne, M.B. Lond., St. Bart.'s; G. H. C. Ovens, M.B. Lond., St. Mary's; W. M. Capper, M.B. Lond., St. Bart.'s; Alan Bowen-Davies, M.B. Camb., Guy's;

A. G. Cross, M.B. Camb., St. Mary's and London; Bodo Schlenburg, M.B. Cape Town, St. Thomas's and St. Bart.'s; Ralph Shackman, M.B. Lond., St. Bart.'s and Sheffield; S. A. Mian, M.B. Punjab, London; R. L. Benison, M.B. Camb., St. Bart.'s; A. E. De Sa, M.B. Bombay, Univ. Coll.; J. D. Fergusson, M.B. Camb., St. Thomas's; F. I. Evans, L.R.C.P. Lond., Camb. and Guy's; S. Y. Feggetter, M.B. Durh.; G. N. Sen, M.B. Calcutta, St. Bart.'s; S. M. Thompson, L.R.C.P. Lond., Leeds; J. G. Bonnin, M.B. Melb.; T. M. d'O'Fay, M.B. Edin., Sheffield; F. G. Fenton, M.B. Melb., Guy's; R. W. S. Fox, M.B. Melb., Guy's; C. H. W. Lawes, M.B. Sydney, St. Bart.'s; Ruby G. Sharp, M.B. Cape Town, Guy's; Jacob Sherne, M.B. Leeds, Guy's; W. H. M. Smith, M.B. Edin., Liverp.; K. W. Starr, M.B. Sydney; J. C. Stewart, M.B. Melb., London; R. R. S. Strang, M.B. Glasg., Univ. Coll.; and Gerald Townsley, M.D. Belf., Univ. Coll.

Diplomas of membership were granted to Gordon Williams and Walter L. Isaac, of St. Mary's Hospital, and diplomas in anaesthetics were granted jointly with the Royal College of Physicians to the following:—

R. A. Beaver, Donald Blatchley, Henry Canwarden, J. A. Carman, Bernard Coden, Phyllis F. L. Daplyn, C. J. M. Dawkins, M. M. Deane, Margaret L. A. Galbraith, Harry Grant-Whyte, V. A. Goldman, G. G. Havers, M. W. P. Hudson, I. C. James, I. D. Jones, R. N. Jones, Agnes W. O. Kennedy, F. B. Mallinson, Ruth E. Mansfield, P. J. Nagle, P. M. Overton, C. B. Picken, R. A. C. Rice, A. D. Woolf, and Tamsin M. Wynter.

The following examiners were elected for the ensuing year:—

**Dental Surgery.**—Surgical Section: Mr. C. E. Shattock, Mr. E. G. Slesinger, Mr. C. P. G. Wakeley, Mr. Reginald Vick, Mr. P. H. Mitchiner, and Mr. Basil Hume. Medical Section: Dr. R. A. Rowlands, Dr. R. A. Hickling, Dr. A. H. Douthwaite, and Dr. Ernest Bulmer.

**Primary Fellowship.**—Anatomy: Mr. P. N. B. Odgers, Prof. H. H. Woollard, and Prof. R. B. Green. Physiology: Dr. D. H. de Souza, Prof. Hamilton Hartridge, Prof. Samson Wright, and Prof. John Mellanby.

**Diplomas of L.R.C.P., M.R.C.S.—Elementary Biology:** Mr. A. J. Grove, Mr. A. E. Ellis, Mr. W. A. Cunningham, and Mr. S. R. B. Pask. **Anatomy:** Mr. E. P. Stibbe, Prof. Lambert C. Rogers, and Dr. A. J. E. Cave. **Physiology:** Prof. A. S. G. J. McC. Huggett and Prof. Samson Wright. **Midwifery:** Mr. A. C. Palmer, Mr. Victor Lack, Dr. Malcolm Donaldson, and Mr. Trevor Davies. **Pathology:** Prof. James McIntosh, Dr. W. G. Barnard, Mr. Robert Davies-Colley, and Mr. B. W. Williams.

**Diploma in Public Health.**—Part I.: Prof. C. C. Okell. Part II.: Dr. James Fenton.  
**Diploma in Tropical Medicine and Hygiene.**—Major-General W. P. MacArthur and Dr. Hamilton Fairley.  
**Diploma in Ophthalmic Medicine and Surgery.**—Part I.: Mr. Leighton Davies and Mr. Affleck Greeves. Part II.: Mr. Foster Moore.

**Diploma in Psychological Medicine.**—Dr. F. L. Golla.  
**Diploma in Laryngology and Otology.**—Part I.: Mr. E. Musgrave Woodman and Mr. Sydney Scott. Part II.: Mr. T. B. Layton.

**Diploma in Medical Radiology.**—Part I.: Prof. J. M. Woodburn Morison. Part II.: Dr. Douglas Webster.  
**Diploma in Anaesthetics.**—Dr. H. E. Gaskin Boyle.  
**Diploma in Child Health.**—Dr. A. G. Maitland-Jones.

The posts of resident medical officer and house surgeon at the General Infirmary, Salisbury, were approved for recognition for the six months' surgical practice required of candidates for the final examination for the fellowship.

#### University of Oxford

Dr. H. A. B. Whitelocke and Dr. Arthur MacNalty have been elected to the board of the faculty of medicine by the general medical electorate.

#### University of Bristol

At recent examinations the following candidates were successful:—

##### FINAL EXAMINATION FOR M.B., CH.B.

**Section II.**—Senta Alkan, Bruno Isserlin (with distinction in surgery and obstetrics), J. S. W. Little, and Ernst Philipp.  
**Group I.**—Ursula G. Hewitt (with distinction in obstetrics).

##### FINAL EXAMINATION FOR L.D.S.

J. G. Coates, R. A. Hilton, Thomas John, C. L. Read, and A. J. Staple.

#### Medical Art Society

The private view of the second annual exhibition of this society will be held at 1, Wimpole-street, London, W., on July 1st from 2-6 p.m. The exhibition will be open during the same hours (except on Saturdays) until July 14th.

#### National Institute for the Deaf

In opening the new headquarters of the institute at 105, Gower-street, W.C., on June 11th, the Duke of York was able to announce that the Pilgrim Trust had promised £2000 to the jubilee appeal fund. The money is to be used to reduce the debt on the new buildings.

#### North Kensington Women's Welfare Centre

On Thursday, June 25th, at 8.30 p.m., at the centre (12, Telford-road, W.), Dr. Mary Redding will give a lecture demonstration on the theory and practice of contraception. Applications for tickets should be made to the secretary of the centre in advance. The lecture is open only to practitioners and medical students.

#### University College Hospital

A Bilton Pollard fellowship of an annual value of £650 has been founded for men students who have held a resident appointment at this hospital. Candidates must be members of the Royal College of Physicians of London or fellows of the Royal College of Surgeons of England and must declare their intention of practising in medicine or surgery. Applications should be sent to the secretary of the hospital not later than June 25th.

#### Fellowship of Medicine and Post-Graduate Medical Association

The following week-end courses have been arranged for July: children's diseases at the Princess Elizabeth of York Hospital (4th and 5th); heart and lung diseases at the Victoria Park Hospital (11th and 12th). An all-day course in proctology will be given at St. Mark's Hospital from the 6th to the 11th, and afternoon courses will be held in dermatology at the Blackfriars Skin Hospital (13th to 25th), and in urology at the All Saints' Hospital (July 13th to August 1st). On Monday, June 29th, at the Royal Westminster Ophthalmic Hospital, Mr. G. G. Penman will give a demonstration on fundi of medical interest at 4.45 p.m., and on Wednesday, July 1st, Mr. C. L. Gimblett will lecture on some points in medical ophthalmology at 5 p.m. On Tuesday, July 7th, at 8.30 p.m., at the in-patient department of the West End Hospital for Nervous Diseases, Mr. Lindsay Rea will give a demonstration on fundus oculi. Further information may be had from the secretary of the fellowship at 1, Wimpole-street, W.

#### Royal College of Surgeons in Ireland

Mr. Adams Andrew McConnell has been elected president, and Mr. William Doolin vice-president of the College. Mr. McConnell is a graduate of Dublin University and is senior surgeon to the Richmond Hospital; he specialises in the surgery of the brain and nervous system. Mr. Doolin is a graduate of the National University and is surgeon to St. Vincent's Hospital and to the Children's Hospital, Temple-street, Dublin.

#### British Postgraduate Medical School

On July 9th, 13th, and 16th, at 3.30 p.m., Mr. V. B. Green-Armytage will lecture at this school on gynaecology and midwifery in the tropics. Applications for tickets should be sent to the dean of the school, Ducane-road, London, W.12.

#### Handicrafts of the London Tuberculosis Dispensaries

An exhibition and sale of handicrafts made by the students attending classes at tuberculosis dispensaries in London will be held at the Carpenters' Hall, Throgmorton-avenue, E.C., on Wednesday and Thursday, June 24th and 25th. The hon. secretary is Mrs. William Brand, 8, Christ Church-place, Epsom, Surrey.

#### King's College Hospital

The Duchess of York, accompanied by the Duke, will open the completion of the nurses' home at this hospital on Nov. 4th, and will receive purses towards its cost which, including equipment, will amount to £30,000.

Lord Hambleden has been elected chairman of the committee of management of this hospital in succession to the late Earl Beatty.

#### Exhibition of Inventions

The twelfth International Exhibition of Inventions arranged by the Institute of Patentees will be held in the Central Hall, Westminster, from Sept. 30th to Oct. 10th, and the Northern Exhibition of Inventions in the St. George's Drill Hall, Newcastle-upon-Tyne, from Nov. 25th to Dec. 5th.

#### Royal Medico-Psychological Association

The ninety-fifth annual meeting of this association will be held from July 1st to 3rd at Folkestone under the presidency of Dr. M. Abdy Collins, who will give an address on the law and the present position of psychiatry. The second day of the meeting will be devoted to a discussion of the manic-depressive psychoses, at which papers will be read by Dr. A. J. Lewis, Dr. H. Tómasson, Dr. T. J. Hennelly, Dr. E. T. O. Slater, and Dr. A. Glen Duncan. At the last session Dr. F. L. Golla, Prof. W. Mayer-Gross, and Dr. Arthur Guirldham will read short papers. The secretary of the association is Dr. Reginald Worth, Springfield Mental Hospital, Tooting, London, S.W.17.

#### Botanical Therapeutics

In the course of a Chadwick lecture on plant pharmacology and medical practice, delivered in the Chelsea Physic Garden on June 11th, Sir William Willcox said that plant products rarely act as tissue poisons. For example quinine, which contains a quinoline nucleus and therefore might well be toxic to the liver, had no toxic effects when carefully used. In the chemical laboratory conditions were very different, and many of the modern artificially synthesised drugs proved to be liver and tissue poisons. At the same time it must be remembered that some of the most powerful therapeutic substances and poisons—e.g., aconitine, strychnine, quinine, hyoscyne, morphine, and cocaine—are derived from plants. Sir William strongly advocated a smaller dosage of morphine and its derivatives: in many conditions, including renal and hepatic disorders, doses of gr. 1/30 were better than those within the official limits (gr.  $\frac{1}{4}$ – $\frac{1}{2}$ ). More careful adjustment of dosage would give better results and involve less risk of addiction. Hyoscyne, too, could often be used more effectively and more safely in smaller quantities, such as gr. 1/400 instead of the ordinary gr. 1/200–1/100. On the other hand some plant products should sometimes be given more freely than is usual—e.g., digitalis in auricular fibrillation and sodium salicylate in acute rheumatism.



**St. Mark's Hospital, London**

On June 11th Lord Harewood laid the foundation-stone of the nurses' home at this hospital which is to be the first stage of a big reconstruction scheme. The home is to accommodate 50 nurses and 27 maids, and it is afterwards proposed to increase the number of beds in the hospital to 95, to provide a second operating theatre, and to enlarge the cancer research laboratories and the out-patients' and X ray departments. Approximately £40,000 is still needed to complete the work.

**Rehabilitation of Persons Injured by Accidents**

The Home Secretary, the Minister of Health, and the Secretary of State for Scotland have appointed Dr. J. F. E. Prideaux, an assistant director of medical services at the Ministry of Pensions, to be a member of the Inter-departmental Committee appointed last April to inquire into the arrangements made in this country for the restoration of the working capacity of persons injured by accidents.

**Worthing Hospital**

Work has been begun at this hospital on the erection of a maternity home at a cost of £13,840, and the contract has been signed for the building of a children's ward. The governors are considering the adoption of the federated superannuation scheme for nurses and hospital officers. Mrs. Arthur Lloyd, of Washington, has promised to give the hospital a deep X ray therapy apparatus. There is an excess of expenditure over income of £4206, and though Worthing has now a population of nearly 60,000, regular subscribers to the hospital number only 600.

**Vacancies**

For further information refer to the advertisement columns

*All Saints' Hospital for Genito-urinary Diseases, Austral-street, West-square, S.E.*—Hon. Pathologist.  
*Ashton-under-Lyne District Infirmary.*—H.S., at rate of £150.  
*Bedford County Hospital.*—First H.S., at rate of £155.  
*Birmingham and Midland Eye Hospital.*—H.S., at rate of £130.  
*Birmingham City, P.H. Dept.*—Two Res. Asst. M.O.'s, each £400.  
*Birmingham, Ear and Throat Hospital.*—Second and Third H.S., each at rate of £150.  
*Birmingham Selly Oak Hospital.*—Res. Surgeon, £700. Pathologist, £750. Also Radiologist, £800.  
*Blackburn County Borough.*—Asst. Dentist, £450.  
*Blackburn Royal Infirmary.*—Res. H.P., £175.  
*Bolton Royal Infirmary.*—H.S., £125.  
*Bradford New Royal Infirmary.*—Two H.S.'s, each £135.  
*Brecon County.*—Asst. M.O., £500.  
*Brighton, Royal Sussex County Hospital.*—Cas. H.S., £120.  
*British Postgraduate Medical School, Ducane-road, W.*—H.P.  
*Burnley, Municipal General Hospital.*—Jun. Res. M.O., £150.  
*Burton-on-Trent General Infirmary.*—H.S., £150.  
*Cambridge, Addenbrooke's Hospital.*—Res. Anaesthetist and Emergency O., at rate of £130.  
*Canterbury, Kent and Canterbury Hospital.*—H.S., at rate of £125.  
*Cardiff, Llandough Hospital.*—Sen. Res. Surg. O., £450.  
*Charing Cross Hospital, W.C.*—Hon. Asst. Radiologist.  
*Chesterfield and North Derbyshire Royal Hospital.*—Cas. O. and Fracture H.S., at rate of £200.  
*Chichester, Royal West Sussex Hospital.*—Sen. and Jun. H.S., £175 and £125 respectively.  
*Colchester, Essex County Hospital.*—H.P., £150.  
*Connaught Hospital, Walthamstow, E.*—H.S. and Cas. O., each at rate of £100. Also Clin. Asst., 1 guinea per session.  
*Derby, Derbyshire Royal Infirmary.*—Gynaecological H.S. and Emergency Anaesthetist, £150.  
*Derbyshire Education Committee.*—Asst. School M.O., £600.  
*Doncaster Royal Infirmary.*—H.P., £175.  
*Dorchester, Dorset County Hospital.*—H.S., at rate of £150.  
*Dorset County Council.*—Clin. Tuber. O., £750.  
*Dover, Royal Victoria Hospital.*—Res. M.O., £180.  
*Edling, King Edward Memorial Hospital.*—Cons. Phys. for Children. Also Cons. Dental Surgeon.  
*Eastbourne, Princess Alice Memorial Hospital.*—Res. H.S., £150.  
*Edinburgh, National Committee for the Training of Teachers.*—Lecturer for Dunfermline College of Hygiene, &c., £500.  
*Edmonton, North Middlesex County Hospital.*—Res. Asst. M.O., £400. Also Jun. Asst. Res. M.O., at rate of £250.  
*Golden-square Throat, Nose, and Ear Hospital, W.*—H.S., £100.  
*Great Yarmouth General Hospital.*—H.S., at rate of £140.  
*Greenwich Metropolitan Borough.*—Tuber. O. for Council's Dispensary and Deputy M.O.H., £750.  
*Grosvenor Hospital for Women, Vincent-square, S.W.*—Hon. Anaesthetist.  
*Hastings, Royal East Sussex Hospital.*—Jun. H.S. and Temp. H.S., at rate of £150 and £200 respectively.  
*Hospital for Consumption and Diseases of the Chest, Brompton, S.W.*—H.P., at rate of £50.  
*Hospital for Sick Children, Great Ormond-street, W.C.*—Cas. M.O., £175.  
*Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.*—Res. H.P., at rate of £100.  
*Indian Medical Service.*—Commissions.  
*Ipswich, East Suffolk and Ipswich Hospital.*—H.S. to the Asst. Surgeons, at rate of £144.

*Isleworth, West Middlesex County Hospital.*—Asst. M.O., £400.  
*Kidderminster and District General Hospital.*—Sen. and Jun. H.S.'s, £150 and £100 respectively.  
*Leeds General Infirmary.*—Hon. Surgeon.  
*Liverpool Sanatorium, Delamere Forest, Frodsham.*—Second Asst. to Med. Supt., £250.  
*London County Council.*—Asst. M.O. (Grade I.), £350. H.P., at rate of £120. Also Temp. Dist. M.O., at rate of £125.  
*London Hospital, E.*—First Asst. and Reg. to Children's Dept., £300.  
*London Lock Hospital, Dean-street, W.*—Surg. Reg., £100.  
*London Lock Hospital, 233, Harrow-road, W.*—Res. M.O., at rate of £175.  
*London University.*—Examinerships.  
*Maidstone, Kent County Ophthalmic and Aural Hospital.*—H.S., at rate of £200.  
*Manchester Royal Children's Hospital, Pendlebury.*—Res. M.O. and Res. H.S., at rate of £125 and £100 respectively.  
*Manchester Royal Infirmary.*—Chief Asst. to Surg. Units, £250. Also Cardiographic Registrar and Res. Clin. Pathologist, each £150.  
*Manor House Hospital, Golders Green, N.W.*—Jun. M.O., £200.  
*Marie Curie Hospital, Fitzjohn's-avenue, N.W.*—Res. M.O., £100.  
*Medical Research Council, 38, Old Queen-street, S.W.*—Research Worker, £500.  
*Metropolitan Hospital, Kingsland-road, E.*—M.O. for Jewish Out-patients, £100.  
*Middlesbrough, North Riding Infirmary.*—Asst. Hon. Surgeon. Also third H.S., at rate of £125.  
*Middlesex Colony for Mental Defectives, Harper-lane, Shenley.*—Second Asst. M.O., £460.  
*Northampton General Hospital.*—Secretary-Superintendent, £600.  
*North Riding of Yorkshire County Council.*—Asst. School M.O., £500.  
*Nottingham City.*—Asst. Tuber. O., £500.  
*Nottingham City Hospital.*—Res. Surg. O., £350.  
*Oxford County and City Mental Hospital, Littlemore.*—Med. Supt., £950.  
*Orford, Wingfield-Morris Orthopaedic Hospital.*—Res. H.S., £100.  
*Plymouth City General Hospital.*—Jun. Asst. M.O., £250.  
*Princess Beatrice Hospital, Earl's Court, S.W.*—Res. M.O., at rate of £150.  
*Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.*—H.S., at rate of £120-£150.  
*Prison Service.*—M.O. Class II., £525.  
*Puney Hospital, Lower Common, S.W.*—Jun. M.O., at rate of £100.  
*Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.*—Fifth M.O. for Antenatal Dept.  
*Queen Mary's Hospital for the East End, Stratford, E.*—Two Cas. and Out-patient Officers, each at rate of £150.  
*Queen's Hospital for Children, Hackney-road, E.*—Res. M.O., at rate of £200. Also H.S. and Cas. O., each at rate of £100.  
*Royal Air Force Medical Service.*—Commissions.  
*Royal Army Dental Corps.*—Dental Surgeons.  
*Royal Chest Hospital, City-road, E.C.*—Hon. Physician.  
*Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.*—Hon. Asst. Aural Surgeon.  
*St. George's Hospital, S.W.*—Res. Obstet. Asst., £100.  
*St. Paul's Hospital, Endell-street, W.C.*—H.S., at rate of £100. Also Clin. Asst., £5 5s.  
*St. Thomas's Hospital, S.E.*—Asst. M.O., at rate of £100.  
*Salford Royal Hospital.*—H.S., at rate of £125.  
*Sheffield Royal Hospital.*—Vacancies on Res. Med. Staff, at rate of £80.  
*Southampton, Isolation Hospital and Sanatorium.*—Jun. Res. M.O., £200.  
*South Eastern Hospital for Children, Sydenham, S.E.*—Jun. Res. M.O., at rate of £100.  
*Southern Rhodesia Medical Service.*—Two Government M.O.'s, £600.  
*South Shields Ingham Infirmary.*—Sen. and Jun. H.S., £200 and £150 respectively.  
*Stafford, Staffordshire General Infirmary.*—H.P. and Cas. O., at rate of £150.  
*Stockport Infirmary.*—H.S., £150.  
*Sudan Medical Service.*—M.O., £E.720.  
*Sunderland Royal Infirmary.*—H.S., £120.  
*Torquay Borough.*—Deputy M.O.H., &c., £600.  
*Torquay, Torbay Hospital.*—Hon. Anaesthetist.  
*Walsall County.*—Asst. M.O.H., £500.  
*Warwick, Warwickshire and Coventry Mental Hospital.*—Deputy Med. Supt., £600.  
*Watford and District Peace Memorial Hospital.*—Pathologist, £250.  
*Western Ophthalmic Hospital, Marylebone-road, N.W.*—Jun. Res. H.S., £100.  
*West London Hospital, Hammersmith-road, W.*—Pathologist, £750. Also Res. Anaesthetist, at rate of £100.  
*Westminster Hospital, Broad Sanctuary, S.W.*—Hon. Anaesthetist.  
*Wigan, Royal Albert Edward Infirmary and Dispensary.*—H.S., at rate of £150.  
*Willesden General Hospital, Harlesden-road, N.W.*—Hon. Clin. Asst. to Skin Dept. Also Res. Cas. O., at rate of £100.  
*Winchester, Royal Hampshire County Hospital.*—Res. Surg. O. and H.P., at rate of £200 and £125 respectively.  
*Windsor, King Edward VII. Hospital.*—Two H.S.'s, each £100.  
*Wolverhampton Royal Hospital.*—H.S. and Asst. Res. M.O., each at rate of £100.  
*Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.*—H.S., at rate of £100.  
*Worcester Royal Infirmary.*—Hon. Physician. Also Hon. Physician for Clinic of Psychological Medicine.  
*Workshop, Victoria Hospital.*—Jun. Res., at rate of £120.  
*York City.*—Asst. M.O.H., £600.  
 The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Nantwich, Cheshire.



## Appointments

- AGAR, HERBERT, M.B. Lond. & Leeds, F.R.C.S. Eng.**, has been appointed Registrar of St. James's Hospital, Leeds.
- COHEN, H., M.B. Edin.**, Junior Surgical Registrar at the Royal Victoria Infirmary, Newcastle-upon-Tyne.
- COOPER, H. ASTLEY, M.D., M.R.C.P. Lond., D.P.M.**, Deputy Medical Superintendent at the Knowle Mental Hospital, Fareham.
- DAVIDSON, ANDREW, M.D. Glasg., D.P.H.**, County Medical Officer of Health and School Medical Officer for the North Riding of Yorkshire.
- GALLOWAY, J. F., M.D. Liverp., D.P.H., D.P.M.**, Medical Officer of Health for Dewsbury.
- JOHNSTONE, A. S., M.B., F.R.C.S. Edin., D.M.R.E.**, Assistant Radiologist at the Leicester Royal Infirmary.
- LYLE, T. KEITH, M.D., M.Chir. Camb., M.R.C.P. Lond., F.R.C.S. Eng.**, Assistant Surgeon to the Royal Westminster Hospital.
- MAGNUS, J. A., M.D. Heidelberg, L.R.C.P. Edin.**, Resident Surgical Officer at the Birmingham and Midland Eye Hospital.
- MCCOERMACK, J. S., M.B. Belf.**, Assistant Tuberculosis Officer for Stoke-on-Trent.
- MACPHERSON, IAN, M.B. Leeds**, Resident Medical Officer, St. James's Hospital, Leeds.
- MONTGOMERY, J. A., M.D. Glasg.**, Resident Medical Officer at the Finchley, Hornsey, Wood Green, and Friern Barnet Joint Isolation Hospital, Muswell Hill.
- O'SHEA, JOHN, M.Ch., F.R.C.S. Irel.**, Resident Surgical Officer at the Royal Manchester Children's Hospital, Pendlebury.
- PARFITT, D. N., M.D., M.R.C.P. Lond., D.P.M.**, Medical Superintendent at the Warwickshire and Coventry Mental Hospital.
- REDDINGTON, M. P., F.R.C.S., Hon. Assistant Obstetric Surgeon** to the Woolwich and District Hospital Association.
- TRAIL, J. D., M.B. Aberd., D.P.H.**, District Tuberculosis Medical Officer for the Durham County Council.
- WEIR, J. A., M.B. Glasg.**, Junior Surgical Registrar at the Royal Victoria Infirmary, Newcastle-upon-Tyne.

Certifying Surgeon under the Factory and workshop Acts :  
Dr. A. DICKSON (Old Deer District, Aberdeen).

## Births, Marriages, and Deaths

### BIRTHS

- CRAIG**.—On June 4th, at Framlingham, the wife of Dr. D. M. Craig, of a daughter.
- DEWES**.—On June 8th, at Cromwell-road, Kensington, S.W., the wife of Dr. Gordon Dewes, of a son.
- FRIEDLANDER**.—On June 13th, at Welbeck-street, the wife of Dr. H. R. Friedlander, of Beckenham, of a daughter.
- HIGHAM**.—On June 7th, at Devonshire-place, the wife of A. R. C. Higham, F.R.C.S. Eng., of a son.
- HOBBS**.—On June 12th, at Ealing, the wife of Dr. A. N. Hobbs, of a son.
- LAWRENCE**.—On June 8th, at Wolverton, Stony Stratford, the wife of Dr. E. D. Lawrence, of a son.
- NICHOLAS**.—On Wednesday, June 10th, at Truro, the wife of Dr. P. B. L. Nicholas, of a daughter.
- PALMER**.—On June 10th, the wife of Dr. Geoffrey Palmer, Auckland, N.Z., of a son.
- PERROTT**.—On June 5th, at Stanmore, the wife of Dr. G. F. Donaldson Perrott, of a son.
- SAWLE THOMAS**.—On June 9th, at Devonshire-place, W., the wife of Dr. J. Sawle Thomas, of a daughter.
- STRATFORD**.—On June 6th, at Hampstead, the wife of Dr. Martin Stratford, of Hatch End, Middlesex, of a son.
- WILKIN**.—On June 11th, at Gloucester, the wife of W. J. Wilkin, F.R.C.S. Eng., of a daughter.

### MARRIAGES

- HUDSON—ADLINGTON**.—On June 9th, in London, Bernard Hudson, M.D., M.R.C.P., of Davos, Switzerland, to Laura Almon, younger daughter of Mr. and Mrs. Adlington, of Bath.
- LOCKETT—BRADING**.—On June 6th, at Emmanuel Church, Croydon, John Morton Lockett, M.R.C.S., to Barbara Cicely, youngest daughter of Mr. L. H. Brading, of Sutton, Surrey.

### GOLDEN WEDDING

- DAVIES—DIXON**.—On June 16th, 1886, William Thomas Frederick Davies, M.B., B.S. Lond., son of Dr. Ebenezer Davies, medical officer of health for Swansea, to Florence, daughter of Thomas Dixon. Present address: Mooi River, Natal.

### DEATHS

- DAVIES**.—On June 11th, suddenly, in London, Conway Davies, M.B. Camb., M.R.C.P. Lond.
- DU BUSSON**.—On June 11th, at Hereford, Edward William Du Buisson, M.R.C.S. Eng., aged 73.

- GILMOUR**.—On June 10th, at Woodbridge, Percy Graham Gilmour, M.R.C.S. Eng.
- MARTIN**.—On June 11th, in London, Henry Charrington Martin, M.D. Edin., of Exmouth, aged 89.
- WHYTT**.—On Monday, June 8th, at Fulham, Alexander Whytt, M.D. Edin., late of Kenley, aged 64.
- N.B.—A fee of 1s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

## Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

### SOCIETIES

- ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.**  
TUESDAY, June 23rd.  
*Pathology.* 8.30 P.M. Mr. Joseph Needham, D.Sc.: Chemical Aspects of Normal and Pathological Growth.
- THURSDAY.**  
*Urology.* 8.30 P.M. Mr. Hugh Lett: On Urinary Calculi, with Special Reference to Stone in the Bladder.
- SATURDAY.**  
*Disease in Children.* 2.30 P.M., Meeting at Addenbrooke's Hospital, Cambridge.
- BRITISH PSYCHOLOGICAL SOCIETY.**  
*Medical Section.*  
WEDNESDAY, June 24th.—8.30 P.M. (11, Chandos-street, W.), Dr. Rowland Hill: Somnifaine Narcosis.
- MEDICO-LEGAL SOCIETY.**  
THURSDAY, June 25th.—8.15 P.M. (Manson House, 26, Portland-place, W.), Annual General Meeting. Mr. J. B. Montagu: The Development in Criminal Law and Penology since 1910.
- SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.**  
*Fever Hospital Medical Services Group.*  
FRIDAY, June 26th.—4.30 P.M., Dr. A. Forrest: Some Aspects of Scarlet Fever and Current Methods of Control.

### LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

- MACALISTER LECTURE.**  
THURSDAY, June 25th.—9 P.M. (National Temperance Hospital, N.W.), Sir Francis Fremantle: A Doctor in Parliament.
- INSTITUTE OF CHILD PSYCHOLOGY.**  
WEDNESDAY, June 24th.—6.15 P.M. (Friends House, Euston-road, N.W.), Dr. Ethel Dukes: The Changing Needs of the Young Child. 8.15 P.M., Dr. Margaret Lowenfeld: Place of Emotion in the Formation of Character.
- BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.**  
MONDAY, June 22nd.—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Miss L. Martindale: Radiation Therapy in Gynaecology.
- WEDNESDAY.**—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).
- THURSDAY.**—2 P.M., Prof. J. C. Windeyer: Diagnosis and Treatment of Some Common Obstetrical Abnormalities. 3 P.M., Dr. R. A. Young: Non-tuberculous Pulmonary Diseases.
- FRIDAY.**—2.15 P.M., Dr. A. A. Davis: Gynaecological Pathology. 2.30 P.M., Mr. Tudor Edwards: Thoracic Surgery.
- Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetric and gynaecological clinics or operations.
- SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.**  
WEDNESDAY, June 24th.—4 P.M., Mr. E. Pearce Gould: Modern Operations for the Cure of Inguinal Hernia.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.**  
MONDAY, June 22nd, to SUNDAY, June 28th.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. Afternoon M.R.C.P. course in neurology and psychopathology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues. and Thurs., 8 P.M., clinical and pathological M.R.C.P. course.—BROMPTON HOSPITAL, S.W. Afternoon M.R.C.P. course in chest diseases.—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham N. Sat. and Sun., course in general surgery.—PRESTON HALL, near Maidstone, Kent. Sat. special demonstrations on pulmonary tuberculosis.—Courses are open only to members.
- HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.**  
WEDNESDAY, June 24th.—2 P.M., Mr. Charles Donald: Peritonitis: Acute and Chronic. 3 P.M., Dr. W. G. Wylie: Typhoid and Paratyphoid.  
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.
- HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.**  
THURSDAY, June 25th.—3 P.M., Dr. S. Nevin: Demonstration.
- UNIVERSITY OF BIRMINGHAM.**  
TUESDAY, June 23rd.—3.30 P.M. (General Hospital), Dr. E. W. Assinder: Neurosyphilis.  
FRIDAY.—3.30 P.M. (Queen's Hospital), Dr. W. Carey Smallwood: Diseases of the Red Blood-cell.

## NOTES, COMMENTS, AND ABSTRACTS

## A HOME FOR TUBERCULOUS NURSES

THE Minister of Health, accompanied by Dr. A. S. McNalty, visited the Papworth Village Settlement on June 12th to lay the foundation-stone of a new home for tuberculous nurses. Sir Kingsley Wood was introduced by Alderman Mrs. Keynes, who spoke as one who had watched Papworth's progress from inception. She said that the scheme was devised by the matron of Papworth, Miss Borne, in view of the urgent need of nurses who had lost their health. The scheme had been welcomed by the nursing profession and there was already a waiting-list for admission. Sir Kingsley Wood said that tuberculosis of every kind was steadily declining in this country. In 1911 there were over 53,000 deaths from all forms of tuberculosis; in 1935 the deaths had declined to some 29,000 out of a larger population. This meant that the death-rate per million had been more than halved in 24 years. Another criterion of progress was the number of notifications of new cases. In 1926 the total notifications were 79,654; in 1935 the figure was 59,623—a drop of 25 per cent. Many important factors had played their part in conquering the disease, like better housing and nutrition, improved hygiene, and increased knowledge. Papworth, the pioneer village settlement in this country, had its origin in the recognition of the fact that the main obstacle to the complete efficiency of sanatorium treatment was the difficulty of satisfying the need for adequate protection and care of the patient during the critical years that supervene after discharge from the sanatorium. The settlement was essentially a preventive measure as it afforded the best possible protection to the family of the tuberculous patient. It was the proud boast of Papworth that not one of the many children of tuberculous patients who had lived in the settlement had developed tuberculosis. It was now proposed, he said, to build a home for the after-care of nurses who had contracted tuberculosis in the course of their duties. Since 1930 Papworth had found it possible to employ some nurses who had originally come to the settlement as patients, either in the wards, or in the industries under sheltered conditions, during the critical years following discharge from the sanatorium; and the idea of the present scheme was to offer the same opportunity to a larger number of nurses. Sir Pendrill Varrier-Jones, the medical director, proposed a vote of thanks to the Minister for his visit.

## NEW REGULATIONS FOR THE M.C.O.G.

WHEN the examination for admission to membership of the British College of Obstetricians and Gynæcologists was first instituted, the candidates as a rule were working in recognised hospitals and were therefore personally known to members of the Council. With the development of the College at home and overseas, however, it has become necessary to revise the regulations and to make the examination not only a test of knowledge and experience but also a guide to the training of candidates. To ensure that the holders of the diploma should have had a sound clinical training, candidates must have been registered as medical practitioners, or entitled to registration, for at least three years. They must produce certificates that they have held resident appointments each for at least six months at an approved hospital in general medicine or surgery, in obstetrics, and in gynæcology. They must also submit records of 25 obstetrical and 10 gynæcological selected and personally attended cases, which they must be prepared to discuss, and two commentaries either on individual cases or on selected groups of cases. Finally there is a written examination of two papers on the anatomy, physiology, and pathology of the female reproductive organs, and on gynæcology and obstetrics, to be followed by a clinical and a viva-voce examination. Each part—the written, the clinical, and the viva voce

—will be conducted by a different pair of examiners. These revised regulations will take effect after the examination held in July.

## THE ART OF THE UNCONSCIOUS

AN exhibition of peculiar interest to the medical profession and especially to psychologists opened on June 11th at the New Burlington Galleries. The artists represented belong to the Surrealist movement, a group which, drawing on Freud and Marx for a justification and theoretical basis, endeavour to serve up their unconscious in the raw, heedless of mere striving after form or composition. This is not to say that there is no form or composition; on the contrary, the apparently superb indifference on the part of many of these displayed subconscious minds to anything other than form, reveals the link between surrealism and abstract art. We are told by Prof. Herbert Read in the catalogue, however, that "The work of art is to be judged in the first place, not by its physique, but by its imaginative scope, its intimate revelations . . . it is beside the point to talk of form and composition." This is probably why such bizarre objects and media are used; it is much harder to view a test-tube, buttons, or a kipper dangling from a few bits of wood and ironmongery as pure form than as evocative symbols; and the same applies to various "natural and familiar objects," such as the piece of dead wood found

the fulfilment of wishes that are incapable of real satisfaction: in Bacon's words "(Poesy) seems to bestow upon human nature those things which history denies to it; and to satisfy the mind with the shadows of things when the substance cannot be obtained." It is, in fact, more than an analogy to compare a hysterical fit with a work of art: both may be regarded as the indirect disguised emergence into conscious life of a repressed wish. The surrealist tries to play the part of the analyst; he strives to reconcile the conscious with the unconscious mind, even though he believes that this is only completely possible in a society based on coöperation rather than competition.

In these endeavours he is not confined purely to art. At the private view, a tall spectre in a white silk wedding-dress paraded round with her head completely enveloped in rose petals, holding in her arms a stockings dummy leg. Many previous public occasions of this movement and its predecessor appear to have begun with a practical joke and ended in riot, and there was a general air of relief that the organisers, possibly out of respect for English gentility, had restrained their subconscious minds to this mild expression. It is to be hoped that the public will be allowed to admire the pictures, many of which are extremely good, undistracted by stark ids "oop fer t'Coop."

**SNAKE-BITE SERUM.**—Messrs. Allen and Hanburys Ltd. ask us to point out that supplies of serum for use in cases of snake-bite are obtainable by day or night from their premises at 7, Vere-street, Cavendish-square, London, W.1.

**MONTAGU HOSPITAL, MEXBOROUGH.**—This hospital is proposing to start a Coronation shilling fund by which it is hoped to raise £10,000 with the object of clearing the existing debt of £4000 and helping to provide funds for the opening of two new wards at present empty.

## ADDRESSES AND ORIGINAL ARTICLES

## THE PRESENT CONCEPT OF FOCAL INFECTION\*

BY WILLIAM P. MURPHY, M.D.

*(From the Medical Clinic, Peter Bent Brigham Hospital, Boston, Massachusetts)*

IN his well-known address on the Rôle of Sepsis and Antisepsis in Medicine, delivered at the opening of the session of the faculty of medicine of McGill University in Montreal on Oct. 3rd, 1910, William Hunter<sup>1</sup> of London introduced his subject in the following manner:—

"After these prefatory remarks regarding the objects of your present studies, I pass on to the subject which I have selected as the special theme on which I desire to address you to-day. That theme is the great part played by Septic Infection—prevalent, potent, easily observed and accessible to treatment, nevertheless continuously overlooked and neglected as an important cause and complication of a whole range of medical diseases. I have selected it not only because of its great practical importance to you in your medical work in after life, but also because the story of its recognition as a great factor in causing disease illustrates in a striking way the truth of what I have just said about the importance of small things in medicine—their observation and interpretation."

"For it was while seeking to throw light on the origin and meaning of a piece of blood pigment present in an organ in the first case I ever examined for curiosities sake that I stumbled upon the chief subject and interest of my life's work—namely, that of anemia. And it was while observing as fully as I could all the features of the first case of anemia which I ever studied clinically that I came upon the curious facts that ultimately led me to recognize the importance of sepsis in medicine not only in producing anemia, but also many other medical affections."

After his observation of this one anæmic patient there followed fifteen years of experimental and pathological work in an effort to explain the meaning of that piece of pigment and the features presented by the one clinical case which led Hunter to his conclusions best expressed in his own words:

"And then I saw, but not till then—what I have since endeavoured to describe in various papers from 1900 onwards up to the present time (that is, 1910) regarding the rôle of sepsis in medicine and the importance of oral sepsis as its chief cause."

And so it is entirely fitting that the present concept of focal infection be considered by one interested in diseases of the blood in consultation with members of the dental profession in commemoration of Hunter's timely and effective discussion of the importance of oral sepsis as a cause for or complicating factor in disease.

As a result of the pioneer work by such men as Hunter,<sup>1</sup> Rosenow,<sup>2</sup> Billings<sup>3</sup> and others concerning foci of infection, we no longer are obliged to assume the pessimistic attitude in respect to the recognition, by members of the dental and medical professions, of infection and its rôle in the production or complication of disease states as was so obviously expressed by Hunter. As he predicted, however, the day has come when the presence of sepsis is sought and the importance of its control recognised.

**Sepsis in the Mouth**

Although a focus of infection may be present in various tissues of the body, it is quite generally agreed

that the mouth is the most important site. Hunter recognised the possibility of infection in various locations, but considered "oral sepsis," referring especially to the teeth, as the most important. Billings<sup>3</sup> listed ten distinct locations where focal infection may be recognised. Of these ten he lists in order of occurrence the tonsils and related tissue first; abscesses of the gums, alveolar sockets, and pyorrhœa alveolaris second. Buchanan,<sup>4</sup> Gilmer,<sup>5</sup> and Mullin<sup>6</sup> likewise believe in the high incidence and importance of oral sepsis as a focus of infection. Rosenow believes that all pulpless teeth are to be considered as foci. In a careful analysis of the infection preceding an attack of rheumatic fever in 810 children, Kaiser<sup>7</sup> found that tonsillitis or sore-throat occurred in 59 per cent., dental infection in 13 per cent., and common cold in 8 per cent. He also concludes that the most severe cases of rheumatic infection followed attacks of tonsillitis and dental infection.

Not only is oral sepsis commonly present, but it is a particularly potent source of infection owing to several unique features of the location of alveolar abscesses, as pointed out by Millin.<sup>6</sup> Whereas an infection of the tonsils, pharyngeal surface, or gum margins may drain freely so that the pus may be swallowed or expectorated, an alveolar abscess is often enclosed in a wall of unusual vascularity which readily carries into the system the toxic products of the bacterial growth. Because of the fact that it may often take the form of a blind abscess, it is probably one of the most commonly overlooked foci.

Not only are we willing now to recognise the occurrence of foci of infection, but considerable evidence has been presented to establish them as the primary causative factor in the production of certain diseases. Their rôle as complicating elements in association with various chronic illnesses is almost uniformly recognised.

In addition to Hunter, such men as Billings,<sup>3</sup> Rosenow,<sup>2</sup> Davis,<sup>8</sup> Nisson,<sup>9</sup> and Koritskiy<sup>10</sup> have been enthusiastic advocates of a causal relationship between foci of infection, especially of the oral cavity, and rheumatic conditions. From a study of 1200 rheumatic children Kaiser<sup>7</sup> has come to several interesting conclusions. Among these are the following pertinent ones: "Rheumatic infections occur slightly more often in children whose tonsils have not been removed at the time of the initial attack." "The mortality-rate is nearly 50 per cent. less in children whose tonsils had been removed at the time of the initial attack," and as previously mentioned, "The most severe cases of rheumatic infection followed attacks of tonsillitis and dental infection."

Rosenow and Meisser,<sup>11</sup> Bumpus and Meisser,<sup>12</sup> and Culver<sup>13</sup> have shown the direct relationship between oral infection and diseases of the kidney. Similar evidence might be presented in relation to other diseases, particularly from Rosenow's splendid studies carried on over a period of many years and upon which he bases his theory of "elective localisation."

Few will question the frequency with which foci of infection complicate chronic disease states. How frequently there are observed tonsil infections, either chronic or repeated acute attacks, pharyngitis, pyorrhœa alveolaris, alveolar abscesses, cholecystitis, pyelonephritis, and so forth, in association with chronic arthritis, diabetes, peptic ulcer, nephritis, endocarditis, and the various blood dyscrasias.

\* Read before the Chicago Dental Society on Sept. 17th, 1935.  
5887

In spite of the fact that these infections are now generally recognised there are undoubtedly many which go unobserved, either through failure to search intensively for them or because they are at times difficult to locate or to recognise. Even a hasty consideration of the patients in any public hospital ward or an examination of one's private case records is sufficient to convince one of these facts. Gilmer<sup>5</sup> stated in 1912 that chronic alveolar abscess is so common that few go through life without one or more such suppurations. He also estimated that 25 per cent. of jaws have suppurating cavities. In his "Practice of Medicine," Osler<sup>14</sup> stated that, "of the twenty cases of pernicious anemia which I had under observation in 1909, pyorrhœa alveolaris was present in more than half."

### The Focus and its Origin

If we may then accept as our present concept, and I believe we may, that foci of infection occur commonly, that they may at times play an important ætiological rôle in the production of disease and that they are important complications in association with many chronic illnesses, then I believe that we as physicians and dentists have several important problems to solve in the practical care of our patients. We must find means to demonstrate the presence of infection in the patient who may consult us before serious chronic illness has appeared and interest and foresight sufficient to eradicate it at that time. In the sufferer from a chronic illness we must not only locate an infection, if present, but also evaluate the importance of this infection to the patient, decide when it is best to undertake to treat the focus and what is the best means of doing so in consideration of the individual patient's difficulty.

It is not always easy to see the importance of an intensive search for an infection in an individual with vague complaints and often even more difficult to realise the importance in such an individual of an innocent appearing infection. Coates<sup>15</sup> has said that many individuals carry septic tonsils for many years without showing evidence of disease of focal infection origin. That many types of organisms, particularly various cocci, may be demonstrated in the oral cavity is well known. By what mechanism these may become pathological for the host as a focus of infection, and so a source of danger, is a problem of greater difficulty perhaps than the demonstration of the organisms. Culver<sup>13</sup> says, "the fact that streptococci are found on and in the healthy human body is not necessarily important if the normal defense mechanism remains intact, but as Williams states, if the local susceptibility is slightly greater or the coccus a little more poisonous there may be a slow growth of the cocci in the tissues with a slow cellular response resulting in a subacute or chronic infective focus or a focal infection." He further elucidates his concept as follows: "These potentially virulent organisms living a saprophytic existence have no influence on the welfare of the host until local or general tissue defense decreases; they may then invade the tissues of the host and produce the pathologic changes which their nature and the various tissue susceptibilities permit." Rosenow<sup>2</sup> believes that the patient's tissues, or tissue juices, afford the conditions favourable for streptococci to acquire and maintain particular elective localising power peculiar to the disease from which the patient is suffering.

As factors which favour the development of a focus and its effect on the individual, Buchanan<sup>4</sup> mentions fatigue, chilling, common cold, and diet. Of these

four factors fatigue is perhaps of the greatest importance as a means of lowering tissue resistance or increasing its susceptibility to infection. The importance of chilling has been questioned, but many of us believe it to be a factor in increasing susceptibility to infection under certain circumstances. The importance of the common cold can hardly be over-estimated particularly because of its frequent occurrence and the lack of real interest shown in its treatment. The present status of diet as a factor in the production of resistance to infection is summarised in an editorial in the *Journal of the American Medical Association*<sup>16</sup> as follows: "Despite the many demonstrated correlations between lack of an essential dietary factor and functional and structural change in the organism, there is surprisingly little cogent evidence of a specific relation between these factors and infection." On the other hand, as a prophylactic measure diet may be looked upon as of great value. Clausen<sup>17</sup> believes, "that an early adequate diet, particularly one rich in vitamin A, tends to prevent the development of a state of susceptibility to infection and a loss of resistance." However, he also concludes, that, "Vitamins added to an essentially normal diet or given after the onset of an infection will not improve the condition present."

Although these factors may be looked upon as contributory causes of the infection and perhaps of the patient's vague symptoms, the practical prophylaxis of a more serious illness must include local treatment of the offending infection when this has been demonstrated. So as recommended by Billings<sup>3</sup> and again by Solis-Cohen<sup>18</sup> it is important in the eradication of a focus of infection not only to remove the infection but also to build up the natural defences of the body. This may be done by combating the factors which play a part in the lowering of tissue resistance. As Solis-Cohen has further remarked, "Focal infection in the oral cavity as a rule can be eradicated by surgery, but it is not always removed when infected teeth are extracted."

### Sepsis and Chronic Disease

In the presence of established chronic disease the problem of focal infection takes on a slightly different aspect. Mullin<sup>6</sup> has said, "To find a focus of infection and to decide when its removal will result in the betterment of the patient's physical condition will ever be a difficult problem." Although this is undoubtedly true there can be little question but that all definite foci of infection should be eliminated in so far as possible in an individual having a chronic disease, whether or not one believes that this will have a direct influence upon the chronic disease state. In the great majority of instances building up the bodily resistance and improving the general state of the individual's health in conjunction with the intelligent use of any known therapy which may be more or less specific for the pathological state present will produce the greatest benefit to the patient.

Consideration as to whether or not a focus exists and as to when and how it is wisest and safest to treat it specifically will be a practical part of the management of all cases of chronic disease. Coates<sup>15</sup> emphasised the importance of coöperation between the patient's physician and the representatives of the various specialties whose advice may be required. Rarely can the specialist in a particular field decide after one or two observations of the patient whether or not the tonsils or teeth harbour a focus detrimental to the patient's health, and even though this be possible, he may not be best qualified to decide when

the infected tonsils or the tooth with a focal abscess should be removed. It will often be necessary for the patient's physician after repeated examinations and long observation to bring together the accumulated facts for consideration with the consulting specialist. With the facts available it will then be possible to decide, not only the proper time for treatment to begin, but also how treatment should be carried out in order to accomplish the greatest ultimate improvement and at the same time avoid the possibility of producing a harmful effect.

These points may best be illustrated by reference to certain situations which have been present in my own patients.

A patient came under my observation with unquestioned evidence of pernicious anæmia but complicated by gall-stones probably associated with infection in the gall-bladder. It was not possible on first examination to know whether or not the infection was an important complicating factor which might hinder improvement, but because of the severity of the anæmia it seemed best to avoid operation at that time. Consequently intensive liver therapy was instituted, but although improvement occurred it was obvious after six weeks' trial that cholecystectomy must be performed before complete recovery could be expected. A transfusion was given, cholecystectomy performed, and improvement occurred in the expected manner.

Another of my patients who has been under treatment with liver for several years and who had shown no evidence of oral sepsis developed an acute alveolar abscess while away on a vacation. She went directly to her dentist who removed the tooth without undue loss of blood, but for several days thereafter the patient felt extremely weak and upset, had a slight fever, and was confined to her bed. A few days later she came to my office, where a blood count showed a decrease of over a million red blood-cells from the level present before the operation, and other evidence of a relapse. In this instance temporary treatment until subsidence of the acute process might better have been undertaken, during which time intensive liver therapy should have been instituted, as this has been found advisable preceding any surgical manipulation so that the system is supplied with an excess of blood-building material at a time when it is most needed.

#### Disorders of the Blood

Owing to the rather frequent occurrence of oral sepsis in patients with various blood dyscrasias, the problem of its treatment becomes a very practical one. Through experience in the management of these various conditions it has been possible to recognise certain rules which if followed will give the best results for each type.

Hunter<sup>1</sup> has called attention to the frequency with which oral sepsis precedes and probably causes secondary or hypochromic anæmia. It is always advisable to search intensively for such an infection which may best be approached surgically after the patient has received a rather intensive course of therapy for control of the anæmia. If the infection be present improvement may not be entirely satisfactory before removal of the focus, but the patient will be in better condition to withstand the effect of the operation.

This situation is illustrated by the case of a patient who entered the Blood Clinic for treatment of a severe hypochromic anæmia. Previous study in the hospital had failed to reveal any other possible cause for the anæmia than an inadequate dietary intake and striking oral sepsis. During several weeks of treatment, in which time a more adequate diet was supplied, progress was slow. Her remaining teeth were carefully extracted one or two at a time until all were removed. During this time the anæmia did not increase and subsequent progress was striking. Had removal of the teeth been undertaken before iron therapy was begun, or if many teeth had been removed

at once, there would have been greater danger of a disturbing upset and I believe that progress would have been no better.

The same caution in regard to the number of teeth which may safely be removed at one time applies even more importantly in pernicious anæmia.<sup>10</sup> Although this will depend to some extent upon the degree of anæmia present and the condition of the teeth which are to be removed, it is as a rule well to remove only a few teeth at a time and, as previously mentioned, it is wise to increase, during the period of extractions, the amount of liver being used, so easily accomplished since the availability of highly concentrated and potent liver extracts for intramuscular use.

Because of severe oral sepsis, one of our clinic patients was to have all of his teeth removed in slow stages by the clinic dentist, in order that he might also be given more injections of liver than he regularly needed. Because of difficulty in leaving his work, however, he went to a nearby dentist, who extracted his remaining 21 teeth in rather slow stages; but unfortunately this was not combined with the more intensive treatment and it was found on his return for a blood count that he had lost a million and a half red blood-cells, felt weak, and had evidence of increased nerve disturbance.

In the condition known as leukæmia, alveolar abscess is not infrequently the initial indication of the disease, and it is also a frequent complication during the course of the disease. In patients with this condition the resistance to infection is low and removal of a tooth may precipitate a critical situation. It is well, therefore, to use caution in applying surgical measures to these patients. An individual who appears at your office with an abscess accompanied by malaise, fever, unexplained glandular enlargement, bleeding from the gums, or unusual pallor should have his blood carefully studied before the extraction and, if there is any suggestion of disturbance, treatment of the infection must be of a temporary nature until the patient's condition be improved by adequate means.

#### Conclusions

One might continue indefinitely to describe similar situations illustrative of the various problems encountered, but it is sufficient to realise that each patient's problem is an individual one, the solution of which will tax the physician's and dentist's skill and judgment. The greatest possible benefit will accrue to the patient if the present concept of focal infection be defined and summarised, for practical working purposes, in the following manner:—

Localised areas of tissue infection, which may be considered to constitute a focal infection, are commonly present in the human body.

The focus of infection may be a primary factor in the causation of certain disease states, and is a complication when present together with a chronic disease.

Whether or not one wishes to believe in the theory of elective localisation as an explanation of the manner in which a pathological state is brought about or even though one does not wish to consider focal infection to be an important aetiological agent, there can be little doubt but that elimination of the infection is desirable because of its influence upon the general body metabolism. The fact that treatment of a focus does not produce striking or complete improvement of a specific disease condition cannot be considered as an important argument against elimination of infections.

A focus of infection may be difficult to locate and it may be impossible at times to decide whether or

not a localised variation from normal in a tissue may be indicative of a true focus. Long observation, detailed study of the patient's various systems, and coöperative consultation between the patient's physician and the dentist or general or specialising surgeon may in the end reveal the desired facts.

When and in what manner treatment of a focus is to be undertaken may also require the coöperative consideration of the patient's problems. In general, however, the proper course to pursue is elimination or drainage of the focus at the proper time and the institution of those measures which may improve the patient's general health and so perhaps, at least indirectly, favour a decreased susceptibility to the effects of the cocci or their toxins. This may include elimination of physical and mental fatigue, avoidance of the simple infections, such as the common cold, and of unnecessary chilling, and the regulation of the dietary intake to include adequate portions of the various elements of the normal diet, and, when indicated, to suit the individual need of the patient.

#### BIBLIOGRAPHY

- Hunter, W.: THE LANCET, 1911, i., 79.
- Rosenow, E. C.: Internat. Clin., 1930, ii., 29.
- Billings, F.: Arch. Internal Med., 1912, ix., 484.
- Buchanan, G.: South African Med. Jour., 1934, viii., 177.
- Gilmer, T. L.: Arch. Internal Med., 1912, ix., 400.
- Mullin, W. V.: New Eng. Jour. Med., 1935, ccxii., 50.
- Kaiser, A. D.: Jour. Amer. Med. Assoc., 1934, cii., 886.
- Davis, D. J.: Arch. Internal Med., 1912, ix., 505.
- Nisson, H. A.: New Eng. Jour. Med., 1935, ccxii., 1027.
- Koritskiy, A. M.: Abstr. Jour. Amer. Med. Assoc., 1935, civ., 696.
- Rosenow, C. C., and Meisser, J. G.: Jour. Lab. and Clin. Med., 1922, vii., 702.
- Bumpus, H. C., and Meisser, J. G.: Arch. Internal Med., 1921, xxvii., 326.
- Culver, H.: Jour. Amer. Med. Assoc., 1934, ciii., 637.
- Osler, Sir W.: Practice of Medicine, quoted by Hunter (ref. 1).
- Coates, G. M.: New Eng. Jour. Med., 1935, ccxii., 52.
- Editorial: Jour. Amer. Med. Assoc., 1934, ciii., 994.
- Clausen, W. S.: Ibid., 1935, civ., 793.
- Solls-Cohen, M.: Ibid., 1934, cii., 1128.
- Murphy, W. P.: Jour. Amer. Dent. Soc., 1936, xxii., 575.

### THE TREATMENT OF STAPHYLOCOCCAL SKIN LESIONS WITH TOXOID \*

BY LIONEL E. H. WHITBY, C.V.O., M.D. Camb.,  
F.R.C.P. Lond.

ASSISTANT PATHOLOGIST, THE BLAND-SUTTON INSTITUTE,  
THE MIDDLESEX HOSPITAL, LONDON

THE treatment of staphylococcal lesions of the skin is ideally carried out by a close coöperation between a dermatologist and an immunologist. Such skin infections are sufficiently common to be met with almost daily from the first moment that a student enters the field of practical medicine and they recur with such frequency even after numerous and varied treatments that the patients themselves tend to lose confidence in their many doctors. The problem of dispersing these infections is complex. There is the question of raising the general resistance to staphylococcal infection—the relatively easy task of the immunologist; there is the problem of lowering the susceptibility of the skin, and there is the necessity for increasing general bodily vigour as well as elimination of foci of sepsis including foci of staphylococcal infection in the nares (Dolman,<sup>1</sup> Valentine<sup>2</sup>). Too frequently the easy task of the immunologist is the only one exploited; often the treatment of the skin itself is not merely neglected

but is not even considered. Bearing in mind that the problem of treatment has these many aspects it is not to be expected that any one immunological antigen would be a panacea for all staphylococcal infections. A large number of antigens have had fashionable phases; most have had but a limited success; few have been used with intelligence. It is undoubtedly important to consider each separate patient as an individual before subjecting him to a long, perhaps painful, course of treatment.

#### Susceptibility of the Skin to Infection

It is not always clear what determines the susceptibility of the skin to staphylococcal infection. Nevertheless certain conditions obviously predispose to infection, and when faced with these the immunologist is not likely to achieve more than a temporary success if any at all. Examples come readily to mind. When there is a chronic aural discharge the skin of the external auditory meatus is often eczematous and unhealthy; infection readily occurs. The same applies to an eczematous skin of any type. Those who, for their living, are condemned to work in oil, such as those who bore steel, are by reason of the oil itself peculiarly liable to boils and pimples on the exposed parts of the body. Some persons have a small local unhealthy patch of skin which is the site of a recurrent boil; often this site is the collar-stud area or the scar of an old wound. Excision is the only rational treatment for such a lesion; immunology accomplishes nothing. One has also to consider what happens when soaps, cosmetics, depilatories, and even water are applied to the skin. Many date their staphylococcal infection to bathing in public baths and attribute the trouble to a germ which has been acquired there. This may be true, but it is equally true that the highly chlorinated water of public baths is to some a definite skin poison. To others, excessive sea-bathing is injurious, whilst some skin appears to be sensitive to even minor chemical changes such as are found in the washing water of different districts. The skin is also sensitive to sunlight. Suitable doses have a stimulating action and may indeed render healthy an unhealthy skin. Overdoses have the opposite effect. In the series described below were seven who, having returned from a summer holiday bronzed from head to foot, almost immediately exhibited a crop of resistant boils. The susceptibility to staphylococcal skin lesions of diabetics and of persons with deep staphylococcal foci of infection is well known.

The curative or deleterious action of ultra-violet rays on staphylococcal infections of the skin possibly supplies a key to the success which often follows the use of remedies of the protein shock type. Ultra-violet rays in suitable doses cause an alteration in local skin metabolism and may effectively reduce susceptibility to infection. The quickening of metabolic processes, the increased blood-supply to the periphery, and even the fever which shock remedies sometimes induce are known to have a tonic action on the skin. Sometimes, if the shock is great enough, the dramatic cure of a long-standing skin affection may occur. The immunologist must give full consideration to this non-specific aspect of the problem before attempting to assess the value of a specific remedy. Many specific remedies must produce part of their effect by shock but one which has a high specific action as well is most likely to achieve success.

#### Scope of the Investigation

In this report no attempt is made to compare the therapeutic effects of toxoid with those of such other

\* A report to the Therapeutic Trials Committee of the Medical Research Council.



treatments for skin infections as intensive local measures, manganese injections, and physiotherapy, which are claimed, when properly used, to give a high proportion of successes. Comparisons of this sort, involving strictly parallel series of cases treated by the respective methods, were not practicable in the circumstances of the inquiry. It should be mentioned, however, that most of the cases of boils referred to me for toxoid injections had already had courses of vaccine, whole blood, or manganese, either singly or in combination, and that many of them had been under treatment for long periods in other departments. During the period of observation of the effects of toxoid, the non-specific treatment of these cases was confined to simple local treatment.

The investigation was undertaken mainly to decide the following points: is toxoid a safe antigen for use in staphylococcal skin infections, and is its use in suitable cases followed by a good percentage of recoveries? In other words, can toxoid usefully be added to the list of remedies available for the treatment of such infections? The results given in the following survey of 200 cases, and the similar experience of other workers,<sup>1 2 6</sup> seem to provide affirmative answers to all these questions. The preparations used by me were two samples of toxoid supplied by Messrs. Burroughs Wellcome and Co. and one from the Lister Institute.

**Results**

All the results expressed in Table I. followed upon immunisation with a total dose of 0.75 c.cm. of toxoid administered intramuscularly. The total dose was distributed in four doses of 0.05, 0.1, 0.2, and 0.4 c.cm. at intervals of one week. Cases recorded as recovered have been free from relapse for periods varying from 2 to 15 months. All lesions were proved by culture to be staphylococcal in origin.

TABLE I.—Summary of Results

Lesion.	Cases.	Recovered.	Recovered or improved but relapsed.	No effect.
Boils .. ..	117	76 (65%)	29 (25%)	12 (10%)
Styes .. ..	42	37 (88%)	5 (12%)	0
Carbuncles ..	24	20 (83%)	4 (17%)	0
Pustular acne ..	9	2	4	3
Sycosis .. ..	8	0	1	7

On clinical grounds the most striking effects have been with boils, styes, and carbuncles. With regard to carbuncles, the majority have also been incised but are regarded as successes for toxoid in view of the speed of healing. In the small series of pustular acne and sycosis the toxoid did not appear to be more effective than vaccine. Forman<sup>7</sup> found toxoid of little or no use for the treatment of sycosis, but Connor<sup>8</sup> has claimed success in this disease after a long course of treatment.

**EXACERBATIONS, RELAPSES, AND FAILURES**

*Exacerbations.*—Thirty-seven patients (18.5 per cent.) (29 boils, 2 styes, 6 carbuncles) exhibited temporary exacerbations during treatment. Of these, 29 made rapid recoveries within a few weeks of the fourth injection. An exacerbation does not seem to contra-indicate treatment but rather to suggest that the individual is a sensitive subject and should be treated with doses smaller than those adopted in this series.

*Relapses.*—Twenty-nine cases (25 per cent.) of boils recovered or improved with the dose adopted but subsequently relapsed after intervals varying

from a few weeks to a few months. A second course has in most cases again procured relief, but to ensure complete freedom from infection most have had to attend for a monthly dose of 0.2 c.cm. of toxoid. Others have had subsequent successful treatment with a combination of toxoid and autogenous vaccine. Five have resisted even continuous treatment though the lesions are undoubtedly smaller and less frequent. Five cases of styes also relapsed but judgment on the reason for their subsequent recovery is difficult to make because their later inoculations were associated with local treatment in the ophthalmic department. As to carbuncles the relapses have been in the nature of small boils rather than fresh carbuncles.

*Failures.*—Complete failure was experienced in 12 cases of boils (10 per cent.). Seven of these were primarily bad subjects by reason of occupation or local skin disease but 5 appeared to have a normal skin. With pustular acne and sycosis, no marked successes were obtained.

**REACTIONS**

All in the series reported have received intramuscular injections, because subcutaneous injections in a preliminary series proved unusually painful and often produced a local reaction. The reactions can be classified into three types:—

(a) *Local* (intense redness of the skin, tenderness, and pain sometimes affecting the greater part of the arm). This occurred in 23 cases (11.5 per cent.). In a preliminary series when subcutaneous injections were made such reactions were extremely common. Some few in the present series may perhaps have been due to a small intracutaneous or subcutaneous leak when making the needle puncture.

(b) *Tiredness, headache, and aching muscular pains:* occurred in 14 cases (7 per cent.). This, as a rule, was with the first injection only.

(c) *Exacerbations (temporary):* 37 cases (18.5 per cent.). This feature has already been commented upon.

In addition, one patient, not in the series, exhibited acute anaphylactic shock when a fourth injection was given at an interval of three weeks after the third injection. He was a case of osteomyelitis who had been operated on in the interval. This severe reaction must be extremely rare for I have heard of no other case after inquiring from many other workers with a large experience of toxoid treatment.

TABLE II.—Units of Circulating Antihæmolysin before Treatment

Cases.	Units.			
	0-1.0	1.5-2	3	More than 3.
100 normals .. ..	76	24	0	0
117 boils .. ..	94	22	1	0
42 styes .. ..	31	11	0	0
24 carbuncles ..	21	3	0	0
9 acne .. ..	6	3	0	0
8 sycosis .. ..	5	3	0	0
17 osteomyelitis ..	1	1	6	9
				(5-38 units)

TABLE III.—Units of Circulating Antihæmolysin after Treatment with 0.75 c.cm. of Toxoid

Cases.	Units.			
	0.4-1.5	2	3-8	11-38
117 boils .. ..	1	15	72	29
42 styes .. ..	0	6	26	10
24 carbuncles ..	0	3	13	8
9 acne .. ..	2	3	3	1
8 sycosis .. ..	2	2	3	1

## CIRCULATING ANTIHÆMOLYSIN

The amount of antihæmolysin has been determined in 100 normals, in 200 cases of superficial lesions before and after treatment, and in 17 cases of deep-seated lesions (osteomyelitis). The results are expressed in International Units (Tables II. and III.).

It would appear that the distribution of antihæmolysin is the same in normal individuals as in those affected with superficial lesions. But the antibody is often definitely increased in deep-seated lesions—a useful diagnostic point in obscure affections of bone. The distribution of antihæmolysin in normal individuals is approximately the same as that found by Parish, O'Meara, and Clark.<sup>8</sup> Titrations were carried out by the method described by these workers.

All three batches of toxoid had approximately the same antigenic power and definitely raised the antihæmolysin titre with the dose employed.

## RELATION OF ANTIHÆMOLYSIN TITRE TO CLINICAL IMPROVEMENT

From first principles it is apparent that an immunity to superficial staphylococcal lesions is not necessarily dependent on a high antihæmolysin titre. Seventy-six normal persons without lesions had titres of 1 unit or less and some had none at all. Relapses have occurred with titres as high as 17 units whilst no effect has sometimes been observed with titres from 8–26 units. Recoveries have occurred with titres as low as 1.5–2. The variability in the titre after a standard dose of toxoid shows that the response to the antigen is very much a function of the individual. But though the titre itself is not an accurate guide to skin immunity it provides an indirect guide to optimum treatment because there does appear to be a titre different for each individual above which it is impossible to increase whatever dose of toxoid is given. And any attempt to raise the titre beyond this point, by large doses of toxoid, usually produces a violent negative phase with a crop of lesions. The best procedure is to determine the antihæmolysin titre before and after a moderate course such as that described above and to observe the clinical effect. If the effect is good the final titre may be assumed to be the optimum for the patient and subsequent treatment for that individual is to estimate the *smallest* "maintenance dose" of toxoid which will maintain the titre at this level. If the clinical effect is to produce an exacerbation the treatment should be stopped; with cessation quite often the lesions disappear. At this point the titre should again be determined and minimal maintenance doses administered. Often such doses are as small as 0.01 c.cm. Estimation of the amount as well as the optimum spacing of doses requires considerable experience and a patient period of trial and error. It may well be that the antileucocidin titre, a procedure developed by Valentine,<sup>2</sup> will be found to be a more accurate guide to optimum treatment and a better test for the efficacy of the antigen.

After cessation of treatment the antihæmolysin titre never remains high for a long period; it slowly declines to a normal level. Most patients are free from relapses despite this decline but in others, when recurrences appear, it is wise to keep the titre high by repeated small inoculations over a long period of time.

## Comments

Previous publications on the efficacy of staphylococcal toxoid in the treatment of superficial lesions have mostly been favourable (Dolman,<sup>1</sup> Murray,<sup>4</sup> Connor,<sup>3</sup> Whitby,<sup>6</sup> Ramon and others<sup>5</sup>) and indicate

that toxoid in carefully chosen dosage is a safe antigen with a considerable chance of success. Judgment by clinical trial is notoriously difficult to make without a very large series of test and control cases. But in the present series the majority of patients had previously had many other forms of local and general treatment without success. In these circumstances the clinical results with toxoid are impressive and are in contrast to the results of Smith<sup>9</sup> who, in a parallel series, found local treatment superior to toxoid. It has long been known that the toxin-producing power of staphylococcus is extremely variable and often absent. Evidence is now accumulating to show that the toxin fractions responsible for a good antigen against superficial lesions are equally variable. Much work requires to be done before these fractions are properly separated, before the efficacy of any batch of toxoid can be properly assessed, and before a method of control is perfected. It seems probable that no one strain of staphylococcus can be relied on to supply the multiplicity of antigens which it is desirable to have present in toxoids for use on human beings. Doubtless some of the failures of toxoid treatment are due to the antigen not being sufficiently polyvalent. Comparison with foreign and dominion workers is complicated by the fact that they usually use a polyvalent antigen. Research has also to establish whether a combination of toxoid and autogenous vaccine is more effective than toxoid alone. On theoretical grounds one would expect this to be so, and I have found such a combination useful in resistant cases and for maintenance treatment.

## Summary and Conclusions

- (1) Staphylococcal toxoid injected intramuscularly is a safe antigen giving rise to a relatively small number of minor reactions.
- (2) Staphylococcal toxoid gives a good clinical result in a high proportion of cases of recurrent and resistant furunculosis, and is useful in the treatment of styes and carbuncles. It is not effective in pustular acne and sycosis with the dose employed in this series.
- (3) Staphylococcal toxoid (and any other immunising agent) is ineffective for skin lesions where the skin itself is, by occupation or disease, peculiarly susceptible to infection.
- (4) The optimum dose of toxoid is an individual factor. Those in whom the antigen produces an exacerbation should receive small doses.
- (5) The antihæmolysin titre is of small value for prognostic purposes but is of some value for estimating optimum dosage.

Through the Therapeutic Trails Committee of the Medical Research Council a large supply of toxoid has been available from the Wellcome Physiological Research Laboratories and the Lister Institute. It is a pleasure to thank Dr. R. A. O'Brien and Dr. H. J. Parish for their willing help and advice in many technical matters and for the material and reagents they have given. I wish to thank also my colleagues on the staff of the Middlesex Hospital for referring their cases to me.

## REFERENCES

1. Dolman, C. E.: *Jour. Amer. Med. Assoc.*, 1933, c., 1007; *THE LANCET*, 1935, i., 306.
2. Valentine, F. C. O.: *THE LANCET*, 1936, i., 526.
3. Connor, J. I.: *Brit. Med. Jour.*, 1935, ii., 1195.
4. Murray, D. S.: *THE LANCET*, 1935, i., 303.
5. Ramon, G., Bocage, A., Richon, R., and Mercier, P.: *Presse méd.*, 1936, xlv., 281.
6. Whitby, L. E. H.: *THE LANCET*, 1934, ii., 779.
7. Forman, L.: *Delib. of IX. Internat. Congress Dermatol.* (1935), 1936, vol. ii.
8. Parish, H. J., O'Meara, R. A. Q., and Clark, W. H. M.: *THE LANCET*, 1934, i., 1054.
9. Smith, J. F.: *Brit. Jour. Derm. and Syph.*, February, 1936, p. 84.

ORAL AND PARENTERAL ADMINISTRATION  
OF  
PROSTIGMIN AND ITS ANALOGUES  
IN MYASTHENIA GRAVIS

By L. P. E. LAURENT, M.D., M.R.C.P. Lond.

MEDICAL REGISTRAR TO THE WEST LONDON HOSPITAL; AND

MARY B. WALKER, M.D. Edin., M.R.C.P. Lond.

ASSISTANT MEDICAL OFFICER, ST. LEONARD'S HOSPITAL  
(L.C.C.), LONDON

A NUMBER of cases of myasthenia gravis under our care have now been taking Prostigmin\* for long periods, most of them for more than a year. The time seems ripe therefore for an assessment of the value of this form of treatment, and for a discussion of dosage and frequency of administration. Above all, in view of the natural anxiety experienced by patients and their physicians as regards the possible ill-effects of prolonged treatment with the drug on the ultimate course of the case, we feel that we should put all the evidence at our disposal on record.

Working independently we have had the opportunity of using analogous drugs by injection and by mouth. The results which we have obtained by the latter method are particularly encouraging, and we believe that many mild cases will experience adequate relief from oral therapy while the more severe cases will require fewer injections.

Apart from drugs of this group some of our patients have taken ephedrine and others have taken potassium chloride in large doses daily.

ORAL ADMINISTRATION

We found a year ago that prostigmin was active orally. Much larger doses are required however if this method of therapy is employed. We found that 25-30 mg. gave us a result comparable in intensity and in duration with that seen after an injection of 0.5 mg. The largest dose which we gave orally was 50 mg. and the result was almost indistinguishable from that obtained with 1 mg. subcutaneously. At this dosage the patients began to experience a little abdominal pain and belching, and owing to inadequate supplies we were unable to continue our investigations with oral prostigmin therapy.

During the past few months we have received supplies of an analogous drug, efficacy of which by injection had already been shown. This drug, Substance 36\* of *Æschlimann* and *Reinert's* series<sup>1</sup> has now been used by us orally in gradually increasing doses with success. We found that 10 mg. gave a demonstrable though weak result. The doses were gradually increased up to 90 mg., which gave rise to no pain or unpleasant side action. With the larger doses we have given tincture belladonna M 30 at the same time, although some of our patients have taken 120 mg. without belladonna and suffered no inconvenience.

The most striking results are of course obtained with the larger doses. We have used on many occasions (in two cases daily for 3 weeks) 150 mg. of Substance 36 together with tinct. belladonna M 20. The substance was given in a solution containing 100 mg. to the ounce. An improvement is noticed

45-50 minutes after the patient takes the drug. It gradually increases in intensity until a maximum is reached two hours after ingestion. It remains maximal for 6-8 hours and then wears off gradually, some definite action being still detectable some 12-16 hours after the start. With the largest dose (150 mg.) the intensity of the improvement is equal to that observed after injection of 3 mg. of prostigmin. With smaller doses proportionate results are obtained, the intensity varying more than the duration. For instance a dose of 75 mg. produces a much less marked improvement, although its action may be shown to last 10-12 hours.

This method of treatment has many advantages. Firstly, it obviates the necessity for injections. Secondly, it gives a more prolonged action than any method which we have previously used, and it would probably be possible by giving two or three doses to keep the patient at her best for the full 24 hours. The longer action should prove particularly useful in severe cases which are liable to have dyspnoic attacks at night after the effect of an injection has worn off (see Case 6).

A FOLLOW-UP OF EIGHT CASES

We have investigated the following eight cases. Some have been under our personal care since they began taking prostigmin, others were under the care of one of us a year ago for some weeks after treatment was begun. We have re-examined them recently.

CASE 1.—A single woman, aged 42, in February, 1928, found that her arms were becoming weak and unduly fatigable. Ptosis, diplopia, and indistinctness of speech began three months later and in 1930 the legs became weak. There were short remissions in 1929 and 1930, and from 1931-33, while taking ephedrine, she improved so much that she could do light work. In September, 1934, she became much worse and was admitted to hospital on Oct. 24th, 1934. She complained of constant diplopia, and of difficulty in speaking and swallowing. She could not raise herself up in bed and could only walk a few steps slowly and unsteadily. There was bilateral, unequal ptosis, the left eyelid drooping more than the right. No tendon-jerks could be elicited.

Hypodermic injections of prostigmin 0.5 mg. were begun on admission, and the dose steadily increased till, in the middle of December, 1934, she was having an injection of 2.5 mg. daily. This was continued until April, 1935, when two injections a day were given—3 mg. in the morning and 2.5 mg. in the afternoon. Atropine gr. 1/100 was given with each injection. In November, 1935, the symptoms improved somewhat and only one injection a day was given. Since March, 1936, Substance 36 has been given daily in increasing doses by the mouth, with tincture of belladonna M 30. The effect of 200 mg. of Substance 36 by mouth equals in intensity that of 3 mg. of prostigmin, and lasts very much longer. The myasthenic symptoms are now decidedly less severe than they were when treatment was begun in October, 1934.

CASE 2.—A single woman, aged 35, noticed the first symptoms in December, 1916. Since 1918 she has had difficulty in speaking and swallowing, sometimes in breathing, and has had to be washed and dressed most of the time. She used to be taken out in a bath-chair. Remissions have been very slight. She was admitted to hospital on April 1st, 1935. There was bilateral, unequal ptosis, and bilateral limitation of movement of the eyes. She was unable to raise her arms above her head or straighten her fingers, which were always slightly flexed. The trunk and legs were also very weak, and she was only able to walk a few yards at a time, swaying from the waist.

Treatment with prostigmin and atropine was begun on April 2nd, 1935, and continued till January, 1936. Usually two injections a day of 3 mg. and 2.5 mg. were given. Since January, 1936, she has had Substance 36 by mouth in increasing doses with tincture of belladonna M 30. In her case 150 mg. of this by mouth has as intense an

\* Prostigmin is dimethylcarbamio ester of 3-oxyphenyl-trimethyl-ammonium-methyl-sulphate. Substance 36 is methyl-phenylcarbamio ester of 3-oxyphenyl-trimethyl-ammonium-methyl-sulphate. Substance 33 is dimethylcarbamio ester of 8-oxy-methyl-quinolinium-methyl-sulphate.

<sup>1</sup> *Æschlimann, J. A., and Reinert, M.: Jour. Pharm. and Exp. Therap.* 1931, xliii., 413.

effect as that of 3 mg. of prostigmin by injection, and the duration is much longer. There has been a decided, though slight, improvement in the myasthenic symptoms since treatment was begun, the general health has improved, and she has gained weight.

CASE 3.—A girl of 17, in November, 1934, found that things began to slip out of her hands, soon afterwards her legs became weak, and in January, 1935, she began to fall about. By the end of the month she was unable to sit up in bed, ptosis came on, and she had three respiratory crises. In February she improved considerably, and since then has remained in much the same condition, except for a short relapse in February, 1936, with one respiratory crisis. From April to September, 1935, she has had injections of 1.5 mg. of prostigmin daily in two doses, and from September to March, 1935, two injections of 2.5 mg., with atropine 1/100 daily. Since March 12th she has had 100 mg. of Substance 38 with tincture of belladonna  $\mathbb{M}$  30 once a day by mouth.

CASE 4.—A single woman, aged 30, has suffered from typical myasthenia gravis for eleven years. The weakness of the legs has always been the chief difficulty, but she also suffers from diplopia, ptosis, and difficulty in mastication. She has received prostigmin by subcutaneous injection since February, 1935. On an average she has three injections of 0.5 mg. daily, but during her regular premenstrual relapses she receives six to eight 0.5 mg. injections daily for a week. During remissions she sometimes has no treatment for two or three days. She also takes 4 g. of potassium chloride in half a tumblerful of water six times a day.

Her present condition is rather better to-day than fifteen months ago when she began to take prostigmin regularly. The large doses given during premenstrual relapses have never interfered with the usual rate or intensity of the remission after the menses. No new symptoms have appeared since treatment was started.

CASE 5.—A woman, aged 27, whose symptoms began in 1929, started treatment in February, 1935. She has had prostigmin daily, two or three injections of 0.5 mg. being given each day. Large single doses of 2.5 mg. with atropine gr. 1/75 have been used on many occasions, and often been followed up by 1 mg. without atropine five or six hours later when the patient had to remain active for a longer period. She also takes 4 grammes of potassium chloride in water four times a day. Examined recently, the most obvious change in her is that she has gained 2 st. in weight. Her dysphagia made normal meals impossible before treatment started and she had lost much weight. Her ptosis is never so marked as it was, and she has not had a relapse with dyspnoeic attacks, such as she had on two occasions before she began the prostigmin injections.

CASE 6.—A married woman, aged 48, has had symptoms since 1924. Ptosis, diplopia, dysphagia, and difficulty in mastication have always predominated. The limbs, although affected, remained relatively strong. She could walk a few hundred yards even when dysphagia and ptosis were marked.

In February, 1935, she began to take daily injections of prostigmin, 2.5 mg. (with atropine gr. 1/75) being used as a single dose at first. Later two or three injections of 1 mg. without atropine were given daily. After three months she suffered a relapse, dysphagia became constant when not under the influence of the drug, the arms became weaker, and attacks of dyspnoea were very frequent. In the absence of sufficient experience we could not escape the possibility that the relapse might be attributable to prostigmin. We were not able, however, to withhold the drug, as we should have liked to do, owing to the urgency of the dyspnoeic attacks. For a period of a fortnight or so 5 mg. were given daily in five doses, and it was remarkable to find this patient fluctuating repeatedly from a state of complete dysphagia and severe dyspnoea to one of relative comfort during which she ate good meals and occupied herself with light household duties. It was very gratifying during this intensive administration of prostigmin to notice a gradual spontaneous improvement, so that we were able to return to the smaller dosage, without recurrence of dyspnoea. For six months her

improvement was maintained. A further relapse occurred however during which more frequent injections were given. In April, 1935, the symptoms were more severe than ever, but relieved as usual after the injections, which were given four-hourly. She died one morning when she had received no prostigmin for five hours as she was thought to be asleep.

CASE 7.—A single woman, aged 22, had ptosis and diplopia in 1932. A few months later the weakness spread to the limbs, affecting the arms particularly. Dysphagia, nasal voice, and difficulty in mastication developed subsequently. Since March, 1935, she has taken 0.5 mg. twice a day and potassium chloride 4 g. four to six times daily. On many occasions she has taken 4.5 mg. prostigmin in divided doses within 24 hours. After a few months' treatment she was definitely worse, left-sided ptosis being constant, and diplopia more frequent. Dysphagia and dysphonia also increased. She has continued the treatment, however, taking rather larger doses, and has shown a steady improvement during the past few months. She has had no dyspnoea or other new symptom.

CASE 8.—A single woman, aged 35, gives a 16-year history of weakness of the limbs, ptosis, diplopia, and difficulty in chewing and in swallowing. The weakness of the arms has been very marked, and talking and chewing are always very difficult without treatment. She has received prostigmin since February, 1935. At first, while in hospital, she had two or three injections of 0.5 mg. daily, and on some occasions single doses of 2.5 mg. with atropine gr. 1/100. For six months after leaving hospital she had one daily injection of 0.5 or 1 mg. Lately, for economic reasons, she has reduced the dose to 1 mg. every other day. She also takes ephedrine gr.  $\frac{1}{2}$  daily and feels better on this drug. She has taken 4 g. of potassium chloride four times a day for the past year, and experiences definite improvement after each dose.

After the injections of prostigmin she leads a fairly active life; for instance, she comes up to London on a bus by herself and does a little shopping, and on one occasion she spent the afternoon at the Zoological Gardens. On such occasions she takes rather more prostigmin—1 mg. on leaving home and 1 mg. three hours later. Her condition when untreated is rather better now than a year ago. No new symptoms have appeared, and there have been no new dyspnoeic attacks. There is a notable improvement in her voice and in her ability to swallow without treatment when compared with her condition of a year ago.

#### DISCUSSION

Our experience with these eight cases has led us to the conclusion that the drugs of this group, when given in the doses which we have indicated, can be taken over very long periods without producing any unpleasant symptoms or leading to any deterioration in the myasthenic condition of the patient.

Abdominal pain can be avoided either by giving atropine with the large doses, or by giving smaller doses more frequently. There are some individual variations in this connexion. When a case begins the treatment, it is wiser to use small doses at first—e.g., 0.5–1 mg. of prostigmin by injection, the dose being increased gradually as the patient's response and susceptibility reveals itself. Soon after treatment begins, the patients who are inclined to over-exert themselves at first may find that they are somewhat weaker after the effect of an injection has passed off than they were before. It is reassuring to find that this inconvenience gradually decreases and patients find themselves as well as they usually are when the drug has ceased to act. It seems to us that ephedrine given in doses of gr.  $\frac{1}{2}$  twice a day is helpful in this respect.

We have also had the opportunity of using Substance 38 by injection. This drug has an action nearly as intense as that of prostigmin, but the duration is much shorter. For instance 0.5 mg.

of prostigmin acts in some cases from two to three hours, whereas 0.5 mg. of Substance 38, given to the same cases, does not act for more than one hour.

Of the eight cases which we have studied, five are somewhat better than a year ago and have suffered no relapses, two have had relapses from which they have recovered although prostigmin was continued throughout, and finally one case has died. The last had a very long history with previous attacks of dyspnoea before treatment began. She had two similar relapses since taking prostigmin and died in the latter of these while she was no longer under the influence of the drug.

We conclude therefore that this treatment appears to have no direct effect on the ultimate course of the myasthenia. At the same time it brings about improvement in the general health of the patients as they are able to eat more adequate meals and to lead a more varied life.

SUMMARY

(1) Prostigmin and an analogous drug (Substance 38) have been given orally with success. The action of the latter is particularly prolonged. (2) Eight cases of myasthenia have been studied after prolonged treatment with prostigmin. (3) No increase in myasthenic symptoms attributable to the treatment has been seen in any case.

We wish to express our gratitude to Dr. Blake Pritchard for his permission to include some of his cases in this investigation; to Dr. A. Morris, medical superintendent of St. Leonard's Hospital, for his permission to publish cases under his care; and finally to Messrs. Hoffmann-La Roche for supplying the drugs which we have used.

FURTHER OBSERVATIONS ON THE GOLD TREATMENT OF RHEUMATOID ARTHRITIS

BY STANLEY J. HARTFALL, B.Sc., M.D. Leeds, M.R.C.P. Lond.

AND

HUGH G. GARLAND, M.D. Leeds, M.R.C.P. Lond.  
HON. PHYSICIANS TO THE LEEDS PUBLIC DISPENSARY AND HOSPITAL

In a previous paper<sup>5</sup> we have published the results of the treatment of 100 cases of rheumatoid arthritis by injection of gold salts. Since then our knowledge of this form of therapy has been considerably extended, and the present paper deals with our experience of nearly 400 cases.

The arthritis clinic of the Leeds Public Dispensary and Hospital, where these patients are being treated, was started in July, 1934, following personal observations of the results of chrysotherapy in a few cases of rheumatoid arthritis seen in our out-patient departments. The original cases were largely treated with gold sodium thiosulphate (Crisalbine), and this drug was used almost exclusively during the first six months. Following the publication of the results in our first hundred cases, Messrs. Schering kindly supplied us with their preparation Solganal B oleosum for extended therapeutic trial, and in October, 1935, Messrs. Bayer generously offered to supply us with their preparation Lopion for the treatment of an unlimited number of cases over a period of a year. The number of patients applying for treatment increased very rapidly, and by February, 1936, over 400 cases had been seen. This paper is not concerned with patients seen after Feb. 11th, 1936,

and up to this time 374 were considered suitable for gold therapy. The present report is based upon these cases, with special reference to 300 who have received at least one full course of treatment. The 100 cases previously recorded are included amongst the present series, many of them having now had further courses of treatment.

The same criteria for diagnosis and methods of selection of cases<sup>6</sup> have been adhered to throughout and, as before, gold has been the only form of therapy, with the exception of the occasional use of aspirin and similar analgesic drugs (excluding amidopyrin preparations); we have studiously avoided all other forms of treatment. The most important modification of our method of treatment has been the gradual reduction of dosage, with regard to both the maximum single dose and the total administered in one course. We have used both the intravenous and intramuscular routes. Among our earlier cases, where crisalbine was employed, there were many who were given the heroic doses then recommended in the treatment of pulmonary tuberculosis; owing to the frequency and severity of toxic reactions the total gold salt given in one course, of approximately 12 injections, was soon reduced to 2.0 grammes, and for the last nine months this total has been further reduced to about 1.0 g., the maximum single dose being 0.1 g. These facts are of importance in assessing our results, as it necessarily follows that the early cases were given larger doses, and this may have considerable bearing both on the curative results and on the incidence of toxic reactions. In the analysis of results in terms of the different gold preparations, and the different dosage employed, a certain difficulty has arisen owing to the fact that many patients have, at various times, been treated with two or more gold salts; we have always, however, used the same drug throughout any one course.

Table I., strictly comparable with that recorded for our first 100 cases, shows the age-distribution and the age of onset of the arthritis in the 374 now under review.

TABLE I.—Age-distribution of 374 Cases

Age-group.	At onset of arthritis.	At commencement of gold treatment.	Age-group.	At onset of arthritis.	At commencement of gold treatment.
0-9	2	1	50-59	76	118
10-19	18	2	60-69	33	65
20-29	56	30	70-79	1	10
30-39	81	57	80-90	1	1
40-49	103	90	Unknown	3	0

There were 77 male and 297 female patients, an approximate sex ratio of 1 to 4. The oldest patient was 84 and the youngest 6 years.

METHOD OF TREATMENT

Of the 300 cases who have received at least one full course of gold, 113 have had two or more courses, 34 have had three or more, 8 have had four, and 1 had five courses. We have continued to give weekly injections, usually ranging from 0.05 to 0.1 g., until a total of about 1.0 g. has been given. Recently however, owing to the delayed onset of some toxic reactions, we have increased the interval between two courses to a minimum of twelve weeks, a procedure previously suggested as likely to be necessary.<sup>6</sup> During the period under review 4463 injections have been given; of the intravenous preparations 1925 were crisalbine and 1498 lopion; there were 957



intramuscular injections of solganal and 83 of Myocrysin. In terms of completed courses there were 215 of crisalbine, 147 of lopion, 92 of solganal, and 10 of myocrysin. In addition, there were 67 incomplete courses of lopion and 4 of solganal. The total number of courses, therefore, is 531, of which 460 have been completed.

The number of individual patients treated with crisalbine was 84, with lopion 80, solganal 47, and myocrysin 1, and in addition 88 received two or more of these preparations in the course of their treatment.

During the last few months we have practically confined ourselves to either 0.05 g. or 0.1 g. as the single dose for injection; we have made no attempt to modify the dosage with regard to the weight of the patient or the metallic gold content of the salt, although these are very pertinent considerations.

#### REACTIONS

We have previously stated<sup>5</sup> that slight painful exacerbations in the joints are frequent, especially during the first half of the first course of injections, and we are still of the opinion that such reactions are of favourable prognosis.

Toxic reactions are still common, but they have been much reduced both as regards frequency and severity. We recorded toxic disturbances in 45 of our first 100 cases; in the present series, which includes the original 45 toxic cases, this figure has fallen to 37 per cent., some toxic reaction having been seen in 113 of 300 patients who have completed one or more courses. Among the 113 patients who have had at least two completed courses, reactions were seen in 64 (56 per cent.); of these the disturbances were limited to the first course in 32, and in subsequent courses these patients showed no further reactions; in 18 cases where no reactions occurred in the first course they were subsequently seen in the second or third courses, while in 14 there were reactions both in the first and subsequent courses. It is of interest to note that of 46 patients who had reactions during the first course 32 (70 per cent.) had no further trouble; this observation indicates in the clearest manner a point we have previously maintained,<sup>5,7</sup> that the presence of the ordinary toxic reactions is no contra-indication to further gold treatment at a later stage.

We have analysed the cases showing toxic reactions in relation to the different preparations and have arranged them in Table II.

TABLE II.—*Toxic Reactions*

Preparation.	Patients treated.	Toxic reactions.
Crisalbine .. ..	84	49 (58%)
Lopion .. ..	80	14 (18%)
Solganal .. ..	47	12 (26%)
Multiple drugs .. ..	88	37 (42%)

Table II. does not include one case treated with myocrysin.

The multiple group includes 88 patients who were treated with two, or sometimes three, of the above preparations, but in 75 of them crisalbine was used in the first course. It is of importance to re-emphasise that the majority of our original 100 cases were treated with crisalbine in doses which we now consider to be excessive, and if over-dosage is one of the factors responsible for toxic reactions, this fact may account for the high incidence in the original series. We have, however, analysed the cases showing toxic reactions with crisalbine alone, and find that the average amount for each course was only 1.34 g.;

in terms of the total gold salt, is very little higher than the average amount of lopion or solganal which we now employ for a single course, suggesting that crisalbine may be a more toxic drug.

Table III. shows the frequency of the different varieties of reactions in relation to the preparations employed; in this table the frequency is given in terms of each course of treatment and not in terms of patients—i.e., the figures apply to courses and not to cases. The table shows that cutaneous and

TABLE III.—*Distribution of Toxic Reactions*

—	Crisalbine.	Solganal.	Myocrysin.	Lopion.	Total.
Courses .. ..	215	92	10	214	531
Total reactions ..	93	16	4	31	144
Skin—					
Pruritus .. ..	55	12	4	15	86
Erythema .. ..	51	11	4	14	80
Desquamation ..	16	4	0	2	22
Others* .. ..	6	0	1	1	8
Mouth—					
Bad taste .. ..	5	1	0	1	7
Soreness .. ..	21	4	1	5	31
Ulcers .. ..	1	0	0	0	1
Alimentary tract—					
Diarrhoea .. ..	17	0	0	8	25
Vomiting .. ..	1	1	1	3	6
Jaundice .. ..	6	2	0	3	11
Colic .. ..	2	0	0	3	5
Nausea .. ..	1	0	0	2	3
Various—					
Cough .. ..	2	0	0	3	5 (†)
Albuminuria ..	2	1	0	0	3
Dysphagia .. ..	1	0	0	0	1

\* Other skin disturbances include exfoliative dermatitis, pustular dermatitis, purpura, urticaria, herpes (2), lichen planus, and erythema nodosum.

alimentary disturbances constitute the majority of the toxic reactions. In our previous paper we analysed these disturbances in terms of patients, the figure then being 47 per cent.; of the next 200 patients 33 per cent. showed reactions, so that for the whole of our cases now presented the incidence of toxic reactions is 37 per cent. of patients, and 27 per cent. for each course of treatment; this difference is due to the fact that one patient may have had reactions in each of two or more courses. We previously recorded three deaths apparently associated with gold intoxication, and as each of these was given only a small or average dose, and the disturbance was peculiar in that it affected selectively the hæmopoietic tissues, we regarded them as being examples of gold idiosyncrasy. In the subsequent 274 cases there has been a further death of similar type; this was in a female aged 54 who developed purpura two months after her twelfth injection of crisalbine, the total amount given in the course being 1.0 g. In spite of repeated blood transfusions she died of aplastic anæmia, associated with widespread gangrenous ulceration of the œsophagus, although there was no complaint of dysphagia during life. It may be of significance that the four fatal cases were middle-aged women and each had been treated with crisalbine, though in no case was the dose of the drug excessive, even when judged by our present standards. It is, however, important to note that blood disturbances, though serious, are not necessarily fatal. We have recently seen another middle-aged female who, following 12 injections of crisalbine (total 1.15 g.), developed purpura and a progressive anæmia, with diminution of leucocytes, the blood count being: hæmoglobin, 76 per cent.; red blood corpuscles, 3,500,000 per c.mm.; leucocytes, 3000 per c.mm., of which neutrophil polymorphs were 42 per cent. Following a blood transfusion and symptomatic treatment the blood picture returned



to normal; about this time, however, the patient developed dysphagia and, in view of the extensive oesophageal ulceration found in the above-mentioned case, the condition was viewed with some alarm. On inspection the dysphagia was found to be due to a small circumscribed nodule just below the pharyngo-oesophageal junction; a small portion of this was excised and found to consist of oedematous, but otherwise normal, oesophageal mucous membrane. At the present time the dysphagia is subsiding and the patient's general health is very good. Ellman and Lawrence<sup>3</sup> have recently reported a somewhat similar though fatal case of agranulocytosis with purpura following a total course of 2.5 g. of solganal. In none of our cases showing severe toxic blood disorders have we seen punctate basophilia as described by Griffiths and Race,<sup>4</sup> but we have not systematically examined the blood of the ordinary toxic cases.

Diarrhoea of transient character has been the commonest alimentary disturbance, but the occurrence of jaundice has been a recent experience, and we encountered no examples of this disturbance in our first 100 cases. Jaundice was seen eight times and in every case it was transient, lasting from 3-4 weeks and leaving no permanent hepatic damage. The clinical picture was almost indistinguishable from the hepatitis which passes for "catarrhal jaundice."

We have found it somewhat difficult to assess the significance of cough in a group of out-patients, a large number of whom habitually suffer from this symptom in winter time. Cough is, however, one of the recognised toxic symptoms of chrysotherapy, and we have gained the impression that its incidence has been unduly high in our patients. We regard the dry, irritable, harsh cough of laryngeal type, unassociated with sputum, as being characteristic of this particular toxic disturbance; it is not accompanied by physical signs or X ray changes in the chest and is, in our opinion, without serious significance.

The rarity of albuminuria is very striking in view of the fact that it has always been considered one of the commoner ill-effects of gold therapy. There is no doubt that it was frequently seen in the early days of chrysotherapy for pulmonary tuberculosis. During the past year alone some 12,000 specimens of urine, from patients under treatment, have been tested for albumin with almost completely negative results. This suggests that albuminuria depends upon the employment of high dosage, and that it is not a necessary precursor or concomitant of other toxic reactions. The three patients showing albuminuria had no other type of reaction, and Table III. does not include 12 cases in whom albuminuria accompanied other toxic disturbances. We have seen nothing comparable with the fatal nephritis recorded by Bourgeois<sup>1</sup> and others.

It has been maintained by Williams<sup>10</sup> that toxic symptoms can be prevented by the use of calcium, for example, by dissolving the gold salt in a solution of calcium gluconate. We have already expressed the opinion that calcium does not prevent toxic symptoms, and therefore serves no useful purpose.<sup>7</sup> Our experience is based upon the treatment of 34 unselected cases; each was given a full course of crisalbine, each dose being dissolved in 10 c.cm. of 10 per cent. calcium gluconate. The 34 patients were given in all 360 injections, the average number per course being 10.5; the total weight of crisalbine given in this way was 29.75 g., the average amount per course 0.87 g. We have compared the toxic disturbances met with in this group with those in

a similar series of patients in whom crisalbine alone was used; this second group consists of 34 patients selected only to the extent of having a comparable dosage of crisalbine, cases receiving very large or very small doses being for this purpose excluded: there were 375 injections of crisalbine, the average number per course being 11; the total weight of crisalbine was 30.3 g., the average per course 0.89 g. In each of these groups of 34 patients 16 (47 per cent.) developed toxic symptoms of the usual type. These facts can be more easily appreciated from Table IV.

TABLE IV

	Patients.	Injections.		Weight of crisalbine (g.).		Patients showing toxic reactions.
		Total.	Average per course.	Total.	Average per course.	
Crisalbine with calcium ..	34	375	10.5	29.75	0.87	16 (47%)
Crisalbine only	34	360	11.0	30.30	0.89	16 (47%)

It is interesting that the case of purpura and dysphagia described above was one in whom the calcium solution was used.

RESULTS

It is difficult to give an accurate survey of our results, as we have made no selection of cases as regards the duration or severity of the disease. Many of our patients have been completely bed-ridden, and commenced attendance on stretchers or in wheeled chairs; on the other hand, many cases have been seen in the early stages of the disease. We have already pointed out<sup>5</sup> that gold treatment has no effect upon completely ankylosed joints, but no matter how hopelessly crippled the patient may be there are nearly always some joints, where the process appears to be active, which respond to treatment; for this reason the patient may remain severely disabled after treatment, but there is considerable reduction in pain and stiffness, with increased movement, and prevention of further increase in disability. We have also seen results which are little short of miraculous in patients showing the severest grades of disability, and a number of those previously bed-ridden become ambulatory, while others discard their crutches and sticks.

In recording our present results we are adhering to the classification used in our previous paper.<sup>5</sup> The term "cure" refers to complete freedom from pain and disability other than that due to bony ankylosis. Any result falling short of this standard is recorded as "marked improvement," but this group includes many patients in whom most dramatic results have been seen. The large majority of our patients fall into one of these two groups, but there are others who have shown improvement of a less striking character, and these are classified as "slight improvement."

TABLE V.—Results

Result.	Cases.	Per cent.
Apparent cure .. ..	25	8.3
Marked improvement ..	208	69.3
Slight .. ..	45	15.0
No .. ..	17	5.6
Worse .. ..	1	0.3
Died .. ..	4	1.3

In addition to the effect on the joint condition, there is a noteworthy improvement in the general

health in the majority of the patients, with an increase in appetite, gain in weight, and a general feeling of well-being and better health, and this is usually associated with a fall in the blood sedimentation-rate.

We have further analysed our results in relation to the different gold preparations used, and they are summarised in terms of percentage in Table VI.: this table refers to the results in regard to completed courses of treatment, irrespective of the number of patients.

TABLE VI.—Effects of the Gold Preparations (Completed Courses)

Result.	Crisalbine.	Solganal.	Lopion.
	Per cent.		
Cured .. .. .	22.5	0	3.8
Marked improvement ..	50.6	77.0	67.0
Slight .. .. .	18.2	10.4	20.4
No .. .. .	3.4	12.6	8.8
Worse .. .. .	1.1	0	0
Died .. .. .	4.2	0	0

In Table VII. an analysis of the results in the 300 patients who have completed one or more full courses of treatment is shown; this includes those who have been treated with two or more different drugs ("multiple"), and it excludes one case treated with myocrysin only (showing marked improvement).

TABLE VII.—Effects of the Gold Preparations (Patients)

Result.	Crisalbine.	Lopion.	Solganal.	Multiple.	Total.
Cured .. .. .	19	3	0	3	25
Marked improvement ..	45	53	37	72	207
Slight .. .. .	16	16	5	8	45
No .. .. .	3	7	6	1	17
Worse .. .. .	1	0	0	0	1
Died .. .. .	4	0	0	0	4
Total .. .. .	88	79	48	84	299

DISCUSSION

The opinion of most physicians who have recorded their experience of gold in the treatment of rheumatoid arthritis is that chrysotherapy is the most notable advance in the treatment of this hitherto incurable disease, a view which is amply borne out by our further experience, and we are at a loss to understand the poor results recorded by Mester<sup>8</sup> in a small series of cases.

It is equally recognised that the great disadvantage of the treatment has been the frequency and occasional severity of toxic complications. During the past two years we have satisfied ourselves that many of these disturbances are due to over-dosing, and a modification of technique in the direction of reduction of dosage has not affected the curative results to any significant extent, while the toxic disturbances have been rendered less frequent and much less severe. We have, therefore, modified a view previously expressed.<sup>6</sup>

Our results up to date are that 78 per cent. of the cases show either apparent cure or marked improvement, while some improvement is shown in a further 15 per cent. The corresponding figures for our first 100 cases were 69 per cent. and 23 per cent., so that from the curative point of view the original promising results have been fully maintained, or even bettered. Conversely, the total number of toxic reactions has been reduced from 45 per cent. to 37 per

cent., and even more important is the fact that serious reactions are much less frequent, the mortality having fallen from 3 per cent. in the first 100 to 0.36 per cent. in the subsequent 274 cases, there having been no fatality among the last 200 patients. Owing to the large size of the clinic, we have not been able to adopt elaborate measures for the anticipation and prevention of toxic symptoms, such as those suggested by Savy<sup>9</sup>—i.e., the blood sedimentation-rate, differential blood count, with a von Bonsdorff count—after each injection, but we have had to rely mainly upon our clinical experience.

In the treatment of toxic reactions we still rely upon symptomatic measures, and we are not familiar with any specific antidote. The problem of idiosyncrasy remains unsolved, and in our experience cannot be predetermined. According to Ellis<sup>2</sup> idiosyncrasy is seen "about once in thirty cases," but we have found it to be less frequent than this. The development of any blood disorder is probably a particular example of this phenomenon, and although not always fatal should be regarded as contra-indicating further gold treatment. Exfoliative dermatitis also contra-indicates further treatment as it is always a serious condition; it has fortunately only occurred once in our experience. We have previously shown<sup>8</sup> that hypertension and arterio-sclerosis do not prohibit gold treatment, but we consider patients with gross hepatic or renal disease to be unsuitable.

It has frequently been claimed that the toxicity rate is higher with intravenous than intramuscular injections: we have always doubted this,<sup>6</sup> and it is significant that in our large experience lopion, an intravenous preparation, has shown the lowest incidence of toxicity (Table II.).

SUMMARY AND CONCLUSIONS

1. Gold treatment was used in 374 cases of rheumatoid arthritis.
2. Cure or marked improvement occurred in 78 per cent., and slight improvement in a further 15 per cent.
3. Reduction in dosage has been followed by considerable reduction in toxic reactions without sacrificing the therapeutic effects.
4. There is no notable difference in the curative effects or toxicity between intravenous and intramuscular methods of administration.
5. The maximum single dose should not exceed 0.1 g., and the total for each course not more than 1.0 g. All patients should have at least two courses, and the interval between courses should be not less than three months.
6. Chrysotherapy is the most important form of treatment for rheumatoid arthritis.

REFERENCES

1. Bourgeois, P., et al.: Bull. et mém. Soc. méd. hôp. de Paris, 1934, 1., 1657.
2. Ellis, R.: THE LANCET, 1935, II., 276.
3. Ellman, P., and Lawrence, J. S.: Brit. Med. Jour., 1935, II., 622.
4. Griffiths, J. G., and Race, J.: THE LANCET, 1935, II., 715.
5. Hartfall, S. J., and Garland, H. G.: Ibid., 1935, II., 8.
6. Same authors: Brit. Med. Jour., 1935, I., 276.
7. Same authors: Leeds Med. Soc. Mag., 1936, VI., 18.
8. Mester, A.: Acta Med. Scand., 1935, V.-VI., 469.
9. Savy, F.: Brit. Med. Jour., 1935, I., 455.
10. Williams, H. J.: Ibid., 1935, II., 1098.

PROVIDENCE FREE HOSPITAL, ST. HELENS.—This hospital, which is conducted by the Poor Servants of the Mother of God, needs £30,000 for extensions. There is a scarcity of private wards, and the nurses have to work and live under trying conditions, as the accommodation is insufficient for the number engaged in the institution.

## THE "ACCIDENTS" OF GOLD TREATMENT IN RHEUMATOID ARTHRITIS

By G. J. VILLIERS CROSBY, M.D. Camb.

CLINICAL ASSISTANT AT QUEEN MARY'S HOSPITAL, STRATFORD;  
HONORARY PHYSICIAN TO ST. PETER'S HOME, KILBURN

DURING the past three years there have been a number of publications in this country upon the use of gold salts in the treatment of rheumatoid arthritis, notably contributions by Forestier, Slot, Pemberton, and Hartfall and Garland. At the same time, much work on this subject has been performed by numerous clinical investigators on the Continent. The results of this treatment have been found to be fairly consistently encouraging, especially in the so-called rheumatoid type of arthritis.

During the past two years I have treated a series of cases of arthritis of various types with similarly hopeful results, using mainly two preparations of gold salts, Allochrysin and Solganal B Oleosum. The completed cases in this series number 27 in all, and the Table shows these results grouped according to the patients' ages. The cases were not specially selected for treatment and it is interesting to note that not only those of recent origin but also those of fairly long standing received benefit. It is remarkable that out of 27 cases only 1 was in the group aged 30-40. In this connexion it should be remarked that bony deformity is in no way ameliorated, as evidenced by X ray examinations before and after treatment, but that improvement seems to be due to holding up of the active inflammatory process. My findings, therefore, as regards the results of treatment, very largely tally with those published by previous workers.

Table Showing Results Grouped According to Age

Age.	20-30	30-40	40-50	50-60	60-70	Over 70	Total.
No improvement	1	—	2	—	1	—	4
Slight improve- ment .. ..	—	—	1	—	1	1	3
Improvement ..	—	—	2	5	3	1	11
Great improve- ment .. ..	2	1	3	2	1	—	9
Total ..	3	1	8	7	6	2	27

A study of the articles published on the subject has led me to conclude that the reactions, or, as they are called by the French writers, "accidents," consequent upon the use of gold salts have been somewhat glossed over. It has become apparent to me that these unfortunate occurrences are considerably more common than most of us care to admit. This seems to be especially the case in the treatment of rheumatoid arthritis, more so in fact than in the treatment of other conditions—e.g., tuberculosis, lupus erythematosus, &c.—with the same medicaments. I have found the incidence of reactions to be high in spite of extreme care in dosage and concurrent treatment. It is, therefore, the object of this article to describe these accidents and to determine, if possible, how far their incidence justifies the use of this form of treatment.

### ETIOLOGY

In the early days of the use of the organic arsenical preparations the problem of toxic reactions was out-

standing, and there seems to be a close analogy between these and the accidents occurring as the result of chrysotherapy. In the latter the phenomena are very variable, both in their nature and in their severity and danger. The theories of their causation are multiple and the amount that has been written is vast and confusing.

Certain of these reactions are said to be due to a phenomenon that has received the name of "biotropism." The term is used to describe what is believed to be an increase in the virulence of "latent organisms" excited by such agents as X rays, gold, arsenic, or bismuth. It is difficult to understand exactly the nature of these organisms or the manner in which they are excited, but there seems to be little doubt that there is a certain group of symptoms not directly attributable to the toxicity of the gold itself. The condition was first described by Milian, and later by a number of other observers, notably, Heuk and Vonkennel, and Coste, Forestier, and Bourderon. Forestier has described biotropism as "the revelation of symptoms of another disease hitherto unsuspected. In a few cases, boils and herpes zoster have been noted, all apparently due to latent disease." Among these biotropic reactions are included erythema, grippe aurique or gold influenza, herpes zoster, neuralgia, and conjunctivitis. Contrary to the opinion of the German authorities, the French authors add to these bronchitis, focal reactions, and agranulocytosis. The remaining reactions are believed to be due rather to the toxicity of the gold preparations themselves. In this connexion it is interesting to note that Freund attributes the skin conditions observed during gold treatment to a toxic accumulation of products of decomposition due to the curative process.

It seems possible that some phenomena may be allergic in nature, and both Feldt and Tzanck have put this forward as a hypothesis. It is well known that certain drugs may act as allergens; among them are aspirin, antipyrin, cocaine, mercury, arsenic, and strychnine (van Leeuwen). That gold might be included in this group does not require a great stretch of imagination, although it is clear that such an explanation will not cover the whole range of phenomena that may result from the administration of the drug.

### TYPES OF REACTION

The importance of differentiating between the various kinds of reactions lies in the decision whether to continue treatment or not. Whereas it is claimed that the biotropic type of case comes to no harm if the treatment is continued, there can be no doubt that the toxic type is likely to be most unfavourably affected. My own experience has led me to believe that it is always wisest to suspend treatment, at all events temporarily.

A method of differentiating between the so-called biotropic cases and the toxic states has been described by Hinault and Mollard, especially with regard to the skin conditions, where diagnosis may be difficult or even impossible. They suggest the intradermal injection of 0.2 c.c.m. of a gold salt (crystalbine). A positive reaction is said to take place in the majority of toxic cases and a negative reaction where biotropism is present. No doubt a positive reaction might also be expected if allergy were the cause, but I have at present no experience of this procedure.

It is to Hinault and Mollard that I am particularly indebted for their brilliant classification of gold "accidents." Following their example, I will classify

these manifestations from a clinical point of view, avoiding as far as possible further reference to their causes.

*Immediate reactions* are not common. The most frequent is a general malaise with a little giddiness and headache, which passes off after a few hours. This has been noticed in 9 of my cases. Symptoms of gastro-enteritis (nausea, vomiting, and diarrhoea) occurred in 1 case. In 2 cases these immediate effects occurred after injections of allochrysin and were not noticed when solganal was substituted, an important point in favour of the latter. Other immediate reactions which have been described are acute shock with pallor, imperceptible pulse, &c., acute pulmonary oedema, laryngeal oedema, marked asthma, and severe vertigo. In these cases, treatment must, of course, be suspended, but such severe phenomena are of extreme rarity.

*Focal reactions.*—In a number of cases exacerbation of the pain and swelling has been noticed in affected joints. This reaction must be taken as a favourable sign. It is noticed normally after 4 or 5 doses have been given and cannot be fairly classified as an accident. It is not, however, present in every case. In my series, 9 patients complained of exacerbation of their rheumatism. It has been found advisable to warn patients of this possibility at the outset of their treatment.

*Rise of temperature* may occur in conjunction with the focal reactions or it may follow an injection. At times the increased temperature may continue for some days, in which case the onset of a skin reaction or digestive disturbance may be suspected. According to Hinault and Mollard, a continued high temperature should suggest an immediate blood count, as it may be the only outward sign of an incipient agranulocytosis (vide infra). A further cause may be a "gold influenza," of which I have had 2 cases in my series. One of these patients continued to show occasional exacerbations of temperature during her course of treatment, until she finally declared herself with an extensive exfoliative dermatitis. This case is described later. Curiously, the other case also eventually suffered from exfoliative dermatitis. Whether this is purely a coincidence cannot be determined. I am in complete agreement with Fellow who considers that high febrile reactions are quite unnecessary for the success of the treatment.

Among *gastro-intestinal and hepatic reactions* may be numbered gastric and intestinal pain, vomiting, diarrhoea, and jaundice. The differential diagnosis of these symptoms may not always be simple. Previous gastro-intestinal derangements have been cited as a possible contra-indication to the treatment, and severe hepatic insufficiency—e.g., cirrhosis or hepatitis—is undoubtedly so. In the allergic type of case, instead of producing an urticaria the treatment may possibly cause a reaction in the form of an attack or attacks of gastro-intestinal disorder. Hinault and Mollard believe that frequently occurring gastric derangements are usually due to transient hepatic insufficiency. Jaundice, on the other hand, is a definite indication of this; it is usually simply catarrhal, but blood examinations should always be undertaken immediately the symptom appears. Fatal icterus gravis has been recorded, and acute yellow atrophy is not unknown, especially in cases where an unsuspected hepatic lesion is present. Such accidents have luckily been extremely rare, and, with proper foresight, should not occur. At various stages of treatment 2 of my cases presented gastro-

intestinal symptoms. These have usually appeared shortly after injection and have been transient in their effect. In one case the treatment was discontinued for a fortnight as the trouble was somewhat persistent.

*Renal reactions.*—It has been noted that 75–80 per cent. of the gold injected is eliminated by the kidneys, and also that renal insufficiency is a definite contra-indication to the treatment. It does not seem unlikely, therefore, that the kidney substance may become affected during the course of treatment, even to the extent of the production of a toxic nephritis. Such accidents are by no means unknown and have been described by various workers. Routine examination of the urine is therefore an absolute necessity, and I have made it a practice to examine a specimen before every injection. Albuminuria is not infrequent during treatment and has occurred in 5 of my cases. It is usually found in small quantities only and as a general rule has very little significance. In each of the 5 cases, a further examination has been made for casts in the urine and in none have these been found. In one case, an unsuspected infection by *Bacillus coli* was discovered; albumin was only found here at the conclusion of treatment when the arthritic condition was greatly improved. Oedema has not been noted in any case. Where albumin has been present in appreciable quantities treatment has usually been suspended for a short time, as a result of which it has usually cleared up entirely and has not recurred on resumption of treatment.

*Affections of the skin.*—The simplest form of skin reaction is a mild itching, sometimes severe enough to be dignified by the name pruritus (4 cases). In a number of cases in the series this has been referred especially to the back of the neck. Urticaria is said to be fairly frequent but has not occurred in any of my cases. Mild local and sometimes generalised erythematous occur, which may be very itchy and at times painful. Reference has already been made to the difficulties of differentiation between the biotrophic and toxic types. An erythema, rather suggestive of a mild eczematous dermatitis, has been noticed, especially in 2 cases. In the former of these, itching was somewhat severe and a raised papular eruption was present, particularly on the forehead just above the eyebrows. This seems to be a favourite site for the appearance of gold rashes. The second case was peculiarly instructive.

The patient, aged 79, had an unusually severe arthritis of the infective type, with raised red cell sedimentation-rate, swollen and extremely painful fluctuating joints, and a temperature occasionally reaching 99.4° F. There was a very marked improvement after a course of injections of solganal given in doses of 0.1 g., totalling 1.8 g., over a period of four months. Towards the end of the treatment, a little irritation of the ankles and shins was noticed and the skin was generally dry all over the body. Although the sedimentation-rate was still high and the arthritis was by no means cured, it was decided to discontinue treatment, partly owing to the patient's age and partly because her arthritis was very much more bearable than it had been. The irritation around the ankles was very variable, but from time to time a mild papular erythema appeared which gradually became semi-permanent in patches. These patches then became scaly and very itchy and one or two similar eczematous places appeared on the thigh. A blood count revealed an eosinophilia of 15 per cent. Suddenly, some six weeks after the last dose of solganal had been given, a generalised papular erythema appeared on the body; this was very variable in its intensity and distribution, almost in the manner of an urticaria. Glucose in large quantities, sodium thio-sulphate (Ametox) by intramuscular injection in doses of 0.45 g. for 10 doses, liver extract, and calcium gluconate

were given, and the condition slowly improved. The patient's general health remained good and the rheumatism showed a general improvement. The long interval between the last dose of gold salts and the appearance of the erythema is of particular interest.

Skin eruptions resembling lichen planus have been described, notably by Gougerot, Burnier, and Photinos, and cited by Hinault and Mollard, and by Bertier and Boquillon. One such case occurred in my series. The diagnosis became, in my opinion, so evidently one of the lichen planus, with lichenification on the inner surface of the cheeks, tongue, &c., that I was at first inclined to believe that the condition had no connexion with the administration of gold. It was only when I found the references quoted above that I realised the possible relationship. The condition cleared up very satisfactorily and quite spontaneously. As usual, the mucous lichenification seemed to be more resistant than the cutaneous. Herpes labialis was noticed in 3 cases; I have seen no case of herpes zoster, and herpes simplex was seen in 1 case about two months after the conclusion of treatment. Conjunctivitis has been entirely absent.

Exfoliative dermatitis of a particularly severe degree may occur during the course of treatment and is without doubt one of the more worrying and serious accidents to be anticipated. The condition has been described under a variety of names: erythrodermia, erythrokeratodermia, toxic dermatosis, &c. It is heralded by a simple erythema which gradually becomes oedematous, with a papular and then possibly a vesicular eruption superimposed. This spreads fairly rapidly, and is accompanied by a general reaction with raised temperature and pulse, malaise, and headache. The face becomes oedematous and erythematous, and there may be exudation, generally near the skin folds. Irritation is intense, and there may be considerable pain necessitating the use of morphia. The acute stage may last as long as four or five weeks, after which a generalised exfoliation takes place, usually in large flakes. The palms of the hands and soles of the feet are chiefly affected, and often simultaneously the mucous membrane of the mouth. The condition must be recognised as of really serious import, for a number of deaths have been reported, though recovery seems to be the rule. I have had the unfortunate experience of having had 2 cases of exfoliative dermatitis in my series.

One of these received a total dose in one course of treatment of 1.9 g. solganal and had been rather troublesome throughout. She had febrile reactions (gold influenza) followed by bronchitis of an asthmatic type and finally the toxic dermatosis. Unfortunately, in this case I was swayed by the advice given by certain authorities, that treatment should be continued in full doses where biotropism occurred. As a result of this experience, my opinion on this matter is now entirely reversed. Treatment consisted of large quantities of glucose by the mouth— $\frac{1}{2}$  lb. a day—and ametoxy by the mouth and intravenously. Local treatment was according to symptoms and was purely palliative. Recovery was complete and practically uneventful, although occasional rises of temperature occurred from time to time (up to 100° F.). It is satisfactory to note that this patient's arthritis, which had been completely crippling, improved enormously.

The second case had received a total dosage of only 0.8 g. allochrysin. The history of onset was very similar to that of the first case, but here oedema was not so great and there were no warning signs beyond occasional irritation. It so happened that, owing to Christmas holidays, the patient had not attended for treatment for nearly a fortnight and had not considered the itching severe enough to report. She was put to bed immediately, following which the condition progressed almost exactly on the lines already described. Treatment was as with

the first case. Exfoliation was particularly severe, especially of the hands, and a secondary furunculosis gave a considerable amount of trouble. Recovery was slow and is not complete after a year. The skin still tends to be rough, and blepharitis is particularly troublesome. She has also had minute patches of alopecia areata, which have now disappeared. It should be noted that she had had a similar trouble previously. In this case again there is now no complaint of rheumatism.

It is useless to under-estimate the severity of the reactions here described, and it must be confessed without reserve that both these cases gave much anxiety, especially during the acute periods. Both patients, however, had had long-standing rheumatoid arthritis. The former of these patients, moreover, on being questioned since her recovery, has stated that it was worth while going through such discomfort to have her rheumatism so much improved; the latter is not quite so sure. Study of the subject suggests that the condition is by no means common, and it is some consolation to know that the occurrence of two such cases in a comparatively short series is not likely to be repeated.

*Stomatitis* seems to occur with some regularity, and may be ulcerative (3 cases). Dysphagia and sore-throat occasionally result and have been noticed in two of my cases. There may also be an unpleasant metallic taste in the mouth and loss of taste (2 cases). Lichenification in the mouth has already been described. Marginal glossitis, ulceration, and swelling of the gums and also superficial vulvitis and ulceration about the anus have been described by various workers.

*Bronchitis*.—Coste, Forestier, and Bourderon have drawn particular attention to this, and believe it to be a true biotropism. It is considered by them to be particularly associated with the use of solganal. I have had one case in which a bronchitis of an asthmatic type was noted, and it is possible that a patient who developed broncho-pneumonia some weeks after cessation of treatment may also have been influenced by the administration of gold. This, however, happened at a time of year when respiratory infections were prevalent.

*Blood conditions*.—Of all accidents due to the use of gold, the hæmopathies are without doubt the most serious and the only ones with a high mortality; luckily they have the advantage of being extremely rare. As evidence of their rarity it may be stated that only 30 cases of purpura have been described in all, and these of all types inclusive of the simple benign variety. Purpura hæmorrhagica, agranulocytosis, and aleucia hæmorrhagica (malignant thrombocytopenia) have all occurred and have all been attended by a high mortality.

One patient under treatment has developed purpura simplex after a total dosage of 1.9 g. of solganal. This patient was suffering from severe rheumatoid arthritis with extreme deformity. She had, moreover, marked anæmia of a secondary type (hæmoglobin 54 per cent., colour-index 0.64) and a relative lymphocytosis with only 35 per cent. of neutrophils in a total leucocyte count of 7200 at the beginning of treatment. I have no doubt, in the light of my present knowledge, that I should not have instituted chrysotherapy in this case. She developed an absolute leucopenia, which has improved since the treatment ceased and with the administration of nuclein, but she still has a neutropenia. She had always been subject to epistaxis. Four months afterwards she still occasionally has slight subcutaneous hæmorrhages. She has, moreover, complained of mild papular erythema and stomatitis from time to time. The painful joints have, on the other hand, been very much improved, and the patient has been able to carry out her duties as a filing clerk in a bank with increased efficiency and with very little absence from work.

The possibility of the incidence of blood dyscrasias must be recognised as an indication of the necessity for frequent blood counts. Coste and Bourderon have made it clear that it is only by neglect of signs of intolerance that the majority of these cases arrive at the stage of severe blood affection. Most of the cases occur in women with hepatic disease.

#### CONCLUSIONS

It has been seen that accidents associated with treatment by gold salts are protean in their character and are, moreover, by no means rare. If, however, all reasonable care is taken in the supervision of the treatment, if careful inquiry is made into the subjective phenomena experienced by the patients themselves, and if the urine and blood are regularly examined, no very serious complication is likely to arise. Possible exceptions to this rule are the skin rashes which may occur suddenly, unexpectedly, and even, as noted above, some weeks after administration has been discontinued. It has been said that eosinophilia is a warning sign, but there is some doubt about this. In only 2 cases in my series were polymorphonuclear eosinophils much preponderant. One of these cases at no time showed any sign of either biotropic or toxic reaction, the other case has been described above as suffering from an erythema of an eczematous type. Coste and Bourderon believe that no conclusion can be drawn as to the significance of excess of eosinophil cells. Numerous authors, on the other hand, have advised caution in cases where eosinophilia rises above 8 per cent.

From the foregoing, it is obvious that treatment of rheumatoid arthritis with gold salts is attended by not a little risk. I have, however, at present no doubt that this form of treatment is quite the most potent now available. It is sincerely to be hoped that some means may be found to reduce the toxicity of the salts either by a change in their chemical composition or by the concurrent administration of some adjuvant. It is my practice to administer calcium gluconate and liver extract by the mouth throughout treatment, but I am very doubtful about their actual efficacy. In all cases of severe reaction I have given ametox by intravenous or intramuscular injection, but without obvious result. I have also given preparations of vitamins A and D. It has been suggested that irradiation with ultra-violet rays might be helpful as a means of prophylaxis against the skin reactions, but I have no experience of this.

It seems that chrysotherapy should only be undertaken when the case is severe enough to warrant such a very real risk, which should be explained to the patient before treatment is instituted.

The greater part of this work was done at Queen Mary's Hospital, Stratford, E., and I am greatly indebted to Dr. Ernest Fletcher, honorary physician to the hospital, for permission to publish these results and for the great help and encouragement he has given me; also to the committee of the hospital for financial assistance in carrying out the work.

#### REFERENCES

- Bertier, L., and Boequillon: Bull. Soc. franç. de dermat. et syph., 1932, xxxix., 1335.  
 Coste, F., Forestier, J., and Bourderon, J.: Bull. et mém. Soc. méd. hôp. de Paris, 1932, xlviii., 1171.  
 Fehlow, W.: Münch. med. Woch., 1930, lxxvii., 2215; Dent. med. Woch., 1933, lix., 1206.  
 Feldt, A.: Klin. Woch., 1926, v., 299; *ibid.*, 1927, vi., 1136.  
 Feldt and Wegner, L.: *Ibid.*, 1928, vii., 1034.  
 Forestier, J.: THE LANCET, 1932, i., 411; Presse méd., 1931, xxxix., 735; Acta Rheumat., 1930, ii., 39; Bull. et mém. Soc. méd. hôp. de Paris, 1930, xlv., 273; THE LANCET, 1934, ii., 646.  
 Freund, R.: Med. Klin., 1931, xxvii., 992.  
 Gougerot, H., and Blum, P.: Bull. Soc. franç. de dermat. et syph., 1933, xl., 256.

(Continued at foot of next column)

## THE CARDIAC OUTLINE

BY T. SKENE KEITH, M.B. Lond.

PATHOLOGIST TO THE NATIONAL HOSPITAL FOR DISEASES OF THE HEART, LONDON

THE almost routine use of the X rays for the inspection of the heart and great vessels postulates a more accurate knowledge of the anatomy of those organs than is supplied by the ordinary text-books. A single stereotyped anatomical description of the surfaces and contours of the "normal" heart is of little value in the widely varying conditions found by the X rays in even ostensibly healthy subjects.

The following anatomical investigations were undertaken to establish what were the normal type or types of heart silhouette as seen from the front at autopsy. It is not claimed that the position of the heart at autopsy is identical with that which it occupied during life—witness the empty shrunken aorta and the distended superior vena cava—but a very short experience of examining hearts in situ directly after the chest has been opened will impress the observer with the great difficulty there is in making the heart take up and retain a new position until and unless the lungs, diaphragm, or great vessels have been damaged. That there is a fair degree of agreement between the outline of the heart as seen at autopsy and that obtained in orthodiagrams or telerradiograms will, it is hoped, be shown in a subsequent paper on the diseased heart.

#### TECHNIQUE

This has been previously described.<sup>1</sup>

The skin and soft parts of the anterior thoracic wall are resected widely; the ribs are cut in the anterior axillary line, for which purpose a heavy pair of gardener's secateurs are invaluable, and removed together with the sternum. Great care is needed in removing the upper end of the sternum so as to avoid cutting the innominate or other large veins. If cut they must be closed with Spencer-Wells forceps as the leaking blood badly obscures the parts. The pericardium is now reflected and dissected off the aorta, superior vena cava, and pulmonary artery. The distance to which this can usefully be done varies in different cases and care is again necessary to prevent loss of blood. The lungs are now gently drawn aside and the whole anterior surface of the heart displayed. A sheet of plate glass with one or more vertical lines ruled on it is now laid over the heart, one line being placed as nearly as possible in the middle line of the body. On this sheet of glass the outline of the heart and its various parts and of the great vessels is drawn with a dermatographic pencil, the greatest care being taken to keep the eye vertically above that part of the heart which is being recorded. The diagram thus obtained is then transferred to a sheet of paper (Figs. 2, 3, 4, 5).

In all some 150 diagrams are available, 78 from hearts not associated with heart disease and over 70

<sup>1</sup> Jour. Path. and Bact., 1933, xxxvi., 199.

(Continued from previous column)

- Gougerot and Weill, J.: Science méd. prat., 1931, No. 1, p. 3.  
 Hartfall, S. J., and Garland, H. G.: THE LANCET, 1935, ii., 8.  
 Houck, W., and Vonkennel, J.: Deut. med. Woch., 1931, lvii., 1224.  
 Hinault, V., and Mollard, H.: Le traitement aurique de la tuberculose, Paris, 1934.  
 Lebouf, F., and Mollard, J.: Presse méd., 1930, xxxviii., 1239.  
 Lebeuf: Paris méd., 1930, ii., 510.  
 Lumière, A., and Julliard, Mlle.: Avenir méd., March, 1932.  
 Milian, G.: Paris méd., 1933, i., 362.  
 Pomberton, H. S.: THE LANCET, 1935, i., 1037.  
 Slot, G.: Practitioner, 1935, cxxxiv., 788.  
 Slot, Deville, P. M., Hill, N. G., Williams, B., and Fridjohn, M. H.: THE LANCET, 1934, i., 73.  
 Tzanck, A.: Immunité, intolérance, biophylaxie: Doctrine biologique et médecine expérimentale, Paris, 1932. Sang, 1932, vi., 896.  
 van Leeuwen, W. S.: Allergic Diseases, London, 1925.



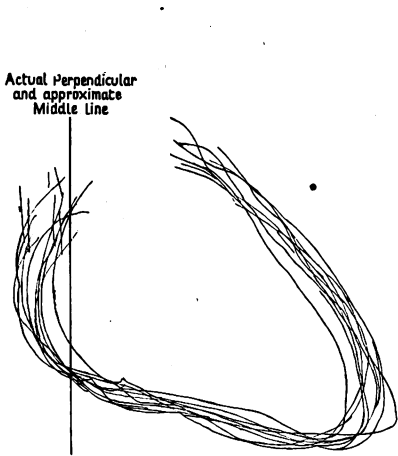


FIG. 1.

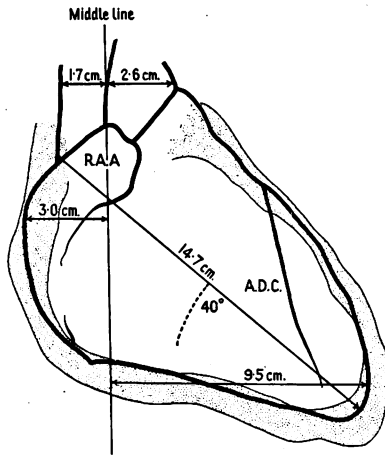


FIG. 2.

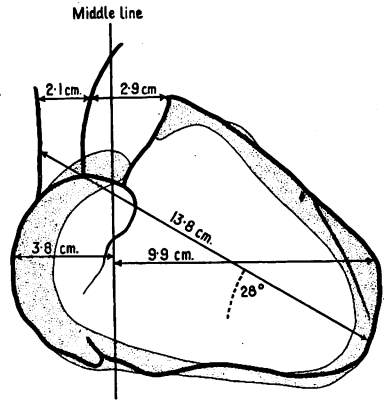


FIG. 3.

FIG. 1.—Composite diagram of 10 silhouettes of hearts of Type I, showing how the arbitrary normal limits were arrived at. Each line represents the outline of a single heart. In making the diagram the diagrams have been freely moved to the right or the left as well as upwards or downwards, but their inclination to the horizontal has been most rigidly preserved.

FIG. 2.—The heart silhouette from a single Type I, inclined heart. The grey background represents the area within which the outlines of the 28 hearts fell.

FIG. 3.—The heart silhouette from a single Type II, horizontal heart. The grey background represents the outlines of 9 hearts of this type.

from cases of morbus cordis of various types. In the present paper it is proposed to deal only with the more or less normal types.

RESULTS OF OBSERVATIONS

To begin with general observations: The first is the prominence of the superior vena cava, which, even when not grossly dilated, is still of considerable size (average width 1.75 cm.). The next is the difference between the anterior surface of the heart as seen in situ and as seen after the removal of the "pluck"—i.e., the trachea, oesophagus, heart, and lungs from the body. In situ little, if any, of the left auricular appendage is seen; after the removal of the pluck it is the most prominent feature of the anterior surface of the heart. This rotation from

left to right of the heart after its removal from the thorax, together with the emptying and collapse of the superior vena cava have been responsible for much confusion in the anatomical interpretation of skiagrams of the thorax.

The anterior surface of the heart mass that corresponds to the shadow seen by the X rays is made up of the superior vena cava, the aorta, the pulmonary artery, the right auricle, the right ventricle; in 9 cases a minute tip of the left auricular appendage, the left ventricle; and in 4 cases a millimetre or two of the inferior vena cava. The margins of this mass are made up as follows:—

The right margin is composed, from above downwards, of the superior vena cava, the right auricle, and in the four cases already mentioned the inferior vena cava.

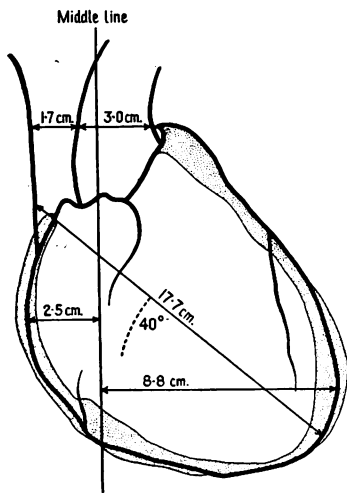


FIG. 4.

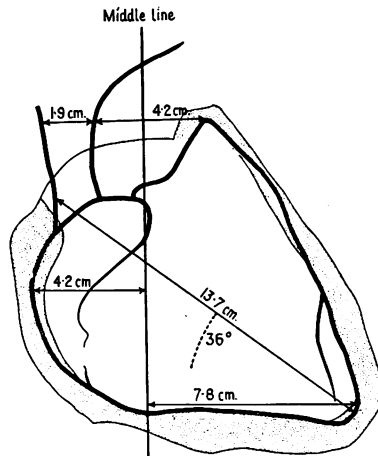


FIG. 5.

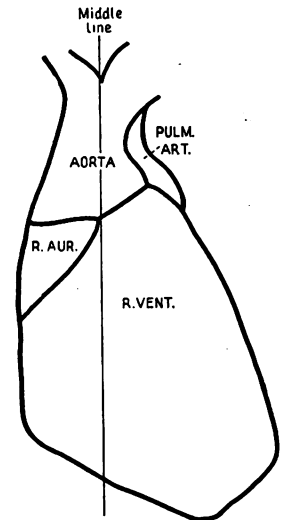


FIG. 6.

FIG. 4.—The heart silhouette from a single Type III, globular heart. The grey background represents the outlines of 8 of the 9 hearts of this type, the remaining heart though of typical outline was so small that its inclusion would have stultified the diagram.

FIG. 5.—A heart silhouette from a single Type IV, square or conus heart. The grey background represents the outlines of the 13 hearts.

FIG. 6.—The silhouette of a unique vertical heart. From a male, aged 37. Died of shock from multiple injuries; no disease of any sort.

The *diaphragmatic surface* is made up of the right auricle, the right ventricle, and in 26 cases a few millimetres of the left ventricle. In 4 cases, as noted, the inferior vena cava formed the extreme right of this margin.

The composition of the *apex* was determined by the position of the anterior descending branch of the left coronary artery whose course marks out the position of the interventricular septum. Unfortunately the importance of this was not at first realised so that in only 33 of the diagrams under review was the course noted. In 26 of these cases the apex is formed by the left ventricle, in the remaining 7 the longitudinal axis of the heart passes through the artery at the apex which therefore consists of the septum rather than of either ventricle. In no case was the apex formed by the right ventricle.

The *left margin* is formed by the left ventricle below and the conus arteriosus, or infundibulum of the right ventricle, above. In 9 cases, as already noted, the tip of the left auricular appendage was seen; its actual position varied: in 1 case it lay against the left ventricle, in 2 cases at the point where the left ventricle and the conus meet, and in the remaining 6 cases it lay against the conus itself.

The upper part of the left margin of the heart, where it is in relation to the great vessels, is the area where this particular method of research gives the least satisfactory results. The reasons are various. First the structures, the aorta, conus, pulmonary artery, &c., far from being in the same plane are echeloned the one behind the other to a considerable depth, this means that not only are they with difficulty reduced to a flat plan, but also that the extent to which they are exposed is conditioned by the amount of time and patience at the observer's command, as these factors control the care and extent of his dissections. Secondly, it is, above others, the area where the view is likely to be obscured by blood. It is therefore with some diffidence that the following figures are given: in 24 out of 60 cases the conus alone was seen, while in 36 from a fraction to 3 cm. of the pulmonary artery was seen.

Between the upper extremities of the left border of the heart and of the right border lie the great vessels, the ascending aorta on the left (average width, 3.1 cm.) and the superior vena cava on the right (average width, 1.75 cm.).

#### SHAPE OF THE HEART SILHOUETTE

Having described in detail the composition of the anterior surface of the heart and its margins, the next point is the actual shape of the heart as a whole. It was soon obvious that so great was the variation in shape, quite apart from size, that to adopt any stereotyped silhouette was impossible. After several abortive attempts the following plan was adopted. A return was made to the post-mortem reports and those cases were noted in which not only was the heart stated to have been normal and free from disease, but where there was also an absence of any other disease in any way liable to affect its size, shape, or position. Thirty such cases were found and their diagrams copied on to stout paper and then cut out so as to make 30 silhouettes. With these cards a sort of "patience" was played and it was found that with one exception, to be noted later, every diagram could be allocated to one or other of three suits. A composite drawing was then made of all the hearts of each type, and the outer and inner lines of these drawings were arbitrarily taken as representing the maximum and minimum normals—that is, in the investigations of the remaining 48 diagrams only those were accepted as normal whose outline fell between these arbitrary limits. In making these composite diagrams nothing was sacred except the perpendicular—i.e., a silhouette

could be moved up or down or from side to side so as to get the greatest possible agreement between it and the diagrams already drawn in, but the inclination of the heart to the horizontal was most carefully preserved. Fig. 1 shows a typical composite diagram.

The next step was to compare the remaining 48 diagrams with these normals, the same method, that of cutting a silhouette, being used. In this way 19 more diagrams were allocated to their various types. There remained 31 diagrams which could not with justice be assigned to any of the three types, but of which 18 formed a definite fourth type of their own. Thirteen diagrams remained which, either from gross deformity or more usually from enlargement, could not be assigned to any of the four types. As reference to the post-mortem reports showed that they were from conditions such as chronic bronchitis, uræmia, and hypertension, they were discarded without compunction.

There were now four distinct types of normal heart diagram and a single exception, derived from 55 separate cases. They are as follows:—

**Type I. *Inclined heart.***—This in the main is the normal heart of the anatomy books except that the rotation from the left to right already remarked upon is absent. This is the largest class accounting for 28 diagrams (just over 50 per cent.) (Fig. 2.)

**Type II. *Horizontal heart.***—This type is somewhat similar to the former and so not unlike the conventional heart. The decreased angle, however, between the long axis and the horizontal, marks it out as a type of its own. Nine diagrams (about 16 per cent.) were of this type. (Fig. 3.)

**Type III. *Globular heart.***—These diagrams are quite unlike the conventional heart, the absence of any apex being most striking. There were 9 (16 per cent.) diagrams of this type, and it is of interest that the subjects were predominantly male, 6 to 1, and that the average age, 48, is the lowest of any type. (Fig. 4.)

**Type IV. *Square or "conus" type.***—This is the type that grew from the rejected diagrams. Not one of the original 30 normals is of this type, but, as it consists of 18 diagrams (33 per cent.), it must be accepted as a fairly common type, even though abnormal. It is noticeable that the average age is increased by 48 per cent. and the superficial area of the diagrams by 14 per cent. on the other types. (Fig. 5.)

Fig. 6 shows the diagram obtained from the heart of a healthy male of 37 who died almost instantly from a fractured base. It is unique in my experience but being healthy and from a healthy subject must be put on record.

The Table gives average figures as to age, sex, superficial area, &c., from normal hearts of the first three types and the 10 smallest hearts of the fourth type.

*Average figures for the four types of heart.*

	Type I.	Type II.	Type III.	Type IV.
Age in years .. .. .	52	50	48	64
Sex (Male .. .. .)	7	2	6	8
(Female .. .. .)	9	4	1	3
Superficial area (sq. cm.) ..	92.9	90.3	93.5	107.7
Longitudinal axis (cm.) .. .	14.9	13.5	13.3	15.2
Inclination of axis .. .. .	37°	32°	42°	33°
Right perpendicular (cm.) ..	2.3	3.2	3.25	3.7
Left (cm.) .. .. .	10.4	8.9	8.0	9.4
Width of aorta, first part (cm.) ..	2.5	3.1	2.6	3.7
" superior vena cava (cm.)	1.5	1.9	1.4	1.9

I should particularly like to acknowledge my thanks to Dr. John Parkinson who first put the idea of this investigation into my head and who by his encouragement kept it there.

## SOME EXPERIENCES IN GALL-STONE SURGERY

By E. R. FLINT, F.R.C.S. Eng.

SURGEON TO THE GENERAL INFIRMARY AT LEEDS

THE general principles which govern surgical procedure in cholelithiasis are based on experience gained in the treatment of a very common disorder. From the enormous amount of material certain conclusions emerge:—

1. Cholecystectomy is a more satisfactory operation than cholecystostomy in that a higher proportion receive ultimate complete relief from symptoms. The definite risk of stones re-forming after the latter operation does not obtain in the former. In performing cholecystectomy nothing should be clamped or cut until it has been clearly identified.

2. After the gall-bladder has been removed a drainage-tube should be inserted across the site, reaching to the front of the kidney.

3. The common duct should be carefully palpated, and if there is any doubt about its contents it should be opened, explored, and drained to the surface.

4. If there should be a stone in the common duct it should be removed, together with all debris both above and below the opening made in the supraduodenal part, a probe should be passed with certainty into the duodenum, and the duct drained through the opening. In those cases in which the stone is wedged immovably in the lower end it is better to remove it transduodenally than to make prolonged efforts to extract it from above.

5. Operation for stone should not be begun in the presence of deep or increasing jaundice. If for any reason waiting seems inadvisable the minimum operative manipulation that ensures free drainage of the bile should suffice.

These are principles that, if not universally held, certainly guide the conduct of the great majority of surgeons. Those to which criticism might be directed are the third and the fifth. As regards the former, it has been said that the smallest stones can be palpated without opening the common duct. My sense of touch is certainly not sufficiently acute for this; on several occasions I have found a stone after opening the duct, when I had felt reasonably sure none was present on palpation. It is particularly difficult to palpate when the pancreas is hard and nodular, as it is very often when there is cholelithiasis. That other surgeons have the same difficulty is supported by the fact that during six years there were at the Leeds General Infirmary 33 autopsies after cholecystectomy in which there had been no operation on the common duct, and in 6 there were stones found in the common duct, presumably undiscovered and certainly left at operation.

Small stones probably often pass through the duct, causing little or no obstruction, and doubt about the necessity of draining the duct should arise not only because of the uncertainty of the presence of a stone, but also on account of the state of the duct with regard to infection. For this reason the duct should be inspected as well as palpated after dividing the peritoneum covering it. If it is found dilated or thickened, having lost its normal bluish appearance, it should be drained whether a stone can be felt or not. A dilated duct associated with infection indicates the necessity for drainage owing to the possibility of widespread injury to the liver, as in the following patient.

CASE 1.—Female, aged 59. She had had for a long time many attacks of cholecystitis, with tenderness over the gall-bladder accompanied by shivering and jaundice. She was admitted in a critical condition and died the

next day without operation. The post-mortem revealed a slightly enlarged gall-bladder containing mucus and three faceted stones, one of which was impacted in the neck. There was no stone in the dilated common duct, but some muddy bile; the pancreas was distinctly fibrotic. The liver showed a thickened capsule with grossly distorted surface, and on section there was extensive fibrosis enclosing small islets of intensely bile-stained fat with some liver tissue surviving in widely separated areas.

### THE SIGNIFICANCE OF JAUNDICE

As regards the fifth principle some amendment is necessary. There is no question that a patient is much safer for operation when jaundice is absent. It is also a fact that jaundice due to obstruction of the common duct by stone usually begins to wane after a period of waiting, and in my experience this is generally a week or less. The greater risk is attributed to post-operative hæmorrhage; in a sense this is true. I do not think, however, it is the jaundice itself that is responsible for this enhanced tendency to bleed, but some derangement of the liver, of which jaundice is a visible indication. My experience leads me to believe that jaundice as such is not of any great moment, though very useful from a practical point of view in helping to assess roughly the state of the liver, which improves as the jaundice goes and steadily gets worse the longer it lasts. If this is true the wording of principle 5 should read, "Operation for stone in the common duct with jaundice should not be delayed beyond the few days necessary to improve the patient's general condition. If during this period jaundice lessens there is no immediate hurry to proceed with surgical measures; if, however, it persists or deepens the minimum operation that ensures drainage of the common duct should be undertaken at once, and the period of delay should rarely, if ever, exceed a week." In this series of 54 cases of stone in the common duct all the deaths occurred in those patients who were jaundiced at the time of operation, and in which it had been present for over a week; in only one was there any noticeable degree of hæmorrhage. The following is an instance of what I think was faulty judgment, in that delay was too prolonged:—

CASE 2.—Female, aged 63. For three years she had had attacks suggesting biliary colic, and 14 days before admission she became jaundiced. This steadily increased, and on admission was very deep. The diagnosis was clearly obstructive jaundice due to a stone in the common duct, and operation was delayed for a further 14 days in the hope that it would diminish. It remained, however, as deep as ever, and the patient vomited altered blood on several occasions. At operation the gall-bladder which contained several stones was drained and also the common duct which contained a large stone and much debris. She died three days later, passing into a lethargic and comatose state with rising pulse-rate and subnormal temperature. A limited post-mortem was performed; there was no undue hæmorrhage, but a section of liver showed on microscopic examination advanced necrosis with collections of polymorphs.

The condition of the liver has an important bearing on the prognosis of cholelithiasis. Unfortunately there is no method of determining its functional capacity with any degree of accuracy, but I think we may take it as established that in all such cases there is some hepatic injury. This was first pointed out by Graham<sup>1</sup> and later by me.<sup>2</sup> The lesion is a round-celled infiltration surrounding the smaller bile-ducts with or without fatty areas and fibrosis; it extends to both lobes of the liver. Similar changes may be seen in any case of chronic infection in the abdomen, but they are always most pronounced in those with cholangitis, especially of long duration.

It is generally appreciated that the latter, which clinically proclaim themselves by rigors, temperature, quickened pulse, and dry tongue, with or without jaundice, are poorer surgical risks than those that apparently have cholelithiasis alone. It may be possible in some of these to demonstrate by tests that the liver is not functioning normally in certain directions, but we are in the dark about the extent of the injury in any particular patient, and indeed there may be very extensive injury without any of these symptoms. I can recall the case of a woman who, apart from slight jaundice on one or two occasions, had had no evidence of any common duct trouble and was apparently a very good risk, and yet at operation I found a soft stone in her common duct which was distended with dirty bile smelling strongly of *Bacillus coli*, and she nearly died within the first week after operation presenting the symptoms that we are accustomed to call cholæmia. Incidentally she recovered under treatment with continuous glucose-saline given by the intravenous drip method, and I think this was the direct cause of her recovery.

#### PRE-OPERATIVE PREPARATION

We should regard any patient with gall-stones as deserving very careful pre-operative supervision, and do all that is possible to ensure that the defences are put into the best possible trim, though it may sometimes seem superfluous. To the above-mentioned principles should be added, then, pre-operative preparation, which our experience has shown to be beneficial and which may be rather prolonged (subject to the reservations given under principle 5). Since paying particular attention to this matter my mortality figures have come down to 2.5 per cent. in 157 cholecystectomies and 4.3 per cent. in 68 choledochotomies, in 225 cases operated on in the last four years; of these, 123 cholecystectomies were for stone, with 3 deaths, a mortality of 2.4 per cent., and 54 choledochotomies were for stone, with 3 deaths, a mortality of 5.5 per cent. Some four years ago a collective investigation of choledochotomy for stone reported at the meeting of the Association of Surgeons of Great Britain and Ireland showed a mortality of 14.65 per cent. in 621 cases; I attribute my improved results almost entirely to careful pre-operative preparation.

Most of this treatment is not peculiar to gall-stone cases, but generally speaking I think that these patients require rather more care in this respect than those in the general run of abdominal work; this is particularly so when there is any suspicion of infection in the common duct.

The lines upon which pre-operative treatment of my patients is conducted was published in THE LANCET<sup>3</sup>; there has been little change except in the matter of pre-operative medication in preparation for spinal anaesthesia, which I now use in most of my gall-stone cases. With the exception of those who are, or recently have been, much jaundiced, they receive 3 grains of Nembutal by mouth 30-45 minutes before operation. The subsequent spinal anaesthesia makes the operation easier for the surgeon owing to the complete muscular relaxation, and the patient has less flatulence and sickness in the post-operative period. With the technique I use now, combined with Icoral immediately before the spinal injection, the heavy fall in blood pressure, which is an alarming feature of spinal anaesthesia, is seldom seen.

#### ANÆSTHESIA

There does not seem to be a great difference between the mortality with ether and that with spinal anaesthesia;

in this series there were 129 of the former with a mortality of 3.8 per cent., and 96 of the latter with a mortality of 2 per cent., but there may be more in it than appears at first sight, because I prefer a spinal anaesthetic to ether in the patients who are considered the more serious risk for two reasons. First, ether is a cell poison and upsets the biochemical properties of the blood; it causes hyperglycæmia and dehydrates the patient, thereby altering acid-base balance. Prolonged administration also exhausts the thyro-adrenal mechanism and possibly promotes pulmonary congestion and œdema. In the poor-risk patient most of these biochemical states have already been adversely affected. Secondly, though the one serious objection in the past to spinal anaesthesia has been the serious fall in blood pressure that threatens peripheral circulation for a short time, and in seriously ill patients this is undoubtedly a dangerous affair, this fall can be eliminated or kept within reasonable bounds by a proper technique—indeed the pressure may be higher at the end than at the beginning of the operation—and I have seen no ill-effects at the time or afterwards, except occasional transient headache, which can be quickly overcome by the recumbent posture.

#### DIFFICULTIES IN DIAGNOSIS

Gall-stones in the common duct associated with jaundice rarely give rise to any serious difficulty in diagnosis; pain of a characteristic type almost always appears in the history; occasionally, however, it is entirely absent. But difficulty does arise in the obstructive kind of jaundice due to supposed malignant disease of the head of the pancreas.

The following two cases were so alike that a similar pathology was expected, but actually it was very different:—

CASE 3.—Male, aged 45. Except for malaria in 1909 and occasional slight attacks since, he had had no illnesses until he began to be jaundiced about Christmas, 1934, this gradually deepened, unaccompanied by pain at any time; it was of the obstructive type with bile in the urine, clay-coloured stools, and a van den Bergh reaction prompt direct strongly positive, and indirect positive. The blood-sugar was normal; Wassermann reaction negative; excess of unabsorbed split fat in stools, neutral fat normal. He had worked in chemical factories, coming in contact with aniline compounds and nitrobenzene. In the three months between Christmas and operation he had lost 3 st. in weight. The liver was found to be much enlarged; the gall-bladder was not definitely felt. Urine was normal apart from the presence of bile. Phenol-tetra-iodophthalein 2.5 g. injected intravenously showed a 50 per cent. retention after  $\frac{1}{2}$  hour.

Operation, March 4th, 1935, for carcinoma of the head of the pancreas. No obstruction was found; common duct was opened and drained. He died nine days later, gradually fading out without any hyperpyrexia.

Post-mortem: A deeply jaundiced patient; gall-bladder small, thick-walled, and contracted; no stones. No fibrosis or malignant disease of the pancreas. Liver 47 oz.; cut section showed deeply bile-stained swollen short bands of liver cells with rather indefinite edges and areas suggesting recent granulations. Nothing else noted beyond some hypostatic congestion of the lungs. Reported as subacute yellow atrophy.

CASE 4.—Male, aged 60. No history of any note until three months before admission, when he had an attack of diarrhœa and vomiting, which was followed in two to three weeks by jaundice; this gradually deepened, unaccompanied by pain, but with gradual loss of weight. On admission he was of a dark yellow-green colour, and had lost 2 st. in weight; the jaundice was of the obstructive type; he felt reasonably well and was getting about. The liver was much enlarged and the gall-bladder was palpable.

Operation, Dec. 7th, 1935: A small carcinomatous lump as large as a hazel-nut was found arising in the ampulla of Vater and projecting into the duodenum; it was excised. The patient died five days later in a similar way to Case 3.

Post-mortem: The operation area was satisfactory. The liver was congested and the capsule thickened; there was some cirrhosis in the centre of the liver lobules. The most prominent feature seen on section was biliary stasis in the form of inspissated plugs of bile within the epithelial cells and in the fine intercellular canaliculi in the centre of the lobules; the Kupffer cells contained similar pigment. There was fibrous thickening in the portal tracts and polymorphic infiltration.

In both cases operation was undertaken to relieve intractable itching, the patients being anxious that something should be done to ameliorate this, and in the confident belief that the jaundice would prove to be due to obstruction of the common duct by carcinoma of the head of the pancreas.

Gall-stones in the common duct unaccompanied by jaundice may be difficult to diagnose correctly; something like 20 per cent. of cases never produce jaundice. Usually it is possible to be confident the patient has stones, but it may come as a surprise to find one or more in the common duct. I have had one case in which there were 35 stones in the common duct and yet there had never been visible jaundice or other indication that the common duct had become involved. This case shows not only the necessity for investigating the common duct when there is no apparent reason to expect any pathological lesion in it, but also the tolerance of this duct to stones which are not causing definite obstruction or infection. Nevertheless, the sooner stones in this situation are removed the better. But what are we to say of those cases with deep jaundice in which we feel confident there is no stone? Should we recommend operation in spite of the very definite risk, or let things alone thinking the patient has not long to live in any case? On the one hand we know that the majority of these patients will be found to have carcinoma of the head of the pancreas, many of whom will fade out a few days after operation, though most will live a few months longer and in reasonable comfort, the anastomosis causing disappearance of jaundice and with it the often intolerable itching, and promoting a return of good spirits and hope as the visible evidence of illness disappears. On the other hand, a few can be completely cured or relieved for a relatively long time. In this category come the unusual cases of stone without pain, chronic pancreatitis (which even at operation may be indistinguishable from growth), a removable carcinoma of the ampulla of Vater, and other rare tumours sometimes of a simple nature. It is chiefly the possibility of unexpectedly finding one of the conditions in the last group that should determine us to give the patient his chance, as it is frequently impossible to be sure beforehand of the nature of his pathological lesion. It is also something in favour of operation that it can bring ease, mental and physical, in very distressing circumstances. I think, therefore, we should take our courage in our hands and operate on all these cases if the patient's condition, after careful preparation, gives a reasonable chance of surviving the operation.

It is not often one will be faced with such a case as No. 3; nevertheless the possibility should be kept in mind, as this patient had passed through the hands of a consulting physician who was convinced that the condition was carcinoma of the head of the pancreas; in the circumstances it was inevitable that operation hurried the patient's demise.

My experience convinces me of the great value of glucose as a pre- and post-operative measure; in what way it acts is not quite clear. It is a good and easily utilised food and this may be its chief merit, though it is said to have a specific action in protecting the liver against further damage. I am doubtful whether it does so in any other way than providing easily assimilated food for the liver, as it does in the tissues generally. For jaundiced patients particularly it is beneficial, and, given as a continuous intravenous drip, it resuscitates in a remarkable manner those patients who after operation look like passing out in a so-called cholæmic state.

As a complication following operation for stone, duodenal fistula is fortunately rare; I have had only one such case, the circumstances of which were as follows:—

CASE 5.—Female, aged 62. She had had repeated attacks of typical biliary colic with jaundice; there was none at the time of operation and she was considered a good risk. At operation a large stone could be felt in the common duct, which was buried behind the duodenum, the latter being hitched up and very firmly adherent in the region of the hilum of the liver to what was apparently an almost completely destroyed gall-bladder. I think there had certainly been a fistula at some time. In order to expose the common duct it was necessary to free the duodenum, and in doing so it was accidentally opened. The stone was removed from a dilated and highly infected duct, which was drained. The duodenum was closed. Some four days later food and very excoriating fluid came through the wound (probably the drainage-tube had fretted through the suture line) and the patient wasted rapidly. Jejunostomy was done, and after a stormy convalescence the patient made an excellent recovery, the tube being removed from the jejunum in about four weeks.

#### ACUTE DISEASE

As regards the treatment of acute gall-bladder conditions, there is considerable divergence of opinion. Probably most surgeons adhere to the time-honoured practice of delay, awaiting the quiescent period which, as a rule, may be safely expected. When there is pus, following a local perforation, or widespread peritonitis, which is rarely seen, immediate operation is rightly performed; but most of the acute gall-bladder trouble is due to impaction of a stone, usually a single cholesterol stone, in the neck of the gall-bladder, and generally in patients of the younger type. My practice is to treat these cases on similar lines to what one does in acute appendicitis—that is to say, remove the gall-bladder at once if the patient is seen within 48 hours of the onset, and delay operation if the patient comes under observation after this period. The reasons for this are: (1) The patients are generally comparatively young and in reasonably good condition, and operation within 48 hours of onset will anticipate, in some cases, local perforation. (2) Removal of a gall-bladder obstructed by a single cholesterol stone will also prevent a great deal of subsequent trouble because it eliminates pus in the gall-bladder, mucocele, secondary stones, perhaps indigestion due to the diminished and possibly persistent cholecystitis, and also the threat to the liver. (3) If the patient is seen after 48 hours, operation is very apt to disseminate the localised mischief during the following two or three weeks with the result that spreading peritonitis, or severe infection of the wound, may arise, facilitated by the large incision through a great deal of fat and the necessarily extensive manipulations, which may be exceedingly difficult.

These risks introduced by operation are, in my opinion, not justified when experience shows that

there is little danger in waiting, since infection generally remains limited in extent and soon dies out or becomes reasonably attenuated.

## REFERENCES

1. Graham, E. A.: *Surg., Gyn., and Obst.*, 1918, xxvi., 521.
2. Flint, E. R.: *Brit. Med. Jour.*, 1929, i., 1041.
3. " " : *THE LANCET*, 1933, i., 1163 and 1223.

## PREVENTION OF DISEASE BY DIET

By A. G. MORISON, M.D. Aberd., D.P.H.

S. DATTA, M.D. Brist.

AND

A. F. WATERS

(From the City of Bristol Public Hospital Services)

In the human experiment, in which the difficulty of full control is notorious, the postulates for the proof of a theory based upon highly controlled laboratory experiment are not often all present in an easily recognised form. This, however, has not prevented considerable gain from coming to mankind out of scientific research.

More than a decade ago McCarrison found that he could keep monkeys from the jungles of Madras healthy or make them ill according to the diet he gave them. In particular, he found that the interaction of faulty food, faulty nutrition, and microbial or toxic agents led to the spontaneous appearance of many diseases or to their controlled appearance according to his desire.<sup>1</sup>

"Public interest has been aroused in this 'newer knowledge of nutrition' as it has been called. The centre of interest is passing from the research laboratory to the application in everyday life of the results of the researches."<sup>2</sup>

The following record of some happenings may be of interest at the present time. In an effort to apply a few of the newer facts of nutrition, some observations which may be pertinent and of significance have been made by the way.

Stapleton Institution is a hospital of 952 beds, functioning as a place for the reception and care of the mentally defective. In 1932 there was an outbreak of dysentery among the inmates (average occupation then 752). On August 21st the first case of dysentery occurred; within forty-eight hours the illness was present in 10 of the 20 wards, and by ten days' time 17 of the wards had become affected. All ages were represented amongst the patients attacked, there being a preponderance of those infirm and elderly, the female proportion being the larger. All this happened in spite of isolation from the commencement of any clinical evidence of intestinal upset, the routine attention to food handling, the wearing of rubber gloves by the nurses on

attending to patients, and the strictest attention to such-like usual details.

Bacteriologically, the first cases presented a *Some* infection, but examination of later cases revealed the presence of Flexner dysentery bacilli, type z. Rigid search failed to reveal any of the usual factors acting as a vehicle for the spread of pathogenic germs. The milk-supply was considered, the farm visited, illness amongst the workers searched for, and the milk itself examined bacteriologically—all with completely negative results. Contamination of the water-supply was also excluded. Of course, such possibilities, on the face of it, seemed to be unlikely explanations of the occurrence, for not one of the resident staff (115) were ill, and further, there was no spread of the illness beyond the institution.

"Green and Mellanby (1930) have pointed out how wide is the margin between the doses of vitamin A which will just maintain a rat in life, if it is not attacked by infection, and the dose which will wholly prevent those infections. The latter dose is about four times as great as the former. Animals receiving doses between these maximum and minimum amounts, while showing no overt symptoms of vitamin-A deficiency, yet suffer from a partial or latent deficiency and are proportionately liable to infection in consequence. This example serves to show that a latent deficiency disease is a real thing and not an imaginary concept."<sup>3</sup>

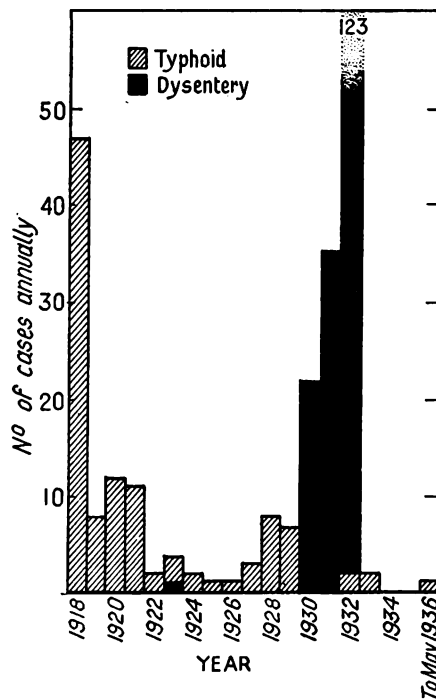
The limitation of this illness at Stapleton to the patients was considered probably significant, and the dietary was examined according to the criticisms suggested by the Advisory Committee on Nutrition.<sup>4</sup> The protective foods found to be in the diet were as follows:—

- (a) *Milk*.—0·56 pints daily per man value;  
Butter 5·25 lb. in the institution per week (margarine 1·27 oz. daily per man value);  
Cheese 1·27 oz. daily per man value.
- (b) *Vegetables*.—Cabbage, twice weekly; onions, once weekly; carrots, once weekly; parsnips, twice weekly; swedes, twice weekly; fresh fruits, absent; fresh salads, absent.
- (c) *Liver*.—Absent.
- (d) *Fish*.—8·2 oz. weekly per man value (large fish—cod, hake, &c.).
- (e) *Eggs*.—0·514 of an egg weekly per man value.

The diet, then, was deficient in the protective foods (although the total calorie supplies as well as the proportion of first-class protein were quite adequate, allowing, in fact, the recommendation of their slight curtailment). For, the consumption of milk was small; there was not a daily supply of fresh fruit, or of fresh vegetables as salads; the margarine was devoid of vitamin; liver was absent, as were also the fat fishes and fish roes; and eggs were but poorly given.

The following recommendations were adopted by the hospital committee:—

- (1) The addition of 6 oz. (minimum) milk daily per patient.
- (2) The introduction of liver once a week as a "meat" dish (herrings or fish roes alternatives).



Incidence of typhoid and dysentery in the institution.



(3) The introduction of fresh fruits (e.g., oranges) or fresh vegetables (e.g., tomatoes) or fresh salads daily according to season.

(4) The margarine to be vitaminised.

(5) The reduction of 8 oz. meat weekly per man value.

In 1918 there were 47 cases of typhoid fever amongst the patients, and during no year afterwards until 1930 was the disease absent from the hospital. In 1930, 22 cases of dysentery occurred, in 1931 35 cases, while in 1932 the epidemic embraced 123 cases. The incidence of typhoid and dysentery illnesses during the period 1918–May, 1936, is depicted in the accompanying Chart.

It is to be noted that since September, 1932, there have been only 3 cases of enteric fever at the institution, while dysentery has been absent. We are not aware of a change in any factor in the life or environment of this community which can be pointed to as likely to have affected the incidence or spread of the intestinal infections amongst its members, unless the considerable changes in the dietary immediately introduced at the cessation of the outbreak in August–September, 1932, be such a factor.

It is frankly admitted that these observations at this institution have been over only a very short period, but observation will continue at this and other institutions where a change in the dietary has been made having in mind the same criticisms.<sup>4</sup> The facts are now recorded because they may represent an application in everyday life of the results of the researches into this "newer knowledge of nutrition."

#### REFERENCES

1. McCarrison, R.: Cantor Lectures, London, 1936.
2. Orr, J. B.: Food, Health and Income, London, 1936.
3. Med. Research Council: Vitamins, A Survey of Present Knowledge, London, 1932.
4. Min. of Health Advisory Com. on Nutrition: Criticism and Improvement of Diets, London, 1932.

## CONGENITAL URETHRAL OBSTRUCTION

By ANNE E. SOMERFORD, M.D. Manch., D.P.H.

PATHOLOGIST, ROYAL MANCHESTER CHILDREN'S HOSPITAL  
AND MANCHESTER SKIN HOSPITAL

THOUGH it is common knowledge that congenital urethral obstruction may be unsuspected until autopsy, yet usually, according to Young, Frontz, and Baldwin (*Jour. of Urol.*, 1919, iii., 289), there are obvious symptoms. These include incontinence alternating with retention of urine, a distended abdomen, and evidence of renal destruction and infection, such as œdema, anæmia, anorexia, diarrhœa, vomiting, and loss of weight.

In the case under consideration the patient was a boy 11 years of age, who died from uræmia a few days after tonsillectomy. The history elicited after death from the mother by Mr. K. H. Watkins (to whom I am grateful for the use of the notes) was as follows. He passed a lot of urine which was sometimes frothy but never blood-stained. He did not have any incontinence, dysuria, or retention, though a large amount was passed during the morning and his diurnal frequency was probably greater than that of other boys. The bowels were usually loose.

At autopsy the following conditions were found. The body generally was well nourished. The brain was congested but was otherwise normal. The

bladder was much enlarged and almost filled the lower half of the abdomen: it contained semi-purulent urine. The wall was somewhat, but not

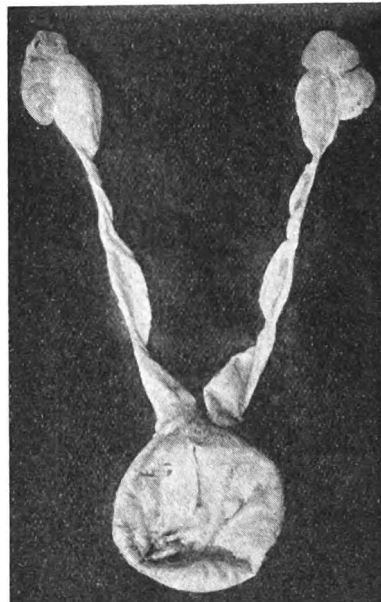


FIG. 1.—The kidneys, ureters and bladder.



FIG. 2.—Dissection of the urethra. The black line points to the enlarged verumontanum.

much, hypertrophied. The ureteral orifices were patent, and it was obvious that there could have been no obstruction to the flow of urine through them. There was double hydro-ureter and hydro-nephrosis (Fig. 1), and sections of the kidneys showed thin shells of tissue with but little remaining kidney structure. As far as could be made out there was no obstruction in the urethra except that caused by a hypertrophied verumontanum (Fig. 2). There were no valves, folds, or diaphragms such as are usually found in obstructions of the posterior urethra.

As cases of congenital hypertrophy of the verumontanum are not common, and the symptoms were so vague and so few, this case seemed worth recording.

## POSITION OF THE URETERS IN A CASE OF PROCIDENTIA

By J. LEON JONA, D.Sc., M.S. Adelaide,  
M.D. Melb., F.R.A.C.S., M.C.O.G.

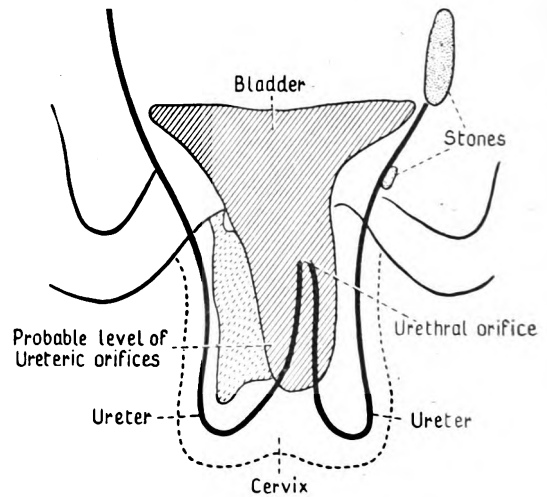
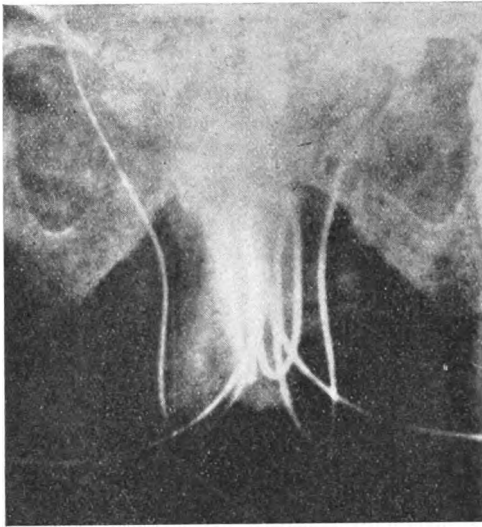
HON. ASSISTANT SURGEON TO THE WOMEN'S HOSPITAL,  
MELBOURNE

THE accompanying radiogram and tracing show the position that the ureters occupied in a case of procidentia; they actually lay outside the body along the antero-lateral aspects of the cervix. The coiled-up catheters can be seen in the bladder, and the base of the bladder, attached to the upper part of the cervix, is well down in the vagina if not actually also outside the body. The catheters in the bladder can also be seen passing upwards to the urethral orifice and so to the outside world.

The picture suggests an interesting point. One could hardly imagine the ureters and bladder "migrating" down the cervix, the alternative

suggestion being that the "hypertrophy" of the cervix has taken place in its upper part in relation to the base of the bladder which, with the ureters,

the ureters attached to these parts of the cervix or adjacent tissue. The pictures certainly suggest that before operating in a case of procidentia a skiagram



Radiogram and tracing showing position of ureteric catheters.

has been carried down in relation to this part of the cervix. One can imagine that the loops in the ureter are due to increased growth of the lateral parts of the cervix; hence the more pronounced descent of

should be taken of the ureters, either with opaque in-lying catheters or by intravenous pyelo-ureterography. It would be interesting to know the findings in a large series of cases investigated in this way.

## SUBPHRENIC ABSCESS

BY WALTER BROADBENT, M.D. Camb.,  
F.R.C.P. Lond.

CONSULTING PHYSICIAN TO THE ROYAL SUSSEX COUNTY  
HOSPITAL, BRIGHTON

SUBPHRENIC abscesses often present difficulties in diagnosis, which are illustrated by the following cases.

CASE 1.—A man, aged 52, had a sudden acute attack of pain in the right epigastrium, which spread to the right under the lower ribs. He did not vomit. When he was seen by a doctor two hours later the pain was acute, the temperature 100° F., and friction was audible for about 4 inches above the right lower rib margin in front. A diagnosis of pleurisy was made. Next day the pain was much less, the temperature 102° F.; the friction had gone and the breath sounds at the right base were diminished.

During the week the man became steadily more ill, his tongue dry and brown, and his temperature 99° in the morning and 102° to 103° at night. Dullness had progressed up to above the angle of the right scapula. A needle had been inserted, but no fluid was found. When I first saw him this dullness was marked but, on deep inspiration, weak breath sounds could be heard almost down to the base, with fine crepitations. In front there was diminished resonance in the right third and fourth spaces, but from the fifth space down to the rib margin resonance was tympanitic. On tapping one coin on another a bell note could be heard from the fifth rib down to 1 inch above the umbilical level in the right nipple line. This bell note area narrowed up to the ensiform cartilage, but widened towards the axilla. Breath sounds, which were fair in the upper chest, ceased suddenly where the tympanitic area began. The heart was pushed upwards and outwards, the apex being in the fourth space 1½ inches outside the nipple line. This was evidently a subphrenic gas-containing abscess, and a needle inserted

in the anterior axillary line in the eighth space let out foul gas and thin foetid pus. Later a portion of rib near the costal margin was removed, and a large abscess opened. A hard irregular ridge could then be felt across the right side of the abdomen above the umbilical level. Unfortunately the man died and no post-mortem was allowed, but the ridge must have been adherent omentum and colon forming the lower limit of the abscess.

In this case the origin of the trouble was, almost certainly, a perforated duodenal ulcer with a slow leak, not sufficient to cause vomiting. In similar cases the gall-bladder and also the falciform ligament become glued by peritonitis to the duodenum and colon, and the colon to the abdominal wall, a channel being formed with the gall-bladder and falciform ligament on either side and the liver and colon above and below, up which the duodenal contents spread round the margin of the liver on to the surface of the right lobe, and form a subphrenic gas-containing abscess.

The friction, which led to the erroneous diagnosis of pleurisy, was really hepatic friction, caused by the diaphragm rubbing on the inflamed upper surface of the liver. Hepatic friction may also be heard in the early stage of a perforated gastric ulcer near the pylorus, and in some cases of cholecystitis; also in cancer of the liver. In cholecystitis and cancer the friction may be heard under the abdominal wall some way below the costal margin.

CASE 2.—The second patient was sent into hospital with a diagnosis of query empyema, needles having been put into the back of the left chest in four different places without result. The man looked very ill and had been running a hectic temperature for a couple of weeks. The lower half of the back of the left chest was dull, breath sounds were absent in the lower 3 inches. In front there was resonance of a tympanitic character below the

fourth rib, and the heart's apex was 1 inch outside the nipple line in the fourth space. On the right side liver dullness was normal external to the vertical nipple line, but internal to this from the fourth rib downwards there was a tympanic area. On percussing over this with two coins a loud bell note could be heard with the stethoscope, and the same bell note could be heard as far as the left anterior axillary line, and down almost to the umbilical level. On rolling the man over on to his right side most of this tympanic area to the right of the sternum was replaced by the absolute dullness of fluid. This sign and the absence of abdominal movement in respiration are important in differentiating the condition from an abnormally dilated stomach. A needle passed into the tympanic area drew off gas and foul-smelling pus. A tube put in just below the left costal margin led to a slow recovery.

This subphrenic abscess must have been caused by the slow leak of a gastric ulcer, which had caused pain but not vomiting. Such abscesses are limited below by adhesions of the great omentum and the front of the stomach to the abdominal wall, and to the left by the spleen and the gastro-splenic omentum. On the right they are bounded by the falciform liga-

ment of the liver which, as the abscess enlarges, is pushed very much to the right of its normal position. At operation I think that it is safer to just drain the abscess, and not to make any attempt to find the gastric ulcer.

When a subphrenic abscess forms without gas the diagnosis is more difficult. The upper abdomen does not move with respiration on the side affected, while it still usually moves on the other side, giving the curious effect of a slight bulge on the sound side in inspiration. If on the left side abnormal dullness may help, but the abscess is usually far back. Then there is tenderness and resistance on deep palpation, and the lower part of the left lung is dull and silent from pressure collapse. If on the right side, it may be a sequel to a ruptured appendix or to a perforated gastric or duodenal ulcer which has been stitched up. The weight of the liver seems to squeeze these abscesses forward, so that they present in front. Liver dullness in the chest becomes duller and rises higher, and breath sounds disappear. A needle should be inserted in front in the sixth space in the dullest and most silent spot.

## MEDICAL SOCIETIES

### ASSOCIATION OF CLINICAL PATHOLOGISTS

THE summer meeting of this association was held in the rooms of the York Medical Society, Stonegate, York, on June 13th. Dr. S. GOODMAN PLATTS (York) occupied the chair.

Mr. E. J. KING, D.Sc. (London), spoke on

#### Phosphatase and Liver Function

The discovery of the enzyme phosphatase, he pointed out, followed the work of Harden on yeast fermentation of sugar, of which he found the formation of phosphoric esters to be an essential stage. Robison found a mechanism in yeast capable of breaking up these phosphoric esters and depositing the phosphate as inorganic calcium salt. This suggested that a similar mechanism might be responsible for deposition of bone salts. The enzyme was shown to be present in hypertrophying and absent in non-ossifying cartilage. Its presence in embryonic bone coincided with the appearance of areas of bone-salt deposition. It was present in rather more than normal amount in rachitic bones. The presence of the enzyme was soon detected in blood, and Kay and Roberts independently found large concentrations of phosphatase in the blood of patients suffering from osteitis deformans, osteitis fibrosa cystica, osteomalacia, and rickets. Later it was discovered that it was also high in other clinical conditions—notably in obstructive jaundice. Dr. King described experiments performed by himself in collaboration with Armstrong and Harris which were designed to throw light on the relationship of the increase in blood phosphatase to disturbance of liver function. Obstruction of the common bile-duct was found invariably to lead to a rise in blood phosphatase. On relief of the obstruction the blood phosphatase fell. The same thing had been demonstrated on human subjects suffering from biliary obstruction and relieved by operation. Previous attempts to estimate the phosphatase activity of bile had failed owing to the fact that bile contains substances which precipitate phospho-molybdic acid, rendering the colorimetric estimation of free phosphate

impossible. With the use of phenyl-phosphate as a substrate, and the substitution of a determination of the phenol instead of the phosphate liberated it was possible to estimate bile phosphatase. The daily excretion of phosphatase in the bile of dogs was followed; great variations were observed, but it became evident that large quantities of the enzyme are constantly being excreted by the liver through this channel. The significance of this constant passage of phosphatase into the intestine with the bile was not clear. There was some reason to believe that the enzyme is concerned in the absorption from the gut of both glucose and fat. It seemed likely that the phosphatase of the blood plasma arises in the bones, and is excreted by the liver into the intestine by way of the bile. Any interference with its normal excretion, such as is encountered in obstructive jaundice, thus results in an elevated level of the enzyme in the blood. Experimental toxic jaundice was produced in dogs by means of chloroform, phosphorus, and toluylene-diamine, and was always followed by an increase of the blood phosphatase. Hæmolytic jaundice was produced by phenylhydrazine; the red cells were grossly reduced in numbers and much bilirubin appeared in the urine, but the blood phosphatase showed no increase. In conclusion Dr. King stated that plasma phosphatase is seldom or never elevated in hæmolytic jaundice. Toxic and infective conditions show moderate increases. Very high phosphatase values occur strikingly in obstructive jaundice alone, and may be diagnostic of this condition.

Dr. F. S. FOWWEATHER (Leeds) offered observations on the

#### Van den Bergh Reaction

The questions most frequently asked of the clinical pathologist in reference to a case of jaundice were, he said: (1) is there an increase in the bile-pigment in the blood, and (2) of what type is jaundice when present? The van den Bergh reaction made a fairly accurate reply to the first question; to the second its response was not so definite. Difficulties arose when there was a mixture of toxic and obstructive jaundice and this was made even worse when hæmolytic icterus was also present. It was doubtful if

the van den Bergh reaction was of prompt direct type in every case of obstructive jaundice and never so in non-obstructive jaundice. McGowan considered that the type of reaction depended on the alkali reserve of the blood and Snider and Reinhold had claimed that it depended on the concentration of the bilirubin. Dr. Fowweather was not inclined to admit either of these explanations as fully satisfactory, though both had elements of truth. Azo dyes were indicators and were influenced by pH; the colour given by the reaction therefore varied with the alkali reserve of the serum used. This variation of colour had led to considerable confusion in the interpretation of so-called "biphasic" reactions. This term should be reserved for those in which some colour develops immediately but only reaches its maximum after a long period. Dr. Fowweather described experiments by means of which he had been able to isolate two separate salts of bilirubin, one giving in solution an indirect and one a direct van den Bergh reaction. The second salt was unstable and reverted readily to the indirectly reacting type. He believed that bilirubin was capable of existing in more than one form, each capable of forming its own salts. Bilirubin capable of giving the delayed reaction existed in the more stable form which Dr. Fowweather called A; in the less stable form B it gave rise to the prompt reaction met with in obstructive jaundice. Variations in the alkali reserve had an influence on the stability of the B form tending to convert it to the A. In regard to the nature of the colour change in the van den Bergh reaction Dr. Fowweather suggested that it was probably due to the fact that bilirubin had the general structure of a butadiene; on coupling with a diazo compound azo derivatives were produced. In view of his conclusions Dr. Fowweather anticipated little further improvement in the diagnostic accuracy of the van den Bergh reaction.

Dr. ALAN MONCRIEFF (London) spoke of

#### Jaundice in Children

He pointed out that the incidence and degree of physiological jaundice in the new-born varied in different clinics and also with the season of the year, being commoner in cold weather. The degree of icterus bore no direct relationship to the amount of bilirubin in the serum, this being due apparently to a variation in the power of the capillary endothelium to hold the pigment back. The polycythaemia of the foetus depended upon the reduced oxygen tension experienced in intra-uterine life and the bilirubinæmia of the new-born depended upon the reduction of the polycythaemia. Icterus gravis seemed to depend upon a failure of the balance between the red cell-destroying and red cell-regenerating functions. It had been attributed both to a primary defect of the erythron and to a primary defect in erythroclasis; probably elements of both entered into the case. The persistence of nucleated red cells in large numbers established the differential diagnosis as between icterus gravis and physiological jaundice. The only effective treatment for the condition was the parenteral administration of whole blood. Dr. Moncrieff pointed out the close relationship between sepsis and jaundice in young children; this was apparently due to the fact that the balance between blood formation and destruction remained unstable and easily upset for some time after birth. Speaking of jaundice in older children Dr. Moncrieff drew attention to the occurrence of cases of illness without visible icterus in children in close contact with others suffering from so-called

catarrhal jaundice. He suggested that certain cases of this malady might show no jaundice, probably due to failure of the bilirubin to pass the capillary endothelium. He described one case which satisfied the hæmatological criteria of acholuric hæmolytic jaundice but failed to show any icterus.

Dr. H. E. COLLIER (Birmingham) spoke of

#### "Lead Action"

as a clinical entity and as a problem in clinical pathology. By "lead action" he meant the often unrecognised degree of slight lead poisoning which precedes the appearance of the classical symptoms and signs of plumbism and which were constantly to be observed among lead workers. The earlier clinical features were pallor, lassitude, and slight dyspnoea on exertion. The earliest laboratory findings consisted of the appearance of basophil stippling of the red cells, without at first any gross diminution in their number; there was also an increased excretion of lead in the urine and faeces and hæmatoporphyrin might appear in the urine. The later clinical effects of "lead action" were premature senility, a tendency to diseases of the heart, blood-vessels, and kidneys, and a lessened expectation of life. In the later stages of lead action basophil stippling of the red cells might be absent; it could, however, usually be made to appear by methods aimed at de-leading such as the exhibition of parathormone or ammonium chloride. Dr. Collier drew attention to the large amount of disability produced by minor degrees of "lead action" and uttered a plea for the frequent and intelligent examination of the blood of those exposed to the risk of lead poisoning.

#### Demonstration

Dr. KING and Mr. G. A. D. HASLEWOOD, D.Sc. (London), demonstrated improvements in the van den Bergh technique. They pointed out that gross inaccuracies exist in the quantitative determination as ordinarily carried out. These were due (1) to the use of an artificial standard of incorrect strength, (2) to an improper allowance being made for the volume relationships in the test, and (3) to the frequent inability to get an accurate match of diazotised sera against any of the artificial standards. The proper strength of the cobalt sulphate standard should be 1.9 g. per 100 c.cm. instead of the commonly used 2.16 g. A constant volume of 4 c.cm. of coloured liquid can be got in the test by the use of 1 c.cm. of serum, 0.5 c.cm. of diazo reagent, 3 c.cm. of absolute alcohol, and 0.5 c.cm. of saturated ammonium sulphate. The difficulty of matching the colours was eliminated by the use of a green glass filter (Ilford spectral green).

Dr. S. C. DYKE (Wolverhampton) demonstrated specimens of adenomatosis of the liver associated with a gross splenomegaly. The condition occurred in an undeveloped female, actual age 24 but apparent age about 12, who was also suffering from chronic renal disease.

---

BIRMINGHAM UNITED HOSPITAL.—Dr. Stanley Barnes has resigned from the office of honorary physician to this hospital owing to his increasing duties as dean of the medical school and as a member of the executive board of the Hospitals Centre. He has been appointed honorary physician to the neurological department, and Dr. T. L. Hardy will succeed him in the charge of a medical unit. Mr. W. S. Adams has been appointed surgeon to the throat and ear department.

## REVIEWS AND NOTICES OF BOOKS

**Symptoms and Signs in Clinical Medicine**

*An Introduction to Medical Diagnosis.* By E. NOBLE CHAMBERLAIN, M.D., M.Sc., M.R.C.P., Lecturer in Medicine, University of Liverpool; Assistant Physician, Royal Infirmary, Liverpool. With a chapter on the *Examination of Sick Children* by NORMAN B. CAPON, M.D., F.R.C.P., Lecturer in Diseases of Children in the University. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 424. 25s.

DURING the student's first months in medical wards he is confronted with a confusing mass of new ideas and new phenomena. He has to acquire the technique of history-taking and physical examination *pari passu* with the principles and the facts of medicine, at the bedsides of patients who come in to hospital because they are ill rather than for the benefit of his education, and with the help of teachers who are apt to forget the limitations of his experience and outlook. An introductory text-book can help him greatly to see order in this new world and to make orderly progress in familiarising himself with it. The book must of course be clear, sound, and thorough, but not cluttered with detail. A description of methods alone is dry; the meaning of the signs and symptoms elicited, and an indication of the disease processes that produce them, are necessary to make them intelligible, but the balance in the book between medicine and method, if we may so express it, must be deftly adjusted. The bedside and test-room methods demand first place and most space, but the more elaborate laboratory and radiological procedures must be mentioned and their purposes indicated, for the student should learn from his first encounter with a patient that a full diagnosis is achieved only by assessing and piecing together all the facts of a case.

Dr. Chamberlain's book meets these considerations really very well. He writes easily and succinctly, he seems to have the good teacher's power to put himself in imagination into the mind of his pupil, and his outlook is fresh and up to date. His illustrations are unusually numerous and apt, though some of the coloured ones are not entirely successful. It is to be hoped that in later editions he may need to borrow even less from older text-books. We should like to see a more physiological discussion of renal insufficiency, which he does not distinguish from renal disease, and a fuller consideration of intermittent claudication and the signs and symptoms of peripheral arterial disease than appears in his one-page section on Trophoneuroses. A few words are inaccurately used: "anthropoid" does not mean ape-like, and "symptom," though properly defined on page 1, is sometimes used elsewhere in place of "sign." But these are minor matters.

The book is well printed and produced, and it deserves a welcome in other medical schools as well as in that from which it comes.

**Die Einheimische Sprue und Ihre Folgekrankheiten**

*Sekundäre Avitaminosen.* By Prof. Dr. K. HANSEN and Dr. H. v. STAA. Leipzig: Georg Thieme. 1936. Pp. 113. M.7.80.

DURING the preceding six months the authors encountered four cases of non-tropical sprue in Germany and one in which the diagnosis was doubtful. They

were sufficiently impressed to write a monograph of 113 pages on the subject, 30 of which are devoted to the case-histories. The value of these case records is limited by the paucity of biochemical data in the cases studied. The first patient, a woman aged 52 years, suffered from rickets as a child, developed gastro-intestinal symptoms 42 years later, and subsequently pigmentation and tetany. Campolon injections (2 c.cm. daily) were followed by a specific reticulocytosis of 8.7 per cent. on the seventh day following injection. A notable feature was the presence of thrombocytosis with a tendency to vascular thrombosis. The pelvis was deformed as in osteomalacia, and osteoporosis was widespread. The adrenals showed a striking abundance of lipoids in the cortex and large nodular islands of cells containing lipoids and resembling adenoma. The second case, occurring in a man of 59, was of considerable interest as it began as a pernicious anæmia with typical blood picture and glossitis. Later, features of subacute combined degeneration of the cord appeared. Diarrhœa with light fatty stools did not occur until three months before death. Autopsy showed subacute combined degeneration of the cord and an absence of hæmosiderosis from the liver. The third patient, a woman of 32, gave a history of four years fatty diarrhœa, megalocytic anæmia, osteomalacia, tetany, nutritional changes in the nails, and pigmentation of the skin. Muscular atrophy and hæmorrhagic diathesis associated with thrombocytopenia developed. Vitamin D given parenterally did not relieve the condition. The fourth patient, a man of 53, was the sole survivor of the series. He gave a history of diarrhœa associated with greyish-yellow fatty stools, osteoporosis, hypochromic anæmia, bleeding gums, and skin hæmorrhages.

The authors are in agreement with Thaysen that celiac disease presents no essential differences from idiopathic steatorrhœa or non-tropical sprue other than those due to age variation. The latter disease in turn is identified with tropical sprue. The anomaly that three out of four of their cases were dead within six months, whereas patients with tropical sprue returning to Europe generally recover, was not commented on—an omission no doubt attributable to the fact, stated in the text, that the authors had had no opportunity of studying tropical sprue.

**The Cerebro-spinal Fluid and its Relation to the Blood**

*A Physiological and Clinical Study.* By SOLOMON KATZENELBOGEN, M.D., Associate in Psychiatry in charge of the Laboratory of Internal Medicine, Henry Phipps Psychiatric Clinic, Johns Hopkins Medical School. Baltimore: The Johns Hopkins Press; London: Humphrey Milford, Oxford University Press. Pp. 468. 22s.

THIS book is a critical review of recent work on the chemistry of the cerebro-spinal fluid and its relation to blood chemistry. The size of the task which the author set himself may be judged from the 40-page bibliography; and the text shows that this is not a mere collection of references, but that each of the articles has been carefully examined. Most of the work deals with the barrier between blood and cerebro-spinal fluid considered as a physiological mechanism. How far the Donnan membrane theory can be applied to the formation of the cerebro-



spinal fluid and how far the process of dialysis is modified by vital forces is a question on which controversy still rages. On the one side there are the adherents of Lina Stern who see in her "hæmato-encephalic" barrier a mechanism with as delicate a poise as an endocrine gland, while on the other side there are those who hold with F. K. Walter that the permeability of the barrier rises and falls equally in respect to all substances, whether these are normally present in the blood or given in test doses. It is unfortunate that workers in these two camps have held their views so strongly that much of their recent work has been polemical rather than scientific. Dr. Katzenelbogen was brought up in Stern's school, and his sympathies naturally tend towards her views, but the review which he has made of the subject is so thorough and critical that the reader should be able to form his own verdict.

The most disappointing chapters are those on chlorides and glucose. The author makes little attempt to explain the very constant level at which the chlorides are held in the cerebro-spinal fluid, nor is his analysis of the recorded observations sufficiently detailed to give the reader a basis on which to form his own conclusions. As regards glucose, much confusion has been introduced by the inclusion of data arrived at by the use of out-of-date and unreliable methods. In fact so few reliable data are available as to the relationship between blood-sugar and cerebro-spinal fluid sugar that most of this chapter should have been omitted. For example, most of the reports of abnormally high percentages of glucose in epidemic encephalitis are worthless as the methods used at that time gave constantly higher results than Mestrezat's method, on which the normal was based. Indeed recent work has only served to show that Mestrezat's estimate of the normal as 55 to 65 mg. per cent. is remarkably correct for all patients with normal blood-sugar levels.

Taken on the whole this is a very able and unprejudiced review of the present state of knowledge of the chemistry of the cerebro-spinal fluid. The omissions are due either to the method of presentation or to the rudimentary state of knowledge on certain aspects of the subject.

### Chemistry of Natural Products related to Phenanthrene

Monograph Series No. 70. By L. F. FIESER, Associate Professor of Chemistry, Harvard University. New York: Reinhold Publishing Corporation; London: Chapman and Hall Ltd. 1936. Pp. 358. 32s. 6d.

This is a most valuable work and one that ought to be at hand in the biochemical and medical library. Every physiologist and every pharmacologist realises the important part that the phenanthrene nucleus has begun to play in physiological and pharmacological rôles. This knowledge has developed entirely during the last ten years. The compounds of phenanthrene were formerly regarded as being of interest only in organic chemistry, but to-day we know that this nucleus is contained in such important physiological substances as the bile acids, the sterols, vitamin D and possibly E, the sex hormones, the cardiac "glucides" derived from the strophanthus plant, and digitalis, to mention only a few of the more important substances.

This book deals with the chemical relationship of these compounds and presents a very full review of literature. The physiological and pharmacological

sections of the book are equally good. It is of interest that its appearance coincides with that of a German monograph, "Über sterine Gallensäuren und verwandte Naturstoffe," by Dr. Hans Lettré and Dr. H. H. Inhoffen. These two books taken together give the reader a view of the present position of sterol chemistry and its application to pharmacology and physiology such as can rarely be obtained by the reading of monographs.

### L'année médicale pratique

By Various Authors. Published under the direction of Dr. CAMILLE LIAN, Professor of the Medical Faculty of the Tenon Hospital. Paris: René Lépine. 1936. Pp. 796. Fr.26.

THE reader gets the impression from this Annual that, though much of the matter here reported may be of an ephemeral nature, French medicine is in a healthily adventurous condition, always willing to try new things. For example, André Trèves and G. Vidal-Naquet describe a method of treating arthritis deformans of the hip-joint by drilling a hole through to the centre of the head of the femur; and J. Périssin, a method of treating causalgia by acetylcholine injections. There is a note on evipan as a general anaesthetic, and a useful article on fractures of the calcaneum. Among many other interesting matters dealt with are the treatment of barbiturate coma, the occurrence of asthma as a sequel to healed pulmonary tuberculosis, the surgery of the diaphragm, and the treatment of cardiac insufficiency by total thyroidectomy. Vratislav Jonas strongly advocates X rays as the treatment of choice in Cushing's syndrome. The rival merits of the lumbar and sub-occipital routes for meningeal puncture are discussed by J. Périssin, and the treatment of intractable chronic prostatitis by intraprostatic injection of vaccines by F. Marsan. A method of treating hay-fever by the injection of sclerosing solutions into the base of the inferior turbinate has, perhaps, a topical interest. The appendix includes lists of recent drugs, books, and instruments, and alphabetical indices both of the editions of the last five years and also of the present edition.

## REPORTS AND ANALYSES

ERGO HEALTH BREAD—STARCH REDUCED  
(POLLEY & CO., LTD., 44/54, PLYMOUTH-ROAD, LONDON, E.16)

THE box contained a number of ordinary-sized rolls each weighing slightly less than  $\frac{1}{2}$  oz. They were very light and bulky in texture. When analysed the following results were obtained:—

	Per cent.
Water .. .. .	8.30
Fat .. .. .	1.27
Ash .. .. .	0.94
Protein .. .. .	37.70
Crude fibre .. .. .	24.00
Altered starch (carbohydrates) .. .. .	27.79

These figures show that "Ergo" bread contains nearly four times as much protein as ordinary white bread. The carbohydrate content (starch altered by cooking) is correspondingly low, and the crude fibre higher than in white bread. The claims of the makers are thus substantiated. The product being attractive in appearance and palatable should be appreciated by those who are concerned in devising suitable dietaries for patients suffering from disorders of metabolism.



# THE LANCET

LONDON: SATURDAY, JUNE 27, 1936

## THE COMMON COLD AND INFLUENZA

It is some five or six years since DOCHEZ and his colleagues in America produced evidence that the common cold has a filtrable virus as its prime cause. Not only was it shown that colds could be produced experimentally in the chimpanzee and human volunteers by means of filtered nasopharyngeal washings, but it was stated that this virus could be cultivated in a tissue medium consisting of minced chick embryo and a special broth in which a high reduction potential was maintained by cysteine hydrochloride and a vaseline seal. Quite special interest was attracted by this last claim since the conditions of cultivation were unlike what had been found essential for the growth of other viruses. Colds were produced in human volunteers by means of culture virus, but failure was recorded when the experimental animal was the chimpanzee. When DOCHEZ's cultures were tested on human volunteers in this country by ANDREWES and OAKLEY entirely negative results were obtained. A recent paper by DOCHEZ, MILLS, and KNEELAND,<sup>1</sup> however, confirms and extends their earlier work. Several strains of cold virus have been isolated and maintained in artificial culture. The conditions of cultivation have been the same as before and colds have been produced experimentally in human volunteers with strains which had reached the eighty-eighth subculture; later subcultures proved avirulent. It was noted that the virulence of the cultures was best maintained when subcultivation was carried out at intervals of 2-3 days; when longer intervals were used, up to 9 days, the percentage of colds produced experimentally with the cultures fell considerably. Other interesting points concerning the virus of the common cold are recorded in this paper. The virus in filtered nasopharyngeal washings can be conserved in an active state for at least 13 days if cysteine is added and the washings stored in the cold, and it has been shown that the virus can be preserved in a dry form. But the main interest of this communication is the reiteration of the claim to have grown the virus by this unusual method.

The same number of the *Journal of Experimental Medicine* contains a second paper by this team of workers which recounts their experience with influenzal virus. Here again human volunteers were their experimental animal and it is claimed that both with filtered nasopharyngeal washings and cultures made by the same method which they used for the virus of the common cold, success attended their attempt at experimental infection.

<sup>1</sup> Dochez, A. R., Mills, K. C., and Kneeland, Y.: *Jour. Exper. Med.*, 1936, lxiil., 559.

The surprising thing is not perhaps that infections were produced, but that these infections, with one exception, took the form of the common cold. Thirty-nine volunteers in all were infected either with filtered nasopharyngeal washings or with cultures, yet in only one was the resulting infection clinical influenza. DOCHEZ's reputation as a research worker will ensure for this work the most serious consideration, but certain facts make it impossible to accept the findings unreservedly. Clinical experience tells us that neither the common cold nor influenza confers a solid immunity, but there is nevertheless a difference between the two, for the immunity conferred by an attack of the latter disease is definitely more durable. It might be, of course, that this difference was merely due to the degree with which the hosts' tissues were implicated, the virus of the two diseases being the same. But against this must be placed the failure of the Hampstead workers to transmit the common cold to the ferret, whereas the virus of epidemic influenza infects this animal readily. It is somewhat surprising that DOCHEZ and his colleagues did not make use of the ferret in their investigations and also that they did not test the neutralising power of an anti-influenza serum on their virus. The susceptibility of the ferret to the virus of epidemic influenza has been abundantly demonstrated and strains isolated from epidemics in different parts of the world seem to be the same; so that had one known how these strains of virus obtained by DOCHEZ from influenza behaved towards the ferret, one would have been in a better position to judge of their work.

The failure to infect ferrets with filtered nasopharyngeal washings from cases of so-called sporadic influenza recorded by ANDREWES, LAIDLAW, and SMITH<sup>2</sup> suggests that sporadic cases labelled influenza may not have the same ætiology as epidemic influenza. Sporadic influenza may even comprise a number of different conditions. Might it not be that DOCHEZ and his team were not working with true influenza? The fact that most of the patients from which they obtained their virus were sporadic cases occurring in inter-epidemic periods lends weight to this view. And this is further strengthened by the observation of MAGILL and FRANCIS<sup>3</sup> that the cultural requirements of the virus of epidemic influenza are the same as those of other viruses, no growth occurring in a tissue medium if reduced oxygenation is maintained by cysteine and a vaseline seal.

## FOCAL INFECTION

No one who has worked on the ætiology of a straightforward infective disease is likely to underrate the difficulties of a valid demonstration that a disease is due to a given micro-organism, even when the effects of the micro-organism are highly characteristic. There are, for example, some awkward gaps still left in the demonstration that scarlet fever is due entirely to the action of

<sup>2</sup> Andrewes, C. H., Laidlaw, P. P., and Smith, W.: *Brit. Jour. Exper. Path.*, 1935, xvi., 566.

<sup>3</sup> Magill, T. R., and Francis, T.: *Jour. Exper. Med.*, 1936, xliii., 803.

the hæmolytic streptococcus, though undoubtedly those who accept this view are in a much stronger position than their opponents. When we seek for the explanation of such a disease as rheumatoid arthritis we are, however, in worse case, and to meet the difficulty the focal infectionist often steps in where the more orthodox pathologist fears to tread. Focal infection of the mouth or tonsils is commonly invoked as the cause of rheumatoid arthritis, but the difficulty immediately arises that most people are sooner or later subject to infection of these parts, and the onus remains of explaining why so many escape arthritic manifestations. If streptococci are the cause of rheumatoid arthritis, why are they so seldom isolated from the joints? Why, again, are the lesions of rheumatoid arthritis so different from those known, on good evidence, to be associated with the actual presence and multiplication of streptococci in the joints? When driven so far, the adherent of the focal infection doctrine must seek refuge in some indirect explanation such as "allergical reaction" or the action of "endotoxin." With the help of either of these additional assumptions it becomes possible to explain why a disease is so unlike what we should expect from our knowledge of its prime cause. Few subjects in medicine have been the excuse for so much loose thinking as that which goes under the name of allergy. In spite of the wide popularity of the allergy theory most immunologists look upon it as vague and unprofitable, or at least they define it so in such a way as to deprive it of any general application. It is perhaps not realised that the idea of endotoxin is equally vague, and indeed, as H. ZINSSER has shown in a brilliant review,<sup>1</sup> no adequate proof has been provided that endotoxins as generally understood have any concrete existence. Much weight is commonly laid on the apparent cures of a general disease which take place after the removal of a local focus of infection. Alternatively, weight is laid on the fact that interference with a focus—e.g., by removing it—may apparently make the disease worse. Such observations can perforce only be made on isolated cases, and controls, admittedly difficult to obtain, are practically never provided.

The doctrine of focal infection has drawn much support from E. C. ROSENOW'S experiments on the elective localisation of bacteria, particularly of the streptococci. He maintains that strains of streptococci from human appendicitis tend to localise in the appendix when injected into experimental animals, that strains from arthritics tend to localise in the joints, and so forth. Unfortunately others have failed to confirm ROSENOW'S experiments, and most bacteriologists remain unconvinced by his attractive theory. W. L. HOLMAN, from a study of the literature,<sup>2</sup> concludes that the bacteriology of focal infection seems to be that of the streptococci; Dr. W. P. MURPHY, in an address published elsewhere in this issue, states that the mouth is the most important site

of focal infection. The streptococci of the mouth may then be looked upon as the crux of the doctrine. C. C. OKELL and S. D. ELLIOTT have recently shown<sup>3</sup> how easily mouth streptococci may under certain circumstances reach the circulatory blood. These observers were endeavouring to fill in some gaps in the ætiology of subacute bacterial endocarditis, and they refrained from applying their findings to the general theory of focal infection. Even with the knowledge that *S. viridans* frequently reaches the blood stream we are brought little nearer to an explanation of most of the diseases which have so far been attributed to focal sepsis. In presenting their case the adherents of the focal infection theory have failed so far to provide statistical data for valid inference, or to satisfy KOCH'S postulates. The doctrine may well have some useful applications in pathology, but its uncritical acceptance will not carry us safely very far. Whether or not certain blood diseases are to be ascribed to septic foci, as suggested many years ago by W. HUNTER, again more recently by P. C. GIBSON,<sup>4</sup> and now by MURPHY, must be decided on the strict laws of evidence.

#### CENTENARY OF LONDON UNIVERSITY

IN the autumn of 1836 KING WILLIAM IV. granted to the University of London the right "to hold forth to all classes and denominations of our faithful subjects, without any distinction whatsoever, an encouragement for pursuing a regular and liberal course of education." To what extent this remarkable phrase in its Charter has been put into practice will no doubt appear in the centenary celebration next week. The breadth of learning which has been aimed at is typified in the selection of those who are to receive honorary degrees from the University at its centenary. The development of a federal university is difficult, and in the absence of any central building to impress on public imagination the extent, repute, and power of its university the people of London have been slow to become aware of what a university ought to mean. Next week will afford the opportunity for a fuller realisation. It may be instructive to recall some of the incidents that led up to the granting of the Charter a hundred years ago as set out in our own columns. Writing on Saturday, Nov. 28th, 1835, Mr. WAKLEY remarked:

"Within a very few years the fact of the metropolis of England not having become an University, under the sanction of an Act of Parliament, or the authority of some royal decree, up to close of the year 1835, will be considered one of the most extraordinary circumstances that can be related in connection with the history of the literature of this country. It does not even appear that, until a very recent period, the question of establishing an University in the metropolis has ever been mooted by persons whose character could give weight to their suggestions. When the project was first announced for founding the University which is now proceeding in its successful career in the northern part of London, the projectors were made the objects of contemptuous

<sup>1</sup> Jour. of Immun., 1920, v., 265.

<sup>2</sup> Arch. Path. and Lab. Med., 1928, v., 68.

<sup>3</sup> THE LANCET, 1935, ii., 869.

<sup>4</sup> Ibid., 1936, i., 994.

ribaldry. . . . The opponents of the measure resorted to every species of slander which malignancy could invent, in order to deter the subscribers from proceeding in the great national work in which they had engaged. It was pretended, indeed, that the idea of founding an University in London, or, rather, of establishing colleges in London, which should confer on the metropolis itself the title of 'an University,' had originated in a desire to offer an opposition to the national Universities of Oxford and Cambridge. . . .

"The founders of the University were stimulated by no such unworthy motive. . . . They were not so vain or so foolish as to attempt to enter into a contest with the ancient Universities of Oxford and Cambridge, immovably fixed as were the latter on solid masses of treasure, and renowned as they had become throughout the world as the most celebrated establishments of learning in civilized Europe. There was no desire to circumscribe the sphere of advantages attaching to a collegiate education, which had been created by those venerated seats of learning. On the contrary, the promoters of the great academic enterprise in London sought to widen that sphere, to multiply the opportunities of learning, and to afford to some thousands of the youthful inhabitants of England the means of acquiring, on cheap and accessible terms, a first-rate education in literature and the sciences. The friends of Oxford and Cambridge, therefore, had no legitimate ground of suspicion or jealousy on that occasion, and it is quite certain that the gentlemen connected with the ancient universities, who are the most exalted from the extent of their learning, and command the greatest share of respect for those qualities which most distinguish at once the philosopher and the man, became at an early period the advocates of the new scheme, and ardently did they desire that the efforts of its supporters might be crowned with success. Without having received the slightest assistance from the Parliament or the Crown, the claims of the University of London to distinction have taken a firm hold on public opinion, and, under difficulties which it may be considered are now surmounted, the institution has passed through a seven years' ordeal, preparatory, we trust, to running a splendid career of national usefulness.

"Under circumstances of so favourable a character, we do not expect the proprietors . . . will approve of any measure which can lead to an inference with the thinking portion of the community that the interests of the University could be advanced, that its reputation could be increased, or that the sphere of its usefulness could be enlarged, by obtaining from the Legislature or the Crown any privileges of a strictly exclusive or local nature. . . . The principle of exclusiveness cannot exist, certainly it cannot flourish, in the new metropolitan institution. London itself must become a regularly-organized and acknowledged University in the British Empire, and the great establishment now styled the University of London will, we are convinced, throughout many succeeding ages, take the lead under the name of 'University College,' or some other title, as the most liberal of those academic establishments, by means of which the fame of the University of the British capital will be mainly sustained. It will constitute at once the chief pillar and the brightest ornament of the metropolitan universities, and the names of its founders will be placed by the future historians of the literature of England amongst those of the chief benefactors of the human race."

A hundred years after these words were written it is recorded, in the Principal's report for 1935-36, that admissions from all sources to the university during the previous year numbered 10,000; that candidates for all examinations amounted to 44,000, of whom 19,000 were successful; and that some 4000 degrees and diplomas were gained. The "great establishment now styled the Univer-

sity of London" has seven university departments, 36 incorporated colleges and schools, and 24 institutions with recognised teachers. The senior academic staff responsible for the organisation of the teaching includes more than 250 professors and 140 readers. The story of this vast expansion from humble beginnings will doubtless be told at the forthcoming celebrations of which a summarised programme appears on another page. It is a source of gratification that of all the faculties none bears a higher reputation than that of medicine and that in this centenary year it is a distinguished member of our profession who occupies the post of vice-chancellor.

## BIRTHDAY HONOURS

THE viscountcy conferred on Lord DAWSON will give peculiar pleasure to the profession of which he is a well-loved member. His personal services to three sovereigns and his standing as elder statesman are common knowledge; the influence of the Royal College of Physicians has been extended during his presidency, now in its sixth year; but known to comparatively few is the extent to which his kindly wisdom has remained at the disposal of younger men who have constantly to remind themselves that he is not of their generation, so youthful is his outlook. Congratulations are due also to Sir RICHARD CRUISE, surgeon oculist to the KING, who becomes G.C.V.O., and to Surgeon Vice-Admiral R. W. B. HALL and Dr. ARTHUR MACNALT, each the medical chief of an important national service, and to the nine knights-bachelor among whom Mr. A. E. WEBB-JOHNSON is the best known in this country for his signal services in re-creating the Middlesex Hospital. Apart from the other honours recorded on p. 1496 there are some recipients not medically qualified whose work has furthered medical progress. Lord WAKEFIELD, a benefactor of hospitals, gets the G.C.V.O., and Sir HERBERT AUSTIN, whose gifts to the University of Cambridge were recently announced, becomes a baron. Lady SUSAN GILMOUR, now D.B.E., has done yeoman service for the Queen's Institute of District Nursing in Scotland. Dr. G. T. MORGAN, F.R.S., is director of chemical research at the Department of Scientific and Industrial Research. To these and to the nurses whose names figure in the list medicine in its widest aspect owes a considerable debt.

---

FRACTURES COMMITTEE OF THE MINISTRY OF HEALTH.—The first meeting of the committee on the rehabilitation of persons injured by accidents, which has been set up by the Home Secretary, the Minister of Health, and the Secretary of State for Scotland, was held on June 18th under the chairmanship of Sir Malcolm Delevingne. It was decided in the first instance to consider arrangements for the treatment of fractures, and information will be collected as to the number of cases of fracture and other injuries by accident, and their local distribution. Films illustrating modern methods of treatment of fractures, and the results obtained in the early restoration of working capacity, were shown to the committee by Mr. Watson Jones of the Liverpool Royal Infirmary, and Mr. Kenneth Pridie of the Bristol Royal Infirmary. The next meeting of the committee will be held in the autumn.

## ANNOTATIONS

## CLINICAL RESEARCH AT CAMBRIDGE

AN important step towards the development of clinical teaching and research at Cambridge has been taken by the general board of the University. The board has recommended the establishment, under the faculty of medicine, of a department of medicine, whose head shall be the regius professor of physic; and the appointment of an assistant director, at a salary of £700 a year, to organise and conduct clinical research at Addenbrooke's Hospital and in the university laboratories. In making these recommendations the board refer to the oft-expressed desire to make better use of the opportunities provided by the hospital for the investigation of disease. Plans for such development have hitherto been frustrated by lack of funds, but an income of not less than £1200 will shortly become available under the Elmore bequest, and full provision can now be made for the stipends of three or four qualified graduates who will undertake research under the direction of the regius professor. "The Elmore bequest," the report continues, "is one reason for the immediate establishment of a laboratory for research in clinical medicine, but another and very important reason is the appointment of Dr. Ryle as regius professor of physic. His two immediate predecessors held their chairs for comparatively short periods and, with only a short prospective tenure at the time of his appointment, neither of them could be expected to develop a school of clinical research in Cambridge. Professor Ryle has many years before him, which he hopes to devote to research, and it is incumbent on the University to provide him with proper facilities. The new arrangements with Addenbrooke's Hospital ... have enabled Professor Ryle to arrange for clinical research to be conducted in the wards and in the out-patients' department of Addenbrooke's Hospital, without additional expense falling on the university or the hospital. These arrangements have the approval of the honorary staff of the hospital, who are willing to put at the disposal of the staff of the proposed department of medicine all the clinical material that is available." Accommodation for laboratory work will be provided by the allocation of certain rooms in the pathological department. Besides the professor the staff will consist of the assistant director and three or four graduates (the Elmore students) who will devote their whole time to clinical observation and research. Members of the visiting staff of the hospital and of its laboratory staff will also join the unit. The establishment of this new department should provide excellent opportunities for collaboration between those engaged upon clinical problems and workers in the other scientific departments of the University. Addenbrooke's Hospital is situated in convenient proximity to the departments of pathology, biochemistry, physiology, and pharmacology.

It is estimated that in addition to the income from the Elmore bequest, £1400 a year will be needed for the payment of the assistant director and the maintenance of the laboratory. Towards this sum the faculty board of medicine have allocated £450 a year from the Sheild Fund, leaving £950 to be provided from the University Education Fund. Although the report of the general board has yet to be approved, applications for the assistant directorship may be addressed to the regius professor at any time before August 1st.

## ADOLF LORENZ ON HIMSELF

A PIONEER in orthopædics born in poverty, Adolf Lorenz<sup>1</sup> was always regarded by his mother as destined to become "ein grosser Herr" through the promise of her brother, the future Abbot Gregory, to have him educated as a choir boy in the great Benedictine monastery of St. Paul, Carinthia. When the boy, at the age of four, clad only in fustian breeches and shirt, found in his father's saddler's shop a single funeral glove, he rushed to his mother saying: "Am I not a real grand gentleman now?" He received the discouraging answer: "But you must have two gloves for that" and spent the rest of his life, he says, in the search for this qualification. Forty-five years later, during one of his numerous visits to the States, he quoted this story; he felt he had found the glove, for he had won the esteem of medical colleagues. In his boyhood, in spite of bare feet, except in mid winter, and a restricted diet, his only ailments were bow-legs and an attack of conjunctivitis; while the cover shows a man looking less than his eighty years, hale and hearty. The choir boy would have become a Benedictine monk and not a doctor, if it had not happened that the Obergymnasium was some distance from his home, and he had to find his own lodgings and earn his keep by tutoring and so tasted the sweets of liberty and of feminine society.

This work is the record of an egoist, but an interesting and versatile one. Lorenz writes in simple language with a sense of dramatic values and a sure instinct for the effective word. His book gives the impression that orthopædics as a specialty started in Vienna about 1890 and there is not the slightest reference to the Italian pioneers or to the Boston workers, while of early visits to Berlin, London, and Paris, the author says: "There was nothing to see or learn." He must have missed Liverpool altogether. He laments the neglect of apparatus by the younger generation of orthopædic surgeons, who are beguiled by the attractions of operative work, a swing of the pendulum back to the day when Lister made open surgery safe. Lorenz recognises the need for scalpel and chisel, but would like them to be the last resort, not the first. He asks to be remembered as a "conservative" surgeon, though he actually achieved fame as a "bloodless" one. He explains that his manipulative methods were forced upon him in early Listerian days because a chronic eczema, induced by the carbolic spray, drove him from operative work, till aseptic technique again put the knife in his hand. The disaster of his youthful career thus benefited thousands of patients.

The book is largely written for that American public which gave the author marvellous welcomes during his extraordinary tours of healing across the States. The first of these resulted from the offer of a two-million dollar fee for the reduction of a congenital hip dislocation in the child of a multi-millionaire—a fee which did not include the prolonged after-care, involving a second visit of the professor to the States and later of the little girl to Vienna. The other visits to America were equally extraordinary because, though the author coöperated with general practitioners, physicians, and lay boards of well-known hospitals, he appears to have ignored entirely the

<sup>1</sup> My Life and Work. By Dr. Adolf Lorenz, Hofrat and Professor of Orthopædic Surgery, University of Vienna. New York and London: Chas. Scribner's Sons. 1936. Pp. 362. 12s. 6d.

band of skilled orthopædic experts who have made famous their centres in Boston, New York, Baltimore, to mention only a few. There is a brief reference to his helpful colleague Albee, and a note that an invitation to the New York Ruptured and Crippled Hospital, given by a physician, was afterwards withdrawn on the representations of other colleagues. It is clear from the author's account of his professional activities that in addition to his technical skill and original ideas it was his personality as a whole which made him so acceptable alike to the poorest parents of cripples and to business magnates in U.S.A., as well as to crowned heads in Europe and to presidents of the United States.

#### THE SIZE AND SHAPE OF THE HEART

In his Lumleian lectures, published in the last two issues of THE LANCET, Dr. John Parkinson gave a masterly account of the variations in shape and size of the heart as revealed by radiography. He described the different forms of silhouette of the normal heart associated with different types of body-build, the abnormal appearances produced by such common deformities as scoliosis, and the deviations from the normal attributable to pathological enlargement of the different chambers of the heart. Incidentally he made it abundantly clear that the information given by the senses of touch and hearing, skilfully combined, on which our fathers in medicine chiefly relied, had been proved to be depressingly unreliable. Seeing is believing, and while the exact significance of shadows thrown by gastric ulcers or duodenal deformity may still be in doubt, the cardiac silhouettes visible under the X rays carry conviction interpreted by the experienced cardiologist with a comparatively small margin of error. Not that radiology can tell the whole truth. A radiogram with the patient facing the screen gives us a nearly perfect picture of what we used to try to map out roughly by percussion. But it is still only a diagram in two dimensions; further information can be obtained by rotating the patient, but even so there is no reliable formula for calculating heart volume, and what we would really like to know is the three-dimensional volume of the heart. As Dr. Parkinson has shown, the greatest contribution which radiology has made to our knowledge of the pathological anatomy of the heart is that the shape of the cardiac silhouette in the different positions enables us to say which chambers of the heart are enlarged.

The more conservative members of the profession may be disturbed by Dr. Parkinson's wholesale condemnation of percussion as a means of estimating the size or shape of the heart, and there is something to be said from this point of view. Admitting that the doctor's coarse thumb and finger often fail to plumb the exact depth and width of the heart, and that radiology can tell us everything which we can learn from percussion with a much greater degree of accuracy, they will contend that it is not, and in the immediate future is not likely to be, available as a routine method for use by the general practitioner. It is certainly incumbent on the clinical teacher to show his students not merely what can be achieved under ideal conditions, but also what they themselves may hope to achieve under the limitations imposed by family practice, where they still have to rely chiefly on their unaided senses. Can we afford entirely to dispense with palpation and percussion? If not we can at least, and this is common ground, teach students the limitations of these methods, and show them, as Dr. Parkinson has done, that the

information they are capable of giving is only a very crude approximation to the truth.

There is another anomaly that has yet to be completely resolved—the fact that both in health and in disease the anatomy of the living heart as revealed by radiography differs considerably from that seen in the post-mortem room. One reason for these differences may well be that the heart of the cadaver is not generally examined *in situ*. In this respect the investigations of Dr. T. Skene Keith reported on p. 1466 of this issue provide an important connecting link between the clinical and post-mortem findings. Dr. Keith is concerned here chiefly with the four normal types of heart silhouette he has been able to make out from a study of some 50 cases. It is rather disappointing that he makes no reference to any cardiac radiograms that may have been taken during the life of this group of cadavers, but he states that in a subsequent paper on the diseased heart it will appear that there is a fair degree of agreement between the outline of the heart as seen at autopsy and that obtained in orthodiagrams or telerradiograms. This is likely to be a study valuable to cardiologists, who will join Dr. Keith in gratitude to Dr. Parkinson who put the idea of this investigation into his head and by encouragement kept it there.

#### DOUBTS ABOUT DRUGS

ALL plants which have been cultivated by man have been profoundly modified from their wild condition. Of late years this has been carried out deliberately and the difference between a Cox's orange pippin and the crab apple or between an exhibition rose and a dog rose of the hedgerows would fill us with astonishment if we were not accustomed to it. These thoughts prompted Mr. Harold Deane's address last Monday afternoon at Bournemouth as chairman of the British Pharmaceutical Conference. Mr. Deane has drugs in his blood, if one may put it that way; his grandfather was the first president of the conference 70 years ago and practised his calling in those ruder ages when the legislature had not as yet been persuaded that the sale of poisons should be allowed only by those who could read and write. In the case of the apple, as in that of the rose, there are easily applied tests of quality; thus the orange pippin tastes better than the crab, and the standard rose is more beautiful to look at, more pleasing to the nose, and more enduring than the dog rose. There are no such simple tests for the properties of cultivated drugs; their medicinal value cannot be judged by their flavour, their appearance, or their colour. Mr. Deane took as an example the cultivated English henbane: "It has," he said, "an altogether different appearance from, and a stronger aroma than, the imported herb. The ordinary pharmacist will say it is a much superior drug, and a tincture made direct from the English drug hardly seems the same preparation as the one made by diluting a liquid extract of the foreign drug. Is there any difference in the medicinal activity? No one really knows." Coming from an eminent pharmacist these observations are a little disquieting. The compilers of the British Pharmacopœia have assumed that the alkaloids are the only thing that matter and have also assumed that these alkaloids are the same after an extract has been evaporated down as they were before; while admitting that these assumptions are "quite likely true," the chairman of the conference says "there is no proof of them." Here, it will be seen, is a twofold doubt: are the medicinal virtues of plants due solely to the



alkaloids and does the extract of a plant evaporated down by heat possess all the virtues of the original drug?

It is a curious fact that the earliest list of drugs in existence, the Ebers Papyrus made in Egypt 4000 years ago, contained a larger number of drugs than does the latest British Pharmacopœia. The total number of drugs known to mankind must run into tens of thousands, yet there are only 63 in the British Pharmacopœia. It has been inferred from this that the vegetable drugs of value are strictly limited in number; it may perhaps be inferred with more justice that there is much research work waiting to be done by bodies like the British Pharmaceutical Conference. Mr. Deane's own view is that there will be a still greater falling off in the use of vegetable drugs and that only such plants as the opium poppy, digitalis, and belladonna, which have active principles with readily determined properties, are likely to remain of importance. He admits, however, that "there are drugs which have properties at present unknown or unproved that may be valuable and research might find them out." Continental opinion favours the view that the day of vegetable *materia medica* has not passed. In many countries vegetable drugs are used more extensively than they are here and several Central European Governments are assisting agriculturists to cultivate them. In Soviet Russia elaborate plans have been made for the cultivation of vegetable drugs, and laboratory work is to be encouraged with the object of sifting the wheat from the chaff in a field which is rank with tares. It is said that man acquired his first knowledge of the value of medicinal plants by observing the ways of animals, and after all these years we still appear to be in doubt whether the dog when he eats the whole herb is not getting the best medicine.

#### THE POOL OF LONDON

Sir Cecil Levita's suggestion in the *Times* to form an airport for London by damming the Thames at Woolwich has drawn from Colonel W. Butler a rejoinder on certain issues of public health. Colonel Butler points out that were the river dammed below London it would, during dry summers when the flow over Teddington Weir is small, become virtually a stagnant pool, its self-purifying powers would thus be reduced, while the adventitious pollution would continue. This is a strong point, although its strength might be obscured for a time by the effect of sedimentation, whereby the mud banks would be concealed and the supernatant water become clear and (possibly) well oxygenated. But sooner or later the mud at the bottom would ferment and the resulting gas, buoying up masses of foul mud, would render the Thames as offensive as was the Lee a few years ago below Tottenham lock. Possibly the water might deteriorate from the beginning of the suppression of tidal motion. There is no doubt that the stirring up of the water of those tidal rivers which from their geographical position must be muddy, by dispersing the lighter (and putrescible) matters of mudbanks, does lead to oxidation of the mud (although it may thereby reduce the dissolved oxygen content of the water) besides accelerating the rate of absorption of oxygen by rapid renewal of the air-water interface. On the other hand the sewage discharged into the Thames above the barrage may be so successfully purified (as is indeed likely so far as West Middlesex is concerned) that the oxidation of accumulated as well as of continuing pollution may go on inoffensively after a time, if not at first.

But even then the pool would become a rich medium for the growth of weeds which, barring the right kind of fauna to keep them within bounds, must impede navigation and themselves become an offence when they rot. Colonel Butler remarks that the rise and fall of the tide displaces the purer air of the river over its banks and conversely draws the stagnating air of the streets into the channel. The volume of air so moved is large—about 50 million cubic yards between London Bridge and Albert Dock. But the movement is spread over some six hours and the atmospheric exchange may be insignificant compared with that due to a breeze or to convection from warm surfaces. The idea of a Thames barrage is not new, although earlier schemes were intended to improve the seaport rather than to provide an airport, and the tidal flow has had earlier apologists. In his presidential address to the civil engineers five years ago Sir Cyril Kirkpatrick said: "The supremacy of London as a port with its approaches from the sea is due to the tidal scour, which should not be impeded."

#### ADJUSTING THE CHILD TO HIS ENVIRONMENT

CHILD guidance clinics usually aim at helping difficult children in two ways: by altering the environment to suit the child's needs, and by direct approach to the child himself. At the Institute of Child Psychology little attention is paid to the former of these two methods. The directors, Dr. Margaret Lowenfeld and Dr. Ethel Dukes, hold the view that none of us can expect to have his environment cut to his own measure throughout life, and that the child's business, therefore, is to learn to fit into his environment. Anyone who has to do with children will appreciate the difficulty of their task. The child's mind is not easily accessible to the Olympians. At the Institute the child is both approached and treated through the medium of play therapy, and a detailed report is written by the worker attending the child on each visit to the clinic. A mass of information has been collected in this way, for treatment may extend over years, so that every child's dossier becomes in time a formidable document. The annual report for 1935 announces that a method of analysing and indexing this valuable psychological material has now been devised, and a system of filing statistical records is already in use. The play therapy rooms are in a sense the most important part of the Institute. Plenty of material is available to occupy hands, wits, and attention. The enuretic boy can, if he will, build a world, and then, Zeus-like, drown it beneath floods from a watering can. The aggressive child can dramatise battle, murder, and sudden death with a patient and consenting adult to abet him. The aim is not only to obtain the disappearance of those symptoms for which the child was referred, but to eradicate the emotional disturbance which lies beneath them. Each child is examined physically at the first visit, and any necessary medical treatment is arranged. Good results are being achieved more easily and quickly as knowledge is gained and mistakes are avoided. All cases discharged are systematically followed up. A three years' training course is open to physicians and psychologists, and a shorter course, of one year, is available for teachers and social science workers. Parents are interviewed on the occasion of their first visit, and a well-placed hint is often of value in changing the parental attitude to the child's peccadilloes. As the report says:

"Though the first aim of treatment is to enable the child to cope even with a difficult environment and



unsatisfactory parents, there is nothing to be lost—and often everything to be gained—by giving the parents an opportunity of helping instead of hindering the child's development."

Mental capacity is assessed, on the child's first visit, by means of the usual mental tests; in addition, the mosaic test, devised at the Institute, is also employed, and is regarded as a test of temperament and emotion. The subject is required to use the mosaic pieces to form a pattern which is pleasing to him, and experience has shown that the designs produced can be classified as fundamental, concrete, abstract, or incoherent; and that the type chosen can be correlated to some extent with temperamental and emotional factors in the subject.

Recently the Institute has published a *News Bulletin* which will appear six times yearly; each issue will contain an article on some topic of interest to those concerned with child psychology, current psychological news, book reviews, and correspondence.

### "AERONEUROSIS"

ON examining 163 unselected aeroplane pilots Captain H. G. Armstrong<sup>1</sup> found that 18 of them (11 per cent.) suffered from a nervous disorder which he calls "aeroneurosis." This is to be diagnosed by "the occurrence of a functional gastric disorder in pilots of several years' experience, combined with a general irritability and increased motor activity with subjective complaints of insomnia and mental fatigue." Prominent among the exciting causes are, first, exposure to the risk of accidents; and, secondly, what Armstrong calls "ego deflation." In his own words, "the World War changed the status of airplane pilots from crazy fools to national heroes . . . gradually however aviation has become more commonplace . . . This slow but definite change has deflated the pilot's ego and thereby created a further emotional stress. There is a constant attempt to regain face, to reclaim and hold a fading dream. . . . The higher the intelligence the more this holds true." He is on safer ground in arguing that prevention is more effective than any particular line of treatment. A careful examination of candidates would probably, he thinks, eliminate the condition, but would have "the distinct disadvantage of depriving aviation of those who are acknowledged to be the highest type pilots. The problem resolves itself into a question of whether it is more desirable to select the better pilots who break down after ten or fifteen years' service or poorer ones who are more durable." Armstrong does not, however, explain how the disorder could be recognised in embryo, nor why it should only be the better pilots that suffer in this way. His paper in fact does not carry full conviction. The nomenclature of psychological medicine is already blamed for being cumbersome and confusing, and a very clear case must be made out before introducing a new disease. The late Graeme Anderson used the term "aeroneurosis" in 1919 but it has never come into currency. And why should it? What is there about the symptoms which do not come under the existing classification of the neuroses? Flying may of course be the "trigger cause" in bringing to light conflicts of an economic, domestic, or instinctive nature. But what occupation may not have the same effect? Even if flying is regarded as an extra load upon a person this is far from proving that the partial breakdown it helps to induce is in any way specific. To base nomenclature upon "trigger causes" is a step in the wrong direction.

### INDUSTRIAL MEDICINE

ON another page Dr. H. H. Bashford describes his unique experience of industrial medicine, for he is chief medical officer to the Post Office which is the largest employer of labour in this country. In many ways, he tells us, the Post Office as an industrial concern differs from other large industries. For instance, all the lower-paid employees receive free medical attention from general practitioners on a capitation basis. This service is of course not compulsory; if they choose to pay for them post-office employees can have their own private or panel doctors, but in any case the local post-office medical officer is responsible for the supervision of the sick absence of the whole staff in the offices to which he is attached. Private certificates must be countersigned by him and panel certificates scrutinised before pay is authorised. This régime has led to another remarkable feature of the post-office medical service; it has complete and accurate sick records under actual working conditions of nearly a quarter of a million men and women aged 16 to 60. In these records there are still unworked mines of information both for industry and medicine. They have already helped, Dr. Bashford tells us, to destroy one or two medical bogies. At first the discovery of albumin in the urine of adolescents was regarded as evidence of the commencement of Bright's disease, until it was found that 1 in 20 of the boys entering post-office service and 1 in 6 of the girls had albuminuria which was really of no serious import. The records too have demonstrated that present-day boys weigh 16 lb. more and are 1½ in. taller than those of the previous generation, the corresponding figures for girls being 10 lb. and 1 in. Not only have these records made medical history, but to some extent also industrial history; for the employees receive full pay when they are absent for illness, and it has been a common criticism outside that this must reflect on the sick rates. Dr. Bashford says "there are undoubtedly some men and women who may take advantage of such a system, but my experience has been that there are relatively not very many." And he adds that although loss of wages may be an incentive to an early return to duty, there is plenty of evidence that it brings the younger men and women back to work too soon. Any move in the direction of an immediate curtailment of pay during sick absence would in his opinion be a retrograde step.

With a few more years of experience to guide them the Industrial Welfare Society have revised their brochure<sup>1</sup> on "Medical Service in Industry." In its present form it is a publication of social importance for it elaborates the influence of industry as a factor in community health. The most important development in the period between the two editions has been the growing realisation that organised economic and industrial functions affect the general health and well-being of the individual, quite apart from specific hazards and risks. Emphasis is laid on the part played by general practitioner and industrial doctor working in harmony, each seeing a different aspect of the patient and each placing his or her experience at the other's service. The idea that industrial medicine is a rival and competitive function to general practice is shown to be false; where a spirit of antagonism exists it is not the conception which is wrong but its interpretation. In this brochure industrial medicine, in its widest sense as a new shoot

<sup>1</sup> Jour. Amer. Med. Assoc., April 18th, 1936, p. 1347.

<sup>1</sup> Issued to member firms only. The address of the society is 14, Hobart-place, London, S.W.1.

on the tree of medical thought and practice, is fairly and accurately presented, though the diversity and complexity of some of the issues are not fully stated. Study of the brochure leaves the impression that a better definition of the work would be the industrial branch of social medicine. There is still, both within and without the medical profession, a failure to realise the larger medical issues resulting from the industrial development of the last twenty years. The Industrial Welfare Society has taken on itself the task of showing that industry has its social duties, not least of which is the need to take a share in preventive medicine. There is welcome evidence that many business firms are taking an interest in the rehabilitation of their employees after injury and we should like to see an analysis of the well-known legal and financial difficulties of treating injured persons with recommendations for their solution founded on the Society's large experience. The chapter on records contains significant data of sickness absenteeism, including an analysis of the 8.4 days lost per year in a staff of 679 women. In another section effort is made to stimulate interest in the medical supervision of the staffs of small firms. Industrial medicine is not the prerogative of large organisations like the Post Office; the problem of the future is the evolution of a practical and comprehensive system for the medical care and supervision of the staffs of the innumerable small concerns. This is bound to come, but it will come quicker with the realisation that new economic and industrial needs call for new measures and that these measures require co-operation between general medicine and the medical problems of a mechanistic economic order. The brochure is issued only to members of the Industrial Welfare Society but the society might do well to make it easily available to the medical profession, and it would be additionally valuable if they would state more fully and explicitly their attitude to the organisation of hospital services. We have an uneasy feeling that these are not always nor everywhere fully in line with modern industrial needs, and nothing would be more valuable than informed, friendly, and constructive criticism.

#### PSYCHOTHERAPY IN GENERAL PRACTICE

"SOME years ago members of the profession were thoroughly hostile to psychotherapy. Now there is an immense appetite for it." Dr. A. C. Court's statement, communicated to a symposium on psychotherapy in general practice arranged by the Medical Society of Individual Psychology on June 11th, reflects an impression which will hardly be disputed. The problem remains how to equip the family doctor with tools which are more effective than his age-old weapons of suggestion, persuasion, and transference; for he has always used a personal influence to straighten out family tangles, and has assumed a fatherly relation to those unable to bear their burdens until they are strong enough to resume them. Now that he is using these methods more consciously and is keen to learn how to use others as skilfully, the question arises how he can best be taught the basis and technique of such psychotherapy as is open to him. Dr. S. Crown, who opened the discussion, suggested the publication of case documents in general medical journals, with analyses of many cases of the particular type of disorder under discussion, of their course and of their treatment; also the organisation of discussions not on general problems but on the results of the psychological investigation of symptoms and diseases. Dr. S. H. Lubner regards as the most important factor an alteration in the attitude of the great teaching hos-

pitals where the medical man derives his technical knowledge. At present, he contends, the teacher is satisfied when the student has differentiated between what is organic and what is "functional," and that a "complete and devastating ignorance of the anatomy and psychopathology of the mental personality is compatible with an honours degree." The student carries this ignorance into general practice where, having rigidly excluded evidence of organic disease, he will fill his record cards with such remarks as "neurasthenic," "nothing wrong," or "swinging the lead," giving the patient tortured by unconscious forces no help in the struggle to escape. Dr. M. Marcus, on the other hand, is less concerned with the student than with the practitioner; he admitted that the wisdom of including psychology in the curriculum of the medical student was open to discussion, but held there should be no question about the absolute necessity of giving the qualified practitioner some knowledge, at least, of its fundamental principles, for without this the practice of medicine became sterile, and divorced from life. Dr. Court, as we have noted above, is more cheerful even about the present position; his thesis is that general practitioners have been doing psychotherapy all the time and doing it well. They will not necessarily be better when more self-conscious, more accomplished; the mysterious qualities which guided them before will continue to be the predominant element in cure. The time has come, however, when the leaders of the profession must guide and control this curiosity now aroused on all sides about mental processes and human behaviour, and as soon as clinical psychology is widely taught it will become an outstanding form of our national method in medicine.

#### VISIT OF FRENCH SURGEONS

THE Royal College of Surgeons of England has made an arrangement with the Académie de Chirurgie of Paris, whereby French surgeons will visit Britain and British surgeons will visit France in alternate years for scientific meetings. The first of these tours will take place in ten days' time, when some 40 French surgeons, led by Dr. Louis Bazy, secretary-general of the Académie, will come to London. On Monday, July 6th, there will be a meeting beginning at 10 A.M. at the College in Lincoln's Inn-fields, when Prof. E. W. Hey Groves will open a discussion on the treatment of fractures of the neck of femur by open operation, and at 11.30 Dr. John Beattie will give an account of recent research at the Royal College of Surgeons. Any surgeons who would like to attend will be welcome at this meeting. The French surgeons will visit the Buckston Browne Farm at Downe, St. Bartholomew's and the London Hospitals, and attend a reception at the College on the same evening.

Mr. H. L. Eason has been re-elected vice-chancellor of the University of London for the coming session.

THE death last week of Mr. J. D. Unwin, Ph.D., puts an end to a career of singular promise. For twelve years Dr. Unwin had been collecting, digesting, and codifying facts relating to sex and culture, which were embodied in a book reviewed a few months ago in *THE LANCET* (1936, i., 437). He set out to test the hypothesis that what we call civilisation has been built up by compulsory sacrifices in the gratification of innate desires, and, although others might interpret differently the data which he analysed, the book placed Dr. Unwin as a pioneer in a new and very interesting branch of statistical sociology. He had been head for five years of Cambridge House where his vivid personality and clear thinking proved a stimulus to other social workers.

## PROGNOSIS

*A Series of Signed Articles contributed by invitation*

### CV.—PROGNOSIS IN ECLAMPSIA AND THE TOXÆMIA OF PREGNANCY

THE entity to which we apply the term toxæmia of pregnancy is at present but ill-defined. Its manifestations resemble those of chronic renal inefficiency. When this latter state of disordered function is complicated by pregnancy the conditions are liable to be confused. That chronic nephritis is very adversely affected by the course of pregnancy is well known, and it is also common knowledge that the prognosis in such cases is bad when the future health is considered. Indeed, Stander has computed that nearly 50 per cent. of women suffering from chronic nephritis and pregnancy are dead within five years of such pregnancy. It is not my intention to deal with this class of case, but to confine myself to a consideration of the prognosis in those cases in which signs of toxæmia have first appeared during the state of pregnancy.

Since the manifestation of toxæmia is so various, particularly as regards the severity of signs and symptoms, it is difficult to formulate any set scheme by which to arrive at a prognosis. It would seem advisable to consider first the state of eclampsia, and thereafter to endeavour to lay down some practical rules for our guidance in the less severe types of toxæmia.

#### ECLAMPSIA

Eclampsia may occur following or in the course of a mild toxæmia, but modern methods of treatment have reduced its incidence to about 1 per cent. in adequately supervised cases of albuminuria with concomitant toxic symptoms. About 5 to 10 per cent. of cases of eclampsia are fulminating in their onset and constitute a clinical drama of such intensity that the fate of the affected patient is a matter of only moments to her friends.

Brought face to face with a patient who has had an eclamptic fit, upon what evidence may we base an immediate prognosis? Certain facts will be forthcoming in the history, certain others will appear on a careful, general, and local examination, and yet a third mass of evidence will be accumulated by intelligent observation during the passage of the first few critical hours. Thus we may be able to build up a reasoned argument as to the chance of immediate recovery. From the *history* we may learn that the eclamptic condition developed suddenly without any complaint of previous ill-health. These fulminating cases always carry a grave prognosis. We may also learn the relationship between the attack and the labour. Of most serious prognostic import are those cases in which the eclampsia develops before labour begins. When labour has been completed the outlook is better, but not so good as it is when the condition arises during the actual process of parturition.

The *examination of the patient* will help prognosis in that certain signs which are of grave import are easily recognisable. A deep coma should always raise a doubt as to the patient's chance of immediate recovery, while the more normal her mental condition appears to be between her fits the more hopeful is the outcome. If her temperature is raised above 102° F. this in itself is a dangerous sign. I have never known a fatal case of eclampsia in which the temperature has been lower than 101° F. A con-

tinuously raised pulse-rate is significant in the same way. If the pulse continues at a rate over 120 between the fits the outlook is poor. Rapid respirations and other signs of pulmonary oedema constitute prognostic danger signals, while lack of general oedema is in my experience a most serious sign. Any degree of jaundice must be regarded as a very grave occurrence and should make us apprehensive of a fatal issue. Examination of the skin is, in my view, one of the most important ways of determining the severity of a case of eclampsia. If there is any skin action whatever the chance of recovery may be accounted good. The blood pressure is important, and it is generally recognised that a blood pressure of over 200 is a serious sign. Another investigation which may easily be made is to pass a catheter so as to gauge the amount of kidney activity. The passage of a catheter is deprecated by some on the grounds that it may precipitate another fit, but my own view is that the actual fits are not of grave importance and that the result obtained by catheterisation gives very valuable evidence. If a catheter specimen provides only about an ounce of blood-stained urine, of high specific gravity, and of a dark colour, loaded with albumin, the outlook is gloomy; whereas if a fair amount is obtained without any blood, the condition is proportionately less severe even though this specimen too is solid with albumin.

As the case proceeds we learn important facts which influence prognosis by carefully observing the *response to treatment*. First the recurrence of fits must be considered. I do not believe that frequently recurring convulsions are in themselves of serious prognostic import, but if the fits cease hope of recovery certainly becomes brighter, especially if at the same time there are signs of improvement in the general condition of the patient. The onset of *any* skin activity is a very hopeful incident; I have never observed the early signs of sweating in fatal cases. An improvement in the mental condition is also favourable, and if the patient becomes conscious within 12 hours I believe that the danger of a fatal result is very small. If no improvement is noted in any of these respects after six hours of treatment a very grave prognosis cannot be avoided.

During the course of treatment, at a time varying from 24 to 36 hours after the onset of the eclamptic state, a sudden very definite clinical improvement may be observed occurring within a very few hours. This is often synchronous with the intra-uterine death of the fetus, and within the next two days the delivery of a macerated child may be expected.

#### TOXÆMIC STATES AMOUNTING TO ECLAMPSIA

The more remote prognosis in these cases of eclampsia, as in the lesser toxæmias of pregnancy, is bound up with the amount of recovery which may take place in the efficiency of the kidney. When a patient has been under treatment for albuminuria of pregnancy with concomitant toxæmic symptoms and has recovered from her condition of ill-health it may safely be assumed that she will, if care is exercised for the rest of her pregnancy, proceed to term without developing any further disturbing symptoms. If recovery does not occur within a week or ten days it must be recognised that the chance of further improvement is small and that continuance of the pregnancy is fraught with danger of permanent

diminution in renal efficiency. If definite but not complete recovery takes place it is my conviction that many of these cases are hopeful and may be brought to a time suitable for an induction of premature labour without jeopardising the patient's future health. After delivery it will be found in cases of eclampsia that the amount of albumin in the urine will diminish very rapidly, and an early disappearance of this abnormal constituent should give rise to a confident hope that complete recovery will take place. The persistence of albumin in slight amount for more than eight weeks should raise a suspicion that the kidney has sustained some permanent damage. A rapid return of blood pressure to within normal limits also suggests a complete recovery from the initial toxæmia.

#### CONFUSIONAL STATES

A definite proportion of cases of eclampsia develop mental confusional states during the puerperium, and this fact should not be forgotten in framing a prognosis of the course and results of the disease. The incidence of mental derangement bears no relation to the severity of the original eclampsia. I have seen it supervene on clinically slight cases.

Eclamptic patients also show an increased morbidity in the puerperium and this fact must not be forgotten. It is, I think, accepted that an ultimate prognosis must be guarded in proportion to the length of the original illness, and if the patient has shown a toxæmia or eclamptic state which has been prolonged beyond three or four weeks it is very doubtful whether complete recovery ever occurs.

#### FUTURE PREGNANCIES

The possibility of danger on future pregnancies must always be carefully considered. The known fact that between 30 and 40 per cent. of patients exhibit recurring albuminuria in subsequent pregnancies must be borne in mind and an interval of at least eighteen months should be allowed to elapse before another pregnancy is undertaken. These subsequent pregnancies must always be watched most carefully from the earliest time, and the appearance of toxic symptoms within three months will immediately raise the question as to whether the pregnancy shall or shall not be allowed to continue.

J. BRIGHT BANISTER, M.D., F.R.C.P., F.C.O.G.,  
Obstetrical Physician to Charing Cross Hospital.

## SPECIAL ARTICLES

### VITAMINS IN HUMAN NUTRITION VITAMIN-C RESERVES OF SUBJECTS OF THE VOLUNTARY HOSPITAL CLASS

BY LESLIE J. HARRIS, Sc.D., D.Sc.\*

M. A. ABBASY, M.B.

OF THE NUTRITIONAL LABORATORY, MEDICAL RESEARCH  
COUNCIL AND UNIVERSITY OF CAMBRIDGE; AND

JOHN YUDKIN, M.A., Ph.D.

OF ADDENBROOKE'S HOSPITAL, CAMBRIDGE

With a note by SIMON KELLY, M.B., B.Sc.,

M.R.C.P. Lond., D.P.H., D.P.M.

PHYSICIAN TO THE MANCHESTER VICTORIA MEMORIAL  
JEWISH HOSPITAL

SURVEYS have now been completed of the urinary excretion of vitamin C of a considerable group of subjects. As there may be some delay in the presentation in extenso of the rather numerous results it seems worth while to summarise the main conclusions reached.

The technique employed was the same as that previously described,<sup>1</sup> urine being collected in dark bottles in the presence of acetic acid and examined within 12 hours, the end-point in the titration being reached in less than two minutes.

*Control tests.*—In order to ensure the statistical significance of the results a further series of control tests has been carried out under rigorously standardised conditions. A group of 6 adult volunteers was first placed on a diet low in vitamin C, followed by a strict scurvy-producing diet—i.e., entirely devoid of all vitamin C—until their "reserves" had fallen to a markedly subnormal level, as indicated by the resulting low urinary output of the vitamin. The reputed "minimal-optimum" daily dose of ascorbic acid (25 mg.†) was then added to this vitamin-C-free

diet. The daily excretion thereupon gradually rose and finally, after about 42–49 days, became steady at 13 to 14.5 mg. (average 13.8 mg.) equivalent of reducing substance per day there being little variation between individual subjects. When this steady state had been reached, a good response on either the first or second day followed the administration of test doses of 700 mg.

This confirms, under more precise conditions, the approximate figures previously given. It appears therefore that if a subject excretes less than 13 mg. per day and fails to respond on the first or second day to a test dose of 700 mg. (per 10 st. body-weight), it is to be presumed that his diet has contained less than the reputed optimum of vitamin C.‡

In a further group of 11 adult subjects it was found that a daily supplement of 40 mg. of ascorbic acid (as orange juice) added to "normal" home diet not rich in fruit or vegetables (vitamin-C content estimated at only 15 mg. per day, making a total intake of 55 mg. per day) led to a daily excretion at equilibrium after 35 days of 25–29 mg. per day (av. 27 mg.). In a previous experiment the addition of a supplement of 90 mg. (estimated total = 105 mg.) led to the excretion of 49–56 mg. per day.

These results indicate that the daily output of vitamin C is governed by the past dietary intake of the subject and that (contrary to some supposition) there is little individual variation between different subjects or between subjects on different "basal" home diets. The detailed quantitative data for urinary responses for intakes lower than the reputed optimum, down to the definitely scurvy-producing "minimum," have still to be determined.

We have also obtained additional data illustrating a diminished excretion of vitamin C during pyrexia and toxæmia, indicating an apparently increased "loss" in the body in these conditions.

*Surveys on hospital patients.*—A group of 74 adult patients from both surgical and medical wards

\* Member of scientific staff, Medical Research Council.

† This optimum dose, 25 mg. of ascorbic acid, is equivalent to about 4.5 c.cm. of fresh orange juice—i.e., the greater part of the juice of a moderate-sized orange.

‡ As under ordinary circumstances the response to a test dose is proportional to the resting level, a measurement of the latter alone is sufficient for most routine tests of the kind here described.

were examined at Cambridge, nearly always within a few days after their admission to hospital. For the reason just mentioned, cases with marked pyrexia or toxæmia were excluded. The average excretion for the whole series was found to be as low as 8.9 mg. per day. Of the 74 subjects examined, no fewer than 62, representing 84 per cent. of the total, excreted less than the "minimum standard" (or "optimum") value of 13 mg. per day. Or, excluding a group of 19 subjects who had been on special diets for some time (see below), 43 cases (= 78 per cent. of the remaining 55 cases) excreted less than the "standard" of 13 mg. per day. The average excretion of the 55 cases was 10 mg. per day.

Results obtained with 30 children show a similar high proportion of cases with a "subnormal" excretion of the vitamin, which confirms preliminary conclusions on children reached previously in three other centres (at London and Birmingham) (control tests having shown that children receiving their adequate daily supplements of vitamin C gave "normal" excretions).<sup>1</sup>

From the appended note it will be seen that Dr. Kelly, who has carried out measurements by the same method at Manchester, has reached similar conclusions for a group of hospital patients in that city.

These results suggest that the intake of vitamin C of this class of the population is generally below the reputed optimum, as it is also below that of "normal" subjects (generally middle class) who have been examined in earlier tests in this country and in Holland, Germany, U.S.A., &c.<sup>2</sup> (daily excretion 20-35 mg.). This finding is in keeping with the conclusion of Orr,<sup>3</sup> based on a study of diet sheets, that about half the population receive less than their reputed optimum allowance of vitamin C.

*Inadequate diets in duodenal and gastric ulcer.*—A type of diet frequently prescribed in duodenal and gastric ulcer, containing little or no fruit juice, is deficient in vitamin C. It seems significant that among the lowest excretions of vitamin C observed in our series, a quite disproportionate number were of patients with gastric or duodenal ulcer. Thus included in our total of 74 adult subjects there were 12 cases of gastric or duodenal ulcer, and 7 cases of dyspepsia which had been on a "gastric diet." The 44 lowest excretions are found to embrace all of these 19 "gastric" cases (or the 29 lowest embrace 16 of them). The average daily excretion for the series of "gastric" cases was 5.6 mg. per day, the highest being 8.7 mg. (compared with an average of 10 mg. for the remaining 55 cases). Since in guinea-pigs deficiency of vitamin C may predispose to gastric ulcer,<sup>4</sup> the possibility of a vicious circle being set up in these conditions should be borne in mind. We would advocate the addition of the strained juice of one orange to the daily ration as a routine applicable for most "gastric" cases.

*Possible deficiency in certain hospital diets.*—In the course of this inquiry we have examined the various diet sheets of a number of representative hospitals. In several of these an adequate daily dose of orange juice has for some time past been included in the regimen as a routine. In others however it is still customary to give little or no fresh fruit (the patient is sometimes left to rely for fresh fruit on gifts brought in by his friends and relatives), and it is difficult to avoid the conclusion that there is a real danger of the diet containing less than the reputed optimum dose of vitamin C. We strongly urge that this question should receive careful attention from those in charge.

*Validity of the accepted figure for "optimum standard."*—It will be noticed that throughout we have been referring to the reputed optimum daily dose of vitamin C. The argument depends largely (at any rate in its more strictly quantitative deductions) on the actual validity of this generally accepted value. We hope to discuss this point in a later paper. In the meantime it may be remarked that the value for this "reputed minimal-optimum dose" is based on a variety of considerations, including (1) a knowledge of the amount of lemon juice needed to prevent the slightest symptoms of scurvy in mariners, and (2) the dose needed to restore subnormal capillary resistance caused by vitamin-C deficiency in human subjects to its normal strength. It will be understood that a small margin is allowed for the probable difference between the bare "minimum antiscorbutic dose" and the "minimal optimum dose"—a relation which in the case of guinea-pigs at least has been worked out with considerable accuracy.

Since so many individuals in certain sections of the population are found to be below the reputed optimum standard in their vitamin-C intake and yet may seem little the worse for it—superficially at any rate—critics may perhaps argue that the accepted standard is unnecessarily high. We think however that it would be a mistake to rush to this conclusion too hastily. A comparison may justly be made here with the accepted standard for the intake of iron and with the prevalence of "sub-clinical" nutritional anæmia. Laboratory tests have shown that a large proportion of subjects in poor-class districts may show some degree of nutritional anæmia compared with the accepted standards. Such individuals may exhibit no clear-cut symptoms of illness. Yet when extra iron is provided their general health and fitness improve, as evidenced for example by their diminished morbidity-rate.<sup>5</sup> A similar state of affairs may well be true for vitamin C, and indeed many suggestions have been made in the clinical literature in the past that a state of latent- or sub-scurvy is not uncommon. In any case, as the consumption of one orange per day is more than adequate to bring the intake up to the level of the reputed optimum—even supposing the diet to contain no other source of the vitamin—it would seem that the standard is sufficiently modest to make it a reasonable aim in practical dietetics.

Our thanks are due to the honorary staff of Addenbrooke's Hospital, in particular to Dr. G. S. Haynes and Dr. Leslie Cole, for their interest and generous help in this work. Messrs. Hoffmann-La Roche kindly provided us with the ascorbic acid used.

#### Note by DR. KELLY

A survey was made of the urinary excretion of vitamin C in 34 unselected adult patients admitted consecutively to the medical and surgical wards of the Manchester Victoria Memorial Jewish Hospital. The technique employed was that described by Abbasy, Harris, Ray, and Marrack<sup>1</sup> and the vitamin-C excretion was estimated almost each day from the day of admission. The following is a summary of the findings.

Of the 34 subjects examined 14 (41 per cent.) excreted less than the minimum standard of 13 mg. per day. The average excretion of the whole series was 16.7 mg. Four cases of diabetes, however, were included, whose diets were rich in vitamin C with correspondingly high figures (40 mg. or more). Excluding these cases the average excretion of the series was 13 mg. per day. In the series were 8



subjects aged 70 years or above, all of whom had low excretions on admission—an average of 10 mg. per day. The 8 cases of gastric or duodenal ulceration admitted for medical treatment excreted on admission above 13 mg. per day, but all showed a fall below that level after four days, reaching an average of 9 mg. after a week. The series also included 5 cases of pneumonia which on admission excreted above 13 mg. and all fell below that figure during the first week to an average of 6 mg. in spite of liberal drinks of orange juice.

The administration of two Redoxon tablets (100 mg. ascorbic acid) per day in all cases with low excretion figures raised the daily excretion to above 13 mg. in 3-7 days, irrespective of the clinical condition or state of illness. This had no discernible effect on the illness.

**Conclusions to Note.**—(1) Of 34 patients admitted to hospital, 14 showed evidence of vitamin-C subnormality, and most of the remainder excreted not more than the minimum standard. (2) All those above 70 years of age showed relative deficiency. (3) All those on dietetic treatment for gastric and duodenal ulceration showed deficiency after four days, though not on admission. The diet in use is deficient in vitamin C. (4) All the cases of pneumonia showed reduced excretion of vitamin C after a week, although receiving more than normally adequate amounts. (5) Correction of the vitamin-C deficiency had no obvious effect on the course of the illnesses. (6) Except for pyrexia and toxæmia, the only factor found influencing the amount of vitamin-C excretion was the amount of vitamin-C intake.

#### REFERENCES

1. Abbasy, Harris, Ray, and Marrack: *THE LANCET*, 1935, ii., 1399.
2. See for example: Harris, L. J., Ray, S. N., and Ward, A.: *Biochem. Jour.*, 1933, xxvii., 2011; Johnson, S. W., and Zilva, S. S.: *Ibid.*, 1934, xxviii., 1393; Eekelen, M. van, Emmerie, A., Josephy, B., and Wolf, L. J.: *Acta Brevia Neerl.*, 1933, iii., 168; Harris, L. J., and Ray, S. N.: *THE LANCET*, 1935, i., 71; Schröder, H.: *Klin. Woch.*, 1935, xiv., 484; Hawley, E. E., Stephens, D. J., and Anderson, G.: *Jour. of Nutrition*, 1936, xi., 135; Ahmad, B.: *Biochem. Jour.*, 1936, xxx., 11.
3. Orr, J.: *Food, Health, and Income*, London, 1936.
4. Smith, D. T., and McConkey, M.: *Arch. Internal Med.*, 1933, li., 413.
5. Mackay, H. M.: *Proc. Roy. Soc. Med.*, 1929, xxii., 385; Mackay et al.: *Med. Research Council, Spec. Rep. Ser. No. 157*, 1931.

## INTERNATIONAL SOCIETY FOR MICROBIOLOGY

THE second international congress of this society will be held in London this year from July 25th to August 1st, Prof. J. C. G. Ledingham, F.R.S., presiding. The headquarters of the congress will be at University College, Gower-street, and all the scientific sections will hold their sittings there. Additional accommodation will be available in the adjacent London School of Hygiene and Tropical Medicine and the Wellcome Research Institute. The congress will be divided into eight sections:—

### General Biology of Micro-organisms

**Subjects discussed and Openers.**—Selective bacteriostasis: inhibitory action on the growth of bacteria and fungi of (1) substances of known constitution, and (2) products of the growth of micro-organisms; importance in the preparation of selective culture media (Prof. A. Fleming, London). Anaerobic bacterial metabolism (Dr. P. Fildes, F.R.S., London). Nutritional factors associated with the growth of micro-organisms (Dr. Lwoff, Paris). Variation: relation of changes in morphological and cultural characters to changes in chemical composition and to alterations in anti-

genic structure; toxin production and pathogenicity (Dr. J. A. Arkwright, F.R.S., London). Preservation of cultures of micro-organisms. Latency: methods of preservation of delicate organisms; preservation of virulence and antigenic structure; changes in the character of bacteria in culture media unfavourable for rapid growth (Dr. O. da Fonseca, Rio de Janeiro). Life-cycles of bacteria: symbiotic associations; filtrable forms (Dr. J. Ørskov, Copenhagen); bacterial photosynthesis (Dr. C. B. van Niel, Pacific Grove, California).

### Viruses and Virus Diseases in Animals and Plants

**Subjects discussed and Openers.**—The general characteristics of viruses, including bacteriophage (Prof. R. Doerr, Basel, and Dr. J. Henderson Smith, Rothamsted). Modes of transmission and paths of infection in virus diseases (Dr. E. Weston Hurst). Evidence concerning the agency of viruses in the aetiology of new growths (Dr. Peyton Rous, New York). Mechanism of immunity in virus diseases and practical applications thereof (Prof. J. C. G. Ledingham, F.R.S., London).

### Bacteria and Fungi in Relation to Disease in Man, Animals, and Plants

**Subjects discussed and Openers.**—The significance of serological and cultural types of bacteria and fungi pathogenic to man, animals, and plants in relation to epidemic, epizootic and epiphytotic outbreaks of disease (Prof. F. Neufeld, Berlin). Pathogenic streptococci: relation to scarlatina, puerperal fever, erysipelas, tonsillitis, acute rheumatism, and infective endocarditis in man, and to mastitis, lymphangitis, and suppurative conditions in animals (Dr. G. J. Hucker, Geneva, U.S.A.). Mycoses in man, animals, and plants; taxonomy; mechanism of pathogenic action; relation to saprophytic species and conditions of saprophytic growth (Mr. J. Ramsbottom, London). Bacteria causing acute inflammation of the alimentary tract and their mechanism of action (Dr. E. O. Jordan, Chicago). Pathogenic anaerobic bacteria (Prof. M. Weinberg, Paris).

### Economic Bacteriology, Soil, Dairying, and Industrial Microbiology

**Subjects discussed and Openers.**—The significance and estimation of the numbers and types of bacteria in milk, including thermophilic and thermophilic organisms; the need for adopting uniform methods (Dr. R. S. Breed, Geneva, U.S.A., and Dr. A. T. R. Mattick, Reading). Factors determining the behaviour of micro-organisms in milk and milk products (Mr. L. J. Meanwell, London). Yeast metabolism (Prof. A. Fernbach, Paris, and Prof. R. H. Hopkins, Birmingham).

The microbiology of water-supplies (Prof. F. E. Fritsch, F.R.S., London). The microbiology of perishable fresh foods, other than milk and milk products and the microbiology of canned foods, other than milk and milk products (Dr. L. H. Lampitt, London). The process of decomposition of plant remains in soil, manure, and compost heaps (Prof. E. Ruschmann, Landsberg a/Warthe). The microbiology of ensilage production (Prof. A. J. Virtanen, Helsingfors). The destruction and protection of woods and cellulosic materials (Dr. A. C. Thaysen, Teddington). Problems of biochemical purification of sewage and of trade effluents (Dr. H. Heukelekian, New Brunswick, U.S.A.). Recent advances in fermentation industries (Prof. T. Chrzaszcz and Dr. J. Janicki, Poznan).

The physiology of nitrogen-fixing organisms and the biochemistry of nitrogen fixation (Dr. C. Stapp, Berlin). The economic importance of the autotrophic and of certain anorganophilic bacteria (Dr. A. C. Thaysen).

### Medical, Veterinary and Agricultural Zoology and Parasitology

**Subjects discussed and Openers.**—The biology of the malarial parasites of man and animals (Lieut.-Colonel J. A. Sinton, I.M.S., Kasauli, India). Chemotherapy: mechanism of drug action and drug resistance (Dr. H. Schlossberger, Berlin). Factors which influence the transmission of infections by arthropod vectors (Prof. E. Brumpt, Paris). The parasitic nematodes of plants (Dr. P. Bovien, Copenhagen). Typhus fever and the rickettsias (Prof. H. Zinsser, Boston, U.S.A.). Immunity against animal parasites (Dr. E. Sergent, Algiers). Coccidia



in relation to domesticated animals (Dr. E. E. Tyzzer, Boston, U.S.A.).

### Serology and Immunochemistry

*Subjects discussed and Openers.*—The structure of natural and synthetic antigens (Dr. M. Heidelberger, New York). Immunity reactions in relation to antigenic structure and variation in bacteria (Prof. W. W. C. Topley, F.R.S., London). Principles and methods for the quantitative determination of antigens and antibodies, including their diagnostic application (Prof. Th. Madsen, Copenhagen). Blood groups and organ specificity (Prof. O. Thomsen, Copenhagen). The significance of allergy in disease (Dr. E. L. Opie, New York).

### Microbiological Chemistry

*Subjects discussed and Openers.*—Metabolic products of the lower fungi (Dr. P. W. Clutterbuck, London). Intermediate carbohydrate metabolism of micro-organisms (Prof. A. J. Kluyver, Delft). Influence of substrate on the chemical potentialities of the cell (Prof. H. von Euler, Stockholm).

### Specific Immunisation in the Control of Human and Animal Disease

*Subjects discussed and Openers.*—The control of diphtheria and whooping-cough by means of specific immunising reagents (Prof. W. H. Park, New York). The prophylaxis and serum treatment of human and animal diseases caused by anaerobic bacteria (Mr. T. Dalling, London). The serum treatment of pneumonia (Prof. J. G. M. Bullowa, New York). The relative value of antitoxic and antibacterial immunity in the prophylaxis and treatment of human and animal diseases in which the invasion by the causative bacterium may occur in a focal or generalised form (Dr. A. B. Wadsworth, New York). The relative value of antitoxic and antibacterial immunity in the prophylaxis and treatment of human and animal diseases, &c.—second day (Dr. F. Gerlach, Mödling bei Wien).

### GENERAL PROGRAMME

Mr. Ramsay MacDonald, Lord President of the Council, will declare the congress officially open at a reception to be held in the great hall of University College, at 9 P.M. on Saturday, July 25th. A reception for the delegates will be given by H.M. Government at Lancaster House, St. James's, at 10 P.M. on July 27th when Sir Kingsley Wood, Minister of Health, will act as host. On July 28th, at 8.30 P.M., the delegates will be the guests of the Royal Society of Medicine at the society's house, 1, Wimpole-street, W., and on July 29th the Royal Society is holding a reception at Burlington House, Piccadilly, W., at 8.30 P.M. The official banquet of the congress will take place at the Trocadero Restaurant, W., at 8 P.M., on July 31st.

From July 27th to 29th an exhibition of scientific instruments—open to non-members of the congress—will be held in the physics department of University College. Microscopes, microprojectors, centrifuges, vacuum pumps, stains, and reagents will be displayed in great variety, and many of the exhibits will be shown for the first time. A number of cinematograph demonstrations will be given at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C., on July 30th at 5 P.M. and on July 31st at 2.30 P.M. Other demonstrations to be given by members of the congress will include the following:—

Significance of allergy in disease (Louis Dienes, Boston, U.S.A.). Growth of coloured bacteria on paper (Prof. A. Fleming, London). Procedure and apparatus for preservation in "Lyophile" form of serum (Drs. E. W. Florsdorf and Stuart Mudd, Philadelphia, U.S.A.). Methods of estimating the effect of chemotherapeutic substances on pathogenic organisms (Prof. von Janesco, Szeged, Hungary). A new group of microbes occurring as symbionts of bacteria and independently (E. Klieneberger, London). Isolation and dissection with the Schouten micro-manipulator (S. L. Schouten, Utrecht,

Holland). A mechanical device which prepares and inoculates rolled tubes (Dr. Redvers Thompson, Ontario, Canada).

Visits will be made to places of scientific and general interest in and near London and also to Oxford and Cambridge. The executive committee invites all who are interested in microbiology to send for a registration form and further particulars from Prof. J. C. Drummond, University College, Gower-street, London, W.C.1.

## EDINBURGH MEETING OF THE BRITISH HOSPITALS ASSOCIATION

(FROM OUR SCOTTISH CORRESPONDENT)

### WAITING-LISTS

At the annual conference of the British Hospitals Association, which opened in Edinburgh on June 18th, Mr. John Fraser, professor of clinical surgery in the University of Edinburgh, read a paper on hospitals and waiting-lists. He said that in some measure the waiting-list could be regarded as a compliment to the institution with which it was associated, and in a teaching hospital it was essential, for it provided a source for the supply of teaching material. On the other hand, the arguments against waiting-lists were open to no question; they were contrary to humanitarian principles, for he questioned whether at any time delay was beneficial, though it might be inevitable. Further, waiting-lists were economically unsound. He had found that on the waiting-lists of 21 of the larger of the general hospitals of England and Scotland there were nearly 20,000 names. Of these probably fully 56 per cent. would be restored to full working powers within a reasonable time after treatment. The loss in terms of work was thus great. The waiting-lists chiefly comprised the cases known as chronic, and in this class they found such conditions as hernia, hydrocele, hæmorrhoids, and injuries and chronic infections of joints. If looked at from the economic standpoint these were the very conditions which should have early attention, but pity and humanity had fixed the standards by which they judged urgency, and the consensus of opinion supported the plea, though no doubt the economist would contest the issue. In certain areas during the past decade the waiting-list figures had risen by 71.4 per cent., while the bed increase had only been 16.9 per cent. Among the reasons for the increase he mentioned the greater tendency to seek hospital treatment, the influence of the Insurance Act, and the larger number of emergency admissions. Motor transport had facilitated the transference of acute cases to hospital, though it was also responsible for some of the most serious emergencies.

Turning to the question of finding a remedy, Prof. Fraser referred to the development of local authority hospitals, but pointed out that these lay under the disadvantage that payment was required, and that this fact, combined to some extent with the influence of precedent, status, and tradition, had so affected the position that the burden of the waiting-lists in voluntary hospitals had in no way been lightened. What then was to be done? He had been impressed by the record of one hospital in particular where there was no waiting-list. This was achieved, first, by limiting emergency admissions to a definite ration, the remainder being sent to municipal and other institutions. Secondly, a proportion of the contributions from workers' organisations had been used to defray the costs of a ward for the less urgent type of surgical cases. He was satisfied that

the adoption of these principles would go a long way towards solving a serious problem.

At the afternoon session Aldermen W. Hyde read a paper on the future policy of contributory schemes and their relation to voluntary hospitals. He drew attention to the consistent expansion of the hospitals contributory schemes since the late war. Under the British Hospitals Contributory Schemes Association more than 100 schemes were affiliated, representing an annual collection exceeding £2,400,000, and it was estimated that the total amount raised by contributory schemes of all types exceeded £3,000,000. He suggested the formation of a consultative joint committee for the purpose of unifying the policy of the various schemes.

#### TREATMENT OF FRACTURES

At the meeting on the following day Mr. R. C. Elmslie, in an address on the treatment of fractures, made a strong plea for the development of fully equipped fracture units throughout the country. In the treatment of fractures, he said, only the very best would do. Referring to the huge number of industrial and road accidents occurring daily, he pointed out that most of these injuries when severe involved fractures, many of which were complicated and required expert treatment if a good result was to be obtained. The lessons taught by war experiences were the saving of life by first aid, the advantages of segregation and team-work, the necessity for physical and gymnastic treatment and for occupational therapy, and the use of convalescent camps and command depôts. He said that some of the worst results of treatment of fractures were those he found in the cottage hospitals and in the smaller provincial towns. The staffs of these hospitals were often general practitioners, and it was a matter of chance if there was some one with the mechanical ability essential for the treatment of fractures. He said that hospitals that had not established fracture units ought to give up the treatment of fractures. In his opinion, they should act as first-aid stations and should transfer the cases of fractures to properly equipped centres.

### BRITISH ASSOCIATION OF RADIOLOGISTS

THE second annual general meeting of the British Association of Radiologists was held at the Royal Infirmary, Manchester, on June 12th and 13th; the 75 members present included radiologists from all over the country.

On June 12th, after the business meeting, Dr. R. S. PATERSON, of Manchester, delivered his presidential address. He spoke of the zeal and initiative of Dr. J. F. Brailsford, who was responsible for founding the association, and then summarised its progress during the past year, outlining also the activities it was hoped to undertake in the future. He emphasised the importance to radiology, from the clinical, ethical, and educational points of view, of an association with a membership limited to medical men practising radiology exclusively. As an instance of the educational advantages, he drew attention to the foundation by the association of a fellowship which would constitute a higher diploma in the speciality.—Dr. F. Hernaman-Johnson, warden of the fellowship, then gave an address on its aims and objects.

The morning of June 13th was devoted to clinical

papers. The president had arranged a symposium on the Radical X Ray Treatment of Malignant Disease in which after he had set out general principles the following took part: Dr. J. Struthers Fulton (Glasgow) spoke on Skin Tolerance; Dr. J. H. Douglas Webster (London) on Malignancy in the Larynx and Pharynx; Dr. Ffrangcon Roberts (Cambridge) on Malignancy in the Oesophagus; Dr. J. E. A. Lynham (London) on Malignancy in the Breast; and Dr. J. F. Bromley (Birmingham) on Malignancy in the Skin. Subsequently, four diagnostic papers were read: Fractures of the Facial Bones by Dr. H. K. Graham Hodgson (London); Complications of Gastro-enterostomy by Dr. S. Cochrane Shanks (London); Cæcal Filling Defects by Dr. J. Burnett King (Edinburgh); and Observed Changes in the Intervertebral Discs following Lumbar Puncture by Dr. J. L. A. Grout (Sheffield).

During the meeting an exhibition of radiograms was on view. A visit was paid to the research department of Messrs. Armstrong Vickers, where the apparatus demonstrated included a new million-volt generator and X ray deep therapy tube. Dr. Russell J. Reynolds gave a demonstration of his latest apparatus for cineradiography.

The annual dinner of the association was held at the Midland Hotel on June 12th, with the president in the chair. Among the official guests were Prof. J. Morley, Prof. E. D. Telford, Prof. F. E. Tylecote, Prof. A. Ramsbottom, Prof. D. Dougal, Mr. G. J. Jefferson, Mr. H. Platt, and Mr. W. Cobbett, chairman of the board of management of the Manchester Royal Infirmary, who responded to the toast of the guests proposed by Dr. Shanks. The toast of the association was proposed by Mr. Jefferson, Dr. E. W. Twining and Dr. Hernaman-Johnson responding.

### MEDICINE AND THE LAW

#### Prosthetic Dentists

PROTHESIS has for centuries connoted to grammarians the addition of a letter or syllable at the beginning of a word. In the literature of surgery the word has been applied to the addition which fills up some deficiency and especially to the making of artificial arms and legs where the natural limbs are lost. From prosthetic surgery it is a short step to prosthetic dentistry; but here this noble-sounding Greek epithet has been adopted by the Society of Prosthetic Dentists of which the Lord Chief Justice had a good deal to say last week in the libel action of Canon and MacDonald v. the British Dental Association. The plaintiffs complained of a passage, headed "National Denture Clinic," which was part of a lengthy report of the proceedings of the representative board of the defendant body at a meeting held in April, 1935. The passage nowhere mentioned either Mr. Canon or Mr. MacDonald: it referred to a clinic set up in Hugh-street, Pimlico, which "professed to be an institution solely for the supply of dentures to the deserving poor." It spoke of a wide appeal for funds made in the press and of house-to-house collections. "While the ostensible object of the clinic may be entirely praiseworthy, there were certain features of the organisation which the Council thought required very close scrutiny." The plaintiffs built up their allegation of libel mainly upon the twin foundations of those phrases "professed to be" and "required very close scrutiny." Plaintiffs who complain of defamation must say exactly what they complain of. Mr. Canon and Mr. MacDonald said

that the defendant association's words meant that the plaintiffs conducted the clinic in a dishonest manner, that the public was deceived by spurious appeals for funds, and that the funds were misapplied by dishonesty or incompetence.

At the conclusion of the evidence and the speeches of counsel the Lord Chief Justice gave the special jury a vigorous summing-up. What, he asked, was there derogatory in saying that an organisation "professed to be" an institution solely for the supply of dentures for the deserving poor? What was there derogatory in saying that it must receive close scrutiny? All human activities of a public nature required and received the closest scrutiny; it was good for the public and for the officials. Lord Hewart passed on to discuss the origin of the Dentists Act, 1921. There had previously been neglect of dentistry and of the rights of the public in relation to dentistry. "To-day you may hear the praises of the great and invaluable profession of dentistry on all men's lips as the result is in most men's mouths." The Act was passed in the interests of the public, of whom poor people formed a large part. Rich people could look after themselves; people of moderate means, or of no means at all, required protection; they were open to be imposed upon by incompetent persons, by quacks who were not qualified. "It is necessary that persons who practise a skilled profession shall have the requisite degree of skill, shall subject themselves to certain tests, and shall be qualified—so it is with barristers, solicitors, accountants, doctors, surgeons, and almost every branch of skilled calling where men practise an art in relation to the health, lives, or fortunes of their fellow-men." Section 14 (2) of the 1921 Act defined the practice of dentistry as including the performance of any such operation and the giving of any such treatment, advice, or attendance as is usually performed or given by dentists; anyone who performs an operation or gives treatment, advice, or attendance "preparatory to or for the purpose of or in connexion with the fitting, insertion, or fixing of artificial teeth" is deemed by Section 14 (2) to have practised dentistry within the meaning of the Act. Dental mechanics might think they could do the work just as well as the registered dentist, but the law said they must not try. The case showed, said Lord Hewart, that there was a body of persons calling themselves "prosthetic dentists" who were dental mechanics wishing to be regarded as, and to act as, dentists. The word "prosthetic" merely meant that something was added. Prosthetic dentists added teeth to the jaw and might as well call themselves dental dentists. If the Society of Prosthetic Dentists had its way, it would get rid of Section 14 of the Act so that an unqualified person might fit a mouth with artificial teeth—"that would be good for the prosthetic dentists but it would not be good for the body politic." The Lord Chief Justice suggested that the British Dental Association, a body charged with the duty of watching the professional skill of dentists and seeing that those who practised as dentists conformed to the statutory provisions, was thoroughly justified in keeping an eye on the prosthetic dentists. It was unfair to represent the Association's efforts as the efforts of a professional body to keep out outsiders and to prevent competition; "only the most ignorant or thoughtless persons would regard them in that way." Some people, said Lord Hewart, might regard the Bar as a close corporation which aimed at preventing outsiders from doing legal work; but it was in the interests of the State and of the public that where professional work was to be done, there should be

high professional training. There had been a virtual admission by Mr. Canon that the plaintiffs' real object was commercial—that was to say, that the Society of Prosthetic Dentists might become a powerful trade-union from which the plaintiffs might draw a salary. Lord Hewart invited the jury to conclude that these persons (who were strongly of opinion that the dental mechanic, the artisan of the business, should be freed from the trammels of the law) formed a society under this curious name and, to get prestige for the society, associated with it this clinic mainly supported by the contributions of well-disposed persons. The National Denture Clinic had three dentists to 17 or 18 mechanics. Undoubtedly its staff attended to the dental needs of the poor, but had it not been made clear that there were clever people in the background whose intention it was to use the prestige of the clinic to assist a movement to enable the mechanic to act as a dentist? Was not this an organisation which called for special scrutiny from the British Dental Association? At the close of the summing-up the jury made short work of the plaintiffs' claim. It found that the words complained of were not defamatory and it added a rider that, while many poor and destitute persons had received benefit from the plaintiffs' organisation, the jurors were not persuaded that the organisation was entirely a charitable institution. Judgment was thereupon given for the defendants with costs and the sensitiveness of the plaintiffs is found to have been excessive.

It is tempting to apply Lord Hewart's remarks about dentistry to the practice of medicine and surgery. He certainly insisted that the public has an interest in the recognition of standards of professional skill in all skilled professions. He certainly rebukes those who would suggest that statutory restrictions are enforced for the benefit of professional monopoly. The 1921 Act gave the dentists a protection from unqualified competitors which is vastly more vigorous than the slender restrictions on the unqualified doctor or the quack surgeon. Perhaps one must not press the recent case too far. To go back to the grammarians with whom these notes began, a scholar who wrote on "Grimm's Law" some fifty years ago observed that Prosthesis in the grammatical sense "belonged to a class of terms denoting arbitrary processes whose intrusion into the realm of language should be viewed with suspicion." The result of Canon and MacDonald *v.* the British Dental Association is to show that the intrusion of prosthetic dentists into the realm of dental practice is to be viewed similarly.

#### Traffic Accident Due to Fainting Fit

The compulsory insurance of motorists against third-party risks is often disappointing to the injured pedestrian or bicyclist. Parliament has not provided that the motorist shall always pay; it has merely provided that, if the motorist must pay, there shall be no default in the payment. The motorist is liable for his negligent driving but not for the consequences of sheer accident. At Southend county court a motorist was lately sued by a boy of 15. The car had suddenly swerved, had crashed through a row of bicycles placed on the kerb, and had pinned the boy against a gate. The boy was badly hurt. Two doctors, called for the defence, supported the view that the motorist had a fainting fit which caused the accident. The plaintiff's case was that the accident caused the fainting fit. There was medical evidence that the motorist had never fainted before and was physically a fit man. The judge held that the

fainting fit caused the accident; the motorist's defence that the accident was inevitable and was nobody's fault was thus established.

If the recovery of damages under the compulsory insurance enactments is thus seen to depend upon the motorist's negligence, the right to recover damages is not limited to recovery through the insurance companies where negligence is proved. There has lately been a High Court case where a motorist recovered from his insurance company the sum of £600 as compensation for injuries received through

another motorist's negligence. It then occurred to him to pursue his common-law right to obtain damages against the man whose negligence had caused him the injuries. The insurance companies behind the respective motorists endeavoured to dissuade the would-be plaintiff from bringing his action. The companies have a "knock-and-knock" system with which they are mutually content. The injured motorist, however, proceeded with his claim and the court held that there was no legal reason why he should not get his damages twice over.

## THE SERVICES

### INDIAN MEDICAL SERVICE: ANNUAL DINNER

MORE than one hundred officers of the Indian Medical Service dined together on June 17th at the Trocadero, when Major-General Sir Robert McCarrison, C.I.E., presided. The members of the Service present were as follows:—

*Major-Generals:* Sir Frank Connor, D.S.O., K.H.S.; W. V. Coppinger, C.I.E., D.S.O.; Sir James Graham, C.B., C.I.E.; Sir John Megaw, K.C.I.E.; H. R. Nutt, K.H.S.; T. G. F. Paterson, D.S.O., K.H.P.; and G. E. Tate, C.I.E.

*Colonels:* H. Ainsworth; J. Anderson, C.I.E.; Sir Charles Brierley, C.I.E.; Sir Samuel Christophers, C.I.E., O.B.E.; H. M. Cruddas, C.M.G., O.B.E.; A. B. Fry, C.B., C.I.E., D.S.O.; J. Fuller-Good; C. A. Gill; T. A. Granger, C.M.G.; C. R. M. Green; E. C. Hodgson, D.S.O., K.H.P.; W. H. Leonard, C.B.; H. M. Mackenzie, C.I.E.; Sir Richard Needham, C.I.E., D.S.O.; A. H. Proctor, D.S.O.; A. J. H. Russell, C.B.E., K.H.S.; Ashton Street; and R. G. Turner, C.M.G., D.S.O.

*Lieut.-Colonels:* C. H. P. Allen; W. G. P. Alpin, O.B.E.; A. C. Anderson; S. Anderson; C. H. Barber, D.S.O.; J. W. Barnett; A. N. Bose, M.B.E.; R. H. Bott, C.I.E.; H. Chand, M.C.; H. P. Cook; A. G. Coullie; D. G. Crawford; J. M. Crawford, O.B.E.; H. J. M. Cursetjee, D.S.O.; J. B. Dalzell Hunter, O.B.E.; H. R. Dutton, C.I.E.; S. C. Evans; J. K. S. Fleming, C.B.E.; T. H. Gloster; C. A. Godson, M.C.; G. F. Graham; V. B. Green-Armytage; A. E. Grisewood; A. F. Hamilton, C.I.E.; W. G. Hamilton; W. L. Harnet, C.I.E.; J. M. R. Hennessy; H. Hingston; J. M. Holmes; E. V. Hugo, C.M.G.; M. L. C. Irvine; I. Davenport Jones; W. D. Keyworth; H. H. King, C.I.E.; E. W. O'G. Kirwan; E. C. G. Maddock, C.I.E.; W. A. Mearns; P. S. Mills; H. E. Murray; F. O'Kinealy, C.I.E., C.V.O.; A. N. Palit; H. Ross, C.I.E., O.B.E.; H. K. Rowntree, M.C.; J. D. Sandes, R. B. S. Sewell, C.I.E.; W. S. J. Shaw; A. L. Sheppard; J. A. Sinton, V.C., O.B.E.; T. G. N. Stokes; H. Stott, O.B.E.; W. A. Sykes, D.S.O.; C. Thomson; F. R. Thornton, M.C.; E. Owen Thurston; A. G. Tresidder, C.I.E.; E. L. Ward, C.B.E.; E. E. Waters; and W. J. Webster, M.C.

*Majors:* R. S. Aspinall, C.I.E.; H. C. Brown, C.I.E.; J. A. Cruickshank, M.C.; A. J. Culhane; Sir T. Carey Evans, M.C.; G. R. McRobert; C. G. Seymour; and R. A. Wesson.

*Captains:* J. H. Boulton; W. Happer; G. Milne; W. J. L. Neal; M. H. Shah; and Jaswant Singh.

*Officers on probation:* Lieut. K. I. E. Macleod; Lieut. G. R. C. Palmer; Lieut. J. G. Thomson; Lieut. A. C. Taylor; Lieut. T. Sommerville; and Lieut. L. S. F. Woodhead.

The last six mentioned were present by invitation and the other guests were Mr. F. H. Brown, C.I.E. (*The Times*), Dr. N. G. Horner (*British Medical Journal*), Dr. Egbert Morland (*The Lancet*), and Mr. J. S. Simpson (India Office).

Sir ROBERT McCARRISON in proposing the toast of an "Ancient and much loved Service" read telegrams of congratulation from the director-general in India and the inspector-general of the Punjab. "Ichabod," he said, was not true of the I.M.S., the glory was not departed; in view of the funda-

mental reforms in progress there was no time when it was so necessary for the Service to give of its best. And he lightly but firmly sketched the many ways in which the I.M.S. had advanced the prosperity of India and was still prepared to lead India "along the right, and now the appointed, way."—Sir JOHN MEGAW proposed "The Chairman," with admiration based on personal knowledge of forty years, and coupled with the toast the name of Lady McCarrison whose moral and intellectual help had supported her husband in directing the nutrition research laboratories at Coonoor and in advancing there the study of vitamin deficiency.—Sir Robert responded with a simple "I thank you," and asked his fellow officers to applaud the team-work of the hon. secretaries Sir Richard Needham and Sir T. Carey Evans. After which Colonel Anderson told some stories.

### INDIAN MEDICAL SERVICE

Bt. Cols. to be Cols.: A. J. H. Russell, C.B.E., K.H.S., and H. H. Thorburn, C.I.E. Lt.-Col. J. Taylor, D.S.O., V.H.S., to be Col.

Capt. (now Maj.) F. M. Collins, I.M.S.; relinquishes the local rank of Maj. on ceasing to hold the appt. of Surg. to H.E. the Viceroy.

Majors J. C. Coutts, R. A. Bennett, and R. A. Anderson, of the R.A.M.C., have been posted to Rawalpindi, Lahore, and Meerut Districts respectively, as specialist in radiology, specialist in medicine, and D.A.D. of Hygiene.

Major A. L. Robb, R.A.M.C., vacates his appointment as M.O. at Army Headquarters, Simla, on July 20th.

### ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. L. F. Strugnell to *Pembroke* for R.N.B.; and J. C. Kelly, D.S.C., to *Amphion*.

Surg. Lt.-Comdr. C. T. Hyatt to *Drake* for R.N.B.

Surg. Lt. D. Ewart to *Royal Oak*.

Mr. A. H. D. O. Richmond has been appointed Admiralty Surgeon and Agent for Grimsby, and Mr. H. Douglas Ord Surgeon and Agent for South Shields.

### ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdrs. J. L. Cox to *Curacoa*; E. G. Thomas to *Iron Duke*; H. G. Ungley to *Excellent*; and C. C. Ungley to *Pembroke*.

Surg. Lts. S. B. Levy to R.N. Hosp., Haslar; and J. F. Corr to *Curacoa*.

Proby. Surg. Lts. P. S. Luffman to *St. Vincent*; and T. D. G. Wilson to *Iron Duke*.

Surg. Sub-Lt. D. S. Macphail to *Victory* for R.N. Hosp., Haslar.

### ROYAL ARMY MEDICAL CORPS

Capt. W. H. Hargreaves is placed on the h.p. list on account of ill-health.

Short Service Commissions: Lt. (on prob.) J. A. Farfor resigns his commission; J. A. G. M. Lynch to be Lt. (on prob.).

### REGULAR ARMY RESERVE OF OFFICERS

Maj. A. G. Cummins, M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

### TERRITORIAL ARMY

Capt. and Bt. Maj. J. Carver and Capt. T. S. Torrance to be Majs.

Lts. K. G. W. Saunders and G. O. Gauld to be Capts.  
Capt. J. E. Snow to be Divl. Adj. 49th (W. Riding)  
Div.

The Efficiency Decoration has been conferred upon  
Lt.-Col. H. V. Walsh.

#### ROYAL AIR FORCE

Squadron Leader F. B. C. L. B. Crawford to Home  
Aircraft Depôt, Henlow.

Flight Lt. C. Crowley to R.A.F. Depôt, Uxbridge.

E. W. R. Fairley and R. C. O'Grady are granted short  
service commissions as Flying Offrs.

Flying Offr. E. H. E. Cross to R.A.F. Station, Upper  
Heyford, on appointment to a short service commission.

*Dental Branch.*—Flying Offrs. A. P. Britton to No. 1  
School of Technical Training (Apprentices), Halton;  
and A. J. S. Wilson to Home Aircraft Depôt, Henlow.

#### DEATHS IN THE SERVICES

Lt.-Col. BELL WILMOTT LONGHURST, R.A.M.C. ret'd.,  
who died on June 15th in his 70th year, was the eldest  
son of the late Sir (Henry) Bell Longhurst, surgeon dentist  
to King Edward VII. Educated at King's College,  
London, he qualified M.R.C.S. in 1891 and after holding a  
house appointment at King's College Hospital joined  
the R.A.M.C., becoming Lt.-col. in 1915. He was in South  
Africa from 1899-1902. In the European war he was in  
charge of the Lahore British General Hospital, France,  
and in 1919-1920 of the 21st General Hospital at  
Alexandria. In 1921 he took the D.T.M. Liverp. and  
specialised in tropical medicine. He found recreation  
in rowing and swimming, being the winner of various  
prizes. He married Eleanor, daughter of Mr. W. O.  
Jarratt, and after his retirement went to live at Bath.

## PANEL AND CONTRACT PRACTICE

### Irregular Certification: A Contrast

AN insurance committee in the south has just  
dealt with three cases in which insurance practi-  
tioners have issued certificates irregularly; in one  
case the doctor was censured—possibly because four  
attempts had been made to secure his services with-  
out success, and he did not attend before the medical  
service subcommittee, contenting himself with writing  
a letter a few hours only before the meeting—and  
in the others the practitioners were merely warned  
that they must comply with the Medical Certification  
Rules. The circumstances in one of these cases are  
worthy of examination; the insured person had  
been on the funds of the society since 1932 with  
heart trouble. In May, 1933, she went to hospital  
until the following December, and then was under treat-  
ment by Dr. A throughout 1934 and until March 7th,  
1935, and fortnightly thence until May 1st, 1935.  
Dr. A did not see her again until March 23rd, 1936,  
but continued to provide prescriptions and certifi-  
cates, which were collected by a child. The practi-  
tioner's evidence was that every time he went to  
see the insured person she collapsed owing to her  
heart condition; that she was very nervous and  
excitable; that he used to pull up his car further  
down the road so that the insured person would not  
know that he was coming to see her; that every  
time he left her in a state of collapse; that he  
explained to the patient's mother why he would not  
call too frequently; that he knew exactly how the  
patient was getting on; that he told the mother  
that if any change in her condition made it necessary  
for him to see her he would come at once if sent  
for; that the insured person lives only 100 yards  
from his surgery; that he admitted issuing the  
certificates without actually seeing the insured person.  
At the meeting of the subcommittee it was sug-  
gested to Dr. A that it would have been better to  
have written to the society stating that he thought  
it inadvisable to visit the patient—for societies are  
empowered in suitable cases to waive the necessity  
for regular medical certificates. The subcommittee  
found that the doctor had committed a breach of  
the rules but they were of opinion that in not visiting  
the insured person the practitioner acted in the best  
interests of the patient, and recommended that he  
should be informed that he must in future comply  
strictly with the Medical Certification Rules. It is  
noteworthy that the period during which the patient  
was not seen by her doctor extended from May, 1935,  
to March, 1936.

As a contrast a neighbouring committee some  
time ago dealt with a similar case—of cardiac trouble

and cataleptic fits and a lengthy period during  
which certificates were issued without examination.  
The doctor told the subcommittee that the patient  
was suffering from major hysteria and mental trouble,  
and that the excitement caused by his visits did her  
more harm than good. The subcommittee quoted No. 9  
of the Certification Rules, and found it "abundantly  
clear" that the doctor, in contravention of that  
rule, issued certificates on dates when he did not  
see the patient. The practitioner must have known  
that he appended his signature to statements which  
were not true, and he seemed to have failed properly  
to appreciate that the form of certificate supplied  
for the use of practitioners contains a statement  
of fact. The committee pointed out that it was  
open to the practitioner to have informed the approved  
society that the condition of the patient had reached  
the stage where no further medical treatment was  
possible for the patient's disability, and of his view  
that his visits, by exciting her, would do more harm  
than good. The society would then have been in a  
position to make other inquiries if they thought fit.  
A fine of £5 was recommended with the rider that  
had he not explained his omission to visit the patient  
as dictated by medical considerations they would  
have suggested a larger amount. The fact that  
the £5 was actually withheld may be taken as  
indicating the Minister's view of the matter.

### Intravenous Injections

The Kent insurance committee have recently  
concurred in the decision of the local medical and  
panel committee that intravenous injections of neo-  
salvarsan are not beyond the range of service of a  
general practitioner. In the case under review,  
however, the service did not fall within the scope of  
the practitioner's obligations under the terms of  
service as it was given in a general hospital with a  
limited staff. The Minister has indicated that he  
does not propose to refer the case to referees.

### "No Smoking"

Mr. X, an insured person, complained to the  
Birmingham insurance committee that Dr. A,  
assistant to Dr. B, had failed to provide him with  
treatment. The story as told to the medical service  
subcommittee was as follows:—

Mr. X said he suffered from bronchitis and on  
March 27th last he developed an affection of the throat.  
Having passed a very bad night he attended next morning  
at the surgery where, although a notice that smoking  
was strictly prohibited was exhibited in the waiting-room,  
Dr. A's clerk was smoking a cigarette. As the smoke  
affected his chest Mr. X asked the clerk to be kind enough

to stop smoking. After waiting some time he was summoned to the consulting-room where Dr. A also was smoking. He asked the doctor if he would be kind enough to put the cigarette on one side, to which he replied with a paraphrase of "An Englishman's home is his castle" and continued smoking. Mr. X then told Dr. A that his throat and chest were very bad and asked for a prescription for medicine similar to that prescribed by Dr. B and also a strong gargle for the throat. He explained that what he wanted was a yellow medicine and alleged that Dr. A referred to a book, wrote out a prescription, tore it up, and refused to give him treatment. Mr. X lost his temper and left the consulting-room without treatment. Next day he saw Dr. B who prescribed medicine and gargle, and after a few days in bed the condition of the throat improved.

In his own account Dr. A said that Mr. X entered the consulting-room and in an abusive manner complained that the clerk and he were smoking. He asked Mr. X to be civil but he became more abusive and demanded a prescription for medicine and gargle. As he had not seen Mr. X before when suffering from a bad throat he told him he wished to examine his throat, adding that he would not smoke during the examination. Mr. X refused to submit to examination and Dr. A thereupon declined to issue a prescription and advised him to see Dr. B if he did not wish to be examined by Dr. A. Dr. A denied having torn up the prescription; he had not even written it. He added that he remained quiet while the insured person was abusing him and that Mr. X had previously attended for treatment while he was smoking without raising any objection.

Mr. X denied using certain bad language attributed to him and stated that the doctor did not ask to examine his throat, and consequently he did not refuse to be examined.

The subcommittee pointed out that the evidence was contradictory. They were, however, satisfied that Mr. X and Dr. A irritated each other, that they became excited and consequently neither of them was able to give a concise statement of what actually had taken place. They were satisfied that Mr. X applied for treatment on March 27th, that he was in need of treatment and that treatment was not provided, and that in failing to provide treatment Dr. A had not complied with the terms of service. As, however, the evidence as to the cause of failure was so conflicting, they recommended the insurance committee to take no action.

## IRELAND

(FROM OUR OWN CORRESPONDENT)

### PAYMENT FOR ANTI-DIPHTHERIA IMMUNISATION

It is unfortunate that a difference of opinion should have arisen between the medical profession of the Irish Free State and the Department of Local Government and Public Health on the question of the remuneration to be paid to medical men for carrying out schemes of immunisation against diphtheria under the direction of the county medical officers of health. The profession is willing to cooperate in what it believes to be a beneficent measure of public health, but it demands that its services should be adequately remunerated. No difference arose between the professional organisations and the local authorities on the question of payment, but the Department refused its sanction to the fees the local authorities were willing to pay. The sums at issue are small, and it is unfortunate if a service beneficial to the health of the community is hindered or hampered by so small a matter. In some quarters blame is put on the profession for not accepting the fees approved by the Department, and it is being

suggested that it is the duty of medical men to serve the public good regardless of remuneration. Nothing is more likely to prevent a friendly arrangement than imprudent demands of this kind. The responsibility for carrying out the immunisation schemes rests on the Department of Local Government and Public Health and on the local authorities. The latter make no complaint of the fees asked for by medical practitioners, and the block comes from the Department.

## THE BIRTHDAY HONOURS

THE list of honours conferred by the King on his 42nd birthday contains the following names of members of the medical profession:—

### Viscount

Lord Dawson of Penn, P.C., G.C.V.O., K.C.B.,  
K.C.M.G., M.D., P.R.C.P.  
Physician in Ordinary to H.M. The King.

### G.C.V.O.

Sir Richard Robert Cruise, K.C.V.O., F.R.C.S.  
Surgeon oculist to H.M. The King; surgeon, Royal  
Westminster Ophthalmic Hospital.

### K.C.B. (Military)

Surgeon Vice-Admiral Robert William Basil Hall,  
C.B., O.B.E., M.R.C.S.  
Honorary physician to H.M. The King; medical  
director-general of the Navy.

### K.C.B. (Civil)

Arthur Salusbury MacNalty, M.D., F.R.C.P.  
Chief medical officer, Ministry of Health and Board  
of Education.

### Knights Bachelor

Lieut.-Colonel Charles Bickerton Blackburn, O.B.E.,  
M.D., Ch.M.  
Member of the council of the New South Wales  
branch of the British Medical Association.

James Sands Elliott, M.B., F.R.A.C.S.  
Honorary consulting surgeon, Wellington Hospital.  
For public services in the Dominion of New Zealand.

Cedric Stanton Hicks, M.Sc., M.B., Ph.D.  
Professor of human physiology and pharmacology at  
the University of Adelaide.  
For services to medical education.

Captain Hibbert Alan Stephen Newton, M.B., M.S.,  
F.R.C.S.

Member of the council and censor-in-chief, Royal  
Australasian College of Surgeons.

Major-General Cuthbert Allan Sprawson, C.I.E., M.D.,  
F.R.C.P., D.Litt.  
Honorary surgeon to H.M. The King; director-  
general, Indian Medical Service.

Lieut.-Colonel John Calderwood Strathearn, C.B.E.,  
M.D., F.R.C.S.  
Warden, St. John of Jerusalem Ophthalmic Hospital,  
Jerusalem; honorary consulting ophthalmic surgeon  
to the Government of Palestine.

Colonel Alfred Edward Webb-Johnson, C.B.E., D.S.O.,  
M.B., F.R.C.S.  
Surgeon to the Middlesex Hospital.

### C.B. (Military)

Air Vice-Marshal Alfred William Iredell, M.R.C.S.  
Honorary physician to H.M. The King; director of  
medical services, Air Ministry.



- Major-General Dudley Sheridan Skelton, D.S.O., M.R.C.S., D.P.H.**  
Honorary surgeon to H.M. The King; deputy director of medical services, Southern Command, India.  
**C.M.G.**
- Henry Harold Scott, M.D., F.R.C.P., F.R.S.**  
Director of the Bureau of Hygiene and Tropical Diseases, London School of Hygiene and Tropical Medicine.  
**C.I.E.**
- Lieut.-Colonel John Joseph Harper-Nelson, O.B.E., M.C., M.D., F.R.C.S.E., I.M.S.**  
Late principal and professor of medicine, King Edward Medical College, Lahore, Punjab.  
**C.B.E. (Military)**
- Group Captain Henry Ashbourne Treadgold, M.D., M.R.C.P.**  
Consultant in medicine, Royal Air Force.  
**C.B.E. (Civil)**
- Philip Douglas Oakley, M.R.C.S.**  
Director of medical and sanitary services, Sierra Leone.  
**O.B.E. (Military)**
- Lieut.-Colonel Norman Mello Fergusson, T.D., M.B., R.A.M.C. (T.A.)**
- Surgeon Captain Ernest MacEwan, M.R.C.S., R.N.**
- Major George Wishart Will, M.B., R.A.M.C.**  
Mental specialist, Southern Command, India.  
**O.B.E. (Civil)**
- Eldred Curwen Braithwaite, M.S., F.R.C.S.E.**  
Surgeon specialist, West African medical staff.
- Raj Kishore Kacker, L.M.S.**  
Medical superintendent, King Edward VII. Sanatorium, Bhowali, United Provinces.
- George Henry Masson, M.D., F.R.C.P.E.**  
Medical officer of health, Port of Spain, Trinidad.
- Lieut.-Colonel Anath Nath Palit, F.R.C.S.E., I.M.S.**  
Civil surgeon, Cuttack; superintendent, Orissa Medical School, Orissa.
- Charles Satchell Pantin, M.D., F.R.C.S.**  
Surgeon, Noble's Isle of Man Hospital.  
For public services in the Isle of Man.
- Walter Alexander Ramsay Sharp, M.B., Ch.M., F.R.C.S.E., F.R.A.C.S.**  
Surgical tutor, University of Sydney.  
For social welfare services in the State of New South Wales.
- Charles Gordon Timms, M.C., L.R.C.P.**  
Medical officer, Somaliland Protectorate.
- Alan Neil Yuille, M.B., F.R.C.S.**  
Government medical officer, Dubbo, State of New South Wales.  
**M.B.E. (Military)**
- Lieutenant Albert Edward Gomez.**  
Senior assistant surgeon, Indian Medical Department, British Military Hospital, Jhansi, India.
- Subadar Sampuran Singh.**  
Sub-assistant surgeon, Indian Medical Department, Indian Military Hospital, Quetta, India.
- Colin Thomas Symonds.**  
Assistant surgeon, Indian Medical Department, British Military Hospital, Belgaum, India.  
**M.B.E. (Civil)**
- Quirino Bonifacio De Freitas, M.R.C.S.**  
Government medical officer, British Guiana.
- Khan Bahadur Kershaw Dinshaw Khambatta, L.M.S., L.R.C.P., D.P.H.**  
Health officer, Poona City Municipality, Bombay.  
**Kaiser-i-Hind Gold Medal**
- Rustomji Bomonji Billimoria, M.D., J.P.**  
Private medical practitioner, Bombay.
- Lieut.-Colonel Sir James Reid Roberts, C.I.E., M.S., F.R.C.S., I.M.S. (ret.).**  
Special member of council, Dewas State (senior branch), Central India.
- Mrs. Ruth Young, M.B.E., M.B.**  
Women's Medical Service; principal, Lady Hardinge Medical College, Delhi.  
**Albert Medal in Gold**
- André John Mesnard Melly, M.C., F.R.C.S.E.**  
Awarded posthumously in recognition of the conspicuous gallantry that he displayed during the disorders in Addis Ababa in May, 1936.

## PUBLIC HEALTH

### A Year of Nutrition Centres in London

In his report<sup>1</sup> as school medical officer for the County of London Sir Frederick Menzies describes the nutrition centres as an attempt to blaze a new trail through uncharted territory. Five centres were established, one in each administration division, in May, 1935, for children who had been sent to voluntary general hospitals as under-nourished by the school-care committees, found there to have no disease, and sent away with nothing done. The children for the centres were selected partly by nomination of the school doctors, partly by nutritional surveys. In future selection will depend on the six-monthly weighing and measuring of all school-children which began in September, 1935.

In the northern division Dr. Margaret Hogarth explored the soundness of selecting children on the basis of failure to approach the normal weight for height, but more than half of these children although lanky were found to be healthy. This method was

therefore abandoned in favour of a special survey with the school doctor of children of poor appearance. Although most of the 303 children attended the centres more than once, a surprisingly large proportion failed to continue attendance, and emphasis is repeatedly laid on the value of the centre in educating parents. Dental caries was not commoner in these children than in others. Anæmia was quite uncommon, the average hæmoglobin content in the children at one centre being 92.5 per cent. Postural defects were often noted. Although it was impossible as a rule to get an accurate account of the child's diet, it was evident that ill-adjustment and ignorance of dietetic needs played a part. Many of the children came from bad houses where, as Dr. Cicely Peake remarks, parents have become hopeless from disappointment in their search for better accommodation. Dr. Alfred Elman emphasises the value of a happy home to the nutrition of a child. None of the physicians in charge is prepared to attribute ill-nourishment to any single and well-defined cause. Dr. L. W. Batten classifies presumed ætiological factors under five broad headings, with some overlapping: constitutional 24, environmental 32, food 8, present disease 8, past

<sup>1</sup> L.C.C. Annual Report of the Council, 1935, Vol. III., Part II. London: P. S. King and Son. No. 3196. Pp. 96. 1s. 6d.

disease 11. Dr. Evelyn Gourlay found three main causes for under-nourishment: (1) life under impoverished conditions; (2) ignorance of dietetic principles; (3) poor housing and overcrowding.

The recommendations for treatment made at the centres were carried out in a large proportion of cases, except that obviously housing improvement was generally impossible. Medical officers give their opinion frankly about the value and permanency of the experiment. Parents and children are benefitting says one, from the investigation and discussion of home difficulties. It is hard to believe, says another, that new light will be thrown on the nature and cause of malnutrition by the examination of any number of subnormal children. Another suggests that a clinic concerned purely with nutrition can hardly exist except as a welfare centre for school-children, but as such it has an important field for investigation and later of social service. Yet another doubts the value of tests and would concentrate on the practical problem of helping parents and children. Finally there is a suggestion that the work could be done as well at special sessions in the schools, but not adequately in the course of routine inspections. A divisional treatment organiser is confident that the most important factor in the work is the education of parents.

### Medico-Psychologist for L.C.C. Remand Home

The appointment is announced of Dr. J. D. W. Pearce as a part-time medico-psychologist at the Stamford House Remand Home under the London County Council. Dr. Pearce's duties, we understand, will be to examine all children admitted to the remand home as to their physical and mental state, with special reference to the delinquency with which the juvenile offender has been charged, and to submit reports to guide the magistrates of children's courts. Until the end of last year the remand home was situated at Ponton-road, Nine Elms-lane, and provided accommodation chiefly for children from the London area; in view of increasing numbers and the desire of other local authorities to share the home, a move was made to more suitable premises in January, 1936. The number of children passing through the home in 1930 was 785; in 1935 it was 2420. Hitherto the medical work has been done by a medical officer from the L.C.C. central public health department, with the assistance of a trained psychologist loaned from the London Child Guidance Clinic. Dr. Pearce will combine these duties, and the unification will reduce the number of examinations required. Reference will still be made to child guidance clinics when prolonged investigation is required.

## CORRESPONDENCE

### OÖPHORECTOMY AND CANCER OF THE BREAST

To the Editor of THE LANCET

SIR,—The interesting paper by Prof. Peter Paterson in your issue of June 20th and his reference to Sir George Beatson's cases prompt me to refer to an analysis of ninety-nine cases of inoperable carcinoma of the breast treated by oöphorectomy, which was published in vol. lxxxviii. of the *Transactions* of the Royal Medical and Chirurgical Society, 1905. In a certain number of these cases the operation was followed by very striking changes: pain was relieved, the general health improved, and the growths diminished in size or even disappeared. In all of them however, with one possible exception, the relief was only temporary, although in fifteen cases it persisted for more than twelve months, and four other patients had good health for over four years. The immediate results in Sir George Beatson's first two cases were very remarkable, but after a time the condition relapsed, and in the light of further experience the hope that this line of treatment might lead to a cure had to be abandoned.

It appears therefore that in some cases of carcinoma of the breast removal of the ovaries may have a pronounced though temporary effect on the growth, and it is significant that little or no improvement is to be expected in patients who are more than fifty years old.—I am, Sir, yours faithfully,

Harley-street, W., June 22nd.

HUGH LETT.

### INSULIN IN SCHIZOPHRENIA

To the Editor of THE LANCET

SIR,—With reference to your leading article in last week's issue (p. 1418) may I, as one who knows this therapy from practical experience both in Vienna and in this country, make a few observations? Surely there must be something to recommend a treatment that Prof. Pötl, who is the successor of Wagner-Jauregg, from personal observation extend-

ing from October, 1933, and relating to over 200 cases declares superior to every other method. Let it at once be said that Prof. Pötl was the first to proclaim that the innovation did not originate from his institution but from the Vienna physician Dr. Sakel, who was indeed fortunate in finding so magnanimous and unselfish a supporter. True, the methods of treatment for schizophrenia have been so numerous as to invoke scepticism against any new method, however well supported, but it is equally true that malarial treatment of G.P.I. was greeted with the same misgivings. The fact that early cases do so well with insulin therapy does not imply that the same patients would have made an equally good recovery without such treatment. After all, our vast mental hospital population of chronic schizophrenics have been early cases some time. If it is true that in this country there is a distressing increase in the number of patients suffering from schizophrenia,<sup>1</sup> the inference appears to be obvious. The recovery-rates with insulin therapy in Vienna and in Switzerland<sup>2</sup> considerably surpass the average expectation of spontaneous remissions, observed over long periods at the same institutions. I have stated elsewhere<sup>3</sup> that insulin treatment on closer acquaintance proves less deadly than at first sight, and that it is hypoglycæmia rather than shock that is the therapeutic agent. Quite a number of patients do well without reaching anything like the shock stage. It is only fair to state that Dr. Berze's criticism was, in his own words, based on general academic considerations rather than familiarity with the therapy in question. His article appeared a fortnight after a preliminary report, dealing with a dozen cases, was made from the Vienna clinic. Since then 200 cases have been treated at Vienna, apart from other centres.<sup>1</sup> The therapy is now being employed all over Europe and in Japan, and most reports are

<sup>1</sup> See Report of the Scottish Board of Control for 1935, p. 26.

<sup>2</sup> Müller, M.: Meeting of Swiss Neurologists and Psychiatrists, Freiburg, November, 1935.

<sup>3</sup> Münch. med. Woch., 1936, lxxxiii., 649.

encouraging. Those wishing to form their own opinion will welcome Dr. Sakel's recent report<sup>4</sup> on 102 cases, early and advanced, with details of their prognosis, response to treatment, and after-history.

I am, Sir, yours faithfully,

Edinburgh, June 22nd. H. PULLAR STRECKER.

### CHICKEN-POX AND SHINGLES

To the Editor of THE LANCET

SIR,—I saw a patient recently suffering from obvious shingles of the maxillary division of the fifth nerve. The vesicles were in two groups, one at the outer margin of the right eye, the other on the right side of the hard palate, and had been there for four days. I was asked whether the condition was infectious, and whether a boy who had been in contact with the case could be sent back to a boarding-school. There had been no known contact with any case of chicken-pox, and my reply was that the boy could safely return to school. Three days after my examination, and a week after the original herpetic eruption, the patient developed chicken-pox. Now although the relationship between chicken-pox and shingles has long been suspected, though not proved, this case raises two points, one academic, one practical. In the first place, if the virus of the two conditions is the same except for its distribution, the incubation period must be different; in the second place, are we to put in quarantine all contacts with shingles, or should we be prepared to burst the bubble reputation and take a chance? In view of the fuss, bother, and excitement occasioned by this particular case in the heart of a mother, and the mind of a housemaster, an authoritative opinion on the latter point would be welcome.

I am, Sir, yours faithfully,

Brecon, June 20th.

DAVID KYLE.

### TREATMENT OF PHLEBITIS IN VARICOSE VEINS

To the Editor of THE LANCET

SIR,—In your issue of May 2nd Mr. Payne writes that my viewpoint is contrary to current teaching and to his own opinions. In view of the fact that I propose a new method of attack on these rebellious disorders, it should be apparent that the views proposed would refute older teachings. He asks whether clinical experience supports my contention that the conservative treatment of phlebitis often ends in a permanently damaged extremity. I would refer him to an article I have just written (Lymphedema occurring with Varicose Veins: Treatment by Injection, Arch. Derm. and Syph., April, 1936) describing many cases of extremities damaged from untreated phlebitis, coupled with histological and clinical proof. It is impossible to overlook the connexion between phlebitis and chronic lymphangitis resulting in lymphoedema. Other physicians besides myself who see these legs constantly in practice realise that there are many thousands of sufferers from lymph legs who might have been saved with more radical treatment at the outset.

Mr. Payne is unwilling to accept my concept of latent phlebitis, stating that the absence of tenderness, thrombosis, and hyperthermia makes the term phlebitis inapplicable. This objection is surprising because for many years clinicians have so classified a great many latent infections and clinical entities. I might mention a few, such as chronic tuberculosis, chronic salpingitis, and chronic tonsillitis. To deny

the existence of an infection because of the absence of clinical signs is dangerous, especially in varicophlebitis, where disastrous results may follow routine injection. Mr. Payne uses injections after an arbitrary period of six months, but does not explain his reasoning for the determination of this lapse of time. He overlooks the significance of migrating reactions, and attempts with theoretical objections to break down the painstaking clinical and laboratory framework on which the modern treatment of this disorder is based.

In any attempt to disprove the more radical approach to this problem may I suggest the following investigations:—

1. Cultural studies of excised portions of varicose veins.
2. Blood culture studies of patients in whom flare-up reactions are obtained during treatment.
3. Studies of the antibody formation in the blood of patients undergoing varicose vein therapy, especially those showing migrating reactions.
4. Histological sections of subcutaneous tissues which are discoloured and hardened in cases of varicose veins.

If Mr. Payne will retrace the path taken by previous investigators he will, I think, arrive at the same conclusion—namely, that phlebitis in varicose veins is the starting-point of a pernicious cycle which results in damaged extremities and should be attacked immediately by the method I have described.

I am, Sir, yours faithfully,

H. I. BIEGELEISEN.

Madison-avenue, New York, June 12th.

### IONISATION FOR HAY-FEVER

To the Editor of THE LANCET

SIR,—I should be grateful if you would allow me space in your columns to disclaim responsibility for the publicity given to my name in the press this week in connexion with a particular form of treatment for hay-fever. In my paper published in the *Practitioner* in May of this year I gave full credit to Mr. Philip Franklin for introducing me to this method of treatment in a communication he made to the *British Medical Journal* in 1931. The use of zinc sulphate for ionisation in the nose is of course not new. With Mr. Franklin I deplore the exaggerated claims made in the press. In my paper the claim I made was that "on theoretical and practical grounds intranasal ionisation of zinc sulphate is a justifiable and valuable method of treating hay-fever and vasomotor rhinorrhoea." Mr. Franklin's own experience and my own further observations lead me to believe that this is no exaggeration.

In your admirable survey of the position at the moment you state, Sir, that ionisation "is evidently not appropriate for slight cases that can be relieved by simpler means." With all respect, I must disagree with this statement. It is impossible to go fully into my reasons for this here; briefly, in my own opinion, the use of sprays and ointments (especially those containing ephedrine) in vasomotor rhinorrhoea should be abandoned. The reactionary congestion which they produce is far worse than the initial discomfort. I am, Sir, yours faithfully,

Park-lane, W., June 19th.

CLIVE SHIELDS.

ROYAL SURREY COUNTY HOSPITAL, GUILDFORD.—On June 13th the Duchess of Northumberland opened the new wards at this hospital providing 32 new beds, 16 for men and 16 for women. The extension has cost £13,500, of which £10,000 was the gift of an anonymous donor. The hospital is very crowded and there is a waiting-list of more than 250.

<sup>4</sup> Dussik, K., and Sakel, M.: Zeits. f. Neurol., 1936, clv., 351, Heft 3.

## PARLIAMENTARY INTELLIGENCE

### UNEMPLOYMENT AND MALNUTRITION

On June 22nd, in the House of Commons, the vote for the salaries and expenses of the Unemployment Assistance Board was considered in Committee.—Mr. LAWSON, who moved to reduce the vote by £100, asked if the 12 months' administration of the Board had been satisfactory to the House of Commons and the country. The fact, he said, still remained that two out of every three men who offered themselves for the Army were physically unfit, and the Government made no secret of the fact that many of the recruits came from areas where unemployment was bad. After 12 months' operation of the means test in Durham, a commissioner was put in charge. When he began in 1932 10,000 children were receiving milk on medical certificates in the schools. When he finished there were 20,000 receiving milk on the charge of the local authorities. Twelve months later there were 25,000 children receiving milk in the schools. Doctors were really alarmed at the state of the children in the area compared with other areas. He was talking to a medical man at the week-end, who told him that 75 per cent. of the children who were sent to the isolation hospital in his (Mr. Lawson's) own area were suffering from malnutrition. That was the case all over the country. The Minister of Labour and the Board could not blink the fact that during the 12 months the Board had been in operation they not only had not touched the edge of the problem affecting work, but that the physical condition of the people in the distressed areas was getting worse. The doctor to whom he had referred had told him that it was almost impossible to deal with some people; they ought to get better, but it was hopeless trying to deal with them because they were hopeless themselves.—Miss HORSBROUGH said that in a great many cases applicants for assistance had far too little knowledge of what was the best food to give the most nourishment. There ought to be, especially where there was a small income, further education as to the best way that income could be used. One heard from medical officers that if they could—she did not think they could, because it would mean interfering with the individual—guide better the food which was chosen, there would be less malnutrition. The subject of nutrition should be studied by all interested in the people, and poor persons who had little to lay out ought to have much more guidance.—Mr. ERNEST BROWN, Minister of Labour, said that in all the years during which a test of need had been applied no one had yet discovered an effective way of applying a test except on a household basis. He intended to make it his business, when the new regulations were presented to the House of Commons, to see that all the information needed was given so that Members might form a judgment on the proposals. The discussion had shown that the debates tended to get out of perspective and individual cases seemed to occupy the whole field, while little attention was paid to the magnitude of the work done by the Board in handling this complex question. Far from the district administration being a soulless bureaucratic thing, it was immensely superior to anything that had ever been done for the unemployed.—After further debate, Lieut.-Colonel MUIRHEAD, Parliamentary Secretary to the Ministry of Labour, said it had been the aim of the Unemployment Assistance Board to introduce a certain amount of elasticity in the administration which was thoroughly desirable. Their report said that every applicant was a separate human being with his own needs and environment, and the Board had throughout encouraged and instructed its officers to take this view of each case. This was shown to be so by the fact that in no less than 20 per cent. of the cases the officers of the Board had used their authority to grant allowances above the normal rate. With regard to welfare work, the Board was coöperating

with the Ministry of Labour and the commissioners for the special areas and with such bodies as the Land Settlement Association.

### NOTES ON CURRENT TOPICS

In the House of Lords on June 23rd the Road Traffic (Driving Licences) Bill was read the third time and passed, and the Public Health (Drainage of Trade Premises) Bill passed through Committee.

#### Exemption from Duty of Invalid Carriages

On June 17th in the House of Commons Mr. KIRKPATRICK moved a new clause in the Finance Bill providing for the exemption of invalid carriages from duty imposed under the Finance Act, 1920, on licences for mechanically propelled vehicles.—Mr. W. S. MORRISON, Financial Secretary to the Treasury, said that this new clause was one that could be accepted. At present the duty on invalid carriages was only 5s. a year and as there were 1600 of these carriages, as far as the Government could tell, the amount of duty which would be lost by accepting the new clause would be some £400 a year.

### QUESTION TIME

WEDNESDAY, JUNE 17TH

#### Medical Practice in Palestine

Mr. GRAHAM WHITE asked the Secretary of State for the Colonies the nature of the representations submitted by the Arabs in Palestine to the Mandates' Commission.—Mr. ORMSBY-GORE replied: Representations have been submitted to the Permanent Mandates Commission on behalf of the Palestine Arab Party, on the subjects of the form of Government in Palestine, Arab education, Jewish immigration, land policy, and the Hahsh Concession, and on behalf of the (Arab) National Medical Association on the number of Jewish medical practitioners in Palestine.

#### Staff Hours at Perth Asylum

Mr. MATHERS asked the Secretary of State for Scotland whether he had considered the petition by the criminal lunatic asylum staff at Perth, complaining of long hours of duty and irregular meal-times; and what action he intended to take to remedy these grievances.—Sir GODFREY COLLINS replied: After consultation between the Governor and the staffs a revised scheme of duties proposed by the staffs was introduced experimentally on April 27th. The working of this scheme will be kept under review and any suggestions made by the staff for alteration will be duly considered. No suggestion for change has so far been made.

#### "Incapable of Work"

Mr. JOSEPH HENDERSON asked the Minister of Health whether he was aware that under the National Health Insurance Act a panel doctor had to certify an individual as fit for work as soon as he was no longer totally incapacitated, whilst some employers, such as railway companies, refused to allow an individual to resume employment until he was fully restored to health, with the result that he was deprived both of wages and national health insurance benefit; and whether, therefore, he would consider the desirability of amending the Health Insurance Acts to provide benefit to an insured person until he was fit to resume his normal employment.—Mr. SHAKESPEARE replied: Insurance medical practitioners and approved societies have been advised that an insured person should be regarded as incapable of work within the meaning of the National Health Insurance Acts if he is unfit to follow his ordinary occupation, but it appears probable that he will soon be fit to do so. Cases of the kind referred to by the hon. Member should not, therefore, arise.

#### Abnormal Maternity Cases

Mr. LEONARD asked the Minister of Health if he was aware that, following the decision of Rochdale doctors to send all abnormal maternity cases to hospital, the

maternal death-rate had been reduced by 60 per cent.; and if he would consider the desirability of urging an extension of this practice.—Mr. SHAKESPEARE replied: My right hon. friend is aware that there has, happily, been a reduction in the maternal mortality-rate in Rochdale which is, he is advised, due to the operation of a number of factors. It has been the practice of my department for many years to urge the provision of hospital beds for abnormal maternity cases.

Mr. LEONARD: Is the hon. gentleman aware that the practice referred to in the question is universal in Holland, where there is an exceptionally low maternal death-rate and, if so, does he not consider it desirable to adopt the practice widespread in this country?

Mr. SHAKESPEARE: I think it is universal in this country as well.

#### R.A.F. Flying near Colindale Hospital

Mr. McENTEE asked the Under-Secretary of State for Air whether he was aware of the serious consequences to patients of the Colindale Hospital arising from the Royal Air Force flying and searchlight operations in the vicinity of the hospital, sometimes proceeding for 12 hours and as late as midnight, and especially near the west side of the aerodrome where the Colindale and Redhill hospitals were situated; that the hospital inmates needed rest and quietness; and that the medical staff had sometimes to suspend their stethoscopic work because of the overhead noise; and whether he would take steps to secure the minimisation at the earliest possible moment of the activities complained of.—Sir P. SASSOON replied: I am aware that complaints have been made in regard to the flying of Royal Air Force aircraft in the vicinity of the Colindale Hospital and the Air Ministry has already issued instructions that pilots are to avoid as far as possible taking off and coming in to land over the hospital, particularly at night. I hope that these steps will materially reduce the inconvenience. At the same time it will, I am sure, be appreciated that the Royal Air Force expansion programme inevitably involves a considerable increase of flying activity, and despite the restrictions placed on pilots a certain amount of inconvenience is unavoidable if the efficiency of the Air Force for defence purposes is to be maintained.

THURSDAY, JUNE 18TH

#### Medical Practitioners and Poison-Gas Treatment

Mr. EMMOTT asked the Home Secretary what facilities had been provided in the London area for doctors wishing to obtain instruction in the treatment of poison-gas cases.—Mr. GEOFFREY LLOYD replied: The General Medical Council and the British Medical Association have been consulted on this matter, and arrangements for giving instruction to medical practitioners in the treatment of poison-gas cases are under consideration. The Air Raid Precautions Department are accumulating stores of respirators and other means of protection for all public air raid precautionary services.

Mr. CARTLAND asked the Home Secretary what steps were being taken to instruct householders as to the methods they could adopt to render their rooms proof against poison gas in the event of air raids.—Mr. LLOYD replied: A handbook on the precautionary measures which members of the public should take in the event of air raids is in an advanced state of preparation.

#### Nystagmus Patients and Workmen's Compensation

Mr. SHORT asked the Home Secretary whether he was aware that many miners in Yorkshire suffering from accidents and industrial diseases and subject to the provisions of the Workmen's Compensation Acts were frequently certified as being fit for work by the indemnity company's doctor but were refused employment when making application to their employers; and whether this aspect would be the subject of consideration of the departmental committee on workmen's compensation.—Sir JOHN SIMON replied: I am aware that in the area named miners who have been in receipt of compensation for nystagmus may find this is an obstacle to re-employment, and this aspect of the matter is being considered by the Departmental Committee in connexion with their inquiry into compensation for that disease.

Mr. T. SMITH: Is the right hon. gentleman aware that this practice is not confined to those who have suffered from nystagmus, but affects also many who have recovered, or partially recovered, from accidents? Has the general question been considered by the department?

Sir J. SIMON replied: I shall be obliged if the hon. Member will communicate with me about other cases, because I should like to learn how much evidence there is of this practice. It would be possible to enlarge the inquiry in case of need.

#### Anti-Gas Instruction Centres

Captain PLUGGE asked the Home Secretary what was the estimated annual output of trainees from the new anti-gas school at Eastwood Park operated by the air-raid precautions department of the Home Office; and whether consideration had been given to the desirability of having additional schools in other parts of the country.—Mr. GEOFFREY LLOYD replied: It is hoped that, under present arrangements, the output of the Civilian Anti-Gas School at Falfield in a full year would be in the region of 600 fully trained instructors in addition to the provision of short courses for some 250 doctors and other specialists. It has been decided that this output shall be increased and the steps by which this may be effected are being examined.

MONDAY, JUNE 22ND

#### The Problem of Nutrition

Mr. CARTLAND asked the Minister of Health what steps his advisory committee on nutrition were taking to collect sufficient data to enable the Government to formulate a policy for dealing with the problem of nutrition.

Mr. LENNOX-BOYD asked the Minister of Health whether, subsequent to the Bishop Auckland potato scheme, any further experiments had been carried out with a view to ascertaining the possibilities of making supplies of nutritious food available at reduced prices to the unemployed.

Mr. SANDYS asked the Minister of Health whether his attention had been drawn to the fact that the average expenditure on food of 4,500,000 persons in this country does not exceed 4s. per week per head; and whether the advice of his medical advisers indicated that this was sufficient to maintain health and working capacity.—Mr. SHAKESPEARE replied: My right hon. friend is aware that an estimate of average expenditure on food has been made to the effect stated, but he is advised that the data on which it is based are not sufficient to justify positive conclusions. The whole question of the adequacy of diets is now being actively examined by the Advisory Committee on Nutrition, who have before them all the available statistical information, including the results of the Bishop Auckland experiment, which my right hon. friend understands the Potato Marketing Board do not propose to repeat this season. The Committee have, however, recommended the departments concerned to collect family budgets and undertake dietary surveys and to obtain information as to the distribution of weekly earnings and family incomes. My right hon. friend, the Minister of Labour, is about to give effect to the recommendation as to family budgets in his forthcoming inquiry as to the cost of living index, and the other matters are now under consideration.

TUESDAY, JUNE 23RD

#### Military Hospital at Radford

Mr. GUY asked the Secretary of State for War if he could give the reasons for the delay in proceeding with the scheme for a new military hospital at Radford.—Mr. DUFF COOPER replied: The provision of the new military hospital at Radford is delayed because of other more urgent building services which must take priority.

#### Patent Medicines

Mr. DAY asked the Minister of Health whether he proposed to introduce legislation to give effect to the recommendations of the select committee on patent medicines.—Mr. SHAKESPEARE replied: No, Sir. The Government have no present intention of introducing legislation for this purpose. As the hon. Member is aware, the subject was recently debated on a Private Member's Bill, which failed to obtain a second reading.

## MEDICAL NEWS

## University of Oxford

Mr. William Stephenson, M.Sc., research assistant and supervisor of the research students' psychology department at University College, London, has been appointed assistant director of the institute of experimental psychology.

## University of Cambridge

On June 23rd the following degrees were conferred:—  
*M.D.*—H. J. Burrows, C. L. Potts, and H. C. Stewart.  
*M.B., B.Chir.*—C. J. Gordon and W. H. Valentine.  
*M.B.*—J. B. Tracey.  
*B.Chir.*—\*W. A. Briggs, \*W. T. Cooke, C. E. Elliott, and H. S. H. Gilmer.

\*By proxy.

## University of London

*Centenary Celebrations.*—The main event in the programme is a reception to be held at the university, South Kensington, on June 29th, when delegates will present congratulatory addresses and honorary degrees will be conferred on the following distinguished men (13 British and 6 foreign): Sir William Bragg, P.R.S., Mr. S. A. Courtauld, Mr. P. M. Evans, LL.D., The Archbishop of Westminster, Sir Joseph Larmor, F.R.S., Dr. J. W. Mackail, O.M., Sir George Newman, Sir Charles Peers, Lord Snell, Prof. G. M. Trevelyan, O.M., Mr. H. G. Wells, Dr. R. Vaughan Williams, O.M., Lord Wright, Don Ramón Perez de Ayala, and Prof. Max Planck; and in absentia Mr. Justice Benjamin N. Cardozo, Prof. Albert Einstein, Prof. Johan Hjort, and Dr. Emile Legouis. In the evening there will be a university dinner at the Grosvenor House Hotel, at which the Chancellor, the Earl of Athlone, will preside, and among the other evening festivities arranged are a Ball given by the Worshipful Company of Drapers at the Drapers' Hall, on June 30th; receptions at Lancaster House, St. James's, by H.M. Government on July 1st, and at the County Hall, Westminster, by the London County Council on July 3rd; and conversaciones at Bedford College for Women and at St. Bartholomew's Hospital medical college on July 2nd. A special service will be held at St. Paul's Cathedral on July 1st preceded by a procession up Ludgate-hill and followed by a lunch given by the Lord Mayor and Corporation of the City of London in the Guildhall. Garden parties will be held to-day, Saturday, at the Royal Holloway College and on July 2nd at King's College of Household and Social Science. On July 3rd a visit will be paid to the new buildings of the university now being erected in Bloomsbury when the architect, Mr. Charles Holden, will be in attendance.

Mr. H. L. Eason has been re-elected vice-chancellor for the year 1936-37.

The title of reader in neurological anatomy in the university has been conferred on Miss U. L. Fielding, M.B. Sydney, in respect of the post held by her at University College.

Miss Fielding has been on the staff of University College since 1923, having formerly been a demonstrator of anatomy in Sydney, and held resident hospital posts there. In order to make a comparative anatomical study of the nervous system she sought an opportunity to work in the department of Sir Grafton Elliot Smith at University College, where she was appointed demonstrator in anatomy and later lecturer in neurology. During the session 1928-29 she was absent on leave, and acted as professor of neuro-anatomy and histology in the American University of Beirut. Miss Fielding has collaborated with Mr. A. S. Parkes, F.R.S., and Prof. F. W. R. Brambell in a series of studies of the ovary and with Prof. Gregor Popa on the vascular connexions of the pituitary body.

Mr. W. V. Mayneord, D.Sc., has been appointed to the university readership in physics tenable at the Royal Cancer Hospital (Free).

Dr. Mayneord was born in 1902. He graduated B.Sc. with honours from the University of Birmingham in 1921, and became M.Sc. in 1922 and D.Sc. in 1933. From 1922-24 he was engaged in research work. In 1924 he was appointed demonstrator in physics at St. Bartholomew's Hospital medical college, in 1927 physicist to the radiological department of the Royal Cancer Hospital, and since 1936 he has also been acting head of the physics department at the hospital. In 1932 he gained the Röntgen award and in the following year he became a Fellow of the Institute of Physics. He has published papers in the *Proceedings* of the Royal Society and in medical, radiological, and chemical journals.

## University of Bristol

The dissertation of Bessie V. F. Dawkins has been approved for the degree of M.D.

## University of Glasgow

Dr. John Shaw Dunn has been appointed to the chair of pathology in the university in succession to Sir Robert Muir, F.R.S.

Dr. Shaw Dunn was born in 1883 at Kilmarnock and educated at Kilmarnock Academy, Glasgow High School, and Glasgow University, where he graduated M.A. in 1901. Four years later he took his M.B. degree with honours and in 1912 his M.D. degree. After graduation he acted as assistant pathologist to the Western Infirmary, and continued studying and teaching pathology as assistant to the professor of pathology until 1914 when he was appointed lecturer in clinical pathology. During the war he served with the R.A.M.C. and received the rank of brevet major. In 1919 he was appointed to the chair of pathology at Birmingham, and three years later to Manchester, where he became M.Sc. in 1929. He took up his present position of Notman professor of pathology at St. Mungo's College, Glasgow, in 1931. His publications include many articles on pathology with special reference to renal disease.

On June 17th the honorary degree of LL.D. was conferred on Dr. T. H. Bryce, emeritus professor of anatomy in the university, and on Sir Leonard Rogers. The following degrees were also conferred:—

*M.D.*—J. F. Smith (with honours), A. A. MacKellie (with high commendation), George Krasner (with commendation), Alexander Maclean, and J. A. Ronghead.

## University of Sheffield

Dr. A. E. Barnes, lecturer on medicine in the university and Semon hon. physician to the Royal Infirmary, Sheffield, has been appointed to the chair of medicine in succession to Prof. A. E. Naish.

Dr. Barnes received his medical education at Sheffield and graduated in 1903 when he took a London degree in medicine. After holding resident appointments at the Royal Infirmary and Royal Hospital, Sheffield, he was awarded the research scholarship of the British Medical Association in 1907. In the same year he took the membership of the Royal College of Physicians and a year later he took the medical degree of the newly constituted University of Sheffield. He then became medical tutor and lecturer on materia medica. During the war Dr. Barnes served at the Sheffield base hospital and afterwards at Salonika, where he was in charge of the medical side of the hospital arrangements. Returning to Sheffield he resumed his position on the medical side of the Royal Infirmary, and in 1921 was elected F.R.C.P. Lond. He also served on the Sheffield insurance committee. His contributions to medical journals include an article on simple methods of diagnosing diseases of the stomach published in our columns.

The following were appointed members of the medical faculty: Sir Arthur Hall, Dr. A. E. Barnes, Dr. H. E. Harding, Dr. C. G. Imrie, Dr. M. A. MacConaill, Dr. Dakin Mart, Dr. E. F. Skinner, Dr. A. G. Yates, Mr. R. St. L. Brockman, and Mr. J. E. Stacey.

## Order of St. John of Jerusalem

The following promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem have been sanctioned by the King:—

*As Knight of Grace.*—Lieut.-Col. W. B. Cockill, T.D., M.D. Mr. W. C. Bentall, O.B.E., and Wing-Commander H. R. G. Poate, F.R.C.S.

*As Commander.*—Dr. J. J. Huey, Dr. M. C. O. Hurly, Dr. E. Llewellyn, Dr. S. Williams, Dr. W. E. Thomas, O.B.E., and Dr. J. M. Wilson.

*As Officer.*—Dr. C. Reid, O.B.E., Dr. T. Bell, Dr. S. T. Rowling, Dr. A. Anderson, Colonel J. A. H. Sherwin, M.D., Dr. P. J. Kelly, C.B.E., Mr. R. F. Moore, O.B.E., F.R.C.S., Dr. F. E. Bendix, Dr. F. J. Green, M.C., Dr. R. B. Milne, and Dr. E. M. Griffith.

*As Associate Officer.*—Colonel D. Horwich, O.B.E., M.R.C.S., and Dr. H. F. Khalidi.

*As Serving Brother.*—Dr. J. A. Kennedy, Dr. L. J. Dunstone, Dr. H. Scholefield, Dr. C. Thompson, Dr. J. L. McK. Brown, Dr. C. C. Hargreaves, Dr. R. M. H. Walford, Dr. H. C. Sinderson, M.V.O., O.B.E., Dr. W. Vickers, D.S.O., Dr. E. Hoerman, Dr. J. P. J. Jenkins, and Dr. C. G. MacKay.

*As Associate Serving Brother.*—Dr. S. P. Swami and Dr. G. S. Vazkar.

## Society for the Provision of Birth Control Clinics

A lecture on the theory and practice of contraception will be given to medical practitioners and medical students by Dr. Gladys Cox on Friday, July 24th, at 6 P.M. at the Walworth Women's Welfare Centre, 153A, East-street, London, S.E. Practical demonstrations will be given on Friday, July 31st, at 6 P.M. and at 7 P.M. by Dr. Lynette Hemmant. Further information may be had from the secretary of the society.



**National Conference on Maternity and Child Welfare**

The National Association for the Prevention of Infant Mortality has organised a national conference which will be held in Liverpool on July 1st, 2nd, and 3rd, under the presidency of Mr. Geoffrey Shakespeare, Parliamentary Secretary to the Ministry of Health. On the first day of the meeting Dame Janet Campbell, Prof. A. Leyland Robinson, Dr. Katharine Hirst, and Miss E. Alden will open a discussion on the promotion of maternal welfare in relation to child health, and Dr. Charlotte Douglas will be the first speaker in a debate on maternal welfare and the public. On July 2nd Dr. Margaret Bjorkegren will speak on the education of parents through day nurseries and nursery schools, and Dr. N. B. Capon and Mr. Bryan McFarland on the importance of co-operation between maternity and child welfare services and the specialist health services. On the last day of the meeting Dr. C. L. C. Burns will be one of the speakers in a discussion on parents and substitute parents, and Dame Louise McIlroy and Prof. S. J. Cowell will open a discussion on antenatal nutrition. During the conference visits will be paid to municipal and voluntary maternity and child welfare institutions. Further information may be had from the secretary of the association, Carnegie House, 117, Piccadilly, London, W.1.

In connexion with this conference the maternity and child welfare group of the Society of Medical Officers of Health is holding a meeting in Liverpool on July 3rd and 4th. The annual general meeting will be held at 5.30 P.M. on July 3rd when Dr. George M'Gonigle will give his presidential address. On the following day papers will be read by Dr. R. E. Roberts (X rays and pelvimetry); Dr. J. Burke (amniography); Dr. R. J. Minnitt (gas and air analgesia in midwifery); and Mr. C. M. Marshall (certain aspects of obstetrics). In the afternoon members will visit Alder Hey Children's Hospital where Dr. Cecile Asher will read a paper on nutrition in infancy. Dr. R. E. Bell, maternity and child welfare department, 67, Dales-street, Liverpool, 2, is making arrangements for the meeting.

**Society of Apothecaries of London**

The livery dinner of this society was to have been held on Feb. 25th but it was cancelled on account of the death of the late King. Opportunity was therefore taken on June 23rd to combine court and livery dinners. The date was happily chosen and King Edward's birthday was marked by sending him a telegram offering loyal greetings of liverymen and guests. A reply expressing the King's thanks was received in the course of the dinner. —The approaching centenary inspired the chief toast of the evening, that of the University of London, and the principal guests included Mr. H. L. Eason, vice-chancellor of the university, Lord MacMillan, chairman of the court, Sir Edwin Deller, principal, Prof. Sidney Luxton Loney, chairman of convocation, Prof. L. N. Filon, and the Rev. Canon J. A. Douglas.—Sir William Willcox, master of the society, proposing this toast, said that that was the first occasion on which the university had been entertained in connexion with its centenary. He believed that the awakening a century ago of the national conscience to the urgent need for a revolution in health, hygiene, and education was responsible for the genesis of the university. In the last decade, however, they had seen greater advances than ever before and he was afraid that the pace might be too fast to be healthy; perhaps they could afford to rest on their laurels. In these democratic days, he concluded, the university had shown itself to be the poor man's university, and from its foundation it had grown by evolution to the most efficient in the world. —Mr. Eason, responding, claimed that the university, the largest in Great Britain, had more than a quarter of the country's students. He was proud that the funds for the new site at Bloomsbury had been obtained before they had begun to build. In granting medical degrees the university, he said, had no desire or intention to supplant the ancient licensing bodies. On the contrary, it envied them their antiquity and it had even been criticised because so small a proportion of the registered medical students had graduated. He felt sure that if the other faculties had alternative and more convenient

and economical portals similar to those of medicine, they would be affected in the same way.—Dr. A. P. Gibbon, senior warden, proposed the health of the Livery. He appealed for funds to undertake essential repairs to the hall's structure.—Mr. V. Warren Low, in replying, compared the place given to organotherapy and patent medicines by certain of the profession to that given to the stuffed alligator in the old apothecary's shop.

**West London Medico-Chirurgical Society**

The fifty-fourth annual banquet of this society will be held at the Trocadero Restaurant, Piccadilly, on Wednesday, July 8th, at 8 P.M. The hon. secretary's address is 128, Harley-street, London, W.1.

**Boscombe Hospital**

Lady Malmesbury has opened the new extension to the nurses' hostel at this hospital, which is the first part of a £50,000 extension scheme. The building contains an attractive recreation-room and a well-stocked library. On the top floor are 83 bedrooms and the floors are sound-proof. A new operating theatre block and wards are at present being built.

**Post-graduate Courses in Berlin**

International post-graduate courses are to be held in Berlin on the following subjects: throat, nose, and ear diseases (Sept. 28th–Oct. 10th); pædiatrics (Oct. 19th–24th); malignant diseases (Oct. 19th–26th); vitamins and hormones (Oct. 26th–31st); tuberculosis (Nov. 2nd–7th); homœopathy (Oct. 12th–Nov. 6th). Monthly courses in all the special departments of medical science, including practical work, will also be held. Particulars may be had from the information bureau of the Kaiserin Friedrich-Haus, Robert Koch-Platz 7, Berlin, N.W.7.

**British Social Hygiene Council**

Addressing the annual meeting of the Council, held at the London School of Hygiene and Tropical Medicine on June 17th, Sir Kingsley Wood, Minister of Health, said that in this country the view had been taken that any element of compulsion in the treatment of venereal disease was likely to defeat its own object. Better results might be expected if the arrangements for treatment were based on the voluntary principle and the conditions under which treatment was provided were such as to encourage persons to make use of them. Treatment was therefore provided free, it was given under conditions of secrecy, and the treatment centres were open to all comers irrespective of their place of residence. Results generally, he said, were improving. There was a more general realisation of the importance of seeking medical advice at an earlier date. Persons attending the treatment centres continued their attendance for a longer period, and an increasing number took advantage of the facilities for diagnosis now available. The incidence of syphilis was declining: recent infections dealt with at the treatment centres in 1935 were just under 6000 as compared with something over 9000 in 1925, while the mortality of infants certified as due to the disease in 1934 was less than one-half what it was in 1924 and about one-sixth of that in 1917. Renewed efforts were, he thought, desirable in two directions. Women should be encouraged to attend the treatment centres, and to bring children for observation and treatment. No new medical discovery was needed to rid the community of congenital syphilis. There was need too for the development of work in rural areas.

**Appointments**

GARFIELD, G. H., M.B. Wales, has been appointed Medical Superintendent of the Penrhilyn Infirmary, Neath.  
GREGORY, J. C., M.R.C.S. Eng., D.C.O.G., Hon. Assistant Medical Officer to the West Herts Hospital, Hemel Hempstead.  
JONES, E. C. B., M.Ch. Orth. Liverp., F.R.C.S. Eng., Surgeon-in-Charge of the East Suffolk and Ipswich Hospital.  
PEARCE, J. D. W., M.D., M.R.C.P. Edin., D.P.M., Medico-psychologist, Stamford House Remand Home, L.C.C.  
SHARPE, B. E. A., M.B. Glasg., D.P.H., Assistant Medical Officer in the School Service of the L.C.C.  
TOWNSLEY, G., M.D. Belf., Resident Surgical Officer at St. Bartholomew's Hospital, Rochester.

## Vacancies

- For further information refer to the advertisement columns
- All Saints' Hospital for Genito-urinary Diseases, Austral-street, West-square, S.E.**—Hon. Pathologist.
- Battersea General Hospital, Battersea Park, S.W.**—Hon. Gynaecologist, Ophth. Surgeon, and Ear, Nose, and Throat Surgeon.
- Bedford County Hospital.**—First H.S., at rate of £155.
- Birmingham, Erdington House.**—Jun. Asst. M.O., at rate of £200.
- Birmingham and Midland Eye Hospital.**—H.S., at rate of £130.
- Blackburn Royal Infirmary.**—Res. H.P., £175.
- Bolingbroke Hospital, Wandsworth Common, S.W.**—Hon. Surgeon. Also Hon. Surg. to Ear, Nose, and Throat Dept.
- Bolton Royal Infirmary.**—H.S., £125.
- Brighton Borough Infectious Disease Hospital and Sanatorium.**—Sen. Res. M.O., £450.
- Brighton, Royal Sussex County Hospital.**—Cas. H.S., £120.
- Bristol Royal Infirmary.**—Res. Med. appts., at rate of £150, £100, and £80.
- British Postgraduate Medical School, Ducane-road, W.**—H.P.
- Burnley, Municipal General Hospital.**—Jun. Res. M.O., £150.
- Burton-on-Trent General Infirmary.**—H.S., £150.
- Cambridge, Addenbrooke's Hospital.**—H.S., at rate of £130.
- Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.**—Hon. Second Asst. in the Out-patient Dept.
- Charing Cross Hospital, W.C.**—Hon. Asst. Radiologist.
- Chester City (Public Assistance) Hospital.**—Jun. Res. M.O., £200.
- Chesterfield and North Derbyshire Royal Hospital.**—Cas. O. and Fracture H.S., at rate of £200. Also H.S. to Ophth. and Ear, Nose, and Throat Depts., at rate of £150.
- Cobham, Surrey, Schiff Home of Recovery.**—Res. Surg. O., £200.
- Colchester, Essex County Hospital.**—Asst. H.S., £120.
- Connaught Hospital, Walthamstow, E.**—H.S. and Cas. O., each at rate of £100.
- Doncaster Royal Infirmary.**—H.P., £175.
- Doncaster Royal Infirmary and Dispensary.**—H.S. to Eye and Ear, Nose, and Throat Dept., £175.
- Ealing, King Edward Memorial Hospital.**—Sen. Asst. Res. M.O., at rate of £200.
- Eastbourne, Princess Alice Memorial Hospital.**—Res. H.S., £150.
- Edmonton, North Middlesex County Hospital.**—Res. Asst. M.O., £400. Also Jun. Asst. Res. M.O., at rate of £250.
- Evelina Hospital for Sick Children, Southwark, S.E.**—H.S., at rate of £120.
- Golden-square Throat, Nose, and Ear Hospital, W.**—Hon. Asst. Surgeon.
- Great Yarmouth General Hospital.**—H.S., at rate of £140.
- Greenwich Metropolitan Borough.**—Tuber. O. for Council's Dispensary and Deputy M.O.H., £750.
- Harrogate Royal Bath Hospital.**—Res. M.O., £156.
- Hastings, Royal East Sussex Hospital.**—Jun. H.S., at rate of £150.
- Hospital for Consumption and Diseases of the Chest, Brompton, S.W.**—H.P., at rate of £50.
- Hull Municipal Maternity Home and Infants' Hospital.**—Jun. Res. M.O., at rate of £100.
- Ilford, King George Hospital.**—Hon. Dermatologist.
- Indian Medical Service.**—Commissions.
- Ipswich, East Suffolk and Ipswich Hospital.**—H.S. to the Asst. Surgeons, at rate of £144.
- Kettering and District General Hospital.**—Second Res. M.O., £125.
- Kidderminster and District General Hospital.**—Sen. and Jun. H.S.'s, £150 and £100 respectively
- Leicestershire and Rutland Mental Hospital, Narborough.**—Asst. M.O., £350.
- Lincoln City.**—Deputy M.O.H., £600. Also Asst. School M.O., £500.
- Liverpool Royal Children's Hospital, Myrtle-street.**—Res. Cas. O., £250. Res. M.O. and Res. Surg. O. for Heswall Branch, each at rate of £120. Also two Res. H.P.'s and two Res. H.S.'s for City Branch, each at rate of £100.
- Liverpool Sanatorium, Delamere Forest, Frodsham.**—Second Asst. to Med. Supt., £250.
- London County Council.**—Asst. M.O. (Grade I.), £350. H.P., at rate of £120. Also Temp. Dist. M.O., at rate of £125.
- London Hospital, E.**—First Asst. and Reg. to Children's Dept., £300.
- London Lock Hospital, 283, Harrow-road, W.**—Res. M.O., at rate of £175.
- London University.**—Examinerships.
- Maidstone, Kent County Ophthalmic and Aural Hospital.**—H.S., at rate of £200.
- Manchester, Crumpsall Hospital and Institution.**—Res. Asst. M.O., £350.
- Manchester, Hulme Dispensary, Dale-street.**—Res. M.O., £250.
- Manchester Royal Children's Hospital, Pendlebury.**—Res. M.O. and Res. H.S., at rate of £125 and £100 respectively.
- Manchester Royal Infirmary.**—Chief Asst. to Surg. Units, £250.
- Manchester, St. Mary's Hospitals.**—Res. Obstet. O., £175.
- Manor House Hospital, Golders Green, N.W.**—Jun. M.O., £200.
- Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W.**—Res. M.O., £100.
- Oldham, Boundary Park Municipal Hospital.**—Res. Asst. M.O., at rate of £200.
- Oldham Royal Infirmary.**—H.S. to Spec. Depts. Also Cas. O. and H.S. to Fracture Dept., each at rate of £175.
- Oswestry Robert Jones and Agnes Hunt Orthopaedic Hospital.**—Two H.S.'s, each at rate of £200.
- Oxford, Winfield-Morris Orthopaedic Hospital.**—Res. H.S., £100.
- Princess Beatrice Hospital, Earl's Court, S.W.**—Res. M.O., at rate of £150.
- Putney Hospital, Lower Common, S.W.**—Jun. M.O., at rate of £100. Also Asst. Hon. Physician.
- Queen Mary's Hospital for the East End, Stratford, E.**—Radiologist, £350. Two Cas. and Out-patient Officers, each at rate of £150. Also Anaesthetist, £50.
- Royal Air Force Medical Service.**—Commissions.
- Royal Chest Hospital, City-road, E.C.**—Hon. Physician.
- Royal National Orthopaedic Hospital, 234, Great Portland-street, W.**—Hon. Asst. Surgeon.
- St. George's Hospital, S.W.**—Res. Obstet. Asst., £100.
- Sheffield, Jessop Hospital for Women.**—H.S., at rate of £100.
- Southampton, Royal South Hants and Southampton Hospital.**—H.S. to Ear, Nose, and Throat Dept. and Res. Anaesthetist, at rate of £150.
- South Shields Ingham Infirmary.**—Sen. and Jun. H.S., £200 and £150 respectively.
- Stafford, Staffordshire General Infirmary.**—H.P. and Cas. O., at rate of £150.
- Stamford, Rutland and General Infirmary.**—H.S., at rate of £250.
- Stockport Infirmary.**—H.S., £150.
- Sudan Medical Service.**—M.O., £E.720.
- Surrey County Council.**—Deputy County M.O.H., £1150. Also First Asst. Res. Asst. M.O. for Surrey County Sanatorium, £600.
- Torquay Borough.**—Deputy M.O.H., &c., £600.
- Warwick, Warwickshire and Coventry Mental Hospital.**—Deputy Med. Supt., £600.
- West Bromwich, Hallam Hospital.**—H.P., at rate of £200.
- Western Ophthalmic Hospital, Marylebone-road, N.W.**—Jun. Res. H.S., £100.
- West London Hospital, Hammersmith-road, W.**—Hon. Asst. Anaesthetist. Also Pathologist, £750.
- Wigan, Royal Albert Edward Infirmary and Dispensary.**—H.S., at rate of £150.
- Wolverhampton Royal Hospital.**—H.S. and Asst. Res. M.O., each at rate of £100.
- Woolwich and District War Memorial Hospital, Shooter's Hill, S.E.**—Hon. Asst. Physician.
- Worcester Royal Infirmary.**—H.P. and Jun. H.S., £160 and £120 respectively.
- Worksop, Victoria Hospital.**—Jun. Res., at rate of £120.
- York County Hospital.**—Res. Anaesthetist and second H.S., £150.
- The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Buckhaven (Fife) and Pembroke (Pembrokeshire).

## Births, Marriages, and Deaths

### BIRTHS

- DUNNING.**—On June 19th, at Harpenden, Herts, the wife of Dr. J. B. Dunning, of a son.
- EVANS.**—On June 16th, 1936, the wife of Ernest Sandford Evans, M.R.C.S., L.R.C.P., of Chelford, Cheshire, of a son (stillborn).
- LORING.**—On June 16th, at Wilton-place, S.W., the wife of Dr. John Nigel Loring, of a daughter.
- MACDONALD.**—On June 18th, at Highgate, N., the wife of Dr. George Macdonald, of a daughter.
- PIERCY.**—On June 15th, at Welbeck-street, the wife of J. E. Piercy, F.R.C.S. Edin., of a daughter.
- POPE.**—On June 14th, at Beckenham, the wife of Dr. Samuel Pope, of a son.
- WYNNE-EDWARDS.**—On June 15th, at Sheringham, the wife of Dr. E. C. Wynne-Edwards, of a daughter.

### MARRIAGES

- BORLAND-CARR.**—On June 15th, in London, Douglas Morris Borland, M.B., Ch.B. Glasg., to Vida Sara Maxwell Carr, daughter of W. B. Maxwell, J.P., Carlisle.
- HYSLOP-COLLARD.**—On June 20th, at St. Alkelda's Church, Giggleswick, William Anthony Hyslop, M.B., B.S. Lond., to Irene Marie Challenor (Wendy), younger daughter of the late Gordon Neville Collard and Mrs. D. C. Chesterton of Hove.

### DEATHS

- CHALLENGER.**—On June 20th, at Abingdon, Harry Septimus Challenger, M.R.C.S. Eng., aged 72.
- CRUTTWELL.**—On June 17th, Harry Athill Cruttwell, M.D. Brux., L.R.C.P. Edin., late of Bagshot and Harley-street, W.
- EADES.**—On June 18th, at Ipswich, Samuel Oliver Eades, L.R.C.P. Edin., aged 76.
- GRINDON.**—On June 20th, at Olney, Francis James Grindon, M.R.C.S. Eng., aged 77.
- LONGHURST.**—On June 15th, Lieut.-Col. Bell Wilmott Longhurst, R.A.M.C. (retired), of Bath.
- MACASKILL.**—On June 12th, at the Hospital for Tropical Diseases, London, Donald Cameron Macaskill, M.D. Edin., D.T.M. & H., of Kuala Lumpur, F.M.S., aged 52.
- OGILVIE.**—On June 17th, at Warrington, Ian Ogilvie, M.B. Aberd.
- PHELPS.**—On June 11th, 1936, peacefully at a nursing-home in London, Edith Cecily Phelps, M.R.C.S., L.R.C.P., late of 243, Roman-road, Bow, daughter of the late Rev. E. R. and Mrs. Phelps.
- TELFORDSMITH.**—On June 16th, suddenly, at Midhurst, Telford Telfordsmith, M.A., M.D. Dub., of Bournemouth.
- TORRANCE SMITH.**—On June 18th, at Oxford, William Torrance Smith, M.B. Edin.
- YEO.**—On June 15th, at Alverstoke, Hants, Robert Frederick Yeo, L.R.C.P.I., Fleet Surgeon, R.N. (retired).
- N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

**MARGATE GENERAL HOSPITAL.**—A contributory scheme associated with this institution has been in existence for eighteen weeks and already nearly 4000 members have been enrolled. It is hoped to obtain a membership of 10,000 which would provide the hospital with a regular and assured annual income of about £5000.

## NOTES, COMMENTS, AND ABSTRACTS

## HEALTH STANDARDS IN INDUSTRY\*

By H. H. BASHFORD, M.D., M.R.C.P. Lond.

CHIEF MEDICAL OFFICER TO THE POST OFFICE

I SHOULD like to make it clear at the outset that, apart from a few visits to large firms of various kinds—generally in search of information about their welfare and medical services, if any—my own experience of industrial medicine has been confined to the Post Office, with which I have now been associated for nearly thirty years. I also fully realise that, in many respects, the Post Office, as an industrial concern, differs very much, both in its general conditions and the recruitment of its personnel, from other large industries. But since, in the last analysis, every industry depends upon—and is necessarily composed of—men and women and boys and girls, there may be something that we can learn from each other.

## The Medical Services of the Post Office

I will begin therefore by explaining something about the Post Office and its medical services, and its particular approach to those problems of health and physical efficiency which are common to us all. Numerically the Post Office is the largest employer of labour in this country. Its staff consists of about 185,000 men and 55,000 women, of whom about 121,000 men and 35,000 women are what are known as established Post Office servants. This means that the great majority enjoy the privileges, when they retire at sixty—or earlier from ill-health—of a non-contributory pension, based on their years of established service and their closing emoluments, and full pay during sick-leave for a period of six months, followed by half-pay for another six months, followed by pay at pension rate so long as the Post Office is advised by its medical branch that there is a reasonable prospect of resumption to render regular and efficient service in the future. The sick-leave privileges begin from establishment, which is preceded by a very thorough medical examination; but the pension privileges are not obtained until after ten years' established service when, however, they become retrospective for that period.

Further, all established Post Office employees under a salary of £230 a year in London and £215 a year in the provinces receive free medical attention, comprising all the services that might reasonably be expected from a general practitioner. These services are provided by some 2600 local Post Office medical officers, distributed over England, Wales, Scotland, and Northern Ireland. They are general practitioners, who hold the Post Office appointment in addition to their private practices, and who are paid on a capitation basis. For example, in such large towns as Birmingham, Manchester, or Glasgow, the centre of the town would be divided between three or four such doctors, each of whom might have from 300 to 500 Post Office employees on his capitation list. The outlying suburbs of such towns, and smaller towns, such as Bedford and St. Albans, would probably have one such medical officer; and in the smaller villages the local doctor might not have more than a dozen Post Office employees under his care.

This medical service is not, of course, compulsory. If they choose to pay for them, Post Office employees can have their own private or panel doctors. But each local Post Office medical officer is responsible for the supervision of such sick absence and indeed of the sick absence of the whole staff of all ranks in the offices to which he is attached. Private

certificates must be countersigned by him, and panel certificates scrutinised, before pay is authorised; and if he is satisfied, after personal examination, that there is no real disability for work or for temporary lighter work, if this is available, he can advise an immediate return to duty. He is also the first instance examiner of all local candidates for ultimate establishment in the Post Office; the local adviser on medical questions to the postmaster, superintending engineer, and district manager of telephones. He keeps an eye on premises from the point of view of sanitation and ventilation; and he furnishes an annual report to the chief medical officer on the health of the staff under his care, the condition of the local post offices, telephone exchanges, and so on, and, as far as he is able, on the general domestic conditions in which the staff live. This service is controlled by a small whole-time headquarters staff in London, consisting of a chief medical officer, a second or deputy chief medical officer, a senior woman medical officer, and four assistant men and four assistant women medical officers, the latter of whom give clinical attention to the large central staffs of men and women in London, amounting to some 24,000.

The chief medical officer acts in a supervisory and consultative capacity to the whole medical service of the Post Office and advises on all general questions which have a medical aspect. Medical reports upon all candidates for the service, in which some abnormality has been recorded, or in which the local Post Office medical officer has advised rejection, are referred to him; and no recommendations for retirement on the grounds of ill-health are proceeded with until, or unless, he has personally seen all the relative medical evidence. He also deals personally with all appeals against medical rejection for established employment or against retirement on the grounds of ill-health. It has also been found advisable to centralise certain other medical procedures. Every case of contact with infectious disease on the part of a Post Office employee is notified to headquarters, and dealt with on the day of receipt, in order to secure uniformity of action throughout the country—the Post Office having abolished the principle of quarantine in most of such cases, with the saving of many thousands of days of enforced absence, and with no greater incidence than the normal of infectious fevers amongst its staff. All cases of pulmonary tuberculosis are also notified to, and dealt with at, headquarters after a certain period of sick absence. Finally, the chief medical officer is responsible for an annual report on the health of the staff, comprising the vital statistics for the year and the average sick rates for the whole and separate classes of the Services, which are further analysed, for comparison purposes, into those of the Post Office staffs in the largest cities, various typical industrial towns, seaside resorts, and so on. In this way an annual picture of the health of the staff and all its numerous constituent groups can be obtained.

## Records and their Value

Such very briefly is the medical organisation of the Post Office, and now I should like to revert again, for a moment, to its industrial aspect, for it is not only the largest but probably the most various employer of labour in this country. Under its permanent heads, the director-general and deputy director-general, it comprises a board consisting of directors of mails, telecommunications, savings, public relations, personnel and establishment, the accountant-general and the engineer-in-chief, and a considerable administrative and clerical staff. It also comprises postmen, the largest single class, half of which is recruited from promoted messenger boys and half from short-service Army and Navy men, sorters, porters, telegraphists, telephonists, engineers, skilled workmen, linesmen, motor transport men,

\* An address to the National Association of Clayworks' Managers, Scarborough, on June 15th.

wireless research experts, storekeepers, repair shop hands, solicitors, and architects; and its smaller unestablished staff includes boys and girls on the way to becoming established, labourers in the engineering department, and an older class of doorkeepers, cleaners, and liftmen, who are generally retired policemen or men from the Services with some sort of long service pension.

But besides all this, it has this, I think, unique feature. It is the only concern of such magnitude, certainly in this country and probably in the world, that has complete and accurate sick records—under actual working conditions—of nearly a quarter of a million men and women from the ages of 16 to 60. In these records—and the medical service of the Post Office dates back to 1855—there are still, I am sure, unworked mines of information both for industry and medicine, although we have been able, perhaps, to contribute a little. Let me give you an illustration or two. Although the incidence of pulmonary tuberculosis in the Post Office compares favourably with the community at large, and is happily diminishing from year to year, yet in so large a service there must necessarily be a good many cases. We have records at headquarters of nearly 3000 such cases, going back now for twenty years, of which we know the exact incidence, subsequent history, and industrial survival rates; and I do not think that there is a comparable body of such figures elsewhere.

Then again we have records of a very large number of cases of gastric and duodenal ulcer, and we have recently published the after-history of 430 such cases, both surgically and medically treated. Over periods of observation, varying from three to twenty years, we have found that, however treated, these cases under actual everyday working conditions incur very much more sick absence than normal people. More than 30 per cent. of them incur more than a month's sick absence from all causes every year; and on an average more than 50 per cent. incur yearly sickness of a fortnight or over. And this is information that could not have been obtained by even the most careful follow-up departments of hospitals or individual surgeons and physicians.

On the other hand our records have helped us to destroy one or two medical bogies. Thirty years ago, for example, no boy whose urine contained albumin was accepted for any service, however otherwise healthy he might seem, and, if he was considered insurable at all, it was only with a heavily loaded premium. Such boys were often forbidden by family or school doctors to play any sort of game and were generally believed to be suffering from the early stages of Bright's disease. But one of my predecessors as chief medical officer, finding a relatively large number of these otherwise healthy seeming boys coming up for examination, came to the common-sense, but then not generally accepted, opinion that they could not all be thus doomed to premature extinction. He accordingly began, very tentatively, to accept them, and when I first came to the Post Office I found a group of thirty, whom I was able to investigate, some of them after ten years' service. I was able to follow them up for another twenty years, and although the condition of albuminuria persisted in a few, they all remained in good health, barring one or two who had suffered from some quite extraneous complaints, and their sick record was no higher, and often indeed lower, than that of the service in general. Further, it was found after examining or investigating a series of 1500 boys at 14, of all sizes and weights, that one in every twenty presented this condition; and in a series of 5000 girls about 16 per cent. Put briefly we have, I think, been able finally to demonstrate—and it is now generally accepted throughout the medical and insurance worlds—that it is a condition of no serious importance at all. It is upon the basis of these and similar particular prolonged large-scale observations that our own physical standards for the acceptance or rejection of new entrants are very largely based.

Another series of observations made possible by these industrial records may also perhaps be mentioned here. Medical notes are kept of all candidates for Post Office employment, and five years ago I was thus enabled to make an interesting and, I think, encouraging series of comparisons. An unselected, consecutive series of 200 London boys of 16, seeking employment from the same sorts of London families and districts, was compared with a similar series of 200 London boys, who were examined twenty-five years previously. The present-day boys were found to weigh, on an average, 16 lb. more, and to be  $1\frac{1}{2}$  inches taller, than those of the previous generation. A similar comparison between unselected, consecutive groups of 200 girls of 16 examined five years ago and twenty-five years before that, showed that the girls of to-day weighed upon an average 10 lb. more, and were 1 inch taller, than the girls of the last generation. And here again was an investigation that could have been made, I think, in no other industry.

It is realised, of course, that the Post Office, with its special conditions of employment, sick pay, and pensions, has perhaps a greater necessity than some industries to maintain such records as I have mentioned. But with the increasing practice in many other industries of establishing some sort of pension scheme—if for no other reason—I feel that the accurate keeping of the sick records of employees must inevitably spread to these; and enough has perhaps been said to illustrate its value from the larger point of view of the general advance of knowledge. But I should have supposed that it might have even a more so-called practical advantage. Most industries are situated and housed in a particular way, and are dependent upon certain particular technical processes; and from time to time such situations, accommodation, and technical processes are presumably altered. Surely a continuous and accurate sick record of the all-important human personnel, when associated and compared with such changes, should afford information to industrial employers, even in a small business or factory, that must, in some way or other, be ultimately valuable both to them and their workers.

#### Some Problems of Sickness

Turning now to the comparison between sick rates in the Post Office and sick rates in other industries, I must again make an apology because this is doubtless of much more interest to me than to you. But a few general considerations that have emerged from it may, perhaps, at least be suggestive. I have already indicated two difficulties with which such a comparison has been confronted. Very few industries, though their number is increasing, do in fact appear to keep sick records at all, and fewer still seem to have records, covering any substantial number of years, of their retirement rates due to ill-health, and the average age of the employees so retired—figures without which mere sick rates are largely valueless.

Again the Post Office as a whole is not strictly comparable with any other single industry; and it is even difficult to find fair standards of comparison for many of its component groups. But I have been able, thanks to the courtesy of their directors or medical advisers, to obtain figures of sick absence, though not of wastage from ill-health, from some undertakings that pay—or contribute to the payment of—their employees during illness, and also from some that do not. And it must be admitted that their sick rates, especially in the latter group, are usually considerably lower than our own.

Indeed, it has been a common criticism in discussing this question with outside employers of labour, and even with some of our own local medical advisers, that the Post Office cannot expect to have really satisfactory sick rates—whatever that may mean—as long as its employees receive full pay when they are absent for illness. Well, I think, superficially speaking, that there is something in such a criticism, though not very much. There are undoubtedly

some men and women who may take advantage of such a system. But my experience has been that there are relatively not very many. And medically speaking, I think there will be general agreement that it is definitely undesirable for a man or woman, directly he or she becomes ill, to incur the additional anxiety of an immediate financial loss.

Moreover there is another side to the picture. Although the loss of wages or salary may be an incentive to an early return to duty, there are not a few instances, of which there is plenty of evidence, of men and women, especially perhaps the younger, coming back to work much too soon, simply because they cannot afford to remain away until they are properly fit. This may well lead to another illness, when the same process is repeated, and ultimately perhaps to a more or less prolonged breakdown, whereupon their firm or industry says good-bye to them. And a quiet talk with the almoners of some of our larger hospitals, who are then faced with the problem of these people, would reveal a somewhat seamier side of this particular way of treating sick absence.

Speaking for the Post Office, at any rate, I should regard any move in the direction of an immediate curtailment of pay during sick absence as a retrograde step from every point of view; and I am sure that, from such a long-distance standpoint of regarding health as we in the Post Office must necessarily take, a low sick rate purchased at such a price—to put it on the lowest possible grounds—would be the worst sort of economy.

Granted this, however, and human nature being what it is, some form of expert and understanding supervision of sick absence does, I think, become necessary, and not always in the interest alone of the employer or paymaster. I have said that, for the great majority of its employees, the Post Office is a whole-life, pensionable service. But it is ten years before any of its employees reach what we call pensionable status; and if, during these early years of service, we find some young man or woman incurring repeated or heavy sick absences for minor or more serious illnesses, we are sometimes obliged to retire them before they become a permanent charge upon the State.

Here again is illustrated the value of an accurate routine sick record. It enables supervising officers to pick up such a case and refer the boy or girl, or young man or woman, to the appropriate local medical adviser; and we often find, in cases of repeated minor sick absence, that the employee in question has no idea of the amount of sick absence incurred. Some of it may be due to thoughtlessness, or what we may call "gutlessness," or a light-hearted taking of sick leave for not quite necessary reasons; and a quiet talk often has the effect of an immediate and permanent improvement. It may also perhaps reveal some minor defect, such as septic tonsils or carious teeth, attention to which again results in an immediate and permanent improvement.

But if, in spite of all this, the heavy sick record persists, retirement may become advisable on medical grounds, and not necessarily, as I have said, with wholly tragic results to the employee. It may be, and often is the case, that he or she is really a square peg in a round hole, and that the sick absence is a reflection of this. In such cases, retirement may well be the stimulus to find some more congenial sphere of action.

At the other end of the scale there is the group of middle-aged or elderly men and women who are beginning to require repeated and lengthy sick absences for such conditions as chronic rheumatism or bronchitis. Here again—and accurate sick records can only show this—there comes a time when retirement is probably in their own truest interests as well as in those of their employers. The fact that they can so retire on a pension must, of course, be an immense help and satisfaction to all concerned.

I need not stress the obvious advantages of proper and expert sick-supervision from the points of view of

detecting and perhaps preventing serious illness; of discovering men and women who are medically affected by certain industrial processes and not by others; or by certain types or hours of duties and not by others. And I would suggest that this is much more easily discovered by medical advisers, whether whole time or part time, who are equally familiar with the particular works and processes involved, the human personnel employed, and their year to year medical records—his knowledge being amplified, perhaps, by that of the private or panel medical attendant, who may be more familiar with domestic strains and stresses unknown at the factory, works, or office.

#### Physical Standards for Entry

So much for the keeping of sick records and the supervision of sick absence; and the question of the physical standards required at the beginning of employment must vary very widely with different industries and individual conditions of pay and pensions. In such a service as the Post Office, with its sick pay privileges and eventual pension rights, admission to its established ranks would necessarily be somewhat stricter than in industries that do not undertake such obligations. An actuarial or group-expectation standard must be applied rather more stringently in the first case than in the second. For example, a boy or girl with a well-compensated organic lesion of the heart may be perfectly competent—time alone can show—to perform any ordinary task for any ordinary lifetime. For a permanent pensionable service they might nevertheless be an unjustifiable risk; and the same would apply to cases of cured or arrested tuberculosis and sundry other conditions.

Standards of vision again must vary from employment to employment. Colour-blindness may disqualify for some and not for others; and this applies, of course, to a very large number of other conditions. Boys who are to become postmen, for instance, in the Post Office, must be free from weaknesses of the legs and feet that would not disqualify them for clerical or certain technical employments. I do think, however, that employers would render a great service, both to themselves and the community, if they insisted on healthy mouths and throats, before accepting young people for permanent employment. But it seems to me that this question of physical standards at entrance can only be satisfactorily settled by each industry in the light of its own requirements; and once more this can only be scientifically determined—or so it seems to me—by the records of its own sick absences and retirements from ill-health, and their causes, carefully kept by the industry concerned, and reviewed in the light of its accumulated experience over a number of years.

#### The General Health and its Maintenance

With regard to the general health of any body of employees, I have said enough, perhaps, to indicate that—important as they must always be as a rough index—sick rates are not necessarily a complete index of health. A low sick rate, under certain conditions of easy dismissal and a disregard of human labour wastage, may well be compatible with a far from desirable general standard of health. Given conditions, however, of reasonable security of tenure, of reasonable hopes of promotion, and of reasonable pay during illness, they do remain the best indication of the general health—and, incidentally, happiness and probable efficiency—of any large staff. And to lower sick rates, and keep them as low as possible, must or should be the concern of every enlightened employer or board of directors. Adequately chosen and examined entrants and adequate medical supervision during employment can help in attaining this. And here I should like to say a word in favour of what we know in the Post Office as the single-day letter privilege. This gives the right to all employees to be away for a day for health reasons on their own letter of explanation. A maximum of seven such



days in the year is allowed but is very seldom reached; and in practice it has been found, in a very large staff, that the average use of this letter is less than one per man per year.

It may be argued that such a privilege is open to abuse, and there may be a few employees who from time to time do abuse it. But it has been our experience that the abuse of it is very rare, and since—in our case at any rate—such single days are of course noted in the sick record, cases of possible abuse can easily be investigated. Taken all round, it may be said that this privilege implies the recognition that men and women are not machines and that they all may occasionally have an "off" day, when a few hours' rest or change may restore physical and mental horizons. Moreover, in employees subject to such complaints as migraine or asthma, such a day taken at discretion may well save several under medical certificate. Looking at it all round, I feel that this privilege, reasonably supervised, is one that is likely, on balance, to reduce sick absence and contribute to the health of employees.

Again, I need not dwell probably upon the value of such ancillary agencies to health as sports clubs of various kinds, which also afford the very salutary and humanising opportunity of allowing the chairman to be beaten by the office boy at tennis or golf. And finally, from what I have been able to see of modern factory and industrial designing and planning, I need not perhaps emphasise the effect of adequate lighting and a cheerful and welcoming scheme of colour decoration in working and retiring rooms. These should be adapted to the position of the rooms, a warmer scheme of colouring for those facing north or east, a cooler for those facing south or west, a warmer scheme for sedentary, a cooler for manual workers. And although the ultimate effect of these on sick rates may be difficult to assess or prove by figures, I am convinced that they must tend in the direction of lowering sick rates.

Much could also be said, of course, upon the influence of atmosphere—in a psychological sense—upon health as well as sick rates. One would suspect, for instance, in an industry, works or factory, where the chief emphasis was upon output, and where supervisors were selected and educated to regard this primarily if not alone, that the standard of health might well leave a good deal to be desired—and probably, in the long run, the quantity and quality of the output also. On the other hand, in an industry whose supervisors, both men and women, were selected, apart from technical qualifications, by virtue of their general knowledge of, and sympathy with, their fellow-beings—and above all by virtue of their ability to be blind at the right moment—one would expect both the health standard and, I should guess, even the output to be relatively higher. In other words, the happy ship is generally, I think, the healthy and efficient one.

## INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED  
JUNE 13TH, 1936

**Notifications.**—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1674; diphtheria, 853; enteric fever, 31; pneumonia (primary or influenzal), 737; puerperal fever, 38; puerperal pyrexia, 114; cerebro-spinal fever, 12; acute poliomyelitis, 7; acute polio-encephalitis, 2; encephalitis lethargica, 8; relapsing fever, 1 (Bolton); continued fever, 1 (Paddington); dysentery, 12; ophthalmia neonatorum, 114. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 19th was 4456, which included: Scarlet fever, 1040; diphtheria, 686; measles, 1508; whooping-cough, 531; puerperal fever, 12 mothers (plus 7 babies); encephalitis lethargica, 284; poliomyelitis, 1. At St. Margaret's Hospital there were 28 babies (plus 16 mothers) with ophthalmia neonatorum.

**Deaths.**—In 122 great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 38 (13) from measles, 4 (0) from scarlet fever, 32 (7) from whooping-cough, 18 (2) from diphtheria, 44 (23) from diarrhoea and enteritis under two years, and 24 (4) from influenza. The figures in parentheses are those for London itself.

Hull reported 5 deaths from measles, no other great town more than 2. Sheffield had 6 deaths from whooping-cough, Birmingham 3. Deaths from diphtheria were reported from 14 great towns, 4 from Liverpool. Portsmouth and Grimsby each had one death from enteric fever.

The number of stillbirths notified during the week was 270 (corresponding to a rate of 36 per thousand total births), including 41 in London.

## Medical Diary

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

### SOCIETIES

- ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.  
WEDNESDAY, July 1st, THURSDAY, and FRIDAY.—Annual Meeting at Folkestone.
- LECTURES, ADDRESSES, DEMONSTRATIONS, &c.  
NATIONAL ASSOCIATION FOR THE PREVENTION OF INFANT MORTALITY.  
WEDNESDAY, July 1st, and THURSDAY and FRIDAY.—National Conference on Maternity and Child Welfare at Liverpool.
- NATIONAL COUNCIL FOR MENTAL HYGIENE, 26, Portland-place, W.  
TUESDAY, June 30th.—3.30 P.M., Annual Meeting. 5 P.M., Dr. H. Crichton-Miller: Mental Hygiene and Preventive Medicine.
- BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.  
MONDAY, June 29th.—2.15 P.M., Dr. Duncan White: Radiological Demonstration. 3.30 P.M., Prof. Miles Phillips: Neoplasms of the Ovary.  
WEDNESDAY, July 1st.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).  
THURSDAY.—2 P.M., operative obstetrics.  
FRIDAY.—2.15 P.M., Dr. A. A. Davis: Gynaecological Pathology. 2.30 P.M., Mr. Tudor Edwards: Thoracic Surgery.  
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetrics and gynaecological clinics or operations.
- FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.  
MONDAY, June 29th, to SUNDAY, July 5th.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. Afternoon M.R.C.P. course in neurology and psychopathology.—BROMPTON HOSPITAL, S.W. Afternoon M.R.C.P. course in chest diseases.—PRESTON HALL, near Maidstone, Kent. Sat.—special demonstrations on pulmonary tuberculosis.—PRINCESS ELIZABETH OF YORK HOSPITAL FOR CHILDREN, Shadwell, E. Sat. and Sun., course in diseases of children.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, W.C. Mon., 4.45 P.M., Mr. G. G. Penman: Demonstration of Fundi of Medical Interest. Wed., 5 P.M., Mr. C. L. Gimblett: Some Points in Medical Ophthalmology.—Courses are open only to members.
- SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.  
WEDNESDAY, July 1st.—4 P.M., Mr. E. Pearce Gould: Modern Operations for the Cure of Inguinal Hernia.
- HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.  
WEDNESDAY, July 1st.—2 P.M., Dr. R. A. Cockayne: Coeliac Disease. 3 P.M., Dr. D. N. Nabarro: Dysenteric Diarrhoea.  
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.
- UNIVERSITY OF BIRMINGHAM.  
TUESDAY, June 30th.—3.30 P.M., Prof. K. Douglas Wilkinson: The Diagnosis and Treatment of Coronary Occlusion.  
FRIDAY, July 3rd.—3.30 P.M. (Queen's Hospital), Mr. R. K. Debenham: Demonstration of Surgical Cases.

**BEQUESTS TO HOSPITALS.**—The late Mr. Caleb Diplock has left £20,000 for distribution among hospitals, homes, and institutions for disabled soldiers and £5000 to the Princess Alice Memorial Hospital, Eastbourne.



# INDEX TO VOLUME I., 1936.

## REFERENCES AND ABBREVIATIONS

Readers in search of a given subject will find it useful to bear in mind that the references are in several cases distributed under two or more separate but nearly synonymous headings. Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Hospitals, which will be found under that heading; and Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word University. (A)=Annotation, (C)=Correspondence, (LA)=Leading Article, (ML)=Medico-legal, (NI)=New Inventions, (O)=Obituary, (PI)=Parliamentary Intelligence, (R)=Review, (PCP)=Panel and Contract Practice, and (P)=Prognosis Series.

A Concordance of page numbers and dates of issue will be found on page II.

### A

- Abbasy, M. A., vitamins in nutrition, 1488  
Abdelsamie, L., early amputation for injury, 187, (A) 1249  
Abdomen—Early Diagnosis of Acute Abdomen (Z. Cope) (R) 149; omental dermoid (E. N. MacDermott) 898; varicosities of (A. L. d'Abreu) 84, (J. W. Riddoch) (C) 227; see also Hemorrhage and Peritoncum  
Abel, A. L., intravenous anaesthesia, 422, 600  
Aberdeen University Club, London, 694  
Abortion—alleged criminal, inquest depositions and (ML) 278; habitual (A) 728; law of (LA) 1073, 1388; maternal mortality and, 404, (PI) 814; Roman Catholicism and, 640, (E. E. Ware) (C) 741  
Abrahams, A., on fatigue, 662, (C) 742  
Abyssinia—British Red Cross units, 59, 158, (A) 441, Italian bombing and (PI) 402, 455, 552, (PI) 635, 694, (PI) 696; Italian arrest of British subject (PI) 1269  
Academic Assistance Council (Lord Rutherford) (C) 739, (LA) 727  
Accidents, see Industrial medicine, Negligence, and Road accidents  
Acetic acid poisoning (PI) 814  
Acetonuria, see Glycosuria  
Acetylcholine—and derivatives (LA) 903; for paroxysmal tachycardia (A. B. Stenhouse) (C) 391; see also Myasthenia gravis and Tissue extracts  
Acholuria jaundice, see Jaundice  
Acriflavine—as urinary antiseptic (E. W. Assinder) 304; uses of, 293  
Actinotherapy—congress of, 233; Jesionek, A., work of (A) 440  
Adams, A., on bronchial carcinoma, 201  
Addison's disease—blood in (E. N. Allott) 1406; potassium-sodium ratio in (LA) 1304; see also Sodium chloride  
Adelphi, The, demolition of (LA) 905  
Adler, A., on psychological approach, 1117  
Adler, S., relapsing fever (C) 448  
Adolescence—education and, 274; psychological disturbances in (R. D. Gillespie and R. A. Q. Lay) (P) 1129; Youth, Sex, and Life (G. M. Cox) (R) 1302; see also Puberty  
Advertising, see Drugs  
Africa—medical service in West Africa (PI) 1093; vanishing fauna of, 1096  
Agranulocytosis—amidopyrin and (ML) 54; meningitis and (S. H. Epstein) (C) 116  
Air, see Ventilation  
Air attacks—food contamination and (PI) 1040; protection against (PI) 514, 580, (PI) 634, 757, (PI) 814, 873, (PI) 924, 978, (PI) 1215, 1501, medical practitioners and (PI) 1501; see also Abyssinia  
Air embolism, pleural shock and (C. O. S. B. Brooke) (C) 56  
Air transport—licence renewals, venereal disease and (H. W. Bayly) (C) 1329; medical examination of pilots (PI) 634; nervous disorder and (A) 1485; oedema of ankles and (M. Weinbren) (C) 170  
Aird, I., on intestinal strangulation 601  
Aitken, A. B., death of, 124  
Aitken, R., on lupus vulgaris, 388  
Albuminuria, see Pregnancy  
Albury, J. B., appointment, 289  
Alcock, N. S., lymphocytic meningitis, 650, (LA) 670  
Alcohol—in hospital practice (A) 617; injections of, 41, 80, (A) 99, 595, (A) 852, 730  
Alcoholism—acute, 50; dangers of, instruction in (PI) 749; manic-depressive insanity and (W. N. East) 161, (A) 155; pseudo-paresis and (E. W. Anderson) 477; see also Road accidents  
Aldridge, H. R., and Hartley, Sir P. H.-S., Johannes de Mirfield of St. Bartholomew's, Smithfield (A) 1079  
Aldridge-Blake scholarship, 172  
Alexander, F. W., sodium mandelate in chronic cystitis (C) 391  
Allen, C., epilepsy and allergy (C) 805  
Allen, Lord, on psychology of international relations, 274  
Allergy—Alleged Dye Dermatitis Committee (W. J. O'Donovan) (C) 1329; asthma and epilepsy (K. Costello and J. T. Fox) 660, (G. H. Oriol) (C) 741, (C. Allen) (C) 805; focal infection and (LA) 1480; food and drug, 754; hay-fever (P. Franklin) (C) 1442, (A) 1424; neuropathic eczema, 1300; pathergy and (S. Leites) 1348, (A) 1364; phlycten and (A) 909; Pollen Grains (R. P. Wodehouse) (R) 1118, (A) 1126; uteraria (A) 618; vulval and anal pruritus and (E. Hunt) 592  
Allison, P. R., brain and lung abscesses in otitis media, spontaneous pneumothorax and, 1060  
Allott, E. N., blood in Addison's disease, 1406; on salt in Addison's disease, 604  
Almoners—Cummins, A., work of (A) 442; Hospital Almoner, 64; Medical Social Work (H. M. Bartlett) 875  
Alstead, S., effect of chloral hydrate on heart, 938  
Altschüler, E., tuberculous thrombophlebitis, 948  
Aluminium—cooking vessels (R. M. Le II. Cooper) (C) 118; splints (A. P. Bertwistle) 146  
Alvarez, W. C., gastric acidity (C) 740  
Ambulances—air, in Britain, 1042; hospitals and (PI) 514; local authorities and (PI) 456  
Amenorrhoea—ovarian and endometrial graft for, 666; ovarian extraversion for, 315  
American Academy of Arts and Sciences, 447  
American Medical Association—ergot alkaloid (A) 909; meeting, 1432  
Amidopyrin—agranulocytosis and (ML) 54; scheduled as a poison (PI) 456  
Ammonium chloride, see Edelema  
Ammonium mandelate, see Urinary Infections  
Amoebic dysentery, see Dysentery  
Amputation, early, for crushed limbs (L. Abdelsamie) 187, (A) 1249, (L. Stiven) (C) 1411  
Amyl nitrite (A) 270  
Anemia—acute febrile, dental sepsis and (P. C. Gibson) 994, (C) 1143, (F. P. Weber) (C) 1086, (LA) 1479; focal infection and (W. P. Murphy) 1451; iron in (L. J. Witts) 1, (A) 493; megalocytic, in British Guiana (A) 1421; pregnancy and (J. A. Boycott) 1165; remedies for, tests of (A) 493; see also—  
Anemia, pernicious—Castle's intrinsic factor in (C. C. Ungley and R. Moffett) 1232, steatorrhoas and, 1298; experimental (A) 493, liver extracts and (A) 98; focal infection and (W. P. Murphy) 1451; purified liver fraction in (C. C. Ungley, L. S. P. Davidson, and E. J. Wayne) 349, (C) 448, (J. F. Wilkinson) 354, (A) 380, 622; spectrographic anomalies of gastric juice in (L. Karczag) 947; stomach and (A) 154; syphilis and (C. R. Box and A. M. Gill) 24, (R. Miller) (C) 115; see also Stomach  
Anaerobic septicæmia (A. Lemierre) 701  
Anæsthesia—basal narcosis (A) 906, coramine and (A) 1420; choice of, 89, 125; deaths from (A) 438, (PI) 456, cerebral surgery and (Z. Mennell) (C) 504; dental prop (W. W. Mushin) 1062; in thoracic surgery (A) 383; intravenous (R. Jarman and A. L. Abel) 422, 690, (S. Horsley) (C) 690; non-volatile narcotics (A) 557; shock and (A) 36; see also Avertin, Cyclopropane, Ether, Midwifery, and Paraldehyde  
Anæsthesia, spinal—pantocain (A. A. Nabi) 779; risks of (A) 616  
Anæhemim, see Anæmia, pernicious  
Anal, see Anus  
Analgesia, see Anæsthesia and Pain  
Anatomy—clinical, of the arm (Praktische Anatomie) (T. von Lanz and W. Wachsmuth) (R) 29; Companion to Manuals of Practical Anatomy (E. B. Jamieson) (R) 91; see also Biology  
Anderson, E. W., alcoholic pseudo-paresis, 477  
Anderson, G. C., badges for doctors' cars (C) 1329  
Andrewes, C. H., on influenza (LA) 32; on viruses of rabbit tumours (A) 1125  
Aneurysm—of splenic artery (S. E. Osborne) 1007; ruptured, of gastric artery (E. E. Lewis) 255; sciatica and, 875  
Angina pectoris—amyl nitrite in (A) 270; pain of, relief of (A) 157; see also Heart and Heart disease  
Animals—diseases of, research on (PI) 458; narcosis in (A) 557; poisons for rodents, 404, 580; University of London Animal Welfare Society, 638; see also Biology and Vivisection  
Ankle—oedema of, air transport and (M. Weinbren) (C) 170; sprained, novocain injection for, 1431  
Ankylostomiasis in Indian seamen (A. H. Walters, G. C. Low, and P. H. Manson-Bahr) 599  
Ansari, M. A. (O) 1212  
Anschutz, W., resection in cancer of stomach, 1175, (LA) 1190  
Antenatal, see Childbirth  
Antivivisection, see Vivisection  
Anus—fistula-in-ano (J. P. Lockhart-Mummery) 657; gonorrhœa of (A) 962; wounds of (W. B. Gabriel) 1345; see also Pruritus  
Anwyl-Davies, T., Treatment of Venereal Disease in General Practice (R) 1357

Appendicitis—260; in infant (F. H. Coleman) 1008  
 Appendix, torsion of, in pregnancy (G. Flatley) 1357  
 Apperley, F. L., gastric acidity, significance of, 5, (A) 35, (C) 630  
 Appointments, weekly lists of, 59, 122, 174, 233, 289, 310, 405, 462, 516, 582, 642, 700, 753, 817, 874, 930, 986, 1042, 1100, 1156, 1219, 1273, 1330, 1390, 1449, 1503  
 Arch, A. J. (O) 509  
 Archer, H. E., excretion of ascorbic acid, 710, (A) 729  
 Arm, see Limbs  
 Army—cerebro-spinal fever in (PI) 750; health of, 220; recruits, defective health of (PI) 577, 696, 1269, 1415; see also Royal Air Force and Services  
 Arnott, W. M., on experimental hypertension (A) 380  
 Arteries—athero-sclerosis, thyroid gland and (N. P. Dungal) 1354; Diseases of Peripheral Arteries (S. S. Samuels) (R) 1012, (C) 1382; embolotomy (LA) 33, (H. I. Deitch) 475; obliterative disease of, 120, 209, 540, (A) 674, 1384, intermittent claudication and (H. T. Simmons) 73; pulmonary embolism, Trendelenburg operation for (A) 1365; see also Hemiplegia and Tissue extracts  
 Arthralgia, bismuth injections and, 65  
 Arthritis, see Rheumatism  
 Artificial pneumothorax—in pleurisy and pneumonia (A. R. Majumder) (C) 226; see also Tuberculosis, pulmonary, surgery of  
 Artificial respiration—for three and a half years (P. M. T. Kerridge) (C) 504; in nicotine poisoning (LA) 555; see also Inhalation therapy  
 Aschheim-Zondek reaction—in teratoma testis, 315; litigation and, 1136  
 Aschoff, L., seventieth birthday of (A) 100  
 Ascorbic acid, see Scurvy  
 Ashworth, J. H., death of, 389  
 Asphyxia neonatorum, nitrous oxide and (A) 1249  
 Aspleny, W. W. R. (O) 1212  
 Assinder, E. W., acridavine as urinary antiseptic, 304  
 Association for Moral and Social Hygiene, 873, (A. Neilans) (C) 923  
 Astbury, W. T., on X ray analysis of proteins, 1152  
 Asthma—epilepsy and (K. Costello and J. T. Fox) 660, (G. H. Oriol) (C) 741, (C. Allen) (C) 805; nervous disorder and (A) 96, 208, (S. Ingvær) 313, 805; prognosis in (L. J. Witts) (P) 273; Treatment of Asthma (F. T. Harrington) (R) 786  
 Atabrin poisoning (M. V. Govindaswamy) (C) 56  
 Athero-sclerosis, thyroid gland and (N. P. Dungal) 1354  
 Athletics—endurance and (LA) 1074; fatigue and, 662, (A. Abrahams) (C) 742; hygiene of, 1153; see also Physical education  
 Atkins, H. J. B., circumcision forceps (NI) 610  
 Atlanto-axial joint, subluxation of (J. T. Chesterman) 539  
 Atmospheric pollution—coal fires and (PI) 696; exhibition, 816; fog, basis of (A) 1077; report on (A) 561; smokeless fuel and (PI) 577  
 Atophan in rheumatism, fatality following (ML) 1379  
 Atropine, large doses of (A) 908, 986  
 Audy, J. R., foreign body in heart at birth (C) 418  
 AUSTRALASIA, CORRESPONDENCE FROM.—  
 Intravenous olive oil emulsion therapy, 860—Maternal and infant welfare, 861—Motor accidents, 861—Post-graduate work, 501  
 Australasian College of Physicians (A) 1251  
 Australian and New Zealand Association for the Advancement of Science, 1272  
 Autopsies, see Post-mortems  
 Avartin in childhood (A) 209  
 Ayad, H., hypervitaminosis D (C) 972

## B

Bachmann, E., on after-care of tuberculosis, 558  
 B. *aertryckii* food poisoning (E. R. Jones and H. D. Wright) 22  
 B. *asiaticus*, diarrhoea and (G. Slot and D. Blomfield) 1116

B. coli, see Urinary infections  
 Backache, low, 1200  
 Bacteriology—Agents of Disease and Host Resistance (F. P. Gay) (R) 610; Bacterial Nutrition (B. C. J. G. Knight) (LA) 1417; bacteriological warfare, 1136; Bacteriology in Relation to Clinical Medicine (M. N. De and K. D. Chatterjee) (R) 487; microbiology congress, 1499; micro-organisms, low temperatures and, 50; Principles of Bacteriology (A. E. Eisenberg, M. F. Huntly, and F. E. Colien) (R) 262; Textbook of Bacteriology (T. B. Rice) (R) 28  
 Bailey, G. N., on aspiration for mammary abscess (A) 440  
 Bailey, H., Demonstrations of Physical Signs in Clinical Surgery (R) 29; Emergency Surgery (R) 955; pocket transillumination (NI) 902; tube for continuous gastric aspiration (NI) 150  
 Bailey, K. V., on ovarian extroversion for amenorrhoea, 315  
 Bailey, S. H., Anti-Drug Campaign (R) 551  
 Baird, D., maternal mortality in hospital, 295, 315, (LA) 319; on ureters in pregnancy (LA) 152  
 Baker, A., on vitamin B<sub>1</sub>, 605  
 Baker, G. A., Russell viper venom in hemophilia, 428  
 Baker, J. R., and Carleton, H. M., Chemical Control of Conception (R) 1071  
 Baker, S. L., on pathology of heart disease, 549  
 Baker-Bates, E. T., on bronchial carcinoma, 201  
 Balantidiasis (P. Manson-Bahr) 759  
 Balfour, D. C., and Eusterman, G. B., Stomach and Duodenum (R) 30  
 Ballance, Sir C. (O) 396, 450  
 Ballance, Sir H. (O) 975, 1033  
 Banister, J. B., on spa treatment of gynaecological conditions, 1137; prognosis in eclampsia and toxæmia of pregnancy (P) 1487  
 Banks-Davis, H. J. (O) 636  
 Bányai, R., death of, 910, (O) 976; intranasal submucous injections of calcium (C) 570  
 Barber, G. O., on school fatigue, 125; School Education and Hygiene and Sex, 519  
 Barbiturates, see Anesthesia, Narcosis, and Phenobarbital  
 Barbour, R. F., chronic cicatrizing enteritis, 299  
 Bardswell, N. D., after-care of tuberculous, 199  
 Barling, S., on diverticulitis of colon, 548  
 Barlow, Sir T., Royal Medical Benevolent Fund (C) 53  
 Barnard, C. C., Classification for Medical Libraries (A) 961  
 Barnard, W. G., xanthomatosis of spleen, 839  
 Barnardo's Homes, 232, 1200  
 Barnett, B., Russell's viper venom (C) 509  
 Barrett, J. F., test for nitrogen retention, 84  
 Bartels, M., Bartels, P., and Ploss, H. H., Woman (R) 1183  
 Bartlett, F. C., on localisation of sound, 852  
 Bartley, A. H., duodenal ulcer treated with histidine (C) 117  
 Barwell, H., prognosis in deafness (P) 159, 214  
 Bashford, H. H., brightness of Post Office messenger (LA) 32, (C) 117; health standards in industry, 1505, (A) 1485  
 Battle, R. J. V., on aspiration for mammary abscess (A) 440  
 Battle, W. H., death of, 326, (O) 396  
 Bauer, F., congenital dislocation of hip, 1057  
 Bayliss-Stirling scholarship, 927  
 Bayly, H. W., Air Ministry and venereal disease (C) 1329; encephalitis lethargica and the law (C) 1141  
 B.C.G.—in France, 683; in Rumania, 626  
 Beanan, A. G., A Doctor's Odyssey (R) 263  
 Beattie, J., on heat regulation (LA) 554  
 Beatty, H., on filarial migration in mosquito (A) 790  
 Beatty, H. B. (O) 338  
 Beaumont, W., Infra-red Irradiation (R) 1013  
 Becker, S. W., Commoner Diseases of the Skin (R) 431  
 Begr, N. D., whooping-cough, 82  
 Behaviour, see Psychology  
 Beit memorial fellowships, 638  
 Bell, J., Peroneal Type of Progressive Muscular Atrophy (R) 1184

Bell's palsy, epiphora following (I. A. Tumarkin) 26, (A) 156  
 Benham, L. R., on phlycten (A) 909  
 Bennett, P. L. T., aseptic face mask (NI) 956  
 Bennett-Jones, M. J., varicose vein injections, 537, (C) 1086  
 Benzadrine, hypertension and (S. A. Peoples and E. Guttman) 1107  
 Berkeley, Sir C., on cancer of cervix, 1011  
 Berry, J. B. (O) 229  
 Bertwistle, A. P., aluminium splints, 146  
 Biegeleisen, H. L., phlebitis in varicose veins, 944, (C) 1499  
 Bile-ducts—intrahepatic cancer of (R. Binning) 656; pain from (A) 155; surgery of (E. R. Flint) 1469, radiography and (J. C. Ross) 251, (LA) 1245; see also Liver  
 Bilharzia, see Schistosomiasis  
 Binet, L., and Roger, G. H., Traité de physiologie, normale et pathologique (R) 204  
 Binning, R., primary intrahepatic carcinoma of bile-duct, 656  
 Biology—International Society for Microbiology, 1490; Microscopic Anatomy of Vertebrates (G. G. Scott and J. I. Kendall) (R) 90; Practical Biology for Medical Students (C. J. Wallis) (R) 203; see also Evolution  
 Birch, C. A., nasal catheter holder (NI) 1014; phenobarbital jaundice, 478  
 Birth, see Childbirth  
 Birth control, see Contraception  
 Birth-rate, see Vital statistics  
 Births, marriages, and deaths, weekly lists of, 60, 126, 173, 238, 294, 348, 405, 462, 520, 582, 639, 697, 753, 818, 874, 930, 986, 1046, 1100, 1156, 1218, 1272, 1330, 1387, 1449, 1504  
 Bismuth injections, arthralgia and, 65  
 Bizarro, A. H., congenital absence of upper and lower limb, 898  
 Blackburn, E. W. (O) 1381  
 Blacker, C. P., on manic-depressive insanity, 430  
 Blacklock, D. B., on malaria (LA) 323  
 on tropical housing, 330  
 Bladder, see Urinary and Urology  
 Blaikie, J. B. (O) 574  
 Blair-Bell, W. (O) 285  
 Blind—certification of blindness, 348; International Association for Prevention of Blindness, 929; pensioners (PI) 696, 697, 872; preventable blindness (A) 1195; talking book for, 844; see also Eyes  
 Blomfield, D., diarrhoea and B. *asiaticus*, 1116  
 Blood—Addison's disease and (LA) 1304, (E. N. Allott) 1496; Cerebro-spinal Fluid and its Relation to the Blood (S. Katzenbogen) (R) 1477; counts, tuberculosis and (F. Heaf) (C) 1142, (A. Piney) (C) 1216; examination, medical education and (H. H. Brown) (C) 117, (H. A. Lane) (C) 284; haematometer, standard, 288, 323; nitrogen retention (J. F. Barrett) 84; red cell sedimentation in heart disease (A) 271; see also Agranulocytosis, Anæmia, Hemophilia, Leukæmia, Purpura, Sodium chloride, and Spleen  
 Blood pressure, high—benzadrine and (S. A. Peoples and E. Guttman) 1107; experimental (A) 380; heart and (A) 1124; mental disturbances and (A) 853; nervous disorder and (S. Ingvær) 343; pre-eclamptic toxæmia and (F. J. Browne and G. H. Dodds) 1059; Variations in Blood Pressure and Nephritis (H. O. Mosenthal) (R) 1071; voluntary (LA) 958  
 Blood-sugar, see Diabetes, Glycosuria, and Hypoglycæmia  
 Blood transfusion—continuous drip, 86; grouping sera, supply of (A) 209; in streptococcal infections (J. A. Hendry and G. J. Griffiths) 145, (A) 157; International Bibliography on the Problems of Blood Transfusion (E. Koenig) (A) 40; malaria and (W. L. Thomas, S. Keys, and S. C. Dyke) 536; storage of blood for (LA) 1246, (W. G. Waugh) (C) 1382  
 Board of Control, Scottish—appointments, 173, 233, 1331  
 Board of Education—physical education, 125, (LA) 93; school-children's health (LA) 151  
 Body, see Emotion and Metabolism  
 Bone—fragility of, otosclerosis and, 661; Localized Rarefying Conditions of Bone (E. S. J. King) (R) 549; osteo-

- porosis, ovarian deficiency and (A) 907; tuberculosis of, 480. (La tuberculose ostéo-articulaire) (J. Calvé, M. Galland, and M. Mozer) (R) 667
- Bordier, H., and Kofman, T., Néodiat-hermie à ondes courtes (R) 723
- Borkenau, F. Pareto (R) 263
- Bornholm disease, see Myalgia
- Borries, G. V. T., on headache and disease in nose, 1067; on otogenous intracranial complications, 1068
- Bourne, G., "hyperglycemic coma" (C) 973
- Bovine tuberculosis—condemned meat and (ML) 912; elimination of (PI) 457; in Ireland, 110; meningitis and (W. T. Munro and H. Scott) 393, 479; Spahlinger treatment for (PI) 750; see also Milk
- Bowen-Jones, L. M. (O) 453
- Box, C. R., syphilitic anemia, 24
- Boycott, J. A., anemia in pregnancy, 1165; on teratoma testis, 315
- Boyd, W., Pathology of Internal Diseases (R) 723
- Boys, L., on spa treatment of gynecological conditions, 1137
- Brachet, A., Dalco, A., and Gérard, P., Traité d'embryologie des vertébrés (R) 1191
- Brackenbury, Sir H., on Curriculum Committee's report, 1320
- Bradshaw lectures, 67, 130, 521, 585, (LA) 612, 1263
- Braucker, W., Haberland, H. F. O., Klose, H., and zur Verth, M., Die Differentialdiagnose chirurgischer Erkrankungen (R) 203
- Bragg-Paul Pulsator (P. M. T. Kerridge) (C) 504
- Brain—abscesses of, otitis media and (P. R. Allison, F. F. Hellier, and G. S. Seed) 1060; epilepsy and cortical rhythm (A) 853; hepatocerebral degeneration, 198; hydrocephalus, 1135; psychosis (A) 850; see also Intracranial and Nervous system
- Brain, R. T., galvanocautery (NI) 488
- Brain, W. R., exophthalmos (A) 1423, thyroid extract and, 182
- Bramwell, E., on Holmes-Adie syndrome, 684
- Bramwell, J. C., gallop rhythm, 189; on pathology of heart disease, 549
- Breast—abscess of (A) 440, (H. Feikema) (C) 1141; benign lesions of (A) 1076; cystic disease of (A) 97, estrin for (E. Dahl-Iversen) 1294; gynecomasty, injury and (ML) 682; menstruation and (A) 675; see also Cancer of
- Breast-feeding—decline of, in France, 1430; nicotine poisoning and, 1432
- Brech delivery (A) 790
- Breen, G. E., xanthomatosis of spleen, 839
- Brend, W. A., Sacrifice to Attila (R) 1119
- Brewer, H. F., on blood-grouping sera (A) 209
- Brews, A., Stockholm technique in cancer of cervix, 713
- Bride, J. W., on ectopic pregnancy, 783
- Bridge, J. C., on fatigue, 663
- Brincker, J. A. H., control of measles, 103, (A) 1018
- Briscoe, H. V. A., on silicosis (LA) 611
- Briscoe, Lady, curarine and prostigmin, 469, (LA) 491
- British Association—1363; public health and agriculture (LA) 31
- British College of Obstetricians and Gynecologists—analgesia by midwives, 282, 288, (LA) 319, 1148; appointments, 873; diplomas, 816; election, 873; fellows, 458, 873; members, 288, 873; membership examination, 1450
- British Empire Cancer Campaign, 920
- British Empire Leprosy Relief Association (A) 618
- British Health Resorts Association—conference, 1137. (A) 1127; food at health resort, 1138; spa treatment of gynecological conditions, 1137
- British Hospitals Association, 1491
- British Institute of Philosophy, 515, 927
- BRITISH MEDICAL ASSOCIATION.—Abortion, law of (LA) 1073—Gallop rhythm and the physiological third heart sound, 189—Gold medal award, 1617—Maternal mortality, 736, (PI) 925—Physical education, 928—Research scholarships and grants, 124
- British Pharmacopœia, addendum to (A) 793
- British Postgraduate Medical School—118; lectures, 288, 516, 578, 693, 870, 1147
- British Red Cross Society—1096; air-raid precautions, 757, 873, 978; hospital library, 233; rheumatism clinic (A) 1021; see also Abyssinia
- British Social Hygiene Council, 694, 1386, 1503
- Britton, S. W., on suprarenal deficiency (LA) 1304
- Broadbent, W., subphrenic abscess, 1474
- Broek, J. H. E., Dramatic Purpose of Hamlet, 63
- Brocq, P., and Chabrut, R., Félix Lejars: Traité de Chirurgie d'urgence (R) 149
- Brodrigg, H. S., test for latent jaundice, 1237
- Bromide intoxication (A) 325
- Bronley, J. F., on X ray therapy, 482
- Bronchi—bronchiectasis, pneumonectomy for (G. A. Mason) 1047; bronchitis, chronic (R. A. Young) (P) 101; cancer of, 201; movements of, 368; radiography of (G. S. Erwin) 1236
- Broncho-pneumonia, see Pneumonia
- Bronchoscopy, see Bronchi and Respiratory efficiency
- Bronner, A. (O) 452
- Brooke, C. O. S. B., pleural shock and/or air embolism (C) 56
- Brooke, G. E. (O) 338
- Brooke, R., gastro-jejuno-colic fistula, 1065
- Brouwer, B., on spleen, liver, and brain, 198
- Brown, H., death of, 123
- Brown, H. H., medical education and blood examination (C) 117
- Brown, R. K., tribute to, 919
- Brown, W., psychology of international relations, 274, 290
- Browne, D., hypospadias, 141; on club-foot and pes cavus, 147; on congenital deformities, 1239; undescended testicle (C) 170
- Browne, F. J., Antenatal and Postnatal Care (R) 29; hypertension in pre-eclamptic toxemia, 1059
- Buchanan, M. (O) 231
- BUCAREST, CORRESPONDENCE FROM.—Albania, medical reforms in, 1259—B.C.G. vaccination, 626—Cosmetics, taxation of, 626—Foreign diplomas, 626—Infant mortality, 626—International Society for Medical History, president of, 1259—Juveniles and the law, 1259—Paediatrics, new society of, 1259—Public health, lay administration of, 1259—University of Bucharest, addresses, 1259
- Buckley, C. W., prognosis in arthritis (P) 1023, 1081
- Bucura, C., death of, 109
- BUDAPEST, CORRESPONDENCE FROM.—Budapest Health Resort Committee, 802—Longevity, 802—Meat consumption, 224—Milk, free, in schools, 224—Nicotine poisoning in infant, 1432—Practitioners, unemployed, in barracks, 223—Primipara, elderly, 224—Public health, 1431—Pyoderma cured with X rays, 1432—Radium purchase, 802—Rheumatism library, 224—Salvarsan tolerance in childhood, 1432—Venereal disease, 801, 1431
- Budget, the (PI) 977, social services and (PI) 1038
- Bugs, orthodichlorobenzene for (A) 1307
- Bull, P., on hypernephroma (A) 615
- Bulleid, A., dental sepsis, 931
- Bullet wounds, deductions from (G. R. Osborn) 1295, dum-dum bullets and (A) 1309
- Bulloch, W., on sterilisation of catgut, 367
- Burial, see Cremation
- Burman, H. J., and Imperatori, C. J., Diseases of the Nose and Throat (R) 204
- Burnet, G., glucose-saline in toxic diphtheria (C) 868
- Burns—tannic acid in (A) 1249; toxæmia of, suprarenal cortex in (W. C. Wilson, G. D. Rowley, and N. A. Gray) 1400
- Burns, B. H., tendovaginitis at radial styloid process, 717
- Burton, A. H. G., puerperal surgical scarlet fever, 1110, (LA) 1122
- Burton's Anatomy of Melancholy, 821
- Busson, B., death of, 388
- Buttle, G. A. H., chemotherapy of streptococcal infections, 1286, (LA) 1303
- Caffeine, action of, 386
- Cairns, H., intracranial tumours, 1222, 1291, (LA) 1305; on radiography in neuro-surgery, 732
- Calcium—intranasal submucous injections of (R. Bárány) (C) 570; metabolism (R. A. McCance) 643
- Calculi—urinary, prognosis of (S. G. MacDonald) (P) 1311; see also Gall-bladder
- Calendar—"Contentment," 238
- Calvé, J., Galland, M., and Mozer, M., La tuberculose ostéo-articulaire (R) 667
- Cameron, D. E., Objective and Experimental Psychiatry (R) 609
- Cameron, J. L., lithotomy instrument table, 1399
- Cameron, S. J., Hewitt, J., Lennie, R. A., and Morton, E. D., Glasgow Manual of Obstetrics (R) 954
- Campbell, C. M., Destiny and Disease in Mental Disorders (A) 1196
- Campbell, J. A., oxygen administration (C) 805, 876
- Campbell, R. M., herpes zoster of trigeminal nerve, 1066
- Camps, F. E., scarlet fever (C) 507
- Canadian Medical Association (A) 99
- Cancer—(Sir R. Muir) 877; congress on, 637; Early Diagnosis of Malignant Disease (G. Keynes) (R) 29; Early Diagnosis of Malignant Disease (M. Donaldson, S. Cade, W. D. Harmer, R. O. Ward, and A. T. Edwards) (R) 845; hypernephroma (A) 615; intracranial (Z. Mennell) (C) 504, (H. Cairns) 1223, 1291, (LA) 1305; mortality from (PI) 1325; pain of, intraspinal alcohol for (A) 852; prevention of (W. S. Handley) 987; selenium treatment of, 1198, (A. T. Todd) (C) 1261; viruses of, tar and (A) 1420; see also Estrin, X rays, and—
- Cancer of—bile-ducts, intrahepatic (R. Binning) 656; breast (A) 97, (W. Cramer and E. S. Horning) 247, (A) 324, 480, (A) 497, (LA) 788, (Sir R. Muir) 877, (W. S. Handley) 987, (J. P. Ross) 1025, (A) 1076, 1364, oophorectomy and splenectomy for (P. Paterson) 1402, (H. Lett) (C) 1498; bronchus, 201; cervix (A. Brews) 713, 720, (E. Hurdon) (C) 806, 865, (W. S. Handley) 987, 1011, 1044, (W. Schiller) 1228, (S. Russ) (C) 1329, 1240; colon (H. H. Rayner) 136, (E. K. Martin) (P) 619, (P. Manson-Bahr) 830, (A) 1306; duodenum (G. Slot and M. H. Fridjohn) 194; œsophagus (G. Grey Turner) 67, 130, retrograde œsophagoscopy and, 86; ovaries, 722; rectum, 1183; skin, ultra-violet rays and (A. H. Roffo) 472; stomach (LA) 788, (Sir J. Walton) 1101, (W. Anschutz) 1175, (LA) 1190, test-meals in (N. F. MacLagan) (C) 1265; testis, 315 uterus, 722, 913, 914, 1044
- Canti, R. G. (O) 166
- Capon, N. P., and Chamberlain, E. N., Symptoms and Signs in Clinical Medicine (R) 1477
- Cardale, H. J., death of, 964, (O) 1032
- Cardell, J. D. M., on ophthalmia neonatorum, 842, 953
- Cardiac, see Heart and Heart disease
- Carless, A., death of, 1022, (O) 1097
- Carleton, H. M., and Baker, J. R., Chemical Control of Conception (R) 1071
- Carmichael, E., on vasomotor responses (A) 326
- Cassidy, D. M. (O) 869
- Castle's intrinsic factor, see Anæmia, pernicious
- Catgut—London Hospital (A. G. Elliott) (C) 333; sterilisation of, 366, (A) 382
- Catheter—nasal, holder for (C. A. Birch) (NI) 1014; tying in (G. B. Davis) 255
- Catholic Medical Congress, 578
- Cattanach, J. G. (O) 1098, 1147
- Caustic holder, pocket, 1277
- Cavendish lecture (A) 1367
- Cawthorne, T., on hearing aids, 1069
- Centenarians—galaxy of, 1221; lithopædion in centenarian (L. G. Lye) 1238
- Central Association for Mental Welfare, 225, (A) 208, 459, 816
- Central Jubilee Fund, 968
- Central Midwives Board, 873
- Central Union of Fathers' Councils, 821
- Cerebral, see Intracranial
- Cerebro-spinal fever—anti-meningococcus serum, 1436; continuous ventricular drainage in (LA) 904; in Army camps (PI) 750; treatment of (A) 495
- Cerebro-spinal Fluid and its Relation to the Blood (S. Katzenebogen) (R) 1477

## C

- Cervical glands, tuberculous (B. C. Thompson) 946, (V. C. Thompson) (C) 1141, (G. Grey Turner) (C) 1262
- Cervix, *see* Cancer of, and Uterus
- Ceylon, malaria in (LA) 322, (W. Schulemann) (C) 332, (PI) 513
- Chabrut, R., and Brocq, P., Félix Lejars: *Traité de Chirurgie D'urgence* (R) 149
- Chadwick lectures, 516, 1041, 1447
- Chamberlain, E. N., and Capon, N. B., Symptoms and Signs in Clinical Medicine (R) 1477
- Chandler, A. C., Introduction to Human Parasitology (R) 1359
- Chaoul, H., on X ray therapy, 482
- Charity—antivivisection and (ML) 624, (Sir L. Rogers) (C) 805; medical card party for (ML) 329, (G. G. Panter) (C) 391
- Charles, E., on population trends (A) 791
- Charles, S. W., prophylactic enucleation of lower wisdom tooth follicles (C) 1262
- Chatterjee, K. D., and De, M. N., Bacteriology in Relation to Clinical Medicine (R) 487
- Cheate, Sir G. L., femoral hernia (C) 630
- Chemical preparations, trade marks for (ML) 1140
- Chemistry—Chemistry of Natural Products related to Phenanthrene (L. F. Fieser) (R) 1478; Thorpe's Dictionary of Applied Chemistry (J. F. Thorpe and M. A. Whiteley) (R) 550
- Chestney, L. M. (O) 112
- Chest, *see* Heart and Lung
- Chesterman, J. T., subluxation of atlanto-axial joint, 539
- Chicken-pox, zoster and (A. G. P. Hardwick) (C) 986, (D. Kyle) (C) 1499
- Chillblains, tuberculosis and (A) 1126
- Childbirth—Antenatal and Postnatal Care (F. J. Browne) (R) 29; elderly primipara, 224; Ideal Birth (Th. Van de Velde) (R) 955; intravenous anaesthesia for (S. Horsley) (C) 690; ophthalmia neonatorum and, 842, 953, (A) 1195; Short Ante- and Post-natal Handbook (R. K. Ford) (R) 551; sudden death in, 665; third stage, management of, 446; uterine activity in (C. Moir) 414; vesicovaginal fistula and (G. S. Woodman) 1112; *see also* Maternal mortality, Midwifery, Obstetrics, and Puerperal infection
- Child guidance, 1022, 1154, 1215, (D. R. MacCallman) (C) 1216, (A) 1484
- Children—adoption of (PI) 455; avertin anaesthesia for (A) 209; birching of (PI) 923; burns in, 1400; Children's Minimum Committee (LA) 81; congenital heart disease (R. Miller) (P) 1197; convalescent furniture for, 406; convulsions in (A) 493; deaf (A) 1020, (PI) 1269; death of child at children's home (PI) 1040; Disease in Childhood: The First Year (R. S. Frew) (R) 1360; East End Hostels Association, 1221; enuresis in, 1009; extradural hemorrhage in child (A. F. Goode) 779; Federation of Children's Moral Welfare Committees, 237; Healthy Babies (N. O. Richards) 406; inflammable toys, danger of (PI) 1269; jaundice in, 1476; Lectures on Diseases of Children (R. Hutchison) (R) 724; menthol therapy, dangers of (A) 38; Mother's Encyclopedia, 1221; overclothed boy (J. Riddell) 819; pink disease in France, 1384; pre-school, health of (A) 1310; psychological disturbances in (H. Weber) 981, (R. D. Gillespie and R. A. Q. Lay) (P) 1129, upbringing and, 275; remand home criticised (ML) 1083; salvarsan tolerance in, 1432; Study of Tics in Pre-school Children (W. E. Blatz and M. C. Lingland) 1221; Surgical Emergencies in Children (H. C. Edwards) (R) 1120; tuberculous meningitis in, 479; *see also* Child Guidance, Infants, Nutrition, and School-children
- Chiropody—Incorporated Society of Chiropodists, 638, 752, (A) 732
- Chloral hydrate, heart and (S. Alstead) 938
- Chloroform, *see* Midwifery
- Cholera, inoculation against (M. Tewari) (C) 572
- Christie, J. M. (O) 870
- Christopher, F., Textbook of Surgery (R) 1242
- Christophers, Sir R., on malaria epidemics (LA) 323
- Cinematograph films—cineradiography, 857; "Eternal Mask" (A) 1309; medical, 461; National Ophthalmic Treatment Board film, 751
- Circumcision—female (B. Girgis) (C) 170; forceps for (H. J. B. Atkins) (NT) 610; in prevention of cancer (W. S. Handley) 987
- Cirrhosis, *see* Liver
- Clark, F. Le Gros, on nutrition in Soviet Russia, 699, 876
- Clark, G. A., radiology in curriculum (C) 1143
- Clark, W. I., and Drinker, P., Industrial Medicine (R) 845
- Clarke, S. H. (O) 689
- Clarkson, R. D., testimonial to, 1271
- Claudication, intermittent (H. T. Simmonds) 73
- Clay, H. H., and Jameson, W. W., Sanitary Inspector's Handbook (R) 902
- Cleminson, F. J., on headache and disease in nose, 1067
- Clery, A. B., on enucleation of pleural adhesions, 148
- Climate, *see* Physical medicine
- Clinical Miscellany (R) 1187
- Clinical science—(Lord Horder) 179, (LA) 266; at Cambridge University (A) 1482; education, medical, and (W. W. C. Topley) 43
- Club-foot, *see* Foot
- Coccidiosis (P. Manson-Bahr) 830
- Cockayne, E. A., transposition of viscera (C) 1442
- Cod-liver oil, *see* Vitamin D
- Cœliac disease, 1298
- Coffee, pharmacology of, 386
- Cohen, H., on bronchial carcinoma, 201
- Colds—influenza and (LA) 1479; menthol for, dangers of (A) 38; symposium on, 580
- Colebrook, L., prontosil in puerperal infection, 1279, (LA) 1303, (C) 1441
- Coleman, F. H., acute appendicitis in infant, 1008
- Coleman, J. S., twin-locking, 196
- Coley, W. B., death of (A) 963
- Colien, F. E., Eisenberg, A. E., and Huntly, M. F., Principles of Bacteriology (R) 262
- Colitis, *see* Colon
- Collapsing therapy, *see* Artificial pneumothorax
- Collier, H., methylene dichloride intoxication, 594
- Collier, H. E., on "lead action," 1476
- Collier, W. (O) 51
- Collins, M., and Drever, J., Psychology and Practical Life (R) 1013
- Collins, M. A., appointment, 459
- Collip, J. B., administration of œstrin in rats, 775, (LA) 788
- Collis, R., Silver Fleece (R) 1416
- Collis, W. R. F., on rheumatic fever, 87
- Colloidal Selenium, *see* Cancer
- Colon—cancer of (H. H. Rayner) 136, (E. K. Martin) (P) 619, cure in (A) 1306; diseases of (P. Manson-Bahr) 759, 830; diverticulitis of, 87, 548; gastro-jejuno-colic fistula (H. S. Morley, R. Brooke, and C. J. H. Little) 1065; pituitary extract and (A) 384; surgery of, 120; ulcerative colitis (A) 272
- Comfrey, value of, 1336
- Committee against Malnutrition, 515, 699
- Commonwealth Fund fellowships, 1196
- Concussion, contusion and, prognosis in (C. P. Symonds) (P) 854
- CONFERENCES AND CONGRESSES.—Actinotherapy, 233—British Health Reports, 1137, (A) 1127—British Hospitals Association, 1491—Cancer, 637—Cardiology, 927—Catholic medical, 578—Climatology, 516—Comparative medicine, 517—Cytology, 693—Dangerous drugs (A) 559—Dentists, 1041—Fever therapy, 497, 1153—Hepatic insufficiency, 752—Institute of Hygiene, 1196, 1322—Journées Médicales de Bruxelles, 288, 1271—Journées Médicales de Paris, 872—Maternity and child welfare, 459, 1503—Mental health, 58, 274, 290—Microbiology, 40, 1490—Obstetrics and gynecology, 849, 862, 913, (LA) 1191—Ophthalmology, 516, 842, (A) 909, 960—Orthopedic surgery, 873—Otorhinolaryngology, 638—Paediatrics, 927—Physical medicine, 919, (A) 1128, 1152, 1200, 1219, (A) 1248—Protection of Infancy, 794—Public health, 1196, 1322, in United States, 1083—Radiological, 873—Social work, 173—Surgery, 119, (A) 209, orthopedic, 873—Tuberculosis, 403, 459—Warfare, regulation of, 58—Wiesbaden, 404, 689
- Confidence, professional, *see* Secrecy, professional
- Conjunctivitis, *see* Eye
- Constitution and disease (A) 793
- Contraception—Birth Control (H. Wright) 407; Chemical Control of Conception (J. R. Baker and H. M. Carleton) (R) 1071; Facts and Fallacies of Practical Birth Control (G. R. Scott) 64; Irish Free State law against (ML) 859; lectures and demonstrations, 164, 288, 515, 694, 927, 978, 1041, 1272, 1447, 1502; National Birth Control Association (A) 98; population trends and (A) 674
- Convulsions—of childhood (A) 493; *see also* Ether
- Cook, J., parotid fistula, 1239
- Cooke, Sir H., death of, 384
- Cooke, W. E., polycystic kidneys, 312
- Cooper, R., acute suppurative thyroiditis, 1172
- Cooper, R. M. Le H., aluminium kettle (C) 118
- Cope, A. E. (O) 1381
- Cope, Z., Early Diagnosis of Acute Abdomen (R) 149; on appendicitis, 260
- Copeland, A. J., "morbis Britannicus" (C) 115
- Copeman, W. S. C., control of measles (C) 226
- Coramine as antidote to barbiturates (A) 1420
- Corbet, W. M., foreign body in heart at birth (C) 392
- Corneal grafts (B. W. Rycroft) 239
- Coronary, *see* Angina pectoris and Heart disease
- Coroners—committee on (LA) 96, report of, 376, (LA) 377, (PI) 514, (T. Leary) (C) 742; coroner on medical errors (ML) 969; expressions of opinions by (PI) 514; twin (A) 559; *see also* Inquests
- Corpus luteum, pregnancy and, 568
- Corrosive sublimate poisoning (A) 617
- Cosmic rays, variations and (LA) 206
- Coste, J. H., retirement of, 629
- Costello, K., asthma and epilepsy, 660
- Court, A. C., on psychotherapy in general practice (A) 1486
- Courts, *see* Crime
- Cousin marriage (J. B. S. Haldane) (C) 332
- Coveney M. F., whooping-cough, 82
- Cowan, J., cardiac infarct, 356
- Cowan, S. T., on cytological examination of milk (LA) 93
- Coward, W., writings of, 820
- Cox, G. M., Youth, Sex, and Life (R) 1302
- Cramer, W., œstrin and pituitary gland, 247, (A) 324, (LA) 788, 1056
- Crimp, *see* Sodium chloride
- Crawford, J. H., phrenicothlasty in pulmonary tuberculosis, 534
- Cremation—(PI) 695; in France, 744
- Crew, F. D. (O) 1327
- Crichton-Miller, H., on mental health, 274
- Crime—bullet wounds (G. R. Osborn) 1295, (A) 1309; finger-print recording (A) 1192; Individual Criminal (B. Karpman) (R) 1186; juveniles and, in Rumania, 1259; medical and psychological treatment of offenders (PI) 632, 871, 1151, (ML) 1082; medical attendance of arrested persons (PI) 403; medico-legal evidence and, 1276; mental disorder and (ML) 107, 221, 277, (W. N. East) 161, (A) 155, 781, (A) 1078, (ML) 1082, 1323, (H. W. Bayly) (C) 1141, (C. Allen) (C) 1441; murder cases (ML) 164, 221, 277, 330, 566, 681, 1323, 1379, fresh evidence and (ML) 860, 969; murder convictions, statistics of (PI) 576; murder, phantasy of (C. Allen) (C) 1441; Notable British Trials (F. T. Jesse) (R) 374; publication of offensive evidence (PI) 513; remand homes, 1498; sexual, prevention of, 237
- Critchley, M., on diaries of literary patients, 1390; on psychogenic pain (A) 792
- Crocodile tears (I. A. Tumarkin) 26, (A) 156
- Croonian lectures, 1096, 1128
- Crosby, G. J. V., gold treatment in rheumatoid arthritis, 1463; Insomnia and Disordered Sleep, 406
- Crowden, G. P., on fatigue, 664
- Crowe, H. W., whooping-cough and vaccine (C) 169
- Crowther, J. A., Manual of Physics (R) 1359
- Cruikshank, E. W. H., on medical education, 223
- Crummer, Le Roy (A Doctor's Odyssey) (A. G. Beaman) (R) 263
- Crustacea as helminth intermediaries, 369
- Cubitt, A. W., mandelic acid in urinary infections (C) 922
- Cullinan, E. R., test for latent jaundice, 1237
- Culpin, M., on historical aspects of psychology (A) 614

Cummins, A., death of (A) 442  
 Cunningham, J. F., on genital prolapse, 88; on sudden death during labour, 665  
 Cunningham, J. H., Year Book of Urology (R) 608  
 Cunnington, C. W., Feminine Attitudes of the Nineteenth Century, 461  
 Curarine—prostigmin and (Lady Briscoe) 469, (LA) 491; *see also* Tetanus  
 Curriculum, medical, *see* Education, medical  
 Cyclopropane anaesthesia (A) 960  
 Cystitis, *see* Urinary infections  
 Cystoscopy—Cystoscopy and Urography (J. B. Macalpine) (R) 1360; retrograde cystoscope (T. J. D. Lane) (NI) 786  
 Cytology, congress of, 693

## D

d'Abreu, A. L., contra-indication to occlusive treatment of varicose veins, 84  
 Dahl-Iversen, E., oestrin in cystic disease of breast, 1294  
 Dain, H. G., gold medal, 1017  
 Dalcq, A., Brachet, A., and Gérard, P., *Traité d'embryologie des vertébrés* (R) 1119  
 Dale, Sir H., on work of Sir Almroth Wright, 797  
 Dalrymple-Champneys, Sir W., on malaria (LA) 323; on sterilised surgical catgut, 366; undulant fever (C) 1143  
 Danby, A., on eclampsia, 370  
 Dangerous drugs—Anti-drug Campaign (S. H. Bailey) (R) 551; conference on (A) 559; loss of (PI) 403; practitioners and (ML) 164, 567; traffic in (A) 794, 1077, 1278  
 Dangers of Being Human (E. Glover) (A) 1308  
 Das, Sir K., death of, 676, (O) 745  
 Datta, S., prevention of disease by diet, 1472  
 Davidson, L. S. P., anaemia in pernicious anaemia, 349, (A) 380, (C) 448, 622  
 Davidson, M., on capacity for work in pulmonary tuberculosis, 857  
 Davies, D. T., peptic ulcer, 521, 585, (LA) 612  
 Davies, W. L., Chemistry of Milk (R) 1070  
 Davis, A. A., alcohol injection for dysmenorrhoea, 80, (A) 99  
 Davis, E. D. D., on ear injury, 661  
 Davis, G. R., method of tying in catheter, 253  
 Dawson, G. G., Healing: Pagan and Christian (R) 149  
 Dawson, Lord, on physical education, 1152; tribute to, 211  
 De, M. N., and Chatterjee, K. D., Bacteriology in Relation to Clinical Medicine (R) 487  
 Dead, disposition of (PI) 695  
 Deafness—hearing aids (PI) 814, (A) 1020, 1069, (A) 1193, 1422, 1278; injury and, 660; National Institute for the Deaf (LA) 1361, 1447; otosclerosis and blue sclerotics, 661; prognosis in (H. Barwell) (P) 159, 214; telephones for (A) 962; vocational training and (PI) 1269; Zünd-Burguet treatment (M. Yearsley) (C) 740; *see also* Ear  
 Deanesly, R., male hormones and accessory substances, 837, (A) 850  
 Death-rate, *see* Vital statistics  
 Defects, *see* Incapacity  
 Deformities, congenital, 1239  
 Deitch, H. I., arterial embolectomies, 475  
 De Lacey, M., phlebitis in varicose veins (C) 1086  
 Delinquency, *see* Crime  
 de Mirfield, J. (Johannes de Mirfield of St. Bartholomew's, Smithfield) (Sir P. Hartley and H. R. Aldridge) (A) 1079  
 Dental, *see* Teeth and—  
 Dental Board—(A) 1250; penal cases, 1315  
 Dental Register—additions to (A) 672; restoration to, 1315  
 Dentistry—congress, 1041; prosthetic dentists (ML) 1492; *see also* Teeth  
 Department of Scientific and Industrial Research, reports, 330, 335, (A) 561  
 Dermatology, *see* Skin  
 Dermoid cyst of gastrohepatic omentum (E. N. MacDermott) 898  
 de Wesselow, O. L. V., pituitary gland in diabetes, 991, (A) 1022  
 Dewey, E., Behaviour Development in Infants (R) 1013

Diabetes—431; blood-sugar rises in, 314; insulin sensitivity and (H. P. Himsworth) 127; pituitary and (O. L. V. de Wesselow and W. J. Griffiths) 991, (A) 1022; Treatment of Diabetes Mellitus (E. P. Joslin) (R) 901; *see also* Insulin and Sodium chloride  
 Diagnosis—Early Diagnosis of Acute Abdomen (Z. Cope) (R) 149; Early Diagnosis of Malignant Disease (G. Keynes) (R) 29; Early Diagnosis of Malignant Disease (M. Donaldson, S. Cade, W. D. Harmer, R. O. Ward, and A. T. Edwards) (R) 845; Index of Differential Diagnosis of Main Symptoms (H. French) (R) 668; problems of, 754; surgical (Die Differentialdiagnose chirurgischer Erkrankungen) (W. Braeucker, H. F. O. Haberland, H. Klose, and M. zur Verth) (R) 203; Symptoms and Signs in Clinical Medicine (E. N. Chamberlain and N. B. Capon) (R) 1477  
 Diaphragm, *see* Tuberculosis, pulmonary, surgery of  
 Diaries—Calendar of Medical History, 65; Hospital Diary, 65; of literary patients, 1390  
 Diarrhoea—*P. asiaticus* and (G. Slot and D. Blomfield) 1116; *see also* Dysentery  
 Diathermy, short-wave, 1202  
 Dick, B. M., and Illingworth, C. F. W., Textbook of Surgical Pathology (R) 902  
 Dickey, A. A. G. (O) 339  
 Dicks, R. L., and Cabot, R. C., Art of Ministering to the Sick (A) 963  
 Diet—anaemia and (A) 154, 1421; dental caries and (A) 36; Gerson (LA) 153; in Scottish prisons (PI) 1446; prevention of disease by (A. G. Morison, S. Datta, and A. F. Waters) 1472; protein, in pregnancy (A) 99; steatorrhoea and, 1298; Streamline for Health (P. B. Hawk) (R) 92; *see also* Metabolism, Nutrition, and Vitamins  
 Dillon, F., mental sickness and certification (C) 1141, 1261  
 Dillon, T. F. (O) 1260  
 DINNERS.—Indian Medical Service, 1494—Joint Tuberculosis Council, 516—Royal College of Surgeons in Ireland, 458—Royal Medical Society, 502—Royal Society of Medicine, 1134, (A) 1126—Society of Apothecaries of London, 1503—Society of Public Analysts, 637—to Dr. and Mrs. Fairbairn, 694  
 Diphtheria—"bacteriological" and clinical, 280; swab in, 256; toxic, glucose-saline in (G. Burnet) (C) 868  
 Disability, *see* Incapacity  
 Disclaimers, 408, 743  
 Disease—Agents of Disease and Host Resistance (F. P. Gay) (R) 610; constitution and (A) 793; Natural History of Disease (J. A. Ryle) (R) 371; *see also* Incapacity  
 Dislocations—Text-book of Fractures and Dislocations (K. Speed) (R) 203  
 Distressed areas, *see* Unemployment  
 District medical service, Poor Law and, 1439  
 Diuresis, *see* Edema  
 Diverticulitis (P. Manson-Bahr) 830  
 Dixon, A. F. (O) 228, memorial to, 288  
 Dixon, C. F., on cure in cancer of colon (A) 1306  
 Dobbie, D. N., non-traumatic surgical emphysema, 365  
 Dochez, A. R., on common cold and influenza (LA) 1479  
 Dodds, E. C., on food at health resort, 1138  
 Dodds, G. H., hypertension in pre-eclamptic toxemia, 1059  
 Dohan, N., death of, 109  
 Doig, A. T., X ray appearances of lungs of electric arc welders, 771  
 Donaldson, M., Cade, S., Harmer, W. D., Ward, R. O., and Edwards, A. T., Early Diagnosis of Malignant Disease (R) 845  
 Donations and bequests (G. R. Girdlestone) (C) 55, 578, 635, 817, 918, 1017, 1080, 1217, (A) 1192, 1251, 1568  
 Dott, N. M., on hydrocephalus, 1135  
 Dougal, D., on granulosa-cell tumour, 316; on radiography in obstetrics (LA) 265; on radium in cancer of cervix, 720  
 Douglas, S. R. (O) 229  
 Dowden, J. W. (O) 636  
 Dressings, inflammable (R. Forbes) (C) 1261  
 Drever, J., and Collins, M., Psychology and Practical Life (R) 1013

Drinker, P., and Clark, W. I., *Industria Medicine* (R) 845  
 Drugs—advertisement of, in America, 223; chemical preparations, trade marks for (ML) 1140; Medicines and Surgical Appliances (Advertisement) Bill (PI) 400, 811, (LA) 787; reactions of protozoa to, 1435; Shops Bill (PI) 1093; vegetable, 1447, (A) 1483; *see also* Dangerous drugs and Prescribing  
 Dudgeon, C. R., on low backache, 1200  
 Ducl, A. B. (O) 976  
 Duff, K., vaginal discharge (C) 571  
 Duke, H. L., "Bayer 205" in human trypanosomiasis, 463  
 Dukes, C., on *B. coli* infections, 483  
 Dunbar, H. F., Emotions and Bodily Changes (R) 608  
 Dungal, N. P., athero-sclerosis and thyroid gland, 1354  
 Dunlop, B., food production (C) 805  
 Dunn, N., on club-feet and pes cavus, 147  
 Duodenum—radiography of, 222; sarcoma of (G. Slot and M. H. Fridjohn) 194; Stomach and Duodenum (G. B. Eusterman and D. C. Balfour) (R) 30; *see also* Peptic ulcer  
 Dust—action of, on tissues (A) 35; in card-rooms (PI) 814, 1151; puerperal infection and (E. White) 941; stonedusting regulations in mines (PI) 458; *see also* Silicosis  
 Duthie, W. C. (O) 338  
 Dyes—Alleged Dye Dermatitis Committee (W. J. O'Donovan) (C) 1329  
 Dyke, S. C., abscess of spinal cord, 1413; blood transfusion, malaria and, 536  
 Dysentery—(P. Manson-Bahr) 759, 830; amebic, 314; Soune (J. J. Laves) 192  
 Dysmenorrhoea—alcohol injection for (A. A. Davis) 80, (A) 99; sympathectomy for (A) 99  
 Dystrophy of fifth finger (A. R. Thomas) 1412

## E

Ear—Gray, A. A., work of (C. S. Hallpike) (C) 226; localisation of sound and (A) 852; Painful and Dangerous Diseases of the Ear (R. R. Woods) (R) 433; vertigo, injury and, 660; vertigo, operation for (A) 1366; Year Book of the Eye, Ear, Nose and Throat (R) 433; *see also* Deafness and Otitis  
 Earp, J. R., Sex and Culture (C) 973  
 East, W. N., alcoholism, crime, and manic-depressive disorder, 161, (A) 155  
 East End Hostels Association, 1221  
 Eastwood, A. (O) 1145  
 Eaton, T. T. W., foreign body in heart at birth (C) 392  
 Ebaugh, F. G., and Strecker, E. A., Practical Clinical Psychiatry (R) 1072  
 Eckhoff, N., prognosis of hand infections (P) 1369, 1425  
 Eclampsia, *see* Pregnancy  
 Ectopic pregnancy—bilateral, 348; repeated, 783  
 Eczema, *see* Skin  
 Eder, M. D. (O) 869  
 Edge, W., purpura haemorrhagica following measles (C) 1036  
 Edridge-Green, F. W., Purkinje's eight-rayed star (C) 117  
 Education—co-education (LA) 33; Education Bill (PI) 1324; for living, 275; *see also* Board of Education, School-children, and—  
 Education, medical—(Lord Horder) 179, (LA) 266; blood examination and (H. H. Brown) (C) 117, (H. A. Lane) (C) 284; cinematograph films and, 461; Curriculum Committee's report, 1319; in Italy, 237; in psychology, 757; in Scotland, 223; radiology in curriculum, 1027, (G. A. Clark) (C) 1143; research and (W. W. C. Topley) 43; *see also* Students, medical, and Universities  
 Edwards, A. T., Donaldson, M., Cade, S., Harmer, W. D., and Ward, R. O., Early Diagnosis of Malignant Disease (R) 845  
 Edwards, H. C., Surgical Emergencies in Children (R) 1120  
 Eichholz Clinic, 293  
 Eidinow, A., counter-irritation by ultra-violet light, 1404  
 Eisenberg, A. E., Huntly, M. F., and Colien, F. E., Principles of Bacteriology (R) 262  
 Electric arc welders, lungs of (A. T. Doig and A. I. G. McLaughlin) 771



Electrocardiogram, *see* Heart  
 El-Ibiary, M. E., transroscope (C) 1160  
 Ella Sachs Plotz Foundation, 232  
 Elliot-Smith, A., on Steinach II. operation, 542  
 Elliott, A. G., London Hospital catgut (C) 333  
 Ellis, H., From Rousseau to Proust (R) 1612  
 Ellis, M., on bronchial movements, 368  
 Ellis, V. H., tendovaginitis at radial styloid process, 717  
 Elsberg, C. A., on physiology of smell (A) 907  
 Embley memorial lecture (A) 438, (Z. Mennell) (C) 504  
 Embolism—air, pleural shock and (C. O. S. B. Brooke) (C) 56; *see also* Arteries  
 Embryology—vertebrate (Traité d'embryologie des vertébrés) (A. Brachet, A. Dalcq, and P. Gérard) (R) 1119  
 Emil-Behne, K., stammering (C) 449, 631  
 Emotion—Emotions and Bodily Changes (H. P. Dunbar) (R) 608; physical manifestations of (S. Ingvar) 313, (A) 673  
 Emphysema—chronic bronchitis and (R. A. Young) (P) 101; non-traumatic surgical (D. N. Dobbie) 365, (G. A. Mason) (C) 448, (B. C. Thompson) 1356  
 Encephalitis—lethargica, law and (H. W. Bayly) (C) 1141; post-vaccinal (P1) 456, (A) 1022  
 Endocarditis, *see* Heart disease  
 Endocrine system—Endocrine Tumours (F. P. Weber) (R) 487; Glandular Physiology and Therapy (R) 552; mental disorder and (A) 271, 794; nervous disorder and (S. Ingvar) 313; *see also* Sex hormones  
 Endometrium, *see* Uterus  
 Endurance, human (LA) 1074  
 Enteritis, *see* Intestine  
 Enuresis, 1609  
 Epididymitis, *see* Infectious diseases  
 Epididymitis, gonococcal (A) 324  
 Epilepsy—asthma and (K. Costello and J. T. Fox) 660, (G. H. Oriol) (C) 741, (C. Allen) (C) 805; bromide intoxication in (A) 325; care of, in Ireland, 862; cortical rhythm and (A) 853; in childhood (A) 493; water metabolism in (LA) 489  
 Epithelioma, *see* Cancer  
 Epsom College, 578  
 Epstein, S. H., agranulocytosis (C) 116  
 Erdman, G., on pollen statistics (A) 1126  
 Ergot alkaloid—isolation of, 622; name for (A) 909  
 Erwin, G. S., bronchography, 1236  
 Essex and Herts Benevolent Medical Society (F. L. Nicholls) (C) 1412  
 Ether convulsions (A) 156, (R. F. Woolmer and S. Taylor) 1605, (J. S. Marr) (C) 1142, peroxides and (A) 1194  
 Eucupin analgesia (A) 731  
 Eugenics—Eugenics Society (A) 210, 383, 516; pre-nuptial health examinations (A) 383; To-morrow's Children: The Goal of Eugenics (E. Huntington) (A) 731; *see also* Sterilisation  
 Eusterman, G. B., and Balfour, D. C., Stomach and Duodenum (R) 30  
 Euthanasia—debate on, 515; His Patients Died (C. Lillingston) (R) 846; pain and (H. H. Greenwood) (C) 55  
 Evans, F., on anaesthesia (A) 906  
 Evans, F. H., on neurotic patient, 899  
 Evans, G., memorial to, 959  
 Evans, W., on oesophagus (A) 1127  
 Evidence, *see* Crime  
 Evolution—bacterial (LA) 1417; Evolution and Heredity (C. E. Walker) (A) 729; Heredity and the Ascent of Man (G. C. Hurst) (A) 729; minerals and (R. A. McCance) 613, (LA) 847; natural selection, scope of (LA) 1189; Variation of Animals in Nature (G. C. Robson and O. W. Richards) (R) 1302  
 Exophthalmos, *see* Eyes  
 Ex-Services Welfare Society, 1331  
 Eyes—blue sclerotics, otosclerosis and, 661; corneal grafts (B. W. Rycroft) 239; Detachment of the Retina (J. C. Marshall) (R) 1118; exophthalmos (W. R. Brain) 182, (A) 1423; glare shield for spectacles, 1336; Holmes-Adie syndrome, 684; nystagmus, workmen's compensation and (P1) 632, 151; ophthalmia neonatorum, 842, 953, (A) 1195; ophthalmic benefit (PCP) 738, (P1) 1151; phlycten, 664, (A) 909; pupillary light reflexes, disturbances of (Die Störungen des Lichtreflexes der Pupille) (O. Löwenstein) (R) 785; Purkinje's eight-rayed star (F. W. Edridge-Green) (C) 117;

radium and (A) 969; sympathetic ophthalmia (A) 1127; trachoma (A. F. MacCallan) 215, international organization against, 1271; Year Book of the Eye, Ear, Nose, and Throat (R) 433; *see also* Blind

## F

Face mask, aseptic (P. L. T. Bennett) (NI) 936  
 Facial paralysis, *see* Bell's palsy  
 Factories, *see* Industrial medicine  
 Fagge, C. H., John Hunter to John Hilton, 409, (LA) 435  
 Fahmy, C., on third stage of labour, 446  
 Fainting, *see* Vasovagal attack  
 Fairbairn, J. S., retirement of, 694  
 Fairbank, H. A. T., final lecture (A) 794  
 Fairley, N. H., tropical sprue (P) 911, 1298  
 Faith healing, *see* Healing  
 Fallopian tubes, *see* Ectopic pregnancy and Salpingitis  
 Faraday Society (A) 1077  
 Fascia introducer for hernia repair (H. F. Moseley) (NI) 956  
 Fatigue, 662, (A. Abrahams) (C) 742  
 Favell, R. V. (O) 453  
 Fear in childhood (H. Weber) 981  
 Feikema, H., mammary abscess (C) 1141  
 Feldman, W. M., nutrition question (C) 804  
 Félix Lejars: Traité de Chirurgie D'urgence (P. Brocq and R. Chabrut) (R) 149  
 Fellowship of Medicine, *see* Post-graduate courses  
 Femoral hernia (A. K. Henry) 531, (Sir L. Cheate) (C) 630  
 Femur—fracture of, bedside radiography for (W. B. R. Monteith) 254; fractures of neck of, instruments for (F. I. Lloyd) (NI) 318; fractures of upper end of, prognosis in (G. F. Stebbing) (P) 385  
 Fergus, C. A. (O) 287  
 Fernic, F. E. (O) 231  
 Fertility, *see* Sterility  
 Fever—heat regulation and (LA) 554; *see also* Infectious diseases and—  
 Fever therapy—congress on, 497, 1153; in gonorrhoea and syphilis (LA) 726, 1262, (A) 1218; *see also* Short wave therapy  
 Fibroids, myomectomy for, 863  
 Fieser, L. P., Chemistry of Natural Products related to Phenanthrene (R) 1478  
 Filarial migration in mosquito (A) 790  
 Findlay, G. M., lymphocytic meningitis, 650, (LA) 670; Rift Valley fever virus, 149  
 Findlay, L., acute suppurative thyroiditis, 1172  
 Finger, fifth, dystrophy of (A. R. Thomas) 1412  
 Finger-printing (A) 1192  
 Fire—prevention of, in hospitals and institutions (P1) 1414; protection of life from (P1) 401  
 Fisher, A. G. T., repair of semilunar cartilages, 1351  
 Fisher, S. D. P., prognosis in spinal caries (C) 630, 740  
 Fistula—anal (J. P. Lockhart-Mummery) 657, (W. B. Gabriel) 1345; gastro-jejuno-colic (H. S. Morley, R. Brooke, and C. J. H. Little) 1065; parotid (J. Cook) 1239; vesicovaginal (G. S. Woodman) 1112  
 Flatley, G., torsion of appendix, 1357  
 Flint, E. R., gall-stone surgery, 1169  
 Fluids, *see* Water metabolism  
 Focal infection—(W. P. Murphy) 1451, (LA) 1479; *see also* Streptococcal infection and Teeth  
 Fog, *see* Atmospheric pollution  
 Földes, E., gastric acidity (C) 1035  
 Folliculin, *see* Oestrin  
 Food—aluminium vessels and (R. M. Le H. Cooper) (C) 118; food chemists' tour, 817; Food Education Society, 459; manufacture and sale of, control of, in United States, 223; preservation of, 339; preservative in, prosecution for (ML) 222; unfit for human consumption (ML) 800, (C. F. White) (C) 867, (ML) 912; *see also* Diet and Nutrition  
 Food poisoning—alleged, hotel sued for (ML) 860; *B. aertrycke* (E. R. Jones and H. D. Wright) 22; prognosis in (W. G. Savage) 965

Foot—club-feet and pes cavus, 147; club-feet, clamp for (M. Forrester-Brown) 897; Foot, The (N. C. Lake) (R) 317; Human Foot (D. J. Morton) (R) 1012; Letterman's supports, 1336  
 Forbes, D., home isolation of scarlet fever, 1438  
 Forbes, R., inflammable dressings (C) 1261  
 Forceps—circumcision (H. J. B. Atkins) (NI) 610; hysterectomy (W. M. H. McCullagh) (NI) 841  
 Ford, R. K., Short Ante- and Post-natal Handbook (R) 551  
 Foreign bodies—inhalation of pins (J. McFarland) 198; in heart, at birth (T. T. Eaton and W. M. Corbet) (C) 392, (J. R. Audy) (C) 448; in oropharynx (A) 1018; surgical packing, negligence claim and (ML) 969, 1378; tooth in lung (ML) 445  
 Forrester-Brown, M., clamp for club-feet, 897  
 Forsbrook, W. H. R. (O) 399  
 Forsyth, D., Psychology and Religion (R) 1359  
 Fothergill, R., testimonial to (C) 171, 158, 294, 373, 577, 866, 971, 1330  
 Fowweather, F. S., on van den Bergh reaction, 1475  
 Fox, J. T., asthma and epilepsy, 660  
 Fractures—about shoulder-joint, 602; aluminium splints for (A. P. Bertwistle) 146; ischaemic paralysis and (A) 1421; osteoporosis and (A) 907; plaster bandages for, 238; plaster work, gadgets in (W. G. Waugh), 427; spontaneous, osteomyelitis and (R. C. Tatham) 195; Text-book of Fractures and Dislocations (K. Speed) (R) 203; treatment of (A) 960; Treatment of Fractures in General Practice (W. H. Ogilvie) (R) 1360; *see also* Incapacity and—  
 Fractures of—femur (E. I. Lloyd) (NI) 318, (G. F. Stebbing) (P) 385, bedside radiography for (W. B. R. Monteith) 254; os calcis, prognosis in (J. P. Hosford) (P) 733; skull, ear injuries and, 660  
 France—undulant fever in (A) 1306  
 Franklin, P., zinc ionisation for hay-fever (C) 1442, (A) 1424  
 Fraser, J., on hospitals and waiting-lists, 1491  
 Fraser, J. S., death of, 1128, (O) 1211  
 Freeman, V., nutrition question (C) 804  
 French, H., Index of Differential Diagnosis of Main Symptoms (R) 668  
 Freud, S., Autobiographical Study (LA) 1015, (A. Wohlgenuth) (C) 1036, (F. Izard) (C) 1143  
 Frew, R. S., Disease in Childhood: The First Year (R) 1360  
 Fridjohn, M. H., sarcoma of duodenum, 194  
 From a Colonial Governor's Notebook (Sir R. St. Johnston) (R) 665

## G

Gabriel, W. B., anorectal wounds, 1345  
 Gadd's Synopsis of the British Pharmacopoeia, 1158  
 Gaddum, J. H., Gefässerweiternde Stoffe der Gewebe (R) 262  
 Gairdner, J., tribute to, 404  
 Gait, *see* Locomotion  
 Galland, M., Calvé, J., and Mozer, M., La tuberculose ostéo-articulaire (R) 667  
 Gall-bladder—gall-stone surgery (E. R. Flint) 1469; Medical Treatment of Gall-bladder Disease (M. E. Refnuss and G. M. Nelson) (R) 1070; radiography of, 222; *see also* Bile-ducts and Liver  
 Galt, H. M. (O) 453  
 Galvanocautery (R. T. Brain) (NI) 458  
 Gamlin, R., Modern School Hygiene, 64  
 Ganbrene, post-operative (A) 494, 964  
 Gardner, R. H., histidine in gastric and duodenal ulcer, 1352, (A) 1365  
 Gardner, A. D., on whooping-cough (A) 1019  
 Garland, H. G., familial cirrhosis and telangiectasia (C) 390; gold treatment of rheumatoid arthritis, 1459  
 Garrod, Sir A. E. (O) 807  
 Gas-and-air analgesia, *see* Midwifery  
 Gastric—artery, ruptured (E. E. Lewis) 255; *see also* Peptic ulcer and Stomach  
 Gastrohepatic omentum, dermoid cyst of (E. N. MacDermott) 898  
 Gauvain, Sir H., on tuberculosis of bones and joints, 480; prognosis in spinal caries (P) 562, (C) 690



Gay, F. P., Agents of Disease and Host Resistance (R) 610  
 Gemmell, A. A., on myomectomy, 863  
 General Medical Council—British Pharmacopœia, addendum to (A) 793, 1366; curriculum committee, 1319, radiology report to, 1027, 1143; penal cases, 1315, 1374, in camera (LA) 556; president's address, 1267; *see also* Medical Register  
 General Nursing Council rules, hospitals and (P) 514, 697  
 General Post Office, *see* Post Office  
 Genetics—British National Human Heredity Council (A) 1126; cousin marriage (J. B. S. Haldane) (C) 332; Genetics (H. S. Jennings) (R) 92; hepatic cirrhosis (F. P. Weber) 305, (H. G. Garland) (C) 390; manic-depressive insanity, 429; Peroneal Type of Progressive Muscular Atrophy (J. Bell) (R) 1184; viscera, transposition of (E. A. Cockayne) (C) 1442; *see also* Eugenics, Evolution, and Sterilisation  
 Genito-urinary—genital prolapse, 88, 915; proctiditis, ureters in (J. L. Jona) 1473; Surgical Diseases and Injuries of the Genito-urinary Organs (Sir J. Thomson-Walker and K. Walker) (R) 784; *see also* Ostrin and Sex hormones  
 Gérard, P., Brachet, A., and Dalco, A., Traité d'embryologie des vertébrés (R) 1119  
 German Society for Internal Medicine, 123  
 Germany—abortion law in, 1388; marriage laws in (ML) 329; medical tour in, 1424  
 Gerson diet (LA) 153  
 Gesell, A., and Thompson, H., Infant Behaviour, Genesis and Growth (R) 668  
 Ghaloungui, P., significance of gastric acidity (C) 1088  
 Giardiasis (P. Manson-Bahr) 830  
 Gibson, F. V. (O) 112  
 Gibson, P. C., acute febrile anaemia, 994, (C) 1143, (LA) 1489; Russell viper venom in hemophilia, 428  
 Giles, A. E. (O) 53  
 Gill, A. M., syphilitic anemia, 24  
 Gill, C. A., on malaria epidemics (LA) 322  
 Gillespie, R. P., prognosis of psychological disturbances in childhood and adolescence (P) 1129  
 Girdlestone, G. R., Lord Nuffield's gift (C) 55  
 Girgis, B., infubulation (C) 170  
 Glandular physiology, *see* Endocrine system  
 Glare shield for spectacles, 1336  
 Glasgow University Club, London, 1096, 1217  
 Glaxo laboratories, 407  
 Glover, E., Dangers of Being Human (A) 1308; on neurotic patient, 899  
 Glycosuria—acetonuria and, in subarachnoid hemorrhage (E. J. S. Woolley) 894, (G. Bourne) (C) 973; hyperglycemic, 431; *see also* Diabetes  
 Godson, J. H. (O) 1260  
 Goethals, T. R., on breech delivery (A) 790  
 Gold treatment of rheumatoid arthritis (S. J. Hartfall and H. G. Garland) 1459, (G. V. Crosby) 1463  
 Golding, J., value of raw and heated milk in nutrition, 1132  
 Goldsmith, W. N., Recent Advances in Dermatology (R) 954  
 Golf—spotlight, 1278; Sussex Medical and Dental Golfing Society, 1331  
 Gonadotropic, *see* Sex hormones  
 Gonorrhœa—(LA) 613; acriflavine in (E. W. Assinder) 304; ano-rectal (A) 962; epididymitis and (A) 324; hyperpyrexia for (LA) 726, 1202, (A) 1248; ophthalmia neonatorum, 842, 953, (A) 1195; salpingitis, professional ethics and (C) 692, 742, 743, 806; short-wave therapy in, 1202; vasotomy outfit (J. F. Peart) 488; *see also* Venereal disease  
 Goodall, F. C., Harley Street address (C) 508  
 Goode, A. F., extradural hemorrhage in child, 779  
 Goodman, N. M., Hygiene or the Gospel of Health, 757  
 Goodwin, G. M., Russell A. Hibbs (R) 92  
 Gordon, R. G., on child psychology, 275  
 Gorun in rheumatism, fatality following (ML) 1379  
 Gosling, B. S., on ultra-short wave technique, 1203  
 Gough, A., on tuberculous of uterus, 1241; on unusual metastasis, 1240  
 Goulstonian lectures, 643, 704, 765, 823, (LA) 847, 1304  
 Govindaswamy, M. V., atebirin poisoning (C) 56

Graham, E. A., 1935 Year Book of Surgery (R) 1187  
 Graham, G., excretion of ascorbic acid, 710, (A) 729; on salt in Addison's disease, 604  
 Grant, J., and Radley, J. A., Fluorescence Analysis in Ultra-violet Light (R) 1416  
 Grant, J. G. (O) 167  
 Grant, J. P., Weiss, S., and Quimby, A. J., Diseases of the Liver, Gall-bladder, Ducts and Pancreas (R) 91  
 Granuloma, non-specific, of small intestine (R. F. Barbour and A. B. Stokes) 299  
 Granulosa-cell tumour, 316  
 Gray, A. A. (O) 165, technique of (C. S. Hallpike) (C) 226  
 Gray, J., experimental renal section, 359  
 Gray, N. A., suprarenal cortex in toxemia of burns, 1400  
 Gray, T., Henoch's purpura and acute obstruction, 841  
 Gray, W. H., chemotherapy of streptococcal infections, 1286, (LA) 1303  
 Green, H. L., on silicosis (LA) 611  
 Green-Armytage, V. B., on sterility, 373  
 Greenwood, R. B., on surgical conscience (A) 850  
 Greenwood, H. H., pain and euthanasia (C) 55  
 Greenwood, M., Medical Dictator (R) 1243; Hill, A. B., Topley, W. W. C., and Wilson, J., Experimental Epidemiology (LA) 1362  
 Gregory, A. S., salaried service of midwives (C) 169  
 Greig, D. M., death of, 1080, (O) 1145  
 Grenfell Association, 751  
 Griffin, E. H. (O) 688  
 Griffiths, G. J., whole-blood injections in streptococcal septicæmia, 145, (A) 157  
 Griffiths, W. J., pituitary gland and diabetes, 991, (A) 1022  
 Grimsdale, T. B. (O) 688  
 Grocer's Company scholarships, 172  
 Growth, *see* Nutrition  
 Guardianship Society, 1041  
 Gubb, A. S. (O) 452  
 Gumpert, T. E., vasovagal attack, 85  
 Gunter, F. E. (O) 869  
 Guttman, E., hypertension and benzedrine, 1107; on mescaline (LA) 553  
 Guyer, O. K. G., polyserositis, 362  
 Gynecology—congress of, 849, 862, 913, (LA) 1191; spa treatment and, 1137; Textbook of Gynecology (W. Shaw) (R) 901  
 Gynecomasty, accident and (ML) 682

## H

Haborland, H. F. O., Braeucker, W., Klose, H., and zur Verth, M., Die Differentialdiagnose chirurgischer Erkrankungen (R) 203  
 Hæmochromatosis, 199  
 Hæmophilia, Russell viper venom in (G. A. Baker and P. C. Gibson) 428, (R. G. Macfarlane and B. Barnett) (C) 509  
 Hæmorrhage—dental extraction and (PCP) 1090; extradural, in child (A. F. Goode) 779; internal, cirrhotic splenomegaly and (J. F. Paterson) 428; internal, ruptured aneurysm and (E. E. Lewis) 255; post-partum, placenta prævia and (D. M. Lindsay) 1064; subarachnoid, glycosuria and acetonuria in (E. J. S. Woolley) 894, (G. Bourne) (C) 973; uterine, treatment of, 914, 916; *see also* Purpura  
 Hagedorn, H. C., on protamine insuliniate (LA) 320  
 Haldane, J. B. S., cousin marriage (C) 332  
 Haldane, J. S. (O) 687  
 Hall, S. B., on psychological investigation, 485  
 Hallpike, C. S., Dr. Albert Gray's technique (C) 226  
 Ham, C. I., Short, A. R., and Pratt, C. L. G., Synopsis of Physiology (R) 724  
 Hamburger, R., on phlycten (A) 909  
 Hamlet (The Dramatic Purpose of Hamlet) (J. H. E. Brock) 63  
 Hampson, A. C., on ventricular drainage (LA) 904  
 Hand infections, prognosis of (N. Eckhoff) (P) 1369, 1425  
 Handley, W. S., prevention of cancer, 987  
 Handwriting, study of, 1385  
 Hansen, K., and Staa, H. v., Die Einheimische Sprue und Ihre Folgekrankheiten (R) 1477  
 Hanson, D. M. (O) 746

Hardwick, A. G. P., chicken-pox and herpes zoster (C) 986  
 Hardy, T. L., on diverticulitis of colon, 548  
 Harley Street address (F. C. Goodall) (C) 508, (C) 572, (C) 631, (S. Wright) (C) 742  
 Harner, W. D., Ward, R. O., Edwards, A. T., Donaldson, M., and Cade, S., Early Diagnosis of Malignant Disease (R) 845  
 Harries, E. H. R., prognosis in measles (P) 677  
 Harrington, F. T., Treatment of Asthma (R) 786  
 Harris, L. J., vitamins in human nutrition, 886, 966, (A) 964, 1488; Vitamins in Theory and Practice (R) 609  
 Harris, S. E., pneumococcus meningitis following tonsillectomy, 143  
 Harris, W., trigeminal tic (P) 41, (A) 730  
 Harrison, J. (O) 113  
 Harrower, J. G., death of, 910, (O) 975  
 Hart, J. D. (O) 113  
 Hartfall, S. J., gold treatment of rheumatoid arthritis, 1459  
 Hartley, Sir P. H.-S., and Aldridge, H. R., Johannes de Mirfield of St. Bartholomew's, Smithfield (A) 1079  
 Harvey, William, Memorial Fund (A) 269; unveiling of statue, 752  
 Harvey, W. C., and Hill, H., Milk: Production and Control (R) 90  
 Hastings lecture, 515, 638  
 Havens, L. C., Bacteriology of Typhoid (R) 550  
 Hawes, J. B., and Stone, M. J., Diagnosis and Treatment of Pulmonary Tuberculosis (R) 1243  
 Hawk, P. B., Streamline for Health (R) 92  
 Hawking, F., on differential cell counts of pituitary gland (A) 1307  
 Hawley, G. W., on biological principles in orthopedic surgery (A) 906  
 Hay-fever—Pollen Grains (R. P. Wodehouse) (R) 1118, (A) 1126; zinc ionisation for (P. Franklin) (C) 1442, (A) 1424, (C. Shields) (C) 1499  
 Hazemann, R. H., on dispensary organisation, 856  
 Headache, disease in nose and, 1067  
 Head injuries, *see* Intracranial and Skull  
 Heaf, F., blood counts in tuberculosis (C) 1142  
 Healing—Christian Science and, 126; Healing: Pagan and Christian (G. G. Dawson) (R) 149  
 Health education—Health Handbooks (A. D. Baker) 406; Hygiene or the Gospel of Health (N. M. Goodman) 757; lectures, 516; Minor Medical Mysteries (L. Williams) (R) 91; Modern School Hygiene (R. Gmlin) 64; on dangers of alcohol (PI) 749; poster, 642; School Course in Hygiene (R. A. Lyster) 64; School Education in Hygiene and Sex (G. O. Barber) 519; Streamline for Health (P. B. Hawk) (R) 92; Youth, Sex and Life (G. M. Cox) (R) 1302  
 Health resorts—treatment at, for insurance patients (PI) 401; *see also* British Health Resorts Association  
 Hearing, *see* Deafness and Ear  
 Heart—chloral hydrate and (S. Alstead) 938; enlargement of (J. Parkinson) 1337, 1391 (A) 1483; Essentials of Cardiography (H. B. Russell) (R) 262; foreign body in, at birth (T. T. W. Eaton and W. M. Corbet) (C) 392, (J. R. Audy) (C) 443; myocardial ischemia, experimental (A) 961; outline of (T. S. Keith) 1466, radiography of, 406, (J. Parkinson) 1337, 1391, (A) 1483; vasovagal attack, electrocardiogram of (T. E. Gumpert) 85, (T. W. Preston) (C) 170; *see also*—  
 Heart disease—Bacterial Endocarditis (C. B. Perry) (R) 954; blood sedimentation-rate in (A) 271; cardiac infarct (J. Cowan) 356, 388; congenital (R. Miller) (P) 1197; enlargement of heart (J. Parkinson) 1337, 1391, (A) 1483; hyperpnea and (A) 1124; nervous disorder and, 343; obesity and (A) 793; œdema of, novurit suppository in (J. Parkinson) and W. A. R. Thomson) 16, ammonium chloride and (A. Schott) (C) 118; paroxysmal tachycardia, acetylcholine in (A. B. Stenhouse) (C) 391; pathology of, 549; presystolic gallop and (C. Bramwell) 189; workmen's compensation and (ML) 799; *see also* Angina pectoris  
 Heat, *see* Fever and Sodium chloride  
 Heffron, R., and Lord, F. T., Lobar Pneumonia and Serum Therapy (R) 1184

Heller, F. F., brain and lung abscesses in otitis media, spontaneous pneumothorax and, 1069  
 Helminthology—crustacea as helminth intermediaries, 369; developments in, 369; lectures on, 978  
 Hemiplegia—prognosis in (N. Hobbouse) (P) 327; vasomotor response and (A) 326  
 Hendry, J., on conservative treatment of ovaries, 862  
 Hendry, J. A., whole-blood injections in streptococcal septicæmia, 145, (A) 157  
 Hennelly, T. J., mental hygiene in mental hospitals (C) 973  
 Hennessy, T. (O) 111  
 Henry, A. K., operation for hernia, 531  
 Henry, C. B., prophylactic enucleation of lower wisdom tooth follicles (C) 921  
 Henry, G. W., Essentials of Psychopathology (R) 1186  
 Hepatic, *see* Liver  
 Herd, S. B., on conservative treatment of endocervicitis, 865  
 Heredity, *see* Genetics  
 Hernia—operation for (A. K. Henry) 531, (Sir L. Cheate) (C) 630, fascia introducer for (H. F. Moseley) (N1) 956; strangulated, complaint concerning (P.C.P) 1350  
 Herpes, *see* Zoster  
 Herringham, Sir W. (O) 1030  
 Hewer, H. R., Practical Zoology (R) 203  
 Hewetson, J. T. (O) 1327  
 Hewitt, J., Lennie, R. A., Morton, E. D., and Cameron, S. J., Glasgow Manual of Obstetrics (R) 954  
 Hewlett, R. T., hypervitaminosis D (C) 115  
 Heyman, J., on cancer of uterus, 865, 913  
 Hibbs, Russell A. (G. M. Goodwin) (R) 92  
 Hicks, C. S., syntropan in sea-sickness (C) 226  
 High-frequency field, *see* Short-wave therapy  
 Hill, A. B., on mortality from phthisis in young adults, 219; Greenwood, M., Topley, W. W. C., and Wilson, J., Experimental Epidemiology (LA) 1362  
 Hill, D. W., and Howitt, F. O., Insulin (R) 784  
 Hill, H., and Harvey, W. C., Milk: Production and Control (R) 90  
 Hill, Sir L., high-frequency field, 311; on hygiene of sport, 1153  
 Hilton, John (C. H. Fagge) 409, (LA) 435  
 Himsforth, H. P., diabetes mellitus, 127; on blood-sugar levels in diabetics, 314; on hyperglycæmic glycosuria, 431  
 Hindley-Smith, J. D., Chronic Streptococcal Toxæmia and Rheumatism (R) 550  
 Hip, congenital dislocation of (F. Bauer) 1057  
 His Patients Died (C. Lillingston) (R) 816  
 Histamine—in rheumatism (F. S. MacKenna) 361; *see also* Tissue extracts  
 Histidine, *see* Peptic ulcer  
 Histology—Microscopic Anatomy of Vertebrates (G. G. Scott and J. I. Kendall) (R) 90  
 History, medical—Coward, W., 820; de Mirfield, J. (Johannes de Mirfield of St. Bartholomew's, Smithfield) (Sir P. H.-S. Hartley and H. R. Aldridge) (A) 1079; Fifty Years a Surgeon (R. T. Morris) (R) 91; French medical leaders of nineteenth century, 1205; Hibbs, Russell A. (G. M. Goodwin) (R) 92; Hilton, John (C. H. Fagge) 409, (LA) 435; History of St. Thomas's Hospital (F. G. Parsons) 785; History of the Canadian Medical Association (H. E. MacDermot) (A) 99; Lack of Hingham, 1159; Medical Dictator (M. Greenwood) (R) 1243; medical letters of sixteenth, seventeenth, and eighteenth centuries (Opuscula Selecta) (A) 557; medical truants (Lord Moyrihan) 1254; Origin and History of the Liverpool Royal Southern Hospital (C. J. Maculister) (A) 1019; pharmacy jars (C. J. S. Thompson) 1157; poor-law medical service, 1439; psychology (A) 614  
 Hobbouse, N., prognosis in hemiplegia (P) 327  
 Hobson, F. G., scarlet fever, 417, (LA) 958  
 Hodson, E. (O) 746  
 Holling, H. E., mandelic acid and ammonium mandelate in urinary infections, 769  
 Holzer, W., and Weissenberg, E., Foundations of Short Wave Therapy (R) 723  
 Home Market (G. Harrison and F. C. Mitchell) 876

Honours—516, 694, 817, 971, 1271; birthday, 1496, (LA) 1481; New Year (A) 40, 60, 100  
 Hopewell-Ash, E. L., Manipulative Methods in Treatment of Functional Diseases (R) 1072  
 Hopkins, Sir G., appointment, 618  
 Horder, Lord, clinical medicine, 179; on *B. coli* infections, 483; on physical medicine, 919  
 Hormones, *see* Endocrine System and Sex hormones  
 Horning, E. S., estrin and pituitary gland, 247, (A) 324, (LA) 788, 1056  
 Horsley, J. S., narco-analysis (C) 55  
 Horsley, S., intravenous anaesthesia for childbirth (C) 690  
 Hosford, J. P., Kummell's disease, 249; fractures of os calcis (P) 733  
 Hospital contributory schemes—East Lancashire, 144; Guest Hospital, Dudley, 817; Nottingham, 876  
 Hospital pay-beds, 232, 233, 500 (PI) 341, 1039, 1150  
 Hospitals—actions against (ML) 445, 501, 566, 1244; administration of (A) 403; alcohol, declining use of (A) 617; almoner, 64, pioneer (A) 442; ambulance services and (PI) 514; American rural, 984; Birmingham hospital centre, 817; British Hospitals Association, 1491; "call-systems," 1044; Dublin, 502, 1084; Durham, 1218; employees of, tuberculosis in (A) 211; Essex, new, 1001; fire prevention in (PI) 1444; fracture units, 1492; French, size of wards in, 862; French, well-to-do patients in, 861; furniture for, 1154; General Nursing Council rules and (PI) 514, 697; Guild of Hospital Librarians, 123, 404, 1159; (Lancashire Year-Book (LA) 1245; Huddersfield municipal hospital, 1042; International Hospital Association, 1271, 1331; Irish, 567; isolation, bed-spacing in (LA) 958; Leeds, coordination of, 1241; London County Council, maternal deaths in, 224; London County Council, overcrowding in (LA) 1015; Manchester, cooperation between, 485, 1088; milk for (PI) 454, 575, (A) 676; rates and (S. R. C. Plimsoil) (C) 448; Scottish, coordination of, 1089; Scottish voluntary, position of, 49, 223, 684, 1028; Southend extensions, 233; South Middlesex and Richmond extensions, 930; Sussex, new, 1204; temperature and humidity in (PI) 749; voluntary hospitals commission, 171; waiting-lists, 1491  
 HOSPITALS.—Addenbrooke's Hospital (A) 1482—Bath Mineral Water Hospital, 752—Bermundsey Medical Mission Hospital, 110—Birmingham Children's Hospital, 752—British Hospital for Mothers and Babies, Woolwich, 737, 1148—Carnarthen County Infirmary, 979—Chelsea Hospital for Women, 1154—Colindale Hospital, Royal Air Force flying and (P) 1501—Durham County Hospital, 1154—East Grinstead Hospital, 167, 403, 449—Edinburgh Royal Infirmary, 169, 1384—Elizabeth Garrett Anderson Hospital, 1386—Glasgow Ear, Nose, and Throat Hospital, 1028—Glasgow Royal Infirmary, 389; ophthalmological department, 918—Glasgow Royal Maternity Hospital, maternal death-rate (D. Baird) 295, 315, (LA) 319—Gloucestershire Royal Infirmary, paying patients in, 500—Guy's Hospital, 1386; clinic for endocrine disorders, 752; Guy's Hospital Reports, 1247—Hammersmith Hospital, 340—Hampstead General Hospital, 979—Hospital for Sick Children, 1312—Kettering General Hospital, 979—King's College Hospital (A) 794, 817, 1042, 1447—Liverpool Royal Southern Hospital, history of (A) 1019—London Hospital; catgut (A. G. Elliott) (C) 333; finances, 752, 1380; Researches Published from the Wards and Laboratories of the London Hospital during 1935 (R) 1188—Middlesex Hospital; new ward, 1004; patient's library, 817—National Hospital, Queen-square, 1161—National Maternity Hospital, Dublin, 389—National Temperance Hospital, 1331—Princess Alice Hospital, Eastbourne, 817—Rothschild-Hadassah University Hospital, 1335—Royal Cancer Hospital; 1143; colloidal selenium investigation, 1198, 1261—

Royal East Sussex Hospital, 1333—Royal Edinburgh Hospital for Sick Children, 1271—Royal Eye Hospital, Southwark, 1154—Royal Free Hospital, 817—Royal Infirmary, Edinburgh; 1271; Pharmacopœia of the Royal Infirmary, Edinburgh, 875—Royal Northern Hospital, 806—Royal Samaritan Hospital for Women, Glasgow, 1377—Royal Sussex County Hospital, 737—Royal West Sussex Hospital, 979—St. George's Hospital; rebuilding fund (A) 1125, 1218; Hunterian Society, address, 754; psychiatric in-patient department (A) 910—St. Mark's Hospital, London, 657, 752, 1331, 1448—St. Mary's Hospital, London, 873, 1042—St. Mary's Hospitals, Manchester, 1080—St. Thomas's Hospital; History of St. Thomas's Hospital (F. G. Parsons) (R) 785—South London Hospital for Women, 1218—University College Hospital; fellowship, 459, 1447; Ringer lecture (A) 560—West End Hospital for Nervous Diseases, 1154—Westminster Hospital; donation, 1251; fall on polished floor (ML) 445; rebuilding, 752—Worthing Hospital, 1448  
 Honecke, É., La rate en pathologie sanguine (R) 1071  
 Housing—architects, employment of, 1277; Brighton slum clearance, 1154; London (PI) 341, 514, 628; nursery schools and (PI) 1215; of aged persons (PI) 1269; overcrowding (PI) 1049, 1151, 1443; rehousing accommodation (PI) 1326; town planning and (A) 496, (PI) 1269; tropical, replica of, 330; vermin-infested bricks (PI) 696  
 Howard, C., art of medicine, 754  
 Howard, F. E., and Patry, F. L., Mental Health (R) 1072  
 Howe, E. G., I and Me (R) 609  
 Howell, J. B., bacteriological grading of milk, 121, (C) 284  
 Howitt, F. O., and Hill, D. W., Insulin (R) 784  
 Hughes, F. W. (O) 1211  
 Hughes, T. A. (O) 1327  
 Hume, N. H. (O) 869  
 Humerus, fractures of, 662  
 Humidity, *see* Ventilation  
 Hungary, artificial pneumothorax in, 237  
 Hunger strike (H. B. Rosair) 778  
 Hunt, E., pruritus of vulva and anus, 592, (A) 617, (C) 741  
 Hunter, John, to John Hilton (C. H. Fagge) 409, (LA) 435  
 Hunterian lectures, 215, 931, 1047  
 Hunterian orations (C. H. Fagge) 409, (LA) 435, 442  
 Huntington, E., To-morrow's Children: The Goal of Eugenics (A) 731  
 Huntly, M. F., Eisenberg, A. E., and Colien, F. E., Principles of Bacteriology (R) 262  
 Hurdon, E., carcinoma of cervix in nulliparous women (C) 806  
 Hurst, A. F., gastric acidity (C) 168  
 Hurst, C. C., Heredity and the Ascent of Man (A) 729  
 Hurtle, W. H., death of (A) 1367  
 Hutchison, R., Index of Treatment (R) 530; Lectures on Diseases of Children (R) 724; nutrition question, 583  
 Hutton, E. L., on congenital G.P.I. (LA) 49  
 Hutton, L., on co-education (LA) 33  
 Hydrology, *see* Physical medicine  
 Hygiene, *see* Health education  
 Hyperglycæmia, *see* Glycosuria  
 Hypernephroma (A) 615  
 Hyperpyrexia, *see* Fever therapy  
 Hypertension, *see* Blood pressure, high  
 Hypervitaminosis, *see* Vitamin D  
 Hypodermic injection, alleged negligence and (ML) 500, (C) 571  
 Hypoglycæmia, spontaneous (A) 792  
 Hypospadias (D. Browne) 111  
 Hysterectomy, *see* Uterus  
 Hysteroscopy (A) 791  
 Illingworth, C. F. W., and Dick, B. M., Textbook of Surgical Pathology (R) 962  
 Immunology (N. P. Sherwood) (R) 317  
 Imperatori, C. J., and Burman, H. J., Diseases of the Nose and Throat (R) 204  
 Impostors, 178, (ML) 683, 1028  
 Impotence, surgical treatment of, 541  
 Incapacity—certificates of, panel practitioners and (PCP) 919; industrial statistics of, 288, (LA) 265; in school

- children (LA) 151; light work and (PI) 635, (J. P. Steel) 735, (A) 728; partial, insurance and (PI) 1500; psychological factors in (T. M. Ling) 1274; rehabilitation after injury, 1017, (PI) 1214, 1448, 1481, 1492; social therapy and, 857, (A) 906; tuberculosis and, in America, 1433; *see also* Workmen's compensation
- Incisions, see Wounds**
- Income tax—Income Tax Guide, 581; practitioners and, 177, (ML) 912**
- India—Indian Medical Service, dinner, 1331; jhin jhinia (A) 790; malaria in (A) 1308; Medical Guide for India and Index of Treatment (E. J. O'Meara) (R) 955; population problem in (A) 39; public health in (Sir J. Megaw) 61; small-pox in (PI) 750; State Medical Faculty of Bengal, 516**
- Industrial Health Research Board—occupational selection (A) 1423; physical standards, 288, (LA) 265**
- Industrial medicine—backache and, 1200; butcher's pemphigus (F. L. Ker) 718; cancer and (W. S. Handley) 987; electric arc welders, lungs of (A. T. Doig and A. I. G. McLaughlin) 771; eyes, care of (A) 1195; factories and workshops, accidents in (PI) 633; factories, health in (PI) 635, 699; fatigue, 662, incentives and (A) 325; fishermen, Haffkrankheit in (A) 1194; gold-mines, health in (A) 1248; hand infections (N. Eckhoff) (P) 1369, 1425; Industrial Health Education Society, 1096, 1218; industrial medical services, 288; Industrial Medicine (W. I. Clark and P. Drinker) (R) 845; manganese poisoning, notification of, 1096; methylene dichloride intoxication (H. Collier) 594; morbus Britannicus in sailors (S. E. Kotoed) 23, (C) 115, (C) 505; occupational selection, 1426, (A) 1423; Post Office medical services (H. H. Bashford) 1505, (A) 1485; research on, 330; stomach disorders in omnibus men (PI) 749; two-shift system, 57; Weil's disease (A) 156, (LA) 849, 1290; women, employment of (PI) 1150, in mines (PI) 1268; *see also* Dust, Incapacity, Silicosis, and Workmen's compensation**
- Industrial Welfare Society, 59, (A) 1485**
- Infantilism, polycystic kidneys and (W. E. Cooke) 312**
- Infant mortality, see Vital statistics**
- Infants—appendicitis, acute (F. H. Coleman) 1008; asphyxia neonatorum, nitrous oxide and (A) 1249; Behaviour Development in Infants (E. Dewey) (R) 1013; breast-feeding, decline of, in France, 1439; congenital deformities, 1239; foreign body in heart at birth (T. T. W. Eaton and W. M. Corbet) (C) 392, (J. R. Audy) (C) 448; gastro-enterostomy for pyloric stenosis (T. J. Wood) (C) 1442; Infant Behaviour, Genesis and Growth (A. Gesell and H. Thompson) (R) 668; milk foods, booklet on, 238; nicotine poisoning in, 1432; of hypertensive mothers, blood pressure in (F. J. Browne and G. H. Dodds) 1059; ophthalmia neonatorum, 842, 953, (A) 1195; pillow, feather, dangers of (A) 1367; protection of infancy, congress on, 794; xanthomatosis of spleen (W. G. Barnard and G. E. Breen) 839; *see also* Children**
- Infectious disease, weekly statistics, 40, 121, 164, 227, 284, 335, 395, 449, 503, 581, 639, 692, 734, 810, 868, 926, 979, 1037, 1089, 1148, 1209, 1266, 1326, 1383, 1436, 1508**
- Infectious diseases—Experimental Epidemiology (M. Greenwood, A. B. Hill, W. W. C. Topley, and J. Wilson) (LA) 1362; hospital for, in Dublin, 502; in Durham (PI) 697; Petteukofer school of epidemiology (A) 1194**
- Influbation (B. Giris) (C) 170**
- Influenza virus (LA) 32, 1479**
- Infra-red irradiation (W. Beaumont) (R) 1013**
- Inguinal hernia (A. K. Henry) 531, (Sir L. Cheate) (C) 630**
- Ingvar, S., physical basis of psychoneurosis, 343**
- Inhalation therapy—in carbon monoxide poisoning, 795; nasal catheter holder (C. A. Birch) (NI) 1014; oxygen tent service (C) 506; oxygen tents, percentage of oxygen in (A) 730, (J. A. Campbell) (C) 805, 876**
- Initial state principle (S. Leites) 1348, (A) 1364**
- Injury—amputation for (L. Abdelsamie) 187, (A) 1249, (H. Stiven) (C) 1441; ear function and, 660; gynæcomasty and (ML) 682; *see also* Incapacity**
- Inquests—depositions at, use of (ML) 278; Nottingham nursing-home death (ML) 278, 330, 556, 1206; rheumatism, treatment of, fatality following (ML) 1379; *see also* Coroners**
- Insomnia, see Sleep**
- Institute of Hygiene, congress, 1196**
- Institute of Medical Psychology—1022, 1084, (LA) 1073, (F. Dillon) (C) 1141, 1261, (J. R. Rees) (C) 1216; lectures, 1271; research fellowships, 693, 1041**
- Institute of Psycho-Analysis, 578**
- Insulin—for seamen (PCP) 573; hyperglycaemic glycosuria and, 431; in schizophrenia (LA) 1418, (H. P. Strecker) (C) 1498; Insulin (D. W. Hill and F. O. Howitt) (R) 784; new compound of (LA) 320; spontaneous hypoglycaemia and (A) 792; *see also* Diabetes and Narcosis**
- Insurance—American view of (PCP) 1437; Austrian, 1204; Family Medical Insurance (J. Lachlan-Cope) 1220, (C) 1263; Irish, 49, 626**
- INSURANCE, NATIONAL HEALTH (see also Incapacity, and Panel and Contract Practice)—(PI) 977—American view of (PCP) 1437—Dental benefit (PI) 1041—Ophthalmic benefit (PI) 1151—Regional medical service (PI) 1094—Small traders and (PI) 750—Spa treatment and (PI) 401—Unemployment and (PI) 341, (PCP) 865**
- International relations, see War**
- Intestine—chronic cicatrising enteritis (R. F. Barbour and A. B. Stokes) 299; nervous disorder and (S. Ingvar) 343; obstruction of, Henoch's purpura and (T. Gray) 841; steatorrhea and, 1298; strangulation of, 601, toxæmia and (A) 1128; uretero-intestinal anastomosis (A) 100, 1112**
- Intracranial—complications, otogenous, 1068; concussion and contusion, prognosis in (C. P. Symonds) (P) 854; hemorrhage, glycosuria and acetonaemia in (E. J. S. Woolley) 894, (G. Bourne) (C) 973; hemorrhage, in child (A. F. Goode) 779; radiography, 782; surgery, speed in (Z. Mennell) (C) 504; tumours, results of operations on (H. Cairns) 1223, 1291, (LA) 1305; *see also* Brain**
- Intravenous—route (C. G. K. Thompson) 1173; *see also* Anaesthesia and Narcosis**
- Invalid Children's Aid Association, 1096, 1160**
- Invalidism—Glorious Bondage of Illness (F. Pastorelli) 238**
- Inventions, exhibition of, 1447**
- Ireland—law against contraceptives (ML) 859**
- IRELAND, CORRESPONDENCE FROM.—Bovine tuberculosis, 110—Coombe Hospital, mastership of, 50—Diphtheria immunisation, payment for, 1496—Epileptics and mental defectives, 802—Hospitals: coöperation of, 1323; Dublin, 502, 1084; position of, 367; sweepstakes, 802—Irish Free State Medical Union, 502—Local authorities, officers of, retirement of, 684, 918, 970—Meade, H. S., honour, 971—Mills, J., death of, 802—National Health Insurance Bill, 49, 636—National Maternity Hospital, 389—"Protected" medical service, 171—Public health estimates, 1084—Queen's University, Belfast, fire at, 389—Registration of births and deaths, 685—Schools, insanitary, 1206—Torrens, D. S., election, 389—Trinity College, Dublin, appointment, 1029—Tuberculosis, 1136—University representation in Dáil, 1029**
- Irish Free State Medical Union, 502**
- Iron—metabolism (R. A. McCance) 643; *see also* Anæmia**
- Ischemic contracture (A) 1421**
- Italy—medical education in, 237; medical journals, amalgamation of, 264**
- Ivory Cross Fund, 692**
- Izard, F., Freudian confessional (C) 1143**
- J**
- Jackson, J. W. (O) 1147**
- James, S. P., on malarial epidemics (LA) 323**
- Jameson, W. W., and Clay, H. H., Sanitary Inspector's Handbook (R) 902**
- Jamieson, E. B., Companion to Manuals of Practical Anatomy (R) 91**
- Jarman, R., intravenous anaesthesia with pentothal sodium, 422, 600**
- Jaundice—acholuric, spleen and, 443; gall-stone surgery and, 1469; in children, 1476; latent, test for (H. S. Brodribb and E. R. Cullinan) 1237; phenobarbital and (C. A. Birch) 478; van den Bergh reaction and, 1475; *see also* Weil's disease**
- Jeffcoate, T. N. A., on organotherapy for uterine hemorrhage, 916**
- Jelliffe, S. E., Diseases of the Nervous System (C) 170**
- Jennings, H. S., Genetics (R) 92**
- Jesionek, A., memorial to (A) 440**
- Jesse, F. T., Notable British Trials (R) 374**
- Jewesbury, E. C. O., Life and Works of Charles Barrett Lockwood (R) 1187**
- Jhin jhinia (A) 790**
- Joe, A., placental extract in measles (C) 972, (A) 1018**
- Johnstone, R. W., Textbook of Midwifery (R) 846**
- Joints—arthralgia, bismuth injections and, 65; lubrication of (E. S. Jones) 1043; tuberculous, 480, (La tuberculose ostéo-articulaire) (J. Calvé, M. Galland, and M. Mozer) (R) 667; *see also* Dislocations and Rheumatism**
- Joint Tuberculosis Council, 516, 816, 1328**
- Jona, J. L., on kidney pelvis, 259; ureters in proctidial, 1473**
- Jones, E. R., B. aertrycke poisoning, 22**
- Jones, E. S., joint lubrication, 1043**
- Jones, R. W., on fractures about shoulder-joint, 603**
- Jones, S. W. M., on eclampsia, 370**
- Jones, T. D., on silicosis in South Wales (A) 1251**
- Joslin, E. P., Treatment of Diabetes Mellitus (R) 901**
- Journals—filling of, 699; Italian medical, amalgamation of, 264; lay, medical articles in, 1136**
- JOURNALS (reviewed).—British Journal of Children's Diseases, 150, 724—British Journal of Surgery, 264, 1014—Prescriber, 1160—Quarterly Journal of Medicine, 263, 1120—Quiet, 1221—West Riding Dental Journal (A) 155**
- Judd, E. S. (O) 287**
- Junior instruction centres, see Unemployment**
- Jupe, M. H., on radiography in neurosurgery, 782**
- K**
- Karczag, L., gastric juice in pernicious anemia, 947**
- Karpman, B., Individual Criminal (R) 1186**
- Karsner, H. T., Human Pathology (R) 667**
- Katzenblbogen, S., Cerebro-spinal Fluid and its Relation to the Blood (R) 1477**
- Kaufmann, C., on female sex hormones, 916**
- Kay, H. D., on physiology of lactation, 519**
- Keith, T. S., cardiac outline, 1466, (A) 1483**
- Kelemen, G., on ear injuries, 660**
- Kellar, R. J., on experimental hypertension (A) 380**
- Kelly, S., vitamins in human nutrition, 1488**
- Kendall, J. I., and Scott, G. G., Microscopic Anatomy of Vertebrates (R) 90**
- Kenderine, Sir C., death of (A) 1251**
- Kennon, R., on kidney, surgery and, 27**
- Kenny, M., protosil in puerperal infections, 1279, (LA) 1303**
- Ker, F. L., pemphigus acutus, 718**
- Kerridge, P. M. T., artificial respiration for three and a half years (C) 504**
- Kettle, M. H., fate of population of women medical students, 1370**
- Keynes, G., Early Diagnosis of Malignant Disease (R) 29; on radiotherapy in carcinoma of breast, 480**
- Keys, S., blood transfusion, malaria and, 536**
- Kidney—calculi of, pregnancy and, 952; hemisection of (J. Gray) 359; horse-shoe, 541; hypernephroma (A) 615; pelvis of, 259; polycystic (W. E. Cooke) 312; surgery and, 27; *see also* Nephritis, Renal, Sodium Chloride, and Urinary**

King, E. J., on phosphatase and liver function, 1475  
 King, E. S. J., Localized Rarefying Conditions of Bone (R) 549  
 King Edward VIII., proclamation of, 211  
 King Edward's Hospital Fund for London, 134, 233, 497, 620, 927, 1218  
 King George V., death of (LA) 205, 212  
 Kipling, Rudyard, death of (A) 211  
 Kirby, J., and McGonigle, G. C. M., Poverty and Health (R) 1358  
 Kleinberg, S., on pre-operative meditation (A) 851  
 Klose, H., Braeucker, W., Haberland, H. F. O., and zur Verth, M., Die Differentialdiagnose chirurgischer Erkrankungen (R) 203  
 Knee-joint—semilunar cartilages, repair and regeneration of (A. G. T. Fisher) 1351  
 Kuecland, Y., on common cold and influenza (LA) 1479  
 Knight, B. C. J. G., Bacterial Nutrition (LA) 1417  
 Knight, G. C., on intestinal strangulation, 601, (A) 1128  
 Knight, R. T., on cyclopropane (A) 960  
 Knowles, F. C., Diseases of the Skin (R) 487  
 Koenig, E., International Bibliography of Blood Transfusion (A) 40  
 Kofman, T., and Bordier, H., Néodiatheorie à ondes courtes (R) 723  
 Kofoid, S. E., morbus Britannicus, 23, (C) 505  
 Kovacs, R., on short-wave diathermy, 1202  
 Kraus, F. (O) 1327  
 Kuczyński, R., on trend of population (A) 674  
 Kuhn, R., vaginal discharge (C) 691  
 Kimmell's disease (J. P. Hosford) 249  
 Kyle, D., chicken-pox and shingles (C) 1499

**L**

Labour, *see* Childbirth and Obstetrics  
 Labyrinth, membranous, transparencies of (C. S. Hallpike) (C) 226  
 Lachlan-Cope, J., Family Medical Insurance, 1220, (C) 1263  
 Lack, T. L. (Lack of Iingham) 1159  
 Lactation—physiology of, 519; *see also* Breast-feeding  
 Laddell, R. M., medical psychology, 175  
 Laidlaw, P. P., on influenza (LA) 32  
 Lake, N. C., The Foot (R) 317  
 Lambert, D. P., merthiolate in tuberculosis, 1176  
 Lambotte, A., festschrift for, 1037  
 Landor, J. V., avitaminoses (C) 1441  
 Lane, H. A., medical education and blood examination (C) 284  
 Lane, T. J. D., retrograde cystoscope (NI) 786  
 Lanc-Roberts, C. S., on sterility, 372  
 Langdon-Brown, Sir W., on menopause, 719; on training in psychology, 757  
 Laryngo-phoniatory, lectures on, 752  
 Laurent, L. P. E., prostigmin in myasthenia gravis, 1457  
 Laws, J. J., Sonne dysentery in mental hospital, 192  
 Lay, R. A. Q., prognosis of psychological disturbances in childhood and adolescence (P) 1129  
 Layton, T. B., prognosis of "enlarged" tonsils (P) 1252

**LEADING ARTICLES**

Abortion, law of, 1073—Academic freedom, 727—Acetylcholine and derivatives, 903—Adelphi, demolition of, 905—Agriculture, public health and, 31—Air-conditioning, 848—Arterial embolctomy, 33  
 Bacterial evolution, 1417—Blood, storage of, for transfusion, 1246—Brain tumours, surgery of, 1305  
 Cerebro-spinal fever, continuous ventricular drainage in, 904—Cholangiography, 1245—Co-education, 33—Common cold and influenza, 1479—Coroners, 96, 377  
 Deaf, care of, 1361  
 Epidemiology, experimental, 1362—Epilepsy, water metabolism in, 489  
 Focal infection, 1479—Freud, S., eightieth birthday, 1015  
 General paralysis of insane, congenital, 490—Gerson diet, 153—Gonorrhoea, 613, hyperpyrexia for, 726  
 Heat regulation, 554—Hilton, John, 435—Honours, birthday, 1481—

Holder, Lord, farewell address, 266—Hospitals, overcrowding of, in London, 1015—Hospitals Year-Book, 1245—Human endurance, 1074—Hypertension, voluntary, 958  
 Induction of premature labour, 1191—Industry, physical standards in, 265—Influenza, 32, 1479—Institute of Medical Psychology, 1073—Insulin in schizophrenia, 1418; new compound of, 320  
 King George V., 205  
 London University, centenary of, 1480  
 Malaria epidemics, 322—Medicines and Surgical Appliances (Advertisement) Bill, 787—Meningitis, acute aseptic, 670—Mescaline in psychiatric research, 553—Midwifery: analgesia in, 319; Midwives Bill, 725—Milk: cytological examination of, 93; grades of, 1016—Mineral metabolism, 379, 847, and the suprarenal gland, 1304—Myasthenia gravis, prostigmin and, 491  
 Narcosis, treatment by, 671—National Institute for the Deaf, 1361—Natural selection, scope of, 1189—Nicotine poisoning, 555  
 Oestrin, tumours, and the pituitary, 788  
 Penal cases before G.M.C., 556—Peptic ulcer, 95, 612—Physical education, 93—Poisons law, 1121—Prostatic involution, 321—Protein therapy, 489—Public health code, 207  
 Radiography in obstetrics, 265—Royal Medical Benevolent Fund, 670, 1420  
 Salt and the sun, 379—Scarlet fever: and puerperium, 1122; hospitalisation of, 958—School-children, health of, 151—Security, 669—Sex and culture, 437—Short wave therapy, 436—Silicosis, 611—Spirochaetal jaundice, 849—Stomach, cancer of, 788, 1190—Streptococcal infections, chemotherapy of, 1303  
 Tuberculosis, segregation of, 1123  
 University Grants Committee, report, 957—Ureters in pregnancy, dilatation of, 152  
 Variations, causes of, 206  
 Whooping-cough, epidemiology of, 1419

League of Nations—nutrition problems and (LA) 31, 460, (PI) 1151; psycho-logy of international relations and, 274, 290, (A) 1308; Red Cross organisations and (PI) 1326; *see also* Dangerous drugs  
 Leak, W. N., vitamin B in nervous diseases, 867  
 Leary, T., future of coroner (C) 742  
 Leatham, R. R. (O) 689  
 Lectures, guide to, 178  
 Lee, D., appointment, 459  
 Leech, P., death of, 442, (O) 509  
 Leete, H. M., scarlet fever (C) 507  
 Leg, *see* Limbs  
 Leiper, R. T., on crustacea as helminth intermediaries, 369  
 Leites, S., initial state principle, 1348, (A) 1364  
 Lejars, Félix, Traité de Chirurgie D'urgence (R) 149  
 Lemierre, A., anaerobic septicaemias, 701  
 Lennie, R. A., Morton, E. D., Cameron, S. J., and Hewitt, J., Glasgow Manual of Obstetrics (R) 954  
 Lennox, W. G., on epilepsy (A) 853  
 Leong, P. C., vitamin B in urine, 886, (A) 964  
 Leprosy in British Empire (A) 618  
 Lett, H., oophorectomy and cancer of the breast (C) 1498  
 Lettsoman lectures, 759, 830  
 Leukoplakia, *see* Pruritus  
 Leukemia—focal infection and, 1451; spleen and (J. W. McNee) (P) 443  
 Levin, E., on hydrocephalus, 1135  
 Levitt, W. M., on cancer of breast, 481  
 Lewis, A., on manic-depressive insanity, 430  
 Lewis, E. C., Urology in Women (R) 552  
 Lewis, E. E., unusual internal haemorrhage, 255  
 Lewis, Sir T., on embolism in limbs, 1384  
 Lewis, W. J., puerperal scarlet fever (C) 1264  
 Leyton, O., on hyperglycaemic glycosuria, 431  
 Lian, C., L'année médicale pratique (R) 1478  
 Libraries—Classification for Medical Libraries (C. C. Barnard) (A) 961; Guild of Hospital Librarians, 123, 404, 1159  
 Lichen planus, *see* Pruritus

Life tables, *see* Vital statistics  
 Lighting—workmen's compensation and (ML) 221  
 Lillingston, C., His Patients Died (R) 846  
 Limbs—arm, clinical anatomy of (Praktische Anatomie) (T. von Lanz and W. Wachsmuth) (R) 29; Armless Fiddler (C. H. Unthan) 237; congenital absence of (A. H. Bizarro) 898; crushed, early amputation for (L. Abdelsamie) 187, (A) 1249, (H. Stiven) (C) 1441; *see also* Arteries  
 Linacre lecture, 1254  
 Lindsay, D. M., placenta praevia and post-partum haemorrhage, 1064  
 Ling, T. M., psychological factors in sickness absenteeism, 1274, 1333  
 Linstead, H., on statutory safeguards against poisoning, 543; Poisons Law (LA) 1121, 1313  
 Lipiodol—in biliary surgery (J. C. Ross) 251; in gynaecology, 372  
 Lister Institute of Preventive Medicine, report, 1434, (A) 1422  
 Lister memorial lecture, 877  
 Lithopedion (L. G. Lye) 123  
 Lithotomy instrument table, 1390  
 Little, C. J. H., gastro-jejuno-colic fistula, 1065  
 Liver—cirrhotic splenomegaly and, 428; congenital syphilis and (A) 38; Diseases of the Liver, Gall-bladder, Ducts and Pancreas (S. Weiss, J. P. Grant, and A. J. Quimby) (R) 91; familial cirrhosis, telangiectasia and (F. P. Weber) 305, (H. G. Garland) (C) 390; function of, phosphatase and, 1475; hepato-cerebral degeneration, 198; infiltration of, with lymphocyte-like cells (F. P. Weber and A. Schüller) 1115; insufficiency, congress on, 752; *see also* Anaemia, pernicious, Bile-ducts, and Jaundice  
 Liverpool School of Tropical Medicine, 1271  
 Livingstone, J. L., Aids to Medicine (R) 149  
 Livingstone-Learmonth, A., death of, 1331  
 Lloyd, E. I., instruments for fractures of neck of femur (NI) 318  
 Lloyd, H., presentation, 233  
 Lloyd Roberts lecture, 1228  
 Lloyd, V. E., gonadotropic hormones in sterility, 474  
 Local authorities—ambulances and (PI) 456; diseased food and (ML) 912; employment of architects by, 1277; Municipal Year Book, 985; school-children's health and (LA) 151; *see also* London County Council  
 Lockhart, L. P., risks of nicotine poisoning (C) 506, (LA) 555  
 Lockhart-Mummery, J. P., fistula-ano, 657  
 Lockwood, C. B. (Life and Works of Charles Barrett Lockwood) (E. C. O. Jewsbury) (R) 1187  
 Locomotion—Mechanics of Normal and Pathological Locomotion in Man (A. Steindler) (R) 1185  
 Lomholt, S., on alpha and beta rays in skin therapy, 1360  
 London—Public Health (London) Bill (PI) 813, (A) 789; sewage, 231, (A) 1484; suburb, consumption of milk in (E. H. R. Smithard) 235; tuberculosis, after-care of, 199; tuberculosis, notification of, 866; *see also* London County Council  
 London and Counties Medical Protection Society, Limited, 929, 1188  
 London County Council—building line, 628; committees, medical members of, 686; diphtheritic infections, 280; duties of, lectures on, 925; hospitals, overcrowding in (LA) 1015; maternity services, 224, 1266, (PI) 1268; measles, control of, 727, (A) 1018; mental hospitals and mental deficiency, 334; nutrition centres, 1497; remand home, medico-psychologist for, 1498; special treatment establishment (ML) 107  
 London Hospital Medical College, 1096  
 London Inter-Collegiate Scholarships Board, 459  
 London School of Hygiene and Tropical Medicine—conference, 873; lectures, 172, 873; research scholarship, 1271; yellow fever, 510  
 Longevity—causes of, 802; centenarians, French, 1221  
 Lord, F. T., and Heffron, R., Lobar Pneumonia and Serum Therapy (R) 1184  
 Lorenz, A., My Life and Work (A) 1482  
 Love, R. J. M., on appendicitis, 260  
 Low, G. C., ankylostomiasis in Indian seamen, 599

- Löwenstein, O., Die Störungen des Lichtreflexes der Pupille (R) 785
- Lowry, T. M., Optical Rotary Power (R) 90
- Luker, S. G., on induction of labour, 1180; treatment of vaginal discharge (C) 508
- Lumbosacral strain (G. A. G. Mitchell) 75
- Lumleian lectures, 618, 1337, 1391, (A) 1483
- Lung—abscesses of, otogenous (P. R. Allison, F. F. Hellier, and G. S. Seed) 1060; Diseases of the Chest (J. A. Myers) (R) 433; of electric arc welders (A. T. Doig and A. I. G. McLaughlin) 771; operations on, anaesthesia for (A) 383; pins inhaled into (J. McFarland) 198; pulmonary embolism, Trendelenburg operation for (A) 1365; radiography of, 406; vessels of, radiography of (A) 1307; *see also* Bronchi, Emphysema, Pneumonia, Respiratory efficiency, Silicosis, and Tuberculosis, pulmonary
- Lupus vulgaris, 388
- Lye, L. G., lithopedion in centenarian, 1238
- Lymphadenoma, spleen and, 443
- Lymphadenosis, aleukemic (F. P. Weber and A. Schüller) 1115
- Lymphocytic meningitis (G. M. Findlay, N. S. Alcock, and R. O. Stern) 650, (LA) 670
- Lynch, G. R., on tea and coffee, 386
- Lyster, R. A., School Course in Hygiene, 64
- M**
- Macalister, C. J., on comfrey, 1336; Origin and History of Liverpool Royal Southern Hospital (A) 1019
- Macalpine, J. B., Cystoscopy and Urography (R) 1360
- McAusland, S., varicose vein injections (C) 1034
- MacCallan, A. F., trachomatous conjunctivitis, 215
- MacCallum, D. R., fellowships in child guidance (C) 1216
- McCance, R. A., mineral metabolism, 643, 704, 765, 823, (LA) 847, 1304; on sodium chloride deficiency (LA) 379
- McCowan, P. K., prolonged narcosis in psychoses (C) 508
- McCullagh, W. M. H., hysterectomy forceps (NI) 841
- McDermot, H. E., History of the Canadian Medical Association (A) 99
- McDermott, E. N., dermoid cyst of gastrohepatic omentum, 898
- Macdonald, A. D., on choice of anaesthetic, 89
- MacDonald, S. G., prognosis of urinary calculi (P) 1311
- McEuen, C. S., administration of œstrin in rats, 775
- McFadyean, K., dressing for incisions, 1177
- McFarland, J., inhalation of pins, 198
- Macfarlane, R. G., Russell's viper venom (C) 509
- McFeely, J. D. (O) 1260
- McGarrity, J., control of measles (C) 332
- McGonigle, G. C. M., and Kirby, J., Poverty and Health (R) 1358
- Mackenna, F. S., histamine in rheumatism, 364
- MacKenna, R. M. B., on psoriasis, 664
- McKenzie, K. G., on operation for aural vertigo (A) 1366
- Mackenzie, M. T. (O) 287
- Mackenzie, R. D., Rift Valley fever virus, 140
- MacLagan, N. F., test-meals in gastric cancer (C) 1265
- McLaughlin, A. I. G., X ray appearances of lungs of electric arc welders, 771
- McLellan, E., undescended testis, 999
- McLester, J. S., Disorders of Metabolism (R) 486
- McNee, J. W., enlargement of spleen (P) 443
- MacNiven, A., on somnifaine therapy, 1182
- Macrae, F., death of, 326, (O) 398
- McRitchie, P., death of, 1154
- McSweeney, C. J., on juvenile rheumatism, 666
- McWhirter, R., on radiography of gastrointestinal tract, 222
- Maddocks, L., on cytological examination of milk (LA) 93
- Magill, I. W., on anaesthetics in thoracic surgery (A) 383
- Maingot, R., Post-graduate Surgery, Vol. I. (R) 486
- Majumder, A. R., collapse therapy in pleurisy and pneumonia (C) 226
- Malamud, W., Outlines of General Psychopathology (R) 317
- Malaria—blood transfusion and (W. L. Thomas, S. Keys, and S. C. Dyke) 536; dysentery and (P. Manson-Bahr) 830; epidemics of (LA) 322, (W. Schulemann) (C) 332; in Ceylon (PI) 513; in congenital general paralysis (LA) 490; in mycosis fungoides (A) 673; man-made, in India (A) 1308
- Malignant disease, *see* Cancer
- Malnutrition, *see* Nutrition
- Malpas, P., on radium in uterine bleeding, 914
- Mammary, *see* Breast
- Mandelic acid, *see* Urinary infections
- Manganese poisoning, notification of, 1096
- Mania, *see* Mental disorder
- Manipulative Methods in Treatment of Functional Diseases (E. L. Hopewell-Ash) (R) 1072
- Manson-Bahr, P. H., ankylostomiasis in Indian seamen, 599; diseases of colon, 759, 830
- Marchiava, E., death of (A) 271
- Maresch, Prof., death of, 388
- Marett, R. R., Tylor (R) 263
- Marion, G., Traité d'urologie (R) 846
- Marmite, booklet on, 126
- Marnoch, Sir J. (O) 336, 400
- Marr, H. C. (O) 1381
- Marr, J. S., ether convulsions (C) 1142
- Marrack, J., nutrition question (C) 739
- Marriage—cousin (J. B. S. Haldane) (C) 332; German legislature on (ML) 329; health examinations before (A) 383; Marriage in My Time (M. C. Stopes) (R) 1186; married women and doctors' bills (ML) 329
- Marriott, H. L., on continuous drip blood transfusion, 86; prognosis of acute poisoning (P) 795; Treatment of Acute Poisoning (R) 432
- Marshall, C. J., on diverticulitis of colon, 87
- Marshall, C. M., on uterine rupture, 952
- Marshall, J., treatment of vaginal discharge (C) 630
- Marshall, J. C., Detachment of the Retina (R) 1118
- Martin, C. P., appointment, 459
- Martin, E. K., prognosis in cancer of colon (P) 619
- Martin, P., on effects of radium on eye (A) 960
- Martindale, L., on uterine hemorrhage in non-malignant disease, 914
- Mason, G. A., extirpation of lung, 1047; mediastinotomy for surgical emphysema (C) 448
- Mason, H. (O) 1033
- Mastitis, *see* Breast
- Maternal mortality—abortion and, 404, (PI) 814; British Medical Association on, 736, (PI) 925; in Australia, 861; in England and Wales (PI) 514, 1042; in hospital (D. Baird) 295, 315, (LA) 319; in London, 224, 1266; in Rochdale, 545, (PI) 1500; in Scotland, 49, (PI) 634, 1270; *see also* Midwifery, Nutrition, and Puerperal infection
- Maternity and child welfare—Birmingham, 638; conference, 459, 1503; fathers' councils and, 821; Wallsend, 1218; Willensden, 821; progress in, 1042; *see also* Maternal mortality and Midwifery
- Mathewson, G. D. (O) 112
- Mattick, A. T. R., on examination of milk for tubercle bacilli (A) 268
- Mattick, E. C. V., value of raw and heated milk in nutrition, 1132
- Measles—control of (J. A. H. Brincker) 103, (J. D. Rolleston) (C) 168, (W. S. C. Copeman) (C) 226, (J. McGarrity) (C) 332, (A. Joe) (C) 972, (A) 1018, 1045; in London (A) 727, 1018; prognosis in (E. H. R. Harries) (P) 677; purpura hemorrhagica and (W. Edge) (C) 1036
- Mechanics of Normal and Pathological Locomotion in Man (A. Steindler) (R) 1185
- Mediastinotomy for surgical emphysema (G. A. Mason) (C) 448
- Medical and Other Verses (A. E. Roche) 65
- Medical annuals—L'année médicale pratique (C. Lian) (R) 1478; Medical Annual (H. L. Tidy and A. R. Short) (R) 1242
- Medical Art Society, 751, 1447
- Medical charity, *see* Charity
- Medical Diary, 66, 122, 174, 234, 289, 341, 404, 460, 517, 579, 638, 698, 753, 822, 872, 929, 979, 1046, 1098, 1155, 1219, 1278, 1331, 1390, 1449, 1508
- Medical Dictator (M. Greenwood) (R) 1243
- Medical Guide for India and Index of Treatment (E. J. O'Meara) (R) 955
- Medical Insurance Agency (A) 1080
- Medical men, *see* Practitioners
- Medical Prayer Union, 1154
- Medical Register—additions to (A) 672; names restored to, 751; *see also* General Medical Council
- Medical Research Council—appointments, 794, 873; bacteriological grading of milk, 217; Experimental Epidemiology (M. Greenwood, A. B. Hill, W. W. C. Topley, and J. Wilson) (LA) 1362; localisation of sound (A) 852; nutrition, 621; œsophagus, relations of (A) 1127; report, 621; travelling fellowships, 1075, 1096; tropical medical research committee (A) 558
- Medical Sickness, Annuity and Life Assurance Society, 750
- Medicine—Aids to Medicine (L. J. Livingstone) (R) 149; art of (C. Howard) 754; Bacteriology in Relation to Clinical Medicine (M. N. De and K. D. Chatterjee) (R) 487; Classification for Medical Libraries (C. C. Barnard) (A) 961; clinical (Lord Horder) 179, (LA) 266; congress of comparative medicine, 517; Minor Medical Mysteries (L. Williams) (R) 91; Minor Medicine of General Practice (L. V. Snowman) (R) 374; Symptoms and Signs in Clinical Medicine (E. N. Chamberlain and N. B. Capon) (R) 1477; *see also* Disease and Therapeutics
- MEDICINE AND THE LAW.—Abortion, alleged criminal, inquest depositions and, 278—Agranulocytosis and amidopyrin, 54—Card party for medical charity, 329—Certification, alleged wrongful, 1244—Chemical preparations, trade marks for, 1140—Contraceptives, Irish law against, 859—Coroner on medical errors, 969—Dangerous drugs, practitioners and, 164, 567—Dentists, damages against, 445, 1433; prosthetic, 1492; sale of dentist's practice, 54—Food: food poisoning, alleged, 860; preservative in, 222; unfit for consumption, 800, 912—Gynecomasty and accident, 682—Hospitals: actions against, 445, 501, 566, 1244; fraudulent conversion by secretary, 107—Hypodermic injection, foot-drop and, 500—Income-tax (deductions for practitioners, 912—Lysol soap, 1434—Marriage: German law and, 329; of girl under 16, 222—Married women and doctors' bills, 329—Mental disorder: crime and, 107, 221, 277, 1082, 1323; juries as judges of, 1206—Motorist's fainting fit, 1493—Murder cases, 164, 221, 277, 681, 1323, 1379, fresh evidence and, 860, 969—Nottingham nursing-home death, 278, 330, 566, title of "nurse" and, 1206—Paraldehyde, fatal dose of, 623—Practice, medical: locum tenens dispute, 683; sale of, 1027—Remand home criticised, 1083—Rheumatoid arthritis treatment, fatality following, 1379—Special treatment establishment, 107—Surgeon, negligence claim against, 969, 1378—Symbols or metric system, 624—Unregistered practitioners, 683, 1628—Venereal Disease Act infringement, 800—Visitation, charitable bequests and, 624—Workmen's compensation: illness, accident and, 683, 799; lightning and, 221; psychic pain and, 445
- Medicines, *see* Drugs
- Megaw, Sir J., public health in India, 61
- Melly, A. J., death of, 1080, (O) 1146
- Memory, loss of (A) 267
- Meningitis—lymphocytic (G. M. Findlay, N. S. Alcock, and R. O. Stern) 650, (LA) 670; pneumococcal, tonsillotomy and (S. E. Harris and H. A. Venikomsian) 143; treatment of (A) 495; tuberculous (W. T. Munro and H. Scott) 393, 479; *see also* Cerebrospinal fever
- Mennell, Z., anaesthesia (A) 438, (C) 504
- Menopause, 719
- Menstruation—breast changes and (A) 675; safe period and (A) 210; *see also* Amenorrhœa and Dysmenorrhœa
- Mental After-Care Association, 638, 1056
- Mental deficiency—amaurotic idiocy, pathology of, 199; boarding out (A) 1192; care of, in Ireland, 802; care of, in London, 334; certification, alleged wrongful (ML) 1244; convulsions and (A) 493; Guardianship Society, 1041; lectures on, 459; research on (PI) 577; special schools (LA) 151, (PI) 749



- Mental disorder—alcoholic pseudo-paresis and (E. W. Anderson) 477; Asylum (W. Seabrook) (R) 901; benzidine in (S. A. Peoples and E. Guttman) 1107; bromides and (A) 325; care of, in London, 334; childbirth and, intravenous anaesthesia for (S. Horsley) (C) 690; Destiny and Disease in Mental Disorders (C. M. Campbell) (A) 1196; endocrine system and (A) 271, 794; hypertension and (A) 853; I Knew 3000 Lunatics (V. R. Small) (R) 901; in-patient department for, in general hospital (A) 910; jury as judges of (ML) 1203; manic-depressive insanity (W. N. East) 161, (A) 155, 429; mesaline research and (LA) 553; narco-analysis for (J. S. Horsley) (C) 55; practitioner, priest and, 274; prolonged narcosis for (D. N. Parfitt) 424, (P. K. McCowan) (C) 508, (LA) 671, (R. Ström-Olsen) (C) 803, 1132; schizophrenia, insulin in (LA) 1418, (H. P. Strecker) (C) 1498; *see also* Crime, Nervous disorder, Psychiatry, and Psychology
- Mental health—clinics, 568; conference, 58, 274, 290; Mental Health (F. E. Howard and F. L. Patry) (R) 1072
- Mental hospitals—accommodation in (PI) 402; chaplains in (PI) 402; Glasgow Royal Mental Hospital, 569; hours of work in (PI) 1500; Lebanon Hospital for Mental Diseases, 1153, 1297; London, 334; London Hospital for Mental Diseases, 1153; medical officer's action against (ML) 1244; mental health and, 568; mental hygiene in (C) 922, (T. J. Hennelly) (C) 973; Napsbury, boy patient at (PI) 634; nurses in (PI) 402; pensioners in (PI) 697; Royal Edinburgh Hospital for Mental and Nervous Disorders, 568; Sonne dysentery in (J. J. Laws) 192; voluntary patients in (PI) 635, 814
- Menthol, dangers of, in childhood (A) 38
- Menzies, Sir F., on London maternity services, 1266; on nutrition centres in London, 1497
- Mercer, W., Orthopaedic Surgery (R) 1416
- Mercurial suppository in cardiac oedema (J. Parkinson and W. A. R. Thomson) 16, ammonium chloride and (A. Schott) (C) 118
- Mercury arc, new, 407
- Mercury bichloride poisoning (A) 617
- Merthiolate in tuberculosis (D. P. Lambert) 1176
- Mescaline in psychiatric research (LA) 553
- Metabolism—Body Water—the Exchange of Fluids in Man (J. P. Peters) (R) 148; Disorders of Metabolism (J. S. McLester) (R) 486; iron (L. J. Witts) 1; lipidoses and, 198; mineral (R. A. McCance) 613, 704, 765, 823, (LA) 847, 1304, 1406; nutrition, growth and, 258; water, in epilepsy (LA) 489; *see also* Sodium chloride
- Methylene dichloride intoxication (H. Collier) 594
- Microbiology, congress of, 40, 1490
- Microchemical Club, 515
- Microscopic, *see* Histology
- Micturition, prostate and (F. Riggall and C. Riggall) (C) 868
- Middlesex Hospital Medical School, address, 701
- Middleton, E. L., on silicosis (LA) 611
- Midwifery—analgesia in, 282, (LA) 319, 665, 844, (PI) 1094, 1148; asphyxia neonatorum and (A) 1249; dextel in, 1148; in Holland, 736; Midwives Bill (PI) 748, (LA) 725, 736, (PI) 1038, 1090, 1149, 1212, 1267, 1443, ten days standard and (A) 1079; Midwives Institute report, 736; rural, in United States, 580; salaried service of (A. S. Gregory) (C) 169; Textbook of Midwifery (R. W. Johnstone) (R) 846; training in, 736; *see also* Childbirth, Maternal mortality, and Obstetrics
- Miraine (C. Allen) (C) 805
- Milk—accredited milk producers' scheme (PI) 1040, 1091, 1151; attested herds scheme (PI) 456, 457; Chemistry of Milk (W. L. Davies) (R) 1070; consumption of (PI) 456, 457, 1325, 1446, in London suburb (E. H. R. Smithard) 235; designations (A) 272, (PI) 402, 514, 697, 752, (PI) 815, 866, 1036, (LA) 1016, 1196; examination and grading of (LA) 93, 121, (J. B. Howell) (C) 284, 217, (A) 268, 866; for hospitals (PI) 454, 575, (A) 676; for juvenile workers, 340; Milk Bill (PI) 402, 454, 512, 575, 634, 748; Milk: Production and Control (W. C. Harvey and H. Hill) (R) 90; nutritive value of, 985, (PI) 1446, sterilised milk and (E. C. V. Mattick and J. Golding) 1132; pasteurising plants, 518; *see also* Bovine tuberculosis, Lactation, Nutrition, and School-children
- Millen, S. A., on *B. coli* infections, 483
- Miller, E., on child psychology, 275; on limits of psychopathology, 1300
- Miller, R., congenital heart disease (P) 1197; on enuresis, 1010; syphilitic anaemia (A) 115
- Millin, T. J., on surgical treatment of impotence, 541
- Mills, J., death of, 802
- Mills, K. C., on common cold and influenza (LA) 1479
- Milroy lectures (LA) 611
- Mineral metabolism, *see* Metabolism
- Miners—nyctagmus (PI) 632, 1301; *see also* Industrial medicine and Silicosis
- Ministration, religious (Art of Ministering to the Sick) (R. C. Cabot and R. L. Dicks) (A) 963
- Ministry of Health—employment of architects, deputation on, 1277; pre-school child, pamphlet on (A) 1310; *see also* Public health
- Minnitt, R. J., on gas-air analgesia, 844
- Mitchell Banks memorial lecture, 987
- Mitchell, G. A. G., lumbosacral strain, 75
- Moffett, R., Castle's intrinsic factor in pernicious anaemia, 1232
- Moir, C., expulsive force of uterus during labour, 414
- Moncrieff, A., on jaundice in children, 1476; on unexpected rickets and scurvy (A) 36
- Monteith, W. B. R., bedside radiography for fracture, 254
- Montessori, M., on child psychology, 275
- Moodie, W., on enuresis, 1009
- Morax, V., tribute to, 1271
- Morbus Britannicus (S. E. Kofoid) 23, (C) 505, (A. J. Copeland) (C) 115
- Morison lectures, 1022
- Morison, A. G., prevention of disease by diet, 1472
- Morison, R., and Saint, C. F. M., Introduction to Surgery (R) 29
- Morland, A., on climate and tuberculosis, 1181
- Morley, H. S., gastro-jejuno-colic fistula, 1065
- Morphine poisoning at nursing-home (ML) 330, 566
- Morphology—Elementary Morphology and Physiology for Medical Students (J. H. Woodger) (R) 203
- Morris, R. J. (O) 453
- Morris, R. T., Fifty Years a Surgeon (R) 91
- Morrish, J. E., purpura hæmorrhagica and scarlet fever, 949
- Morton, D. J., Human Foot (R) 1012
- Morton, E. D., Cameron, S. J., Hewitt, J., and Lennie, R. A., Glasgow Manual of Obstetrics (R) 954
- Moseley, H. F., fascia introducer for hernia repair (NI) 956
- Mosenthal, H. O., Variations in Blood Pressure and Nephritis (R) 1071
- Mosquito, filarial migration in (A) 790
- Motorists—carrier licences and (A) 38; medical, 1154, badge for 694, (PI) 696, (G. C. Anderson) (C) 1329; tests for (PI) 1445; *see also* Road accidents
- Mottram, V. H., on food at health resort, 1139
- Moynihan, Lord, medical truants, 1254
- Mozer, M., Calvé, J., and Galland, M., La tuberculose ostéo-articulaire (R) 667
- Mucnde, L., on parasitic and fungal skin diseases, 314
- Muir, E., on leprosy in the Empire (A) 618
- Muir, Sir R., malignancy, 877
- Mumps orchitis (A) 851
- Municipal Year Book, 985
- Munro, Sir D., on physical standards in industry (LA) 265, 288
- Munro, W. T., meningial tuberculosis, 393
- Murder, *see* Crime
- Murphy, W. P., focal infection, 1451, (LA) 1479
- Mushin, W. W., dental prop, 1062
- Music, therapeutic value of, 821
- Mutations, *see* Evolution
- Myalgia, epidemic (A) 1194, in Manchester (W. J. Rutherford) (C) 1216
- Myasthenia gravis, prosthigmin in (Lady Briscoe) 469, (LA) 491, 903, (L. P. E. Laurent and M. B. Walker) 1457
- Mycosis fungoides (A) 673
- Myers, C. S., on mental fatigue, 662
- Myers, J. A., Diseases of the Chest (R) 433
- Myocardium, *see* Heart
- Myomectomy, 863
- N
- Nabarro, D., prognosis of congenital syphilis (P) 498, (LA) 490
- Nabi, A. A., pantocain L, 779
- Naegele pelvis, 722
- Napier, L. E., gastric acidity (C) 390
- Narcosis—analysis and (J. S. Horsley) (C) 55; prolonged, in psychoses (D. N. Parfitt) 424, (P. K. McCowan) (C) 508, (LA) 671, (R. Ström-Olsen) (C) 803, somnifaine for, 1182; *see also* Anaesthesia
- Nasal, *see* Nose
- National Baby Week, 1221
- National Ophthalmic Treatment Board film, 751
- National Temperance League, 340
- Natural History of Disease (J. A. Ryle) (R) 374
- Natural selection, *see* Evolution
- Naval Medical Compassionate Fund, 694
- Negligence—alleged, against surgeon and county council (ML) 969, 1378; alleged, doctor's bill and (A) 1306; alleged, hypodermic injection and (ML) 500, (C) 571; dentist's, for tooth in lung (ML) 445; hospital's, for child's fall (ML) 566; hospital's, polished floor and (ML) 445; paraldehyde, fatal dose of (ML) 623
- Neilans, A., regulation of prostitution, 64, (C) 923
- Neison, G. M., and Rehfuss, M. E., Medical Treatment of Gall-bladder Disease (R) 1070
- Nephritis—experimental (A) 1078; hypertension and (A) 380; Variations in Blood Pressure and Nephritis (H. O. Mosenthal) (R) 1071; *see also* Kidney and Sodium chloride
- Nervous disorder—asthma and (A) 96, 208, epilepsy, migraine, and (C. Allen) (C) 805; Enquiry into Prognosis in the Neuroses (T. A. Ross) (R) 723; Glasgow clinic for, 502; jhin jhinia, neuro-mimesis and (A) 790; Manipulative Methods in Treatment of Functional Diseases (E. L. Hopewell-Ash) (R) 1072; physical basis of (S. Ingvar) 343; practitioner, priest and, 274; prevention of, 65; sickness absenteeism and (T. M. Ling) 1274, 1333; treatment of, by family practitioner, 899; workmen's compensation and (ML) 445; *see also* Mental disorder, Psychology, and Stammering
- Nervous system—alcoholic pseudo-paresis (E. W. Anderson) 477; Diseases of the Nervous System (S. E. Jelliffe) (C) 170; heat regulation and (LA) 554; Holmes-Adie syndrome, 684; Rift Valley fever virus and (R. D. MacKenzie and G. M. Findlay) 140; *see also* Hemiplegia, Sympathectomy, and Vitamin B
- Netter, A., death of, 743
- Neumann, C. Z., foudain in undulant fever, 1001
- Neuritis, *see* Vitamin B
- Neurology—meeting in Holland (A) 1078
- Neurosis, *see* Nervous disorder
- Neurotropic, *see* Nervous system
- Neustatter, W. L., nutrition question (C) 690
- Newham, H. B., portraits of public health pioneers (C) 1262
- NEW INVENTIONS.—Circumcision forceps (H. J. B. Atkins) 610—Cystoscope, retrograde (T. J. D. Lane) 786—Face mask, aseptic (P. L. T. Bennett) 956—Fractures of neck of femur, instruments for (E. I. Lloyd) 318—Galvanocautery (R. T. Brain) 488—Gastric aspiration, continuous, tube for (H. Bailey) 150—Hernia repair, fascia introducer for (H. F. Moseley) 956—Hysterectomy forceps (W. McK. H. McCullagh) 841—Nasal catheter holder (C. A. Birch) 1014—Saline, intravenous apparatus for (C. E. Watson) 202—Transillumino-scope, pocket (H. Bailey) 902—Vasotomy outfit (J. F. Peart) 488
- NEW PREPARATIONS.—A-B-D Capsules (Abbott Laboratories) 581—Acriflavine B.D. (Intravenous) (British Drug Houses) 1336—Anahemin B.D.H. (British Drug Houses) 822—Apondon "Divag" (Coates and Cooper) 126—



Bellergal (Sandoz Products) 126—  
Brom-Nervacit (Brom-Nervacit Ltd.)  
581—Canned Pineapple Juice, "Dole  
Brand" (J. K. Husband and Co.) 1160  
—Clauden (Medical Laboratories) 66—  
Crookes' Super-D Oil (Crookes Labora-  
tories) 1336—Dissolved Vaccines G.L.  
(Glaxo Laboratories) 66—Entoral (Eli  
Lilly) 986—Eestofom (Crookes Labora-  
tories) 66—Eucortone (Allen and  
Hanburys) 822—Eulykol (Burroughs  
Wellcome) 1222—Hewsol (C. J. Hewlett  
and Son) 293—Immune Globulin  
(Human) (Lederle Laboratories) 1277—  
"Iozo" White Stainless Iodised Ointment  
(Christopher, Stanley and Co.) 581  
—"Kaldrox" Absorbent Compound  
(Petrolagar Laboratories) 126—Luteo-  
antin (Gedeon Richter) 822—Lysantol  
(Allen and Hanburys) 1277—Mandelix  
(British Drug Houses) 1160—Multivite  
Pellets (British Drug Houses) 293—  
"Neoket" Compound Mandelic Acid  
Granules (Boots Pure Drug Co.) 1277—  
Normo-gastrine (Burgoyne, Burbidge  
and Co.) 822—Novurit Suppositories  
(Chimoin Chemical and Pharmaceutical  
Works) 822—Petein (Schering-Kahl-  
baum) 581—Recresal (Coates and  
Cooper) 986—Skol Healing Antiseptic  
(Skol Products) 986—Stypven (Bur-  
roughs Wellcome) 985—"Tabloid"  
Blaud Pill and Copper (Burroughs  
Wellcome) 126—Trancusalve (Trans-  
cutan) 1336—Vasobroman (Gedeon  
Richter) 1222

Newsholme, H. P., on ophthalmia  
neonatorum, 842

Nicholls, P. L., Essex and Herts Bene-  
volent Medical Society (C) 1442

Nichols, A. B., and Ruddiman, E. A.,  
Incompatibilities in Prescriptions (R)  
1187

Nicol, W. D., on congenital G.P.I. (LA) 490

Nicolle, C., death of (A) 560, 570

Nicotinic poisoning (L. P. Lockhart) (C)  
506, (LA) 555, in infant, 1432

Nichans, P., hypertrophy of prostate, 307,  
(LA) 321, (A) 439

Nissen, N. I., on poliomyelitis (A) 793

Nitrogen retention—test for (J. F.  
Barrett) 84; *see also* Addison's disease

Nitrous oxide, *see* Midwifery

Noise—Anti-Noise League journal, 1221

Norris, C. T., sex and culture (C) 1087

Norris, T. St. M., perforated gastric ulcer,  
362

North, T., syntropan in sea-sickness (C)  
1263

Nose—blowing of, dangers of, 665;  
catheter holder (C. A. Birch) (NI) 1014;  
disease in, headache and, 1067;  
Diseases of the Nose and Throat (C. J.  
Imperatori and H. J. Burman) (R)  
204; ionisation for hay-fever (P. Frank-  
lin) (C) 1442, (A) 1424; reflexes from,  
respiration and, 368; submucous injec-  
tions of calcium (R. Bárány) (C) 570;  
Year Book of the Eye, Ear, Nose, and  
Throat (R) 433; *see also* Smell

Novurit, *see* Mercurial suppository

Nuffield, Lord, gift by, to orthopaedics  
(G. R. Girdlestone) (C) 55

Nursery schools (PI) 1215, 1386

Nurses—examinations, medical panel for,  
817; in mental hospitals (PI) 462;  
in Russia, 63; liability of (ML) 623;  
title of nurse (ML) 1206; training of,  
in Scotland, 569; tuberculous, home  
for, 519, 1450; *see also* General Nursing  
Council

Nutrition—Advisory Committee on (PI)  
697, 1501; agriculture and (LA) 31;  
Budget and (PI) 1038; Committee  
against Malnutrition, 515, 699; destruc-  
tion of food (PI) 1385, 1445; diet  
of people and (PI) 1446; Food, Health,  
and Income (Sir J. Orr) 679, (PI) 697,  
747, (B. Dunlop) (C) 805; in Soviet  
Russia, 699, 876; League of Nations  
and problems of (LA) 31, 460, (PI)  
1151; lectures on, 927; maternal mor-  
tality and (PI) 634, 1148; meals and  
milk for mothers and infants (PI) 634,  
697, 747, 1214; measles and, 677;  
Medical Research Council on, 621;  
metabolism, growth and, 258; prob-  
lem of (PI) 1501; question of (R. Hut-  
chinson) 583, (W. L. Neustatter) (C) 690,  
(J. Murrack) (C) 739, (E. P. Poulton)  
(C) 803, (W. M. Feldman) (C) 804,  
(V. Freeman) (C) 804; *see also* Diet,  
Milk, School-children, Unemployment,  
and Vitamins

Nuttall, H. C. W., on appendicitis, 261

Nystagmus, workmen's compensation and  
(PI) 632, 1501

Obesity—heart disease and (A) 793;  
Streamline for Health (P. B. Hawk)  
(R) 92

## OBITUARY

Ansari, M. A., 1212—Arch, A. J., 509  
—Asplen, W. W. R., 1212

Ballance, Sir C., 396, 450—Ballance,  
Sir H., 975, 1033—Banks-Davis,  
H. J., 636—Bárány, R., 910, 976—  
Battle, W. H., 396—Beatty, H. B.,  
338—Berry, J. B., 229—Blackburn,  
E. W., 1381—Blaikie, J. B., 574—  
Blair-Bell, W., 285—Bowen-Jones,  
L. M., 453—Bronner, A., 452—  
Brooke, G. E., 338—Buchanan, M.,  
231

Canti, R. G., 166—Cardale, H. J., 1032  
—Carless, A., 1022, 1097—Cassidy,  
D. M., 869—Cattanach, J. G., 1098,  
1147—Chesney, L. M., 112—Christie,  
J. M., 870—Clarke, S. H., 689—  
Coley, W. B. (A) 963—Collier, W.,  
51—Cope, A. E., 1381—Crew, F. D.,  
1327

Das, Sir K., 745—Dickey, A. A. G.,  
339—Dillon, T. F., 1260—Dixon,  
A. F., 228—Douglas, S. R., 229—  
Dowden, J. W., 636—Duel, A. B.,  
976—Duthie, W. C., 338

Eastwood, A., 1145—Eder, M. D., 869  
Favell, R. V., 453—Fergus, C. A., 287  
—Ferne, F. E., 231—Forsbrook,  
W. H. R., 399—Fraser, J. S., 1211

Galt, H. M., 453—Garrod, Sir A. E., 807  
—Gibson, E. V., 112—Giles, A. E., 53  
—Godson, J. H., 1260—Grant, J. G.,  
167—Gray, A. A., 165—Greig, D. M.,  
1145—Griffin, E. H., 688—Grims-  
dale, T. B., 688—Gubb, A. S., 452—  
Gunter, F. E., 869

Haldane, J. S., 687—Hanson, D. M.,  
746—Harrison, J., 113—Harrower,  
J. G., 910, 975—Hart, J. D., 113—  
Hennessy, T., 111—Herringham,  
Sir W., 1030—Hewatson, J. T., 1327  
—Hodson, E., 746—Hughes, F. M.,  
1211—Hughes, T. A., 1327—Hume,  
N. H., 869—Hurtley, W. H. (A) 1367

Jackson, J. W., 1147—Judd, E. S., 287

Kenderdine, Sir C. (A) 1251—King  
(George V. (LA) 205, 212—Kipling,  
Rudyard (A) 211—Kraus, F., 1327—  
Leatham, R. R., 689—Leech, P., 509

McFeely, J. D., 1260—Mackenzie,  
M. T., 287—Macrae, F., 398—  
Marchinfava, E. (A) 271—Marnoch,  
Sir J., 336, 400—Marr, H. C.,  
1381—Mason, H., 1033—Mathewson,  
G. D., 112—Melly, A. J., 1146—  
Mills, J., 802—Morris, R. J., 453  
Netter, A., 743—Nicole, C. (A) 560,  
570

Orlebar, J. A. A., 231—Osborn, S.,  
974

Pavlov, I. P., 564—Payne, A. E.,  
1098—Pearson, K. (A) 1021—  
Percival, A. S., 51—Petavel, Sir J.,  
794—Pinchin, A. J. S., 399—  
Power, P., 1260—Pritchett, S. I.,  
920—Pruen, S. T., 574

Read, M., 167—Reidy, J., 167—  
Rob. J. W., 337—Rogerson, C. J.,  
1097—Rose, F. P., 1147—Ruther-  
ford, J., 687

Saunders, E. A., 231—Shadwell, A.  
(A) 731—Shaw, H. B., 1144—  
Sheldon, W. S., 1033—Sheppard, A.,  
337—Smith, M. H., 974, 1033—  
Swanson, J., 1135

Tibbetts, T. M., 745—Turner, R.,  
113—Turner, W., 869—Tweddie,  
A. R., 745, 810

Umanski, M., 1260

Vann, A. M., 920—Vaquez, L. H., 970—  
Vernon, E. M., 452

Walther, C., 50—Waugh, A., 509—  
Westmacott, F. H., 52—White,  
C. J. G., 167—Whittaker, Sir J. S.,  
809—Williams, J. H., 399—Wilmer,  
W. H., 746—Wood, J., 165—Wright,  
J. H., 1381—Wyllis, H. J. M.,  
1260

Yule, V. T. B., 574

Obstetrics—breech delivery (A) 790;  
congress of, 849, 862, 913, (LA) 1191;  
Glasgow Manual of Obstetrics (S. J.  
Cameron, J. Hewitt, R. A. Lennie,  
and E. D. Morton) (R) 954; induction  
(J. H. Peel) 935, 1178, (LA) 1191,

(H. R. Spencer) (C) 1263; Naegele  
pelvis, 722; Obstetric Pelvis (H.  
Thoms) (R) 609; placenta previa,  
post-partum haemorrhage and (D. M.  
Lindsay) 1064; radiography in, 27,  
(LA) 265; Roman Catholicism and,  
640, (E. E. Ware) (C) 741; twin-  
locking (J. S. Coleman) 196; *see also*  
Childbirth, Maternal mortality, and  
Midwifery

O'Connor, F. W., on filarial migration in  
mosquito (A) 790

O'Donovan, W. J., Alleged Dye Der-  
matitis Committee (C) 1329

Oedema—cardiac, novurit suppository  
in (J. Parkinson and W. A. R. Thomson)  
16, ammonium chloride and (A.  
Schott) (C) 118; of ankles, air trans-  
port and (M. Weinren) (C) 170

Oesophagostomiasis (P. Manson-Bahr) 759

Oesophagus—carcinoma of (G. Grey  
Turner) 67, 130, retrograde oesophago-  
scopy in, 86; foreign bodies in (A)  
1018; radiography of, 222; relations of  
(A) 1127

Oestrin—cancer and (Sir R. Muir) 877,  
pituitary, tumours and (B. Zondek)  
10, (A) 37, (W. Cramer and E. S.  
Horning) 247; (A) 324, (B. Zondek)  
776, (LA) 788, (W. Cramer and E. S.  
Horning) 1056, cystic disease of  
breast and (A) 97, (E. Dahl-Iversen)  
1294; granulosa-cell tumour and,  
316; prolonged administration of, in  
rats (C. S. McEuen, H. Selye, and  
J. B. Collip) 775, (LA) 788; *see also*  
Sex hormones

Offices, health conditions in (PI) 695

Ogilvie, W. H., Treatment of Fractures  
in General Practice (R) 1360

Oldham, J. B., on renal degeneration, 484

Olive oil, intravenous, 860

Olsen, P. F., on cure in cancer of colon  
(A) 1306

O'Meara, E. J., Medical Guide for India  
and Index of Treatment (R) 955

Omnipraticiens (C) 1036

Operations—synthetic suture material  
for (A) 1195; *see also* Post-operative  
and Pre-operative

Ophthalmology—congress, 516, (A) 960  
*see also* Eyes

Optical Rotatory Power (T. M. Lowry) (R)  
90

Opuscula Selecta (A) 557

Oral sepsis, *see* Streptococcal infection and  
Teeth

Orchitis, mumps (A) 851

Order of St. John of Jerusalem—appoint-  
ments, 123, 1502; hospital library,  
233; promotions, 123, 1502

Orenstein, A. J., on health in Rand  
mines (A) 1248

Oriel, G. H., epilepsy and allergy (C) 741

Orlebar, J. A. A. (O) 231

Orr, Sir J., Food, Health, and Income,  
679, (PI) 697, 747, 805; on agriculture  
and public health (LA) 31

Orthopaedics—biological principles in (A)  
906; Brazilian society of, 1272;  
clinics for, in Cornwall, 1272; congress,  
873; Hibbs, Russell A. (G. M. Goodwin)  
(R) 92; Lorenz, A., work of (A) 1482;  
Mechanics of Normal and Pathological  
Locomotion in Man (A. Steindler) (R)  
1185; Nelson Loose-Leaf Living  
Surgery (R) 150; Orthopaedic Surgery  
(W. Mercer) (R) 1416; scholarship  
(G. R. Girdlestone) (C) 55, 978

Osborn, G. R., deductions from bullet  
wound, 1295, (A) 1309

Osborn, S. (O) 974

Osborne, S. E., aneurysm of splenic  
artery, 1007

Os calcis, fractures of, prognosis in  
(J. P. Hosford) (P) 733

O'Shaughnessy, L., phrenicosthasty in  
pulmonary tuberculosis, 534

Osteomyelitis, spontaneous fracture and  
(R. C. Tatham) 195

Osteoporosis, *see* Bone

Otitis—anaerobic septicemias and, 701;  
intracranial complications of, 1068,  
lung abscesses, spontaneous pneumo-  
thorax and (P. R. Allison, F. F.  
Hellier and G. S. Seed) 1060; measles  
and, 677; *see also* Deafness

Otosclerosis, blue sclerotics and, 661

Ovaries—cancer of, hysterectomy and,  
722; conservative treatment of, 862,  
(LA) 1191; extroversion of, for  
amenorrhoea, 315; graft of, 666;  
granulosa-cell tumour, 316; removal  
of, for cancer of breast (P. Paterson)  
1402, (H. Lett) (C) 1498; *see also*  
Sex hormones

Oxygen—debt (A) 381; *see also* Inha-  
lation therapy

## P

- Paget's disease of the nipple (J. P. Ross) 1025
- Pain—alcohol injection for (A. A. Davis) 80, (A.) 99. Intraspinal (W. R. Russell) 595, (A.) 852; diagnostic value of, 754; Eucupin analgesia for (A.) 731; psychogenic (A.) 792; *see also* Euthanasia and Sympathectomy
- Palestine—Rothschild-Hadassah University Hospital and Medical School, 1335
- Palmer, A. C., on sterility, 373
- Pancreas—Diseases of the Liver, Gall-bladder, Ducts and Pancreas (S. Weiss, J. P. Grant and A. J. Quimby) (R) 91; tumours of, hypoglycaemia and (A.) 792; *see also* Diabetics
- PANEL AND CONTRACT PRACTICE (*see also* Insurance, National Health).—Amputation of finger, 738—Appliances at cost price, 1029—Assistant, part-time, 279—Benefit: overpayments, 1265; unemployment and, 865—Certificates: irregular, 1495; of incapacity, 919; ophthalmic, 738—Clerical work, 333—Complaints against practitioners, 279, 685, 1210, 1380, 1495—Deposit and treatment, 1089—Dispensing discrepancy, 279—Envelopes, grubby, 971—Haemorrhage following dental extractions, 1090—Health insurance, American view of, 1437—Insulin for seamen, 573—London insurance committee clerk's letter, 113—Medical records, secrecy of, 815, 971—Panel treatment, employer and, 919—Prescribing, excessive, 1029, 1147—Prescriptions: payment for, 738; test, 971—Public medical services, 1265—Representation recommended, 685—Sickness in Scotland, 1147—Specialist services, 113, 573, 627, 738, 1495—Spinal jackets, 1209—Surgery: inspection, 574, 815; unrecognised, 1380—Temporary residents, 279—Tuberculosis notification, 866
- Panther, G. G., card party for medical charity (C) 391
- Pantocain L (A. A. Nabi) 779
- Paraldehyde—analgesia by midwives, 282, (LA) 319; fatal dose of (ML) 623
- Parasitology—Introduction to Human Parasitology (A. C. Chandler) (R) 1359
- Parathyroid glands—Parathyroids in Health and Disease (D. H. Shelling) (R) 28; surgery of, 119
- Pareto (E. Borkenau) (R) 263
- Parfitt, D. N., prolonged narcosis for psychoses, 424, (LA) 671
- PARIS, CORRESPONDENCE FROM.—Academy of Surgery, 569—Aschheim-Zondek reaction, lawsuit and, 1136—Autopsies, precautions against infection at, 861—Bacteriological warfare, 1136—B C G statistics, 683—Birth-rate, 278—Breast-feeding, decline of, 1430—Cremation, 744—Euthanasia, 446—Handwriting, study of, 1385—Hippocratic oath, 446—Hospitals: exploitation of, 861; large-ward, 862—Identity cards, 569—Medical articles in lay press, 1136—Medical defence union, 970—Netter, A., death of, 743—Nicolle, C., death of, 570—Paris traffic, 569—Pink disease, 1384—Practices, medical, traffic in, 1205—Practitioners: family, 278; nineteenth century, 1205; position of, 446—Prizes and awards, 110—Rat-bite fever, 684—Silicosis, 684—Sprained ankle, novocain injection for, 1431—Typhoid fever, 1431—Vaquez, L. H., death of, 970—Venereal disease, 50, 970—Walther, C., death of, 50
- Parish, H. J., on swab in diphtheria, 256
- Parkes, A. S., sex hormones and accessory substances, 837, (A) 850; sex hormones and prostate, 242
- Parkinson, J., enlargement of the heart, 1337, 1391, (A) 1483; mercurial suppository for cardiac oedema, 16
- PARLIAMENTARY INTELLIGENCE
- Abyssinia: bombing of Red Cross units in, 402, 455, 635, 696; Italian arrest of British subject, 1269—Acetic vinegar, 814—Air attacks: food contamination and, 1040; protective measures against, 514, 634, 814, 924, 1215, 1501—Air pilots, medical examination of, 634—Alcohol: dangers of, instruction in, 749; road accidents and, 633—Aliens and medical practice, 871—Ambulance services, 456, 514—Amidopyrin, 456—Anesthetics: deaths from, 456; surgical operations and, 513—Animals: diseases of, research on, 458; vivisection, 1150, 1214, 1325, 1385—Antimony in enamel ware, 814—Anti-tetanus serum, 1094—Army: cerebro-spinal fever in, 750; recruits, defective health of, 577, 696, 1269, 1445—Atmospheric pollution: coal fires and, 696; smokeless fuel and, 577
- Birth registration, mother's age and, 1094—Bovine tuberculosis: elimination of, 457; Spallinger treatment for, 750—Budget, 977, social services and, 1038—Butter, imported, 1040
- Cancer mortality, 1325—Children: adoption of, 455; corporal punishment of, 923; death of child at children's home, 1040; pre-school, 1445—Coroners: committee on, 634; expressions of opinions by, 514—Cost-of-living index number, 924, 1325—Crime: medical attendance of arrested persons, 403; murder convictions, 576; psychological treatment of, 632, 871, 1151; publication of offensive evidence, 513
- Dangerous drugs: addicts, 1325; loss of, 403—Dead, disposition of, 695—Deaf: hearing aids, advertisement of, 814; vocational training, 1269—Diphtheria immunisation, 1325—Dust in card-rooms, 814, 1151
- Education Bill, 1324—Erysipelas deaths, 635
- Factories: accidents in, 633; health conditions in, 635—Fire: prevention of, in hospitals and institutions, 144; protection of life from, 401—Food: contamination, newspaper wrappers and, 575; destruction of, 1385, 1445; supply of, in war time, 1325, 1445—Foot-and-mouth disease, imported chilled meat and, 576
- Honey, "prepared," sale of, 1270—Hospitals: ambulance services and, 514; General Nursing Council rules and, 514, 697; military, at Radford, 1501; temperature and humidity in, 749; Voluntary Hospitals (Paying Patients Bill) 341, 1039, 1150—Housing: Bethnal Green slums, 514; condemned, in London, 341; of aged persons, 1269; overcrowding, 1040, 1151, 1445; rehousing accommodation, 1326; town and country planning, 1269; vermin-infested bricks, 696
- Incapacity: light work and, 635; partial, insurance and, 1500—Inflammable toys, 1269—Influenza: and common cold, 1270; at Chatham Barracks, 697—Insurance, National Health: 977; dental benefit and, 1041; ophthalmic benefit and, 1151; regional medical service, 1094; small traders and, 750; spa treatment and, 401; unemployment and, 341—Invalid carriages, exemption from duty of, 1500
- League of Nations: nutrition and, 1151; Red Cross organisations and, 1326
- Malaria in Ceylon, 513—Maternal mortality: 514, 634, 634, 925, 1500; abortions and, 814; in Scotland, 1270—Maternity services, 513, 1094, 1268—Meals for mothers, 634, 1214—Medicines and Surgical Appliances Bill, 460, 811, 1501—Medicine stamp duty, 813—Mental deficiency: research on, 577; special schools for, 749—Mental disorder, out-patient clinics for, 925—Mental hospitals: accommodation in, 402; chaplains in, 402; hours of work in, 1500; maintenance charges and, 1326; Napsbury, boy patient at, 634; nurses in, 402; pensioners in, 697; voluntary patients in, 635, 814—Midwives Bill, 748, 1090, 1149, 1212, 1267, 1443, for Scotland, 1150, 1445—Milk: accredited milk producers' scheme, 1040, 1094; attested herds scheme, 456, 457; designations, 402, 514, 697, 814, 1151; for mothers and infants, 634, 697; in schools, 457, 747; Milk Bill, 402, 454, 512, 575, 634, 748; national health and, 747; price, public demand and, 457; production and consumption of, 456, 1325—Motor driving: diabetic patients and, 514; facilities for practitioners, 696; tests, 1445
- Nursery schools in slum areas, 1215—Nursing: General Nursing Council rules, 514, 697; national pension fund for nurses, 813—Nutrition: League of Nations and, 1151; national health and, 576, 747; nutritive values of foods, 1446; problem of, 1501; surveys, 401, 697—Nystagmus, 632, 1501
- Offices, health conditions in, 695—Omnibus men, gastric disorders among, 749
- Palestine, medical facilities in, 1040, 1500—Pensioners: blind and insane, 697; blind, 872, guide dogs for, 696; cost of, in hospitals, 872; expectation of life of, 576; hospital allowances and, 456; temporary, 814—Poisons: loss of, 403; Poisons Act, 696; rules, interpretation of, 455—Practitioners: motor facilities for, 696; panel, clerical assistance and, 872; poison-gas treatment and, 1501—Prescribing: illegible, 455; insurance, excessive, 1094—Prison: prisoner's defiance of medical officer, 872; Scottish, dietaries of, 1446; warder, blood transfusion and, 1326—Public assistance to persons over sixty-five, 1269—Public Health Bill, 576, 814, 871, 1093—Public Health (London) Bill, 813—Puerperal infection: in Derbyshire, 750; quarantine of midwives, 1326
- Radium supplies, 872—Road accidents: alcohol and, 633; danger spots and, 925; in 1935, 341; sounding of horns and, 634—Royal Air Force: flying near Colindale Hospital, 1501; margarine supplied in, 749, 871—Royal Army Medical Corps deficiency, 1270
- Scarlet fever, destruction of school books and, 458—School-children: clothing for, 456; dental services for, 577; meals for, 515; milk for, 454, 457, 512, 575, 634, 747; nutrition surveys of, 401; physical education for, 511, 813; school home work, 454—Schools: health conditions in, 1326—Scientific apparatus, importation of, 1385, 1444—Scottish health services, committee on, 1445—Sewage, rural, 1151—Shops (Sunday Trading Restriction) Bill, 1093—Silicosis, 513, 514, 575, 632, 1094, 1095, 1149—Small-pox: deaths from, 577; in India, 750; port notification of, 1269; vaccination and, 403, 513—Stone-dusting regulations in mines, 458
- Telephone calls, emergency, 402—Temperature and humidity conditions in hospitals and schools, 749—Tuberculosis in Wales, 576, 1325—Typhoid in Derbyshire, 402, 697
- Unemployment: distressed areas, 341, 697; insurance benefits and, 341; malnutrition and, 576, 1500; means test, 923, 1038; needs of invalids and, 1215; training centres, 575, 696, 749, 813, 1093
- Vaccination: deaths following, 513, 576; lymph from rabbits, 456; lymph supplies for, 513; small-pox and, 403, 577—Ventilation of House of Commons, 1095—Veterinary surgeons, local authorities and, 1151
- Wales, bronchitis and tuberculosis in, 576, 1325—Water-supplies: grants for, 401; pollution of, 1094, 1151, 1268, 1444—West Africa, medical service in, 1093—Wheat reserve for war emergency, 1445—Women and young persons, employment of, 1150—Women in mines, 1268—Working hours, reduction of, 1385—Workmen's compensation: departmental inquiry into, 401; medical and legal expenses, 402; negligence of fellow workmen and, 748; nystagmus patients and, 1501; rehabilitation and, 1214; Workmen's Compensation Convention, 634, 814
- Paronychia (N. Eckhoff) (P) 1425
- Parotid—duct, dilatation of (R. T. Payne) 655; fistula (J. G. Cook) 1239; swelling, recurrent (A) 268
- Parry, L. A., on doctor as detective, 1276
- Parsons, F. G., History of St. Thomas's Hospital (R) 785

- Parsons, L. G., on steatorrhœa, 1299  
 Passira, F., death of 109  
 Pasterisation, *see* Milk  
 Pastour, J. F., cirrhotic splenomegaly, 428  
 Paterson, P., oophorectomy and splenectomy in cancer of breast and uterus, 1402  
 Paterson, R., on carcinoma of breast, 481  
 Pathergic state (S. Leites) 1348, (A) 1364  
 Pathology—Human Pathology (H. T. Karsner) (R) 667; Pathology of Internal Diseases (W. Boyd) (R) 723; postage of specimens, 403; Textbook of Surgical Pathology (C. F. W. Illingworth and B. M. Dick) (R) 902  
 Patients—His Patients Died (C. Lillings-ton) (R) 846; married women, bills and (ML) 329; Patient and the Weather (W. F. Petersen) (R) 375  
 Patry, F. L., and Howard, F. E., Mental Health (R) 1072  
 Pavlov, I. P., death of, 564  
 Payne, A. E. (O) 1098  
 Payne, R. T., dilatation of Stenson's duct, 655; phlebitis in varicose veins (C) 1034  
 Pearl, R., on constitution and disease (A) 793  
 Pearson, K., death of (A) 1021  
 Peart, J. F., vasotomy outfit (NI) 488  
 Peel, J. H., induction of labour for disproportion, 935, (LA) 1191  
 Pellagra—preventive factor, *see* Vitamin B  
 Pelvis—kidney, 259; Naegele, 722; Obstetric Pelvis (H. Thoms) (R) 609  
 Pemberton, W. W., appointment, 578  
 Pemphigus acutus (F. L. Ker) 718  
 Penmacmawr, climate of, 237  
 Pensioners—blind and insane (PI) 697; blind, guide dogs for (PI) 696; blind, number of (PI) 872; expectation of life of (PI) 576; hospital allowances (PI) 456; in hospital, cost of (PI) 872; neurasthenic and shell-shocked (PI) 814  
 Pentothal sodium anaesthesia (R. Jarman and A. L. Abel) 422  
 Peoples, S. A., hypertension and benzedrine, 1107  
 Peptic ulcer—gastro-jejuno-colic fistula and (H. S. Morley, R. Brooke, and C. J. H. Little) 1065; histidine in (LA) 95, (A. H. Bartley) (C) 117, (R. H. Gardiner) 1352, (A) 1365; observations on (D. T. Davies) 521, 585, (LA) 612, (E. Rosenthal) (C) 1263; perforated (T. St. M. Norris) 362; post-operative mortality of (A) 557; subphrenic abscess and (W. Broadbent) 1474  
 Percival, A. S. (O) 51  
 Peritoneum—non-specific immunity of (A) 558; *see also* Polyserositis  
 Perkius, G., on fractures about shoulder-joint, 602  
 Peroncal Type of Progressive Muscular Atrophy (J. Bell) (R) 1184  
 Perry, C. B., Bacterial Endocarditis (R) 954  
 Personality, human (A) 1196  
 Pes cavus, 147  
 Petavel, Sir J., death of, 794  
 Peters, B. G., on helminthology, 369  
 Peters, J. P., Body Water—the Exchange of Fluids in Man (R) 148  
 Peters, R. A., biochemical lesion in vitamin-B deficiency, 1161  
 Petersen, W. F., Patient and the Weather (R) 375  
 Pettekofer, epidemiological school of (A) 1194  
 Pharmaceutical Society, 124, 340  
 Pharmacopœias—British Pharmacopœia, addendum to (A) 793, 1366; Gadd's Synopsis of the British Pharmacopœia, 1158; Pharmacopœia of the Royal Infirmary, Edinburgh, 875; United States pharmacopœia (A) 1366  
 Pharmacy jars (C. J. S. Thompson) 1157  
 Phenanthrene (Chemistry of Natural Products related to Phenanthrene) (L. F. Fieser) (R) 1478  
 Phenobarbital, jaundice due to (C. A. Birch) 478  
 Phlebitis, *see* Veins  
 Phlycten, 664, (A) 909  
 Phosphatase and liver function, 1475  
 Phosphorus metabolism (R. A. McCance) 643  
 Photography, handbook of, 700  
 Phrenic nerve operations, *see* Tuberculosis, pulmonary, surgery of  
 Physical education—1152; British Medical Association report on, 928; in schools, 49, 125, (LA) 93, (PI) 511, 813, 928; "Keep fit" movement, 125, (LA) 93; lectures, 288  
 Physical medicine—climate, epidemics and (A) 1194; climate, tuberculosis and, 1181; climatophysiology conference, 516; congress of, 919, (A) 1128, 1152, 1200, 1219, (A) 1248; developments in, at Bath, 340; Hydrotherapy and Climatotherapy (M. B. Ray) (R) 1301; International Society of Medical Hydrology, 926; Patient and the Weather (W. F. Petersen) (R) 375  
 Physical standards, *see* Incapacity  
 Physics—Manual of Physics (J. A. Crowther) (R) 1359; Optical Rotatory Power (T. M. Lowry) (R) 90  
 Physiology—Elementary Morphology and Physiology for Medical Students (J. H. Woodger) (R) 203; Experimental Physiology (M. B. Visscher and P. W. Smith) (R) 317; normal and pathological (Traité de physiologie, normale et pathologique) (G. H. Roger and L. Binet) (R) 204; Synopsis of Physiology (A. R. Short, C. I. Ham, and C. L. G. Pratt) (R) 724  
 Pickering, D., on climate of Penmaen-mawr, 237  
 Pickering, G. W., on obliterative arterial disease, 540  
 Pillow, feather, dangers of (A) 1367  
 Pim, F. de B., death of, 414  
 Pinchin, A. J. S. (O) 399  
 Pineal gland (A) 558  
 Pinea, A., blood counts in tuberculosis (C) 1216  
 Pink disease, in France, 1384  
 Pins, inhalation of (J. McFarland) 198  
 Pituitary extract, action of, on colon (A) 384  
 Pituitary gland—diabetes and (O. L. V. de Wesselow and W. J. Griffiths) 991, (A) 1022; differential cell counts of (A) 1307; exophthalmos and, 182; Simmonds's disease and, 951; tumours of, operations on (H. Cairns) 1223, 1291, (LA) 1305; *see also* Estrin and Sex hormones  
 Placental extract, *see* Measles  
 Placenta previa—post-partum hæmorrhage and (D. M. Lindsay) 1064; uterine rupture and, 952  
 Plague, rats and, 281  
 Plant Viruses (K. M. Smith) (R) 1013  
 Plaster work, *see* Fractures  
 Platt, R., mandelic acid and ammonium mandelate in urinary infections, 769  
 Pleural—pain, artificial pneumothorax in (A. R. Majumder) (C) 226; *see also* Polyserositis and Tuberculosis, pulmonary, surgery of  
 Plimsoll, S. R. C., hospitals and the rates (C) 448  
 Ploss, H. H., Bartels, M., and Bartels, P., Woman (R) 1185  
 Pneumococcal meningitis, tonsillectomy and (S. E. Harris and H. A. Yenikomshian) 143  
 Pneumoconiosis, *see* Silicosis  
 Pneumonia—artificial pneumothorax in (A. R. Majumder) (C) 226; diagnosis and treatment of (C. Howard) 754; Lobar Pneumonia and Serum Therapy (F. T. Lord and R. Hefron) (R) 1184; measles and (E. H. R. Harries) (P) 677; olive oil therapy in, 860  
 Pneumothorax—benign, spontaneous (P. R. Allison, F. F. Hellier, and G. S. Seed) 1060; *see also* Artificial pneumothorax  
 Poison gas, *see* Air attacks  
 Poisoning—acetic acid (PI) 814; acute, prognosis in (H. L. Marriott) (P) 795; atebriin (M. V. Govindaswamy) (C) 56; bromide (A) 325; corrosive sublimate (A) 617; lead, 1476; manganese, notification of, 1096; methylene dichloride (H. Collier) 594; nicotine (L. P. Lockhart) (C) 506, (LA) 555, in infant, 1432; paraldehyde (ML) 623; strychnine, detection of (A) 495; Treatment of Acute Poisoning (H. L. Marriott) (R) 432; *see also* Crime and—  
 Poisons—amidopyrin, sale of (PI) 455; for rodents, 404, 580; loss of (PI) 403; law and (A) 37, (PI) 455, 543, (C) 1088, (LA) 1121, 1313  
 Poliomyelitis—(A) 793; vaccination, danger of (A) 158  
 Pollen Grains (R. P. Wodchouse) (R) 1118, (A) 1126  
 Polyneuritis, *see* Vitamin B  
 Polyserositis (O. K. G. Guyer and F. B. Smith) 362  
 Poor law, district medical service under, 1439  
 Population, *see* Vital statistics  
 Post-graduate courses: Aberdeen, 638—Berlin, 1503—Birmingham, 637—Fellowship of Medicine and Post-Graduate Medical Association, 59, 173, 233, 328, 459, 578, 694, 873, 978, 1100, 1154, 1218, 1336, 1447—Freiburg, 978—Glasgow, 1153—Joint Tuberculosis Council, 816—Newcastle, 123—New South Wales, 501—Paris, 515—Public health, 1207—Royal National Orthopedic Hospital, 288—St. Bartholomew's Hospital, 1042; *see also* British Postgraduate Medical School  
 Post-graduate Surgery, Vol. I. (R. Maingot) (R) 486  
 Post-mortems—clinical medicine and (Lord Horder) 179, (LA) 266; infection at, in Paris, 861; Post Mortems and Morbid Anatomy (T. Shennan) (R) 667  
 Post Office—medical services (H. H. Bashford) 1505, (A) 1485; messenger, brightness of (LA) 31, (H. H. Bashford) (C) 117; visit to, 519  
 Post-operative—dressing for incisions (K. McFadyean) 1177; gangrene (A) 494, 964; mortality in gastric surgery (A) 557; treatment of anorectal wounds (W. B. Gabriel) 1345; *see also* Catgut  
 Pot, A. W., macroscopic agglutination test in Weil's disease, 1290  
 Potassium metabolism—(R. A. McCance) 643; Addison's disease and (LA) 1304  
 Poulton, E. P., on nutrition, 258, (C) 803  
 Poverty, *see* Unemployment  
 Power, P. (O) 1260  
 Practice, medical—Home Market (G. Harrison and F. C. Mitchell) 876; Minor Medicine of General Practice (L. V. Snowman) (R) 374; sale of (ML) 1027, 1205; Treatment of Fractures in General Practice (W. H. Ogilvie) (R) 1360; Treatment of Venereal Disease in General Practice (T. Anwyl-Davies) (R) 1357; *see also* Refugees and—  
 Practitioners—American, young (A) 908; as detectives, 1276; Austrian, position of, 109; called to the bar, 289; damages claims by (ML) 501, 1244; dangerous drugs and (ML) 164, 567; Doctor's Odyssey (A. G. Beaman) (R) 263; family, treatment of necrosis by, 899, (A) 1486; French, 278, 446, 1036, of nineteenth century, 1205; German marriage laws and (ML) 329; Hungarian, unemployed, 223; income tax and, 177, (ML) 912; increased hospitalisation and, 1028; insurance, complaints against (PCP) 279, 685, -1210, 1380, 1495, payment and (A) 1306; insurance, representation concerning (PCP) 685; locum tenens dispute (ML) 683; motorists, badge for 694, (PI) 696, (G. C. Anderson) (C) 1329; "omnipraticiens" in France (C) 1036; poison-gas treatment and (PI) 1501; presentations to, 340; telephone exchange for, 1217; truant (Lord Moynihan) 1254  
 Pratt, C. L. G., Short, A. R., and Ham, C. I., Synopsis of Physiology (R) 724  
 Pregnancy—albuminuria of, protein diet and (A) 99; anaemia in (J. A. Boycott) 1165, (A) 1421; Aschheim-Zondek reaction, litigation and, 1136; corpus luteum and, 568; eclampsia and toxæmia of, 370, (J. B. Banister) (P) 1487, blood pressure in (F. J. Browne and G. H. Dodds) 1059; lithopædion (L. G. Lye) 1238; neuritis of, vitamin B in (G. W. Theobald) 834; renal calculi and, 952; ruptured uterus and (I. H. K. Stevens) 538; Simmonds's disease and, 951; torsion of appendix in (G. Flatley) 1357; uterine in (LA) 152, (A) 210, 259; *see also* Childbirth and Ectopic pregnancy  
 Premature burial—Society for Prevention of Premature Burial (C) 333  
 Pre-operative medication (A) 851  
 Preputiomy, *see* Circumcision  
 Prescribing—illegibility of prescriptions (PI) 455; incompatibilities in Prescriptions (E. A. Ruddiman and A. B. Nichols) (R) 1187; Incompatibility in Prescriptions (T. Stephenson) (R) 608; insurance, excessive (PCP) 1029, 1147, (PI) 1094; insurance, payment for (PCP) 738; insurance, test prescriptions and, 971; Prescription Writing and Formulary (C. Solomon) (R) 434; symbols or metric system (ML) 624  
 Preston, T. W., vasovagal attack (C) 170  
 Price-Jones, C., on measurement of red cell (A) 560

Princes in the Tower (A) 1367  
 Prisons—health in (A) 1078; hunger strike (H. B. Rosair) 778; prisoner's defiance of medical officer (PI) 872; Scottish, diet in (PI) 1446; *see also* Crime  
 Pritchett, S. I. (O) 920  
 Proctidentin, *see* Genito-urinary  
 Progesterone, *see* Sex hormones  
**PROGNOSIS.**—Arthritis (C. W. Buckley) 1023, 1081—Asthma (L. J. Witts) 273—Cerebral concussion and contusion (C. P. Symonds) 854—Chronic bronchitis and emphysema (R. A. Young) 101—Colon, carcinoma of (E. K. Martin) 619—Dacryosis (H. Barwell) 159, 214—Eclampsia and toxæmia of pregnancy (J. B. Banister) 1487—Food poisoning (W. G. Savage) 965—Fractures of os calcis (J. P. Hosford) 733—Fractures of upper end of femur (G. F. Stebbing) 385—Hand infections (N. Eckhoff) 1369, 1425—Heart disease, congenital (R. Miller) 1197—Hemiplegia (N. Hobhouse) 327—Measles (E. H. R. Harris) 677—Poisoning, acute (H. L. Marriott) 795—Psychological disturbances in childhood and adolescence (R. D. Gillespie and R. A. Q. Lay) 129—Spinal caries (Sir H. Gauvain) 562—Spleen, enlargement of (J. W. McNece) 443—Sprue, tropical (N. H. Fairley) 911—Syphilis, congenital (D. Nabarro) 498—Tonsils, "enlarged" (T. B. Layton) 1252—Trigeminal tic (W. Harris) 41—Urinary calculi (S. G. MacDonald) 1311  
 Progressive muscular atrophy (Peroneal Type of Progressive Muscular Atrophy) (J. Bell) (R) 1184  
 Prolapse, *see* Genito-urinary  
 Prontosil, *see* Puerperal infection and Streptococcal infection  
 Prosser White oration, 1368  
 Prostate—stones in, 1312; *see also* Sex hormones  
 Prostigmin, *see* Myasthenia gravis  
 Prostitution, regulation of (A. Neilans) (C) 64, 923, (C) 631  
 Protein—diet in pregnancy (A) 99; therapy (LA) 489; X ray analysis of, 1152; *see also* Nitrogen retention  
 Protozoal infections, 314  
 Proust (From Rousseau to Proust) (H. Ellis) (R) 1012  
 Pruen, S. T. (O) 574  
 Pruritus of vulva and anus (E. Hunt) 592, (C) 741, (A) 617, (A. Savill) (C) 691, 754  
 Psittacosis, 801  
 Psoriasis—664; vulval pruritus and (E. Hunt) 592  
 Psychiatry—Objective and Experimental Psychiatry (D. E. Cameron) (R) 609; Practical Clinical Psychiatry (E. A. Strecker and F. G. Ebaugh) (R) 1072; *see also* Mental disorder and—  
 Psychology—Behaviour Development in Infants (E. Dewey) 1013; child guidance, 1022, 1154, 1215, (D. R. MacCallman) (C) 1216, (A) 1484; childhood, psychological disturbances in, 274, (H. Weber) 981, (R. D. Gillespie and R. A. Q. Lay) (P) 1129, 1221; co-education, problem of (LA) 33; community welfare and, 288; diploma in psychological medicine, 515; dramatic Purpose of Hamlet (J. H. E. Brock) 63; Essentials of Psychopathology (G. W. Henry) (R) 1186; fatigue, 662; Freud, S. (Autobiographical Study) (LA) 1015, (A. Wohlgenuth) (C) 1086; From Rousseau to Proust (H. Ellis) (R) 1012; I and Me (R. G. Howe) (R) 609; Infant Behaviour, Genesis and Growth (A. Gesell and H. Thompson) (R) 668; Institute of Psycho-Analysis, 578; medical (R. M. Ladell) 175, 485, (A) 614, 1117, 1360, (A) 1486, education in, 757; memory, loss of (A) 267; Mental Health (F. E. Howard and F. L. Patry) (R) 1072; of incapacity, 857, (A) 946; of international relations, 271, (W. Brown) 299, (Dangers of Being Human) (E. Glover) (A) 1308; Outlines of General Psychopathology (W. Malamud) (R) 317; pain, psychogenic (A) 792; Psychology and Practical Life (M. Collins and J. Drever) (R) 1013; Psychology and Religion (D. Forsyth) (R) 1359; security, national and individual (LA) 669; surrealism exhibition, 1459;

*see also* Emotion, Institute of Medical Psychology, Mental disorder, and Nervous disorder  
 Psychoneurosis, *see* Nervous disorder  
 Psychopathology, *see* Psychology  
 Psychoses, *see* Mental disorder  
 Psychosin (A) 850  
 Puberty, physiological changes during (A) 269  
 Public assistance—medical service in Clydebank, 918  
 Public Health—clinic at Wellington, 404; conference of, 1322, in United States, 1083; in Hungary, 1431; in India (Sir J. Megaw) 61; in Ireland, 1084; legislation (LA) 207, (PI) 813, 814, (A) 789, (PI) 871, 1093; pioneers, portraits of (H. B. Newham) (C) 1262; post-graduate teaching of, 1207; Sanitary Inspector's Handbook (H. H. Clay and W. W. Jameson) (R) 942; *see also* Nutrition, Vital statistics, and—  
**PUBLIC HEALTH.**—American school medical service, 395—Building line in London, 628—Coste, J. H., retirement of, 629—Diphtheritic infections, 280—Hospitals, coordination of, 1088—Life table, 686—London County Council: maternity services, 224, 1266; medical members of committees, 686; mental hospitals and mental deficiency, 334; nutrition centres, 1497; remand home, medico-psychologist for, 1498—Meningeal tuberculosis (W. T. Munro and H. Scott) 393—Midwifery, problems of, 1148—Milk, bacteriological grading of, 121, 866, designations and, 1036—Public-school boys, lectures to, 925—Rat plague, 281—Scarlet fever, isolation of, at home (D. Forbes) 1138—Small-pox, 1208—Special areas, 503—Speech training, 225—Syphilis, cost of, 1382—Two-shift system, 57  
 Public medical services (PCP) 1265  
 Puerperal infection—anaerobic organisms and (A. Lemierre) 701; dust and (E. White) 941; in Derbyshire (PI) 750; phimosis and (W. S. Handley) 987; prontosil in (L. Colebrook and M. Kenny) 1279, (LA) 1303; respiratory infection and, 547, 622; *see also* Maternal mortality and Scarlet fever  
 Pulmonary, *see* Lung  
 Pupils, *see* Eyes  
 Purkinje's eight-rayed star (F. W. Edridge-Green) (C) 117  
 Purpura—haemorrhagica, measles and (W. Edge) (C) 1036; haemorrhagica, scarlet fever and (J. E. Morrish) 949; Henoch's, acute obstruction and (T. Gray) 841  
 Pyelitis, *see* Kidney  
 Pyloric, *see* Stomach  
 Pyoderma cured with X rays, 1432  
 Pyorrhœa, *see* Teeth  
 Pyrexia, *see* Fever  
**Q**  
 Quigley, J. F., on angular pain (A) 157  
 Quimby, A. J., Weiss, S., and Grant, J. P., Diseases of the Liver, Gall-bladder, Duets, and Pancreas (R) 911  
**R**  
 Radiography—analysis of proteins, 1152; bedside, for fracture (W. B. R. Monteith) 254; bronchography (G. S. Erwin) 1236; Cambridge diploma in, 1323; cineradiography, 857; Cystoscopy and Urography (J. B. Macalpine) (R) 1360; Essentials of Radiography (H. B. Russell) (R) 262; medicine and (Lord Horder) 179, (LA) 266; negatives, ownership of (A) 614; obstetrical, 27, (LA) 265; of bile-ducts (J. C. Ross) 251, (LA) 1245; of chest, 406; of gastro-intestinal tract, 222; of heart (J. Parkinson) 1337, 1391, (A) 1483; of lungs of electric arc welders (A. T. Doig and A. I. G. McLaughlin) 771; of nervous system, 782; of pulmonary vessels (A) 1307  
 Radiology—congress, 873; in curriculum, 1027, (G. A. Clark) (C) 1143; *see also* Radiography, Radium, and X rays  
 Radiotherapy, Radium, and X rays

Radium—eye and (A) 960; in cancer, 86, 480, 713, 720, 913, 1011, 1183, 1228, 1329; in skin therapy, 1300; National Radium Commission, 732, report (A) 675; protection from, 330; radio-active elements, 1154, (A) 1363; supplies of (PI) 872; uterine bleeding treated with, 914; uterine cancer following, 914; *see also* Cancer  
 Radley, J. A., and Grant, J., Fluorescence Analysis in Ultra-violet Light (R) 1416  
 Rait, Sir R., death of, 1251  
 Ramel, E., on neuropathic eczema, 1300  
 Ramsay, W. A., adult scurvy (C) 805  
 Rao, P. R., on congenital syphilis (A) 38  
 Rat-bite fever, 684  
 Rat plague, 281  
 Rates—hospitals and (S. R. C. Plimmsoll) (C) 448; scientific societies and (A) 496  
 Ray, M. B., Hydrotherapy and Climatotherapy (R) 1301  
 Rayner, H. H., carcinoma of colon, 136  
 Read, G. D., on maternal welfare, 821  
 Read, M. (O) 167  
 Rectum—cancer of, radiotherapy in, 1183; gonorrhœa of (A) 962; wounds of (W. B. Gabriel) 1345  
 Red Cross—as sanctuary, 552; organisations, League of Nations and (PI) 1326; *see also* Abyssinia and British Red Cross Society  
 Rees, J. R., Institute of Medical Psychology, 1084, (C) 1216  
 Refugees—Academic Assistance Council and (Lord Rutherford) (C) 739, (LA) 727; medical practice and (C) 631, (S. Wright) (C) 742, (PI) 871  
 Registrar-General, *see* Vital statistics  
 Rehabilitation, *see* Incapacity  
 Rehfuess, M. E., and Nelson, G. M., Medical Treatment of Gallbladder Disease (R) 1070  
 Reid, A. M., on phlyctenular conjunctivitis, 664  
 Reidy, J. (O) 167  
 Relapsing fever, ticks and (S. Adler, O. Theodor and H. Schieber) (C) 448  
 Religion—Psychology and Religion (D. Forsyth) (R) 1359  
 Remand homes—criticisms of (ML) 1083; medico-psychologist for, 1498  
 Renal—denervation, 484; efficiency, test for (J. F. Barrett) 84; *see also* Kidney  
**REPORTS AND ANALYSES.**—Ergo Health Bread (Polley and Co.) 1478—Monbergo Medicated Wine (Cistercian Monks of Mount St. Bernard Abbey) 30—Patenhofer Genuine German Lager Beer (Light) (J. C. Nussle and Co.) 1241—Russian Imperial Stout (Barclay Perkins and Co.) 30  
 Reproductive, *see* Sex hormones and Sterility  
 Research—at Royal College of Surgeons, 1217, (A) 1192; clinical, at Cambridge (A) 1482; Department of Scientific and Industrial Research, 330, 335, (A) 561; fellowships, 752, 1153; government grants for, 403; Lister Institute report, 1434; medical education and (W. W. C. Topley) 43; Researches Published from the Wards and Laboratories of the London Hospital during 1935 (R) 1188; rheumatism, prizes for, 158; *see also* Medical Research Council  
 Research Defence Society—1271, (A) 1309; Stephen Paget lecture (A) 1368  
 Respiratory efficiency—oxygen debt and (A) 381; tests of (A) 441  
 Resuscitation, *see* Artificial respiration and Inhalation therapy  
 Retina (Detachment of the Retina) (J. C. Marshall) (R) 1118  
 Reynolds, R. J., on cineradiography, 857  
 Rheumatism—arthritis in Finland, 985; arthritis, prognosis in (C. W. Buckley) (P) 1023, 1081; British Red Cross Society's clinic (A) 1021; Canadian Rheumatic Disease Association, 1271; Chronic Streptococcal Toxæmia and Rheumatism (J. D. Hindley-Smith) (R) 559; clinic in Aberdeen, 750; focal infection and, 1451, (LA) 1479; gold treatment of (S. J. Hartfall and H. G. Garland) 1459, (G. J. V. Crosby) 1463; gorun in, fatality following (ML) 1379; histamine in (F. S. Mackenna) 364; in Finland, 985; research, prizes for, 158  
 Rheumatism, juvenile—666; community and, 1323; home for rheumatic children, 72; in school-children (LA) 151; streptococcal throat infections and, 87, (W. P. Murphy) 1451

- Rice, T. B., *Textbook of Bacteriology* (R) 28
- Richards, N. O., *Healthy Babies*, 406
- Richards, O. W., and Robson, G. C., *Variations of Animals in Nature* (R) 1302
- Rickets, *see* Vitamin D
- Riddell, J., overclothed boy, 819
- Riddell, V. H., on blood transfusion, 86
- Riddoch, J. W., abdominal varicosities (C) 227
- Rift Valley fever virus (R. D. Mackenzie and G. M. Findlay) 140
- Riggall, C., and Riggall, F., micturition and prostate (C) 868
- River pollution, *see* Water-supplies
- Road accidents—alcohol and (PI) 633; danger spots and (PI) 925; in Australia, 861; in 1935 (PI) 341; motorist's fainting fit, negligence claim and (ML) 1493; sounding of horns and (PI) 634; *see also* Injury
- Rob, J. W. (O) 337
- Roberts, J., on dangers of nose-blowing, 665
- Roberts, R. E., on radiography in obstetrics, 27
- Robinson, A. L., on the uterus, 863
- Robinson, R. H. O. B., on horseshoe kidney, 541
- Robson, G. C., and Richards, O. W., *Variations of Animals in Nature* (R) 1302
- Robson, J. M., on corpus luteum in pregnancy, 568
- Rockefeller Foundation (LA) 1075, 1310
- Rodents, poisons for, 404, 580
- Rodger, T. R., on otosclerosis, blue sclerotics and fragilitas ossium, 661
- Roffo, A. H., ultra-violet rays and cancer, 472
- Roger, G. H., and Binet, L., *Traité de physiologie, normale et pathologique* (R) 204
- Rogers, Sir L., charitable bequests and vivisection (C) 805; on climate and tuberculosis, 1181
- Rogerson, C. J. (O) 1097
- Rolleston, J. D., control of measles (C) 168; on snuff-taking (A) 1020; on swab in diphtheria, 257
- Roman Catholicism—Moral Problems in Hospital Practice (P. A. Finney) 640, (E. E. Ware) (C) 741
- Romanis, W. H. C., apical thoracoplasty, 714
- Roques, F., on induction of labour, 1178
- Rosair, H. B., hunger strike, 778
- Rose, F. P. (O) 1147
- Rosenthal, E., observations on peptic ulcer (C) 1263
- Ross, C. W., on crelic disease, 1299
- Ross, J. C., lipiodol in biliary surgery, 251
- Ross, J. P., on obliterative arterial disease, 540; Paget's disease of nipple, 1025
- Ross, T. A., Enquiry into Prognosis in the Neuroses (R) 723
- Rothschild-Hadassah University Hospital and Medical School, 1335
- Rous, P., on virus-tumours and tar (A) 1420
- Rousseau (From Rousseau to Proust) (H. F. Ellis) (R) 1012
- Rowett Research Institute—appointment, 927
- Rowlands, R. P., and Turner, P., Operations of Surgery (R) 1358
- Rowley, G. D., suprarenal cortex in toxæmia of burns, 1400
- Roxburgh, A. C., *Common Skin Diseases* (R) 434
- Royal Academy (A) 1076
- Royal Air Force—health of (A) 39; occupational selection of apprentices (R. H. Stanbridge) 1426, (A) 1423; *see also* Services
- Royal College of Physicians of Edinburgh—appointments, 403; diplomas, 978; fellows, 403, 1153; Gibson lectures, 1251, 1384; Lister fellowship, 1153; lectures, 978, 1022; pass list, 340
- Royal College of Physicians of London—appointment, 339; Bradshaw lecture, 521, 585, (LA) 612, 1263; Croonian lectures, 1096, 1128; diplomas, 172, 339, 458, 693, 926, 1096, 1217, 1446; election, 1096; fellows, 1095; Goulstonian lectures, 643, 704, 765, 823, (LA) 847, 1304; licences, 339, 1095; Lulmeian lectures, 618, 1337, 1391, (A) 1483; medals, 339; members, 339, 1095; membership examination, 326; Milroy lectures (LA) 611; Oliver-Sharpay lectures, 676; presentation to library, 339; presidential election, 853; silicosis (LA) 611
- Royal College of Surgeons in Ireland—dinner, 458; election, 1447
- Royal College of Surgeons of Edinburgh—diplomas, 978; fellows, 1217; pass lists, 340, 927
- Royal College of Surgeons of England—appointments, 172, 458, 926, 1217, 1446; Arris and Gale lectures (LA) 554; Bernhard Baron laboratories, 1217, (A) 1192; Bradshaw lecture, 67, 130; Croonian lectures, 1096; demonstrations, 515; dental examinations, 693; diplomas, 172, 339, 458, 693, 926, 1096, 1217, 1446; elections, 693, 1096, 1217, 1446; examiners, 1446; fellows, 172, 458, 926, 1446; French surgeons' visit (A) 1486; hospitals approved for surgical practice for F.R.C.S., 172, 458, 1217, 1447; Hunterian lectures, 215, 931, 1047; Hunterian oration, 409, (LA) 435; lectures, 123, 693; licences, 339, 693; Lister memorial lecture, 877; medals, 1217, 1446; pass list, 1153; prizes, 172, 458, 926, 1446; representatives, 172; research donation, 693, 1217, (A) 1192; research fellows, 172; student-ship, 288
- Royal Faculty of Physicians and Surgeons of Glasgow—diplomas, 978; fellows, 403, 927, 1331; pass list, 340
- Royal Institute of Public Health—congress, 1196
- Royal Institution of Great Britain, 59, 979, 1100
- Royal Medical Benevolent Fund (Sir T. Barlow) (C) 55, (A) 154, 172, 371, 605, (LA) 670, 744, 929, 1154, (A) 1196, 1251, 1368, (LA) 1420
- Royal Medical Benevolent Fund Society of Ireland, 171
- Royal Microscopical Society, 403
- Royal Sanitary Institute, 60, 202, 459, 515, 816, 1217
- Royal Society—403; conversazione (A) 1310; Fellows (A) 1124; medical research fellowship, 1133; natural selection (LA) 1189; sodium chloride deficiency (LA) 379
- Royal Society of Arts, 123, 146, 638
- Royal Statistical Society, 219
- Ruddiman, E. A., and Nichols, A. B., *Incompatibilities in Prescriptions* (R) 1187
- Rumsey, H. St. J., stammering (C) 572, 692
- Russ, S., progress in radiotherapy (C) 1329
- Russell, H. B., *Essentials of Cardiography* (R) 262
- Russell viper venom in hæmophilia (G. A. Baker and P. C. Gibson) 428, (R. G. Macfarlane and B. Barnett) (C) 509
- Russell, W. K., on electropxyrexia, 1203
- Russell, W. R., intraspinal alcohol for pain, 595, (A) 852; on vitamin-B in polyneuritis (A) 727, (C) 922
- Russia—abortion law in, 1388; nursing in, 63; nutrition in, 699, 876; visits to (C) 1261, 1272
- Rutherford, J. (O) 687
- Rutherford, Lord, protection of science and learning (C) 739
- Rutherford, W. J., epidemic myalgia in Manchester (C) 1216
- Rycroft, B. W., corneal grafts, 239
- Ryle, J. A., *Natural History of Disease* (R) 374
- Ryles, C. S., obstinate syringe (C) 66
- S**
- Sacrifice to Attis (W. A. Brend) (R) 1119
- Sacro-iliac strain, 1200
- Saint, C. F. M., and Morison, R., Introduction to Surgery (R) 29
- St. John Ambulance Brigade—air raid precautions, 757; appointment, 927; Hygiene or the Gospel of Health (N. M. Goodman) 757
- St. Johnston, Sir R., From a Colonial Governor's Notebook (R) 668
- St. Mary's Hospital medical school, women medical students of (M. H. Kettle) 1370
- Salicin, 293
- Saline, intravenous, apparatus for (C. E. Watson) (NI) 202
- Salpingitis—gonococcal, professional ethics and (C) 692, 742, 743, 806; treatment of, 862
- Salt, *see* Sodium chloride
- Salvarsan tolerance in childhood, 1432
- Samuels, S. S., *Diseases of Peripheral Arteries* (R) 1012, (C) 1382
- Sanitary Inspector's Handbook (H. H. Clay and W. W. Jameson) (R) 902
- Sarcoma of duodenum (G. Slot and M. H. Fridjohn) 194
- Sarsfield, L. G. H., *Electrical Engineering in Radiology* (R) 1301
- Saunders, E. A. (O) 231
- Savage, W. G., prognosis in food poisoning (P) 965
- Savill, A., pruritus of vulva and anus (C) 691
- Saye, L., on chronic miliary tuberculosis, 858
- Scarlet fever—(F. G. Hobson) 417, (H. M. Leete) (C) 507, (J. C. Sleight, J. L. M. Wood, and F. E. Camps) (C) 507; hospitalisation of (LA) 958; isolation of, at home (D. Forbes) 1438; puerperal (A. H. G. Burton and J. H. Weir) 1110, (LA) 1122, (W. J. Lewis) (C) 1264; prodermia and, 1432; toxic purpura hemorrhagica and (J. E. Morrish) 949
- Schieber, H., relapsing fever (C) 448
- Schiller, W., cancer of cervix, 1228
- Schistosomiasis—dysentery and, 759; molluscs and (A) 494
- Schizophrenia—insulin in (LA) 1418, (H. P. Strecker) (C) 1498; murder phantasy and (C. Allen) (C) 1441
- Schliephake, E., on ultra-short waves, 1201
- Scholarships for sons of medical men, 326, 751
- School-children—American, medical inspection of, 395; clothing for (PI) 456; dental treatment (PI) 577; Education Bill and (PI) 1324; fatigue in, 125; health of (LA) 151, school conditions and (PI) 749, 1326; homework and (PI) 454; instruction for, in dangers of alcohol (PI) 749; milk and meals for, 224, (PI) 454, 457, 512, 515, 575, 634, 748, nutrition surveys and (PI) 401; nursery schools (PI) 1215, 1386; nutrition centres in London, 1497; public-school boys' course in public health, 925; School Education in Hygiene and Sex (G. O. Barber) 519; school medical service (LA) 151; school sanatorium, 950; sight, care of (A) 1195; *see also* Physical education and Stammering
- Schott, A., ammonium chloride as diuretic (C) 118
- Schulemann, W., malaria epidemic in Ceylon (C) 332
- Schüler, A., infiltration of liver with lymphocyte-like cells, 1115
- Sciatic nerve—aneurysm and, 875; hypodermic injection and (ML) 500
- Scientific Research, Department of, 330, 335, (A) 561
- Scientific societies and rates (A) 496
- Sclerotics, blue, otosclerosis and, 661
- Scotland—health services in (PI) 1445; maternal mortality in (PI) 1270; overcrowding in (PI) 1040; sickness-rate in (PCP) 1147
- SCOTLAND, CORRESPONDENCE FROM.—Ashworth, J. H., death of, 389—Association of Surgeons, meeting, 1135—British Hospitals Association, 1491—Chair of dentistry, 1028—Corpus luteum and pregnancy, 568—Department of Health for Scotland, report, 916—Dispensary services, 49—Edinburgh Medical Journal, 918—Edinburgh Royal Infirmary, 109, 1384—Education, medical, 223—Embolism in the limbs, 1384—Gastro-intestinal tract, X ray examination of, 222—Glasgow clinic for nervous disorders, 502—Glasgow Royal Infirmary, 223, 389—Holmes-Adie syndrome, 684—Hospitals, voluntary, position of, 49, 223, 684, 1028—Hydrocephalus, 1135—Labour, third stage of, 446—Lupus vulgaris, 388—Maternal mortality, 49—Mental hospitals and mental health, 568—Midwifery, 1322—Myopia, 1322—Nurses, training of, 569—Ophthalmology, facilities for, 918—Physical education in schools, 49—Practice, private, diminishing, 1028—Public assistance medical service, 918—Rheumatism, 1323—Royal Medical Society dinner, 502—State medicine and industrial hygiene, 1322—Swanson, J., death of, 1135—Tuberculosis, 1322
- Scott, G. G., and Kendall, J. I., *Microscopic Anatomy of Vertebrates* (R) 90



- Scott, G. R., Facts and Fallacies of Practical Birth Control, 64
- Scott, H. H., meningial tuberculosis, 393 479
- Seowen, E. F., undescended testicle (C) 116
- Screw-cap for bottles, 1160
- Scoury—adult (H. E. Archer and G. Graham) 710, (A) 729, (W. A. Ramsay) (C) 805; cod-liver oil and (R. T. Hewlett) (C) 115; on antiscorbutic diet (A) 36; vitamin-C reserves, survey of, 967, (A) 961, (L. J. Harris, M. A. Abbasy, J. Yudkin, and S. Kelly) 1188
- Seabrook, W., Asylum (R) 901
- Seamen—insulin for (P.C.P.) 573; venereal disease in (A) 1193; *see also* Morbus britannicus
- Sea-sickness, syntropan in (C. S. Hicks) (C) 226, 641, (T. North) (C) 1263
- Seborrhoeic dermatitis, vulval pruritus and (E. Hunt) 592
- Secrecy, professional, gonococcal infection and (C) 692, 742, 743, 866
- Security, psychology of (L.A.) 669
- Seed, G. S., brain and lung abscesses in otitis media, spontaneous pneumothorax and, 1060
- Selenium in cancer (A. T. Todd) (C) 1261
- Sellers, T. H., apical thoracoplasty, 714
- Selye, H., administration of oestrin in rats, 775
- Semilunar cartilages, repair and regeneration of (A. G. T. Fisher) 1351
- Septicæmia, *see* Streptococcal infection
- SERVICES, THE.—Army Medical Services:** 42, 114, 331, 392, 563, 973, 1330, 1440—Colonial Medical Service: 114, 447, 629, 870, 1210, 1383—Deaths in the Services: 114, 173, 392, 447, 563, 629, 796, 870, 1330, 1440, 1495—Indian Medical Service: 42, 114, 173, 227, 281, 331, 417, 499, 563, 629, 676, 796, 870, 910, 973, 1037, 1085, 1131, 1210, 1383, 1494; dinner, 927, 1491; prospects in (A) 497—Royal Air Force: 42, 114, 173, 227, 281, 331, 392, 447, 499, 563, 629, 676, 732, 796, 870, 910, 973, 1037, 1085, 1131, 1210, 1253, 1330, 1383, 1440, 1495—Royal Army Medical Corps: 42, 114, 173, 227, 281, 331, 392, 447, 499, 563, 629, 676, 732, 796, 870, 910, 973, 1037, 1085, 1131, 1210, 1253, 1330, 1383, 1440, 1494; training, 984—Royal Naval Medical Service: 42, 114, 173, 227, 281, 331, 392, 447, 499, 563, 629, 676, 732, 786, 870, 910, 973, 1037, 1085, 1131, 1210, 1253, 1330, 1383, 1440, 1494
- Sewage—London, 231, (A) 1484; rural, (P1) 1151; *see also* Water-supplies
- Sex—impotence, surgery of, 541; Sacrifice to Attis (W. A. Brend) (R) 1119; Sex and Culture (J. D. Unwin) (L.A.) 437, (C) 1087, (J. R. Earp) (C) 973, (C. T. Norris) (C) 1087; sexual crime, prevention of, 237; Youth, Sex, and Life (G. M. Cox) (R) 1362
- Sex hormones—916; abortion and (A) 728; corpus luteum in pregnancy, 568; for sterility, 372, (V. E. Lloyd) 471; for undescended testis (P. Williams) 426, (E. McLellan) 999; for uterine hæmorrhage, 916; male, accessory substances and (R. Deanesly and A. S. Parkes) 837, (A) 850; menopause and, 719; osteoporosis and (A) 907; ovarian and endometrial graft and, 666; prostate and (S. Zuckerman) 135, (L.A.) 152, (S. Zuckerman and A. S. Parkes) 242, (P. Niehans) 307, (L.A.) 321, (A) 439, 542, physiology of nutrition and (F. Riggall and C. Riggall) (C) 868; research on, 1135; standards for, 623; teratoma testis and, 315; ureters and, in pregnancy (L.A.) 152, (A) 210, 259; *see also* Oestrin
- Shadwell, A., death of (A) 731
- Shaw, B. H., biochemical lesion (C) 1265
- Shaw, F., on radiography in obstetrics (L.A.) 265; on radium in cancer of cervix, 720
- Shaw, H. B. (O) 1144
- Shaw, W., Textbook of Gynecology (R) 901
- Sheldon, W. S. (O) 1033
- Shelley, H. M., Tropical Diseases (R) 487
- Shelling, D. H., Parathyroids in Health and Disease (R) 28
- Shennan, T., Post Mortems and Morbid Anatomy (R) 667
- Shepherd, H. L., on eclampsia, 371
- Sheppard, A. (O) 337
- Sherwood, N. P., Immunology (R) 317
- Shields, C., ionisation for hay-fever (C) 1499
- Shingles, *see* Zoster
- Ship's surgeon, duties of (C) 505
- Shock—pleural, air embolism and (C. O. S. B. Brooke) (C) 56; surgical, anaesthesia and (A) 36
- Shope, R. E., on viruses of rabbit tumours (A) 1125
- Short, A. R., and Tidy, H. L., Medical Annual (R) 1242; Ham, C. I., and Pratt, C. L. G., Synopsis of Physiology (R) 724
- Short wave therapy—(L.A.) 436, (H. J. Taylor) (C) 573, 1201; biological action of (Sir L. Hill and H. J. Taylor) 311; Foundations of Short Wave Therapy (W. Holzer and E. Weissenberg) (R) 723; Néodiatthermie à ondes courtes (H. Bordier and T. Kofman) (R) 723; Short Wave Therapy and General Electrotherapy (H. F. Wolf) (R) 723
- Shoulder-joint, fractures about, 662
- Silicosis—(A) 35, (L.A.) 611; colliery employee and (P1) 513; in miners (P1) 514, 575, 684, (P1) 1094, 1095, 1149, (A) 1251; oxygen debt and (A) 381; workmen's compensation and (P1) 401, 632
- Silver Fleecce (R. Collis) (R) 1416
- Silvette, H., on suprarenal deficiency (L.A.) 1304
- Simmonds's disease, 951
- Simmons, H. T., intermittent claudication, 73
- Simpson, W. M., on artificial fever therapy, 1202, (A) 1248
- Sinton, J. A., on man-made malaria in India (A) 1308
- Sinuses, *see* Nose
- Skin—alleged dye dermatitis committee (W. J. O'Donovan) (C) 1329; alpha and beta rays in therapy of, 1300; cancer of, ultra-violet rays and (A. H. Roffo) 472; Common Skin Diseases (A. C. Roxburgh) (R) 434; Commoner Diseases of the Skin (S. W. Becker) (R) 434; Diseases of the Skin (F. C. Knowles) (R) 487; lupus vulgaris, 388; mycosis fungoides (A) 673; neuropathic eczema, 1300; parasitic and fungal infections of, 314; pemphigus acutus (P. L. Ker) 718; pruritus of vulva and anus (E. Hunt) 592, (C) 741, (A) 617, (A. Savill) (C) 691, 754; psoriasis, 664; practice of dermatology (Nouvelle pratique dermatologique) (R) 1414; pyodermitis, X rays for, 1432; Recent Advances in Dermatology (W. N. Goldsmith) (R) 954; staphylococcal lesions of, toxoid in (L. E. H. Whitby) 1454; urticaria (A) 618
- Skinner, A. H., doubtful case of typhus fever (C) 570, 1143
- Skull, fractures of, ear injury and, 660
- Slater, E. T. C., on manic-depressive insanity, 429
- Sleep—Insomnia and Disordered Sleep (G. J. V. Crosby) 406
- Sleigh, J. C., scarlet fever (C) 507
- Slome, D., on intestinal strangulation, 601, (A) 1128
- Slot, G., diarrhoea and *B. asiaticus*, 1116; sarcoma of duodenum, 194
- Small, V. R., I Knew 3000 Lunatics (R) 901
- Small-pox—deaths from (P1) 577; in East Sussex, 1209; in India (P1) 750; major and minor, 1208; vaccination and (P1) 403; *see also* Vaccination
- Smell, physiology of (A) 907
- Smith, F. B., polyserositis, 362
- Smith, K. M., Plant Viruses (R) 1013
- Smith, M. H. (O) 974, 1033
- Smith, P. W., and Visscher, M. B., Experimental Physiology (R) 317
- Smith, R. E., on school sanatorium, 950
- Smith, W., on influenza (L.A.) 32
- Smithard, E. H. R., consumption of milk in London suburb, 235
- Smoking, punishment for (L. P. Lockhart) (C) 506, (L.A.) 555
- Snake venom, *see* Russell viper venom
- Snowman, L. V., Minor Medicine of General Practice (R) 374
- Snuff-taking (A) 1020
- Social work, conference on, 173
- Societies, charitable, *see* Charity
- SOCIETIES, MEDICAL**
- ASSOCIATION OF CLINICAL PATHOLOGISTS.—Demonstration, 1476; diabetes, blood-sugar levels in, 314; jaundice in children, 1476; lead action, 1476; phosphatase and liver function, 1475; protozoal infections, 314; skin diseases, 314; teratoma testis, 315; van den Bergh reaction, 1475
- ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.—Meetings, 178, 1272; physical standards in industry, 238, (L.A.) 265; psychological factors in sickness absenteeism (T. M. Ling) 1274, 1333
- ASSOCIATION OF SURGEONS.—Meeting, 1135
- BRITISH ASSOCIATION OF RADIOLOGISTS.—Presidential address, 1492
- BRITISH PSYCHOLOGICAL SOCIETY.—Co-education (L.A.) 34; sex and culture (L.A.) 437
- CAMBRIDGE GRADUATES' MEDICAL CLUB—1386
- CAMBRIDGE UNIVERSITY MEDICAL SOCIETY.—Medical education and medical research, 43
- EDINBURGH MEDICO-CHIRURGICAL SOCIETY.—Holmes-Adie syndrome, 684; lupus vulgaris, 388; X ray examination of gastro-intestinal tract, 222
- EDINBURGH OBSTETRICAL SOCIETY.—Cancer of cervix, 1011; third stage of labour, 446
- EDINBURGH PATHOLOGICAL CLUB.—Corpus luteum and pregnancy, 568; vitamin-B injection in nervous diseases (A) 727
- GLASGOW OBSTETRICAL SOCIETY.—Maternal mortality in hospital (D. Baird) 295, 315, (L.A.) 319
- HUNTERIAN SOCIETY.—Elections, 927; fatigue, 662; Hunterian oration, 442; lecture, 123; measles, control of, 103, (A) 1018; medal, 578; meeting, 816; psychoneurosis, physical basis of (S. Ingvarg) 343
- JOINT TUBERCULOSIS COUNCIL.—Dinner, 516
- LIVERPOOL MEDICAL INSTITUTION.—Bronchial carcinoma, 201; conjunctivitis, phlyctenular, 664; gas-air analgesia, 844; kidney, surgery and, 27; nose-blowing, dangers of, 665; psoriasis, 664; psychological investigation, 485; puerperal sepsis, 547; radiography in obstetrics, 27; renal denervation, 484
- LONDON JEWISH HOSPITAL MEDICAL SOCIETY—816
- MANCHESTER MEDICAL SOCIETY.—Anæsthetic, choice of, 89, 125; doctor as detective, 1276; election, 1271
- MANCHESTER SURGICAL SOCIETY.—Anorectal wounds (W. B. Gabriel) 1345
- MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—School sanatorium, 950
- MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.—Address, 978; lectures, 978; psychological approach, 1117; psychology, education in, 757; psychopathology, limits of, 1300; psychotherapy in general practice (A) 1486
- MEDICAL SOCIETY OF LONDON.—Appendicitis, 260; *B. coli* infections of urinary tract, 483; carcinoma of stomach (Sir J. Walton) 1101, (L.A.) 1190; diseases of colon, 759, 830; Lettsomian lectures, 759, 830; meetings, 123; phlebitis, 606; sterility, treatment of, 372
- MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.—Hydrocephalus, 1135
- MEDICO-LEGAL SOCIETY.—Medico-legal problems, 781; poisoning, statutory safeguards against, 543
- MIDLAND MEDICAL SOCIETY.—Diverticulitis of colon, 548; medical psychology, position of, 175
- MIDLAND OBSTETRICAL SOCIETY.—Eclampsia, 370
- NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.—Ectopic pregnancy, repeated, 783; extraversion of ovaries for amenorrhœa, 315; granulosa-cell tumour, 316; Nagele's pelvis, 722; ovarian tumours and hysterectomy, 722; radium in cancer of cervix, 720; renal calculi in pregnancy, 952; Simmonds's disease, 951; tuberculosis of uterus, 1241; unusual metastasis, 1240; uterine rupture and placenta prævia, 952
- OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.—Ophthalmia neonatorum, 842; phlycten (A) 909;



- radium and the eye (A) 960; talking book for blind, 844
- PADDINGTON MEDICAL SOCIETY.—Income-tax in general practice, 177
- PATHOLOGICAL SOCIETY OF MANCHESTER.—Heart disease, 549
- PHYSIOLOGICAL SOCIETY.—Rickets and scurvy, unexpected (A) 36
- ROYAL ACADEMY OF MEDICINE IN IRELAND.—Childbirth, sudden death during, 665; genital prolapse, 88; ovarian and endometrial graft, 666; pleural adhesions, enucleation of, 148; rheumatic fever, infective factor in, 87; rheumatism, juvenile, 666
- ROYAL MEDICAL SOCIETY.—Dinner, 502
- ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—Meeting, 1447; mesocaine research (LA) 553; sonnifaine therapy, 1182
- ROYAL SOCIETY OF MEDICINE.—Sections of: Anesthetics (A) 383—Comparative medicine (A) 557—Dermatology, 1300—Disease in Children, 258, 1009, 1239—Epidemiology, 256 (A) 1019—History of Medicine, 1219—Laryngology, 368, 1068—Medicine, 431, 540, 719—Neurology, 198 (LA) 490 (A) 1078—Obstetrics and Gynecology, 1178 (LA) 1191—Orthopedics, 147, 602—Otolaryngology, 1068—Psychiatry, 429, 1009—Radiology, 482, 782, 1027, 1143—Surgery, 86, 366, 601—Therapeutics and Pharmacology, 604 (A) 1420—Tropical Diseases and Parasitology, 369—Urology, 259, 541
- Subjects for discussion: Addison's disease, salt in, 604; alpha and beta rays in skin therapy, 1300; amesbiod in thoracic surgery (A) 383; blood transfusion, continuous drip, 86; bronchial movements and nasopulmonary reflex, 368; catgut, sterilised surgical, 366; clinical cases, 147; club feet and pes cavus, 147; colon, diverticulitis of, 87; congenital deformities of mechanical origin, 1239; coramine (A) 1420; diphtheria, swab in, 256; ear injuries, 660; enuresis, 1009; general paralysis of insane, congenital (LA) 490; headache, disease in nose and, 1067; hearing aids, 1069; helminth intermediaries, crustacea as, 369; helminthology, developments in, 369; hyperglycaemic glycosuria, 431; impotence, surgical treatment of, 541; induction of premature labour, 1178 (LA) 1191; intestinal strangulation, 601; kidney, horseshoe, 541; kidney pelvis, 259; manic-depressive insanity, 429; menopause, 719; metabolism, nutrition, and growth, 258; miscellaneous diseases, 1240; neuropathic eczema, 1300; non-volatile narcotics (A) 557; obliterative arterial disease, 540; occupational selection of aircraft apprentices, 1426; otogenous intracranial complications, 1068; otosclerosis, blue sclerotics, and fragilitas ossium, 661; prostatic obstruction, Steinach II, operation for, 542; psychology, historical aspects of (A) 614; radiography in neuro-surgery, 782; radiography in obstetrics (LA) 265; radiology in curriculum, 1027, 1143; shoulder-joint, fractures about, 602; spleen, liver, and brain, 198; vitamin-B, content of human diet, 605; whooping-cough (A) 1019; X ray therapy, developments in, 432
- Dinner, 1134, (A) 1126; fellowship, 1154; Royal Medical Benevolent Fund and (LA) 1420; visit to Bath, 1219; visit to Holland (A) 1078
- ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—Filarial migration in mosquito (A) 790; malaria (LA) 322; steatorrhoeas, 1298
- St. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—Prosser White oration, 1368
- SOCIALIST MEDICAL ASSOCIATION.—Meeting, 1153
- SOCIETY FOR THE STUDY OF INEBRIETY.—Alcoholism and crime, 161, (A) 155; snuff-taking (A) 1020
- SOCIETY OF MEDICAL OFFICERS OF HEALTH.—Child welfare, 1503; maternal mortality, 545; meeting, 158; neurosis, prevention of, 65; post-graduate teaching of public health, 1207
- SOCIETY OF MEDICAL OFFICERS OF SCHOOLS.—Fatigue in school-children, 125
- SOCIETY OF RADIOTHERAPISTS OF GREAT BRITAIN AND IRELAND.—404; radiotherapy of carcinoma of breast, 480; radiotherapy of carcinoma of rectum, 1183
- TUBERCULOSIS ASSOCIATION.—After-care, 199, 857, (A) 906; climate and tuberculosis, 1181; dispensary organisation, 856; military tuberculosis, chronic, 858; provincial meeting, 694; pulmonary tuberculosis, capacity for work in, 857; tuberculosis of bones and joints, 480; tuberculosis meningitis in children, 479
- UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY.—1041, 1217
- WEST KENT MEDICO-CHIRURGICAL SOCIETY.—Dinner, 1096; neurotic patient, 899
- WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—1503; Cavendish lecture (A) 1367
- Society for Protection of Science and Learning, *see* Academic Assistance Council
- Society for Relief of Widows and Orphans of Medical Men, 233, 1272
- Society of Apothecaries of London.—dinner, 232, 1503; diplomas, 58, 340, 1041, 1270; pass lists, 58, 340, 515, 1041, 1270, 1331
- Society of Chemical Industry, 232, 386
- Society of Public Analysts, 232, 386, (A) 1194; dinner, 637
- Sociology—Pareto (F. Borkenau) (R) 263; scholarship in, 1270; Tylor (R. R. Marett) (R) 263
- Sodium chloride—Gerson diet (LA) 153; heat and (LA) 379, morbus Britannicus and (S. E. Kofoed) 23, (C) 505, (A. J. Copeland) (C) 115; in disease, 604, (R. A. McCance) 647, 704, 765, 823, (LA) 847, 1304, 1406
- Sodium mandelate in chronic cystitis (F. W. Alexander) (C) 391
- Solomon, C., Prescription Writing and Formulary (R) 434
- Solomons, B., on ovarian and endometrial graft, 666; on salpingitis, 863
- Somerford, A. E., congenital urethral obstruction, 1473
- Sonnifaine, *see* Narcosis
- Sonne dysentery (J. J. Laws) 192
- Soper, F. L., on yellow fever, 510
- Sorsby, A., on phlycten (A) 909
- Spas, *see* Health resorts
- Special areas, *see* Unemployment
- Specialist treatment—intravenous injections and (PCP) 1495; light treatment and (PCP) 113; London County Council and (ML) 107; London insurance committee's report (PCP) 573; operations and (PCP) 627, 738
- Specimens in the post, 408
- Speech training, *see* Stammering
- Speed, K., Text-book of Fractures and Dislocations (R) 203
- Spence, A. W., undescended testicle (C) 116
- Spencer, H., induction of labour, 1179, (C) 1263
- Spinal analgesia, *see* Anesthesia, spinal, and Pain
- Spinal cord, abscess of (R. M. Walker and S. C. Dyke) 1413
- Spine—caries of, prognosis in (Sir H. Gauvain) (P) 562, (C) 690, (S. D. P. Fisher) (C) 630, 740; Kummell's disease (J. P. Hosford) 249; low back-ache, 1200; lumbosacral strain (G. A. G. Mitchell) 75; subluxation of atlanto-axial joint (J. T. Chesterman) 539
- Spirochetal jaundice, *see* Weil's disease
- Spleen—aneurysm of splenic artery (S. E. Osborne) 1007; blood pathology and (La rate en pathologie sanguine) (E. Houcke) (R) 1071; enlargement of (J. W. McNeen) (P) 443, intra-abdominal haemorrhage and (J. F. Paterson) 428; lipoidoses and, 198; removal of, for cancer of breast (P. Paterson) 1402; xanthomatosis of (W. G. Barnard and G. E. Breen) 839
- Splints, aluminium (A. P. Bertwistle) 146
- Spondylitis, *see* Rheumatism
- Sport, *see* Athletics
- Sprue—non-tropical (Die Einheimische Sprue und Ihre Folgekrankheiten) (K. Hansen and H. v. Staa) (R) 1477; tropical, idiopathic steatorrhoea and, 1298; tropical, prognosis of (N. H. Fairley) (P) 911
- Staa, H. v., and Hansen, K., Die Einheimische Sprue und Ihre Folgekrankheiten (R) 1477
- Stallybrass, C. O., on swab in diphtheria, 257
- Stammering, treatment of, 225, (A) 208, (K. Emil-Behnke) (C) 449, (C) 631, (H. St. J. Rumsey) (C) 572, (C) 692
- Stanbridge, R. H., occupational selection of aircraft apprentices, 1426, (A) 1423
- Staphylococcal—leucocidin and antileucocidin (J. Wright) 1002; toxin (F. C. O. Valentine) 526; toxoid in skin lesions (L. E. H. Whitby) 1454
- Steatorrhoea, *see* Sprue
- Stebbing, G. F., prognosis of fractures of upper end of femur (P) 385
- Steel, J. P., compensation and the return to work, 735, (A) 728
- Steele, G. H., on retrograde oesophago-scopy, 86
- Steinach's ligature II. (P. Niehans) 307, (LA) 321, (A) 439, 542, physiology of micturition and (F. Riggall and C. Riggall) (C) 868
- Steindler, A., Mechanics of Normal and Pathological Locomotion in Man (R) 1185
- Stenhouse, A. B., acetylcholine for paroxysmal tachycardia (C) 391
- Stenson's duct, idiopathic dilatation of (R. T. Payne) 655
- Stephen Paget lecture (A) 1368
- Stephenson, D., chemotherapy of streptococcal infections, 1286, (LA) 1303
- Stephenson, T., incompatibility in Prescriptions (R) 608
- Sterilisation—in United States, 108; mayhem charges, 801
- Sterility—causes of (A) 210; male, gonadotropic hormones for (V. E. Lloyd) 474; treatment of, 372
- Stern, R. O., lymphocytic meningitis, 650, (LA) 670
- Stevens, I. H. K., rupture of uterus, 538
- Stimuli, pathergic state and (S. Leites) 1348, (A) 1364
- Stiven, H., early amputation for severe injury (C) 1441
- Stokes, A. B., chronic cicatrising enteritis, 299
- Stomach—acidity of (F. L. Apperly) 5, (C) 630, (A) 35, (A. F. Hurst) (C) 168, (L. E. Napier) (C) 390, (W. C. Alvarez) (C) 740, (E. Földes) (C) 1035, (P. Ghalioungui) (C) 1088; cancer of (LA) 788, (Sir J. Walton) 1101, (W. Anshütz) 1175, (LA) 1190, test-meals in (N. F. MacLagan) (C) 1265; continuous aspiration of, tube for (H. Bailey) (NI) 150; disorders of, in omnibus men (PI) 749; nervous disorder and (S. Ingray) 343; pyloric stenosis, gastro-ostomy for (T. J. Wood) (C) 1442; radiography of, 222; Stomach and Duodenum (G. B. Eusterman and D. C. Balfour) (R) 30; *see also* Anemia, pernicious, and Peptic ulcer
- Stone, M. J., and Hawes, J. B., Diagnosis and Treatment of Pulmonary Tuberculosis (R) 1243
- Stopes, M. C., Marriage in My Time (R) 1186
- Strachan, G. I., on uterine carcinoma following radiotherapy, 914
- Strecker, E. A., and Ebaugh, F. G., Practical Clinical Psychiatry (R) 1072
- Strecker, H. P., insulin in schizophrenia (C) 1498
- Streptococcal infection—anaerobic (A. L. Lauer) 701; chemotherapy of (A) 269, (G. A. H. Buttle, W. H. Gray, and D. Stephenson) 1286, (LA) 1303, (L. Colbrook) (C) 1441; Chronic Streptococcal Toxaemia and Rheumatism (J. D. Hindley-Smith) (R) 550; immuno-transfusion for (J. A. Hendry and J. Griffiths) 145, (A) 157; of throat, rheumatism and, 87, 1451, (LA) 1479; olive oil therapy in, 860; *see also* Purpural infection, Scarlet fever, and Typh
- Ström-Olsen, R., treatment by prolonged narcosis (C) 803
- Styrene, detection of (A) 495
- Students, medical—Elementary Morphology and Physiology for Medical Students (J. H. Woodger) (R) 203; Medical and Dental Students Register (A) 672; Practical Biology for Medical Students (C. J. Wallis) (R) 203; women, fate of (M. H. Kettle) 1370; *see also* Education, medical, and Universities

Subarachnoid hemorrhage, glycosuria and acetonuria in (E. J. S. Woolley) 894, (G. Bourne) (C) 973  
 Subphrenic abscess (W. Broadbent) 1474  
 Sun, see Ultra-violet rays  
 Suppository, see Mercurial suppository  
 Supracranial cortex—in toxæmia of burns (W. C. Wilson, G. D. Rowley, and N. A. Gray) 1400; see also Addison's disease  
 Surgery—congress of, 119. (A) 209; conscience and (A) 850; Demonstrations of Physical Signs in Clinical Surgery (H. Bailey) (R) 29; emergency (Félix Lejars; *Traité de Chirurgie D'urgence*) (P. Brocq and R. Chabrut) (R) 149; Emergency Surgery (H. Bailey) (R) 955; Fifty Years a Surgeon (R. T. Morris) (R) 91; French surgeons' visit (A) 1486; Hilton, John (C. H. Fagge) 409, (LA) 435; Introduction to Surgery (R. Morrison and C. F. M. Sait) (R) 29; Nelson Loose-Leaf Living Surgery (R) 150; Operations of Surgery (H. P. Rowlands and P. Turner) (R) 1358; Post-graduate Surgery, Vol. I. (R. Maingot) (R) 486; surgical diagnosis (*Die Differential-diagnose chirurgischer Erkrankungen*) (W. Braeucker, H. F. O. Haberland, H. Klose, and M. zur Verth) (R) 203; Surgical Emergencies in Children (H. C. Edwards) (R) 1120; Textbook of Surgery (F. Christopher) (R) 1242; Textbook of Surgical Pathology (C. F. W. Illingworth and B. M. Dick) (R) 902; Year Book of Surgery (E. A. Graham) (R) 1187; see also Operations  
 Surrealism exhibition, 1459  
 Sutherland, H., Tuberculin Handbook (R) 955  
 Suture material, synthetic (A) 1195  
 Swanson, J., death of, 1135  
 Sweepstakes—Irish Hospitals, 802, 1228  
 Symonds, C. P., prognosis in cerebral concussion and contusion (P) 854  
 Sympathectomy—for arterial disease, 73, 120, 540; renal, 484; for dysmenorrhœa (A) 99; value of (A) 209; vasomotor responses and (A) 326  
 Syntropan, see Sea-sickness  
 Syphilis—anaemia and (C. R. Box and A. M. Gill) 24, (R. Miller) (C) 115; arterial, internal hemorrhage and (E. E. Lewis) 255; bismuth in, arthralgia and, 65; cancer and, 987; congenital (A) 38, (D. Nabarro) (P) 498, general paralysis of insane and (LA) 490; fever therapy in, 1202, (A) 1248; in United States, 1083, 1382; of colon, 830; salvarsan tolerance in childhood, 1432; symptomatology of, 1390; see also Venereal disease  
 Syringe, obstinate (C. S. Ryles) (C) 66

**T**

Talipes, see Foot  
 Tannic acid in burns (A) 1249  
 Tatham, R. C., spontaneous fracture in osteomyelitis, 195  
 Tattersall, N., on dispensary organisation, 856  
 Taylor, H. C., on breast changes and menstruation (A) 675  
 Taylor, H. J., high-frequency field, 311, (C) 573  
 Taylor, S., late ether convulsions, 1005, (A) 1194  
 Taylor, W., on eclampsia, 371  
 Tea, pharmacology of, 386  
 Teeth—anaemia and (P. C. Gibson) 994, (C) 1143, (F. P. Weber) (C) 1086, (LA) 1479; cancer and (W. S. Handley) 987; damages for inhaled tooth (ML) 445; dental benefit (PI) 1041; dental prop (W. W. Mushin) 1062; diet and (A) 36; extracted without permission (ML) 1433; extraction of, hemorrhage following (PCP) 1090; of school-children, care of (LA) 151; painless cavity preparation, 610; systemic disease and (A. Bullied) 931, (W. P. Murphy) 1451, (LA) 1479; West Riding Dental Journal (A) 155; wisdom, enucleation of follicles of (C. B. Henry) (C) 921, (G. P. G. Wakeley) (C) 1036, (S. W. Charles) (C) 1262  
 Telangiectasia, see Liver  
 Temperature, see Fever, Sodium chloride, and Ventilation  
 Tendons—tendovaginitis at radial styloid process (B. H. Burns and V. H. Ellis) 717; tenosynovitis, 1369

Tennent, T., on congenital G.P.I. (LA) 490  
 Testis—mumps and (A) 851; teratoma of, 315; undescended (A. W. Spence and E. F. Scowen) (C) 116, (D. Browne) (C) 170, (P. Williams) 426, (E. McLellan) 999  
 Tetanus—curarine in (R. West) 12; psychosin and (A) 850; see also Catgut  
 Tewari, M., anti-cholera inoculation (C) 572  
 Thatcher, L., hypervitaminosis D, 20, (A) 36  
 Thaysen, Th. E. W., death of, 1080  
 Theobald, G. W., vitamin B in pregnancy, 834  
 Theodor, O., relapsing fever (C) 448  
 Therapeutics—Index of Treatment (R. Hutchison) (R) 550; Medical Guide for India and Index of Treatment (E. J. O'Meara) (R) 955; Treatment in General Practice (A) 732  
 Thomas, A. R., dystrophy of fifth finger, 1412  
 Thomas, H., on causes of variations (LA) 206  
 Thomas, W. L., blood transfusion, malaria and, 536  
 Thompson, B. C., subcutaneous emphysema in pulmonary tuberculosis, 1356; tuberculous cervical glands, 946  
 Thompson, C. G. K., intravenous route, 1173  
 Thompson, C. J. S., pharmacy jars, 1157  
 Thompson, H., and Gesell, A., Infant Behaviour, Genesis and Growth (R) 668  
 Thompson, V. C., tuberculous cervical glands (C) 1141  
 Thoms, H., Obstetric Pelvis (R) 609  
 Thomson, A. P., on menopause, 719  
 Thomson, W. A. R., mercurial suppository for cardiac œdema, 16  
 Thomson-Walker, Sir J., and Walker, K., Surgical Diseases and Injuries of the Genito-urinary Organs (R) 784  
 Thoracic, see Lung and Tuberculosis, pulmonary  
 Thorpe, J. F., and Whiteley, M. A., Thorpe's Dictionary of Applied Chemistry (R) 550  
 Throat—Diseases of the Nose and Throat (C. J. Imperatori and H. J. Burman) (R) 204; Year Book of the Eye, Ear, Nose, and Throat (R) 433; see also Streptococcal infection  
 Thrombosis, see Arteries and Veins  
 Thumb-grip developer, 238  
 Thyroid extract, exophthalmos following (W. R. Brain) 182  
 Thyroid gland—athero-sclerosis and (N. P. Dungal) 1354; exophthalmos and (A) 1423; nervous disorder and (S. Ingvar) 343; suppuration of (R. Coope and L. Findlay) 1172  
 Tibbetts, T. M. (O) 745  
 Ticks, relapsing fever and (S. Adler, O. Theodor, and H. Schieber) (C) 448  
 Tidy, H. L., on Curriculum Committee's report, 1320; and Short, A. R., Medical Annual (R) 1242  
 Tissue extracts, vasodilatory (Gefässerweiternde Stoffe der Gewebe) (J. H. Gaddum) (R) 262  
 Tod, M. C., on radiotherapy in cancer of rectum, 1183  
 Todd, A. T., selenium in cancer (C) 1261  
 Tonsils—"enlarged" (T. B. Layton) (P) 1252; removal of, pneumococcus meningitis and (S. E. Harris and H. A. Yenikonschian) 143; see also Streptococcal infection  
 Toothbrush, hygienic, 1045  
 Topley, W. W. C., medical education and medical research, 43; Greenwood, M., Hill, A. B., and Wilson, J., Experimental Epidemiology (LA) 1362  
 Topping, A., on maternal mortality, 545  
 Torrens, D. S., election, 389  
 Tours, medical, 163, 1261, 1272, 1424  
 Toussaint, C. H. C., on tuberculous meningitis, 479  
 Trachoma, see Eyes  
 Transilluminescope, pocket (H. Bailey) (NI) 902, (M. E. El-Ibiary) (C) 1160  
 Treatment, see Therapeutics  
 Trigeminal nerve, herpes zoster of (R. M. Campbell) 1066  
 Trigeminal tic (A) 730; prognosis in (W. Harris) (P) 41  
 Tropical medicine—research on (A) 558, 1368; Tropical Diseases (H. M. Shelley) (R) 487; tropical houses, replicas of, 330; see also Sodium chloride  
 Trypanosomiasis prophylaxis with "Bayer 205" (H. L. Duko) 463

Tuberculosis—1322; after-care, 199, 857, work and (A) 906; American League of Tuberculosis, 1433; blood counts in (P. Heaf) (C) 1142, (A. Piney) (C) 1216; cervical gland (B. C. Thompson) 946, (V. C. Thompson) (C) 1141, (G. Grey Turner) (C) 1262; chilblains and (A) 1126; chronic, miliary, 858; climate and, 1181; conferences, 403, 459; dispensary organisation, 856; epidemiology of (A) 381; Gerson diet in (LA) 153; in Austria, 109; in hospital employees (A) 211; in Ireland, 1136; in London, notification of (PCP) 866; in nurses, after-care of, 519, 1450; in Russia, 340, 699, 876; in Wales (PI) 576, 1325; London dispensaries exhibition, 1447; lupus vulgaris, 388, cancer and, 987; meningial, 479; merthiolate in (D. P. Lambert) 1176; National Association for Prevention of Tuberculosis, 403, 979; of colon (P. Manson-Bahr) 830; of uterus, 1241; osteo-articular (La tuberculose ostéo-articulaire) (J. Calvé, M. Galland, and M. Mozer) (R) 667; phlycten and, 664, (A) 909; post-graduate course in, 816; sanatorium treatment in Sweden, 1222; segregation of (LA) 1123; spinal (Sir H. Gauvain) (P) 562, (C) 690, (S. D. P. Fisher) (C) 630, 740; superinfections, 876; thrombophlebitis and (F. Altshuler) 948; Tuberculin Handbook (H. Sutherland) (R) 955; see also B C G, Bovine tuberculosis, Milk, and—  
 Tuberculosis, pulmonary—capacity for work in, 857; cineradiography of, 857; demonstration, 232; Diagnosis and Treatment of Pulmonary Tuberculosis (J. B. Hawes and M. J. Stone) (R) 1243; early diagnosis of (A) 561, 917; Diseases of the Chest (J. A. Myers) (R) 433; mortality from, in young adults, 219; silicosis and (LA) 611; subcutaneous emphysema and (B. C. Thompson) 1356; surgical emphysema and (D. N. Dobbie) 365, (G. A. Mason) (C) 448; survival in (A) 615; see also—  
 Tuberculosis, pulmonary, surgery of—apical thoracoplasty (W. H. C. Romanis and T. H. Sellors) 714; diaphragm, temporary paralysis of (L. O'Shaughnessy and J. H. Crawford) 534; in Hungary, 237; pleural adhesions, open operation for, 148; pleural shock, air embolism and (C. O. S. B. Brooke) (C) 56  
 Tumarkin, I. A., crocodile tears, 26, (A) 156  
 Turnbull, H. M., on obliterative arterial disease, 540  
 Turner, G. G., on income tax in general practice, 177  
 Turner, G. Grey, carcinoma of œsophagus, 67, 130; tuberculous cervical glands (C) 1262  
 Turner, P., and Rowlands, R. P., Operations of Surgery (R) 1358  
 Turner, R. (O) 113  
 Turner, W. (O) 869  
 Tweedie, A. R. (O) 745, 810  
 Twining, E. W., on radiography in neurosurgery, 782  
 Twin-locking (J. S. Coleman) 196  
 Tylor (R. R. Marett) (R) 263  
 Typhoid fever—Bacteriology of Typhoid (L. C. Havens) (R) 550; in Derbyshire (PI) 402, 697; in France, 1431; serum treatment of (A) 442; virulence antigen, 1435  
 Typhus fever—doubtful case of (A. H. Skinner) (C) 571, 1143; epidemiology of (A) 1250

**U**

Ultra-short waves, see Short wave therapy  
 Ultra-violet rays—counter-irritation by (A. Eidenow) 1404; Fluorescence Analysis in Ultra-violet Light (J. A. Radley and J. Grant) (R) 1416; mercury arc, new, 407; skin cancer and (A. H. Roffo) 472; see also Actinotherapy and Specialist treatment  
 Umanski, M. (O) 1260  
 Unconscious, see Psychology  
 Undulant fever—(Sir W. Dalrymple-Champneys) (C) 1143; foudain in (C. Z. Neumann) 1001; in France (A) 1306

Unemployment—disabled soldiers' hospital allowances and (PI) 456; food supplies and (PI) 576; health insurance and (PI) 341, (PCP) 865; infectious diseases in Durham (PI) 697; means test (PI) 923, 1038; nurseries for children of unemployed, 1386; Poverty and Health (G. C. M. M'Gonigle and J. Kirby) (R) 1358; special areas, report on, 503; training centres, health in (PI) 575, 696, 749, 813, 1093; see also Nutrition

Unley, C. C., anaemias in pernicious anaemia, 349, (A) 380, (C) 448, 622; Castle's intrinsic factor in pernicious anaemia, 1232

United States of America—insurance, American view of (PCP) 1437; rural hospitals in, 984; rural midwifery in, 580; school medical work in, 395; sterilisation in, 1083; syphilis in, 1382; young doctor in (A) 908

UNITED STATES OF AMERICA, CORRESPONDENCE FROM.—Alcoholism, acute, 50—American Medical Association, 1432—Cramp, A. J., retirement of, 447—Dayton clinics closed, 800—Mayhem charges, 801—Medicines, patent, control of, 223—Micro-organisms, low temperatures and, 50—Mortality, trends of, 917—Public health, conference on, 1083—Surgeon-General, appointment of, 969—Syphilis, 1083—Tuberculosis, case finding in, 917—Tuberculous, league of, 1433

Universities—University Grants Committee, report (LA) 957; University Travel Guild, 694

UNIVERSITIES.—Aberdeen: appointment, 1217; degrees, 873; diplomas, 873; donation, 1217—Adelaide: 905; appointment, 927—Bristol: degree, 1502; pass list, 1447—Birmingham: donation, 637; lectures, 637, 1080; pass list, 123; post-graduate courses, 637—Cambridge: appointments, 339, 1095; clinical research at (A) 1482; degrees, 123, 288, 403, 515, 693, 1095, 1217, 1331, 1446, 1502; diploma in radiology, 1323; donation, 1080; election, 1095; grant, 123; lectures, 232; pass lists, 58, 458—Dublin: appointment, 578; election, 1386; pass list, 816—Durham: degrees, 58; diplomas, 58; reconstitution of (A) 270—Edinburgh: degrees, 58, 693; diploma, 58; grant, 1310; medal, 58—Glasgow: appointments, 1217, 1502; degrees, 973, 1502; lectures, 403, 873; medals, 973; ophthalmology, chair of, 918—Leeds: appointments, 751, 1270; pass list, 751—Liverpool: lecture, 987; pass list, 751—London: appointments, 172, 232, 339, 515, 578, 693, 816, 1270, 1386, 1502; biochemistry, chair of, 693; centenary, 158, (LA) 1480, 1502; degrees, 816; dietetics, chair of, 515; diplomas, 58; election, 1502; fellowships, 339, 578; lectures, 172, 232, 403, 497, 515, 638, 927, guide to, 178; medal, 578; pass lists, 58, 123, 816, 973, 1386; readerships, 693, 1386, 1502; Rogers prize essay, 693; university teachers, 693—Manchester: appointment, 751; degree, 816; pass list, 816; scholarships, 978—National University of Ireland: appointments, 693; degrees, 693, 1271—Oxford: appointments, 1095, 1153, 1502; degrees, 578, 751, 1095, 1153, 1386; elections, 637, 1270, 1331, 1446; fellowships, 288, 751; institute of experimental psychology, 693, 1095; scholarship, 288—Queen's University, Belfast: degrees, 58, 1331; fire at, 389—St. Andrews: appointments, 58; chair of dentistry, 1028—Sheffield: appointments, 458, 1153, 1502; pass list, 751—Wales: diplomas, 1386; scholarships, 458

Unregistered practitioners—bogus doctors (ML) 683, 1028

Unwin, J. D., death of, 1486; Sex and Culture (LA) 437, (C) 1087

Ureters—dilatation of, in pregnancy (LA) 152, (A) 210, 259; implantation of (A) 100, (G. S. Woodman) 1112; position of, in proclivita (J. L. Jona) 1473; stones in (S. G. MacDonald) (P) 1311

Urethral obstruction, congenital (A. E. Somerford) 1473

Urinary—calculi, prognosis of (S. G. MacDonald) (P) 1311; see also Genito-urinary and—

Urinary infections—acriflavine in (E. W. Assinder) 304; *R. coli*, 483; mandelic acid and ammonium mandelate in (H. E. Holling and R. Platt) 769, (A. W. Cubitt) (C) 922; sodium mandelate in (F. W. Alexander) (C) 391

Urine—retention of (H. P. Winsbury-White) 1008; see also Glycosuria

Urology—Cystoscopy and Urography (J. B. Macalpine) (R) 1360; text-book of (Traité d'urologie) (G. Marion) (R) 846; Urology in Women (E. C. Lewis) (R) 552; Year Book of Urology (J. H. Cunningham) (R) 608

Urticaria (A) 618

Uterus—bleeding from, treatment of, 914, 916; conservative treatment of, 863, (LA) 1191; endocervicitis, 865; endometrial graft, 666; expulsive force of (C. Moir) 414; hysterectomy forceps (W. M. H. McCullagh) (NI) 841; hysteroscopy (A) 791; myomectomy, 863; rupture of (I. H. K. Stevens) 538, placenta previa and, 952; tuberculosis of, 1241; see also Cancer of, Genito-urinary, and Vaginal

## V

Vacancies, weekly lists of, 59, 124, 178, 234, 294, 342, 408, 462, 520, 582, 642, 700, 758, 818, 874, 930, 980, 1045, 1099, 1155, 1222, 1273, 1332, 1386, 1448, 1504

Vaccination—deaths following (PI) 513, 576; encephalitis and (PI) 456, (A) 1022; lymph supplies for (PI) 513; see also Small-pox

Vaginal—discharge, devesgan in (A) 382, (S. G. Luker) (C) 508, (K. Duff) (C) 571, (J. Marshall) (C) 630, (R. Kuhn) (C) 691; discharge, pruritus and (A. Savill) (C) 691; fistula (G. S. Woodman) 1112; see also Genito-urinary

Valentine, F. C. O., staphylococcal toxin, 526

Van den Berg, M. R. H., on dispensary organisation, 856

Van den Bergh reaction, 1475

Van de Velde, Th., Ideal Birth (R) 955

Vann, A. M. (O) 920

Variations, see Evolution

Varicose veins, see Veins

Variola, see Small-pox

Varrier-Jones, Sir P., on after-care of tuberculosis, 857

Vasomotor responses (A) 326; see also Tissue extracts

Vasotomy, outfit for (J. F. Peart) (NI) 488

Vasovagal attack (T. E. Gumpert) 85, (T. W. Preston) (C) 170

Veins—phlebitis, 606, (H. I. Biegeleisen) 944, (C) 1499, (R. T. Payne) (C) 1034, (M. De Lacey) (C) 1086, tuberculous (E. Altschüler) 948; varicose, injection treatment of (M. J. Bennett-Jones) 537, (C) 1086, (S. McAusland) (C) 1034, thrombosis of vena cava and (A. L. d'Abreu) 84, (J. W. Riddoch) (C) 227; see also Claudication

Veneral disease—Air Ministry and (H. W. Bayly) (C) 1329; in France, 50, 970; in Hungary, 801, 1431; in seamen (A) 1193; Treatment of Venereal Disease in General Practice (T. Anwyll-Davies) (R) 1357; Venereal Disease Act infringement (ML) 800; word "venereal" (A) 438; see also Gonorrhœa, Prostitution, and Syphilis

Ventilation—air-conditioning (LA) 848; temperature and humidity in hospitals and schools (PI) 749

Verity, G., death of, 556

Vernon, E. M. (O) 452

Vertigo—aural, operation for (A) 1366; injury and, 660

Vesicovaginal fistula (G. S. Woodman) 1112

VIENNA, CORRESPONDENCE FROM.—Bucura, C., death of, 109—Busson, B., death of, 388—Coronary occlusion, 388—Dohan, N., death of, 109—Electropathology museum, 801—First-aid society, 388—Insurance, health, 1204—Maresch, Prof., death of, 388—Micro-chemistry, society for, 1205—Passim, F., death of, 109—Practitioners, age-groups of, 109—Psittacosis, 801—Tuberculosis, 109

Violinist, armless (The Armless Fiddler) (C. H. Unthan) 237

Viper venom, see Russell viper venom

Viruses—cancer (Sir R. Muir) 877; fibroma and myxoma, in rabbits (A) 1125; influenza (LA) 32, common cold and (LA) 1479; lymphocytic meningitis (G. M. Findlay, N. S. Alcock, and R. O. Stern) 650, (LA) 670; Plant Viruses (K. M. Smith) (R) 1013; research on, 1434; Rift Valley fever (R. D. MacKenzie and G. M. Findlay) 140; trachoma (A. F. MacCallan) 215; tumour-producing, tar and (A) 1420

Viscera, transposition of (E. A. Cockayne) (C) 1442

Visscher, M. B., and Smith, P. W., Experimental Physiology (R) 317

Vital statistics—birth-rate in France, 278; birth-rate, mother's age and (PI) 1094; for 1935 (A) 210; infant mortality in Rumania, 626; in Scotland, 918; life table, 636, (A) 674; mortality from phthisis in young adults, 219; mortality, trends of, in United States, 917; population trends (A) 210, 674, 791, in India (A) 39; Poverty and Health (G. C. M. M'Gonigle and J. Kirby) (R) 1358; see also Maternal mortality

Vitamin A—deficiency, P-P factor and (J. V. Landor) (C) 1441; deficiency, tests for (L. J. Harris) 966, (A) 964

Vitamin B—deficiency, biochemical lesion in (R. A. Peters) 1161, (B. H. Shaw) (C) 1265; excretion of, in urine (L. J. Harris and P. C. Leong) 886, 967, (A) 964; P-P factor, deficiency of (J. V. Landor) (C) 1441; injection of, in nervous diseases (A) 727, (W. N. Leak) (C) 867, (W. R. Russell) (C) 922; in neuritis of pregnancy (G. W. Theobald) 834; in standard diets, 605

Vitamin C, see Scurvy

Vitamin D—hypervitaminosis, cod-liver oil and (L. Thatcher) 20, (A) 36, (R. T. Hewlett) (C) 115, (H. Ayad) (C) 972; unexpected rickets and (A) 36

Vitamin E—abortion and (A) 728

Vitamins—deficiency of, tests for (L. J. Harris) 966, (A) 964; immunity and (A) 852; research on, 1436; tissue culture and (A) 1424; Vitamins in Theory and Practice (L. J. Harris) (R) 609; see also Diet and Nutrition

Vivisection—charitable bequests and (ML) 624, (Sir L. Rogers) (C) 805; Research Defence Society and (A) 1309

Volkmann's ischæmic contracture (A) 1421

Von Lanz, T., and Wachsmuth, W., Praktische Anatomie (R) 29

Von Weizsäcker, on work and disease, 857, (A) 906

Vulva, see Pruritus

## W

Wachsmuth, W., and von Lanz, T., Praktische Anatomie (R) 29

Wakeley, C. P. G., prophylactic enucleation of lower wisdom tooth follicles (C) 1036

Wales—bronchitis and tuberculosis in (PI) 1325; Penmaenmawr, climate of, 237; tuberculosis in (PI) 576; see also Silicosis

Walker, A., on induction of labour, 1176

Walker, C. E., Evolution and Heredity (A) 729

Walker, K., and Thomson-Walker, Sir J., Surgical Diseases and Injuries of the Genito-urinary Organs (R) 784

Walker, M. B., prostigmin in myasthenia gravis, 1457

Walker, Sir N., presidential address, 1267

Walker, R. M., abscess of spinal cord, 1413

Wallis, C. J., Practical Biology for Medical Students (R) 203

Walsh, C. H., on renal calculi in pregnancy, 952; on ovarian tumours and hysterectomy, 722

Walters, A. H., ankylostomiasis in Indian seamen, 599

Walther, C., death of, 50

Walton, Sir J., carcinoma of stomach, 1101, (LA) 1190

War—bacteriological warfare, 1136; psychology of (W. Brown) 274, 290, (Dangers of Being Human) (E. Glover) (A) 1308

- Ward, G., on recovery after childbirth (A) 1079  
 Ward, G. G., on genital prolapse, 915  
 Ward, R. O., Edwards, A. T., Donaldson, M., Cade, S., and Harmer, W. D., Early Diagnosis of Malignant Disease (R) 845  
 Ware, E. E., moral problems in hospital practice (C) 741  
 Water metabolism, *see* Metabolism  
 Water-supplies—grants for (PI) 401; pollution of, 335, (PI) 1091, 1151, 1263, 1444, 1100, (A) 1484  
 Waters, A. F., prevention of disease by diet, 1472  
 Watson, C. E., apparatus for intravenous saline (NI) 202  
 Watson, D. M. S., on natural selection (LA) 1189  
 Watson, H. H., on silicosis (LA) 611  
 Watson, Sir M., on basis of tropical medicine (A) 1363; on malaria (LA) 323  
 Waugh, A. (O) 509  
 Waugh, W. G., gadgets in plaster work, 427; storage of blood for transfusion (C) 1382  
 Wayne, E. J., anaemia in pernicious anaemia, 349, (A) 350, (C) 448, 622  
 Weather, *see* Physical medicine  
 Weatherly, L. A., on medico-legal problems, 781  
 Weber, F. P., acute febrile anaemia (C) 1086; Endocrine Tumours (R) 487; hepatic cirrhosis, 305; infiltration of liver with lymphocyte-like cells, 1115  
 Weber, H., fear in childhood, 981  
 Webster, J. H. D., "near" X ray therapy (C) 571  
 Weeks, C., on alcohol in hospital practice (A) 617  
 Weil's disease—(LA) 849; macroscopic agglutination test in (A. W. Pot) 1290; meningial form of (A) 156  
 Weinbren, M., oedema of ankles and air transport (C) 170  
 Weir, J. H., puerperal surgical scarlet fever, 1110, (LA) 1122  
 Weiss, S., Grant, J. P., and Quimby, A. J., Diseases of the Liver, Gall-bladder, Ducts, and Pancreas (R) 91  
 Weissenberg, E., and Holzer, W., Foundations of Short Wave Therapy (R) 723  
 Wenyon, C. M., on protozoal infections, 314  
 West, R., curarino in tetanus, 12  
 Westmacott, F. H. (O) 52  
 Westminster Hospital Medical School, 978  
 Wheeler, R. E., on epidemiology of whooping-cough (LA) 1419  
 Whipple, G. H., on anaemia (A) 493  
 Whitaker, Sir J. S., death of, 732, (O) 809  
 Whitaker's Almanack, 758  
 Whitby, L. E. H., staphylococcal toxoid in skin lesions, 1454  
 White, C. F., sardines unfit for human food (C) 867  
 White, C. J. G. (O) 167  
 White, E., transmission of haemolytic streptococci by dust, 941  
 White, P., on examination of milk for tubercle bacilli (A) 268  
 Whitehouse, B., on spa treatment of gynaecological conditions, 1138  
 Whitley, M. A., and Thorpe, J. F., Thorpe's Dictionary of Applied Chemistry (R) 550  
 Whitlows (N. Eckhoff) (P) 1369  
 Whooping-cough—epidemiology of (LA) 1419; spread of (A) 440; vaccine (N. D. Begg and M. F. Coveney) 82, (H. W. Crowe) (C) 169, (A) 1019  
 Wilkinson, J. F., anti-anaemic principle of liver, 354, (A) 380  
 Willcox, Sir W., on botanical therapeutics, 1447; on statutory safeguards against poisoning, 544  
 William Withering lectures, 964  
 Williams, E., death of, 459  
 Williams, J. H. (O) 399  
 Williams, L., Minor Medical Mysteries (R) 91  
 Williams, P., undescended testis, 426  
 Willmore, J. G., on hypoglycaemic glycosuria, 431  
 Wilmer, W. H., death of, 676, (O) 746  
 Wilson, G. S., on bacteriological grading of milk, 217  
 Wilson, H., on neurosis, 65  
 Wilson, J., Greenwood, M., Hill, A. B., and Topley, W. W. C., Experimental Epidemiology (LA) 1362  
 Wilson, J. St. G., on Simmonds's disease, 951  
 Wilson, W. C., suprarenal cortex in toxæmia of burns, 1400  
 Winnicott, D. W., on enuresis, 1010  
 Winsbury-White, H. P., retention of urine, 1008  
 Wise, E., on midwifery in Holland, 737  
 Witts, L. J., prognosis in asthma (P) 273; therapeutic action of iron, 1  
 Wodehouse, R. P., Pollen Grains (R) 1118, (A) 1126  
 Wohlgenuth, A., Freud's eightieth birthday (C) 1086  
 Wolf, H. F., Short Wave Therapy and General Electrotherapy (R) 723  
 Women—Feminine Attitudes of the Nineteenth Century (C. W. Cunningham) 461; health of, lectures on, 516; in mines (PI) 1263; married, doctors' bills and (ML) 329; medical students, fate of (M. H. Kettle) 1370; training of, for citizenship overseas, 74; Woman (H. H. Ploss, M. Bartels, and P. Bartels) (R) 1185  
 Wood, J. (O) 165  
 Wood, J. L. M., scarlet fever (C) 508  
 Wood, P., on sedimentation-rate in heart disease (A) 271  
 Wood, T. J., gastro-enterostomy for pyloric stenosis (C) 1442  
 Woodger, J. H., Elementary Morphology and Physiology for Medical Students (R) 203  
 Woodman, G. S., vesicovaginal fistula, 1112  
 Woods, R. R., Painful and Dangerous Diseases of the Ear (R) 433  
 Woolley, E. J. S., glycosuria and aceto-nuria in subarachnoid haemorrhage, 894  
 Woolmer, R. F., late other convulsions, 1005, (A) 1194  
 Work, *see* Industrial medicine and—  
 Workmen's compensation—accident, illness and (ML) 683, 799; departmental inquiry into (PI) 401; lightning and (ML) 221; negligence of fellow workmen and (PI) 743; nystagmus and (PI) 632, 1501; occupational diseases and (PI) 814; psychic pain and (ML) 445; *see also* Incapacity and Silicosis  
 Wounds—anoctal, healing of (W. B. Gabriel) 1345; dressing for (K. McFadyean) 1177  
 Wright, Sir A., presentation to, 797  
 Wright, A. D., on other convulsions (A) 156; on phlebitis, 606  
 Wright, H., Birth Control, 407  
 Wright, Hedley, on puerperal sepsis, 547  
 Wright, H. D., *B. aertrycke* food poisoning, 22  
 Wright, J., staphylococcal leucocidin and antileucocidin, 1002  
 Wright, J. G., on non-volatile narcotics (A) 557  
 Wright, J. H., death of, 1331, (O) 1381  
 Wright, S., address in Harley Street (C) 742  
 Wright, W., on the Princes in the Tower (A) 1367  
 Wrigley, A. J., on induction of labour, 1178  
 Wyatt, J., on induction of labour, 1179  
 Wyllys, H. J. M. (O) 1260

## X

- Xanthomatosis, *see* Spleen  
 X rays—development of, on continent, 858; Electrical Engineering in Radiology (L. G. H. Sarsfield) (R) 1301; in cancer, 86, 480, 482, (J. H. D. Webster) (C) 571, (W. S. Handley) 987, 1183, 1228, (S. Russ) (C) 1329, 1492; in pyoderma, 1432; in uterine haemorrhage, 914; *see also* Radiography and Radiology

## Y

- Yearsley, M., Zünd-Burguet treatment (C) 740  
 Yellow fever, 510  
 Yeunikomshian, H. A., pneumococcus meningitis following tonsillectomy, 143  
 Young, R. A., prognosis in chronic bronchitis and emphysema (P) 101  
 Youth, Sex, and Life (G. M. Cox) (R) 1302  
 Yudkin, J., vitamins in human nutrition, 1488  
 Yule, V. T. B. (O) 574

## Z

- Zinc ionisation for hay-fever (P. Franklin) (C) 1442, (A) 1424, (C. Shields) (C) 1199  
 Zondek, B., follicular hormone and pituitary gland, 10, (A) 37, 776, (LA) 788  
 Zoology—Practical Zoology (H. R. Hewer) (R) 203; *see also* Morphology  
 Zoster—chicken-pox and (A. G. P. Hardwick) (C) 986, (D. Kyle) (C) 1499; of trigeminal nerve (R. M. Campbell) 1966  
 Zuckerman, S., oestrogens and male reproductive tract, 135, (LA) 152; on fertility (A) 210; sex hormones and prostate, 242  
 zur Verth, M., Braencker, W., Haberland, H. F. O., Klose, H., Die Differentialdiagnose chirurgischer Erkrankungen (It) 203













