NOVEMBER, 1951

THE ULSTER MEDICAL JOURNAL

PUBLISHED BY
THE ULSTER MEDICAL SOCIETY

Smartly Turned out!

You would like your friends to say you're always smartly turned out, and they will, if you make up your mind to have your Suits Dry-Cleaned at regular intervals; constant brushing is not sufficient to retain that degree of freshness necessary to gain attention and merit approval . . . that tired look your soiled clothes have can only be eliminated by skillful Dry-Cleaning and Tailor Pressing.

Your favourite Suit or Raincoat can be returned to you in five days with all those Stains and Creases removed and much of the charm they gave when they were new restored.

Lilliput

LAUNDRY & DYEWORKS LTD.

DYERS & CLEANERS

To Particular People

DUNMURRY - BELFAST

Telephone: Dunmurry 2344 (3 lines)

Ask for details of our new five-day Service from Vanman, Local Receiving Office, or Agent.

Stewart's

"washed-out"

...defines a common deficiency

The water-soluble vitamins—those of the B complex and ascorbic acid —are not stored by the body to any great extent; any excess above immediate needs is, in a real sense, 'washed out' from the system. And so, in these days of haphazard feeding, it is easy for a deficiency to arise—showing itself in an indefinite lassitude and fatigue, and often accompanied by sub-clinical skin and digestive disorders. Just as easily, the condition can be corrected with Nicorbin, which presents the four most important water-soluble vitamins in convenient tablet form.

NICORBIN tablets In bottles of 50 and 500

Each tablet contains: aneurine hydrochloride (vitamin B_1), 1 mg.; riboflavine, 1 mg.; nicotinic acid (P.P factor), 10 mg., ascorbic acid (vitamin C), 25 mg.

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX - ENGLAND

D

" Fluids not too good, Sister—
just as well he's on 'Sulphamezathine' "

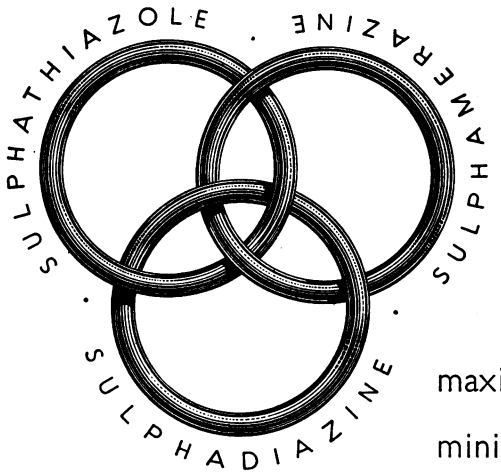
High potency combined with exceptionally low toxicity make 'Sulphamezathine' one of the most suitable sulphonamides for routine use. Nausea, vomiting and other common reactions are rarely encountered and, because of its high solubility, renal complications do not occur.

'SULPHAMEZATHINE'

Sulphadimidine B.P. Trade Mark

Available in the form of tablets (0.5 *gramme*); *lozenges; oral suspension and powder; and as the sodium salt in sterile solution for parenteral administration.*

IMPERIAL CHEMICAL (PHARMACEUTICALS) LTD.
A subsidiary company of Imperial Chemical Industries Ltd.
Wilmslow, Manchester
Ph.239



maximum efficacy

minimum risk

trade mark **'SULPHATRIAD'** brand

compound sulphonamides

The solubility in the urine of three sulphonamides administered together is considerably greater than that of one sulphonamide in the same total dosage. The risk of crystal deposition and its attendant danger of renal damage has been largely overcome by the use of such mixtures of sulphonamides.

The bacteriostatic activities of the three components of 'Sulphatriad' brand compound sulphonamides are additive, whereas the danger of crystalluria is only as great as if each component had been administered separately in the same partial dosage.

'SULPHATRIAD' is supplied as follows

Tablets: containers of 25, 100 and 500 x 0·50 gramme

Suspension: containers of 4 and 40 fl. oz.

(each tablet or each fluid drachm of suspension contains sulphathiazole 0·185 gramme, sulphadiazine 0·185 gramme, sulphamerazine 0·130 gramme)

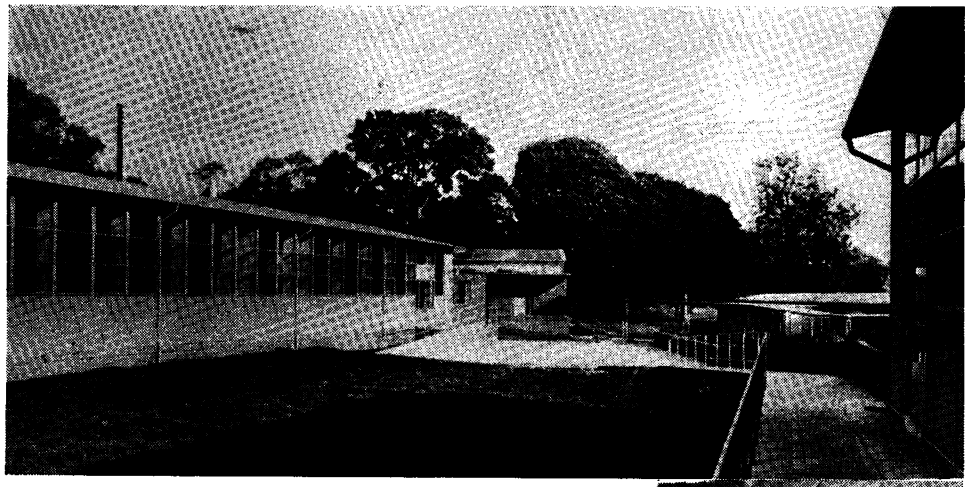
manufactured by

MAY & BAKER LTD

MA 48577

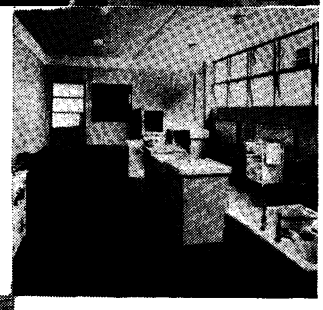
distributors

PHARMACEUTICAL SPECIALITIES (May & Baker) LTD., DAGENHAM



ANOTHER MAJOR PROBLEM SOLVED

By specifying 'Bristol' Aluminium Buildings—the immediate answer to Northern Ireland's urgent need of hospital, sanatorium and clinical accommodation—Muckamore Abbey Mental Institution has been more than trebled in size in a matter of weeks. Aluminium extensions which have been added are permanent and capable of enlargement, if necessary, at a later date. Excellent harmony of old and new at Muckamore Abbey shows that aluminium extensions can be planned to blend pleasantly with existing groups of buildings, while their excellent design and physical qualities ensure equable ventilation and heating combined with exceptional cleanliness and hygiene **—factors which are speedily gaining world-wide recognition from medical authorities.**



★

In Northern Ireland "Bristol" structures have been erected, are in the process of erection or are projected at:—

"Bristol" HOUSING

PERMANENT ALUMINIUM BUILDINGS

COMPLETED: Ballynahinch, Ballycastle, Glengormley, Finaghy, Sydenham, Ashfield No. 1, Annadale No. 1, Bangor - Wexford - Enniskillen - Festival of Britain, Muckamore Abbey

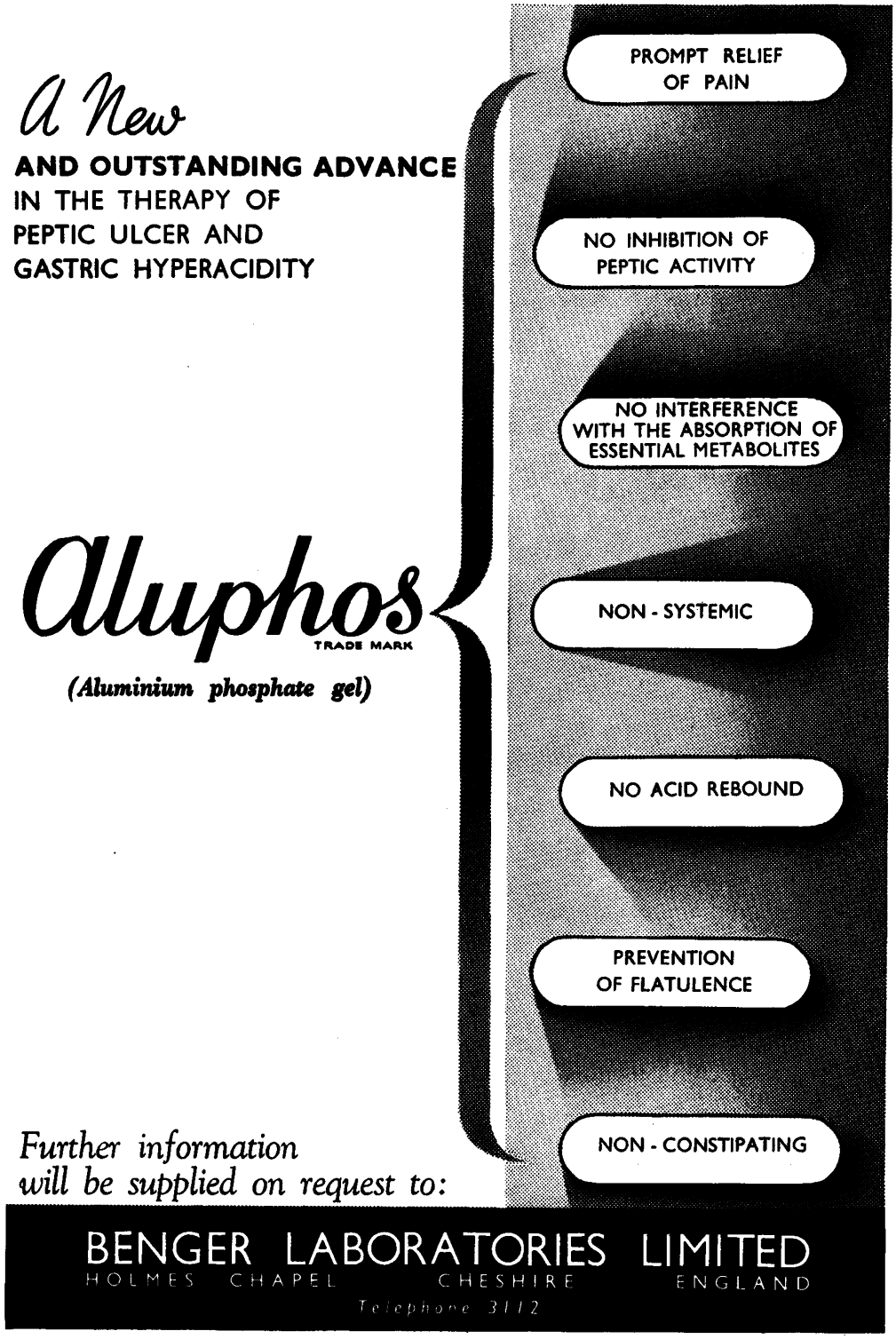
UNDER COMPLETION: Ashfield No. 2, Annadale No. 2, Crumlin, Ballyclare, Whitehouse, Royal Victoria Hospital

A neuro-surgical unit has been constructed at the Royal Victoria Hospital, Belfast, and an Industrial Medical Unit has been built at Short Brothers and Harland Ltd.

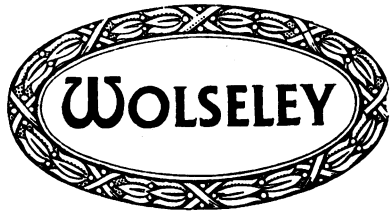
Manufactured and erected in Northern Ireland by

SHORT BROTHERS & HARLAND LIMITED

COMMERCIAL DIVISION . GLEN WORKS . NEWTOWNARDS


A New
AND OUTSTANDING ADVANCE
IN THE THERAPY OF
PEPTIC ULCER AND
GASTRIC HYPERACIDITY
Aluphos
TRADE MARK
(Aluminium phosphate gel)
PROMPT RELIEF OF PAIN
NO INHIBITION OF PEPTIC ACTIVITY
NO INTERFERENCE WITH THE ABSORPTION OF ESSENTIAL METABOLITES
NON - SYSTEMIC
NO ACID REBOUND
PREVENTION OF FLATULENCE
NON - CONSTIPATING
Further information will be supplied on request to:
BENGER LABORATORIES LIMITED
HOLMES CHAPEL CHESHIRE ENGLAND
Telephone 3112

Appointed



Distributors

Having been appointed Wolseley Distributors in Northern Ireland, we offer immediate service to Wolseley Owners. Skilled Factory-trained Staff; comprehensive replacement Engine and Spare Parts Service are now available for all Wolseley Cars at our Depot, 123 Donegall Street

"QUALITY FIRST" SERVICE

As Morris Distributors, our association with the Nuffield Organisation is of long standing. We continue to offer to all Morris Owners the facilities for servicing Morris Cars which have for so many years been at their disposal

Distributors for Northern Ireland:

W. H. ALEXANDER, Ltd.

MAY STREET 22671 | DONEGALL STREET 26637 | HOLMES STREET 22851

BELFAST

REVIEW

AIDS TO ANATOMY: POCKET ANATOMY. By R. J. Last, M.B., B.Sc. (Adel.), F.R.C.S. Pp. viii-380, with 60 illustrations. 11th Edition. March, 1951. Price 7s. 6d.

THIS edition of the well known "Pocket Gray," as it has been called during part of its long history, has been thoroughly revised by the Professor of Applied Anatomy, at the Royal College of Surgeons of England, and is assured of a ready welcome. The Birmingham revised terminology is used throughout, and much old material has been replaced by new. This latter may seem an impossibility, but besides some generalizations on joints and muscles, which were not given previously, information on the arches of the foot, the thoracic wall, the breast, the lymphatic system, the cranial autonomic ganglia, the dermatomes and the larynx has been expanded. The new conceptions of the true attachments and actions of the popliteus muscle, which were mainly worked out by the editor himelf, have also been incorporated in text and diagram.

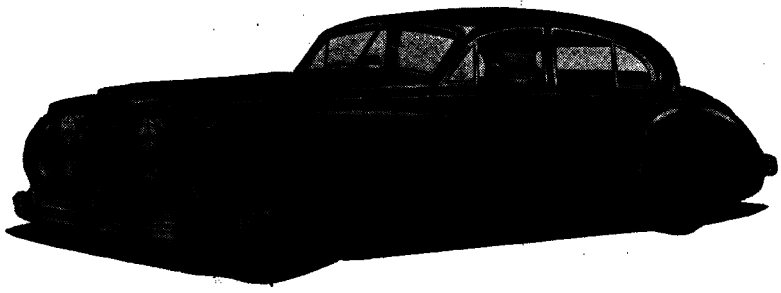
Agreement on the segmental distribution of the nerves to the skin seems to be as difficult to attain as international agreement, so perhaps it is not surprising that in a book of this nature the editor should give only his personal opinion on this debatable question. The experimental results of Keegan and Garrett (1948) have been ignored and the older scheme of dorsal and ventral axial lines on the limbs has been retained. The newer explanation of a single ventral axial line at which the more cranial nerves meet the more caudal would appear to have the support of both experimental and clinical evidence, and it is a pity that it was not given preference. The general plan of the book is unchanged and its usefulness as an aide memoire should ensure its continued popularity.

W. R. M. M.

The professional touch!

Designed by specialists, and made by specialists for the motorist who specially likes a car that is completely different has given the Jaguar the right to its claim of being . . . .

The finest car of its class in the world



JAGUAR

Grace . Space . Pace

Since the debut of the Mark VII Jaguar, time has shown how well it merited that first sensational acclamation. In the past 12 months the Jaguar has dominated the International motoring scene, gaining success in no fewer than 12 major events, including the Le Mans 24-hour race — the first British car to do so for 16 years. Jaguar are proud of this year of great achievement and of the generous tributes paid to their cars throughout the world

Distributors for Northern Ireland:

Victor LIMITED

ONE UPPER QUEEN STREET, BELFAST

Telephone 21677 (2 lines)

Stewart's

TYRESOLES

REGISTERED TRADE MARK

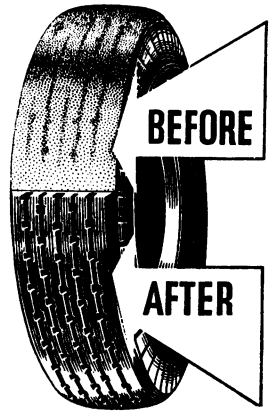
give ***NEW***

TYRE MILEAGE OVER AGAIN

at approximately

HALF THE COST OF NEW TYRES

Every make and size of tyre can be treated



★ **WYRESOLES** For added safety specify "WYRESOLES," the steel claw tread that grips — an outstanding success in the 1951 Monte Carlo Rally.

Harry **FERGUSON** (Motors) Ltd

JOY STREET PHONE 25444 (7 lines) **BELFAST**

Active little bodies

MUST have nutritious food in plenty, food so nutritious that, along with bodily growth, there should be a corresponding development of brain power

R.S.O. FOOD

"A PURE WHITE PRODUCT"

provides the necessary nutriment; it is a natural food in easily digested form

"There's a wealth of Health in every tin"

Product of

WHITE, TOMKINS & COURAGE LTD. - BELFAST

Manufacturers of Pure Foods since 1841

OUR MOTOR AMBULANCE

is ever ready for conveying patients to and from Hospital or Nursing Home in city or country — distance no object
Specially designed and equipped to ensure safe, comfortable travel under all conditions

MODERATE CHARGES

MELVILLE & CO., LTD.

TOWNSEND STREET - BELFAST

In time of need ——— 'Phone ——— Belfast 26272

For Cleansing and Disinfecting Wounds and Burns

'Cetavlon' is an efficient antiseptic, highly germicidal against both Gram-positive and Gram-negative bacteria. Solutions of 'Cetavlon' also possess exceptional detergent properties and are especially suitable for cleansing and disinfecting the skin. They are easily prepared, pleasant to handle, and economical in use.

'Cetavlon' has the following advantages over other antiseptics when used for cleansing and disinfecting wounds and burns.

- All contaminating matter quickly and easily removed.
- Highly bactericidal in low concentration.
- Non-toxic and non-irritant.
- Does not retard healing.

'Cetavlon' is available in powder form; as a 20% Concentrate; and as a Tincture.

'CETAVLON'

TRADE MARK — CETRIMIDE

Literature and further information available, on request, from Imperial Chemical Industries Limited, Imperial House, Donegall Square East, Belfast.

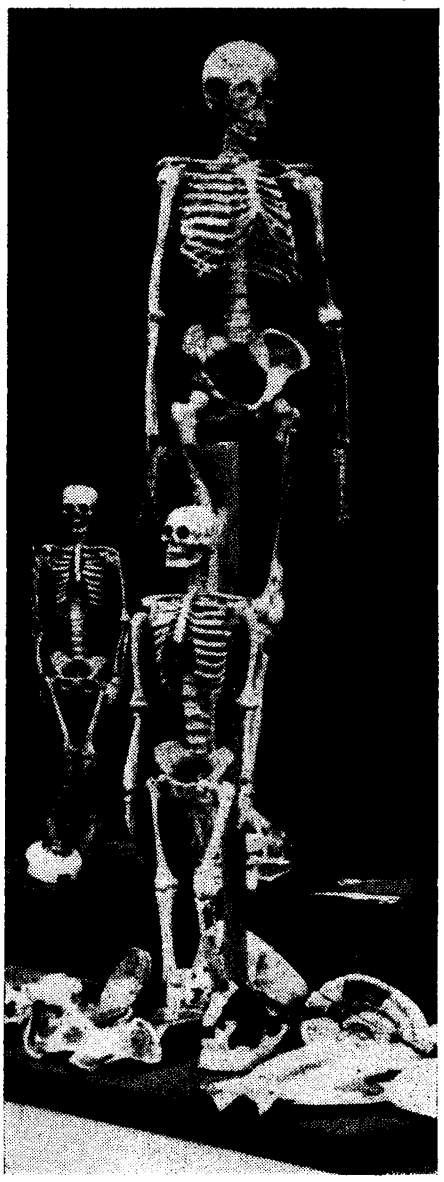
IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED

A subsidiary company of Imperial Chemical Industries Ltd. WILMSLOW, MANCHESTER

ICI

Ph.207/1

CLARKES *of Donegall Square*



"The Famous Miniature Skeleton."

SOLE NORTHERN IRELAND AGENTS FOR

ANATOMICAL MODELS

by

EDUCATIONAL & SCIENTIFIC PLASTICS, LTD.

MADE IN PLASTIC AND CAST LATEX

E PRODUCT S P

FULL AND HALF SKELETON

SKULL

FUNCTIONAL FOOT AND LEG

FLEXIBLE BRAIN

DEMONSTRATION EYE

FLEXIBLE HEART

FOETAL BLOOD CIRCULATION

OBSTETRIC PHANTOM WITH FOETAL DOLL, ETC.

OBSTETRIC PELVIS WITH FOETAL SKULL

and Several Other Models

◆

A Comprehensive Medical, Surgical and Laboratory Service

JOHN CLARKE & CO. LTD., 8 DONEGALL SQ. W. BELFAST 27256/7

PRINTED FOR THE ULSTER MEDICAL SOCIETY BY GRAHAM AND HESLIP, LIMITED, BELFAST.
ADVERTISEMENT AGENTS: GEO. A. STEWART LTD., 38 DONEGALL PLACE, BELFAST.

The Ulster Medical Journal

VOL. XX

PUBLISHED BY
THE ULSTER MEDICAL JOURNAL
1951

CONTENTS

No. 1. May, 1951

PAGE

A Medical Survey of the Irish Famine of 1846. Lt.-Gen. Sir William MacArthur, K.C.B., D.S.O., O.B.E., M.D., D.SC., F.R.C.P., F.R.C.P.I. - 1

The Happiness of the Child. F. M. B. Allen, M.D., F.R.C.P. - - 16

The General Practitioner in Eclipse. J. B. Young, M.C., M.B. - - 31

The Value and Limitation of Electroencephalography. J. H. D. Millar, M.D., M.R.C.P.(LOND.) - - - - - 41

Hyperchloræmic Acidosis with Nephrocalcinosis. Joan B. T. Logan, M.D., M.R.C.P. - - - - - - - - 58

Evaluation of the Treatment of Disseminated Sclerosis with Arsenicals. J. H. D. Millar, M.D., M.R.C.P.(LOND.) - - 62

Post-Partum Eclampsia. William S. Campbell, B.SC., M.B., B.CH., F.R.C.S. (ENG.), M.R.C.O.G., L.M.(ROTUNDA) - - - - - 66

Leucotomy: A Follow-up of Sixty Cases. C. B. Robinson, M.D., F.R.C.P.(I), D.P.M. - - - - - - - 75

Recent Reverses in Immunisation. W. J. McLeod, M.D., D.P.H. - 78

Congenital Atresia of the Œsophagus. A. A. H. Gailey, M.D., D.C.H., M.R.C.P.E., and W. A. B. Campbell, M.D., D.C.H., M.R.C.P.E. - - 81

Royal Medical Benevolent Society of Ireland - - - 86

List of Additions to the Medical Section of the Library of the Queen's University of Belfast, October, 1950-February, 1951 87

Reviews - - - - - - 30, 57, 61, 65, 91, 92

No. 2. November, 1951

Gilbert and Sullivan. J. G. Johnston, M.C., M.D., J.P. - - - 93

A Short History of Otolaryngology. Kennedy Hunter, M.B., F.R.C.S. (EDIN.), D.L.O.(ENG.) - - - - - - 106

A History of The Queen's University of Belfast Dental School. P. J. Stoy, B.D.S., F.D.S.R.C.S. - - - - - - 118

The Pattern of Disease. F. M. B. Allen, M.D., F.R.C.P. - - - 131

Dental Disease and Civilisation. P. J. Stoy, B.D.S., F.D.S.R.C.S. - 144

The Control of Diseases of Tissue Reactivity by Cortisone. Wm. Townsley, M.D. - - - - - - - - 159

Doctor and Patient in the Age of Hippocrates. E. D. Phillips, M.A. 172

Recent Trends in Maternal Mortality in Northern Ireland. E. A. Cheeseman, B.SC.(ECON.), PH.D.(MED.) - - - - 181

The Lacrimal Channels in Cyclopia. W. R. M. Morton - - 189

List of Additions to the Medical Section of the Library of the Queen's University of Belfast, March-September, 1951 - 195

Reviews - - - - - - 105, 130, 143, 158, 171, 180, 198

CONTENTS

PAGE

GILBERT AND SULLIVAN. J. G. Johnston, M.C., M.D., J.P. - - - 93

A SHORT HISTORY OF OTOLARYNGOLOGY. Kennedy Hunter, M.B., F.R.C.S. (EDIN.), D.L.O.(ENG.) - - - - - - 106

A HISTORY OF THE QUEEN'S UNIVERSITY OF BELFAST DENTAL SCHOOL. P. J. Stoy, B.D.S., F.D.S.R.C.S. - - - - - - 118

THE PATTERN OF DISEASE. F. M. B. Allen, M.D., F.R.C.P. - - - 131

DENTAL DISEASE AND CIVILISATION. P. J. Stoy, B.D.S., F.D.S.R.C.S. - 144

THE CONTROL OF DISEASES OF TISSUE REACTIVITY BY CORTISONE. Wm. Townsley, M.D. - - - - - - - 159

DOCTOR AND PATIENT IN THE AGE OF HIPPOCRATES. E. D. Phillips, M.A. 172

RECENT TRENDS IN MATERNAL MORTALITY IN NORTHERN IRELAND. E. A. Cheeseman, B.SC.(ECON.), PH.D.(MED.) - - - - 181

THE LACRIMAL CHANNELS IN CYCLOPIA. W. R. M. Morton - - 189

LIST OF ADDITIONS TO THE MEDICAL SECTION OF THE LIBRARY OF THE QUEEN'S UNIVERSITY OF BELFAST, March-September, 1951 - 195

REVIEWS - - - - - 105, 130, 143, 158, 171, 180, 198

Fellows and Members of the Ulster Medical Society receive the Journal free.
Subscription to non-members, five shillings annually.

THE ULSTER MEDICAL JOURNAL

NOTICE TO CONTRIBUTORS

1. Manuscript should be typewritten and fully corrected. Contributors will be responsible for the payment of any sum charged for correction of the printer's proof in excess of ten shillings per sheet (16 pages).
2. Illustrations must be in finished form ready for reproduction. They must be properly labelled in type or by hand, with reference pointers if necessary.
3. Line drawings must be sent whenever possible. Illustrations requiring half-tone blocks are costly, and unless printed on special art paper are often unsatisfactory. Authors will be charged for these half-tone blocks at cost price.
4. The legend describing an illustration must be inserted in the appropriate place in the text, and should not be placed on or appended to the drawing.
5. Orders for reprints must be given when the author returns the printer's proof. The cost of these may be obtained from the printers in advance.
6. Editorial communications should be sent direct to the Editor, Dr. J. E. Morison, M.D., B.SC., Institute of Pathology, Grosvenor Road, Belfast.

ADVERTISEMENTS

First advertising forms go to press thirty days in advance of the date of issue. In forwarding copy, time must be allowed for setting up and submitting proof. All communications for space must be sent direct to the advertisement controllers: MESSRS. GEO. A. STEWART LTD., 38 Donegall Place, Belfast. 'Phone: Belfast 23455.

DATES OF PUBLICATION

Under present difficult circumstances it is hoped to issue two numbers each year: on 1st May and on 1st November.

THE QUEEN'S UNIVERSITY OF BELFAST

LIST OF ADDITIONS TO THE MEDICAL SECTION OF THE LIBRARY

MARCH-SEPTEMBER, 1951

PERIODICALS

American College of Surgeons. Bulletin. 36 :2—, 1951—.
British Journal of Physical Medicine. New series, 14—, 1951—.
Cancer, 1—, 1948—.
Chicago Medical School. The Chicago Medical School quarterly, 12 :2—, 1951—.
Empire Rheumatism Council. *Cortisone Committee*. Annotated bibliography of cortisone, A.C.T.H. and related hormonal substances. 2—, 1951—.
Gastroenterology, 17—, 1951—.
Illinois Medical Journal, 96 :3—, 1949—.
Japanese Journal of Experimental Medicine, 20 :5—, 1950—.
Journal International De Chirurgie, 8-11 :2, 1948-1951.
Journal of Clinical Endocrinology, 10—, 1950—.
Journal of Neuropathology and Experimental Neurology, 9—, 1950—.
Journal of Thoracic Surgery, 21—, 1951—.
New York University. Journal of Dentistry, 9 :3—, 1951—.
Revue Neurologique, 84—, 1951—.
Scientia Medica Italica, 1—, 1950—.
Seuchenbekämpfung, 1-4, 1924-1928.
Suomalainen Tiedeakatemia. Toimituksia. Sarja A. V. Medica-anthropologica, 19—, 1949—.

PHYSIOLOGY

ADLER, F. H. : Physiology of the Eye (1950).
BURGER, G. C. E., AND OTHERS (eds.) : Malnutrition and Starvation in Western Netherlands, September, 1944—July, 1945, 2v. (1948).
COLD SPRING HARBOR SYMPOSIA ON QUANTITATIVE BIOLOGY, 12. Neucleic acids and nucleoproteins (1947).
DICKINSON, C. J. : Electrophysiological Technique (1950).
DU BOIS, E. F. : Fever and the Regulation of Body Temperature (1948).
EMMENS, C. W. (ed.) : Hormone Assay (1950).
GYORGY, P. (ed.) : Vitamin Methods. Vol. 2 (1951).
HARRIS, P. L., AND KUJAWSKI, W. (comps.) : Annotated Bibliography of Vitamin E., 1940-1950 (1950).
KAMEN, M. D. : Radioactive Tracers in Biology, 2nd Ed. (1951).
LEE, D. H. K. : The Physiology of Tissues and Organs (1950).
MOMMAERTS, W. F. H. M. : Muscular Contraction (1950).

PENFIELD, W., AND RASMUSSEN, T. : The Cerebral Cortex of Man (1950).
SUMNER, J.B., AND MYRBACK, K. (eds.) : The Enzymes, Vol. 1, pt. 2 (1951).
WILLIAMS, R. J., AND OTHERS : The Biochemistry of B. Vitamins (1950).
WOLF, A. V. : The Urinary Function of the Kidney (1950).

BACTERIOLOGY

BURNET, F. M., AND FENNER, F. : The Production of Antibodies, 2nd Ed. (1949).
KIDD, J. G. (ed.) : The Pathogenesis and Pathology of Viral Diseases (1950).
WAKSMAN, S. A. : The Actinomycetes (1950).

GENERAL MEDICINE

GREEN, D. E., AND KNOX, W. E. (eds.) : Research in Medical Science (1950).
HALLIDAY, J. L. : Psychosocial Medicine (1948).
INSTITUT PASTEUR : Bibliothèques. Catalogue des Périodiques et des Congrès (1951).
MCDONALD, D. (comp.) : Surgeons Twoe and a Barber (1950).
MACNALTY, Sir A. S. : The Renaissance and its Influence on English Medicine, Surgery and Public Health (1946).
MANSON-BAHR, P. H., AND ALCOCK, A. W. : The Life and Work of Sir Patrick Manson (1927).
MEDICAL RESEARCH COUNCIL : Studies of Undernutrition, Wuppertal, 1946-9 (1951).
ROGERS, Sir L. : Happy Toil (1950).
ROYAL COLLEGE OF PHYSICIANS OF LONDON : Committee Reports, December, 1942—April, 1947.

PATHOLOGY

NEWBURGH, L. H., AND LEAF, A. : Significance of the Body Fluids in Clinical Medicine (1950).
OGILVIE, Sir W. H., AND THOMSON, W. A. R. (eds.) : Pain and Its Problems (1950).
SODEMAN, W. A. (ed.) : Pathologic Physiology (1950).

PRACTICE OF MEDICINE

ALTSCHULE, M. D. : Physiology in Diseases of the Heart and Lungs (1949).
BANKS, H. S. (ed.) : Modern Practice in Infectious Fevers, 2v. (1951).
BERMAN, C. : Primary Carcinoma of the Liver (1951).
BROWN, J. W. : Congenital Heart Disease (2nd edition, 1950).
DAVIDSON, M. : Cancer of the Lung (1930).
EWING, J. : Cancer . . . Contributions in Honor of James Ewing. Ed. by F. E. Adair (1931).
FARRIS, E. J. : Human Fertility and Problems of the Male (1950).

FISHERBERG, A. M. : Heart Failure, 2nd edition, 1948).
HANDLEY, W. S. : Cancer of the Breast (1922).
HILLIS, J. D. : Leprosy in British Guiana (1881).
HILTON, J. : Rest and Pain. Ed. by E. W. Walls and E. E. Philipp (1950).
HIMSWORTH, H. P. : Lectures on the Liver and its Diseases (2nd edition, 1950).
IVY, A. C., AND OTHERS : Peptic Ulcer (1950).
MANSON, SIR P. : The Filaria Sanguinis Hominis (1883).
MEYER, A. : The Collected Papers, Vol. 1-2 (1950-1951).
PENROSE, L. S. : The Biology of Mental Defect (1949).
PLESCH, J. : Physiology and Pathology of the Heart and Blood Vessels (1937).
RAFFERTY, T. N. : Artificial Pneumothorax in Pulmonary Tuberculosis (1947).
SARNAT, B. G., AND SCHOUR, I. : Oral and Facial Cancer (1950).
SCOTLAND, Department of Health : Tuberculosis. Report of the Scottish Health Services Council's Committee (1951).
SIGURDSSON, S. : Tuberculosis in Iceland (1950).
STEVENS, F. J. : Smallpox (1906).
THORN, G. W., AND OTHERS : The Diagnosis and Treatment of Adrenal Insufficiency (2nd edition, 1951).
WHITBY, SIR L. E. H. AND BRITTON, C. J. C. : Disorders of the Blood (6th edition, 1950).
WOOD, P. : Diseases of the Heart and Circulation (1950).

SURGERY

BONNIN, J. G. : A Complete Outline of Fractures (3rd edition, 1951).
BONNIN, J. G. : Injuries to the Ankle (1950).
CANTOR, M. O. : Intestinal Intrubation (1949).
LEARMONTH, SIR J. : The Contribution of Surgery to Preventive Medicine (1951).
MAINGOT, R. (ed.) : Techniques in British Surgery (1950).
NANGLE, E. J. : Instruments and Apparatus in Orthopædic Surgery (1951).
PYE, W. : Surgical Handicraft. Ed. by Hamilton Bailey (16th edition, 1950).
SWEET, R. H. : Thoracic Surgery (1951).
BAILEY, P., AND CUSHING, H. : Tumours of the Glioma Group (1926).

OPHTHALMOLOGY.

DOGGART, J. H. : Diseases of Children's Eyes (2nd edition, 1950).
SORSBY, A. (ed.) : Systemic Ophthalmology (1951).

OBSTETRICS AND GNÆCOLOGY

BROWNE, O'D. T. D. : The Rotunda Hospital (1947).
KLEIN, H. R., AND OTHERS : Anxiety in Pregnancy and Childbirth (1950).
MEIGS, J. V., AND STURGIS, S. H. (eds.) : Progress in Gynecology (Vol. 2, 1950).
POTTER, E. L., AND ADAIR, F. L. : Fetal and Neonatal Death (2nd edition, 1950).
RANDELL, M. : Fearless Childbirth (1949).

PÆDIATRICS

COURNAND, A. : Cardiac Catheterization in Congenital Heart Disease (1949).
GESELL, A., AND OTHERS : Vision : Its Development in Infant and Child (1950).
MODERN TRENDS IN PÆDIATRICS. Ed. by Sir L. Parsons (1951).

DENTISTRY

COOLIDGE, E. D., AND HINE, M. K. : Periodontia (1951).
OSBORNE, J. : Dental Mechanics for Students (3rd edition, 1950).
SALZMANN, J. A. : Principles of Orthodontics (2nd edition, 1950).

THERAPEUTICS

BALLARD, E. : On Vaccination (1868).
CLAYTON, E. B. : Electrotherapy and Actinotherapy (1949).
COPEMAN, S. M. : Vaccination (1899).
CYRIAX, J. : Text-book of Orthopædic Medicine (Vol. 2, 1950).
EVANS, G. A. (ed.) : Medical Treatment (1951).
GREENBERG, L. A. : Antipyrine : a Critical Bibliographic Review (1950).
GUTHRIE SMITH, O. F. : Rehabilitation, Re-education and Remedial Exercises (2nd edition, 1949).
KOVACS, R. : Electrotherapy and Light Therapy (6th edition, 1949).
MAYNEORD, W. V. : Some Applications of Nuclear Physics to Medicine (1950).
SEATON, E. C. : A Handbook of Vaccination (1868).
STERN, B. J. : Should We be Vaccinated? (1927).

REVIEWS

PATTERNS OF MARRIAGE. By E. Slater and M. Woodside. 1951. London : Cassell & Co. First Edition. (311 pp., 14 tables, 5 appendices).

THE marriage relationships of two groups of 100 service men and their wives, normally resident in Greater London, are reviewed. All the men were hospital patients between 1943 and 1946. One group were admitted for neurotic illness (neurotic group) and the other for illness or injury without neurosis (control group). Data were collected by personal interview only from married couples who were willing to co-operate. In the author's opinion it is believed that the sample is "a fairly representative one of Londoners of working and lower middle class, married and between the ages of twenty-two and forty-seven. It contains a small excess of Jews, an inadequate representation of the most prosperous and the very poorest and is probably weighted in favour of those who are fairly happily married." It is important that the reader should fully appreciate these and other limitations of the data in the generalisations

THE ULSTER MEDICAL SOCIETY

THE MEDICAL INSTITUTE,

COLLEGE SQUARE NORTH, BELFAST.

Dear Sir (or Madam),

If you are not a member of the Ulster Medical Society, we would appeal to you to give the question of joining your consideration. The Society has been in existence since 1862, and has always been active in keeping its members interested in the advances in medical science as well as in current professional affairs. The Medical Institute, situated in College Square North, belongs to the Society (through the generosity of Sir William Whitla), and is ideally adapted for meetings, committee meetings, and recreation. There is a library with current medical periodicals, and facilities for reference to medical literature are available in conjunction with the library at the Queen's University. There is also a billiards-room available to members, and lighter periodicals are also provided. Meetings are held at intervals of a fortnight during the winter months, and papers are contributed by members. Distinguished visitors are occasionally asked to contribute papers on subjects upon which they are specially qualified to speak. **The Ulster Medical Journal, the official organ of the Society, is issued to all Fellows and Members free of charge.**

May we, therefore, appeal to you to join the Ulster Medical Society, and so enable us to widen its influence and sphere of usefulness still further? A proposal form is appended: your proposer and seconder must be Fellows of the Society.

If you do not wish to become a member of the Society, will you consider entering your name as a subscriber to THE ULSTER MEDICAL JOURNAL? The subscription is five shillings per annum, payable in advance to the Honorary Treasurer.

We remain,

Yours faithfully,

J. G. JOHNSTON, *President.*
J. W. S. IRWIN, *Hon. Secretary.*
J. C. C. CRAWFORD, *Hon. Treasurer.*

FELLOWS.—All persons registered for seven years as medical practitioners under the Medical Acts shall be eligible for election as Fellows. The annual subscription shall be two guineas for those practising or residing within a radius of ten miles from the centre of the city of Belfast, they shall be known as Town Fellows; one guinea for those practising or residing outside this radius, they shall be known as Country Fellows.

LIFE FELLOWS.—Any duly elected Fellow or Member shall, subject to the approval of the Council, be entitled to a life-fellowship on payment of a single subscription of twenty guineas for a Town Fellow, or ten guineas for a Country Fellow. All Fellows or Members of the Society who have paid subscriptions for forty years or more shall be exempted from any further subscription.

MEMBERS.—All persons registered as medical practitioners under the Medical Acts shall be eligible for election as members of the Society on an annual subscription of one guinea. Such membership shall terminate at the end of the seventh year after the date of medical registration. Members shall then become Fellows.

....19.....

To DR. J. C. C. CRAWFORD,
438 LISBURN ROAD,
BELFAST.

Dear Sir,

We nominate for $\frac{\textit{Fellowship}}{\textit{Membership}}$ *of the Ulster Medical Society—*

Name of Candidate .....

Postal Address .....

Year of Qualification and Degrees.....

.....

Signature of Proposer.....

Signature of Seconder.....

BANKER'S ORDER

(Ulster Medical Journal)

.....*19*..... .....

Name of Bank .....

Address of Bank or Branch .....

Please pay to the account of the Ulster Medical Society (Northern Bank, Shaftesbury Square, Belfast), ULSTER MEDICAL JOURNAL *Account, the sum of five shillings, and continue to pay this amount on the 1st November each year until further notice.*

Signature..... 2d. STAMP .....

Address ....

This should be sent to the Honorary Treasurer, DR. J. C. C. CRAWFORD,
438 Lisburn Road, Belfast, for registration.

CONTENTS

PAGE

GILBERT AND SULLIVAN. J. G. Johnston, M.C., M.D., J.P. - - - 93

A SHORT HISTORY OF OTOLARYNGOLOGY. Kennedy Hunter, M.B., F.R.C.S. (EDIN.), D.L.O.(ENG.) - - - - - - 106

A HISTORY OF THE QUEEN'S UNIVERSITY OF BELFAST DENTAL SCHOOL. P. J. Stoy, B.D.S., F.D.S.R.C.S. - - - - - - 118

THE PATTERN OF DISEASE. F. M. B. Allen, M.D., F.R.C.P. - - - 131

DENTAL DISEASE AND CIVILISATION. P. J. Stoy, B.D.S., F.D.S.R.C.S. - 144

THE CONTROL OF DISEASES OF TISSUE REACTIVITY BY CORTISONE. Wm. Townsley, M.D. - - - - - - - 159

DOCTOR AND PATIENT IN THE AGE OF HIPPOCRATES. E. D. Phillips, M.A. 172

RECENT TRENDS IN MATERNAL MORTALITY IN NORTHERN IRELAND. E. A. Cheeseman, B.SC.(ECON.), PH.D.(MED.) - - - - 181

THE LACRIMAL CHANNELS IN CYCLOPIA. W. R. M. Morton - - 189

LIST OF ADDITIONS TO THE MEDICAL SECTION OF THE LIBRARY OF THE QUEEN'S UNIVERSITY OF BELFAST, March-September, 1951 - 195

REVIEWS - - - - - 105, 130, 143, 158, 171, 180, 198

Fellows and Members of the Ulster Medical Society receive the Journal free.
Subscription to non-members, five shillings annually.

THE
ULSTER MEDICAL JOURNAL

PUBLISHED ON BEHALF OF THE ULSTER MEDICAL SOCIETY

Vol. XX 1st NOVEMBER, 1951 No. 2

Gilbert and Sullivan

By J. G. JOHNSTON, M.C., M.D., J.P.

Presidential Address to the Ulster Medical Society.

LADIES AND GENTLEMEN,—For upwards of forty years I have lived the busy life of a general practitioner attached to a small hospital in a provincial town. This demanded all my attention and most of my energies, but somehow within the last few years, I have been pitchforked into the arena of medical politics, and in that field great honours have been bestowed upon me. The very greatest of these —the position to which you, Sir, have installed me to-night

It is a great honour for any medical man to be elected President of this Society and immeasurably greater when that person is a humble general practitioner like myself. Some time ago a B.M.A. Committee put the G.P. under the microscope, and in their published report they say of him that "Only a superman could possess all the desirable qualities of the ideal general practitioner. He should have inexhaustible tact, wisdom, patience, discretion and imperturbability. He needs to be gentle, yet firm in speech and action, and his manner must inspire confidence and trust. He should have a kindly, humane approach to his patients, and however pressed for time, he should make each patient feel that his illness is of real concern to him."

Formidable as is the list of qualtiies here cited, there is a very important one not as yet mentioned, viz., the making of speeches, to me the most terrifying of them all.

The little boy who was asked to explain the origin of speeches (species), and who answered that it was something that came down from the apes, was perhaps not so far wrong, though it resulted from either faulty hearing or a mistaken conception of Darwin's evolutionary hypothesis. But, however the custom arose of inflicting a speech on an incoming president, it is a barbarous one and one that falls not infrequently on the medical practitioner.

As this is a learned and scientific Society, it is generally assumed that the President will have something to hand on, usually in his own speciality or in some branch of medicine or medical practice in which he takes a particular interest; and it is here, ladies and gentlemen, that as President, I have my first lapse from the standards of my distinguished predecessors.

I am now approaching the working end of a busy life, and looking back over those years, I have tried to focus on something that gave me great help or great pleasure, and might equally well do the same for others; and with your permission and indulgence, I will leave work altogether in the background and talk to you for a short time on one of my hobbies, and ask you to spend an evening with "Gilbert and Sullivan."

It is reasonably certain that there are in this audience a great many Gilbert and Sullivan fans who, like myself, find pleasure, enjoyment, and mental relaxation in the works of these great artists, to them I need not apologise. But to those others, doubtless higher minded and more deeply learned in drama and music, and who might reasonably be anticipating a learned discussion, I do most humbly apologise for reducing this meeting to a dissertation on musical comedy and a Gilbert and Sullivan concert, and ask you to bear with me for a short time and

"Winnow all my folly, folly, folly and you'll find
A grain or two of truth among the chaff.
Oh, winnow all my folly, folly, folly and you'll find
A grain or two of truth among the chaff."

Who were they, these paladins of light opera who had all the world singing their praises? Two Victorian gentlemen of conflicting temperaments. They are still names to conjure with and are a theatrical trade mark for witty lyrics and sparkling melodies. Each of them had a distant connection with the art of medicine, in that Gilbert was the son of a Naval surgeon, and Sullivan, for the greater part of his life, suffered from renal calculus.

Which was the greater man, or greater artist? That question could lead to endless debate and no real comparison, for each was a master of his own art and each was vitally necessary to the other. Gilbert was certainly the more dominating personality and probably the better brain. He had written many plays before meeting Sullivan, but few of these had more than a limited success, and none have survived the interval of fifty years, with perhaps the exception of "Pygmalion and Galatea" and, of course, "The Bab Ballads."

Sullivan, the finer artist, would, on the other hand, still be remembered for his compositions outside the partnership. But together they undoubtedly attained to the pinnacle of their success and have given us a series of comic operas which are as fresh and enjoyable to-day as they were some fifty years ago.

With the time at my disposal it will not be possible to do more than merely scratch the surface of their works and display the more obvious of the gems that they contain. The operas are classics, and like the classics in literature they will, I believe, live for ever. The English stage has nothing quite like them, and a

curious thing, which to my mind stamps them with genius, is that they are as topical to-day in their allusions as ever they were.

Sullivan's music has a sweet simplicity and a pure quality of melody. It is whimsical, sad, joyous, haunting, all in turn; and so it is with Gilbert's lyrics. He took our national characteristics, even our national institutions, and pilloried them with the joy of laughter, with witticism and good natured ridicule. Gilbert's lyrics are as mirrors for all of us to see ourselves as we really are, and having seen, exercise that truly British virtue of being able to laugh at our own vanities and weaknesses.

The plot of many of the operas can be found in one or other of "The Bab Ballads." To quote from one, "My Dream" :—

"The other night from cares exempt
I slept, and what d'you think I dreamt,
I dreamt that somehow I had come
To dwell in topsy-turveydom."

Most of Gilbert's plots were written in topsy-turveydom. A comic opera world where sailors talk in poetry and kings run on little errands for their ministers of state. Babies are being constantly mixed up or kidnapped, an adventure which really did happen to Gilbert during a visit to Italy at the age of three. He was ransomed for the equivalent of £25.

The scenes of many of his plays are really Victorian England, and many of his characters actual people, thinly disguised. He liked to poke fun at self-made men. For example, the judge in "Trial by Jury," who starts as an impecunious party and marries a rich attorney's elderly ugly daughter.

Or a dry dig at the Army and Navy. The Duke of Plaza Toro in "The Gondoliers," who 'led his regiment from behind, he found it less exciting.' And Sir Joseph Porter, in "Pinafore," says, 'stick close to your desks, and never go to sea, and you all may be the rulers of the Queen's Navee.' The House of Lords gets its touch in "Iolanthe," and the Law with its 'highly susceptible Chancellor.'

If Gilbert was the brains of the Savoy Operas, Sullivan, a more human individual, was the heart. He could take a lyric of Gilbert's, which seemed only mock serious, and give it beauty and appeal. Much of Sullivan's serious work is forgotten, he wrote and composed innumerable songs and many hymns, of which the most famous and popular is that militant marching tune, "Onward, Christian Soldiers."

His famous ballad, "The Lost Chord," written at the bedside of his dying brother, is still popular, and it is an interesting fact that this composition leapt into further fame as the first phonograph record to be made in England. The singer was Sullivan's lady friend, Mrs. Ronalds. He dedicated the ballad to her and at her request the manuscript was buried with her. Sullivan was a bachelor, but was she the dark lady of his sonnets?

Sullivan also left us one symphony, which he tells us was composed during a visit to Ireland whilst travelling by jaunting car from Holywood to Belfast. It has been called his Irish Symphony.

Gilbert and Sullivan met and were introduced in 1871. They were both already well-known men. Gilbert was one of the most popular of contemporary dramatists, and Sullivan had already arrived as a composer, notably with his incidental music to "The Tempest" as well as songs and hymns.

The first result of their collaboration was the production of "Thespis," or "The Gods Grown Old." Strangely enough it was a failure and ran for only a short time. A quotation from it may explain a good deal of Gilbert's philosophy of life :—

"Well, well, it's the way of the world,
And will be through all it's futurity,
Though noodles are baroned and earled,
There's nothing for clever obscurity."

And this may also account for the paucity of honours, political or otherwise, that have been bestowed on the medical profession.

Their second effort, "Trial by Jury," was written and produced as a curtain raiser and replaced an airy trifle called "Cryptoconchoidsyphonostomata." It was an immediate success and made such a sensation that it quickly became the main attraction. You all know the story of this delightful dramatic cantata, a parody on a breach of promise trial, and how it ended when the judge announced to the Court :—

"Put your briefs upon the shelf,
I will marry her myself."

And this just after the defendant had vowed :—

"And this I am willing to say,
If it will appease their sorrow,
I'll marry one lady to-day
And I'll marry the other to-morrow."

There is no dialogue, and the play is a musical treat from the raising to the lowering of the curtain.

This success made professional friends of men so dissimilar and was the absolute foundation of all their after successes, and the forerunner of the many years of collaboration in the Savoy Operas.

However, they each continued with their more serious work, and D'Oyley Carte enters the scene as the producer and manager for their further joint efforts. In 1877 their first full length opera, "The Sorcerer," was produced. This and "Trial by Jury" are the only two operas that were not embellished with an alternative title.

"The Sorcerer" was quite a success, but somehow leaves less to be remembered than the other operas and contains fewer catch phrases. The music is delightful but did not become universally popular.

Their next play was "H.M.S. Pinafore," or "The Lass that Loved a Sailor." It is a satire, and gibes at the system that makes a civilian the head of the Navy and at a patriotism that rejoices in platitudes and cliches. "Pinafore" took

America by storm and, of course, was pirated there, there being no copyright between the two countries. Consequently, Gilbert, Sullivan and D'Oyley Carte determined to produce their next effort in America and so establish a right of way, as it were.

Neither Gilbert nor Sullivan felt unduly flattered when, in an after-dinner speech, an American judge hoped they would both be brought before him on a charge of being drunk and disorderly, so that he might repay the pleasure "Pinafore" had given him by letting them off.

"Pinafore" created the catch phrase "What, never?", with its answer "Well, hardly ever," which caused a Teutonic sufferer to exclaim, "Dot Pinafore expression vos a noosance, auf you tole a feller sometings he speaks nodings but von blame English. . . He say, vot hardly, sometime, nefer. Vot kind of language is dose?"

Even the late lamented Kaiser William III, when Sullivan was presented to him, sang, "He polished up the handle of the big front door."

The partnership was now going well, with three successful productions and their next effort, called "The Pirates of Penzance," or "The Slave of Duty," was first produced in New York to secure American copyright, whilst a token performance was given in a small theatre in Paigton, Devon, before being produced in London.

Throughout, the words are deliciously Gilbertian with contradictory humours and amazing perplexities. The most preposterous things are uttered by the characters in the most serious way and the maddest folly is clothed with a gravity that makes it ridiculous and laughable. Here again Gilbert pokes fun at the "nouveau riche," when General Stanley mourns his fate at the tombs of his ancestors, purchased less than a year ago.

The opening chorus is taken almost entirely from "Thespis," and my musical friends inform me that in that delightful solo, "Poor Wandering One," Sullivan has copied from or followed the lead of Verdi in "La Traviata." The best fun comes in the second act when the police and pirates do wordy battle and the Sergeant sings, "When a Felon's Not Engaged in his Employment," and also, "When the Foeman Bares his Steel." If "Pinafore" took New York by storm, "The Pirates" swept them off their feet, but at home there were criticisms, especially when the Pirate King remarks, "I don't think much of our profession, but contrasted with respectability, it is comparatively honest," and the skit, "I am the very model of a modern Major General" was not welcomed in certain quarters.

Their next production, "Patience," or "Bunthorne's Bride," satirises the æsthetic craze of 1880, when everything and everybody, according to these false amateurs of art, were either "too-too," or "utterly too-too" or "quite too utter," and it was considered the smart thing

"To walk down Piccadilly,
With a poppy or a lily
In your mediæval hand."

Gilbert plays upon the axiom that nothing is certain except the improbable. The dialogue is witty all through and the lyrics are some of the very best he ever wrote.

Sullivan wrote a particularly happy score for "Patience," and Gilbert himself maintained that its popularity was mainly due to the delightful music. It teams with golden numbers, and the best known perhaps are "The Heavy Dragoon," "When I First Put this Uniform On," "The Most Intense Young Man," "Love is a Plaintive Song," and the duet, "Prithee, Pretty Maiden."

Musically the gem of the opera is the unaccompanied sextet, "I Hear the Soft Note of the Echoing Voice." I hope you will listen to it shortly.

"Patience" was the first opera produced in the Savoy Theatre, which had just been specially built for the Gilbert and Sullivan productions, and was followed by "Iolanthe," or "The Peer and the Peri," which has been described as that very pretty yet somewhat cynical, politically speaking, fairy opera.

The plot is taken from the "Bab Ballads," a fairy marries a mortal and the offspring partakes of the natures of both.

In creating the Lord Chancellor, Gilbert used all his legal knowledge, and of his gibes at bench and bar it may be safely said :—

"The joke is good extremely
And justifies the mirth."

And his songs, "The Law is the True Embodiment of Everything that's Excellent," and "When I Went to the Bar as a Very Young Man," are probably more widely known than any other songs in the English language, whilst the Nightmare Song is Gilbert's supreme achievement as a patter song. Private Willis, Grenadier Guards, pokes nightly fun at our present political system :—

"When in that House M.P.'s divide,
If they've a brain and cerebellum too.
They've got to leave that brain outside
And vote just as their leaders tell 'em to."

And the legal conundrum :

"I wouldn't say a word that could be construed as injurious,
But to find a mother younger than her son is rather curious
And that's the kind of mother that is usually spurious."

The music is some of the prettiest and quaintest that Sullivan ever composed. For example, that charming duet, "None Shall Part Us," the delightful ballad, "In Babyhood," and the dignity and majesty of the Peers entrance and chorus.

About this time the Suffragist movement and the question of Votes for Women was being vigorously pursued. Gilbert was a firm opponent and satirises it in his next play, "Princess Ida," or "Castle Adamant."

He maintained that if women chained themselves to the Houses of Parliament, men should do likewise to the railings of the Queen Charlotte Maternity Home and demand beds for men.

The dialogue of "Princess Ida" bristled with smart remarks and was well peppered with pungent puns.

King Gama says of the Princess :—

"She's so particular
She'll scarcely suffer Dr. Watt's hymns,
And all the animals she owns are hers."

Whilst another character remarks that the cock-crowing, at which the ladies of the University rise every morning, is "done by an accomplished hen."

It had only a mediocre success, and yet it contains many of Sullivan's charming melodies, catchy, tuneful and quaint. There is a delightful trio in the first act :—

"Expressive glances shall be our lances
And pops of sillery our light artillery."

"The Disagreeable Man" is capital fun, ending with "And I Can't Think Why."

The soldiers sing :—

"Politics we bar
They are not our bent,
On the whole we are
Not intelligent."

By the way, it was in this piece that the late Sir Henry Lytton made his first appearance as a Savoyard.

"Princess Ida," when revived in 1922, was received with thunders of applause, and one wonders why so charming a piece should have almost failed when first produced. The humours of Gilbert are very patently exploited, especially in the first two acts, while the characters of King Gama and his loutish sons are a sheer revelation of delight.

Their next production proved the most popular and the most successful of the series. I need scarcely say that it was "The Mikado," or "The Town of Titipu."

It is one of the few Savoy Operas, the origin of which cannot be traced back to the Bab Ballads. It was produced in 1885 and its original run was for 672 performances.

The arresting quality about "The Mikado," the cleverest comic opera of its particular kind ever written, is that the story commences directly the curtain rises, and the plot, although Gilbertian, carries through to the end of the fable.

The lyrics are certainly the most delightful—semi-serious or wholly extravagant —that even Gilbert himself ever penned, whilst the music is all sparkle from beginning to end, from Nanki-Poo's first song, "A Wandering Minstrel I," to the finale :—

"The threatened clouds have passed away
And brightly shines each dawning day,
And though the night may come too soon,
We've years and years of afternoon."

In addition to the antics of Ko-ko, the Lord High Executioner, it introduces that well-born pluralist character, Pooh-bah, which is really a play on British politics.

"A Pooh-Bah paid for his services.
I . . . a salaried minion.
But I do it. It revolts me. . . . But I do it."

Its best known songs are Yum Yum's solo, "The Sun and I," the immortal "Tit Willow," and "The Flowers that Bloom in the Spring." The "Three Little Maids from School" is, or are, a sheer joy.

Gilbert has once again his grim joke about punishment; "boiling oil and molten lead—something humorous but lingering"—and this appears also in the song,

"To sit in solemn silence in a dull, dark dock,
Awaiting the sensation of a short, sharp shock."

Extracts from the Mikado's song, "My Object All Sublime," are not unknown in this room, and I am still adding to my little list of those who never would be missed.

The last literary work of Gilbert's life was the re-writing of the story of "The Mikado" for children, in which there is a new and delightful version of the little list song.

Gilbert was asked why in writing this opera he did not use any of the distinctive class titles of old Japan. He replied that when he found that the aristocracy of old Japan were called Samurais, the obvious rhyming phrase had decided him to keep clear of historical accuracy.

A revival of the opera was once banned by the Lord Chamberlain as being insulting to the Japanese, then our allies, but a Japanese envoy who saw the play states, "I saw nothing whatsoever to complain of, but only bright music, much fun and no insults." "The Mikado" is still the most popular of all the Savoy Operas with the general public.

Strangely enough, Gilbert never saw his productions after the final dress rehearsal and, with a single exception, he never witnessed any of his operas as a member of the audience.

It was going to be difficult to keep up to the standards of "The Mikado," and naturally the theatre-going public were certain to be very critical of its successor. Realising this, great care was taken with their next opera, which was called "Ruddigore," or "The Witches Curse."

There was great exception taken to the title to begin with. The press of the day shuddered with horror and there was a proposal to change the name to "Kensington Gore," but Sullivan stood firm.

Apropos of the name, there is a good story told of Gilbert :—A friend meeting him one day soon after its production, asked how his "Bloodygore" was going. Gilbert answered, "I presume you mean Ruddigore." "It's the same thing," said the friend. "Indeed," replied Gilbert acidly, "then if I say I admire your ruddy countenance (which I do), it means I like your bloody cheek (which I don't)."

Sullivan always contended that this opera contained some of the best of his light opera compositions, and the music received a chorus of admiration. There are some delightful solos, and "Ruddigore" abounds in duets and trios like, "I am a Very Abandoned Person." The chorus of the solo, "My Boy, You May Take it from Me," applies very much to the world of to-day, and not less to the General Health Services.

"If you wish in the world to advance,
Your merits you're bound to enhance,
You must stir it and stump it
And blow your own trumpet,
Or, trust me, you haven't a chance."

The libretto is humorous ingenious and admirably constructed, but some have criticised it as too indefinite and halting, whilst Gilbert's song, "The Darned Mounseer," created such a storm in France that he was many times challenged to mortal combat.

The idea for a new plot came to Gilbert when waiting in a railway station where he had seen the picture of a Beefeater on a poster. He called it first, "The Tower of London," then "The Tower Warden," later still "The Beefeater," and finally, "The Yeoman of the Guard," or "The Merryman and his Maid."

In this opera the achievement of the collaborators reached its highest point—it is a perfect work of art. The story is human, free from topsy-turveydom, and Gilbert has put a great deal of what he thought was his essential self into the character of Jack Point, with his jest and joke, his quip and crank.

Phoebe Meryll is perhaps the most fascinating and human character he ever created, she opens the play with a plaintive solo, "When Maiden Loves," and later is the delightful coquette in "Were I Thy Bride." One of the most attractive items is the duet, "I Have a Song to Sing O"; this caused Sullivan endless trouble in the setting, mainly, I believe, owing to the fact that each succeeding verse has two more lines than its predecessor, and was finally settled by Gilbert humming the rhythm to Sullivan—the only known instance of Gilbert suggesting the music as well as the words. This has been described to me by a musical friend as "using a simple harmony over a drone bass," or, in technical terms, "Tonic and dominant harmonies over a tonic pedal." I wouldn't know. There are other delightful songs, such as, "Is Life a Boon?" and "When Our Gallant Norman Foes," and many duets and trios culminating with the pathetic irony of the Jester's song, "They Don't Blame You so Long as You're Funny."

In the opinion of many people, "The Yeomen of the Guard" is far superior, both musically and dramatically, to all the other operas. There is a strong flavour of sad philosophy all through the play; laughter and tears mingle in reasonable proportions.

Gilbert's favourites among his operas were "The Yeomen of the Guard," "Ruddigore," and "Utopia Ltd." Both he and Sullivan considered "The Yeomen" their most finished production, and after some years of neglect the first

two now stand high in public favour, although Sullivan always had a great affection for his share in "Ruddigore."

After the melodrama of "The Yeomen" comes the rollicking comedy of "The Gondoliers," or "The King of Barataria." Produced in 1889, it is almost in prophetic vein, foretelling Socialism and Republicanism, and indeed present-day rationing, where the two republicans reigning jointly as kings have to demand one extra ration, which is only granted after legal argument.

The libretto was one of the wittiest Gilbert ever wrote and the music caught its spirit to perfection. The opera is a satire on snobbery, the snobbery of a courtier for whom a Queen can do no wrong.

"And noble Lords will scrape and bow
And double themselves in two."

And the corresponding snobbery at the other end of the scale.

"To everyone who feels inclined
Some post we undertake to find,
And all shall equal be."

The story is not only Gilbertian, but absolutely improbable, and consequently, very droll and enjoyable. The show is full of brilliant costumes, sparkling music and witty inverted wisdom turned paradox, with many seductive melodies set to enchanting lyrics.

We meet The Duke of Plaza Toro, that "celebrated, cultivated, underrated nobleman," and the Grand Inquisitor with his song, "No Possible, Probable Shadow of Doubt, No Possible Doubt Whatever." "Tessa has a beautiful solo, "When a Merry Maiden Marries, Sorrow Goes and Pleasure Tarries," Marco that gem of a tenor solo, "Take a Pair of Sparkling Eyes," and The Grand Inquisitor that perfect comic song, "When Everyone is Somebodee, Then No One's Anybody."

Nowhere has Gilbert summed up his own philosophy more completely than in the quintet :—

"Try we lifelong we can never
Straighten out life's tangled skein,
Life's perhaps the only riddle
That we shrink from giving up."

After the production of "The Gondoliers," in writing to thank Sullivan for the splendid work he had done, Gilbert said: "It gives one the chance of shining right through the twentieth century with a reflected light." "Don't talk of reflected light," Sullivan answered, "in such a perfect book as 'The Gondoliers,' you shine with an individual brilliancy which no other writer can hope to attain."

Sullivan tells a good story against himself. He was watching a performance one night from the back of the dress circle and unconsciously began to hum the melody of the song then being sung. An elderly musical enthusiast turned angrily to him and said, "Look here, Sir, I paid my money to hear Sullivan's music, not yours."

A serious break in the partnership occurred during the run of this play, when each sought a new collaborator for his work, but with very limited success. Happily after some time the differences were smoothed over, and in October, 1893, Gilbert and Sullivan were again together at the Savoy with the presentation of "Utopia Ltd," or "The Flowers of Progress."

This was a satire of contemporary English life :—The party system, the War Office, company promoting and the Victorian drawing-room were all subjects for excellent jokes, yet it is also full of patriotic praise and fervour. It is said that "Utopia" was modelled upon that glorious country called Great Britain, to which some add, but others do not—Ireland.

It had a good run, and was followed in 1896 by "The Grand Duke," or "The Statutory Duel," the last Gilbert and Sullivan Opera and the least successful of the series. It was the final flash in the pan, in fact, it was only a spark, and the most famous association in theatrical history fizzled out like a damb squib. The plot was not convincing, being described as uninteresting, ingustible and dry, but the songs and ballads were, if anything, quainter and more fantastic than ever.

The parodying of the English Court was resented in the highest quarters, and probably had something to do with the comparative failure of this opera, the last of the Mohicans in the series of Savoy successes.

I have already talked too long, but no paper of this kind would be complete without a few of Gilbert's more polite stories. It was at a dinner party in New York that one of his best known "cracks" was born :—"Oh, Mr. Gilbert," a wealthy lady gushed, "your friend Mr. Sullivan's music is really too delightful. It reminds me so much of dear Bach. Do tell me, what is Bach doing just now? Is he still composing?" "Well, no, madam," Gilbert replied. "Just now, as a matter of fact, dear Bach is by way of decomposing."

He was never fond of, nor kind to the clergy, and once staying in a provincial hotel he found himself amongst a conference of divines. One addressing him with quiet irony said : "I should think, Mr. Gilbert, you must feel slightly out of place in this company." "Yes," answered Gilbert, "I feel like a lion in a den of Daniels."

Someone took him to task for using the word "coyful." "How can anyone be full of coy?" "I don't know," replied Gilbert, "but for that matter, how can anyone be full of bash?"

To an actress who had to cry, "Stay, let me speak," but who kept on crying, "Stay, stay, let me speak," he said : "It isn't stay, stay; it's *stay*—one stay—not a pair of stays."

A well-known manager, supposed to be living with a certain actress, had cast her for a leading part and was puffing her in the press. Gilbert's comment was "The fellow is blowing his own strumpet."

Watching a rehearsal one day with Barrington, Gilbert enquired, "Where's Miss A?" Barrington pointing backstage said, "She's round behind." "I know," said Gilbert, "but where is she?"

Chatting with a friend one day on the steps of his club, Gilbert was accosted by a stranger, "I beg your pardon, sir, do you happen to know a member of this club, with one eye, called Matthews?" "I can't say I do," answered Gilbert, adding after a grunt, "What's his other eye called?"

During the limerick craze, and he was responsible for dozens, many of them unprintable, he wrote a verse that started a new fashion :—

"There was a young man of Tralee
Who was horribly stung by a wasp,
When they said, does it buzz,
He replied, Yes, it hurts,
It's a horrible brute of a hornet."

Once when invited to attend a concert in aid of the Soldiers' Daughters' Home, he regretted that he could not be present, but said that he would be delighted to see one of the Soldiers' Daughters home after the entertainment.

In a revival of "The Yeomen of the Guard," Gilbert complained that Workman, who played Jack Point, was caressing Elsie and Phoebe with unnecessary warmth. "Ah yes, I see," said Workman, "you would not kiss them more than once?" "Oh, indeed I would," exclaimed Gilbert, "but I must ask you not to."

His directions at rehearsals were emphatic and explicit, and having difficulty with the chorus of "The Gondoliers" when they sang "We Thank You Most Politely, Gay and Gallant Gondolieri," Gilbert explained with some force that the ladies *must* go down on the 'po,' and was very annoyed when someone sniggered.

Mr. Blackwell of Jam fame was his neighbour, and complained that some of Gilbert's servants had trespassed and done damage in his grounds. Gilbert wrote to him : "Dear Mr. Blackwell, I am exceedingly sorry that my men should have damaged your preserves."

Talking to the Editor of "Punch," Gilbert said : "I suppose you do get some good jokes sent in occasionally." "Oh, yes," said Burnand, "heaps." "Then," said Gilbert, "I wish to goodness you would use some of them."

"Actresses often paint, but they do not always draw," is another of his terse criticisms.

Gilbert was knighted in 1907, twenty-four years after Sullivan had received his title. He described it as a tin-pot, tuppence halfpenny sort of distinction, or as a commuted old age pension.

It is one of the ironies of the story of Gilbert and Sullivan that, great as was the immediate popularity of the operas, it was not until after Sullivan's death that there was a general and conscious appreciation of the gift that these two men had given to the English stage. They found it a prey to the coarsest, least refined form of burlesque, they left it an endowment of the richest wit and humour.

The partnership of thirteen years had done its work, the great operas had been written. Gilbert and Sullivan tried other collaborators without success; they were

ideal for one another, two strong personalities linked in words and music, even if they failed to agree together.

The end of the story—honours, titles, riches, the knowledge of having given to the world immortal works.

And even in their passing was the quality of topsy-turveydom. The gay Sullivan, now an invalid, struggling to compose appropriate music for Kipling's "Absent-minded Beggar." And the ironic Gilbert, who once said: "I should like to die upon a summer day in my own garden," losing his life in saving a woman from drowning in a pool at his home near Harrow.

What a Gilbertian contrast to the remark of Private Willis to the buxom Queen of the Fairies in "Iolanthe," when she pops the question: "Well, ma'am, I don't think much of a British soldier who wouldn't ill-convenience himself to save a female in distress."

Sullivan died on 22nd November, 1900, aged 58 years. His body was embalmed, and at the express wish of Queen Victoria, was buried in the crypt of St. Paul's Cathedral. A monument to his memory was erected in the Savoy Gardens, Embankment, and when Gilbert was asked to choose a quotation from one of the libretti, he suggested this couplet from the "Yeomen":—

"Is life a boon?
If so it must befall
That Death whene'er he call
Must call too soon."

The Gilbert and Sullivan Society still make a yearly pilgrimage and place wreaths on the column.

Gilbert was 75 when he died, and his remains were cremated—he had no use for the pomp and the purple—and his ashes are buried in Great Stanmore Churchyard. He is immortalised, however, by the erection of a bronze plaque placed in the Strand, opposite Charing Cross Station, close to the memorial to Sir Arthur Sullivan. The inscription is worthy of it and of him. "His foe was folly and his weapon wit."

"Fame was theirs at the end of their days,
An even greater fame is theirs to-day."

REVIEW

THE RATIONAL TREATMENT OF CATARRH. By W. Annadale Troup, M.C., M.D. Chaterson. 10s. 6d.

THIS monograph, written by a Physiotherapist, who is obviously an enthusiast, gives a full account of the use of infra-red and ultra-violet rays in the treatment of catarrhal infections of the nose and sinuses. K. H.

ideal for one another, two strong personalities linked in words and music, even if they failed to agree together.

The end of the story—honours, titles, riches, the knowledge of having given to the world immortal works.

And even in their passing was the quality of topsy-turveydom. The gay Sullivan, now an invalid, struggling to compose appropriate music for Kipling's "Absent-minded Beggar." And the ironic Gilbert, who once said: "I should like to die upon a summer day in my own garden," losing his life in saving a woman from drowning in a pool at his home near Harrow.

What a Gilbertian contrast to the remark of Private Willis to the buxom Queen of the Fairies in "Iolanthe," when she pops the question: "Well, ma'am, I don't think much of a British soldier who wouldn't ill-convenience himself to save a female in distress."

Sullivan died on 22nd November, 1900, aged 58 years. His body was embalmed, and at the express wish of Queen Victoria, was buried in the crypt of St. Paul's Cathedral. A monument to his memory was erected in the Savoy Gardens, Embankment, and when Gilbert was asked to choose a quotation from one of the libretti, he suggested this couplet from the "Yeomen":—

"Is life a boon?
If so it must befall
That Death whene'er he call
Must call too soon."

The Gilbert and Sullivan Society still make a yearly pilgrimage and place wreaths on the column.

Gilbert was 75 when he died, and his remains were cremated—he had no use for the pomp and the purple—and his ashes are buried in Great Stanmore Churchyard. He is immortalised, however, by the erection of a bronze plaque placed in the Strand, opposite Charing Cross Station, close to the memorial to Sir Arthur Sullivan. The inscription is worthy of it and of him. "His foe was folly and his weapon wit."

"Fame was theirs at the end of their days,
An even greater fame is theirs to-day."

REVIEW

THE RATIONAL TREATMENT OF CATARRH. By W. Annadale Troup, M.C., M.D. Chaterson. 10s. 6d.

THIS monograph, written by a Physiotherapist, who is obviously an enthusiast, gives a full account of the use of infra-red and ultra-violet rays in the treatment of catarrhal infections of the nose and sinuses. K. H.

A Short History of Otolaryngology

By KENNEDY HUNTER, M.B., F.R.C.S.(EDIN.), D.L.O.(ENG.).

Opening Address, Winter Session 1951-52, Royal Victoria Hospital, Belfast

IT is customary to refer to the speaker at the annual address at the opening of the winter session as the orator. I was relieved to find, on looking up the Oxford Dictionary, that orator was defined as "the maker of a speech" as well as "an eloquent public speaker." I may, therefore, claim the title for to-day.

On behalf of the medical staff, I have the honour of extending a hearty welcome to the students of all years, but more especially to those who walk the wards of this hospital for the first time. This is one of the most important milestones in your life, probably your first experience of mass sickness and suffering. The suffering may not be noticed by some of you at first, as the majority of those who suffer succeed in hiding it from the superficial observer. Those whose heart is really in medicine will soon learn to see through the barrier and will thus have acquired something which is essential to a good doctor. You must not only learn all about the diseases which afflict the human frame, but also the individual reactions which vary so much from one patient to another. This you can only acquire by careful observation and close contact with patients during your time in the wards. No amount of reading can do this. The advantage which you take of the opportunities presented during your undergraduate years in hospital will, more than anything else, pave the way for success or failure in your profession.

It is our sad duty to record the great loss which this hospital and the whole community have sustained during the past year by the passing of three distinguished members of the visiting staff.

Professor Sir William Thomson was a member of the staff of this hospital for thirty-one years, and occupied the Chair of Medicine at Queen's University for twenty-seven years. He was elected to many important positions, including membership of the General Medical Council.

Known to all as "W. D.," he was a man of outstanding personality. His humility, gentleness and charm endeared him to all. He was one of the greatest of our clinical teachers and was beloved by students and patients alike. He was strong and brave in time of adversity, of which he had more than his share. He fought and conquered a long and tedious illness, and bore the loss of his only son with courage and dignity. Many here to-day will never forget his help and encouragement during their early professional days. None sought his help in vain. He was a great scholar and an outstanding orator. No man has done more for the advancement of our Medical School. His countless friends rejoiced when the King conferred a Knighthood upon him in January, 1950. Unfortunately, he

was not to live long to enjoy this well-merited honour. Death struck suddenly on 26th November, 1950.

Dr. Samuel Ireland Turkington died on 1st August, 1951.

He was a member of the visiting staff of this Hospital for twenty-five years. A recognised authority on diseases of the chest, his opinion was widely sought. Few practitioners in the Province have not, at some time, called him out in consultation. He, also, was an outstanding clinical teacher. He was renowned far beyond our own school for his teaching of the clinical examination of the chest. "Turkie," to all who knew him, was a man of wide culture. He made the classics a hobby, and took a keen interest in the Ulster dialect. He had a fund of witty stories, many of them true personal experiences. He was a very popular after-dinner speaker. A sombre and pessimistic mask covered a most kind, generous and sympathetic heart.

On 9th September, 1951, Professor Charles Gibson Lowry passed away. Affectionately known as "C. G.," he was a member of the staff of this Hospital for twenty-six years.

Emeritus Professor of Midwifery and Gynæcology and Pro-Chancellor of Queen's University, he earned a world-wide reputation. As a result of his efforts, the Royal Maternity Hospital was built, and remains as a fitting memorial to his work for the mothers and babies of his and succeeding generations. He played a large part in the foundation of the Royal College of Obstetricians and Gynæcologists and became a Vice-President of the College. Like Professor Sir William Thomson, he was the crown nominee for Northern Ireland on the General Medical Council. Many honours were bestowed upon him, the last being an Honorary Degree by Queen's University. As a teacher, he was unique. His students honoured him by never missing one of his lectures, unless it was absolutely impossible to attend. All listened with rapt attention to the wisdom which flowed frim his lips. His teaching was always practical. A common question to a student at one of his clinical lectures was "What would you do?" He made a point of knowing all his students, and followed their progress with the greatest interest. He was always kind and sympathetic, quiet of speech, and his presence provoked a feeling of confidence in time of trouble.

His friends and colleagues presented him with his portrait, painted by James Gunn, when he retired from the Chair in 1945.

Rarely has the hand of death been laid so heavily upon our senior colleagues as during the past year. To the bereaved relatives, we offer our very sincere sympathy.

On behalf of my colleagues, I have great pleasure in welcoming to the staff the following new members :—

Dr. J. F. Bereen, Dr. W. H. T. Shepherd, Dr. D. A. D. Montgomery,
Dr. J. S. Logan, Dr. J. F. Pantridge, and Mr. T. B. Smiley.

"It is good to look back to the olden days and gratefully to recall the men whose labours in the past have made the present possible." "By the historical method alone can many problems in medicine be approached profitably." Many

of you will recognize these words of William Osler. I propose this morning to take his advice and give you a short history of Oto-Laryngology. In doing this, we must not forget what Susruta said in the fifth century A.D.: "He who knows only one branch of his art is like a bird with one wing."

We might say that the first known Rhinologist was an Egyptian called Sekhet'enanch, who lived about 3,500 years before Christ. Evidence of this was a drawing on a slab found in a royal sepulchre. It depicts the physician and his wife. The inscription says that King Sahura had ordered it to be engraved as a testimony to his doctor Sekhet'enanch, because he had "made his nostrils well, and he, therefore, wished him long life and happiness."

Folk-lore has passed down the ages by word of mouth and folk medicine is probably the oldest form of medical practice. Strange and interesting superstitions are connected with the ear, nose and throat; for example, that the conception of the Virgin Mary arose from the breath of the Holy Ghost in her ear. The shape and size of the ear is supposed to indicate the individual's character, small ears being the sign of mental power, large ears show a dull wit, and pointed ears a bad character. The wearing of ear-rings to cure weak eyes is still believed in by some uneducated people. The preference for lamb's wool over cotton wool is probably a relic of the folk-lore remedy for deafness. The belief that tingling of the ears is a sign that others are speaking of you, dates back to the time of Pliney. If the left ear tingles, someone is speaking well of you, if the right ear tingles, the reverse.

It was generally believed in Shakespeare's time that poisons dropped into the ear were as lethal as if they were swallowed. You will remember the case of Hamlet's father.

The popular belief in the close relation between the size of the nose and the sexual organs dates back to ancient times.

In the Middle Ages St. Blaise was a well-known saint, and has been called the "defender of the throat."

Ætius of Amida, who lived in the fourth century, advised that after other methods had been unsuccessful in the removal of a foreign body from the throat, the physician should say to the foreign body—"Piece of bone or thorn, whatever thou art, just as Jesus Christ caused Lazarus to come forth from the tomb and Jonah from the belly of the whale (here the patient should be seized by the throat) in the name of St. Blaise, martyr and servant of Christ, I order thee to come up or go down." In Roman Catholic churches on the 3rd of February, the ceremony of the "Benediction of the Throat" is still carried out in memory of St. Blaise.

The earliest of all books on medicine are the Egyptian Papyri. The Papyrus Ebers, probably completed about 1550 B.C., contains prescriptions for diseases of the ear; for example, "for an ear that is suppurating, olive oil, frankincense and sea salt syringed into the ear;" and "for an ear that hears badly, red lead and resin, grind to a powder, rub in fresh olive oil and apply to the ear." It is possible that the existence of the eustachian tubes were known, as it is stated

in the Papyrus, "the breath of life passes by the right ear, the breath of death by the left ear."

In the Edwin Smith Papyrus, which is even earlier than that of Ebers, there are many references to injuries of the nose, and the frequency of bleeding from the ear in head injuries is mentioned and regarded as an unfavourable sign.

There is little mention of diseases of the ear, nose and throat in ancient Hebrew medical literature, but the Hindus were probably the first to practice rhinoplasty. New noses were made from flaps from the cheek and forehead. This operation was probably in great demand, as cutting off the nose was the usual punishment for adultery. Ma Huang, or Ephedrine, was known in China for centuries before it was introduced to the Western World.

There is little more to record until the coming of the Father of Medicine—Hippocrates, who lived twenty-five centuries ago. That was the golden age of Aristotle, Plato and Socrates. Hippocrates rescued medicine from the sphere of magic. He was the first to describe the tympanic membrane—"a dry thin spun web," and he connected it with the organ of hearing. His writings contain case reports of cases of otitis, and one of his aphorisms reads : "Children suffer from ear discharge, adults from deafness." He also noted the association of headache, otorrhœa and high palate. Hippocrates' sponge method of removing nasal polypi was used until near the end of the nineteenth century. Three or four strings were tied to a small sponge. The ends were knotted together and fixed to the end of a probe, and was then passed through the nose into the pharynx and brought out of the mouth. A forked probe was held in the pharynx, and over this the strings were passed and traction exerted. The sponge was thus pulled through the nostril into the naso-pharynx bringing with it the polypi. It was only successful when the polypi were large and soft.

About four hundred years after Hippocrates, Cicero wrote about nasal physiology. He mentioned the value of the moisture in the nose in arresting dust.

Cornelius Celsus described an incision through the palate for the evacuation of a quinsy. His description of the removal of an insect from the ear is interesting. "An insect must first be killed with vinegar, and then removed with a probe, the patient should be encouraged to sneeze, or better still, he should be bound to a table with the affected ear downwards, and the table should then be forcibly struck with a hammer so that the foreign body may be shaken out of the ear." Celsus even described tonsillectomy with the finger nail. His description of the treatment of injuries of the external ear is quite modern. He advised careful suturing of the skin, if broken, but if intact and a swelling occurs below it, the ear is to be opened from behind and a window cut in the cartilage.

Claudius Galen was born in Asia Minor in A.D. 131. Some of his writings were centuries in advance of their time. He advised that carious bone should be removed after making an incision behind the ear. This is probably the first reference to mastoid operative surgery, but centuries were to pass before his advice was put into practice.

The basis of surgical and medical knowledge is human anatomy, so the birth of the Science of Surgery dates from the foundation of the Schools of Alexandria by Ptolemy Soter, King of Egypt in 255 B.C. Here human anatomy was first systematically studied and taught. Unfortunately all the knowledge gained was lost, when the Alexandrian Libraries were burnt. For over a thousand years anatomy was forgotten and Medicine slipped back into the darkness.

After the fall of Constantinople in 1453, valuable manuscripts were scattered through the Mediterranean countries, and in particular Italy.

One of the Byzantine compilers, Ætius of Amida who lived between A.D. 500 and 550, gives an excellent description of diseases of the ear, nose and throat, including the operation of tonsillotomy. Forceps are recommended for the removal of foreign bodies in the throat, but if the foreign body cannot be seen, the patient is given a piece of raw meat on a string, which is pulled up after he has swallowed it.

Paul of Ægina was another Byzantine compiler. He described a throat condition, which was probably diphtheria. For ear discharge, he advised many kinds of drops. His advice on the treatment of nasal disease is good. "Before treating affections of the nose, the whole body must be treated."

Towards the end of the thirteenth century, human dissection again began to be practised in Italy. The first textbook on anatomy was written in 1316. At that time, the whole dissection of the body had to be completed in four days.

With the Renaissance, artists wanted anatomical knowledge, and some artists performed their own dissections. Leonardo da Vinci recorded a great many of his thoughts, plans and anatomical drawings in notebooks. After passing through many hands, they found their way into Windsor Castle Library. It is interesting to note that Leonardo was left-handed, and that he wrote from right to left. With a mirror, his writings are easily read. He described the maxillary and frontal sinuses, also the facial muscles and their functions. He distinguished seven movements of the tongue. He also described the tonsils, trachea and bronchi as far as their third subdivision. It is strange that he made no mention of the vocal cords. Unfortunately, his drawings were not published until 1898, otherwise they would have advanced the study of anatomy and physiology, and so of medicine and surgery by many years.

The first use of the ear speculum is attributed to Fabrice de Hilden, but it was probably used by Guy de Challiac in the fourteenth century. However, as reflected light from a mirror was not used at that time, it cannot have been of very much use.

With the coming of the sixteenth century, anatomy made great strides. Andreas Vesalius, Professor of Anatomy at Padua, revolutionized anatomy by describing what he had seen at personal dissection. He gave a detailed description of the malleus and incus, two of the small bones in the middle ear;; the third one, the stapes, was not described until some years later. A contemporary of Vesalius was Bartolomeus Eustachius, a name well known in otology. He wrote what was probably the first textbook devoted to the ear, but his renown is associated with

the tube which bears his name. He gave an accurate description of its structure and position, but made no mention of its function.

Another well-known name in otology is Gabriel Fallopius. He succeeded Vesalius. He described all, and named some of the following structures: the inner and middle ears, the chorda tympani, trigeminal, auditory and glossopharyngeal nerves. He described the bony canal for the facial nerve which bears his name. His knowledge was mainly anatomical, as he regarded purulent discharge from the ear as "excrement of the brain."

Let us leave the ear for the moment and look at the history of Tracheotomy.

Galen, Aretæus and Paul of Ægina mentioned cutting the trachea, but the first good description is by Fabricius. It reads as follows: "Of all the surgical operations which are performed on man for the preservation of his life by the physician, I have always judged to be the foremost that by which man is recalled from a quick death to a sudden repossession of life, a feat which raises the surgeon nearest to the level of Æscalapius; the operation is the opening of the aspera arteria, by which patients, from a condition of almost suffocating obstruction to respiration, suddenly regain consciousness, and draw again into their heart and lungs that vital ether, the air, so necessary to life, and again resume an existence which had been all but annihilated." Although he gave advice on the technique of the operation, he never performed it himself. It was probably first performed by Antonio Muser Brasavola in 1564.

Other nose and throat operations performed in the Middle Ages were uvulotomy, tonsillotomy and removal of nasal polypi. The actual cautery was used extensively.

Many famous names grace the seventeenth century, of these the most eminent was William Harvey, who discovered the circulation of the blood, and so opened a new concept in Medicine.

Thomas Willis' famous work, "Cerebri Anatome," was illustrated by Sir Christopher Wren, the latter drew the first circle of Willis. In otology, Willis is remembered by the symptom which bears his name—Paracusis Willisi. He described it as follows: "We meet with a certain kind of deafness in which those affected seem wholly to want the sense of hearing, yet, as soon as a great noise as of great guns, bells or drums is made near the ears, they distinctly understand the speeches of bystanders, but the noise continuing, they presently grow deaf again. I heard from a credible person that he once knew a woman, though she were deaf, yet so long as a drum was beaten within her chamber, she heard every word perfectly, wherefore her husband kept a drummer on purpose for his servant, that by that means he might have some converse with his wife."

Duverney of Paris in 1683, corrected an age-long error by proving that the eustachian tube was not an avenue of breathing, but existed simply as a means of renewing the air within the tympanum. His theory of hearing was very like that of Helmholtz. He compared the cochlea to a musical instrument suggesting that the lower tones were perceived by the basal coil of the cochlea and the higher tones by the apical portion. Helmholtz showed that the high tones were perceived

in the basal coil, and the low tones by the apical portion. Duverney also made important observations an aural pathology; that at post-mortem, pus was often found in the tympanum even when the brain was normal, so the pus could not have come from the brain as was the accepted theory at that time.

Another well-known name in otology is Antonio Valsalva. He wrote a book called Tractatus de Aure Humana, published in 1704. He was the first to demonstrate ankylosis of the stapes at post-mortem. The significance of this observation was not appreciated for over a century. His name is associated with the test of inflating the middle ear by closing the mouth and nose and forcing air up the eustachian tubes. The eustachian catheter was invented by Edine-Gilles Guyot, a postmaster at Versailles. He succeeded in relieving his own deafness by the use of a curved tube passed into the mouth and behind the palate. Nearly twenty years later, Archibald Cleland, a Scottish military surgeon, recommended passing a silver tube via the nose and syringing with water. It did not occur to him that air might be blown in.

Following the advances in anatomy, further attempts at surgical treatment were made, these included opening of the mastoid and incision of the tympanic membrane.

In 1760, Petit successfully opened the mastoid in a case of suppuration, but the pathology not being understood, the operation was tried for cases of deafness without suppuration, and so it soon fell into disrepute.

Astley Cooper observed cases of perforation of the tympanic membrane with relatively little deafness, so he thought that the deafness due to eustachian obstruction might be relieved by puncturing the tympanic membrane. However, he gave up the operation as he was unable to keep the opening patent, and after its closure, the hearing became worse than before. Twenty years later, Itard gave the true indications for the operation, namely, the presence of exudate in the middle ear which was unable to escape.

Following these abortive attempts at surgical treatment, the surgery of the ear remained practically at a standstill until the middle of the nineteenth century. The treatment of ear disease was almost wholly emperical, mainly useless to a large extent in the hands of quacks. Ballance quotes the case of the great statesman, Peel, who placed himself under the care of a then notorious ear quack, called Curtis. The latter was summoned to Whitehall Gardens to attend Mr. Peel, then Secretary of State for the Home Department, who was suffering from a temporary deafness. One of Curtis's modes of practice, which he adopted in almost every case, was to clear out the affected organ by means of injecting warm water through an enormous syringe, not unlike a garden syringe. He brought this instrument with him to the residence of his illustrious patient. On his arrival, he found Mr. Peel in the drawing-room with the Duke of Wellington, Sir Astley Cooper and Sir Henry Halford. He immediately commenced to syringe the ear. During the operation, Mr. Peel became rather too inquisitive as to the nature of his complaint, its situation and the modus operandi of the remedy. Curtis was in a very difficult position, but his natural shrewdness and his imperturbable coolness, made

him equal to the occasion. I saw, he said, that I must stop this inconvenient questioning, so putting the point of the syringe by the side of the ear passage, I gave him a dig and said, "Mr. Peel, if you don't hold your tongue, I shall certainly do you a mischief." "He was as dumb as an oyster afterwards."

The speciality of laryngology really began with the discovery of effective means of demonstrating the interior of the larynx, but prior to this, several diseases of the throat had been described and some attempt had been made at treatment.

Horace Green, known as the Father of American Laryngology, was the first to introduce medicaments into the larynx. He also removed a laryngeal polyp from a child of 11 years old. He did this by direct vision, depressing the tongue until the growth was visible.

Another American, Gordon Buck, in 1848, published an important paper on "Edematous Laryngitis and its treatment by scarification." He was one of the first to remove an intra-laryngeal growth by laryngo-fissure .

Like the eustachian catheter, the laryngoscope was discovered by a layman. Manoel Garcia, a Spanish singing teacher, who lived and worked in London, was on holiday in Paris. Here is his own description of his inspiration: "One September day in 1854, I was strolling in the Palais Royal, preoccupied with the ever-recurring wish, so often repressed as unrealizable, when suddenly I saw the two mirrors of the laryngoscope in their respective positions, as if actually present before my eyes. I went straight to Charriere, the surgical instrument maker, and asking if he happened to possess a small mirror with a big handle, was informed that he had a little dentist's mirror which had been one of the failures of the London Exhibition in 1851. I bought it for six francs. Having obtained also a hand mirror, I returned home at once, very impatient to begin my experiments. I placed against the uvula the little mirror (which I had heated in warm water and carefully dried); then flashing upon its surface with the hand mirror a ray of sunshine, I saw at once, to my great joy, the glottis wide open before me, and so fully exposed that I could perceive a portion of the trachea. When my excitement had somewhat subsided, I began to examine what was passing before my eyes. The manner in which the glottis silently opened and shut and moved in the act of phonation, filled me with wonder."

Garcia wrote a paper entitled, "Observations on the Human Voice." This paper was communicated by the physiologist, William Sharpey, to the Royal Society of Medicine, which had been founded in 1660. Thereafter, followed a controversy between Professor Turck of Vienna and Professor Czermak of Budapest. Both claimed priority as the first to use the laryngoscope in the diagnosis of laryngeal disease. After a bitter fight, this was settled by a Commission of the Academie des Sciences of the Institute of France by according each an honourable mention and suggested that an equal amount of money, 1,200 francs, should be awarded to each.

In England, the great possibilities of the instrument were seen by Sir Morell Mackenzie, one of the most famous names in British Laryngology. Born in 1837, he was a brilliant student, and was admitted a Member of the Royal

College of Surgeons at the age of 21. He studied in many European countries and soon became well known as a laryngologist. In 1863, he was awarded the Jackonian Prize for his essay on "The Pathology and Treatment of Diseases of the Larynx." He founded the Hospital which is now known as the Throat Hospital, Golden Square. His most outstanding work was his textbook, "Diseases of the Throat and Nose." When at the height of his fame, he became involved in a most unfortunate affair, which was given world-wide publicity. In 1887, he was summoned to Berlin to see the Emperor Frederick III, who was suffering from cancer of the larynx. I will quote from College's paper on the subject in the Journal of Laryngology and Otology, 1936. "Sir Morell Mackenzie arrived in Berlin on 20th May, 1887. He found the Crown Prince Frederick, who was under the care of Professor Gerhardt, had been suffering from an affection of the larynx since the autumn of 1886, and that a diagnosis of cancer had been made, and that the operation of thyrotomy was to be undertaken on the following day by Professor Von Bergmann, who had made all the necessary preparations. Mackenzie was asked to give a final opinion before operation. He examined the patient with a mirror, and saw a growth on the posterior part of the left cord which was partly subglottic. There was some limitation of movement. He expressed the opinion that the diagnosis of cancer had been made on insufficient evidence, and that a portion of the tumour should be removed for examination under the microscope. He did this the following day, and Professor Virchow reported the growth to be benign. On 8th June, a further piece was removed and Virchow pronounced the growth to be pachydernia verrucosa. On the strength of this report, it was decided to treat the case by endo-laryngeal extirpation with forceps. On June 14th, the Crown Prince arrived in England to take part in the Jubilee Procession on June 21st. On June 28th, another piece, thought to be the entire growth, was removed in London and sent to Virchow, who again found no evidence of malignant change. In September, a swelling was seen below the left cord, which increased in size and began to ulcerate and soon a swelling appeared below the right cord. He was seen in November by Professor Schrotter of Vienna, who made a diagnosis of cancer, and advised removal of the entire larynx or as an alternative, that a palliative tracheotomy be performed. The patient declined excision of the larynx, but agreed to tracheotomy, when necessary. An external swelling appeared, and increasing dysphœa had to be relieved by tracheotomy, which was performed by Dr. Bramann on 9th February. A month later, particles of cancerous tissue were found in the sputum by Professor Waldeyer. The patient, now Emperor, steadily declined and died on 15th June, 1888 A post-mortem was performed by Virchow and Waldeyer, and an extensive glottic and sub-glottic cancer was found with secondary glands. Mackenzie, faced with dignity the bitter attacks by his German colleagues upon his personal character and his professional skill. He had relied too much on the three negative biopsy reports.

Some years after the death of the Emperor, the London Laryngological Society, realizing the deep injustice that had been done to Mackenzie, decorated

his grave, a very belated honour, and the marble cross bears the following inscription :—

"Sir Morell Mackenzie, M.D.
Lives of great men all remind us
We can make our lives sublime,
And departing leave behind us
Footprints on the sands of time."

The Laryngoscope was introduced into the United States in 1858 by Ernest Krakowiczer of Vienna. He first demonstrated the vocal cords with a mirror in New York. One of the first Laryngologists in the United States was Dr. Jacob da Silva Solis Cohen, who was born in New York about 107 years ago. It is said that the famous American surgeon, Dr. Gross, criticized Solis Cohen for leaving the ranks of what he called legitimate practice to become engaged in a narrow speciality. "Why does he devote most of his time to a cubic inch of the human anatomy? Some day, I suppose, we shall have specialists confining themselves to diseases of the navel!"

Solis Cohen was the first American to perform laryngectomy. Local anæsthesia of the larynx was introduced by Koller. The drug was of course cocaine. This was about 1880. In the same year, Joseph O'Dwyer of New York demonstrated intubation of the larynx. This was a great advance in the treatment of laryngeal diphtheria and is used at the present time. No one has been able to improve upon his intubation tube.

The next step was an attempt to introduce tubes into the œsophagus and stomach. The pioneers were Stoerk and Kussmaul, the latter used a sword swallower as his subject. He was successful, but the light was very poor. This darkness was lit up by Edison's discovery. Killian of Freiburg was the first to introduce a tube into the bronchi. Haslinger of Vienna and the Jacksons of America have brought the technique up to its present high standard. The bronchoscope may be described as the midwifery forceps which delivered the speciality of thoracic surgery.

In the nineteenth century, otology made great strides. Joseph Toynbee gave otology a scientific basis by his beautiful dissections of over two thousand ears, these formed the Toynbee Collection in the Museum of the Royal College of Surgeons, which was destroyed by enemy action in 1941. He described otosclerosis and demonstrated ankylosis of the stapes of the fenestra avolis in 160 specimens. His assistant and successor was James Hilton, a philosopher as well as a surgeon. He advised early incision of the tympanic membrane in acute otitis media. A contemporary was Sir William Wilde of Dublin, father of Oscar Wilde. He set up a dispensary for diseases of the eye and ear in a disused stable, this eventually became St. Mark's Hospital, Dublin. He was the first to teach otology in the United Kingdom, and students came from all over the world, particularly America. His name is still associated with the method of treating mastoiditis by a post-aural incision—Wilde's Incision.

Modern surgery really began with the discoveries of Morton, Simpson, Pasteur and Lister. Anæsthesia and antiseptics set surgery free from the fetters which held it.

Two famous names of the latter part of the nineteenth century and the beginning of the twentieth century are Sir Charles Ballance of London and Sir William Macewen of Glasgow. Ballance's volumes on the Surgery of the Temporal Bone are classics and should be read by all interested in otology. The results of Macewen's operations for otogenic cerebral abscess are still remarkable. Quoting from a statistical table in his famous book: "Of 25 cases, 19 were operated upon and 18 cured." This series of cases would be difficult to equal, even with all our chemotherapeutic aids.

Tonybee's description of otosclerosis, especially his findings that the organ of hearing itself was intact, led surgeons to investigate the possibility of operative measures to enable the sound waves to byepass the middle ear obstruction and reach the intact cochlea.

Kessel, in 1876, attempted removal of the stapes, but where this was possible, infection usually supervened and either the cochlea died or sometimes patient and cochlea. Later, the promentary was trephined and the opening covered with a muco-periosteal flap. No lasting improvement was obtained, and often the hearing was made worse.

In 1913, Jenkins of London, at the International Medical Congress in London, described two cases in which he had made an opening in the external semi-circular canal. Improvement was only temporary.

In 1917, Holmgren made an opening in the superior semi-circular canal, which would be covered by the dura hoping to delay or prevent bony closure.

Sordille of Nantes also became interested in the problem. He eventually covered the opening in the lateral canal by a muco-cutaneous flap continuous with the tympanic membrane. His operation was described in 1929 as an open operation done in two, three or more stages to combat infection. In 1938, Lempert of New York described a one-stage operation with approach through the meatus. In 1940 and 1941, he described further modifications, and in 1942 Shambaugh of Chicago added the use of constant irrigation, and the use of a binocular dissecting microscope when drilling the external canal. This is the type of operation which is being done to-day.

Time will not permit me to bring this short history up to date. During the first half of this century, otology and laryngology, in company with the other branches of medicine and surgery, have made great advances, thanks to the work of famous men like Albert Gray and Brown Kelly of Glasgow, Donald Patterson of Cardiff, Logan Turner of Edinburgh, Sir St. Clair Thomson, Mackenzie, College and many others. Many of the advances, of course, could not have taken place without the corresponding advances in the other branches, such as radiology, anæsthesia, bacteriology, etc. The advances in chemotherapy during the past fifteen years have completely changed our ideas on the treatment of the various infections, and we look forward to the future with hope and confidence to equally great dis-

coveries. Future scientific development may explain and solve many of our present problems. Over a century ago, a Swiss scientist discovered that when he covered a bat's eyes it could still give a perfect example of blind flying, but when he covered its ears, the bat remained obstinately grounded, or if it attempted to fly, it flew into every obstacle. The development of Radar and the supersonic wave analyser revealed the method whereby the bat can fly in the dark and avoid hitting any obstruction. The bat in flight sends out an interrupted train of high frequency sound, generally through its mouth, but sometimes through the nostrils. These vibrations are reflected from objects in their path and return to the bat as an echo. As the time interval between the transmitter squeak and its echo is proportional to its distance from the reflecting body, the bat is able to fix its position with accuracy.

The expansion of scientific methods, however, should not be allowed to obscure the value of the older methods of accurate clinical observation.

Sir St. Clair Thomson said that he who looks only forward seldom sees but one road to advance, generally a crowded one and sometimes a wrong one. While he who looks backward may see several and can appreciate that many of them lead nowhere, that some still point to promising lands and have never been thoroughly explored; and that not a few were paths converging on the broad road of progress where we walk with so much confidence, and with too much self-righteousness.

Bibliography

Osler, William: Aequanimitas with other Addresses.

Guthrie, Douglas: *A History of Medicine.*

Thomson, Sir St. Clair: "Historical Evolution of Oto-Laryngology," *Proc. Roy. Soc. Med.*, 24; 1931.

Stevenson, R. S., and Guthrie, D. J.: *History of Otolaryngology.*

Rolleston, J. D.: "Otology and Folk-Lore," *J. Laryng*, 57; 1942.

Rolleston, J. D.: "Laryngology and Folk-Lore." *J. Laryng*, 57; 1942.

Mettler, C. C.: *History of Medicine*, Philadelphia, 1947.

Ballance, Chas. A.: *Surgery of the Temporal Bone*, 1919.

Imperatori, C. J.: "Leonardo Da Vinci's Contribution to Laryngology, Rhinology and Phonetics." *Ann. Otol.*, etc., St. Louis, 50; 1941.

Guthrie, D.: "Development of Medical Studies in Britain; Oto-laryngology," *Brit. med. Bull.*, 2; 1944.

Delavan, D. B.: "Origin of Laryngology, *Ann. Otol.*, etc., St. Louis, 50; 1941.

Bryan, J. H.: "History of Laryngology and Rhinology and Influence of America in Development of this Speciality," *Ann. med. Hist.*, 5; 1933.

Halloran, G.: "Sir Morell Mackenzie: Medical Visionary," *Med. I. Aust.*, 1; 1938.

Glas, E.: "How Medical Science Found Way to Look into Respiratory Tract," *Med. Rec.*, 156; 1943.

Macewen, Sir Wm.: *Pyogenic Infective Diseases of the Brain and Spinal Cord*; 1893.

Cawthorne, T.: "Review of Surgery of Otosclerosis," *Proc. Roy. Soc. Med.*, 6; 1947.

Howarth, W.: "The End of an Era; A Retrospect and a Prospect," *J. Laryng*, 63; 1949.

A History of
The Queen's University of Belfast Dental School

By P. J. Stoy, B.D.S., F.D.S R.C S.
Professor of Dentistry in the Queen's University of Belfast

Although there had been discussions for many years, the first definite step taken to institute a School of Dentistry in Northern Ireland was on the 18th June, 1919, when the Senate of the University adopted a motion by Professor James Lindsay, the Professor of Medicine, seconded by Dr. Leslie, "That a Committee be appointed to consider what steps, if any, should be taken to provide teaching in Dentistry in the University, and generally to report on the subject of dental treatment." As a result of this, a Committee was appointed, which included not only the medical members of the Senate, but also Mr. R. M. Jones, the Headmaster of the Royal Belfast Academical Institution, and the Lord Mayor, Mr. John C. White. Its Chairman was Professor Lindsay. This Committee was able to report some five months later, on the 14th November, that a Dental Department was an essential feature of practically all Medical Schools, and that even in Ireland there was a Dental Department at Trinity, a Dental School at the National University and one in the process of formation at Cork; that, consequently, Belfast occupied an isolated position in that, although there was a flourishing Medical School of over half a century's duration, no steps had been taken to promote instruction in dentistry. It was also stated in that report that the Royal Victoria Hospital was taking active steps to provide the necessary clinical facilities and that the dental practitioners in Belfast had been consulted and had promised co-operation. The Committee's report reveals that although no Dental School was in existence at Queen's, there were, however, some undergraduates at the University who were registered there as dental students, but that these, after studying their preliminary subjects, were obliged to continue their curriculum at Edinburgh, Liverpool, London, Dublin, or elsewhere. (An early example is Mr. J. F. Houston of Southsea.) Reference was made to the possibility of early legislation for the purpose of checking irregular dental practice, so that the demand for Diplomas in Dentistry would be greatly increased.

As a result of this report the Senate recommended the establishment of a School of Dentistry at the University and the adoption of the necessary steps to enable the University to confer a Diploma in Dentistry. The Standing Committee on the 13th February, 1920, recommended the passing of a new statute empowering the University to confer the distinctions of L.D.S. (Licentiate of Dental Surgery), B.D.S. (Bachelor of Dental Surgery), and M.D.S. (Master of Dental Surgery), and the creation of lectureships in Dental Surgery, Dental Mechanics, Dental Metallurgy and Materia Medica, and Orthodontia.

The First Staff

These lectureships were subsequently advertised at a salary of £50 per annum each, and six applications were received, viz. :—

Mr. H. Elwood, L.D.S.
Mr. H. T. A. McKeag, B.D.S.
Mr. W. M. Hunter, L.D.S.
Mr. P. J. McStay, L.D.S.
Mr. J. Malone, L.D.S.
Mr. W. M. Swan, L.D.S.

It was agreed that the qualifications of all these were of the highest order, and that they were all eligible for any of the lectureships. Eventually it was recommended that Mr. Elwood be appointed Lecturer in Dental Mechanics, Mr. Swan Lecturer in Dental Surgery, Mr. McKeag Lecturer in Orthodontia, and Mr. Hunter Lecturer in Materia Medica and Metallurgy. Their periods of office were to commence on the 1st October, 1920. This is the date, therefore, at which the Dental School may be considered to have commenced. These four lecturers held their appointments continuously for twenty-nine years, and it was only in September, 1949, that two of them retired—Mr. Elwood and Mr. Hunter. These, together with the other two, were for a long time the four senior part-time lecturers on the University staff.

Early Developments at the Royal Victoria Hospital

Meanwhile, developments were taking place at the Royal Victoria Hospital, and the necessary steps to establish a Clinical Dental Department were being actively pursued. A certain amount of dental work had been done there for many years, for there is a reference in the Annual Report for 1903 that 1,915 teeth had been extracted in the Extern Department, and subsequent reports show that that number mounted gradually, until in 1909 it was close on 5,000. This work was done in the Extern Department—presumably by the Medical Officers. The first proposals for a separate dental department were made at a meeting held at the invitation of Mr. Malone in his house at Queen's Elms. On 6th December, 1919, two vacancies for Honorary Dental Surgeons, "fully qualified and registered," were advertised. Each of these dental surgeons was to visit the hospital twice a week and their number was to be added to as required. Mr. W. M. Swan, L.D.S.R.C.S.(Eng.), and Dr. J. S. O'Neill, L.D.S.R.C.S., were elected to the two vacancies on 8th January, 1920, and so became the original staff of the Dental Department. The Annual Report for 1920 expresses the hope that these appointments were only the precursor to the establishment of an important Dental School in Belfast, and that in this adventure the University and the Hospital would be joint coadjutors.

The cost of the initial equipment was met from a gift of the Working Men's Committee, who provided a sum of £200, and treatment was commenced in a suitable room on the ground floor of the King Edward Building. This was the spare Pathology Laboratory, lent by Sir Thomas Houston, situated next to the patients'

entrance—the patients waited in the corridor. There were only two chairs, but then there were only two students entered at the University for Clinical Practice, Messrs. Graham and Christie. When three more students joined these two, it became obvious to the Medical Staff that clinical training would have to be started in the near future. Recommendations for the provision of a clinical department were presented and adopted, but a condition was made that the scheme was expected to be self-supporting and must not be a burden on the hospital. Consequently, extern patients were to be charged a small fee for extractions with local or general anæsthetics, and for fillings.

In 1922 the Honorary Staff was increased by the addition of four more dental surgeons, Messrs. Elwood, Hunter, Malone and Spence Andrew. Each dental surgeon now attended one morning a week and did all the work—which was considerable. Four more chairs were also provided, including a very fine D.M. Co. chair, which was the gift of Mr. W. H. Elwood, senior. The other chairs were provided by the hospital through the good offices of the Working Men's Committee, also another larger room in the Pathological Block, again provided through the courtesy of Sir Thomas Houston who was a never-failing supporter of the Dental Staff.

"Dental Day, 1921"

When the five students who had entered the University were expected at the hospital for training, repeated applications were made to the Board of Management for more room. This at first met with no success, but after threats of resignation, the Treasurer of the hospital hit upon a bright idea. He asked whether it would be possible to get the students to go out in fancy costume and collect money for the hospital, as had been done in Sheffield and Aberdeen. In return he was questioned whether, if such an event could be organized, it would benefit the Dental Department, and he had replied, "not only the Dental Department, but all departments at the hospital." The matter was then put before the Students' Representative Council of the University, who declared that the students were ready for anything —of this nature. The 26th April, 1921 (Students' Day), saw the city given over to a Students' Rag. At that time curfew was imposed at 10 p.m., but by arrangement with the police it was lifted to 12 midnight. Prizes for the best costumes were provided by two members of the staff, Messrs. Swan and Malone, and presented by a distinguished lady, Lady Craig, wife of the future Prime Minister, at the City Hall, amid great enthusiasm. The effort was known as "Dental Day," and the result, including subscriptions by well-wishers, brought in £988. 4s., which was paid over to the hospital to be made available to the Dental Department.

This fund was used to purchase two army huts, which were placed end to end, so providing a space 60' x 20', which was a Dental Department, consisting of a conservation room, a dental laboratory, and a waiting-room. The fund was also enough to equip these rooms. The extractions were still carried out in a room across the passage in the Pathological Block, where there were three chairs. The department so constituted, although small, was considered suitably equipped, and from its inception early in 1922 its popularity was assured, so that "soon it was

not only insufficient for the number of students seeking instruction and practice, but also for the number of patients applying for treatment." It is interesting to note that the total cost of establishing this department was £995. 16s. 8d., so that the actual outlay by the hospital was only £7. 12s. 8d. It is also interesting to record that these huts are in use to-day as an "Observation Ward."

It was, of course, necessary to give supervision in Dental Mechanics, and on 10th April, 1921, there appeared an advertisement for a thoroughly skilled Dental Mechanic to take charge of the new laboratory. This post was filled by Mr. Donaldson, who was an original member of the General Health Services Board and the Dental Advisory Committee. About the same time the University decided to appoint a Lecturer in Dental Anatomy; Professor Walmsley undertook this additional duty, and for it received a similar stipend to that of the other dental lecturers (£50).

Plans for Expansion.

The clinical accommodation for dentistry at the R.V.H. was soon found to be totally inadequate, and it was clear that an alternative site would soon have to be found. Dr. O'Neill and Mr. Swan (who was acting as Honorary Secretary to the Staff), were asked to draw up for the Board of Management of the Hospital a report on the requirements of an up-to-date Dental Department, "where students of dentistry might obtain instruction and the Dental Hospital Practice of this curriculum and which would be recognised by the University of Belfast and other bodies presenting Degrees and Diplomas in Dental Surgery." With the object of examining the working of a Dental Hospital at close quarters, Mr. Swan and Dr. O'Neill, in 1923, visited Dublin and spent a day at the Incorporated Dental Hospital of Ireland, where there was a very successful School of Dentistry. The Dublin University, the National University, and the Royal College of Surgeons all grant Degrees or Diplomas in Dental Surgery, and the dental students of these institutions usually obtained their training and practice at this Dental Hospital, which was a building about the size of the Samaritan Hospital and where there were, at that time, upwards of thirty students. As a result of this visit, Messrs. Swan and O'Neill recommended that the Dental Department should include a Waiting-room for patients with *seating accommodation,* an ordinary Extraction Room or Dispensary, an Anæsthetic Department, with dressing and recovery rooms, a Mechanical Laboratory, a Prosthetic Room, a large well-lighted Conservation or Filling Room, with as many chairs as possible, a Staff Room, an Office, and a room for Lectures and Demonstrations. The specific number of chairs recommended was twelve. They also reported that the staff should include a skilled dental mechanic with a boy to assist him, so that the making and fitting out of patients with dentures could be undertaken, and so that it would also be possible for students to take their course of instruction in Dental Mechanics at the hospital *with benefit to the funds of the hospital.* More honorary dental surgeons were recommended and two honorary anæsthetists. This staff, with the assistance of the nursing staff of the hospital, was thought to be sufficient to commence

with! House-surgeons and demonstrators to instruct the students, it was suggested, could be appointed when the occasion arose.

The King Edward Building

The Hospital considered this report, and thereupon decided upon a large extension of the dental department as part of a general scheme for expansion of the whole hospital. The new site was to be the top floor of the King Edward Building, which had been originally designed for, and which was at that time still used as, nurses' bedrooms. Corridors running east and west on both sides would have to be built in order to give greater depth to the proposed Conservation Room and Workshop, and a considerable amount of plumbing installed in connection with the fountain spittoons. Three bedrooms and a bathroom were to be reserved as emergency sleeping accommodation for the resident staff, as it was thought that the immediate requirements of the dental department would be met without the use of this floor space, but these quarters were to be surrendered to the dental department in the fulness of time. The cost of constructional alterations were estimated at about £2,400, and the work was to start in the summer of 1924. The equipment which was in use was to be transferred to the new quarters. It consisted of "seven dental chairs and appurtenances and most things required in a workshop with seating accommodation for eight pupils." The overall cost, including equipment, was estimated at £4,000.

Visit by the Dental Board

To help meet this expenditure an application for a grant was made in September, 1923, to the Dental Board, who appointed Mr. William Guy to visit the hospital, and this he did a few weeks later. As a result of that visit the hospital was requested to forward a statement of receipts and expenditure of the department up to date, and the hospital's reply makes interesting reading in these days. In 1922 the expenditure was £327. 14s. 4d. and the receipts from patients £194. 7s. In the first nine months of 1923 the expenditure had risen to £477. 17s. 11d. and the receipts to £209.

There is no record of the report made by Mr. William Guy on his visit, but one gathers that it was distinctly unfavourable, because there is a letter dated 21st November, 1923, from Mr. J. H. Stirling (who was a member of the Dental Board) to the Superintendent, Col. J. D. Forrest, regretting that he, Stirling, did not hear about the proposed visit of Mr. Guy, as although he could not have obviated the report, he might at least have understood better the reasons for such a report as Mr. Guy had presented to the Dental Board. It appears that the Board recommended a large grant to Edinburgh, a small one to Liverpool, a smaller one still to Dublin, and nothing to Belfast. Stirling goes on to say that Mr. Guy's report fortunately offered so many opportunities, both from what it said and from what it left unsaid, for a vigorous attack, that he was successful in getting the whole vote shelved and referred back to the Sub-Committee, thus holding it up until the following February. Meanwhile, Stirling pressed for the work on the alterations to the new department to be begun as soon as possible,

as this would be a factor in influencing the Board to make a grant. There is a suggestion that Guy commented strongly and adversely on some of the items of the proposed expenditure on equipment, that he considered the sum set down for dental chairs quite too high, and some of the other equipment unnecessary. The reply eventually received from the Dental Board after the February meeting pointed out that the Board was not in any way concerned with dental hospitals as such, but only with hospitals as part of or adjuncts to Schools of Dentistry. The relevant Minute of the Board read :—

Belfast. 13th February, 1924.

"Queen's University Dental School at Belfast appears to be in need of additional accommodation, and the Committee think that a grant should be made towards the cost of the proposed alteration and additional equipment, and they recommend—'That the Dental School of the Queen's University, Belfast, be informed that the Board are willing to make a grant of £2,000 towards the cost of alterations to the King Edward VII Memorial Building, and the cost of additional equipment which are estimated to cost £4,000'."

One might note here that as far back as January, 1925, correspondence between Stirling and the Superintendent of the R.V.H. made it clear that the Board of Management of the Hospital did not look upon the proposed dental department in the K.E.B. as the final phase in the development of the Clinical Dental School, but merely as a provision for the requirements of the next few years, for they expected that future building schemes were bound to come with the development of the city and that such schemes would include a more elaborate Dental Clinic.

The limited accommodation which was available in the original department was by now compelling the Dental Staff to refuse candidates for training in Dental Mechanics, although it is stated that, apart from this, the School was succeeding in meeting the requirements of the other students, but only under difficulty. The projected expansion, temporary though it was considered, would bring up the accommodation of the Conservation Room to seventeen and of the Mechanics' Laboratory to twenty, i.e., practically a threefold increase. The eestimated overall cost had by now however risen to £12,400.

Appointment of Orthodontist

The work of the department had increased enough in 1924 for the Honorary Dental Staff to feel that their numbers should be augmented by a special dental surgeon for the treatment of irregularities of children's teeth (Orthodontia). They suggested the addition of Mr. McKeag, who was the lecturer in this subject at Queen's and who had been giving practical instruction in the dental department.

Further Temporary Accommodation at R.V.H.

The alterations and extensions to the K.E.B. were for a variety of reasons delayed, so the Board of Management, in order to meet the most pressing needs of the dental department allotted, as a temporary measure, a small ward to the

dental department. This was equipped with several dental chairs for conservation work, the chairs being part of the equipment for the larger premises. The report of the work of the department for 1924 gives some interesting figures: 6,900 patients were treated in the Extraction Room, 333 of these being intern; 234 general anæsthetics were given; 170 dentures were inserted; 1,787 patients attended the Conservation Room. The scale of charges, when imposed, was still the same as that which had been introduced in July, 1922. Extractions had been free, whether *with or without* local anæsthetics, fillings 5s. (2s. 6d. for subsequent fillings), dentures £3 for full upper or lower. The Dental Staff thought the time had come to revise these, and in April (1924) it was suggested imposing a charge of 6d. for extractions under local anæsthetic and 3s. 6d. per tooth under general anæsthetic; fillings, with the exception of gold inlays, were to cost 1s., inlays were 4s. (minimum), and special charges were to be made in the cases of Orthodontia.

Co-Operation Between Queen's and R.V.H.

The extra accommodation required and the increase in the original estimate of the cost of alterations to the K.E.B. made it necessary to ask for an increased grant from the Dental Board. This, however, was refused on the grounds that the Board had no interest in the hospital as such. The Board indicated, however, that an application from Queen's for a grant to provide equipment for the Dental School would be favourably received, although as a condition of any such grant it insisted that any equipment purchased with it should remain the property of the University, even though it was located in the hospital. The hospital did not like parting with control of any part of their property, and efforts were made to find a formula which would meet the wishes of the Dental Board. The letting of a portion of the buildings to the Dental School was suggested. Alternatively, as a less objectionable course, it was thought that the Senate of the University might appoint two representatives from the Dental School on the Board of Management. Stirling thought a better plan was to get the Corporation to include a clause into their next Bill giving the R.V.H. not only the particular power of adding another acre to the grant of ground already given to the Queen Street Children's Hospital, but also the general power of allocating other pieces of ground to other similar institutions, so that a new Dental School or Hospital might be erected on part of this ground. Stirling seems to have been a bit upset by the protracted negotiations taking place, for on the 5th January, 1926, he wrote a stiff letter to the Superintendent complaining that he had not had a reply to his letter of some weeks ago in which he suggested that the hospital should acknowledge that it holds movable dental equipment in trust for the Dental School, and adding that if the hospital did not see its way to make such a declaration he would be reluctantly compelled to refer the matter back to the Dental Board for further instructions, and possibly to move there that the grant be rescinded, as most of the members of the Board, including himself, were of the opinion that the Board had no power to make grants to the hospital purely as such. The Board of Management of the hospital apparently accepted this ultimatum, for on the 3rd

February they wrote to the Board accepting the £2,000 on behalf of the hospital on the understanding that movable equipment to the value of £2,000 or future grants be considered by the Board as held in trust for the Queen's University.

The Opening of the Present Dental Clinical Department

The new premises were opened on the 20th October, 1926. The following extracts from a Press report on that occasion are worth quoting :—"The entire upper storey of the King Edward Building is being adapted as a dental clinic. Practically the whole of one side will be occupied by a large conservation room with about twenty chairs. During last year nearly 10,000 extractions were made, and it is hoped that with the increased facilities the public will learn to attend for fillings before the extraction stage has been reached. The greater portion of the other side will be occupied by the workshop and its accessory laboratories, where the dental students will become familiar with the mechanical side of their profession. The rest of the available space will be taken up with waiting, demonstration, and extraction rooms."

Another Press report states :—"A splendid example of the progressive policy of the Board of Management of the R.V.H. in connection with the important scheme of extension and improvements upon which they have been engaged for a considerable time past is to be found in the new dental hospital which has just been opened to the public and is already being very extensively availed of. It has been organised and equipped on the most up-to-date lines; lacking in nothing that scientific invention and professional experience can devise, and its work will constitute an important and increasingly useful phase of the many-sided activities of the great hospital dedicated to the memory of the gracious Queen Victoria. The dental department had been for a long time greatly hampered for space, and sufficiency of equipment, only a comparatively small building or hut being available. There is now nothing to interfere with the most efficient working of the department; and the growing requirements of the future have, with characteristic foresight, been amply provided for. The clinic serves a dual purpose. First and primarily, it is for the benefit of the public, especially the poorer class, to afford them the highest professional skill and treatment at the minimum of cost. In the second place, it will fulfil another important function as a dental school for the practical training of those taking up dentistry as a profession. The managing body and the esteemed superintendent of the R.V.H., Col. J. V. Forrest, C.B., C.M.G., are to be sincerely congratulated upon the successful and thoroughly satisfactory completion of this branch of the great scheme in which they have been engaged.

"The new department is excellently located in a series of spacious rooms and halls on the upper flat at the King Edward Building, every possible regard being paid to lighting, heating and ventilation. There is a commodious reception or waiting room, comfortably furnished. Experts who have been over the new dental clinic declare it to be the finest and most perfectly equipped in the three kingdoms. Special rooms are allocated to anæsthetics, conservation, extraction

purposes, laboratories; there is a prosthetic room, equipped with all the most up-to-date apparatus in connection with the fitting &c., of artificial teeth, and there is also a large X-ray department modelled on the most modern lines, with an adjoining dark room for X-ray photography work. Two of the largest rooms are so partitioned that they may readily be converted into one for the purpose of lectures to students or similar uses. The most comfortable and up-to-date dental chairs have been introduced, and every appliance that science has adapted to dental practice has been introduced, so that the operation of extraction so far from being an ordeal, is undergone under the most ideal conditions imaginable, comfort and speed being combined with painlessness. A special department is devoted to children, the importance of care of whose teeth is being increasingly realised by the public.

"The staff of the department take a particular pride in the X-ray department, which, while it has entailed heavy outlay in order to get the best scientific equipment procurable, will form an invaluable adjunct to the working of the dental clinic. New methods are now adopted for ascertaining what is wrong with the teeth. Instead of probing the mouth with the aid of a mirror, as a result of which the information obtainable is often inadequate, an X-ray photograph can be taken comfortably while the patient sits in a chair in front of the machine. It is understood that the machine will help to avoid the unnecessary extraction of teeth, as the dentist will be able to see by the photograph what is exactly the matter. He will, for instance, be in a better position for diagnosing diseases at the roots of the teeth, ascertain the condition of the jaws, and that like." Can this be the department which we now know!!

Another report refers to one side of the building being devoted to the "manufacture of dentures."

1925-27

A number of resignations and new appointments took place during the period 1925-27. In 1925 it was decided to create a special lectureship in Dental Materia Medica, as Mr. Hunter, who had included this subject in his lectures on Metallurgy, felt unable to continue, as at least fifteen additional lectures in this subject were required. Dr. V. G. L. Fieldon was appointed to take his place.

The first four students qualified in 1924; by 1925 the number had risen to six. The first B.D.S. qualified in the following year, 1926. On 17th February, 1927, Messrs. James Lyons and D. S. Rankin were appointed to the Honorary Staff. On 27th April, in response to an advertisement for a thoroughly skilled Dental Mechanic, Mr. J. A. Clarke of Londonderry was appointed. He took up his appointment on the 30th May. Two days earlier Mr. A. M. Henderson, L.D.S., replaced Mr. W. B. S. Andrew, who had resigned.

Transfer of Dental Mechanics to Queen's

The teaching and proper location of the dental mechanics' teaching department had been exercising the minds of the Staff for several years. In 1925 Academic Council had recommended that before admission to first-year classes each dental

student should present a certificate of having completed five hundred hours of instruction in Dental Mechanics, that the winter session in dentistry should begin on the 1st or 2nd September, and that the attendance on Dental Mechanics should be compulsory between that date and the commencement of classes at the University. Thus from the very beginning the dental student was working harder than his fellows in the Medical or any other Faculty. In 1926 the Finance Committee, possibly impressed by the extra amount of work required, had recommended doubling the salaries attached to the lectureships in the four subjects, Dental Mechanics, Dental Surgery, Orthodontia, and Metallurgy, the increase being from £50 to £100.

On November 25th, at the Staff Meeting, called to consider a possible offer of a grant from the Dental Board, the following suggestion had been made :—That it would be advantageous for the mechanical students to take out their first two years' course at the University instead of the Hospital, and it was pointed out that the fee for this two years' course was £84, which would more than cover the cost of teaching and materials. Already there was £400 in hand from these fees. It was at this meeting that the following ambitious proposals had been made to the Dean of the Medical Faculty :—That a separate lecture theatre with lantern be supplied for the lecturers and that a room adjoining this be fitted with cases to serve as a museum; that a mechanical laboratory with benches to accommodate thirty pupils be erected, together with a large classroom with benches in which preliminary instruction could be given in Operative Dental Surgery, also another laboratory for Dental Histology, Pathology and Bacteriology.

It was not until February, 1929, that the Finance Committee of the University considered the proposal that the first year's Dental Mechanics should be taken at the University. To provide and equip the necessary accommodation in the buildings formerly occupied by the U.V.F. Hospital, the Dental Board made a grant to the University of £300, whilst the Dental Staff set aside £250 from the Fund at their disposal (The Dental Fund). The Finance Committee proposed that the University provide a sum of £200 on the understanding that the Dental Board confirm its grant of £300. Thereafter the course of Prosthetic Dentistry was divided into two parts, the Junior part being done at Queen's and the Senior part at the Dental Department, R.V.H. Pupils had to satisfy the staff of their competence in Part I before commencing Part II, and the examination was both theoretical and practical. An instructor to supervise the work at Queen's was required, and on the 1st January, 1930, Mr. Kenneth B. Rae was appointed at a salary of £150 per annum, and remained in post until 31st December, 1948. To encourage the students, the W. H. Elwood Scholarship in Prosthetic Dentistry was instituted, the first recipient of this being Mr. R. H. Elliott (27th March, 1929). The runner-up was Mr. A. Moore, who received £5.

The Annual Report of the Vice-Chancellor for 1929 refers to these new arrangements. He said that the work of the first-year dental student had been hampered up to date by the fact that while their lectures were given in the University, their practical work was done in the Hospital, and much time was wasted in going from

one place to the other, but that this state of affairs had been remedied by the fitting up in the U.V.F. Hospital of an excellent laboratory where the first year's work in Dental Mechanics could be done. He explained how this had been made possible by grants from the Dental Board, from the University and from the Dental Staff, and he emphasised how much the University owed to the "lecturers of the Dental School, who, in spite of the demands of their private works, have given thought and time ungrudgingly to the many problems which the organisation of a young school presents." It was in October, 1929, that the part-time lectureships in Dental Radiography and Dental Anæsthetics were established, the first holders being C. Henry McComb (Dental Radiography) and Stafford Geddes (Dental Anæsthetics). By now the total number of students in the School is reported as fifty, and the number qualifying in 1929 as twelve.

The Dental Fund.

During the establishment and equipment of the Dental Laboratory at the University a series of conferences took place between representatives of the Dental Department, the Board of the R.V.H., and the Finance Committee with regard to the financial arrangements for transferring the teaching to the University. On 19th February, 1930, it was finally settled that the University should take over the complete control of the fees payable for the Dental Mechanics and that it should discharge the expenses applicable to the Department. No expense for which the University would be liable was to be incurred without the sanction of the Senate on the recommendation of Faculty and Academic Council. The Dental Staff were to pay over to the University the accumulated funds in their hands and the University undertook to utilize these funds (in future referred to as the Dental Fund) together with the Dental Mechanics' fees received from future students, exclusively for dental teaching. Two members from the Dental Staff at the R.V.H. were to be co-opted on to the Faculty as additional representatives. The Vice-Chancellor's report of this year refers to the establishment of a laboratory and to the "intricate negotiations between the University and the Hospital and the Dental Staff about the final arrangements."

The Dental Registrar

In 1928 a recommendation was received from the Standing Committee that a Sub-Dean be appointed for the Department of Dentistry at a salary of £25 per annum, and although the Finance Committee concurred in this recommendation, there is no record of anyone being appointed to this post. A Dental Registrarship was instituted instead, and Mr. Hunter served the School in this capacity for many years, to be succeeded by Mr. McKeag.

New Appointments

In April, 1933, the Dental Staff recommended to the University the appointment of an Anæsthetic Room Surgeon and a Senior Demonstrator. These appointments were to be made annually, and were not subject to the maximum of three years. The salaries were to be £150 each per annum. The Anæsthetic Room appointment

was given to Dr. Neill, who still holds it. The first Senior Demonstrator was Mr. M. G. Riordan. In 1934 the Dental Board ceased giving grants towards the part-time lectureships of Dental Anæsthetics and Dental Radiology, with the result that in July of that year the Finance Committee recommended that these salaries be paid out of the Dental Fund. The Dental Board, however, offered help towards the establishment of a part-time tutorship and lectureship in Clinical Dental Surgery. This post was established in July, 1938, its first holder being Mr. M. G. Riordan, who previously had held the post of Demonstrator. In March, 1939, the Finance Committee put forward a building development plan in which it was recognized that the present space allotted to dentistry was inadequate and that considerable extension was urgently required. In particular, it was thought that the Dental Laboratory should be at least double in size, that a larger lecture room should be provided, and that the existing museum was inadequate.

Proposals for a Chair in Dentistry

The same year the Dental Board offered a contributory grant to a Chair in Dental Surgery, but this grant was only for a limited period so that the Finance Committee were concerned about making an appointment which would be permanent. In July, however, the Standing Committee recommended the establishment of a whole-time Professorship in Dental Surgery, the salary for which was to be obtained partly from the Dental Board and partly from the Dental Fund. It was thought that the holder should have a clinical appointment in addition to his University appointment, so as to integrate these two aspects of his work.

The B.D.A. Annual Meeeting.

In 1938 saw the Annual Meeting of the B.D.A. being held in Belfast under the Presidency of Mr. H. Elwood. University buildings were placed at the disposal of the Meeting, and the clinical sections were held in the Dental Department at the Royal Victoria Hospital. For this event a considerable amount of new equipment, including several electric dental engines, were installed and the Hospital Department received a long overdue redecoration.

Death of Mr. Riordan

In 1946 Mr. Riordan died. He had served the Dental School with devotion for almost twenty years, having graduated in 1925, was a dental house-surgeon at the hospital soon after qualification, and subsequently became Tutor, and then Lecturer in Clinical Dental Surgery. He was not only a good teacher but a first-class operator, and had acquired a large consulting practice. He had had a serious illness in 1945, but after an operation he recovered sufficiently to enable him partially to resume practice. His death at the early age of 42 was a grievous loss to the Dental profession in Northern Ireland. Mr. R. S. L. Sloan, who followed him, held the appointment of Lecturer in Operative Dental Surgery until December, 1949.

Lecturer in Anatomy to Dental Students

In 1946, again with the help of the Dental Board, a full-time lectureship in Anatomy to Dental Students was established, and to this post Dr. James H. Scott was appointed, thus replacing Mr. C. McNeill, who had acted for many years in a part-time capacity after Professor Walmsley had given up lecturing in this subject.

The Senate Committee on Dental Studies

In spite of this appointment in Anatomy, the affairs of the Dental School were causing grave concern to both the Dental Staff and to the University, and a decision had to be reached whether to close the School down or to take steps to develop it on much more vigorous lines. To decide this issue a strong committee was appointed by the Senate, including amongst others, the Vice-Chancellor, the Dean of the Faculty of Medicine, Dr. Carnwath, and Mr. T. Elwood of the Ministry of Health. This Committee, in February, 1947, published an interim report in which was outlined various recommendations which were thought necessary to bring the School into line with other similar institutions in England. The annual cost would be in the order of £8,000. Its final report (15th October, 1947) reviewed the history of the Dental School and the position of recruitment to the profession in Northern Ireland against the background of the Teviot recommendations; put forward suggestions for the abolition of the diploma course and the estabishment of a basic five-year degree qualification, and listed recommendations with regard to the accommodation, staffing, recruitment and administration of the School. This report was approved in principle by the Senate, but no action followed. In April, 1948, the first full-time Professor of Dentistry took up his duties, and the first phase of the history of the School may be considered to have ended.

REVIEW

DISEASES IN INFANCY AND CHILDHOOD. By R. W. B. Ellis, O.B.E., M.A., M.D., F.R.C.P. Edinburgh : E. & S. Livingstone. Pp. 695. Illustrated. 42s.

Professor Ellis has written his new textbook of Diseases in Infancy and Childhood in a style that makes it a pleasure to read. The text flows smoothly and nowhere is there an impression of the cramming in of facts.

Proper emphasis is placed on those conditions, social and pathological, which distinguish the care of children from adult medicine. The value of a full history. including the mother's observations and an assessment of her attitude to the child, is stressed.

Almost one-third of the whole book is devoted to the care of the new-born, congenital malformations, and the effects of congenital syphilis. The chapter on congenital malformations is outstanding for its completeness and for the plentiful photographs and X-rays, which are of excellent quality throughout the whole book.

The text ranges widely, and where considerations of space have in some cases necessitated short summaries of rarer conditions, this is done by the selection of facts of most practical importance and of most certain foundation. The bibliography of both rare and common conditions is wide and up to date. J. B. T. L.

Lecturer in Anatomy to Dental Students

In 1946, again with the help of the Dental Board, a full-time lectureship in Anatomy to Dental Students was established, and to this post Dr. James H. Scott was appointed, thus replacing Mr. C. McNeill, who had acted for many years in a part-time capacity after Professor Walmsley had given up lecturing in this subject.

The Senate Committee on Dental Studies

In spite of this appointment in Anatomy, the affairs of the Dental School were causing grave concern to both the Dental Staff and to the University, and a decision had to be reached whether to close the School down or to take steps to develop it on much more vigorous lines. To decide this issue a strong committee was appointed by the Senate, including amongst others, the Vice-Chancellor, the Dean of the Faculty of Medicine, Dr. Carnwath, and Mr. T. Elwood of the Ministry of Health. This Committee, in February, 1947, published an interim report in which was outlined various recommendations which were thought necessary to bring the School into line with other similar institutions in England. The annual cost would be in the order of £8,000. Its final report (15th October, 1947) reviewed the history of the Dental School and the position of recruitment to the profession in Northern Ireland against the background of the Teviot recommendations; put forward suggestions for the abolition of the diploma course and the estabishment of a basic five-year degree qualification, and listed recommendations with regard to the accommodation, staffing, recruitment and administration of the School. This report was approved in principle by the Senate, but no action followed. In April, 1948, the first full-time Professor of Dentistry took up his duties, and the first phase of the history of the School may be considered to have ended.

REVIEW

DISEASES IN INFANCY AND CHILDHOOD. By R. W. B. Ellis, O.B.E., M.A., M.D., F.R.C.P. Edinburgh : E. & S. Livingstone. Pp. 695. Illustrated. 42s.

Professor Ellis has written his new textbook of Diseases in Infancy and Childhood in a style that makes it a pleasure to read. The text flows smoothly and nowhere is there an impression of the cramming in of facts.

Proper emphasis is placed on those conditions, social and pathological, which distinguish the care of children from adult medicine. The value of a full history. including the mother's observations and an assessment of her attitude to the child, is stressed.

Almost one-third of the whole book is devoted to the care of the new-born, congenital malformations, and the effects of congenital syphilis. The chapter on congenital malformations is outstanding for its completeness and for the plentiful photographs and X-rays, which are of excellent quality throughout the whole book.

The text ranges widely, and where considerations of space have in some cases necessitated short summaries of rarer conditions, this is done by the selection of facts of most practical importance and of most certain foundation. The bibliography of both rare and common conditions is wide and up to date. J. B. T. L.

The Pattern of Disease

By F. M. B. ALLEN, M.D., F.R C.P.

Presidential Address to Northern Ireland Branch of the British Medical Association, 24th May, 1951

IN approaching a topic suitable for addressing you on this occasion, I decided to resist the temptation to bring forward a subject which might be of interest only to a limited section of my audience. I chose as the title of my address one which has appeared to me attractive, because, as a doctor, who for more than twenty-five years, has been almost exclusively engaged with illness among infants and children, I have seen a great deal of the beginnings of disease. Many of my patients whom I saw in early infancy returned to me from time to time, so that I became fascinated with the concept that the disorders and "dis-harmonies" of their bodily function tended to conform to a pattern of events. One could almost forecast that this child, subject to catarrhal affections in infancy, would suffer from tonsillar infection in childhood and acne at puberty; whereas that child liable to papular urticaria in infancy would have spasmodic bronchitis in childhood and migraine in adolescence.

We, as pædiatricians, deal with patients who have not submitted their bodies to abuse nor to the insults of excessive smoking or alcoholism, nor have their minds been burdened with the anxieties of overwork or business worries. We therefore see disease without many of the "complications" of environmental or personal factors which are so important in dealing with disorders in the adult. Moreover, we see the early stages of the development of disease, the very inception of conditions such as rheumatic infection, chronic respiratory disorders such as bronchiectasis, and the whole picture of tuberculosis.

The design of the disease is repeated constantly, though its outline may become progressively obscured. The fundamental disturbance of tuberculous infection is the same in infancy and in old age, in the lung, the meninges, the kidney or in glands. The ancient clinical accounts of the disease still stand the test of accuracy in observation, and the earliest attempts at the minute description of microscopic changes are no different from our modern findings. It is true that additional knowledge has been acquired and much that appeared obscure has been illuminated. But the fact remains that to understand the protean manifestations of tuberculosis one must be familiar with the basic pathological changes that occur in the affected organ, and realise that these changes conform to a well-recognised pattern.

In health there is an adaptation of the organism to environmental factors ensuring a constant balance which results in a "healthy" mind and body. Disease is the opposite of health. Disease is a departure from this condition of

equilibrium—a want of harmony. Adami defined disease as a "process or succession of disturbances induced by any agent which disturbs the normal activities of the organism as a whole or of its constituent parts." While our minds may, in the first instance, co-relate this definition with processes which are strictly pathological, it must be remembered that some conditions, of the nature of a congenital structural defect or a functional aberration (inborn errors of metabolism —chemical malformation), come within its boundaries; whilst in others, compensatory or adaptive processes may keep pace with morbid changes producing a suitable adjustment which maintains life free from symptoms. In the event of removal of one kidney or its destruction, hypertrophy occurs in the other to such a degree that there is no loss of total function; the liver has amazing powers of regeneration—it can suffer considerable material loss and yet overcome this handicap by renewal of its vital cells.

Thus we must clearly understand that disease can be recognised by the presence of symptoms, but careful consideration must be given before an assurance is given that the organism is capable of normal function.

Thus, we must clearly understand that though disease or, to quote Adami, "disturbances of the normal activities of the organism as a whole or of its constituent parts" may be present, an assurance, after the most careful consideration, may sometimes be given that the organism is capable of achieving an adequate adaptation and of living normally among his fellow-creatures.

What is a Disease?

Primitive man in his superstitious ignorance regarded disease as the result of some offence committed against a deity or the action of the dead or even the machinations of an enemy. Disease was regarded as an invasion of the body, a "demoniac possession" by something which either had to be got out or let out! Hence the explanation of the trephining operations of Neolithic times.

Another view was that disease was "determined" by predestination, that some impulse caused a predetermined reaction. As you can imagine, this brings the grim figure of Calvin before one's mind, but I do not intend to deal with disease in relation to theological concepts.

Predestination does, however, demand some consideration in relation to diathesis, or the constitutional factor in disease. Hippocrates accepted the idea of a diathesis, and this view was held until the end of the nineteenth century. Jonathan Hutchinson (1884) defined a diathesis as "any bodily condition, however induced, by virtue of which the individual is, for a long period, or usually through the whole life, prone to suffer from some peculiar type of disease." Better understanding of disease processes, the discovery of bacteria and their relation to disease, of protozoa and viruses and vitamins have served to remove many of the "diatheses" from serious consideration, so that the scrofulous diathesis is recognised as tuberculosis and the malarial diathesis has been abandoned. This advance is attributable to progress in knowledge of the sciences ancillary to medicine. Bacteriology and biochemistry have assisted pathology in

a better understanding of the origin of disease. Tuberculosis and syphilis were recognised as infective granulomatous processes, but there was a great deal of confusion about distinguishing the two conditions until the causal organisms were identified and specific methods of diagnosis were established. The strumous diathesis did not distinguish between the liability to and infection by the tubercle bacillus. And yet this "diathesis" permitted confusion between tuberculous and syphilitic infection until bacteriology explained the difficulty in distinction by discovery of the tubercle bacillus and the spirochæte of syphilis.

In passing, however, it must be noted how bacteriology did serve to re-establish for a time the diathesis theory by recording how comparatively few individuals become the victims of tuberculosis considering how ever-present the tubercle bacillus is, and how so many of us are exposed to its inroads. The modern view is, of course, that a large percentage of the population are already the victims of a primary tuberculous infection which may, fortunately, occur in childhood and confer upon the individual a considerable degree of immunity; an immunity which will be useful to him in withstanding subsequent infections at a more vulnerable age. This, I think, partially explains the view of the relative importance of the "soil" and the "seed."

The rickety child was presented as another constitutional tendency. And yet in the midst of arguments which tried to maintain this thesis was an observation (by Spencer Watson) in 1882 that "free exposure to sunlight and warmth would do much to enable a child improperly fed to effect assimilation in such a way as to keep clear of rickets." He goes on to say that "we may certainly believe it probable that our climate and the narrow, sunless streets of our large towns take their share in the production of rickets." It was not until the 1920s that the cause of rickets was determined as a vitamin deficiency, and it became fully established that it could be prevented (and cured) by a balanced diet containing an adequate amount of vitamin D or by exposure of the body to sunlight whereby a particular sterol (ergosterol) present in the skin was irradiated and converted into this essential substance.

The role of diathesis has had its day and is now all but discredited. The wisdom of one generation is the foolishness of the next.

The discovery of chromosomes and the acceptance of Mendel's work on heredity established the biological doctrine of the germ plasm and the transmission of character according to a law of inheritance. Acquired characters are not transmitted because they only affect somatic cells. This seemed to give a further turn to the pattern of disease—just as in history which is so prone to "repeat" itself by substituting a new name for an established one and producing a "new" picture of circumstances not so different from the old.

In 1826 Laycock published his lectures on "Physiognomical Diagnosis," in which he called attention to certain facial types which assisted in the diagnosis of the diseases from which their owners were suffering. Twenty years ago Draper of Columbia University was engaged in trying to establish by anthropological measurements the existence of certain types, such as the gall-stone type, the

peptic ulcer type and the pernicious anæmia type. His volume, "Human Constitution," is a tribute to his shrewd observation, but might prove a source of pitfalls to the inexperienced. That this is a subject of interest to-day is proved by the current visit of Kretschmer, who classifies various types of human being, and endeavours to trace a connection between physical appearance and human character. This is not such a modern idea, however. You will remember how Shakespeare made Cæsar prefer fat men and dislike Cassius with his "lean and hungry look." This presumed relationship between character and physique is but a step towards evolving a relationship between disease and physical build; and, indeed, between the psychical state and body disorder has been attracting interest, as evidenced by a recent volume bearing the title, "Personality in Peptic Ulcer."

The occurrence of peptic ulcers bears some relationship to the personality and temperament of the individual. It is notorious how it exists in those who are noted for their "drive," their versatility, their high emotional quality, their self-reliance and determination to achieve their goal.

Errors in Metabolism.

That disease follows a pattern is born out by the relation to structural malformations of Garrod's well established "inborn errors of metabolism." The recognised "errors" (of albinism, alkaptonuria, cystinuria, pentosuria and porphyrinuria) appear to be the result of incomplete breaking down (or building up in the case of albinism) of tissue components so that by failure of completion of the process intermediate products of proteins or sugars are excreted.

Congenital malformations of the alimentary tract, of the heart, and of the genito-urinary tract and elsewhere are likewise the result of interference with the normal progress of development of the human individual. Very early in embryonic life dramatic and all-important events are happening. The differentiation of the sexes is determined at the eighth week. Shortly afterwards the primitive cardiac tube undergoes its first rotation, and the elementary digestive tract begins to lay the foundations for the development not only of its own complicated cellular function, but also of the "buds" which eventually give origin to the ancillary organs of digestion. Some maternal event may influence the development of these organs if it happens to coincide with the "period of crisis" in the evolution of the fœtus. It is part of our current belief that a virus disease, such as German measles, occurring in a mother in the early weeks of her pregnancy may result in her infant being born with congenital cataract or a deformed heart. It is more than probable that other conditions in the mother will be discovered to bear a direct relationship with the physical perfection of her offspring.

It is possible that inborn errors of metabolism can be explained by a similar argument. The mechanism whereby certain sugars and proteins are broken down completely is the result of the action of a specific enzyme. Should some unfavourable episode occur in the mother's health involving the blood supply to the embryo at a critical period of its development, it is conceivable that the production of this enzyme may be interfered with and even denied to the body functions.

Cœliac disease seems to provide a great opportunity for logical thinking and further research. I am convinced that cœliac disease is one of the rarer causes of steatorrhœa in children; but the disease conforms to a pattern which can be recognised by clinical and laboratory methods and distinguished by them from other conditions associated with an increase in the fat content of the stool. We know much concerning the fate of the fat and its relation to starch and carbohydrate in this disease; but at least one item of knowledge is missing and its identity eludes us. It would appear that some unidentified enzyme or hormone is involved in the utilisation of fat and carbohydrate, and that its absence (or the presence of an abnormal enzyme) interferes with the normal metabolic processes. One might almost classify cœliac disease as an error in metabolism whereby a digestive process which should normally be complete is interrupted, just as the presence of alkaptone in the urine is an indication of the interruption of the normal breaking down of an amino acid by some unidentified agent.

Until recent years the disorder of fibro-cystic disease of the pancreas (with its associated cystic disease of the lungs) was not recognised. Now a relatively simple clinical test of discovering the absence of pancreatic enzymes in the duodenal juice distinguishes this condition from other causes of steatorrhœa. Here is an example of the failure to provide normal enzymes essential to proper digestive function. Whether the disorder arises as the result of ill-health in the mother, or some factor of inheritance is as yet unknown.

Recently a disorder of blood has been described in children in which there appears to be the absence of some factor, as yet unknown, which produces physiological replacement of obsolete blood corpuscles. Red cell maturation fails at the late normoblastic stage in this condition, and it has been christened "erythrogenesis imperfecta" (Cathie). Here there is an opportunity to fit a pathological entity into an error of metabolism whereby physiological function is incomplete.

A further example of errors of metabolism is the series of cases of methæmoglobinæmia which have been described in Northern Ireland, with the addition of a further case recently. It is suggested that this interesting condition (Breakey *et al.*) is due to an inborn biochemical error, the symptoms of which appear in infancy and may persist into adult life. It is interesting to record that the use of vitamin C and methylene blue overcomes the metabolic error.

That the list of errors of metabolism is incomplete is obvious when one considers the recent descriptions of galactosuria and the most interesting work on the excretion of amino acids in the urine (some of them unrecognised in human physiology).

In bringing to your notice the "inborn errors of metabolism" in relation to a disorder such as cœliac disease, I do so because one should realise that each step in metabolism requires the presence of a definite agent, be it enzyme or hormone, and its absence may induce a predisposition to a disease. That the absence of this ferment may be determined in embryonic life is a possibility in view of our

knowledge of the effect of the mother's health upon the structural perfection of the foetus. It is certainly true that long before birth the infant is stamped with individuality—not only of sex, but with the perfection or otherwise of his organs and the functional efficiency of the specialised cells which make up the pattern of his existence.

I do not intend to dwell upon the factor of heredity in relation to disease, although I have no doubt that the science of genetics has much to contribute to our understanding. Hæmophilia, with its tragic and dramatic manifestations, is an outstanding proof of the reality and the importance of inheritance. The fact that it affects males and is transmitted by females provides a valuable field for investigating some of the laws of inheritance and the factors governing the transmission of disease. Other diseases are undoubtedly inherited and the risks of occurrence are increased by the marriage of first cousins. The inheritance of diseases of a definite pattern is accepted, but the influence of genes and chromosomes upon the product of conception is much too complex to be pursued on this occasion.

Idiosyncrasy and Allergy.

The term allergy was given by von Pirquet to describe all forms of altered reactivity of the organism. Idiosyncrasy is a special instance of the sensitivity of the individual to an irritating agent. All of us have encountered the patient who is specially sensitive to various drugs such as iodide, cocaine, atropine, etc., in whom most inconvenient and distressing reactions occur. We now recognise that equally dramatic results can occur in certain individuals who are hypersensitive to such foodstuffs as eggs, mushrooms and shell-fish. In recent years an attempt has been made to explain the occurrence of certain diseases on a basis of allergy or sensitivity to substances which are classified as "allergens."

These may be inhaled or taken in the diet. Among the former are pollens of flowers, shrubs and grasses, dust, the dander of horses and feathers. Common allergens which are ingested include eggs, milk (particularly the protein in solution in whey), pork foods and cocoa products. The diseases which it is alleged can be attributed to allergy include asthma, urticaria, vaso-motor rhinitis ("hay fever"), eczema, and even enuresis. The sensitivity of the individual can be determined by skin testing with solutions of proteins capable of producing allergic reactions. The list of test substances is fairly numerous, but in the U.S.A. amounts to hundreds.

I have indulged in a considerable amount of clinical observation of skin testing for allergic phenomena, and am satisfied that it offers a field of useful evidence open to the reasonable interpretation of the results. In some cases the reactions are convincing and coincide with the patient's experience; in this event avoidance of the offending allergen achieves a dramatic response. If it is impossible to eliminate the obnoxious agent the patient can be desensitised by a course of injections of progressively increasing dosage of the specific protein.

It is true, however, that patients often display cutaneous reactions to substances

which do not induce unpleasant reactions. My experience has taught me that this may only be a temporary immunity, and that some factor may inadvertently be added to the patient's cosmos which will render him sensitive thereafter. I have noted on a number of occasions how an individual who shewed a skin reaction to, say, horse-hair without any inconvenience when in contact with it, displayed serious reactions to contact with horse-hair following the use of one of the antibiotics such as penicillin. A reasonable explanation would appear to be that the horse-hair allergen was "fixed" and was "freed" by the introduction of a potent and very energetic allergen such as a fungus product penicillin. I am satisfied that this explains much of the "asthma" (which I prefer to term "spasmodic bronchitis") which afflicts many people who have been given penicillin for their recurring attacks of bronchitis, which were essentially of an "exudative" type and not so inconvenient as their "asthma."

It is important nevertheless to understand the relationship of an individual's "constitution" and the occurrence of a disease. I hesitate to use the term diathesis, but there does appear to be a case to be made for the recognition that some patients react to insults in the form of allergens in a manner which does not occur with others. They demonstrate a series of ailments throughout life which might not seem related but which do, in fact, occur so often according to a set pattern that one must accept them as part of a single disorder. One such series is that of the infant which suffers from eczema until about the age of two years. This distressing condition occasionally causes death, but in those who survive, the eczema rarely completely responds to the best efforts of the dermatologist. Remissions may occur, especially when undernutrition is procured: there is a prospect that adreno-cortico-tropic-hormone (A.C.T.H.) may achieve a dramatic response. Spontaneous remission of the eczema usually takes place at two years, but, unfortunately, is now to be followed by the occurrence of flexural prurigo—a most irritating lesion involving, particularly, the flexures of the elbows and knee areas, and sometimes also the wrists and ankles. Measures of amelioration are available, and occasionally a definite allergic agent can be identified. The condition is prone to recur or to persist in spite of treatment and then, unhappily, to be replaced by attacks of asthma which are distressing and persistent during childhood and into adolescence. Occasionally the components of the syndrome can be related to some allergen, for example, egg-white or milk protein to account for the eczema, to be succeeded by horse-hair as the agent responsible for the prurigo, and later, house-dust or poultry feathers as the cause of the asthma.

Again, one sees the infant who is the victim of "hives" (papular urticaria) which responds so quickly to the change to a hospital bed. This individual may later suffer from seborrhœic dermatitis and allergic urticaria due to some specific foodstuff or physical contact. "Cyclical vomiting" in childhood is frequently identical with, or inevitably to be followed by attacks of migraine; sometimes inconveniently associated with "hay fever" (vaso-motor rhinitis)—all in the same person.

The advent of papular urticaria or eczema in an infant provides a favourable opportunity for the doctor to assume the rôle of prophet. It is almost inevitable that in later life—childhood, adolescence or manhood—some or all of the features of this pattern will appear. They may even be (and often are) the only departure from robust good health and the enjoyment of living.

I recall the first time I spoke in this room, I tried to draw a picture of the type of child who is prone to rheumatic infection—juvenile rheumatism and chorea. Now almost twenty-five years later I am still quite convinced that there is something in our physical make-up which predisposes—if not predestines—a child to rheumatic infection. The dark-haired child with a clear complexion, blue eyes and flat "pavement" teeth portrays one physical type which is liable to fall victim to this insidious disease; fortunately, the same type of child if it gets chorea seems to avoid cardiac involvement. Those of my friends who so often visit our hospitals invariably remark upon the number of "red" haired children in the wards, as compared with provincial cities in Great Britain—and almost every one of them is under treatment for rheumatic heart disease!

The Nervous Child

I do not wish to trespass in the field of psychosomatic medicine, largely because the subject is much too complex, and too little understood. I do wish to record, however, that I am now old enough to have watched some of my infant patients reach adolescence, and indeed some of them have reached parenthood!

I learned, particularly from H. C. Cameron, to recognise the infant who suffers from "nervous unrest." The restless, fidgety, alert infant, who wakens easily, is bright and interested in its surroundings and who looks forward eagerly to the next event which will relieve the monotony of its existence. It feeds greedily, and often vomits because of this habit; its bowels usually move with each feed; it cries from boredom and for the purpose of securing attention. Its feeds are changed because of the vomiting, its (alleged) "diarrhœa" is treated with dietetic regulation or by sulphaguanidine, and the mother is distressed because she is blamed for spoiling her baby! In truth, the blame might be rightly placed upon her for choosing as father of her child a parent who probably behaved in a similar fashion to his mother—or she herself to her mother!

This type of infant reaches the age of mixed feeding with joy, although his energy and physical activity may have prevented him from ever being the nice plump, placid infant so beloved of the professional photographer. His joyous approach to mixed feeding is surely in the hope that the days of monotonous milk-feeding are over and that more attractive items will appear in the diet. Too often the mother, full of good intentions, maintains a relatively tasteless, insipid routine of food in the interests of physical development. All the ancillaries which make for the pleasures of the table are denied the child—as is the fashion of a modern Minister of Food. First-class protein, in the form of egg dishes, meat, sausages, bacon are withheld—unless some favoured relative surreptitiously

introduces a piece of fried bacon, some potato chips, or a sardine with vinegar—to the unadulterated joy and gastronomic appreciation of the recipient.

The child may protest (subconsciously) by refusing to continue with this Calvinistic stringency of diet, and the mother declares there is "lack of appetite." The psychiatrist will call the condition "negativism," and the family doctor may be misled and think he recognises the early manifestation of what is sometimes called "anorexia nervosa."

One could continue to build up the life history of this child in detail as it passes through childhood to adolescence. I would mention briefly, however, that these children frequently remain thin, appear to be under-nourished and often suffer from functional bed-wetting, stammering and defects of posture. Their pseudo-malnutrition provokes anxieties of the worst kind in the minds and thoughts of the parents, with fears of tuberculosis or worse. The environment is one of acute anxiety and attempts are made to "build up" the child by including in the diet cod-liver oil, top-milk or cream, and butter and eggs far beyond the tolerance of any child, let alone one who is notoriously unable to metabolise fats with the facility of his more stolid contemporaries.

This child has many attractive qualities—to his school-teacher he appeals because of his intelligence, receptiveness and conscientious attention to learning; to his colleagues he is the "organiser" of games, the leader in enthusiastic enterprise, always punctual (almost inconveniently so!), courageous and never lacking in initiative. But his parents recognise that he is fundamentally shy and restless in his home life. He bolts his meals so that he may be in time for his next outlet, and how impatient he is with his mother if his meal is not ready! He would prefer to absent himself rather than attract attention by being late for church or school, and a train could be fifteen minutes ahead of schedule and he will be on the platform awaiting it!

His school homework is usually well within his intellectual ability (unless he has been pressed into a class above his age) but the anxiety he displays that it is correct is intense, and how he re-lives his duties when he goes to bed! Sleep is restless and sometimes accompanied by bed-wetting. Before he reaches bed, however, he has many phases of physical activity of general fidgetiness or moving from one chair to another, from one room to another, changing his interest from a book to a jig-saw and then to some forgotten toy in the attic—until his exasperated parent appeals impatiently for him to "stop fidgeting and to sit at peace!" A cynic once referred to this child as being so restless that he interfered with his father listening to Children's Hour! An emotional outburst may result, with a consequent refusal of meals and an anxious mother appears once more in the consulting-room with a further manifestation of parental anxiety.

Physical examination is reassuring, a tonic is prescribed and perhaps a week's relief from school for "overwork" is advised. Weeks and months pass with the parental eye always on the look-out for the dreaded cough of consumption or the

abdominal pain of "glands." Instead, the child continues in his course of energetic, "highly strung" living. At school he is fidgety in the presence of a formidable teacher and is blamed for his restlessness or referred to the doctor as a case of early chorea. Examinations and events which are outside the routine are accompanied by frequency of urination, or "diarrhœa." The strain of modern educational demands may indeed provoke a recognisable "anxiety neurosis" causing acute distress both to the patient and his parents.

In adolescence and later this anxiety neurosis may be very pronounced and be responsible for fainting attacks, effort syndrome and phobias. The psychiatrist will uncover the picture from infancy onward and recognise how the disorder of adolescence or manhood has followed a well recognised pattern since babyhood.

How much human misery and anxiety is caused by the unconscious sowing of the seeds of doubt and disquiet in our patients' minds is not assessable. But I am satisfied that if the parents of an infant who suffers from "nervous unrest" are made to understand how troublesome (but how interesting) their progeny is going to be and how he will tend to follow a pattern of functional disorder, their conduct can be regulated and a much happier childhood be enjoyed by the patient!

It is not possible for us to offer a rational explanation as to why an individual of this particular type should appear in a family. My enquiries from parents have given strong support to the view that this disposition is inherited. It is only on the rarest occasions that the parents deny that either one or both is not highly strung and suffered similarly in childhood—and even continue to do so in adult life. That a disturbance of the balance of behaviour of this type runs in families was asserted by Langdon-Brown in support of Cammidge's research. Cammidge collected many family histories, and these suggest that such inheritance follows Mendelian laws.

In passing, I must recall the view that some disorders of function—which I may remind you are regarded as "diseases"—are the result of sympathetic-endocrine imbalance. The endocrines form a complicated organisation whose ramifications are widespread and are as yet imperfectly understood in relation to disturbance of physiology. We recognise the patient suffering from cretinism or myxœdema as distinct from the result of thyrotoxicosis; but we have only an imperfect understanding of the complex functions of the pituitary gland and its influence upon its colleagues and of the control by the sympathetic nervous system. Nor do we fully appreciate the effects of gonadal secretions and hormones upon the individual as well as upon such an influential and complicated organ as the pituitary.

Eppinger and Hess tried to classify neurotics into sympatheticotonics and vagotonics. This division is not acceptable because it is too inelastic, but we can identify individuals who suffer from overaction of the sympathetic and display tachycardia, sweating, raised blood sugar, hypertension and are often subject to phobias. Overaction of the vagus is associated with slow pulse rate, low blood sugar,

constipation and a temperament of vague apprehension. These are recognisable types of individuals, prone to their own particular physical and functional disturbances, but the action of endocrine glands is much too complex to make a useful classification.

While the clinical manifestations of a disease may change with the years or for reasons of climate, or on account of increased resistance or loss of virulence, the basic morbid process remains true to pattern. Rheumatic fever has altered from a distressingly painful disease, associated with profuse sweating of an acid character, to an insidious disease of childhood. But the morbid histology of the infection is the same. Tuberculosis is a relatively benign disease if first acquired at an age when lymphatic growth is active, i.e., between 5 and 10 years (or even 2 to 14 years). Before the age of 2 years it carries a heavy mortality and in adolescence it is a serious disease with a dread record of fatalities. The descriptions of the tubercle which have been handed down to us from the times of Hippocrates and Galen apply to-day, and the descriptions of the morbid histology by Virchow and Villemin are the equal of the modern pathologist.

Galen must have observed every phase of tuberculosis which can occur, because he wrote about the disease under one name or another in every form in which we see it. He did not recognise the unity of the various forms which he described and apparently had only a vague suspicion of the relationship between them. In his writings are such headings as Phthisis, Hectic Fever, Tabes, Marasmus, Struma, Hæmorrhage, and Atrophy,

The Clinical History.

Modern clinical medicine owes its birth to Sydenham by observance of the Hippocratic discipline and by the introduction of clinical study. He sought, by the direct study of sick persons, to write a natural history of disease.

Witness his description of acute rheumatism: "The Disease comes at any time, but especially in the Autumn and chiefly seizes those that are in the Flower of their Age. . . . . It begins with shivering and shaking, and presently heat, restlessness and thirst; and other symptoms which accompany a Fever. After a day or two, and sometimes sooner, the Patient is troubled with a violent Pain, sometimes in this, sometimes in that Joint, in the Wrist and Shoulders, but most commonly in the Knees; it now and then changes places and seizes elsewhere, leaving some redness and swelling in the Part it last possessed. When this Disease is not accompanied with a Fever it is often taken for the Gout though it differs essentially from that as plainly appears to anyone that well considers both Diseases."

I claim that while the clinical manifestations of a disease may alter with the passage of time or because of other factors, the underlying pathological changes retain their character throughout the ages. We should try to understand the basic alteration in the function of the body or in one of its organs caused by a disease for a true interpretation of the disease and its consequences. I think the

dermatologists have a relatively simple task because they can actually see the lesions and can study their characteristics, their histology and the changes produced by treatment. If the gastroenterologist could only view the duodenum to ascertain if the ulcer which the radiologist asserts is present really exists and if it does respond to dieting, to alkalies, and to prohibitions of tobacco and alcohol. And if the neurologist or neurosurgeon could only see with a magic eye the site of a suspected brain tumour or a lesion in the brain!

In arriving at a conclusion to this address, I assert that disease conforms to a pattern with modifications, due to numerous factors. In reaching the ultimate evaluation of a disease, I feel that too little attention is paid to its "life history." So many things ought to be considered. For example, what type of individual is liable to suffer from peptic ulcer? What antecedent factors in his heredity, his habits, his occupation, his temperament are possibly related to its occurrence? Does any particular infection, diet or disease precipitate the ulcerative process, or is it due to biochemical or endocrine causes?

If one knew the intimate physical history of a series of individuals with peptic ulcer for the previous 20-25 years of their life, one might answer some of these questions. The Chinese, two thousand years ago, claimed that the art of diagnosis lay in observation, auscultation, interrogation and palpation. Auenbrugger (1771) added percussion and Lænnec perfected auscultation. All the ancillaries of modern medicine do not replace a complete chronological record of the patient's symptoms, followed by observation of the patient and a sound clinical examination of his body and an assessment of his temperament and social adjustments. Human beings are not made from one mould; mankind individually differ widely in their make-up and power of response. In illness we all wish to be treated as a special problem, not as one of a group of "cases." Every illness is the reaction of the body and mind of the patient to some factor which may be simple or complicated. The reactions of man become more complex as he moves from childhood and the simple life of the country to maturity and the whirlpool of modern civilisation. The seeds of ill-health in the adult may be sown in childhood, and Galen, you will remember, published two editions of his book "The Vocation of Old Age." In this he maintained that to escape old age it was necessary to lay the foundation for it in infancy and to "develop the child and the man in harmony with Nature's laws."

By whatever means we arrive at the understanding of the nature of a particular disease, I am sure we shall only do so when we are fully aware of its "life history." Consultants and specialists have an unfavourable opportunity of learning the details of the features of disease in its early stages, because they have to try to extract from the patient (whether he be garrulous or obtuse) a clinical history. The gaps in the patient's knowledge of his early symptoms or his inherent lack of observational faculties draw a blind which conceals what is so fundamentally important.

To some extent, those of us engaged with illness in infants and children are

in a more favourable position, because we have to be objective and depend upon our own observation with the advantage of an unbiased and interested historian in the person of the parent.

I would, however, emphasise that the family doctor is the one who is most likely to teach us, because he can evoke the confidence and sympathy of the patient; he is in the position of counsellor and friend for a lifetime, and will be familiar with the individual's characteristics and the trends of each member of the family and all the surrounding factors which make up the composite picture of the disorder.

I submit, therefore, in considering disease in its widest aspect, we must recognise that there are reasons for renewing our belief in predisposition to certain diseases, whether due to physical, emotional or functional factors. Also in the production of physical disorder, congenital defects of structure and of function arise, and I suggest that the inborn errors of metabolism are a much more extensive group than that originally described by Garrod, and that these errors are really in the nature of congenital malformations of chemistry.

In whatever grade of medical practice we find ourselves, or in whatever field of medicine we work—let us free ourselves of the barnacles of prejudice, learn from the past and not live in it, and rid our minds of outworn shibboleths. Thus we may view the problem of disease with a fresh mind.

REFERENCES

ADAMI, J. G.: *The Principles of Pathology*; 1910.
SULLIVAN, A. J., MCKELL, T. E.: *Personality in Peptic Ulcer*; 1950.
CATHIE, I. A. B.: *Arch. Dis. Child.*, 124, 313; 1950.
BREAKEY, V. K. ST. G., GIBSON, Q. H., HARRISON, D. C.: *Lancet*, i, 935; 1951.
CAMERON, H. C.: *Lancet* i, 1, 1928.
LANGDON-BROWN, W.: *Brit. med. J.*, 1, 525; 1930.
FLICK, L. J.: *Development of Our Knowledge of Tuberculosis* (Philadelphia); 1925.
WILSON, MAY J.: *Rheumatic Fever* (Commonwealth Fund), 1940).
WONG, K. C.: *Brit. med. J.*, ii, 206; 1929.

REVIEW

HANDBOOK OF PSYCHOLOGY. By John H. Ewen. London: Sylviro Publications Ltd., 19 Welbeck Street, W.1. Price 25s.

THOSE who have read the author's "Aids to Psychology," "Catechism of Psychology," and "Mental Health" will welcome this work, which gives a concise account of phychology and its relationships to psychological medicine. In the interesting first section on normal psychology he quotes freely from older psychologists, as well as making references to modern lines of research. He belongs to the Purposivist School, basing many of his ideas on his belief in the Hormic Theory, but gives a well-balanced account of his subject. The short second section forms a useful introduction to the study of psychiatry by explaining the practical application to it of the principles of psychology.

This book can be recommended to practitioners intending to study for the Diploma in Psychological Medicine. It is unfortunate that a number of errors have been overlooked.

D. M. G.

in a more favourable position, because we have to be objective and depend upon our own observation with the advantage of an unbiased and interested historian in the person of the parent.

I would, however, emphasise that the family doctor is the one who is most likely to teach us, because he can evoke the confidence and sympathy of the patient; he is in the position of counsellor and friend for a lifetime, and will be familiar with the individual's characteristics and the trends of each member of the family and all the surrounding factors which make up the composite picture of the disorder.

I submit, therefore, in considering disease in its widest aspect, we must recognise that there are reasons for renewing our belief in predisposition to certain diseases, whether due to physical, emotional or functional factors. Also in the production of physical disorder, congenital defects of structure and of function arise, and I suggest that the inborn errors of metabolism are a much more extensive group than that originally described by Garrod, and that these errors are really in the nature of congenital malformations of chemistry.

In whatever grade of medical practice we find ourselves, or in whatever field of medicine we work—let us free ourselves of the barnacles of prejudice, learn from the past and not live in it, and rid our minds of outworn shibboleths. Thus we may view the problem of disease with a fresh mind.

REFERENCES

ADAMI, J. G.: *The Principles of Pathology*; 1910.
SULLIVAN, A. J., MCKELL, T. E.: *Personality in Peptic Ulcer*; 1950.
CATHIE, I. A. B.: *Arch. Dis. Child.*, 124, 313; 1950.
BREAKEY, V. K. ST. G., GIBSON, Q. H., HARRISON, D. C.: *Lancet*, i, 935; 1951.
CAMERON, H. C.: *Lancet* i, 1, 1928.
LANGDON-BROWN, W.: *Brit. med. J.*, 1, 525; 1930.
FLICK, L. J.: *Development of Our Knowledge of Tuberculosis* (Philadelphia); 1925.
WILSON, MAY J.: *Rheumatic Fever* (Commonwealth Fund), 1940).
WONG, K. C.: *Brit. med. J.*, ii, 206; 1929.

REVIEW

HANDBOOK OF PSYCHOLOGY. By John H. Ewen. London: Sylviro Publications Ltd., 19 Welbeck Street, W.1. Price 25s.

THOSE who have read the author's "Aids to Psychology," "Catechism of Psychology," and "Mental Health" will welcome this work, which gives a concise account of phychology and its relationships to psychological medicine. In the interesting first section on normal psychology he quotes freely from older psychologists, as well as making references to modern lines of research. He belongs to the Purposivist School, basing many of his ideas on his belief in the Hormic Theory, but gives a well-balanced account of his subject. The short second section forms a useful introduction to the study of psychiatry by explaining the practical application to it of the principles of psychology.

This book can be recommended to practitioners intending to study for the Diploma in Psychological Medicine. It is unfortunate that a number of errors have been overlooked.

D. M. G.

Dental Disease and Civilisation

By P. J. Stoy, B.D.S., F.D.S.R.C.S.

Inaugural Lecture in the Chair of Dentistry, of the Queen's University of Belfast

Dental disease is the almost universal experience of modern man. In Great Britain, the United States, Germany, Scandinavia and New Zealand—countries which may be looked upon as highly civilised—dental caries is extremely widespread. Parodontal disease is also common, while maldevelopment of the jaws and irregularities in position of the teeth are so common that in Northern Ireland, for instance, the need for treatment of these abnormalities far exceeds the facilities available. There is ample evidence as to the widespread nature of these diseased conditions, for one of the main duties of the School Dental Officer has been to examine the teeth of all children under the care of his Education Authority, and the recent report on the health of the County Borough of Belfast for 1948 reveals that 77.6 per cent. of all the children examined had decayed teeth. The position in adults is even worse. In the Army the examination of 18-year-old recruits showed that of all males 98.5 per cent. had carious teeth, and that on the average each had lost between three and four teeth. It has been said that 15,000,000 fillings were inserted by the Army Dental Corps during the war. In the United States defective teeth were the greatest single cause of deferment under the Selective Service Act, and in one instance cited 97 out of 642 men between the ages of 21 and 35 were rejected for this reason alone.

For dental disease to be a sign of civilisation, it must be shown that its existence has increased, pari passu, with the increasing adoption of that mode of living which is generally looked upon as the criterion of civilisation. This, in fact, is exactly what all historical evidence and present-day geographical surveys show. This evidence is now reviewed.

Although it has been frequently stated that primitive uncivilised man did not suffer from dental disease, a careful examination of skulls reveals that the condition was not unknown, for in the remains of the primitive Rhodesian man, the age of which is estimated at 250,000 years, there is decay in most of the upper teeth. This, however, was apparently an exception for such remote times, for an extensive survey held in 1919 revealed that European human skulls before the Neolithic period were free from caries. These European skulls all belong to the long-headed type, but with the arrival of the broad-headed races (about 1200 B.C.) dental decay also made its appearance. It must be remembered, when trying to assess the extent of dental decay from skulls, that many of the teeth become loose and fall out as the soft tissues are lost; the appearance of the bony socket in such

cases, however, is quite different from that in which loss took place during life, for, to mention one point, there is no healing or filling up with new bone. At the same time loss during life may have been, and in some cases probably was, due more to pyorrhœa than to caries.

Besides the evidence of bony remains there is also that of literature. The oldest literature in existence dates back to 3000 B.C. and is Babylonian; it is in the form of bricks on which characters are inscribed, and it is significant that these contain descriptions of dental disease. In those remote days worms were thought to be the cause of many morbid conditions and in one description such a worm is supposed to be speaking. It says "set me amid the teeth and let me dwell in the gums, that I may destroy the blood of the teeth and of the gums chew the marrow."

The extensive Egyptian remains, which include large numbers of skulls and mummies, are of the greatest interest in tracing the development of dental troubles, because they cover a period of several thousands of years. Before 3000 B.C. caries was rare; in the age of the Pyramids it became more prevalent, particularly in lower Egypt, while by the time of Anthony and Cleopatra an examination of about one hundred skulls showed over 40 per cent. to be affected. In addition, there is evidence of very widespread pyorrhœa which, in spite of some accounts to the contrary, does not appear to have received any proper treatment. The Etruscans, on the other hand, were more advanced—dentally; they not only suffered from pyorrhœa, but also treated it. Specimens have been found (dated 800 B.C.) in which gold wire was twisted round loose teeth binding them to their neighbours, and Dr. Lindsay (to whom I am indebted for many of the historical details) states in her History of Dentistry that no such work or any attempt at treatment of caries is found in any of the thousands of mummies that have been examined.

In Ancient Greece there is ample evidence of dental disease. Hippocrates refers to extractions both when the teeth are decayed and when they are loose, while oral hygiene is advocated by Diocles of Carystos, his recommendation being that the gums are massaged daily with the fingers. In Roman literature of the Imperial era there are also many references—to black teeth, loose teeth, and even to artificial teeth.

In Great Britain the change in the incidence of dental disease before, during and after the Roman domination is illuminating. Among the Ancient Britons, very little caries was present, and it did not increase to any great extent until the more cultured ways of the Roman became comparatively widespread. The incidence then increased to almost 30 per cent. There followed in Anglo-Saxon times a rapid drop, a drop which took place almost immediately after the departure of the legions. With the slow emergence from the Dark Ages dental disease again increased, and also its treatment. By the Middle Ages the Tooth Drawer was recognised professionally, and there are many references to him in contemporary literature. It is an interesting reflection on the medical profession of that time that they were very loath—probably from fear—to extract teeth, and at this date

and for centuries afterwards they would advocate all sorts of devices and treatments rather than the use of forceps. Rubbing the gums with the fat of a green frog to make the teeth fall out was one such formula. In 1400 a Tooth Drawer of the City of London, Matthew Flint by name, was ordered to be paid 6d. daily at the Exchequer "that he should do what pertains to his art to any poor lieges of the king, who may need it, without receiving anything from them." (This to me seems the beginning of our National Health Services and free dental treatment, exactly 550 years ago.) The calling of Tooth Drawer became one of sufficient importance to be recognized by the Barber Surgeons, for in 1551 one of their Minutes reads: "John Bryckett, Tooth Drawer, was admitted a brother into this house." Not only extractions, but also prevention, was practised by these Tooth Drawers, for another reference is "to the making of cleane teeth," obviously the treatment we now call scaling.

In the Tudor and Stewart periods the constant allusions to toothache and bad breath shows that dental disease was, by then, quite prevalent. Queen Elizabeth had toothache from the time she was a child, and it is recorded that on one occasion when she was suffering acutely—and causing those around her to suffer also—it was suggested she should send for her surgeon and have the tooth out. This she dreaded doing so much that an old bishop, who was present at the time, volunteered to have one of his own extracted to prove that the operation was not such an ordeal as the Queen imagined. A foreigner paying a visit to her court describes her as having black teeth, which, he goes on to say, was a characteristic of the English. All these historical references are confirmed by an examination of the skulls of Londoners of the sixteenth and seventeenth centuries.

From the Tudors to the present day there would appear to have been a further steady increase, although accurate surveys were not made until the present century. In 1914 an examination of children in Shropshire was carried out, and this revealed that only three per cent. of the 12-year-olds and only 5 per cent. of the 5-year-olds were free from caries. In just under 4,000 of these 5-year-olds over 1,000 had ten or more carious teeth each. Nor it this experience confined to the British. Similar surveys show that in Germany and the United States the position is as bad, if not worse. In the States it has been shown that the average number of teeth decayed, missing or filled, of the typical 7-year-old is 1.4, and that this number increases by about one tooth per year, until by the time he is 30, two-thirds of his teeth have been attacked. It can be said that the average American will experience tooth decay in his permanent teeth at the age of eight years—that is, within two years of these teeth having started to erupt.

This fate, however, has not overtaken all modern races, but only those who are civilised, or to be more accurate, I should say those who live a civilised way of life. The Eskimo fisherman, the New Zealand Maori living away from the large cities, the South African Bantu living under his native conditions, all these have nearly perfect teeth. But as soon as such primitive people live alongside civilised white men, dental disease appears or rapidly increases. In the Eskimo, for instance,

experience shows that the increase has been ten-fold in a few years; with the Maori it has been even greater. This review of the evidence shows, therefore, that dental disease and civilisation go hand in hand.

Now, one of the chief results of civilisation is a change of diet, and it is this change that has been considered to be a probable cause of the increase in dental diseases. Such a change may have either a general effect on the health—in which case the bad teeth are only a part, although an obvious part, of a wider upset, or since all foods enter the body via the mouth, it may have purely a local effect. Both these possibilities have to be considered.

There is no doubt that in the light of modern dietetic knowledge the food of the vast majority of the people in Great Britain has been, and in some cases is, totally inadequate. Food is necessary for four main reasons—to supply energy to keep the body warm and to provide for movement; to supply material to replace worn out tissues; to supply the necessary vitamins without which many of the body processes do not take place, or take place too slowly, and lastly to supply, in small quantities, certain vital elements.

The three main classes of foodstuff—carbohydrates, fats and proteins—may each be used by the body as a source of energy, although the carbohydrates are most efficient in this respect, but it is only protein—in fact only certain types of protein—that will give the body the necessary tissue replacement materials, while some of the vitamins are confined to fresh and usually uncooked foods. The distribution of the trace elements is still, to a large extent, a matter of speculation. With the exception of these trace elements we know nowadays the normal nutritional requirements of the body, and in the light of this knowledge the adequacy of diets can be assessed. Where obvious shortcomings exist, some deficiency disease will make itself manifest, and in many of them there will be dental symptoms. It has been stated that the teeth can be looked upon as an index of ill-health.

The inadequacy of the English diet in past centuries becomes apparent when one surveys English literature. Early writings show that all classes of the population received insufficient quantities of fresh fruit and vegetables, and hence of vitamin C. In the Middle Ages few vegetables were available and fruit was only obtainable in the summer, when it was so expensive in the towns that it could only be afforded by the well-to-do classes. The diet in winter consisted of large quantities of salted and pickled meat with practically no garden produce, and as a result, by the early spring scurvy must have been widespread. Now one of the results of scurvy is that the gums get soft, swollen, and bleed easily, while the teeth become loose—so loose, in fact, that in the later stages they may actually fall out. Although the disease is not described in early English medical textbooks, there is abundant evidence that it existed, for a "herbal" speaks of remedies for "making loose teeth firm and for puryfying the blood in spryngtyme."

As might be imagined, sailors were particularly affected by the disease, and Hakluyt, writing at the end of the sixteenth century on Magellan's voyages, says this: "by reason of Famine and the unclean feeding (of the sailors), some of their gums grew so over their teeth, that they died miserably for hunger."

Another Mariner of those days, Jacques Cartier, who sailed from St. Malo to explore those parts of America which, as he quaintly puts it, "were to the backside of Newfoundland," gives an account of an attack of scurvy amongst his men :— "their gums were spotted with spots of blood of a purple colour, their mouths became stinking and their gums so rotten that all the flesh did fall off, even to the roots of the teeth, which did also almost all fall out." The loosening of the teeth referred to in earlier writings were probably in part due to this disease. Although the virtue of oranges and lemons as a remedy for this almost invariable fate of the Tudor sailor was realised about 1580, it was not generally adopted in the Navy until 1795. Meanwhile, on land, remedies used included lettuce, parsley, and strawberries, the latter being recommended as good to "fasten loose teeth and to heal spongy foul gums." Some abuse seems to have been made of these remedies, for in St. Bartholomew's Hospital it is recorded in 1678 that patients were given scurvy-grass ale—*provided it was ordered by the doctor.* Scurvy became much less common in the eighteenth and nineteenth centuries, except during the Crimean War—when it became so prevalent again that it occasioned more loss of life among the troops than any other cause. Now, with the issue of cheap orange juice to all expectant mothers and young children, and the recognition of the value of fresh fruit and vegetables, the condition is rare, and the dental conditions associated with it a curiosity.

Another deficiency disease (with dental symptoms) which used to be prevalent was rickets—a condition associated with the lack of the bone forming vitamin, vitamin D, but in which the amount of calcium and phosphorus is also most important. In rickets the eruption of the teeth is often delayed and they may become improperly calcified, although appearing quite normal to the naked eye. The disease is mainly one of childhood and is more common when children are artificially fed instead of being breast fed, the reason for this being that although there is ample calcium in cow's milk, it is in a much less assimilable form. Wherever a nursing mother is grossly ill-nourished, however, rickets will frequently affect the child. Because of the slow calcification of the bones of the skull, the pressure of the growing brain will cause a swelling of the head, particularly of the forehead, and the weight of the body leads to a bending of the legs. Both these are characteristic features. As most of the teeth are forming and calcifying before birth or during suckling, many of these will also be involved.

Rickets does not appear to have been common in England until the 1620s, for it was not described in the medical works until about 1645, but there is evidence of its presence in Northern Germany and the Low Countries at a very much earlier date. For example, many of the religious paintings of the fifteenth and sixteenth centuries show a young woman holding a child with the bossed forehead and bent limbs of this disease. It had become very common in Ireland by the middle of the seventeenth century, for the Natural History of 1645 describes it thus : "Amongst the reigning diseases of Ireland rickets also may with good reason be reckoned, a disease peculiar to young children." The cause of this increase in rickets about 1620 may have been the terrible depression and poverty in the last one or two

decades of the Tudors (1580-1600), when in the South of England, at any rate, dairy products (which for centuries had been an important part of the diet of the poor country folk) became scarce and dear. These products are rich in vitamin D, calcium and phosphorus, so their withdrawal from the diet led to a reduction in the intake of not only the vitamin but also of both these elements, particularly the former. There was, in addition, a shortage of milk which increased this lack. The calcification of the teeth suffered along with the bones and caries became more common. From 1700 to 1750 economic conditions were better and the calcium intake rose. From 1750 to 1800 economic conditions got worse again, and with this the incidence of rickets went up. It was in this period that cod liver oil was first used medicinally at Manchester. With the Industrial Revolution and the rise of the great manufacturing towns of the North of England, rickets became more and more widespread. By 1870 30 per cent. of poor children had obvious rickets; by 1889 it was estimated that almost every child in Glasgow had it; in fact, a map of the distribution of the disease might be a map of the density of the industrial population. There is no doubt that alongside this rise of rickets in the 1800s the state of the teeth deteriorated badly; nor is it surprising that this should be so, because as has been shown, the diet of the people, especially in the towns, became poorer and poorer in tooth forming elements. This was partly the result of the declining consumption of milk which had been taking place since 1750, and also partly a consequence of the introduction of white flour. Such flour is much poorer in calcium and phosphorus than the wholemeal that had always been the normal constituent of bread up to this date. To these two factors may be added a decline in breast feeding for which industrialisation was partly responsible. Quite early in the 1800s it was noticed that bad teeth were becoming more common; by the last 25 years of the century its spread was alarming. It was during this century that toothbrushes were first used—"tooth preservers," as they were then called. Tooth powders were also introduced, although not every dentist approved of them. One contemporary advertisement reads: "The teeth should be cleaned after every meal with a tooth preserver and then rinsed with tepid water—never neglect this at night—those who observe this rule will seldom have any occasion for dentrifices." The advertisement goes on to give advice on the type of toothbrush to be used—advice which still applies. "It is the rage just now with some dentists to recommend brushes so hard that they fetch blood like a lancet wherever they touch—instead of 'tooth preservers' they should rather be termed 'gum bleeders.' "

Another result of this decline in tooth health was the great increase in the use of false teeth. These were known as "patent masticators," and another advertisement of this period announces that "Those who could not enjoy solid food because of bad teeth or the lack of them are informed that with the assistance of Mr. Parker, Cutler, of St. James Street, London, they would be able to masticate, denticate, chump, grind, swallow, with the best."

I have up to now been giving some account of the systemic results of wrong diets and their effects on dental health. Since food is taken via the mouth, it may also have a purely local action, an action which can be due to either the chemical

or to the physical nature of the diet. The increase in tooth decay that I have just described as taking place in the last few hundred years has been widely attributed not so much to those general diseases mentioned, but rather to the local action of the refined flour and to the eating of large quantities of sugar. Both of these types of carbohydrates, it is stated, are acted upon by organisms in the mouth to give rise to acids. These in their turn act upon the enamel shell of the tooth, dissolve the calcium salts, of which it is almost entirely composed, and then spread into the underlying dentine. Sugar, particularly, has been incriminated, since a rise in its consumption roughly parallels the incidence of decay and its use as an article of diet goes much further back in history than the introduction of refined white flour. From the early 1400s consumption in England was steadily rising, particularly among the wealthy classes. A German visitor to England in 1598 suggested that bad teeth were common enough at that time amongst those who could afford sweet meats, and also comments on their "black teeth"—"a defect," he says, "the English seem subject to from their too great consumption of sugar." To cane sugar was soon added beet sugar. Although its presence was known as early as 1605, it was not extensively extracted until the days of Napoleon, when the cutting off of all trade by the English blockade forced the Continental countries to find another source. This development of the beet industry further encouraged sugar consumption during the nineteenth century to such an extent that it has now become a main item of the modern diet. In 1930, for instance, the consumption per head per year in the United States was 125 lbs.—2½ lbs. per person per week!

The change in the type of flour eaten took place much later. For generations wheat had been home grown and ground between stone rollers, but with the rise of industrialisation most of the wheat was imported. Partly because of the greater ease of storing it in a purified form, this wheat had removed from it the kernel and husk, and this gave rise to a much finer and more refined type of flour, which contained, however, less calcium.

It was soon realised that the increased consumption of white flour was associated with an increase in caries, and striking examples of this have been recorded in Tristan da Cunha and Switzerland. The former is an isolated community where the state of the teeth has been kept under expert observation during a period when such a change in flour and also an increase in sugar intake has taken place. The population is only a few hundred, and when H.M.S. Carlisle was surveying the South Atlantic in the thirties it called at the island. This was in 1932. The teeth of the inhabitants were examined and found to be remarkably good; 83 per cent. of them were free from caries and no child under 5 had a single bad tooth. The diet at this time was the same as it had been for years—potatoes, fish, cheese, milk, vegetables, but hardly any flour. Only when a ship had called in the past, and this was a rare event, was there an opportunity to obtain white flour or sugar. Tooth-brushes were unknown. Five years later the island was again visited by the same ship and it was found that decay had spread at an alarming rate. Half of the inhabitants had bad teeth, the children being the ones most affected. There had

been only one change in the mode of living that could explain what had happened. Until recently it had been very exceptional for a ship to visit the island more than once a year, but during the three years 1934-37 no less than ten had called, and the inhabitants had had such quantities of white flour and sugar as they had never seen before. On this last visit, incidentally, the ship also provided the inhabitants with their first toothbrushes.

Another very good example is to be found in Switzerland in the Goms Valley. This is a high and formerly inaccessible valley in the mountains in the south of the country. It had been inhabited by the same people for at least two thousand years. Migrations and wars had passed by without affecting this small, isolated community, where the inhabitants were farmers living on rough rye and barley, green vegetables, meat and dairy produce. Wheat did not grow in the valley because of the high altitude and sugar was practically unknown. It had to be brought in on the shoulders of porters over the steep and narrow mountain paths. It was considered an expensive luxury. The bread was made of coarsely ground whole rye, which was only baked two or three times a year and then dried and stored. In these circumstances the native population was practically free from caries, as can be seen from the numerous skulls found in the various burial grounds. Towards the end of the 1800s a road, and later a railway, were built and stores were established that sold the regular food products like wheat flour, sugar and sweets. The deterioration in dental health was remarkable, and by plotting on a map of the valley the percentage of caries amongst the school children in the various villages, it can be shown that the amount of tooth decay is in direct proportion to the nearness of the general stores and to the general accessibility of the village.

As I have said, the explanation given to these findings was that the "refined" carbohydrates of the white flour and the sugar is more easily fermentable, so that acid is more easily produced, and this acid will dissolve the calcium of the enamel. This hypothesis, however, does not explain the fact that some of the South Sea islanders eat very large quantities of sugar cane and yet retain perfect teeth without decay. With them the large amounts of sugar do not seem to have any ill effect. Again, many persons in civilised white communities also have sound dentitions, in spite of lack of oral hygiene and a high consumption of sugar. A further weakness in the hypothesis is that biochemists show that the carbohydrates in sugar and "refined" flour do not break down any more quickly than those in whole ground wheat and other "rough" carbohydrates. It is clear then that the true explanation is not so simple, although the relationship between the increased intake of refined carbohydrates and caries is irrefutable.

If an increase in sugar and refined carbohydrates causes an increase in caries, a diminution of the former should reasonably lead to a diminution in the latter. Such indeed occurs. For example, it takes place in individuals suffering from diabetes. These being unable to utilise sugar properly are placed on a special diet without sugar and low in carbohydrates. It is a clinical observation that such patients do experience a decrease in decay. The best example, perhaps, is seen

in the effects of war-time diet on the teeth of various European countries. Numerous surveys have been made of caries incidence, and they all show a significant reduction associated with the change of diet that took place. A detailed analysis of the statistics, however, reveals that this reduction did not occur in the first two years of war, but was mainly found in the last two or three years, or even, in some cases, after the war was over, when sugar consumption had actually gone up. In Norway, for instance, the intake of sugar nearly doubled between 1944 and 1948, yet decay had considerably decreased in these years. It was further found that the greatest reduction occurred in children born during the war. A re-investigation of the actual records of the examinations of the teeth in Tristan da Cunha discloses the important fact that the teeth which had decayed under the influence of the change in diet between the two surveys were those which were actually developing and calcifying when the change took place. The teeth which had already calcified were not involved. It might appear, therefore, that it is the amount of sugar in the diet during the formation of the teeth that is important, and it has been suggested that there is a rise of sugar in the blood, which prevents in some way the proper calcification of the teeth. The teeth are thereby rendered less resistant to the processs of decay even though no naked eye changes in the teeth can be seen. It is further suggested that it is this change in the blood rather than the presence of starch or sugar in the mouth that is important. The assumption is :—If the teeth are well formed they will resist decay, in spite of a diet with a high sugar content, whereas if the teeth are badly formed they will decay in the presence of sugar and white flour, but will not if these articles are excluded from the diet.

But we are still faced with the anomaly of the West Indian native whose diet is rich in starchy foods; who from childhood loves to chew and suck sugar canes, even when his teeth are forming and yet has a perfect dentition. Even the expectant mothers of these countries take the high sugar diet without harm to their offspring. So again the solution of the problem is not so simple as excess sugar in the diet during tooth calcification, and another explanation, not primarily dependent on sugar consumption, has to be found.

One possibility is that the result depends on the quality and quantity of the non-carbohydrate portions of the diet. If, besides excess sugar, the diet contains the right substances (including the trace elements), it may be that no bad results will follow; whereas if sugar replaces some of, or all, these essentials, decay will result. By quality I mean nutritional value and this depends very largely on the health of the soil on which the food is grown. Soils can become worn out or damaged; the intensive cultivation of crops in wheat-exporting countries and the use of artificial phosphates is thought by some to have exhausted the natural resources of such soils. The history of the Middle Ages in England contains a good example of this wearing out of soil with its effect on the food. The simple methods of cultivation which had been created by the Saxons were incorporated by William the Conqueror into the Feudal system and persisted for hundreds of years without any proper rotation of crops. As a result, the open arable fields lost their fertility, the harvest yields dropped and the quality of the wheat

deteriorated. All kinds of diseases followed, until in 1347-48 the Black Death swept the country killing one-third to one-half of the population. This disaster, by drastically reducing manpower, led to a breakdown of the Feudal System and also led to a change in the agricultural system. The worn out fields were gradually enclosed by hedges and laid down to grass to feed the sheep, which were to supply the wool for the new wool trade. For over one hundred years the land was allowed to recover, become manured and thus regain its vitality. When it was again ploughed up the yields of wheat were found to have increased threefold—an indication of the increased health of the soil.

This idea that the quality and nutritional value of the food depends upon natural manuring, the avoidance of artificial phosphates, or exhausting the soil by intensive cultivation has received much attention recently in relation to tooth decay. During the last war it was observed that between 1939 and 1944 the teeth of children in the Royal Commercial Travellers' School in Middlesex underwent a phenomenal reduction in caries. Boyd Carpenter, the dentist in charge, could only attribute this reduction to the special attention paid by a new gardener to provide the school with vegetables and salads from the school garden, which for many years had been naturally manured. He quotes the case of a girl, aged 14, who, on examination, was found to have a perfect set of teeth—no fillings, no decay, no inflammation of the gums. On enquiring into her family history, he learned that both her father and mother had very carious teeth, as had her grandparents; on going into it further, he found that the grandparents had lived in London on the usual city diet, but that when their child was about 12 they had built a house in the country, enclosed a large garden, and used natural manures only. The granddaughter had been born into these better nutritional surroundings, and the result was seen in her perfect dentition.

The improvement of the teeth of London school children during the war years has been attributed to similar causes rather than to decreased sugar intake. Surveys of the 5-year-olds show that, as in Norway, there was a decrease in caries between 1939 and 1943, followed by a much greater decrease between 1943 and 1945. It is suggested that before the war the children were nourished largely from abroad on wheat grown on soils which had been worn out by intensive cultivation. During the war they received a large supplement of their nutrition from home sources from food grown on soil which, having received decades of rest, had recovered its fertility. It is deduced from these and similar experiments that there exists what may be called a nutritional cycle, and that this cycle is broken by any departure from the natural processes, particularly by the introduction of artificial manures or by the intensive cultivation of one crop. I might mention that in the sea, however, this natural cycle has remained undisturbed, with the result that fish contain all the nutritional essentials. The observation that Eskimos living on the coast have perfect dentitions would fit into with this theory, for they eat the whole carcase of the fish, skin, offal and all. Away from the coast the Eskimo dentition is not so good. Again, amongst the North American Indians the tribes with the best dentitions are the nomads, who follow the buffalo and live on its flesh, while

the worst tribes physically, are those living agricultural lives. These findings may be explained by the fact that the animals, by instinct, feed on the most fertile soils and also because nomadic races can never exhaust the soil resources in any one place. It may also be the reason for the rise in caries in primitive races when they change from nomadic to agricultural habits.

The decay in Egyptian teeth has similarly been explained by the loss of soil fertility, rather than to the pasty foods that came into vogue after the Greek invasion, particularly as the latter did not occur until 323 B.C., whereas caries, as we have seen, was increasing from about 1600 B.C. Now about one hundred years before this, in 1700 B.C., Joseph was the Food Controller, and Egypt became a great corn-producing country; yields were great and the grain was stored and exported. It was this, leading to the exhaustion of the soil by intensive cultivation, that was responsible for the caries.

The theory that the change in quality of the food may lead to drastic changes in the health of the body, and hence to the teeth, has been supported by animal experiments. Two groups of rats fed on similar diets, one group from organically manured soil, the other on a typically English diet, showed spectacular differences. On the latter diet a group of 20 rats had only 11 offspring, of which 2 died and nine were killed by their parents, an accepted sign of malnutrition. The second group, on the other hand, fed on vital foods, had 134 offspring, all of them being reared to maturity.

In the light of all of these findings this bad effect of a high sugar or carbohydrate diet may be attributed to the fact that the ingestion of this sugar or carbohydrate causes a drop in the total intake of the nutritive foods. The total calories required by the body may be made up, but the less obvious vital elements will be missing. To give an analogy: it is like driving an internal combustion engine on petrol without oil—it will go for a time, but the absence of the oil will soon have serious effects; so long as sufficient oil is given, excess petrol is not undesirable. Now, the same applies to diet. In fact, when any excess effort is required the carbohydrates are the most efficient source of the necessary energy. Modern man, however, has an entirely different mode of living from his Stone Age ancestor, and this has very marked physiological repercussions. The increasing use of labour-saving devices of every description, and the mechanisation of the age, has resulted in a decreased physical activity and with this decrease has come a lowering of the body's need for calories. Whereas our Stone Age ancestors, without clothing or central heating, leading a vigorous life, may have needed between 5,000 and 6,000 calories a day, a man living in this highly mechanised age may only require as few as 1,600. On the other hand, the tempo of life has increased, so that the modern need is for food with more nutritives and fewer calories. This causes a nutritional dilemma—how to get the maximum amount of nutrition out of the minimum amount of calories. The present-day methods of food manufacturers, instead of helping to solve this dilemma, have made the problem more acute, because the processing and refining

our food undergoes has reduced still further the nutritive value of food substances grown on already impoverished soil.

The solution of this dilemma is by no means easy, but it can be overcome to some extent by giving the right type of food the right priority. Broadly speaking, food which furnishes a high quota of proteins of a high biological value should come first in supplying the daily need. This type of food would include dairy produce such as milk and cheese, together with meat, fruit and vegetables. These, besides giving the various nutritive essentials, will also, of necessity, supply a certain number of calories. The next priority should be given to grains and cereals in their whole grown form, and lastly, in order of necessity and importance should come the refined sugars and their derivatives, like cakes and sweets. To obtain a sufficient amount of essential nutritives, modern man must consume food which in itself will give him from 1,600 to 1,800 calories. It is only by increased physical activity that he is able to consume refined sugar without depriving himself of these essentials. We can say, then, that for individuals whose total metabolic capacity does not exceed 1,800 calories daily, there is no room for a diet of refined sugar. For those individuals whose total metabolism exceeds 1,800 calories daily, refined sugar may have a place in their diets, but only in proportion as their capacity increases. To give an example, men under rigorous training may require 5,500 calories daily for maintenance of body weight, and these may consume large quantities of carbohydrates and refined sugar without any harm, provided always that the first 1,800 calories are supplied by the essential foods mentioned.

Further support of this hypothesis is seen in the state of the teeth in Greece during the war. Unlike the other occupied or belligerent countries there was no decrease in decay, but rather an increase, and this may be explained as follows :— In Norway, and in Britain, although carbohydrate intake went down, the general standard of nutrition was maintained or even improved. Children were therefore getting the protective foods and doing without excess refined carbohydrates. In Greece such a standard was not maintained and the population not only went without carbohydrate, but also without the necessary nutritive essentials. Teeth calcifying during this period were therefore badly developed and so more subject to disease.

There is another feature about the sugar cane loved by the West Indian and that is its fibrous nature. This brings one to the question of the physical state of the food, and its effect on dental disease. Primitive diets require considerable mastication, modern diets are soft—the less effort required the better the food is considered. The highest recommendation to the cook is that the food melts in the mouth and the meat requires no chewing. Now, hard fibrous food has two actions on the teeth—it keeps them clean and it exercises the jaws. The former is not so important, as we have seen, if the teeth have become properly calcified, but it is very important if they have not. The cleansing of the teeth by the artificial means of the toothbrush is the basis of all modern methods of

oral hygiene, although primitive man had sound teeth without its use. The latter action of hard fibrous foods—the use of the jaws—is more important as it is a physiologic fact that tissues to remain healthy must be exercised. Most jaws and teeth were developed to tackle hard, tough foods and all primitive skulls show well developed bones, large muscle attachments and teeth worn flat by attrition, although the latter is partly due, it is true, to the presence of grit in the food. The force which the muscles of mastication are able to exert can be measured by an instrument, the gnathodynamometer, and this shows that the average force of the bite is just under 200 lbs. weight, although in some persons it may be very much higher. Bread requires only 1-2 lbs. for mastication, articles of diet like boiled tongue 3 lbs., and even a tough steak only 90 lbs.—less than half the average force of the bite. Rarely then are the muscles used to a fraction of their capacity—in fact, many edentulous patients can manage the modern diet by eating with their tongue and palate alone. In passing, I might say that chocolate fudge appears to me to incorporate all the undesirable properties of modern diet—it is sweet, full of calories, and melts in the mouth without the slightest mastication !

This lack of mastication affects not only the bone and tooth attachment but also the gums. Denied their normal stimulation by friction, they tend to become soft, easily injured and inflamed. The lack of stimulation of the bone leads to under-development of the jaws—a fact that has been proved by animal experiments. Since the size of the teeth is not so easily affected (for they are fully grown before they come into functional activity), the teeth become crowded and this irregularity also predisposes to disease.

The possible causes of the present bad state of the teeth having been reviewed, what hope emerges of successful treatment? It is axiomatic that prevention is preferable to cure—in dental disease it is the only hope, for it is so widespread that to provide adequate facilities would, in my opinion, tax too much the resources of the community, both in money and in manpower. In the United States, where Dental Services are much more highly organised than here, it is said that it would take the total dental personnel a minimum of four years to treat existing decay. It has also been stated that for every tooth that has been filled four more decay. The long-term preventative plan, therefore, would be to make all teeth resistant to decay, and this, we have seen, is achieved by allowing the teeth to calcify under suitable conditions. This means beginning before birth. The expectant mother should have an adequate diet of nutritive, high quality food grown under suitable conditions and on healthy soil, and, unless she is very active and so with a high calorific capacity, she should do without refined carbo-hydrates and excessive sugar. The child also should have a good diet and do without sweets and refined sugars until the crowns at least of the permanent teeth have finished calcifying. If we exclude the wisdom teeth, which develop last, this would mean exercising restraint until about the age of 9 or 10, after which the child should be able to take sweets and sugar with comparative impunity—as far as his dental health is concerned, at any rate. Such advice is

more easily given than taken, not only because of the food habits of the population, developed over generations and based on custom, and not only because of the cost and availability of such high quality food, but also, as we have seen, because of the low calorific requirements of the body under modern living conditions.

For those whose teeth are already formed, but badly calcified, several lines of treatment are possible. Most important is the reduction in refined carbohydrates and sugars, particularly in childhood, but this reduction is difficult to obtain during these critical years without the full co-operation of the parents. Incidentally, it is now thought that high carbohydrate intake is associated with other conditions besides caries—diseases such as "polio," rheumatic fever and arthritis. A careful cleaning of the teeth after meals will remove all fermentable carbohydrates and so help to reduce decay and this is why the proper use of the toothbrush is so important. Recently tooth powders containing ammonium have been advised, as such dentifrices render alkaline the surfaces of the teeth for many hours and so may be expected to prevent the action of acids on the enamel. The clinical efficiency of such tooth pastes, however, has yet to be definitely proved, for although considerable reduction of decay has been reported, this reduction may be due to the extra oral hygiene accompanying the enthusiastic use of a new technique.

The element fluorine also plays a part in preventive measures. It had been noticed for many years that the teeth in certain regions became mottled or stained soon after eruption, and it was found that this could be associated with a high percentage content of the element fluorine in the drinking water. In some way fluorine prevented the proper calcification of the teeth and in some towns of the United States special water supplies were arranged from distant sources to avoid this damage. Further investigation revealed that although too much fluorine in the water was harmful, a small amount was not only necessary but seemed to give some immunity to decay. A very good example of this is seen in the two English boroughs of North and South Shields—two communities living under very similar conditions, separated by the river Tyne, but having completely different water supplies. The children in South Shields were found to have much less caries than those in North Shields, and the only significant difference in their living conditions was that the water contained more fluorine. It is now accepted that fluorine up to one part per million in drinking water helps to prevent dental decay, although the way it acts is not clear. It has been suggested that the fluorine forms a compound with the calcium salts in the enamel which are more resistant to acid, and this is supported by the finding that the front teeth show a greater reduction in caries than the back teeth—explained by the fact that drinking water would flush the incisors more than the molars. Another explanation is that the fluorine has some action on the organisms involved in causing dental decay. Whatever the explanation, this action of fluorine can be used as a preventative measure against decay. Where drinking water has insufficient fluorine, the

element may be added up to the desired amount, and this also has been done in several communities in the States. Or fluorine can be given in the form of pills, but being a powerful poison except when taken in very small quantities and having undesirable effects on other parts of the body, this method is not advisable. A safer way is to paint the surface of the teeth with fluorine solution, and many experiments are taking place at the moment under controlled conditions to see whether any significant reduction of decay takes place in such circumstances. Yet another way is to include fluorine in tooth paste and several such medicated tooth pastes are already on the market.

From what has been said it will be gathered that we already have enough knowledge to reduce, if not to prevent, a large amount of the dental disease from which we are at present suffering. It is not so much the acquisition of more information, but making use of that which has already been obtained. Any programme of prevention must start with the children in whom the teeth are still calcifying, and it is for this reason that Child Dentistry is so important. It is a tragedy that under the National Health Scheme the School Dental Service should have lost so many of its Dental Officers who have been attracted out into general dental practice where their time is mainly spent in repairing the ravages of dental disease, rather than in preventing these ravages from ever taking place. The greatest need of Dentistry to-day is the development of efficient preventive measures which can be applied to the child population, and the Queen's University of Belfast is alive to this need, for steps are being taken to institute a department of Child and Preventive Dentistry which will do much to reduce this widespread damaging condition in Northern Ireland.

REVIEW

AIDS TO PUBLIC HEALTH. By Dr. Llywelyn Roberts. Sixth Edition. Published in February (Baillière, Tindall & Cox), 1950,

APPROXIMATELY four years after the previous edition, has had to take account of the Social Legislation which has been introduced since the last edition appeared. This has been admirably accomplished though one would have hoped that some cognizance might have been given to the Health and Welfare Legislation enacted in Northern Ireland, especially in so far as it is different from corresponding enactments in England and Wales and so enhance the value of the book to students resident here. Minor omissions are to be found on chance references to topics indexed, e.g., on pages 93 and 276 pemphigus neonatorum is omitted from the notifiable diseases—nor is this first fact mentioned in the description of the disease on p. 66.

It is perhaps inevitable that in a book of 304 pages the very wide field covered should, on many topics, contain only a headline with a short summary, but as the title indicates this volume will prove a useful aid to the Study of Public Health and a concise summary of the subject, though these limitations should be remembered. W. G. S.

element may be added up to the desired amount, and this also has been done in several communities in the States. Or fluorine can be given in the form of pills, but being a powerful poison except when taken in very small quantities and having undesirable effects on other parts of the body, this method is not advisable. A safer way is to paint the surface of the teeth with fluorine solution, and many experiments are taking place at the moment under controlled conditions to see whether any significant reduction of decay takes place in such circumstances. Yet another way is to include fluorine in tooth paste and several such medicated tooth pastes are already on the market.

From what has been said it will be gathered that we already have enough knowledge to reduce, if not to prevent, a large amount of the dental disease from which we are at present suffering. It is not so much the acquisition of more information, but making use of that which has already been obtained. Any programme of prevention must start with the children in whom the teeth are still calcifying, and it is for this reason that Child Dentistry is so important. It is a tragedy that under the National Health Scheme the School Dental Service should have lost so many of its Dental Officers who have been attracted out into general dental practice where their time is mainly spent in repairing the ravages of dental disease, rather than in preventing these ravages from ever taking place. The greatest need of Dentistry to-day is the development of efficient preventive measures which can be applied to the child population, and the Queen's University of Belfast is alive to this need, for steps are being taken to institute a department of Child and Preventive Dentistry which will do much to reduce this widespread damaging condition in Northern Ireland.

REVIEW

AIDS TO PUBLIC HEALTH. By Dr. Llywelyn Roberts. Sixth Edition. Published in February (Baillière, Tindall & Cox), 1950,

APPROXIMATELY four years after the previous edition, has had to take account of the Social Legislation which has been introduced since the last edition appeared. This has been admirably accomplished though one would have hoped that some cognizance might have been given to the Health and Welfare Legislation enacted in Northern Ireland, especially in so far as it is different from corresponding enactments in England and Wales and so enhance the value of the book to students resident here. Minor omissions are to be found on chance references to topics indexed, e.g., on pages 93 and 276 pemphigus neonatorum is omitted from the notifiable diseases—nor is this first fact mentioned in the description of the disease on p. 66.

It is perhaps inevitable that in a book of 304 pages the very wide field covered should, on many topics, contain only a headline with a short summary, but as the title indicates this volume will prove a useful aid to the Study of Public Health and a concise summary of the subject, though these limitations should be remembered. W. G. S.

The Control of Diseases of Tissue Reactivity by Cortisone

By William Townsley, M.D.
BELFAST

Formerly Musgrave Research Scholar and Assistant in Pathology, Queen's University, Belfast

In this paper, a review of the use of cortisone acetate in diseases of tissue reactivity is given, and particular attention is directed to the author's experience of its application to one of these diseases—psoriasis.

Pathology of Psoriasis.

The primary lesion is often a well defined pinhead size papule covered with fine silvery scales. The individual lesions spread at the periphery and often unite with other patches to form large plaques and sheets. Histological examination shows excessive growth of the epithelium with a badly formed horny layer (parakeratosis) and a downward growth of the interpapillary processes. As the patch enlarges healing and hyperparakeratosis occur behind the advancing periphery. There is a cellular infiltration around the papillary and subpapillary vessels and leucocytes collect between the horny cells.

Aetiology.

Various causes have been suggested in the past for the appearance of psoriasis —parasitic agencies, toxins of bacterial and metabolic origin, neuropathic disturbances, mechanical trauma and heredity.

Psoriasis is a "disease of tissue reactivity," that is the defensive and reparative processes (whatever the ætiological agent) in the epithelial tissues are active and the repair constitutes the visible disease. In diseases of tissue reactivity the common site of involvement is mesenchymal tissue (fibroblasts and reticulo endothelial elements), but epithelium, where repair and replacement are constantly necessary, is also affected. Numerous examples of the harmful effects of mesenchymal tissue responses to injury, both during the active stages of inflammation and repair and in the late healed stage, can be found in a clinical survey; uveitis and rheumatoid arthritis demonstrate distortion of normal morphology and disturbance of normal function in the eye and joints respectively; fibrosis with reduction of blood supply in chronic inflammatory lesions prevents immune bodies and drugs from inhibiting the growth and activity of bacteria in the inflamed area; fibrosis causes contraction and obstruction of tubes—in the œsophagus, duodenum, urethra, etc.—and distorts the heart valves in rheumatic fever. Two examples of diseases of overactivity of the repair process in the epithelial tissue group are obvious—psoriasis, with its hyperkeratosis, and keloid formation after burns or injuries.

Inflammation is basically the same after different forms of injury (Menkin, 1940); it involves the local and the general response—the latter incorporating stimulation of the pituitary and adrenal glands (Selye, 1946 and 1949). Selye has given the terms alarm reaction and adaptation mechanism to these changes.

Treatment of these diseases of tissue reactivity, different in ætiology but similar in effect, must be directed at (1) removing the causative agent, where known; and (2) the control of tissue proliferation. Several research workers have shown that the administration of cortisone acetate (a secretion of the cortex of the adrenal gland) or pituitary adrenocorticotrophic hormone, ACTH (which stimuates the production of cortical hormone), has inhibited the proliferation of mesenchymal and epithelial tissues (Baker, 1949; Becks, et al., 1944). Baker demonstrated that ACTH retards wound healing by decreasing the cellularity of connective tissue and by causing atrophy of collagen fibres, and also that it determines an atrophy of the epithelial structures—hair, epidermis and sebaceous glands. Ragan, et al. (1949) observed that ACTH and cortisone retarded fibroblast production. It appears, from consideration of various results, that the relatively large doses of cortisone given to animals retard wound healing, but the moderate therapeutic doses (100 mg. daily) given to humans have little notable effect on incidental wound healing.

Although it may not be possible to suppress the causative agent in many of these diseases, it is now obvious that the tissue proliferation and exudation may be controlled—either directly by the oral or parenteral administration of exogenous cortisone, or indirectly by the injection of ACTH, which stimulates the adrenal cortex to increase its endogenous hormone production.

Hench (1949) and his co-workers reported the suppressive effect of these hormones on the tissue reactivity of rheumatoid arthritis. In acute rheumatic fever and rheumatoid arthritis there is widespread involvement of the mesenchymal tissues characterized by focal injuries to connective tissue, with œdematous swelling and degeneration of collagen fibres. The pathological changes in the subcutaneous nodules of rheumatoid arthritis consist of foci of collagen degeneration similar to the focal changes in anaphylactic hypersensitivity. Cortisone and ACTH therapy, in patients with rheumatoid arthritis, reduced the fibrous tissue reaction and gave early relief from pain and increased the mobility of joints. Early acute cases responded best, because chronic cases showed irreversible bony and old scar tissue deformities. Laboratory control demonstrated a fall in the red cell sedimentation rate and a reduction in blood globulin. Albright (1943) has described the adrenal cortex as anti-anabolic, and it is possible that the fall of blood globulins after the administration of cortisone may be due to inhibition of protein synthesis. It is now known that the effect of ACTH and cortisone on rheumatoid arthritis is confined to a temporary suppression of activity during the period of treatment and that they have no other effect on the course of the disease (Freyberg, 1950).

In rheumatic infection the antibodies to hæmolytic streptococcal infection arise

from those mesenchymal cells (reticulo-endothelial system) which produce immune bodies, and it has been stated that these antibodies are the agents which damage the connective tissues (Gubner, 1949). The effectiveness of cortisone in acute rheumatic diseases, however, is due to direct action on the mesenchymal connective tissues and not to suppression of mesenchymal immune bodies—because in man cortisone does not inhibit antibody formation (Mirick, 1950).

Although cortisone does not inhibit antibody formation in man, a diminution of antibody response has been demonstrated in animals during its administration (Bjorneboe, 1951)—possibly due to relatively large doses. The question arises whether or not cortisone increases susceptibility to infection. Finland (1950) and co-workers treated pneumococcal pneumonia in man with ACTH and the general signs of illness were suppressed in twenty-four hours, but the blood and sputum contained type 8 pneumococci for four days; however, there was no interference with the normal antibody response. In experimental pneumococcal infection the results were unfavourable (White and Marshall, 1951). If the diagnosis between rheumatic fever and subacute bacterial endocarditis, or between non-infective and pyogenic arthritis (including tuberculosis), is doubtful, antibiotics, sulphonamides or other drugs lethal to micro-organisms should be administered before cortisone to avoid the possibility of uncontrolled bacteræmia or septicæmia.

Cortisone has also been used to depress the reaction of mesenchymal derivates in certain experimental states—for example, the tuberculin reaction (Stoerck, 1950), the Schwartzman phenomenon (Soffer, et al., 1950) and anaphylaxis (Dougherty, 1949).

The hypersensitive state—which includes anaphylaxis or serum sickness and bacterial allergy—has responded well to treatment with cortisone and ACTH.

The hypersensitive state may manifest itself as anaphylaxis (serum sickness) with degeneration of collagen and spasm of smooth muscle following injection of egg albumin or foreign serum into an animal sensitized to these proteins, or as bacterial allergy—a local inflammatory necrotising lesion succeeding the introduction of a specific antigen (for example, tuberculin) in an animal sensitized by infection with the corresponding organism (tubercle bacillus in this example). Both anaphylaxis and bacterial allergy are due to the interaction of a sensitizing antigen with the specific antibody; though fundamentally similar, the results are different and one can be established independently of the other.

During the process of developing active immunity to infection with bacteria the body tissues become hypersensitive to the protein of the attacking organisms. Subsequently, the tissues will suffer severe local damage by small amounts of the bacterial protein which are harmless to a normal body. Rich has stressed the fact that immunity and allergy are separate and distinct phenomena. Bacterial allergy may be seen in many infections—streptococcal, pneumococcal, straphylococcal, etc.

Anaphylaxis and bacterial allergy differ in that anaphylaxis can be passively transferred—that is, the serum of a sensitized animal will make a normal animal

anaphylactic, but the serum of an allergic animal will not induce allergy in a normal animal. Bacterial allergy does not depend on circulating antibody whereas anaphylaxis does. In the tuberculin type of allergic reaction the change progresses slowly over a number of days and occurs within the cells. In the anaphylactic local reaction necrosis and damage result from (1) increased permeability and necrosis of vascular endothelium and interference with tissue nutrition; (2) spasmodic contraction of smooth muscle fibres; (3) degeneration and fragmentation of collagen. There is often an associated eosinophilia in blood and tissue. Involvement of vascular endothelium gives rise to such conditions as purpura, urticaria and angioneurotic œdema; when smooth muscle is affected conditions like asthma are apparent. The pathological processes in the cells which are the seat of the reaction are not clear, but there may be released proteolytic enzymes, histamine or acetyl choline.

Many substances in addition to foreign protein are capable of producing anaphylactic hypersensitivity—simple chemical substances like iodine and more complex chemicals like atropine, sulphonamides and penicillin. The simpler substances may combine with body proteins to form more complex antigens. Carey (1950) and others proved the efficacy of ACTH and cortisone in treating patients suffering from various hypersensitivity reactions (exfoliative dermatitis after iodine therapy, angioneurotic œdema and urticaria after penicillin, and dermatitis and leucopenia following sulphonamide treatment, etc.).

There is reason to believe that the anaphylactic type of hypersensitivity may be the cause of the pathological changes in more diseases than those mentioned in the two preceding paragraphs. Weintraud (1913) and later investigators have suggested that the focal lesions of rheumatic fever are due to anaphylactic responses to bacterial products released in the tissues of patients who have been sensitized by infection. Rich (1943) demonstrated in rabbits sensitized to sterile horse serum, with anaphylactic sequelæ, lesions similar to those of human rheumatic carditis. He further showed vascular lesions of periarteritis nodosa following anaphylactic hypersensitivity to serum and sulphonamides. He emphasised the importance of remembering that both anaphylactic hypersensitivity and the tuberculin type of hypersensitivity may develop during bacterial infection. For example, in pneumococcal infection the capsular carbohydrate induces anaphylactic hypersensitivity and the somatic protein causes the tuberculin type of hypersensitivity. The two hypersensitive states may occur in infection with hæmolytic streptococci, e.g., Coburn noted in the skins of rheumatic patients such responses as the immediate wheal and erythema.

The areas of focal damage to connective tissue elements (œdema and degeneration of collagen fibres) in acute rheumatic fever are essentially similar in microscopic appearance to the tissue damage in local anaphylaxis (including the Arthus phenomenon). Rich also emphasised the presence of that criterion of local anaphylaxis, tissue eosinophilia, in myocarditis of rheumatic origin.

Harvey (1950) and his associates administered cortisone and ACTH to

patients suffering from ocular diseases in which hypersensitivity played a part and found dramatic improvement; the cortisone and ACTH blocked the inflammatory and exudative manifestations. These diseases were non-granulomatous iritis (a manifestation of bacterial hypersensitivity), sympathetic ophthalmia (hypersensitivity to uveal tract pigment), and tuberculous uveitis (hypersensitivity to tuberculo—protein).

Woods and Wood (1950) demonstrated experimentally in rabbits that cortisone and ACTH reduced or abolished the inflammatory and exudative phase of the ophthalmic reaction in bacterial allergy, the ocular protein anaphylactic reaction, the focal lesions in tuberculous eyes and the non-hypersensitive reaction to irritants (glycerine and jequirity infusions) instilled into the conjunctiva. The last experiment—blocking of the non-hypersensitive reaction to chemcial irritation—is evidence that cortisone acts directly on the mesenchymal tissues and not on the antigen-antibody reaction.

In diseases where the hypersensitive state is due to invading organisms the treatment must not be confined to a reduction by cortisone in tissue damage, but must include an attack on the virulent organisms by antibiotics, sulphonamides or other specific forms of therapy. Since cortisone cannot be used indefinitely, its beneficial effects are greatest in those hypersensitive states which have a limited duration or in which the infection can be quickly overcome.

It has been stated that cortisone has an anti-hyaluronidase action. Hyaluronidase, the spreading factor of Duran-Reynals (1942), is an enzyme which lowers the viscosity of hyaluronic acid to that of water. Hyaluronic acid, a secretion of connective tissue cells, is the ground substance of the tissue spaces and the precursor of collagen. The spreading factor can be extracted from invasive bacteria such as staphylococci, pneumococci, and streptococci, from testicular and malignant tissues and from snake venom.

Turner and Hollander (1950), in a paper on the effect of cortisone in experimental syphilis in rabbits, noted that the syphilomas were small, contained a tenacious mucoid material (hyaluronic acid) and exhibited a paucity of mononuclear cells; virulent treponemes multiplied more rapidly than in control experiments where no cortisone was administered. When cortisone and penicillin were given together the treponemes were killed rapidly, but the dead micro-organisms were not removed as quickly as in lesions in animals receiving penicillin only.

Carey (1950) noted a rise in leucocyte count on the third day during treatment of sulphonamide hypersensitivity with ACTH. Experimental studies have also demonstrated a marked neutrophilia with both ACTH and cortisone.

It has been reported that the increased level of circulating adrenal steroids after ACTH administration inhibits histamine formation and accelerates its breakdown. However, intracutaneous injections of histamine have been given to patients under treatment with ACTH for a variety of diseases and in no case was there any evidence that the local cutaneous reaction was suppressed. Cortison and ACTH produce remissions in asthma, but it appears that the beneficial action of the

hormones is not through an anti-histamine action—in fact, the site of operation and mechanism of the action is not yet known (Carey, 1950).

The excretion of urinary adrenal corticoids is increased in acute emotional stress, acute trauma, surgical wounds, physical strain of short duration and pregnancy. In prolonged stress or trauma there is a fall of urinary corticoids and the nitrogen loss characteristic of acute trauma is absent. It now appears that the adrenal cortical hormones mobilize protein, but the fate of the protein depends on the state of the body as a whole—in acute stress it is deaminated and lost while in chronic stress and pregnancy (where it passes to the anabolic area of fœtus and uterus) it is retained. The body state may also determine whether or not wound healing will be retarded when the level of circulating steroids is high.

It has been suggested (Selye, 1949) that there is some degree of antagonism in the body between the two groups of adrenal cortical hormones, the mineralocorticoids (e.g., desoxocortisone) and the glucocorticoids (e.g., cortisone). Selye states that the mineralocorticoids induce various defensive tissue reactions (augmentation of granuloma formation and of allergic responses, primarily in connective tissue, and anabolism). He also claimed that periarteritis nodosa, malignant nephrosclerosis and morphological changes similar to hypertensive and rheumatic diseases could be produced experimentally by administration of the mineralocorticoids desoxocortisone and desoxycorticosterone acetate.

On the contrary the glucocorticoid cortisone and ACTH (which is predominantly a glucocorticotrophic hormone) have an inhibitory effect—diminution of granuloma formation and of allergic response, inhibition of mitosis in cells (Green, 1951) and catabolism. Their suppressive effect on collagen diseases and hypersensitive states has already been described.

Toxæmia of pregnancy, in part at least, may be due to excessive secretion of mineralocorticoids and relative deficiency of glucocorticoids. Recent work points to hyperactivity of the adrenal gland in late pregnancy (Venning, 1946) and a high urinary level of mineralocorticoids in toxæmia of pregnancy (Tobian, 1949). Moore and co-workers (1951) decided on the exhibition of cortisone (despite its salt and water retaining propensities) in a series of eight cases of pregnancy toxæmia. The clinical results were good—headache was relieved, vision improved, the patients felt better, and œdema and albuminuria were reduced (though ascites appeared in some cases), but the effect on blood pressure was disappointing. It seems probable that some cortical steroids may exert a direct influence on water excretion independent of electrolytic or vascular changes.

Other effects of cortisone administration are :—

(a) Cushingoid side effects—associated with increased glucocorticoid excretion in the urine. Osteoporosis may cause fractures.
(b) Diminution of pituitary adrenocorticotrophic hormone—hence its beneficial action in the hypercorticism of the adrenogenital syndrome.
(c) Transient hypocorticism following cessation of cortisone therapy.

A test, based on the decrease in circulating eosinophile cells within a few hours

after injection of ACTH, has been devised (Thorn, et al., 1948) to diagnose Addison's disease (adrenal cortical insufficiency) or pituitary deficiency. In this test a single intramuscular injection of 25 mg. of ACTH is given, and a fall of 50 per cent. or more in the value of circulating eosinophile cells four hours later indicates a satisfactory adrenal cortical response.

The description "diffuse collagen disease" (Klemperer, et al., 1942) has been applied to several diseases of varied manifestations, but common involvement, the connective and vascular tissues. They are characterized microscopically by a general or local vasculitis, thickening of the collagen fibres and swelling of the ground substance; the terminal picture is often one of fibrinoid degeneration and necrosis. There is frequently ocular involvement in these diseases—both of the blood vessels, as in periarteritis nodosa and cranial arteritis, and of the mesenchymal tissues of the conjunctiva, iris, sclera and choroid as in rheumatoid arthritis and dermatomyositis.

The following list summarizes the diseases which respond with varying degrees of success—some of them dramatically—to treatment with cortisone and ACTH. It has been divided into groups, but grouping is obviously unsatisfactory because, for example, periarteritis nodosa is classified under "diffuse collagen diseases," and drug rashes under "hypersensitivity state"—yet it is known that hypersensitivity to iodine can produce both periarteritis nodosa and a skin rash.

Diffuse collagen diseases :

Rheumatoid arthritis, rheumatic fever, disseminated lupus erythematosus, periarteritis nodosa, dermatomyositis, temporal or cranial arteritis, thromboangiitis obliterans, serum sickness, scleroderma, Schönlein-Henoch purpura.

Acute inflammatory skin diseases :

Psoriasis, pemphigus, exfoliative dermatitis.

Acute inflammatory eye diseases :

Keratitis, iritis, choroiditis, uveitis, optic neuritis, conjunctivitis, sympathetic ophthalmia.

"*Hypersensitive States*" :

Angioneurotic œdema, bronchial asthma, drug rashes.

Blood disorders :

Acute leukæmia, chronic lymphatic leukæmia, Hodgkin's disease, lymphosarcoma.

Nephrotic syndrome :

Ulcerative Colitis :

Gout :

Adrenal Cortical Hormones.

The cortex of the adrenal gland secretes three types of hormones.

(a) Compound F like hormones.

(17—Hydroxycorticosterone steroids).

These hormones convert glucose to glycogen in muscles and liver and restore glycogen that has been used in the reaction to sudden stress or the "alarm" reaction; mobilize fat as a source of energy; mobilize amine acids from tissue

proteins—partly for providing energy and for conversion to glucose and glycogen and partly for protein synthesis in damaged tissues. When the compounds are administered in large doses the following changes are noted :—(1) increased excretion of nitrogen, potassium, phosphate and calcium; (2) hyperglycæmia and glycosuria; (3) decreased respiratory quotient. Cortisone acetate (11-dehydro-17 hydroxycorticosterone-21-acetate) belongs to this group.

(b) Desoxycorticosterone hormones.

An excess of circulating hormones of this group causes retention of sodium, chloride and water, increased excretion of potassium, fatigue and electrocardiographic changes. Oedema is evident due to water retention. The hormones of group A (17 hydroxycorticosterone steroids) also produce these electrolytic changes but in a less marked degree.

(c) Adrenal androgens.

When stimilated to excess secretion they result in masculinization, amenorrhœa and hirsutism. They are anabolic in character.

Treatment with Cortisone or ACTH.

The following procedure should be adopted in a full clinical and physiological investigation :—

(1) Restrict sodium chloride and increase potassium intake to avoid œdema.
(2) Record body weight daily—and, if practicable, fluid intake and output.
(3) Read blood pressure values daily, because hypertension may occur from water retention.
(4) Examine blood films for fall in eosinophile counts.
(5) Test urine for sugar.
(6) Take electrocardiograms twice weekly.

Dosage With Cortisone (Merck).

The dosage for psoriasis—at any rate for early acute cases of psoriasis—is probably comparable to that for acute rheumatoid arthritis. When a maximal response is required for early acute rheumatoid arthritis the advised dosage is :—

100 mg. every 8 hours for 3 doses; then
100 mg. every 12 hours for 2 doses; then
100 mg. every 24 hours for 7 to 14 days.

After that the daily dose should be gradually reduced (by 10 mg. every second day) until the daily dose is 50 mg. The dosage schedule may then be altered to 100 mg. every other day and this is maintained until the end of the course—which may extend up to six weeks and involve the use of up to 4 grammes of cortisone. A rest period of at least four to six weeks is allowed between each course. If the expected response is not obtained four or five days after initiating the treatment the dosage should be increased to 100 mg. every 12 hours for 4 doses. Injections must be given into muscle. Cortisone can also be given orally.

In the case treated by the author, the psoriasis was widespread and chronic and the total dose of cortisone acetate was small, 1.5 grammes. It was obvious that no dramatic response would be obtained—as in early acute rheumatoid arthritis

on full dosage—but it was hoped that the process of reversal of the pathological changes would be sufficiently established to prove the efficacy of treatment by cortisone. The results (described later) indicated that cortisone treatment was satisfactory—in that it initiated the desired regressive changes in the lesions, and because the degree of regression—incomplete though it was—was consistent with the small dosage and the long duration of the disease.

Dosage With Adrenocorticotrophic Hormone (ACTH).

This hormone from the anterior part of the pituitary gland acts by increasing the production of the adrenal cortical steroids. The aim of the treatment, as with the direct introduction of cortisone into the body, is to gain a therapeutic effect with minimum metabolic disturbance. After the disease has been suppressed the smallest effective maintenance doses are employed.

In most cases injections of 10 to 25 mg. every six hours of ACTH (Armour) are required to effect remissions in diseases like rheumatoid arthritis. Unlike cortisone, ACTH must be given at short intervals (every six hours). If the total daily dose is given in only one or two injections the response is absent or poor. The injections, as with cortisone, must be given by the intramuscular route. Usually 12.5 mg. every six hours for two weeks is sufficient to establish remission, then the dose is tapered off.

Cortisone and ACTH have recently been used in America by Freyberg (1950) and Hench in the treatment of psoriatic arthritis; they concluded that long standing cases do not respond fully even with large doses. In early cases of psoriatic arthritis, the arthritis responded to relatively small doses (10 mg. every six hours) of ACTH, but in chronic cases the arthritic response was poor even with large doses. The psoriatic lesions, in contrast with the arthritic lesions, seem to require much larger doses to effect complete remission—doses of 25 mg. or even 50 mg. every six hours have been needed. Even with these large doses the skin lesions in chronic cases do not disappear completely.

Gubner (1951) describes the suppressive effect of aminopterin (a folic acid antagonist) in diseases of reactivity—rheumatoid arthritis and psoriasis—and demonstrates striking remissions in psoriasis. However, the toxic effects were also marked, e.g., ulceration of the mouth and abdominal cramps due to suppression of normal epithelial growth in the mouth and intestinal tract, and alopecia. Gubner states that the therapeutic and toxic doses are so close as to preclude its clinical use.

Case Report.

The patient, a man of 40 years of age, had widespread psoriasis covering his back, chest, abdomen, arms and legs. He has never been free from psoriasis for the past twenty-two years, and the present widespread condition has existed for the past fifteen years. He has had relief for short periods (up to two months) on various occasions by using ultra violet light and tar ointment and stated that if he attacked one area (e.g., back or chest or arms) vigorously for fourteen to twenty-one days with the combined light and tar methods, he could restore the

skin of the selected area to normal and that the remissions would persist for four to eight weeks. His method involved using tar ointment night and morning every day and irradiation with the mercury vapour ultra violet lamp every second day; the lamp was usually placed fifteen inches from the skin and the period of irradiation was one minute on each occasion. During restoration to normal, there appeared erythema of skin and desquamation of the scales, then brown discoloration, and finally, a normal flat appearance where the former raised, red, scaly patches existed. Lately dithranol ointment gave better results than tar ointment.

He has suffered from hay fever every year. He also complained of lumbago and sciatica, and these rheumatic affections have troubled him for the past three months. X-ray examination of the lumbar spine, sacrum, coccyx, pelvis, sacro-iliac joints and intervertebral spaces showed no abnormalities. Wassermann reaction was negative. Examination revealed no cardiovascular disease, nephritis or metabolic disorder (e.g., diabetes).

Family History.

Various members of his family have had psoriasis; three brothers have intermittently had small lesions; his daughter had fleeting small psoriatic papules; his paternal grandmother complained of the same condition. His elder brother, like himself, suffered from hay fever, but his father has been free of psoriasis and hay fever.

Treatment of the Case with Cortisone.

The course consisted of 1,500 mg. (1.5 grammes) of cortisone acetate (Cortone, Merck) given by intramuscular injection over a period of fourteen consecutive days. He received 100 mg. once daily except on two days, when he got 100 mg. morning and evening, and the thirteenth and fourteenth days when he got 50 mg. each day.

During the first week of treatment he spent most of each day in bed but returned to work during the second week. He stopped all other forms of treatment, but from the seventh day used the sun lamp and tar on his right thigh, and tar ointment only on his right arm. Baths were taken as usual.

His weight was taken each day and varied from 13 stones 4 lbs. to 13 stones 6 lbs. over the course of fourteen days' treatment. It varied between 13-4lbs. and 13-5 lbs. during the first four days, then rose to 13-6 lbs., and remained at this level from the fifth to the eleventh day, when slight œdema appeared in the right ankle. Oedema with slight pitting on pressure appeared on the left ankle on the following (twelfth) day. The weight fell to 13-5lbs. on the twelfth, thirteenth and fourteenth days.

The blood pressure was recorded every second day until œdema appeared, then each day after that manifestation of electrolytic change. The readings were :—

110	115	120	120	120	120	100	100	100
85	90	90	90	90	90	75	75	75

It is evident that both the systolic and diastolic pressures rose from the initial values $\frac{110}{85}$ to $\frac{120}{90}$ on the fifth day and remained at that value until œdema appeared on the eleventh day. On the following and subsequent days, when œdema was still present, the systolic and diastolic pressures fell to below their original levels—that is, to $\frac{100}{75}$.

Retention of sodium, chloride and water with œdema may occur early in the course, but is usually followed by spontaneous diuresis on continued administration—or as a result of stopping treatment.

Blood pressure and weight rise when sodium, chloride and water retention occur, hence the increase in weight and elevation of pressure on the fifth day. The fall in body weight and blood pressure on the twelfth day may have been due to spontaneous diuresis about this time. There is also the possibility that the slight terminal hypotension was due to increased urinary excretion of potassium. No doubt the electrolytic disturbance with fluid retention was present in the body from the fifth day although it only became evident in the ankles on the eleventh day and that coincided with the spontaneous diuresis and reversal towards normal. The œdema of ankles subsided on the second day after cessation of the treatment.

The patient stopped using table salt from the beginning of the course and used salt-free foods (as far as possible) after the appearance of œdema in his legs on the eleventh day. He experienced a feeling of well-being and mental ease throughout the course of injections. This was not merely due to absence from work and business worries, because it persisted throughout the second week when he returned to his business. He mentioned on the third and eighth days that he felt thirsty.

From the third day he noted that the psoriasis had stopped burning and itching and that there was a slight decrease in the redness of some of the patches, especially on his neck. From the eighth day the psoriatic lesions were paler in the centre, the large crusts and scales had ceased to form and only fine scales were visible. At the end of the course the lesions showed definite improvement, though not complete disappearance; the centres of many lesions were paler and any scales which formed were of a fine powdery type. The right thigh and the right arm, subjected also to ultra violet light and tar inunctions, showed a more advanced improvement.

The lumbago and sciatica varied from day to day during the course and on some days symptoms had almost disappeared. At the end of the course he complained of some slight pains in the ankles.

Three weeks after the termination of the course of treatment the psoriasis showed a return to its former state—crusting had reappeared in the form of large scales, and he felt burning, itching and tightness of the skin.

Summary and Conclusions.

Cortisone acetate is a crystalline substance elaborated by the cortex of the adrenal gland; its production is stimulated by the adrenocorticotrophic hormone of the anterior part of the pituitary gland. It was originally named compound E (also independently described as substance FA and compound F) and was extracted from beef adrenal glands. Later it was synthesized from a bile acid.

The administration of cortisone is beneficial in the "diseases of tissue reactivity," that is, the collagen diseases (e.g., acute rheumatic fever and acute rheumatoid arthritis), where it suppresses fibroblastic activity and the epithelial diseases (e.g., psoriasis), where it induces remissions by inhibiting excess epithelial proliferation.

During treatment with cortisone there is suppression of inflammatory and exudative responses, but there is no attack on the factor causing the individual disease. Cortisone therefore does not cure the disease—it suppresses the proliferative activity of the host tissues and effects a disappearance of the pathological lesions during the period of administration and for a few weeks after cessation of treatment. The remission is temporary and the visible signs of disease return—unless the disease has run its course or the organisms responsible have been killed by antibiotics, sulphonamides or other means. The suppression of connective tissue proliferation reduces ultimate morphological distortion and allows therapeutic agents to enter chronic inflammatory areas and destroy embedded noxious organisms. Cortisone is palliative rather than curative.

The aim of treatment with cortisone and ACTH is to gain a therapeutic response with minimum metabolic disturbance, and when the signs of disease have gone the smallest effective dose should be employed. On account of the metabolic changes (especially those involving blood sugar levels and tissue fluid exchanges) and psychological alterations, the following conditions have been cited as contra-indications to cortisone therapy :—Hypertension, congestive heart failure, psychosis, chronic nephritis, diabetes, Cushing's syndrome and recent surgical wounds. The total dosage of cortisone in a course is three to four grammes and the course lasts two to six weeks. The standard dose is 100 mg. once daily by intramuscular injection for fourteen days, but 100 mg. may be given twice or three times daily for the first day or two. After fourteen days the daily dose is reduced by 10 mg. every second or third day, until 50 mg. daily is being given; then 100 mg. are given every other day.

In the case reported in this paper—widespread chronic psoriasis of twenty-two years' duration—the total amount of cortisone available was small (1.5 grammes) and the duration of treatment was short (fourteen days), yet there was a definite though slight improvement. The improvement manifested itself in the following changes—pallor of the central parts of the lesions, cessation of burning and itching, and the conversion of large scales and crust into fine powdery scales. These changes indicate reversal of the pathological processes in the skin and point to a more dramatic response in early acute psoriasis—when cortisone becomes more plentiful.

References.

ALBRIGHT, F. : *Harvey Lectures,* 38, 123; 1943.
BAKER, B. L. : *Amer. Ass. Adv. Sci.*, Dec., 1949.
BECKS, H., *et al.* : *Endocrinology*, 34, 305; 1944.
BJORNEBOE, *et al.* : *J. exp. Med.*, 93, 37; 1951.
CAREY, R. A., *et al.* : *Bull. Johns Hopk. Hosp.*, 87, 354; 1950.
DOUGHERTY, T. F. : *Amer. Ass. Adv. Sci.*, Dec., 1949.
DURAN-REYNALS, F. : *Bact. Rev.*, 6, 197; 1942.
FINLAND, M., *et al.* : *Proc. First Clin. ACTH. Cong.*, 529; 1950.
FREYBERG, R. H. : *Bull. N.Y. Acad. Med.*, 26, 206; 1950.
GREEN; GHADIALLY : *Brit. med. J.*, 1, 496, 1951.
GUBNER, R. : *Amer. Clinica*, 14, 13; 1949.
GUBNER, R. : *Amer. J. med. Sci.*, Feb., 1951.
HARVEY, A. M., *et al.* : *Bull. Johns Hopk. Hosp.*, 87, 461; 1950.
HENCH, P. S., *et al.* : *Proc. Mayo Clin.*, 24, 181; 1949.
KLEMPERER, P., *et al.* : *J. Amer. med. Ass.*, 119, 331; 1942.
MENKIN, V. : *Dynamics of Inflammation*, 1940.
MIRICK, G. S. : *Amer. Soc. Clin. Invest.*; 1950.
MOORE, H., *et al.* : *Brit. med. J.*, 4711; 1951.
RAGAN, C., *et al.* : *Proc. Soc. Exp. Biol., N.Y.*, 72, 718; 1949.
RICH, A. R.; GREGORY, S. E. : *Bull. Johns Hopk. Hosp.*, 72, 65; 1943.
RICH, A. R.; GREGORY, S. S. : *Bull. Johns Hopk. Hosp.*, 73, 239; 1943. *Ibid.*, 78, 43; 1945.
SELYE, H. : *J. clin. Endoc.*, 6,117; 1946, and *B.M.J.*, 1129; 1949.
SOFFER, L. J., *et al.* : *Science*, 111, 303; 1950.
STOERCK, H. C. : *Fed. Proc.*, 9, 345; 1950.
THORN, G. W., *et al.* : *J. Amer. med. Ass.*, 137, 1005; 1948.
THORN, G. W., *et al.* : *New Engl. J. Med.*, 241, 529; 1949.
TOBIAN, L. : *J. clin. Endoc.*, 9, 319; 1949.
TURNER, T. B.; HOLLANDER, D. H. : *Bull. Johns Hopk. Hosp.*, 87, 505; 1950.
VENNING, E. H. : *Endocrinology*, 39, 203; 1946.
WEINTRAUD, W. : *Berl. klin. Wschr.*, 50, 1381; 1913.
WHITE, R. G.; MARSHALL, A. H. E. : *Lancet*, April 21, p. 891; 1951.
WOODS, A. C.; WOOD, R. M. : *Bull. Johns Hopk. Hosp.*, 87, 482; 1950.

REVIEW

GOOD HEALTH WITH DIABETES. By Ian Murray and Margaret B. Muir. Edinburgh: E. & S. Livingstone Ltd., 16 and 17 Teviot Place. Price 2s.

THIS booklet of forty-four pages is full of most useful hints for diabetics. In general, it contains little which can be adversely criticised. In detail, however, the authors condone the measurement of diet by eye rather than by weighing, although they suggest that weighing should be occasionally used to ensure that the eye is not becoming over-generous in its estimate. No reference is made to globin insulin.

The booklet should be helpful particularly to the newly diagnosed diabetic, as it contains the answers to many simple questions which are all too often neither answered nor anticipated by the non-diabetic medical adviser.

C. R. M.

REVIEW

AIDS TO ANATOMY: POCKET ANATOMY. By R. J. Last, M.B., B.Sc. (Adel.), F.R.C.S. Pp. viii-380, with 60 illustrations. 11th Edition. March, 1951. Price 7s. 6d.

THIS edition of the well known "Pocket Gray," as it has been called during part of its long history, has been thoroughly revised by the Professor of Applied Anatomy, at the Royal College of Surgeons of England, and is assured of a ready welcome. The Birmingham revised terminology is used throughout, and much old material has been replaced by new. This latter may seem an impossibility, but besides some generalizations on joints and muscles, which were not given previously, information on the arches of the foot, the thoracic wall, the breast, the lymphatic system, the cranial autonomic ganglia, the dermatomes and the larynx has been expanded. The new conceptions of the true attachments and actions of the popliteus muscle, which were mainly worked out by the editor himelf, have also been incorporated in text and diagram.

Agreement on the segmental distribution of the nerves to the skin seems to be as difficult to attain as international agreement, so perhaps it is not surprising that in a book of this nature the editor should give only his personal opinion on this debatable question. The experimental results of Keegan and Garrett (1948) have been ignored and the older scheme of dorsal and ventral axial lines on the limbs has been retained. The newer explanation of a single ventral axial line at which the more cranial nerves meet the more caudal would appear to have the support of both experimental and clinical evidence, and it is a pity that it was not given preference. The general plan of the book is unchanged and its usefulness as an aide memoire should ensure its continued popularity.

W. R. M. M.

References.

ALBRIGHT, F. : *Harvey Lectures,* 38, 123; 1943.
BAKER, B. L. : *Amer. Ass. Adv. Sci.*, Dec., 1949.
BECKS, H., *et al.* : *Endocrinology*, 34, 305; 1944.
BJORNEBOE, *et al.* : *J. exp. Med.*, 93, 37; 1951.
CAREY, R. A., *et al.* : *Bull. Johns Hopk. Hosp.*, 87, 354; 1950.
DOUGHERTY, T. F. : *Amer. Ass. Adv. Sci.*, Dec., 1949.
DURAN-REYNALS, F. : *Bact. Rev.*, 6, 197; 1942.
FINLAND, M., *et al.* : *Proc. First Clin. ACTH. Cong.*, 529; 1950.
FREYBERG, R. H. : *Bull. N.Y. Acad. Med.*, 26, 206; 1950.
GREEN; GHADIALLY : *Brit. med. J.*, 1, 496, 1951.
GUBNER, R. : *Amer. Clinica*, 14, 13; 1949.
GUBNER, R. : *Amer. J. med. Sci.*, Feb., 1951.
HARVEY, A. M., *et al.* : *Bull. Johns Hopk. Hosp.*, 87, 461; 1950.
HENCH, P. S., *et al.* : *Proc. Mayo Clin.*, 24, 181; 1949.
KLEMPERER, P., *et al.* : *J. Amer. med. Ass.*, 119, 331; 1942.
MENKIN, V. : *Dynamics of Inflammation*, 1940.
MIRICK, G. S. : *Amer. Soc. Clin. Invest.*; 1950.
MOORE, H., *et al.* : *Brit. med. J.*, 4711; 1951.
RAGAN, C., *et al.* : *Proc. Soc. Exp. Biol., N.Y.*, 72, 718; 1949.
RICH, A. R.; GREGORY, S. E. : *Bull. Johns Hopk. Hosp.*, 72, 65; 1943.
RICH, A. R.; GREGORY, S. S. : *Bull. Johns Hopk. Hosp.*, 73, 239; 1943. *Ibid.*, 78, 43; 1945.
SELYE, H. : *J. clin. Endoc.*, 6,117; 1946, and *B.M.J.*, 1129; 1949.
SOFFER, L. J., *et al.* : *Science*, 111, 303; 1950.
STOERCK, H. C. : *Fed. Proc.*, 9, 345; 1950.
THORN, G. W., *et al.* : *J. Amer. med. Ass.*, 137, 1005; 1948.
THORN, G. W., *et al.* : *New Engl. J. Med.*, 241, 529; 1949.
TOBIAN, L. : *J. clin. Endoc.*, 9, 319; 1949.
TURNER, T. B.; HOLLANDER, D. H. : *Bull. Johns Hopk. Hosp.*, 87, 505; 1950.
VENNING, E. H. : *Endocrinology*, 39, 203; 1946.
WEINTRAUD, W. : *Berl. klin. Wschr.*, 50, 1381; 1913.
WHITE, R. G.; MARSHALL, A. H. E. : *Lancet*, April 21, p. 891; 1951.
WOODS, A. C.; WOOD, R. M. : *Bull. Johns Hopk. Hosp.*, 87, 482; 1950.

REVIEW

GOOD HEALTH WITH DIABETES. By Ian Murray and Margaret B. Muir. Edinburgh: E. & S. Livingstone Ltd., 16 and 17 Teviot Place. Price 2s.

THIS booklet of forty-four pages is full of most useful hints for diabetics. In general, it contains little which can be adversely criticised. In detail, however, the authors condone the measurement of diet by eye rather than by weighing, although they suggest that weighing should be occasionally used to ensure that the eye is not becoming over-generous in its estimate. No reference is made to globin insulin.

The booklet should be helpful particularly to the newly diagnosed diabetic, as it contains the answers to many simple questions which are all too often neither answered nor anticipated by the non-diabetic medical adviser.

C. R. M.

Doctor and Patient in the Age of Hippocrates

By E. D. PHILLIPS, M.A.

Department of Greek, The Queen's University of Belfast

THE medical literature of the ancient Greeks is bulky enough to be put beside the complete extant works of Plato and Aristotle, but its public among classical scholars is now small, while among medical men only those study it who take a special interest in the history of their profession. A hundred years ago this was not so, for then the Hippocratic and similar writings had only just become obsolete as medical handbooks after centuries of use. Some modern doctors who have never looked at them may still find in them much interest and entertainment, and a considerable amount of good sense. To remind these of Hippocratic practice and treatment of patients is the purpose of the present article, which does not pretend to cover more than the *Corpus Hippocraticum*, the varied collection of medical books written during the fifth and fourth centuries B.C., and later attributed in bulk to Hippocrates.

The medical profession in those centuries was not, any more than other professions, an officially organised body of men having recognised qualifications and subject to a recognised discipline with fixed requirements and penalties. There was indeed a professional spirit among the best practitioners, but this was an ethical attitude without external sanctions. It was part of the teaching of the medical schools and of the guilds, particularly the Asclepiadæ of Cos to which Hippocrates himself belonged. The career of a doctor generally began in one of these schools and he would usually belong to one of the guilds, but practice was equally open to others, including quacks, charlatans, drug-sellers, gymnastic trainers, and even magicians. Against these the reputable doctor had to maintain himself by personal qualities and skill in debate no less than by the mere results of medical competence.

Training was naturally not an affair of well defined stages such as medical examinations now require. Medical schools with distinctive doctrines, which appear in some of the extant books, existed at Cyrene, at Cnidos, on the islands of Cos and Rhodes, and in Southern Italy and Sicily. But almost nothing is known of their management and routine, and no certificates or diplomas were granted by them enabling a man to practice. Instruction was badly hampered by the religious ban on dissection of the human body, which prevented accurate anatomy of the deeper parts; this was removed only in the third century B.C. at Alexandria, where even vivisection was sometimes allowed; and such freedom continued there until the time of Galen in the second century A.D. It was once held that early medicine owed much to a kind of hospital training carried out in the temple of Asclepius on Cos, where many invalids spent periods under cure by

visions and faith healing. But this idea has since been abandoned, for it is now known that the temple was not built until the middle of the fourth century, when Hippocrates was dead and scientific medicine well established. Nor is there any reference to temple medicine in Hippocratic books.

Medicine was learnt mainly by practical apprenticeship. Theoretical instruction by lecture or book existed, but was not highly esteemed except as an aid to experience. It was usual to pay a fee to an established practitioner for his training, just as young men who needed the art of argument for law or politics paid a fee to a sophist. This is clear from Plato's *Protagoras* (311B) and *Meno* (90B); in the Hippocratic *Oath* a fee is presupposed as usual, and also apparently a covenant or contract of apprenticeship. The course included precepts, oral instruction, and lastly, "all other instruction," by which practical training under the teacher is probably meant. The *Corpus* also contains manuals of ethics and manners called *Precepts* and *Decorum*, and several other books which are obviously technical lectures.

Practical training is thus outlined in *Decorum*. "Let there be one of your pupils in charge of the patient to carry out your instructions without unpleasantness and administer the treatment. Choose out of one of those who have already been admitted to the secrets of the art to add anything necessary and apply remedies with safety. He must also see that nothing escapes you between visits. Never put a layman in charge of anything, otherwise any mischance will bring down blame on you." This passage not only shows how advanced training was completed, but makes clear the ancient arrangements for skilled nursing in cases where the family alone was not adequate. Surgical training and also nursing and attendance are indicated in the little book *In the Surgery*: "Let those who look after the patient present the part for the operation as you want it, and hold fast the rest of the body, so as to keep all steady, observing silence and obeying their superiors." The presence of these advanced students is also assumed in *The Doctor*; they must practice using instruments which cannot be handled by the inexpert. At the end of this book there is a note on military surgery, in which anyone intending to learn how to extract the heads of missiles from wounds is advised to take service as a medical officer with mercenaries. Any false pretence of knowledge will soon be exposed, for it is essential to recognise the signs of weapons still in the body. The trained surgeon will never leave a wounded man without knowing whether the right operation has been done.

Law lays down that anyone who means to learn medicine properly must enjoy natural ability, teaching, a suitable place, diligence, and time. The considered opinions of his teachers must fall on him in childhood like seeds on ploughland; the place of instruction is like nourishment for the plant from the surrounding air; diligence is the working of the soil; time strengthens these and perfects their nature. *Precepts* deplores the faults of the late learner. He can do nothing that is to hand and his recollection of things not to hand is only tolerable; he is full of quarrelsome inefficiency, headstrong outrage, and neglect of what is seemly; from him, when he is in charge, come definitions, professions, and oaths great

only in virtue of the gods invoked. Bewildered laymen are lost in admiration and crowd to see him even before they are ill.

After their apprenticeship the majority of doctors spent a period of time in itinerant practice. *Law*, for instance, requires that a man shall attain a real knowledge of medicine before he travels from city to city. *Airs Waters Places* in its first half is written as a guide for itinerant practitioners in foreseeing the effects of local weather and drinking waters. *Epidemics* surveys the results of such practice on the northern coasts of the Aegean in many case-histories and in periodical generalisations. A successful doctor could then establish a permanent practice in one place, and gain as his highest reward an appointment paid by the State. Democedes of Croton in South Italy, for instance, held appointments, each more lucrative than the last, at Aegina, Athens, Samos, and the Persian court. Competence was particularly necessary in Persia, where his Egyptian predecessors, having failed to cure the sprained ankle of King Darius, were rescued only by his entreaty from impalement. (Herodotus III, 125 and 129-137).

The manners and behaviour proper to an established doctor are indicated in several books. *The Doctor* requires that he shall look healthy and as plump as nature intended him to be, for the vulgar reckon that those who are not will never take good care of others. In person he must be clean, well-dressed, and anointed with sweet-smelling unguents, but not so as to arouse suspicion. He must be discreetly silent and most regular in his life, for this will do his reputation much good. He must be grave and kind to all, and never forward or obtrusive, for these traits are despised, however useful. He must be of serious but not harsh countenance, for harshness is taken to mean arrogance and unkindness. If on the other hand he abandons himself to laughter or is too merry he will appear vulgar. He must be scrupulously fair, and use self-control when he meets women and maidens and possessions very precious indeed. The same requirement is found in the *Oath*, where the learner swears not to abuse the bodies of man or woman, bond or free.

Similarly, in *Decorum*, the doctor is required to be of a ready wit, for dourness is repulsive to healthy and sick alike. He must not expose too much of his person, or gossip to laymen, which may bring resistance to his treatment. On entering the sick-room he must bear in mind his manner of sitting, the arrangement of his dress, decisive and brief utterance, composure, bedside manner, care, replies to objections, calmness in trouble, rebuke of disturbance, and readiness for service. He will make frequent visits and careful examinations, and be ready to meet unexpected phases of the illness. He will also keep watch on the faults of his patients, which will make them often lie about the taking of things prescribed. For, through not taking disagreeable drinks in purging or other treatments, they have died before now. Their doings never result in a confession, but the blame is put on the doctor.

Decorum also has careful instructions on the sick-bed with regard both to the season and to the kind of illness. Some patients are put in breezy spots,

others into covered places underground. Noises and smells, particularly the smell of wine, are bad; such things must be avoided or changed. Everything must be done quietly and adroitly and concealed from the patient during treatment. Necessary orders must be given cheerfully and serenely, and the patient's attention must be diverted from what is being done to him. Sometimes he must be reproved sharply and emphatically, and sometimes comforted with solicitude and attention, though nothing must be revealed of his future or present condition. For many patients, hearing this, have taken a turn for the worse.

Precepts has some sensible suggestions on the psychological handling of patients. The sick man must be persuaded not to worry about his condition, and to leave everything to the doctor. Under orders he will not go astray, but left to himself he will sink through his painful condition, give up the struggle, and depart this life. Long-standing desires of the patient should not be too long repressed, apparently because valuable strength is spent in this repression. In chronic disease a modicum of indulgence may set a man on his feet again. An interesting point is the advice about fees. The doctor should not begin by discussing these; otherwise he will give the impression that he will either go away and leave the patient if no agreement is reached or will neglect him and prescribe no immediate treatment. Such worry is harmful to a troubled patient; the doctor should rather reproach one whom he has saved than extort money from those at death's door. Therefore the patient's means must be considered carefully and sometimes service must be given for nothing. If there is a chance of serving a stranger in financial need, full assistance should be given. For where there is love of man there is also love of the art. Some patients even recover simply from contentment at the goodness of the physician.

Precepts further urges the doctor not to hesitate, when he finds himself in difficulties through inexperience, to call in others in order to learn the truth by consulting them and enjoy the abundant help of fellow professionals. Physicians in consultation must never quarrel or jeer at one another; jealousy is a sign of weakness.

Prognostic recommends the physician to practise forecasting, for if he discovers unaided in the presence of patients the present, the past, and the future, and fills in the gaps in the account given by the sick, he will be the more believed to understand the cases and will gain more patients. He will at any rate be blameless if he declares beforehand who will die and who recover. In *Art* the practice of not treating the incurably sick is defended with the assertion that only a madman would demand of any handicraft what is beyond its technical means.

Practical directions for the consulting-room or surgery are given in *The Doctor*. It must be in a suitable place, which no wind reaches, nor excessive glare from the sun. For a bright light, which is no inconvenience to the doctor, is very different for the patient. In particular, no light must cause or aggravate an affliction of the eyes. The chairs for doctor and patient must be of the same height. Bronze must not be used for anything but instruments. Pure and

drinkable water must be kept ready for those under treatment; wiping cloths must be clean and soft; there must be linen for the eyes and sponges for wounds. Bandages, medicaments, lint round wounds, and plasters must be exactly suited; washing and cleaning must be quick. Elegant and spectacular bandaging must be avoided; it is useless and miserable and the mark of a charlatan; the patient looks not for adornment but benefit. Surgical knives, cupping-glasses, the ligaturing of veins, and instruments in general are mentioned, which must not be touched by the unskilled. Oddly enough, forceps for extracting teeth and taking hold of the uvula are excepted as fit tools for anyone who comes along.

Decorum advices practise in palpating, anointing, and washing, in moving the hands, in administering lint, compresses, bandages, ventilation, and purges, in treating wounds and eye-trouble, and the previous preparation of instruments, appliances, knives, and so forth. There should also be a second physician's case ready, of simple make, that can be carried on a journey by hand; this should be methodically arranged. *In the Surgery* contains directions for the operator's stance with the weight resting on the foot opposite to the working hand; also for lighting, natural and artificial. The patient must do all that he can to assist the surgeon by correct posture. The surgeon must practise all operations with each hand and with both together to achieve skill and painlessness; his nails must be level with his finger-tips and neither longer nor shorter. Instruments must be neither in the way of the operator nor out of reach, but near the part under operation; if an assistant gives them, he should be ready a little beforehand and act when the surgeon bids him. Water is important, and its temperature must be tested by pouring over the hand.

The main work of surgeons in that age was the setting of broken bones and the reduction of dislocated joints, described respectively in *Fractures* and *Joints*. Surgery of the soft and deep parts is hardly mentioned except in the obstetrical books, and very little is said of amputation. Trepanning, however, was well known, as to earlier peoples and even to savages.

Fractures begins with directions for treating a broken forearm. Various positions for presenting the limb are condemned; for instance, putting it up with the elbow extended as an archer's arm is when he holds a bow, which some consider to be truly "according to nature." In this position much pain would be inflicted, additional to that of the injury, and if the elbow were afterwards bent, neither the bones, tendons, nor flesh would keep their position, but would rearrange themselves in spite of the dressings. To extend the arm in supination is also wrong; this was suggested by a practitioner who thought this the natural position, because the prominence of the wrist on the same side as the little finger appears to be in line with the point of the elbow. But here again the bones and muscles will take another position when the arm is bent, and in any case the prominence of the wrist belongs to the ulna, while the point of the elbow is the head of the humerus. If the forearm is supinated, the bone is obviously distorted, and so are the sinews on the inner side from the fingers and wrist, which extend to the lower end of the humerus. The proper way to extend the forearm is to

turn the bone stretching from the region of the little finger to the elbow so that it lies straight, and so have the sinews from the wrist to the lower humerus in direct line. The arm when slung will then keep its position and give no pain.

The cure is easier when the bones of the forearm are not both fractured; if only one is fractured, it is easier when the radius is injured, even though this is thicker, for the ulna can then be used as a splint. If the ulna is broken, slight extension suffices, but if both are broken, very strong extension is necessary. During extension the parts must be pressed into position with the palms of the hands and the skin anointed, but not enough to make the dressing slip. The patient must have his hand a little higher than his elbows to diminish the flow of blood. The first bandage must be applied with its head on the fracture to give support without much pressure, and then carried upward to hold back the blood; the second must begin again on the fracture and be carried downward with decreasing pressure, and then back again. The patient should feel an increase of pressure at first and on the following day a slight soft swelling should appear. But by the third day the whole bandaging should seem loose, and on the seventh, the bandaged parts should be quite thin and the fractured bones mobile for adjustment.

Splints should now be applied round the limb and contained in ligatures as loose as is consistent with firmness, so that they do not add to the compression. On the third day the whole bandaging should be tightened. The splints should be thicker where the fracture projects, but not much thicker; they must not lie in the line of the thumb, but on one side or the other, nor in the line of the little finger where the wrist projects, or, if they must be so laid, they must be shorter, so as not to touch the wrist and cause ulceration and denuding of tendons. If all goes well the part put up in the splints should be left until the twentieth day. It takes about thirty days altogether for the bone of the forearm to unite, but constitutions and ages differ greatly.

This is a simple and familiar example; another is the extension of a broken leg. This is said to be much more difficult, and to require two men to pull, or even a fixed post to which the patent's foot is bound while both men pull him by the shoulders and the hollow of the knee. Or leverage may be applied with vertical rods at either end of a plank placed under the bed, which have straps running from them to the knee and thigh of the patient. Windlasses may also be used at either end. So much for the primary extension : maintenance of the bone in this position was achieved by the following neat apparatus. Two circlets of Egyptian leather, "such as are worn by those kept for a long time shackled in the large fetters," were fitted over the leg just below the knee and just above the ankle, and secured at their proper distance apart by springy rods of cornel-wood. These were longer than that distance, bent convexly, and fixed into leather loops on the outside of the circlets. The rods were longer or shorter according to the tension desired, and clearly acted in the same way as the modern rigid frame with plaster of paris.

Trepanning is described in *Head-Wounds*. The various parts of the skull, particularly the bregma, the temples and the sutures are described and their relative thickness and hardness carefully noted. Details are given of the various kinds of fracture, contusion, and wounding caused by ancient weapons, including missiles, such as spears and sling-stones. Perpendicular wounds from heavy missiles falling from a height are the deepest, and will be surrounded by much crushed and pounded tissue if they are made with rounded or blunt weapons. The most serious fractures run through or along the sutures.

Wounds with damage to the bone must be incised, including any undermined region round the edge. But certain parts must not be incised, such as the temple or the region above it traversed by the temporal blood-vessel. If this is done, spasm seizes the patient; incision by the right temple will cause spasm on the left side of the body and vice versa. This is one of several passages in the *Corpus* where the contralateral action of the hemispheres of the brain is noted.

Denuded bone must be scraped with a raspatory to give a view of the latent fractures. These will be even better exposed if a black solution is dropped on the bone and left for a day, so that, on cleaning, the damaged parts will be found to have absorbed the blacking and will mark themselves out clearly against the whiteness of the rest. In trepanning, the bone must not be removed at once down to the membrane, which may become macerated on exposure, or be wounded by the instrument. The operation should be stopped while there is still a little bone to be sawn through; this will separate of its own accord. The saw should be repeatedly cooled in cold water, for otherwise it is heated by rotation and cauterizes the bone. The saw in this case was a crown-shaped instrument with teeth set in a circle round the bottom; it was turned by a bow and cord. After the operation the wound must be dried up as quickly as possible to avoid suppuration near the membrane and damage to the brain.

Joints includes an account of surgery on displaced vertebræ, which was often of the most violent kind. The author condemns one spectacular method of treating humps due to dislocation and not disease. This was succussion on the ladder. The patient was tied to the middle of a ladder, upside down or right way up according as the hump was lower or higher; the ladder was erected against some high tower or house, on top of which well-trained assistants stood; these lifted the ladder and dropped it again repeatedly to the ground on its end. The ground had to be hard and the assistants able to drop the ladder smoothly, neatly, vertically and simultaneously. A better device was a pulley and block for hoisting the ladder. The intention was evidently to shake out straight the back-bone of the patient fastened to the ladder. The author says that those who use this device wish to make the vulgar gape in wonder at a man suspended and treated in such a way, for they always applaud without troubling themselves over the result. He himself never saw a man cured by it yet.

His own method was no comfortable one. The patient lay prone on a wide board, with his legs and shoulders held in ropes attached to vertical levers at the ends. Across his back, in contact with the hump, a plank with a pad under-

neath was placed, and, at its further end, caught in a transverse groove cut in a wall or in a horizontal plank fixed in the ground. Extension with the ropes and downward leverage with the plank on the hump were simultaneously applied. Less powerful methods were pressure on the hump with the hands and arms and the weight of the shoulders; sitting on the hump and jerking up and down; or pressure with one foot.

A word is now necessary on the treatment of internal diseases. These were not, before the days of the microscope, classifiable except by obvious symptoms, and, in the case of fevers, by duration and periodicity. The Coan School, to which Hippocrates belonged, criticised the Cnidian for elaborate classifying of diseases by symptoms. Their own doctrine was, as may be seen from *Prognostic*, a sort of general pathology adjusted to individual patients, which was in those days of more practical use. Individual prognosis and not classifying diagnosis was for them the mark of the trained practitoner. This is reflected in the maxim *Nouson physies ietroi* ("natures are the healers of diseases"); the familiar expression, *vis medicatrix naturæ*, is put into the plural, so that individual constitutions are declared the healers in all their variety.

Drugs were purges, diuretics, emetics, expectorants, sudorifics, sleeping-draughts and the like, which were intended to draw off, or at least collect locally, morbid humours which were causing the disease. This was also the main purpose of bleeding. There were, in addition, external applications such as plasters, poultices, embrocations and vapour baths. The aim was to keep the patient warm and comfortable and maintain his strength with drinks and slops given at the right intervals. One interesting example of operative treatment was that given according to *Diseases* (II, 47) for empyema of the lungs. The cavity of the chest was opened by cautery or incision to drain the pus; warm wine and oil were poured in to keep the lung from drying too suddenly, and a tin tube swathed in lint was sometimes left in the incision to complete the drainage of more watery fluid.

There is a very large literature dealing with fevers, acute and chronic, and some masterly descriptions of tuberculosis in *Epidemics* and elsewhere. The author of *Joints* knows that tuberculosis at the back of the chest can cause a hump. Regimen in health is treated at length and evidently regarded as equally important with the care of sickness.

On the social standing of doctors and patients we have two interesting passages from Plato's *Laws* (IV, 720aff., and IX, 857c), which reveal a situation not obvious from the Hippocratic writings. There we find two classes of doctors mentioned, doctors proper, and assistants, who were evidently a kind of slave used as medical orderlies. The latter learnt their art under the direction of their masters by observation and practice and not in the freeborn manner by the study of nature, so that their attitude was not that of genuine doctors. So also among patients there were slaves and freemen. The slaves were usually doctored by these slave assistants, who prescribed autocratically what they thought right without giving any explanation or listening to the patient. Freemen were treated by

free doctors who gave nothing without their patient's consent and discussed their ailments scientifically with them. A slave assistant, if he were present at this sort of treatment, would burst out laughing, and say, "You fool, you are not doctoring your patient, but almost educating him, so as to be not a healthy man but his own doctor."

This differential treatment is nowhere indicated in the Hippocratic *Corpus*. In the *Epidemics*, for instance, the occupation of patients is often given with their case-histories; these mention shoemakers, leather-workers, an officer in charge of the market, a miner, vine-dressers, fullers, stone-cutters a school-teacher, a *grammaticus*, the keeper of a *palæstra*, a cook, a gardener, a groom, a boxer, a ship's supercargo, a merchant, many wives and children, and also many slaves, mostly domestic. These cases are all carefully investigated and described. The aim of the treatise is purely descriptive, and treatment is hardly mentioned, but no difference whatever appears in the attitude to the various cases. Perhaps the doctors who wrote our treatises were more conscientious than the majority.

In conclusion, a few remarks on the Hippocratic *Oath* may be of interest. Certain general provisions are well known; lethal drugs are not to be administered to anyone who asks for them, abortion is not to be practised, and the persons and private affairs of all patients, bond or free, are to be respected. But the learner also swears not to practise surgery, but to yield place to practitioners of that art. This undertaking cannot without hypocrisy be an ethical condemnation of those who did certain dirty work when it was necessary. It has been interpreted by Dr. Edelstein in his edition (Supplement No. 1 to the *Bulletin of the History of Medicine*, Johns Hopkins Press, 1943) as a provision due to the ascetic tradition of the Pythagorean philosophers, who had a rule against shedding blood. According to him the whole *Oath* has a Pythagorean flavour, and was originally confined to doctors of this philosophical or religious persuasion. Its other provisions have been retained with sound instinct by the medical profession until our own day.

REVIEW

STUDIES ON TUMOUR FORMATION. By G. W. de P. Nicholson. Pp. 637, figures 184. Butterworth & Co. Ltd. 1950. £3. 3s.

THIS is a collected series of the papers by Nicholson which appeared originally in Guy's Hospital Reports. Nicholson's work, long familiar to pathologists, is well worthy of a larger audience. Few medical men have written more piquantly, or argued so logically from facts. Throughout we have a series of facts personally observed, described in pungent, but scientifically clear, language, with the literature used as it ought to be, "merely as an aid and as a check on hasty conclusions." Included are scholarly discussions on malformations, the hypernephromata, and teratomata, in which certain popular fallacies are exposed. "Knowledge is at all times a description, but never an explanation," and Nicholson is largely content to leave theorizing to others. It is probably impossible to reach the truth about tumours whilst arguing solely from one method of attack, but all serious students of cancer should be familiar with these writings. Such familiarity would do much to give balance to the outlook of the pure experimentalists.

free doctors who gave nothing without their patient's consent and discussed their ailments scientifically with them. A slave assistant, if he were present at this sort of treatment, would burst out laughing, and say, "You fool, you are not doctoring your patient, but almost educating him, so as to be not a healthy man but his own doctor."

This differential treatment is nowhere indicated in the Hippocratic *Corpus*. In the *Epidemics*, for instance, the occupation of patients is often given with their case-histories; these mention shoemakers, leather-workers, an officer in charge of the market, a miner, vine-dressers, fullers, stone-cutters a school-teacher, a *grammaticus*, the keeper of a *palæstra*, a cook, a gardener, a groom, a boxer, a ship's supercargo, a merchant, many wives and children, and also many slaves, mostly domestic. These cases are all carefully investigated and described. The aim of the treatise is purely descriptive, and treatment is hardly mentioned, but no difference whatever appears in the attitude to the various cases. Perhaps the doctors who wrote our treatises were more conscientious than the majority.

In conclusion, a few remarks on the Hippocratic *Oath* may be of interest. Certain general provisions are well known; lethal drugs are not to be administered to anyone who asks for them, abortion is not to be practised, and the persons and private affairs of all patients, bond or free, are to be respected. But the learner also swears not to practise surgery, but to yield place to practitioners of that art. This undertaking cannot without hypocrisy be an ethical condemnation of those who did certain dirty work when it was necessary. It has been interpreted by Dr. Edelstein in his edition (Supplement No. 1 to the *Bulletin of the History of Medicine*, Johns Hopkins Press, 1943) as a provision due to the ascetic tradition of the Pythagorean philosophers, who had a rule against shedding blood. According to him the whole *Oath* has a Pythagorean flavour, and was originally confined to doctors of this philosophical or religious persuasion. Its other provisions have been retained with sound instinct by the medical profession until our own day.

REVIEW

STUDIES ON TUMOUR FORMATION. By G. W. de P. Nicholson. Pp. 637, figures 184. Butterworth & Co. Ltd. 1950. £3. 3s.

THIS is a collected series of the papers by Nicholson which appeared originally in Guy's Hospital Reports. Nicholson's work, long familiar to pathologists, is well worthy of a larger audience. Few medical men have written more piquantly, or argued so logically from facts. Throughout we have a series of facts personally observed, described in pungent, but scientifically clear, language, with the literature used as it ought to be, "merely as an aid and as a check on hasty conclusions." Included are scholarly discussions on malformations, the hypernephromata, and teratomata, in which certain popular fallacies are exposed. "Knowledge is at all times a description, but never an explanation," and Nicholson is largely content to leave theorizing to others. It is probably impossible to reach the truth about tumours whilst arguing solely from one method of attack, but all serious students of cancer should be familiar with these writings. Such familiarity would do much to give balance to the outlook of the pure experimentalists.

Recent Trends in Maternal Mortality in Northern Ireland

By E. A. CHEESEMAN, B SC.(ECON.)., PH.D.(MED.).

From the Department of Social and Preventive Medicine of the Queen's University of Belfast

INTRODUCTION

THE risk of death attributed to pregnancy and child-birth has been more than halved in Northern Ireland during the last twenty years. In the early thirties about 130 such deaths occurred each year; by the end of the forties this average had been reduced to approximately 50. In terms of maternal mortality rates, this reduction represents a fall from 5.3 deaths per 1,000 live births in 1931-33 to 1.9 per 1,000 in 1946-48.

Many factors have contributed to this achievement and amongst others, Macafee (1949) has stressed the importance of the work of the Colebrooks (1935 and 1946) on infection, the discovery and use of the sulphonamide drugs, penicillin and new antiseptics, improved medical training and the changed view of the community to the subject of child-bearing. The need to make early arrangements for confinement during the war and post-war period has resulted in the expectant mother being seen as a potential patient early in her pregnancy, and she ". . . can be guided, supervised and helped throughout."

Elder (1949) has shown that the most marked decline in maternal mortality during the present century occurred during the last decade. The published statistics might even be interpreted as indicative of an upward trend in the first thirty years of this century; but, for reasons which follow, the study of registered maternal mortality rates over an extended period of time in the past is hazardous and liable to be misleading.

In the present paper an attempt has been made to examine the recent improvement in the rates with particular reference to geographical aspects. If the improvement has not been uniform over the whole country then it follows that medical and social progress has not been universally experienced or that in some areas factors are present which counteract such progress.

LIMITATIONS OF THE AVAILABLE DATA

Since 1922, two revisions have been made in the classification of causes of death used by the Registrar-General for Northern Ireland. (Manual of the International List of Causes of Death, 1929 and 1938). It follows that between 1922 and 1948, the last year for which published figures are available, the annual deaths have been tabulated in three different classifications and refer to deaths registered in the periods, 1922-30, 1931-39, and 1940-48. The second of these

revisions affecting deaths occurring from 1940 and onwards, was of particular importance in the present context. With effect from that year the opinion of the certifying physician as to the principal cause of death, became, in most instances, the main factor in determining the cause of death group to which each specific death was allotted. Before 1940 this was not always so. Although this revision is unlikely to materially affect comparisons in the maternal mortality rate before and after 1940 when that rate includes all puerperal causes, it does upset comparisons made in terms of maternal mortality rates attributed to specific causes of death (e.g., puerperal infection).

To avoid these difficulties of classification, the rates discussed in the present paper are limited to the period 1931-48 for maternal mortality from all causes and to the period 1940-48 for maternal mortality from specific causes. Thus Tables I and II deal with the total maternal mortality rates in various geographical and administrative areas of Northern Ireland in the periods, 1931-33, 1934-36, 1937-39, 1940-42, 1943-45 and 1946-48; while Table III deals with mortality attributed to "puerperal and post-abortive infection" and to "other diseases of pregnancy, childbirth and the puerperal state" for various administrative areas for the last three of the above-named periods only.

One other aspect of the rates discussed here requires attention. Lacking information about the number of pregnancies as distinct from births occurring on a national scale, it has been the convention in the past to express maternal mortality as a given number of deaths per 1,000 total births (i.e., live and still-births combined). In Northern Ireland, still-births are not registered and the maternal mortality rates are, of necessity calculated in terms of live births only. This imperfection should be borne in mind in making comparisons with rates of other countries since it inevitably results in an overstatement of the mortality rate compared with that computed by the conventional method.

Maternal Mortality from all Causes

The causes of death considered here are those resulting from the following conditions in combination :—

Post-abortive infection.
Infection during childbirth and the puerperium.
Abortion without mention of septic conditions.
Ectopic gestation.
Hæmorrhage of pregnancy.
Toxæmias of pregnancy.
Other diseases and accidents of pregnancy.
Hæmorrhage of childbirth and the puerperium.
Puerperal toxæmias.
Other accidents of childbirth.
Other or unspecified conditions of childbirth and the puerperal state.

The average annual maternal mortality rates from all these causes combined from 1931 to 1948 are shewn for each of the six administrative counties and the

two county boroughs in Table I. All births and deaths have been allocated to the normal place of residence of the parents and the deceased respectively before publication by the Registrar-General in his annual reports for the period under review and consequently the rates shown in this and later tables are in no way affected by the practice of expectant mothers who normally live in rural areas having their confinements in maternity hospitals and nursing homes located in urban areas.

TABLE I

Maternal Mortality in Northern Ireland Classified by County and County Borough, 1931-48

Area	1931-33	1934-36	1937-39	1940-42	1943-45	1946-48
	Deaths per 1,000 Live Births					
County Boroughs						
Belfast	5.22	5.01	4.88	3.25	2.39	1.60
Londonderry	3.48	5.15	2.41	3.80	3.31	0.97
Administrative Counties						
Antrim	5.51	6.86	4.92	3.20	3.29	1.42
Armagh	5.40	7.22	4.62	4.73	3.15	2.65
Down	5.56	6.06	5.09	4.36	3.21	2.22
Fermanagh	6.29	3.49	4.12	4.43	4.08	2.65
Londonderry	5.87	5.50	5.10	4.49	3.42	1.68
Tyrone	4.74	5.72	4.40	3.50	3.14	2.78
All Areas	5.29	5.95	4.71	3.75	2.99	1.90
	Death Rate in each period as a percentage of the rate in 1931-33					
County Boroughs						
Belfast	100	96	93	62	46	31
Londonderry	100	148	69	109	95	28
Administrative Counties						
Antrim	100	125	89	58	60	26
Armagh	100	134	86	88	58	49
Down	100	109	92	78	58	40
Fermanagh	100	55	66	70	65	42
Londonderry	100	94	87	76	58	29
Tyrone	100	121	93	74	66	59
All Areas	100	112	89	71	57	36

The number of deaths on which the rates of Table I are based in the later periods is fairly small; for example, in 1946-48 there were only 173 deaths from all the above causes in the whole of Northern Ireland, compared with 273 in 1943-45, 307 in 1940-42, 360 in 1937-39, 452 in 1934-36 and 399 in 1931-33. Comparison of the rates between different counties and county boroughs in the

later triennia are therefore liable to be misleading on account of the unstable nature of the rates, but it does appear that there has been very little consistency in the geographical distribution of the mortality over the period under review. Thus the highest recorded rate in 1946-48 was that of County Tyrone, 2.78 deaths per 1,000 live births; in the previous three year period, 1943-45, with the exception of the County Borough of Belfast, the lowest rate was returned from County Tyrone; in earlier periods the rate for this county was consistently below the average for the country as a whole. On the other hand, Londonderry County Borough, with a rate of 0.97 deaths per 1,000 live births in 1946-48—the lowest of any area—had a rate of 3.31 per 1,000 in 1943-45, a level exceeded only by County Fermanagh and County Londonderry. Such fluctuations between the areas are typical of the experience during the last twenty years.

In the second part of the table the rates in each three-year period, in each area, are expressed as a percentage of the rate in 1931-33 in order to facilitate comparisons of the relative trends between the eight areas. In Belfast County Borough and County Londonderry, the decline in maternal mortality has been experienced over the whole eighteen years and in both areas it was more rapid after 1940 than before that year. In all the other areas except County Fermanagh, the rate increased between 1931-33 and 1934-36; in Counties Down and Tyrone, the peak was followed by a continual downward trend; in Counties Armagh and Antrim and the County Borough of Londonderry the subsequent downward trend was apparent though irregular—in the last-named the irregularities in the rates are probably due to the smallness of the numbers involved. In County Fermanagh, the rate fell between 1931-33 and 1934-36, increased slightly between 1934-36 and 1937-39, remained fairly constant until 1943-45, and thereafter decreased again —again these irregularities may be due to the small experience involved.

Over the whole period 1931-48, maternal mortality declined by 64 per cent. of its original level. The relative decline was above this average (i.e., the improvement was relatively greater) in County Antrim (74 per cent.), Londonderry County Borough (72 per cent.), County Londonderry (71 per cent.) and Belfast County Borough (69 per cent.) and below the whole country average in County Tyrone (41 per cent.), County Armagh (51 per cent.), County Fermanagh (58 per cent.) and County Down (60 per cent.).

These figures suggest that least improvement in the rate has occurred amongst the areas which are predominantly rural in character. This suggestion is confirmed by Table II which sets out the data for aggregates of county boroughs, other urban districts and rural districts separately. Until 1937-39, the lowest maternal mortality rates were experienced in the county boroughs and the highest in the other types of urban district. During and after the war years, the county borough rates still maintained their lowest position but the rural rates exceeded those of other urban districts. Over the whole period 1931-48 the fall in maternal mortality has consequently been much slower in the rural districts, by 1946-48 the rural rate was 41 per cent. of its initial level—than in either the county boroughs (30 per cent.) or the other urban districts (33 per cent.).

TABLE II

Maternal Mortality in Northern Ireland Classified by Type of Area, 1931-48

TYPE OF AREA—AGGREGATE OF	1931-33	1934-36	1937-39	1940-42	1943-45	1946-48
	Deaths per 1,000 Live Births					
County Boroughs	5.02	5.68	4.58	3.32	2.50	1.53
Other Urban Districts	6.31	6.72	4.88	3.91	3.12	2.09
Rural Districts	5.19	5.92	4.78	4.03	3.35	2.15
ALL AREAS	5.29	5.95	4.71	3.75	2.99	1.90
	Death Rate in each period as a percentage of the rate in 1931-33					
County Boroughs	100	113	91	66	50	30
Other Urban Districts	100	106	77	62	49	33
Rural Districts	100	114	92	78	65	41
ALL AREAS	100	112	89	71	57	36

MATERNAL MORTALITY ATTRIBUTED TO INFECTION

In the three periods, 1940-42, 1943-45 and 1946-48, the mortality can be divided into that due to infection (puerperal and post-abortive) and to other causes of death and the rates in the three periods can be compared. Table III gives the relevant mortality rates and shows that over this nine-year period the rate of decline of mortality from all causes has not been greatly different in the three types of area tabulated—aggregates of county boroughs, other urban districts and rural districts. The 1946-48 rate fell to a level of 46 per cent. of the 1940-42 rate for county boroughs, compared with 53 per cent. for both urban and rural districts. In other words during the years in which the rate was falling most rapidly for the country as a whole, all types of area appeared to enjoy this improvement equally although county boroughs may have benefited slightly more than other areas. If, however, the mortality due to infection, is considered as a separate entity the story is somewhat different.

Mortality due to puerperal and post-abortive infection in the years 1940-42 was highest in the county boroughs and least in other urban districts. In the years 1946-48 the position was reversed. Thus over the nine years the greatest relative decrease in mortality due to infection occurred in the county boroughs where the rate in 1946-48 was only 17 per cent. of its level in 1940-42. Conversely, the least change in mortality of this kind occurred in urban districts other than county boroughs for which the last rate was as high as 65 per cent. of the first. Mortality, due to infection in rural areas, appeared to follow a course mid-way between the two types of town areas—the rate in 1946-48 was 38 per cent. of its level in 1940-42.

This dramatic decline in mortality attributed to puerperal and post-abortive infection in the county boroughs is the main factor contributing to the appar-

TABLE III

Maternal Mortality (indicating Mortality due to Infection), in Northern Ireland Classified by Type of Area, 1940-48

Type of Area— Aggregate of	Deaths per 1,000 Live Births			Death Rate as a Percentage of that in 1940-42		
	1940-42	1943-45	1946-48	1940-42	1943-45	1946-48
	Puerperal and Post-abortive Infection					
County Boroughs	0.99	0.88	0.17	100	89	17
Other Urban Districts	0.75	0.43	0.49	100	57	65
Rural Districts	0.86	0.59	0.33	100	69	38
All Areas	0.89	0.68	0.30	100	76	34
	Other Diseases of Pregnancy, Childbirth, and the Puerperal State					
County Boroughs	2.33	1.62	1.36	100	70	58
Other Urban Districts	3.16	2.69	1.60	100	85	51
Rural Districts	3.17	2.76	1.82	100	87	57
All Areas	2.86	2.31	1.60	100	81	56
	All Causes of Maternal Mortality					
County Boroughs	3.32	2.50	1.53	100	75	46
Other Urban Districts	3.91	3.12	2.09	100	80	53
Rural Districts	4.03	3.35	2.15	100	83	53
All Areas	3.75	2.99	1.90	100	80	51

ently favourable overall experience in these areas. As will be seen from Table III, the mortality rate due to causes other than infection has declined by 42 per cent. since 1940-42—a decline very little different from that of rural districts (43 per cent.).

The continual downward trend in mortality due to infection is well marked in Table III for all areas except "other urban districts." In these areas, the rate fell from 0.75 to 0.43 deaths per 1,000 live births between 1940-42 and 1943-45, representing a fall of 43 per cent., which was greater than that experienced either in the county boroughs (11 per cent.) or the rural districts (31 per cent.). This favourable trend of the urban districts was not maintained after 1945, for the rate increased slightly to 0.49 per 1,000. The increase was negligible, but the rates in county boroughs and rural districts fell relatively more rapidly after 1945 than they did before, and while it is true that the numbers of deaths involved are small, it seems important that this tendency should be watched carefully in future years.

Finally, reference to Table IV shows that post-abortive infection has almost completely disappeared as a cause of death in Northern Ireland. In 1946-48 the rate was as low as 0.03 deaths per 1,000 live births—one such death occurred in 1947 and none in 1946 or 1948. In the country as a whole infection during childbirth and the puerperium appears to have given rise to a mortality which is declining at a slightly faster rate than mortality due to non-infective causes.

TABLE IV

Maternal Mortality in Northern Ireland by Detailed Cause of Death, 1940-48.

International List No. 1938 Revision	Cause of Death	Deaths per 1,000 Live Births			Death Rate as a Percentage of that in 1940-42		
		1940-42	1943-45	1946-48	1940-42	1943-45	1946-48
140	Post-abortive Infection	0.25	0.14	0.03	100	56	12
147	Infection during Childbirth and the Puerperium	0.64	0.54	0.27	100	84	42
140 and 147	Puerperal and Post-abortive Infection	0.89	0.68	0.30	100	76	34
142-145	Diseases and Accidents of Pregnancy	0.89	0.85	0.38	100	96	43
141	Abortion, without mention of Septic Condition	0.10	0.07	0.08	100	70	80
146 148-150	Other Accidents and Diseases of Childbirth and the Puerperium	1.87	1.39	1.14	100	74	61
141-146 148-150	All Sources of Maternal Mortality, excluding Infection	2.86	2.31	1.60	100	81	56
140-150	All Causes of Maternal Mortality	3.75	2.99	1.90	100	80	48

Summary

1. An analysis of maternal mortality in Northern Ireland, with particular reference to geographical distribution, has been made for the period 1931-48. A more detailed analysis has been possible for the years 1940-48.

2. The absence of any consistent geographical pattern in mortality during the period has been noted.

3. In all areas maternal mortality declined over the eighteen years, and in some areas it was apparent that the onset of the decline occurred before 1931 (e.g., Belfast County Borough and County Londonderry).

4. Generally the rate of decline in the maternal mortality rate was faster after 1940 than before that year.

5. Over the whole period, 1931-48, maternal mortality fell more slowly in the rural districts than in urban districts, although since 1940 the rate of decline has been approximately the same in rural districts and urban districts other than county boroughs.

6. When similar types of district are considered, it is clear that mortality due to puerperal and post-abortive infection has decreased relatively more, since 1940, than mortality due to other causes. This reduction of deaths due to infection has been of particular significance in county boroughs and is largely due to the tendency for post-abortive infection to disappear as a cause of death.

Acknowledgments.

Mr. J. D. Merrett of the Department of Social and Preventive Medicine, The Queen's University of Belfast, has given considerable help in the preparation of the statistical material in this work.

References.

Colebrook, D. C.: "The Source of Infection in Puerperal Fever due to Hæmolytic Streptococci," *Spec. Rep. Ser. Med. Res. Coun.*, No. 205, London: H.M.S.O.; 1935.

Colebrook, L.: *J. Obstet Gynæc. Brit. Emp.*, 2, 53; 1946.

Elder, A. T.: *Uster med. J.*, 18, 171; 1949.

Macafee, C. H. G.: *Ulster med. J.*, 18, 129; 1949.

"Manual of the International list of Causes of Death as adopted for use in England and Wales, Scotland and Northern Ireland (1929), London: H.M.S.O.

"Manual of the International list of Causes of Death as adopted for use in England and Wales, Scotland and Northern Ireland (1938), London: H.M.S.O.

The Lacrimal Channels in Cyclopia

An Investigation of their Presence in the Specimens in Ireland

By W. R. M. Morton,

Department of Anatomy, Queen's University, Belfast

The problem of the origin of the naso-lacrimal apparatus in cyclopia, raised by the observation of Chatterjee (1950) of canaliculi and naso-lacrimal ducts and sac in a human cyclops, led me to investigate the microscopic structure of the lower lids of a full-term male human cyclops which recently came into my possession, and, through the kindness of Professors M. A. MacConnail, E. Keenan, and C. A. Erskine, to examine the external appearances of the specimens of cyclopia in the anatomical museums at the University Colleges at Cork and Dublin of the National University of Ireland, and at Trinity College, Dublin University, respectively. A total of seven specimens has been examined; this represents all the specimens of cyclopia present in the Anatomical Museums of Ireland, there being no specimen at University College, Galway, or at The Royal College of Surgeons in Ireland.

Material and Method

The specimens were examined with a low power magnifier for the presence of lacrimal puncta, and the Cork specimen was dissected by Dr. Fitzgerald and shown at the summer meeting of the Anatomical Society, and will be the subject of a separate report by him. My own specimen had the medially situated soft tissue of the lower orbital region serially sectioned in the coronal plane at ten microns, and was stained with hæmatoxylin and eosin.

Specimen 1. (T.C.D.1)—A small microcephalic female fœtus with a large encephalo-meningocœle extending from the forehead to the lower end of the vertebral column. It had a foot-length of 4.9 cms. from which its age was estimated as twenty-five weeks (Streeter, 1921). The head was in extreme retraction, and a proboscis separated the encephalo-meningocœle from the prominent single eyeball. The medial ends of the two lower eyelids were separated from each other by a small caruncle, which showed a median verticle raphe dividing it into two halves. A definite punctum was found at the medial end of the right lower lid, and what was thought to represent a punctum was found in a corresponding position on the left lower lid. The lower lids continued round the single eyeball to become continuous with the upper lids without any external canthi. The medial ends of the upper lids showed no signs of puncta, and were separated by a small amount of loose tissue resembling somewhat a caruncle. The single optic bulb showed two distinct oval cornea elongated vertically. The proboscis measured 1.5 cm. long and showed a single blind opening at its tip.

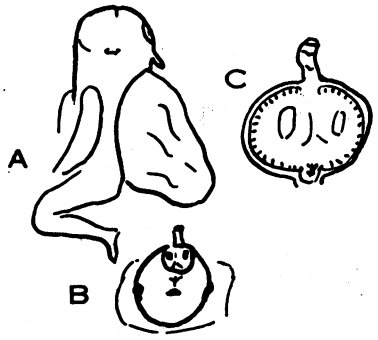


FIG. 1

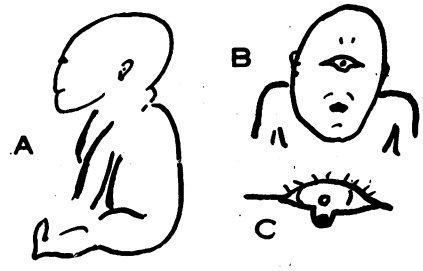


FIG. 2

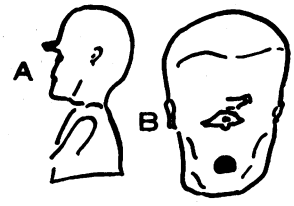


FIG 3

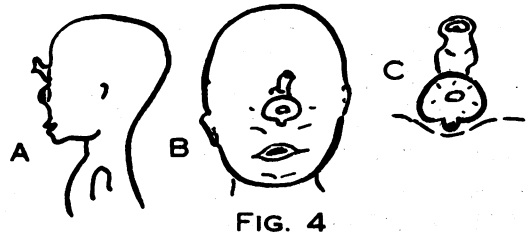


FIG. 4

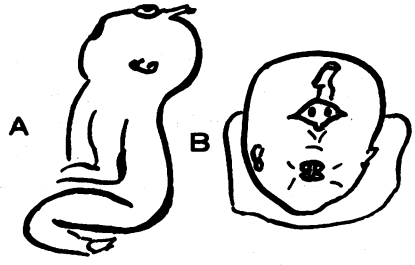


FIG. 5

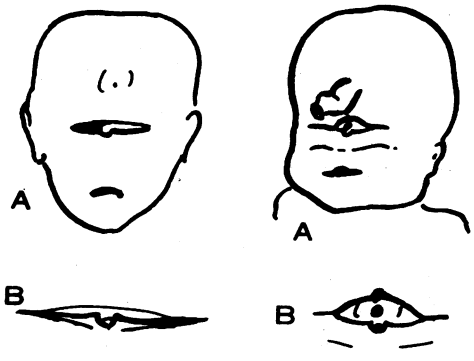


FIG. 6

FIG. 7

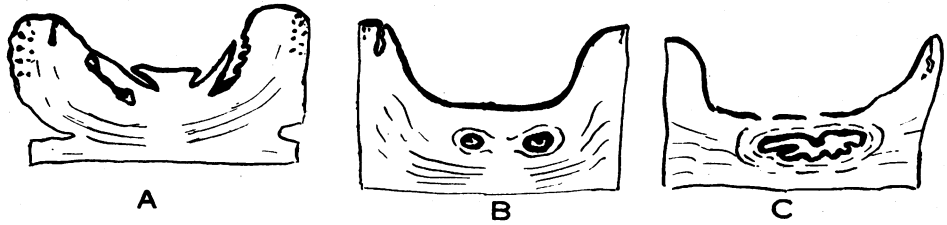


FIG. 8

Specimen 2. (T.C.D.2).—This was a well developed male fœtus of 8.0 cms. foot-length and estimated to be nearly full-term. The testes were undescended. A single central caruncle separated the two lower lids, each of which showed a well marked punctum at its medial end. A large single upper eyelid extended from well marked lateral creases across the single eyeball. The cornea was single and elongated transversely. A slight depression above the orbit was present instead of a proboscis.

Specimen 3. (T.C.D.3).—This consisted of a well formed head and upper thorax of a fœtus estimated from its size to be about twenty weeks old. The lower eyelids, each with a punctum, were separated as before by a central caruncle. The details of the single eyeball could not be distinguished. A proboscis 1.3 cm. long, with a single blind opening transversely elongated, was present above the orbit.

Specimen 4. (U.C.D.1).—This was a well formed female fœtus with a foot-length of 6.1 cms. and estimated age of thirty-one weeks. The single eyeball, with single transversely elongated cornea, projected prominently below a proboscis 1.7 cm. long. The roughly circular eyelid which almost surrounded the eyeball ended below in two medial extremities separated by a small caruncle. A punctum was present on each of these extremities. The face below the orbit was flattened and the skin creased transversely; the lips protruded prominently below this flattened area. The proboscis showed a blind inverted U-shaped opening with an external groove on the skin below the partial septum on the lower wall of the opening.

Specimen 5. (U.C.D.2).—This was a female of foot-length 6.3 cms. and estimated age of thirty-two weeks. The anencephalic head was hyperextended on a short spinal column which had marked lordosis in the neck region. Separate upper and lower lids were present on each side. The lower lids were separated by a median caruncle, and puncta were thought to be present but could not be identified with absolute certainty. The single eyeball showed two oval corneæ elongated vertically. The skin below the eyeball ended in a deeply sunk widely open mouth region. A thin transverse strip of skin, springing laterally from what seemed to be the outer canthi of the glabrous portions of the upper and lower lips, divided the mouth opening into two parts, one above and one below the strip. The detailed arrangement of the parts could not be ascertained exactly by simple inspection. A proboscis 2.5 cms. long protruded above the orbit.

Specimen 6. (U.C.C.1).—This consisted of the head region of a fœtus of about thirty-five weeks gestation. A small central caruncle separated the median ends of the lower lids. Dr. Fitzgerald found two small puncta at the inner ends of these lids during his detailed examination of the specimen, although their presence was at first doubted.

Specimen 7. (Q.U.B.I.)—This was a full-term male infant which had lived for a few hours after birth. Labour had been normal, and the thirty-year-old mother had five previous children all normal. The external appearance of the head was

good. The single median eye, with an almost circular cornea, was surrounded by two upper and two lower lids. A central caruncle separated the latter, and puncta were clearly visible at the inner ends of these lower lids when the specimen was first examined a few hours after death. A 2.0 cms. long proboscis projected above the eye. The skin below the orbit was creased transversely and the lips were prominent. The testes had not descended, and the prepuce had failed to develop.

Microscopic examination of coronal sections of the soft tissue of the lower orbital margin showed the two puncta, each of which measured approximately 0.24 mm. in diameter, opening downward and medially into rugose canalicule. The latter measured 0.36 to 0.48 mm. in diameter and passed downwards and backwards to meet at approximately 1.34 mm. deep to the surface skin, where they formed a transverse median channel measuring from 0.33 to 0.48 mm. anteroposteriorly and 3.1 mm. transversely at its widest part. This central duct is not appreciably larger therefore than either of the canaliculi and cannot be regarded as forming a distinct lacrimal sac such as is mentioned by Chatterjee. It continued throughout all the sections available, becoming narrower in the deeper parts. Its final end point was not reached as section of the facial skeleton was not attempted.

The main macroscopic features of the different specimens are summarised in Table I. It will be seen from this table that puncta were present in the lower lids of probably all the specimens, and that a median caruncle separated the lower lids in all cases. A proboscis was present in five and absent in two cases, the cornea was single in three and double in two cases. (Its disposition was undetermined in two cases.) The sex ratio for five cases was, Male to Female equals 2 to 3. The estimated ages ranged from twenty weeks fœtal life to full term

Discussion

Keibel (1912) states that the work of Fleischer (1906) on the pig and rabbit, and of Matys (1906) on the marmot and pig, made clear the mode of formation of the naso-lacrimal apparatus in man, and that it is the same as that found by Born (1879, 1883) and Legal (1881, 1883) to be the case in the Sauropsida and mammals. He holds that Born showed the naso-lacrimal duct to arise as a solid epithelial bud which grows down freely through the mesoderm to the nasal cavity from the conjunctival portion of the lacrimo-nasal groove. The lacrimal canals (or canaliculi) bud out from the solid lacrimal duct, and secondarily acquire connections with the lid margins, and do not represent the original connection of the anlage with the conjunctival epithelium, which is lost. Chatterjee rightly notes that most subsequent workers have based their accounts on that of Born. He seems, however, to have overlooked, or given insufficient thought to, the accounts of Mann (1928) and Frazer (1931), in which detailed descriptions are given of the mode of overlap of the maxillary process and lower and upper lids. These authors maintain that there are three parts of a field of buried ectoderm

which give rise to the naso-lacrimal duct, lower, and upper canaliculi respectively. These parts are formed by the maxillary process overlapping the lateral nasal process, and by medial overgrowths of the lower and upper lids respectively. The buried ectodermal field is covered, therefore, by (a) maxillary overgrowths, and (b) a paraxial overgrowth. Parts of this buried ectodermal field are said to persist as the naso-lacrimal passages, although, owing to a temporary loss of staining properties, there is an apparent break-up of the original ectodermal connection. They maintain that this temporary appearance led previous observers to the conclusion that the passages arose as a secondary epithelial down-growth in the plane of the original epithelial field.

The continued growth of the eyelids, leading to the covering of the eyeball, is probably accompanied by a sinking in of the level of the conjunctival floor, so that, however formed, the lacrimal passages open on puncta on the raised parts of the lids. The caruncle, which is formed (Ask, 1907) by the lower canaliculus cutting off the most medial part of the lower eyelid, is thought to sink in at the same time. Chatterjee found distinct evidence of two "punctæ lacrimalis" situated in the lower lid of his specimen on either side of a notch and median caruncle, with histological evidence of two inferior canaliculi and two lacrimal sacs. No "lacrimal canal" or upper puncta were seen. Apart from the absence of any lacrimal sacs, the microscopic appearance of the present specimen appears to agree with that of Chatterjee. The macroscopic appearance of two lower lids, each with a punctum, separated by a single central caruncle in the other specimens suggest that the microscopic appearances would be similar. This general pattern can probably be best explained by accepting Frazer's and Mann's views on the normal mechanism of formation of the lower canaliculi, as it seems probable that in cyclopia the maxillary processes meet in the mid-line below the orbit, that the medial ends of the normally growing lids continue growing upwards and medially, burying the canalicular and caruncular fields, and that the absence of a fronto-nasal process between the eyes brings the right and left fields of ectoderm into contact with each other, resulting in a single central caruncle separating two normally situated puncta. The presence of a definite raphe on the surface of the caruncle in Specimen 1, lends support to this view. The buried ectodermal fields would of necessity be continuous where the two maxillary processes meet in the mid line, and so the canaliculi, which develop by a secondary overgrowth of lid material (Mann), would meet in a common mid-line duct. The absence of puncta in the upper lids could be explained by assuming that the upper lids were unable to overgrow the misplaced fronto-nasal material in the same way as the maxillary processes were able to overgrow each other in the absence of any definite obstruction to such overgrowth.

It may be concluded, then, that the power of forming puncta and canaliculi, and possibly the dilated upper part of the lacrimal duct system, is present in the maxillary processes and is independent of the presence of the lateral nasal process; that is to say, the maxillary process material is self-determining in this respect.

Summary

1. The macroscopic appearances of the eyelids in seven cases of human cyclopia are given.

2. The microscopic appearance of the lower eyelids of one of these cases is given, and it is shown that the lower lacrimal puncta lead to canaliculi which become confluent in the mid-line.

3. The mechanism whereby these channels are formed is discussed and it is concluded that the maxillary processes are self-determining as regards formation of puncta and canaliculi.

Explanation of Figures

In figures 1 to 7, which represent specimens 1 to 7 respectively, the lettering (A), (B), and (C) indicates the general lateral view of the specimen, the face view, and the appearance of the eyelids and eyeball as seen from the front.

Figure 8 shows three sections from Specimen 7.

(A) Puncta leading into canaliculi.

(B) Canaliculi nearing mid-line.

(B) Single mid-line duct.

Table 1

Specimen No.	1	2	3	4	5	6	7
Sex	F	M		F	F		M
Age in weeks	25	39	20	31	32	35	40
Puncta in lower lids							
Lt.	?	+	+	+	?	+	+
Rt.	+	+	+	+	+	+	+
Caruncle	+	+	+	+	?	+	+
Upper lid :							
Notched or Single	N	S	S	S	N	?	N
Cornea :							
Single or Double	D	S	?S	S	D	?	S
Proboscis :							
Present or Absent	P	A	P	P	P	A	P
Other abnormalities noted	+	+			+		+

+ = Present. ? = Doubtful.

Literature

Ask, F.; *Anat. Anz.*, 30, 197-200; 1907.

*Born, G.: *Morph. Jb.*, 5, 62-140, 401-429; 1879; 8, 188-232; 1833.

Chatterjee, H.: Internat. Anat. Congress, Oxford. *Abstracts*, pp., 39-40; 1950.

Corner, G. W.: Contrib. Embryol. Carnegie Instn., 11, 143-170; 1921.

*Fleischer, B.: *v. Graefes Arch. Ophthal.*, 62, 279-399; 1906.

Frazer, J. E.: "A Manual of Embryology," London; 1931.

Keibel, F.: In Keibel & Mall's *Manual of Human Embryology*, 2, p. 254; 1912.

*Legal, E.: *Morph. Jb.*, 8, 353-372; 1883.

Mann, I.: *The Development of the Human Eye*, Cambridge, p. 256; 1928.

*Matys, V.: *Z. Augenheilk.*, 16, 303-314; 1906.

Morton, W. R. M.: *Brit. J. physiol. Optics.*, 8, 65-72; 1951.

*Quoted by Keibel.

PÆDIATRICS

COURNAND, A. : Cardiac Catheterization in Congenital Heart Disease (1949).
GESELL, A., AND OTHERS : Vision : Its Development in Infant and Child (1950).
MODERN TRENDS IN PÆDIATRICS. Ed. by Sir L. Parsons (1951).

DENTISTRY

COOLIDGE, E. D., AND HINE, M. K. : Periodontia (1951).
OSBORNE, J. : Dental Mechanics for Students (3rd edition, 1950).
SALZMANN, J. A. : Principles of Orthodontics (2nd edition, 1950).

THERAPEUTICS

BALLARD, E. : On Vaccination (1868).
CLAYTON, E. B. : Electrotherapy and Actinotherapy (1949).
COPEMAN, S. M. : Vaccination (1899).
CYRIAX, J. : Text-book of Orthopædic Medicine (Vol. 2, 1950).
EVANS, G. A. (ed.) : Medical Treatment (1951).
GREENBERG, L. A. : Antipyrine : a Critical Bibliographic Review (1950).
GUTHRIE SMITH, O. F. : Rehabilitation, Re-education and Remedial Exercises (2nd edition, 1949).
KOVACS, R. : Electrotherapy and Light Therapy (6th edition, 1949).
MAYNEORD, W. V. : Some Applications of Nuclear Physics to Medicine (1950).
SEATON, E. C. : A Handbook of Vaccination (1868).
STERN, B. J. : Should We be Vaccinated? (1927).

REVIEWS

PATTERNS OF MARRIAGE. By E. Slater and M. Woodside. 1951. London : Cassell & Co. First Edition. (311 pp., 14 tables, 5 appendices).

THE marriage relationships of two groups of 100 service men and their wives, normally resident in Greater London, are reviewed. All the men were hospital patients between 1943 and 1946. One group were admitted for neurotic illness (neurotic group) and the other for illness or injury without neurosis (control group). Data were collected by personal interview only from married couples who were willing to co-operate. In the author's opinion it is believed that the sample is "a fairly representative one of Londoners of working and lower middle class, married and between the ages of twenty-two and forty-seven. It contains a small excess of Jews, an inadequate representation of the most prosperous and the very poorest and is probably weighted in favour of those who are fairly happily married." It is important that the reader should fully appreciate these and other limitations of the data in the generalisations

from "sample" to "population" which he will be tempted to make; to this end the introductory chapter requires careful study.

The content of the report covers many aspects of marriage. These are considered under the following heads :—The family background, childhood and education of the men and their wives, their occupations, sports and hobbies, details of their courtship and their reasons for marrying, their relationship during marriage with reference to their happiness, sex life and desire for children. Further chapters include a review of the data from the aspect of assortative mating and discussions on the effects of marriage, and health of the women. It is impossible in a review of this length to discuss all the points made by the authors and what follows is a selection of some of the more positive findings.

Comparison of the subjects with their parents suggested that the former had attained a better occupational, educational and financial level than the latter. Part, but, in the opinion of the authors, not all of this trend can be attributed to the general rise in the standard of life between the two generations. Unexpectedly, there was no evidence of association between the health of parents and their fertility or happiness as judged by their children. It appeared that childhood happiness was more dependent on maternal than paternal temperament. The estimated incidence of "marked neurotic traits" in childhood was two to three times greater in the neurotic than in the control group, and child health was better in the latter group. Both in the neurotic group and in the control, there was evidence that husbands and wives resemble each other in personality and temperament. Furthermore, there was more neurosis in the wives and their parents in the neurotic group than there was in the control group.

This book is easy reading since the authors have overcome the "catalogue effect," which is frequently a feature of reports on such investigations, by quoting liberally from case histories. The presentation of the tabular information, however, leaves much to be desired; the contents of the tables are not always clear owing to a frequent absence of totals, subtotals and headings —particularly these are essential when, as in some instances, the same individual appears a number of times in the same table. Similarly where statistical tests of comparisons between the various groups are made it is not always clear to which of the data they are being applied and the unqualified terms "significant" and "not significant" appear frequently, when, in the opinion of the reviewer, some indication of the probability level of the "significance" would have been preferable.

The subject of the report, by its very nature, makes it one of the least adaptable to sample survey technique, but in the authors' words, "the need for caution does not, however, relieve us of the duty of investigation." Their acceptance of this duty has put on record a unique collection of data and their frank exposition of the difficulties involved will be of great value for future investigators.

E. A. C.

VENEREAL DISEASES DESCRIBED FOR NURSES. By R. C. L. Batchelor, M.A., M.B., D.P.H., F.R.C.S.(Ed.), M.R.C.P.E., and Marjorie Murrell, M.B., B.S., D.P.H., F.R.C.S.(Ed.), M.R.C.S. Pp. 217. Illustrated. Edinburgh : E. & S. Livingstone Ltd. 1951. 12s. 6d.

A SIMPLE textbook describing the outstanding features of the venereal diseases for nurses has been a long-felt want and this little book is most welcome. The work is divided into an introduction followed by five chapters describing in turn syphilis, gonorrhœa, other venereal diseases, genital sores and their differentiation, ethical and sociological considerations, and index.

The outstanding characteristics of the venereal diseases are set out in a clear simple style which is a pleasure to read. The pathological processes at work in the causation of the various syphilitic lesions are explained simply yet adequately for the purposes for which the book is written. The treatment described for syphilis in particular is conservative and orthodox and follows the usually accepted British practice of combining the old-established methods with the newer antibiotic therapy.

In the section on gonorrhœa, not all venereologists will agree with the value of the smear in

from "sample" to "population" which he will be tempted to make; to this end the introductory chapter requires careful study.

The content of the report covers many aspects of marriage. These are considered under the following heads :—The family background, childhood and education of the men and their wives, their occupations, sports and hobbies, details of their courtship and their reasons for marrying, their relationship during marriage with reference to their happiness, sex life and desire for children. Further chapters include a review of the data from the aspect of assortative mating and discussions on the effects of marriage, and health of the women. It is impossible in a review of this length to discuss all the points made by the authors and what follows is a selection of some of the more positive findings.

Comparison of the subjects with their parents suggested that the former had attained a better occupational, educational and financial level than the latter. Part, but, in the opinion of the authors, not all of this trend can be attributed to the general rise in the standard of life between the two generations. Unexpectedly, there was no evidence of association between the health of parents and their fertility or happiness as judged by their children. It appeared that childhood happiness was more dependent on maternal than paternal temperament. The estimated incidence of "marked neurotic traits" in childhood was two to three times greater in the neurotic than in the control group, and child health was better in the latter group. Both in the neurotic group and in the control, there was evidence that husbands and wives resemble each other in personality and temperament. Furthermore, there was more neurosis in the wives and their parents in the neurotic group than there was in the control group.

This book is easy reading since the authors have overcome the "catalogue effect," which is frequently a feature of reports on such investigations, by quoting liberally from case histories. The presentation of the tabular information, however, leaves much to be desired; the contents of the tables are not always clear owing to a frequent absence of totals, subtotals and headings —particularly these are essential when, as in some instances, the same individual appears a number of times in the same table. Similarly where statistical tests of comparisons between the various groups are made it is not always clear to which of the data they are being applied and the unqualified terms "significant" and "not significant" appear frequently, when, in the opinion of the reviewer, some indication of the probability level of the "significance" would have been preferable.

The subject of the report, by its very nature, makes it one of the least adaptable to sample survey technique, but in the authors' words, "the need for caution does not, however, relieve us of the duty of investigation." Their acceptance of this duty has put on record a unique collection of data and their frank exposition of the difficulties involved will be of great value for future investigators.

E. A. C.

VENEREAL DISEASES DESCRIBED FOR NURSES. By R. C. L. Batchelor, M.A., M.B., D.P.H., F.R.C.S.(Ed.), M.R.C.P.E., and Marjorie Murrell, M.B., B.S., D.P.H., F.R.C.S.(Ed.), M.R.C.S. Pp. 217. Illustrated. Edinburgh : E. & S. Livingstone Ltd. 1951. 12s. 6d.

A SIMPLE textbook describing the outstanding features of the venereal diseases for nurses has been a long-felt want and this little book is most welcome. The work is divided into an introduction followed by five chapters describing in turn syphilis, gonorrhœa, other venereal diseases, genital sores and their differentiation, ethical and sociological considerations, and index.

The outstanding characteristics of the venereal diseases are set out in a clear simple style which is a pleasure to read. The pathological processes at work in the causation of the various syphilitic lesions are explained simply yet adequately for the purposes for which the book is written. The treatment described for syphilis in particular is conservative and orthodox and follows the usually accepted British practice of combining the old-established methods with the newer antibiotic therapy.

In the section on gonorrhœa, not all venereologists will agree with the value of the smear in

the diagnosis and tests of cure in the female. Nor will many agree about the value of sulphonamide therapy in gonorrhœa, though the importance of right diagnosis before treatment and the withholding of penicillin where double infection is suspected are rightly stressed. The importance of adequate follow-up after penicillin therapy is also pointed out.

The necessity of contact tracing and the need of careful and tactful approach to the patient is rightly stressed, and in particular where the elderly patient is unaware that he is suffering from "V.D." The importance of investigating the family unit in congenital syphilis is also emphasised.

More stress could be laid on the importance of not diagnosing syphilis on the result of a blood test and, indeed, it is a pity that the non-specific reactor does not receive mention at all. Further emphasis might also be placed upon when a case is infectious and when non-infectious, a still thorny problem in the nursing of the "V.D." patient, though mention is made about this problem in the Introduction.

Bye and large, this is an excellent little book. It is produced in a pleasing manner on good paper with clear print. The illustrations are adequate and the only typographical error noted was on p. 23 where "contact" should be "contract" in the lower third of the page. Drs. Batchelor and Murrell are to be congratulated on producing a book which has not only been a long-felt want but one which can be recommended with confidence to both men and women in the nursing profession.

J. S. McC.

COMBINED TEXTBOOK OF OBSTETRICS AND GYNÆOLOGY FOR STUDENTS AND MEDICAL PRACTITIONERS. By Professor Baird. Livingstone. 1411 pages. 70s.

THIS book is reproduced in a most excellent manner and should be acceptable to many students and doctors in practice. One perhaps might criticise its bulk and the authors perhaps should consider in future producing it in two volumes.

It stresses the importance of the modern outlook on obstetrics without failing to warn the reader of the dangers of the past. These dangers are liable to be overlooked by the modern student, who must realise that it is only by careful attention to prevention that a return to conditions of the past can be avoided.

The book is full of valuable information not only for the student but also the teacher.

The text is excellent and while stressing the essentials does not fail to draw attention to the rarer conditions in their proper perspective.

The illustrations, of which there are 594, are appropriate and clarify the text. The coloured illustrations are beautifully reproduced.

The introduction of a chapter on the psychological aspects of midwifery and gynæcology is timely and its perusal would repay any student doctor and indeed many teachers. How many people forget that "She is one organic whole" and that the history should be a "friendly talk?"

One small criticism. "Stress incontinence" in the index refers one to page 855, whereas this condition is really dealt with on pages 717 and 1335.

Professor Baird and his colleagues are to be congratulated on a first class production.

C. H. G. M.

the diagnosis and tests of cure in the female. Nor will many agree about the value of sulphonamide therapy in gonorrhœa, though the importance of right diagnosis before treatment and the withholding of penicillin where double infection is suspected are rightly stressed. The importance of adequate follow-up after penicillin therapy is also pointed out.

The necessity of contact tracing and the need of careful and tactful approach to the patient is rightly stressed, and in particular where the elderly patient is unaware that he is suffering from "V.D." The importance of investigating the family unit in congenital syphilis is also emphasised.

More stress could be laid on the importance of not diagnosing syphilis on the result of a blood test and, indeed, it is a pity that the non-specific reactor does not receive mention at all. Further emphasis might also be placed upon when a case is infectious and when non-infectious, a still thorny problem in the nursing of the "V.D." patient, though mention is made about this problem in the Introduction.

Bye and large, this is an excellent little book. It is produced in a pleasing manner on good paper with clear print. The illustrations are adequate and the only typographical error noted was on p. 23 where "contact" should be "contract" in the lower third of the page. Drs. Batchelor and Murrell are to be congratulated on producing a book which has not only been a long-felt want but one which can be recommended with confidence to both men and women in the nursing profession.

J. S. McC.

COMBINED TEXTBOOK OF OBSTETRICS AND GYNÆOLOGY FOR STUDENTS AND MEDICAL PRACTITIONERS. By Professor Baird. Livingstone. 1411 pages. 70s.

THIS book is reproduced in a most excellent manner and should be acceptable to many students and doctors in practice. One perhaps might criticise its bulk and the authors perhaps should consider in future producing it in two volumes.

It stresses the importance of the modern outlook on obstetrics without failing to warn the reader of the dangers of the past. These dangers are liable to be overlooked by the modern student, who must realise that it is only by careful attention to prevention that a return to conditions of the past can be avoided.

The book is full of valuable information not only for the student but also the teacher.

The text is excellent and while stressing the essentials does not fail to draw attention to the rarer conditions in their proper perspective.

The illustrations, of which there are 594, are appropriate and clarify the text. The coloured illustrations are beautifully reproduced.

The introduction of a chapter on the psychological aspects of midwifery and gynæcology is timely and its perusal would repay any student doctor and indeed many teachers. How many people forget that "She is one organic whole" and that the history should be a "friendly talk?"

One small criticism. "Stress incontinence" in the index refers one to page 855, whereas this condition is really dealt with on pages 717 and 1335.

Professor Baird and his colleagues are to be congratulated on a first class production.

C. H. G. M.