THE

JOURNAL OF HYGIENE

EDITED BY

GEORGE H. F. NUTTALL, M.D., PH.D., Sc.D., F.R.S.

QUICK PROFESSOR OF BIOLOGY IN THE UNIVERSITY OF CAMBRIDGE

IN CONJUNCTION WITH

JOHN S. HALDANE, M.D., LL.D., F.R.S.,
Late Reader in Physiology in the University of Oxford.
CHARLES J. MARTIN, C.M.G., M.B., D.Sc., F.R.S., Director of the Lister Institute, London.
J. C. G. LEDINGHAM, M.B., D.Sc.,
Bacteriologist-in-Chief, Lister Institute, London.
G. S. GRAHAM-SMITH, M.D., F.R.S.,
University Lecturer in Hygiene, Cambridge.
MAJOR GREENWOOD, M.R.C.P., LOND.,
Medical Officer (Medical Statistics), Ministry of Health.

PUBLISHED QUARTERLY



CAMBRIDGE UNIVERSITY PRESS C. F. CLAY, MANAGEB LONDON: FETTER LANE, E.C. 4 ALSO

H. K. LEWIS AND CO. LTD., 136, GOWER STREET, LONDON, W.C. 1 WILLIAM WESLEY AND SON, 28, ESSEX STREET, STRAND, LONDON, W.C. 2 CHICAGO: THE UNIVERSITY OF CHICAGO PRESS (AGENT FOR THE UNIVERSITY OF CHICAGO PRESS (AGENT FOR THE UNIVERSITY OF CHICAGO ADA) BOMBAY, CALCUTTA, MADRAS: MACMILLAN & CO., LTD. TOKYO: THE MABUZEN-KABUSHIKI-KAISHA

Price Twelve Shillings and Sixpence net

Issued 22 March, 1921.

The University of Chicago Press

THE UNIVERSITY OF CHICAGO SCIENCE SERIES

- The Evolution of Sex in Plants. By JOHN MANNING COULTER. x + 140 pages, 12mo, cloth; 8s. 3d. net.
- Individuality in Organisms. By Charles Manning Child. x + 122 pages, small 12mo, cloth; 10s. net.
- The Origin of the Earth. By THOMAS C. CHAMBERLIN. xii + 272 pages, small 12mo, cloth; 115. 6d. net.
- Finite Collineation Groups. By HANS F. BLICHFELDT. xii + 194 pages, small 12mo, cloth; 10s. net.
- A Chemical Sign of Life. By Shiro Tashiro. x + 142 pages, small 12mo, cloth; 8s. 3d. net.
- The Biology of Twins. By HORATIO HACKETT NEWMAN. x + 186 pages, small 12mo, cloth; 10s. net.
- Food Poisoning. By EDWIN OAKES JORDAN. viii + 116 pages, small 12mo; 8s. 3d. net.
- The Electron: Its Isolation and Measurement, and the Determination of some of its Properties. By ROBERT ANDREWS MILLIKAN. xii + 268 pages, small 12mo, cloth; 11s. 6d. net.
- The Living Cycads. By CHARLES JOSEPH CHAMBERLAIN. xiv + 172 pages, small 12mo, cloth; 10s. net.
- Problems of Fertilization. By FRANK R. LILLIE. xii + 278 pages, small 12mo, cloth; IIS. 6d. net.

Volumes Planned or in Preparation

Black Body Radiation. By CHARLES E. MENDENHALL.

Mechanics of Delayed Germination in Seeds. By W. CROCKER.

The Rigidity of the Earth and of Materials. By A. A. MICHELSON.

Linear Integral Equations in General Analysis. By ELIAKIM HASTINGS MOORE.

> Agents for the British Empire (except Canada) CAMBRIDGE UNIVERSITY PRESS Fetter Lane, London, E.C. 4

THE JOURNAL OF HYGIENE

https://doi.org/10.1017/S0022172400007907 Published online by Cambridge University Press

CAMBRIDGE UNIVERSITY PRESS C. F. CLAY, MANAGER LONDON: FETTER LANE, E.C. 4



H. K. LEWIS & CO., LTD., 136, GOWER STREET, LONDON, W.C. I WILLIAM WESLEY & SON, 28, ESSEX STREET, STRAND, LONDON, W.C. 2 CHICAGO: THE UNIVERSITY OF CHICAGO PRESS (Agent for the United States and Canada) BOMBAY, CALCUTTA, MADRAS: MACMILLAN & CO., LTD. TOKYO: THE MARUZEN-KABUSHIKI-KAISHA

All rights reserved

https://doi.org/10.1017/S0022172400007907 Published online by Cambridge University Press

THE

JOURNAL OF HYGIENE

EDITED BY

GEORGE H. F. NUTTALL, M.D., PH.D., Sc.D., F.R.S. guick professor of biology in the university of cambridge

IN CONJUNCTION WITH

JOHN S. HALDANE, M.D., LL.D., F.R.S. LATE READER IN PHYSIOLOGY IN THE UNIVERSITY OF OXFORD CHARLES J. MARTIN, C.M.G., M.B., D.Sc., F.R.S. DIRECTOR OF THE LISTER INSTITUTE, LONDON J. C. G. LEDINGHAM, M.B., D.Sc. BACTERIOLOGIST-IN-CHIEF, LISTER INSTITUTE, LONDON G. S. GRAHAM-SMITH, M.D., F.R.S. UNIVERSITY LECTURER IN HYGIENE, CAMBRIDGE MAJOR GREENWOOD, M.R.C.P. (LOND.) MEDICAL OFFICER (MEDICAL STATISTICS), MINISTRY OF HEALTH

VOLUME XIX. 1920-21

· · · · · · · · · · · · · · · · · · ·
 An Alexandra (1994) An Alexandra (1994) An Alexandra (1994) An Alexandra (1994) An Alexandra (1994) An Alexandra (1994)

CONTENTS

No. 1 (JULY)

BRUCE, SIR DAVID. Tetanus. Analysis of 1458 Cases, which occurred in Home Military Hospitals during the years 1914—1918. (With 12 Diagrams and 1 Curve)	PAGE
GRIFFITH, A. STANLEY. A Study of the Serological Reactions of Meningococci and an account of the Method of Preparation of Anti-meningococcus Serum. (With 2 Charts)	33
BUXTON, P. A. Carriage of Coliform Bacilli by the Oriental Hornet (Vespa orientalis Fabr.)	
SHEARER, C. On Defense Rupture and the Antagonistic Action of Salts.	72
GREEN, IONE H. Report of Experiments on the Cold Storage of Herrings carried out at North Shields	75
CUMMING, R. H. and MATTICK, A. T. R. An Enquiry concerning the State of Cleanliness of Empty Milk Churns	84
BROWNING, C. H. and KENNAWAY, E. L. Suggestions for a New Criterion of a Positive Wassermann Reaction based on an Analysis of 2334 Quantitative Tests. (With 3 Text-figures)	87
CUNNINGHAM, ANDREW and THORPE, B. A. The Milk Supply of the City of Edinburgh	107
WILSON, W. JAMES. The Wilson-Weil-Felix Reaction in Typhus Fever.	115
Notice: The Second International Congress of Comparative Pathology .	131

No. 2 (October)

GRAHAM-SMITH, G. S. The Behaviour of Bacteria in Fluid Cultures as	
indicated by Daily Estimates of the Numbers of Living Organisms.	
(With 29 Charts and 1 Text-figure)	133
FREDERICK, ROBERT C. The Conversion of Air into a Lethal Mixture of	
Gases by Storage of Tobacco and other Vegetable Substances	205
DUDGEON, LEONARD S. Blackwater Fever	208

Contents

No. 3 (JANUARY)

	PAGE
GRABHAM, GEORGE WALTER. Some factors in Thermal Sanitation in the Tropics. (With Plate I, 3 Charts and 3 Text-figures)	245
HEHEWERTH, F. H. and KOP, W. A. The Wassermann Test in Patients affected with Malaria in the Tropics	277
BLOCH, C. E. Clinical investigation of Xerophthalmia and Dystrophy in Infants and Young Children (Xerophthalmia et Dystrophia Alipo- genetica) (With Plates IIIV and 5 Charts)	283
McDowall, R. J. S. The Water Supply of the Egyptian Expeditionary Force, with Special Reference to the Efficiency of Mechanical Rapid Filtration with Chlorination	305
MALTANER, FRANK and HOPPE, ELLA. The Chemotactic Effect of Osmosis upon Leucocytes	309
GILL, C. A. Malaria in England, with Special Reference to the Rôle of Temperature and Humidity	320

No. 4 (MARCH)

.

GARDNER, A. D. A Dreyer's System	Valı 、		of		"Ag	glutin	abilit	y-fac	tor"	in	33
PRATT-JOHNSON, J. T a Mosquito Survey										und	34
TOPLEY, W. W. C. Th istics of Long-cont	-								aract	er-	35
LLOYD, D. JORDAN, C. Sourness) in Break resistant Spores in	d. T	ogethe	er wi	ith a							38
DURHAM, HERBERT E. about Hereford	The ·	Prev	aleno	ce of	Thyr	oid E	nlarg	emen	t in a	and	39
INDEX OF AUTHORS				•	•		•			•	40
INDEX OF SUBJECTS	•										40

THE CAMBRIDGE PUBLIC HEALTH SERIES

Under the Editorship of

G. S. GRAHAM-SMITH, M.D., F.R.S., AND J. E. PURVIS, M.A.

- Flies in Relation to Disease. Non-Bloodsucking Flies. By G. S. GRAHAM-SMITH, M.D., F.R.S., Lecturer in Hygiene in the University of Cambridge. Demy 8vo. Second edition, revised and enlarged. With 27 plates, 32 text-figures and 20 charts. 15s. net.
- Flies in Relation to Disease. Bloodsucking Flies. By EDWARD HINDLE, B.A., Ph.D. Demy 8vo. With 88 text-figures. 15s. net.
- Infant Mortality. By HUGH T. ASHBY, B.A., M.D., B.Ch. (Camb.), M.R.C.P. (London). Demy 8vo. With 9 illustrations. 12s. 6d. net.
- Occupations from the Social, Hygienic, and Medical Points of View. By Sir THOMAS OLIVER, M.A., M.D., LL.D., D.Sc., F.R.C.P., Professor of Medicine, University of Durham. Demy 8vo. 8s. 6d. net.
- The Causes of Tuberculosis. Together with some Account of the Prevalence and Distribution of the Disease. By L. COBBETT, M.D., F.R.C.S., University Lecturer in Pathology, Cambridge. Demy 8vo. With 23 plates and 8 diagrams. 23s. net.
- The Chemical Examination of Water, Sewage, Foods and other Substances. By J. E. PURVIS, M.A., University Lecturer in Chemistry and Physics as applied to Hygiene and Public Health, Cambridge, and T. R. HODGSON, M.A., Public Analyst for the County Boroughs of Blackpool and Wallasey. Demy 8vo. 10s. 6d. net.
- The Bacteriological Examination of Food and Water. By W. G. SAVAGE, B.Sc., M.D., D.P.H., County Medical Officer of Health, Somerset. Second edition. Demy 8vo. With 16 illustrations. 10s. net.
- Sewage Purification and Disposal. By G. BERTRAM KERSHAW, M.Inst.C.E., Engineer to the Royal Commission on Sewage Disposal. Demy 8vo. With 4 tables and 56 text-figures and plans. 14s. net.
- **Post-mortem Methods.** By J. MARTIN BEATTIE, M.A., M.D., Professor of Bacteriology, University of Liverpool. Demy 8vo. With 8 plates and 3 text-figures. 12s. net.
- Isolation Hospitals. By H. FRANKLIN PARSONS, M.D., D.P.H., formerly First Assistant Medical Officer of the Local Government Board. Demy 8vo. With 55 text-figures. 15s. net.
- Food Poisoning and Food Infections. By W. G. SAVAGE, B.Sc., M.D., D.P.H. Demy 8vo. 15s. net.

A list of volumes in preparation will be sent on application

CAMBRIDGE UNIVERSITY PRESS, FETTER LANE, LONDON, E.C. 4 C. F. CLAY, Manager

Journal of Anatomy

Originally the Journal of Anatomy and Physiology. Conducted on behalf of the Anatomical Society of Great Britain and Ireland by PROF. ARTHUR KEITH and others.

For fifty-two years the *Journal of Anatomy* has been the chief medium by which British Anatomists have made known their researches in vertebrate and human anatomy. It is published quarterly, in January, April, July and October. The subscription price is 40s net per volume; single numbers, 10s net each.

The British Journal of Psychology Medical Section

EDITED by T. W. MITCHELL

The British Psychological Society recently decided to issue a separate journal to be called *The Medical Section of the British Journal of Psychology*. The new Journal will deal with every aspect of Psychology which has any bearing upon the pathology and treatment of disease, and with every aspect of disease which may contribute anything to our knowledge of Psychology. The subscription price per volume of about 350 pages, Royal 8vo, is 25s. net.

CAMBRIDGE UNIVERSITY PRESS, FETTER LANE, LONDON, E.C. 4 C. F. CLAY, MANAGER

The Quarterly Journal of Medicine

Edited by

J. ROSE BRADFORD R. HUTCHISON A. E. GARROD H. D. ROLLESTON

W. HALE WHITE

with the help of

Clifford Allbutt Byrom Bramwell John Cowan David Drummond T. Wardrop Griffith G. Lovell Gulland Arthur J. Hall W. P. Herringham J. A. Lindsay Norman Moore George R. Murray R. W. Philip

R. Douglas Powell Seymore J. Sharkey A. M. Stalker R. Stockman John Thomson

Single Numbers 8s. 6d. net. Volumes 35s. net Annual Subscription 25s.

HUMPHREY MILFORD, OXFORD UNIVERSITY PRESS, AMEN CORNER, E.C. 4

THE CAMBRIDGE PUBLIC HEALTH SERIES

Under the Editorship of

G. S. GRAHAM-SMITH, M.D., F.R.S., AND J. E. PURVIS, M.A.

- Flies in Relation to Disease. Non-Bloodsucking Flies. By G. S. GRAHAM-SMITH, M.D., F.R.S., Lecturer in Hygiene in the University of Cambridge. Demy 8vo. Second edition, revised and enlarged. With 27 plates, 32 text-figures and 20 charts. 15s. net.
- Flies in Relation to Disease. Bloodsucking Flies. By EDWARD HINDLE, B.A., Ph.D. Demy 8vo. With 88 text-figures. 12s. 6d. net.
- Infant Mortality. By HUGH T. ASHBY, B.A., M.D., B.Ch. (Camb.), M.R.C.P. (London). Demy 8vo. With 9 illustrations. 12s. net.
- **Occupations** from the Social, Hygienic, and Medical Points of View. By Sir THOMAS OLIVER, M.A., M.D., LL.D., D.Sc., F.R.C.P., Professor of Medicine, University of Durham. Demy 8vo. 7s. 6d. net.
- The Causes of Tuberculosis. Together with some Account of the Prevalence and Distribution of the Disease. By L. COBBETT, M.D., F.R.C.S., University Lecturer in Pathology, Cambridge. Demy 8vo. With 23 plates and 8 diagrams. 23s. net.
- The Chemical Examination of Water, Sewage, Foods and other Substances. By J. E. PURVIS, M.A., University Lecturer in Chemistry and Physics as applied to Hygiene and Public Health, Cambridge, and T. R. HODGSON, M.A., Public Analyst for the County Boroughs of Blackpool and Wallasey. Demy 8vo. 10s. 6d. net.
- The Bacteriological Examination of Food and Water. By W. G. SAVAGE, B.Sc., M.D., D.P.H., County Medical Officer of Health, Somerset. Second edition. Demy 8vo. With 16 illustrations. 10s. net.
- Sewage Purification and Disposal. By G. BERTRAM KERSHAW, M.Inst.C.E., Engineer to the Royal Commission on Sewage Disposal. Demy 8vo. With 4 tables and 56 text-figures and plans. 14s. net.
- **Post-mortem Methods.** By J. MARTIN BEATTIE, M.A., M.D., Professor of Bacteriology, University of Liverpool. Demy 8vo. With 8 plates and 3 text-figures. 12s. net.
- Isolation Hospitals. By H. FRANKLIN PARSONS, M.D., D.P.H., formerly First Assistant Medical Officer of the Local Government Board. Demy 8vo. With 55 text-figures. 15s. net.
- Food Poisoning and Food Infections. By W. G. SAVAGE, B.Sc., M.D., D.P.H. Demy 8vo. 15s. net.

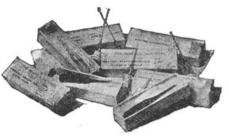
A list of volumes in preparation will be sent on application

CAMBRIDGE UNIVERSITY PRESS, FETTER LANE, LONDON, E.C. 4 C. F. CLAY, Manager

THE TUBERCULINS OF THE WIMPOLE INSTITUTE

Public Health Officers and Sanatorium officials approve of them and their value is becoming increasingly evident. German products have become entirely supplanted and the superiority of Wimpole Tuberculins amply demonstrated.
 We would especially call attention to our "A.F." or ALBUMEN-FREE, which contains nothing but the specific toxins elaborated by the Tubercle

bacillus and is therefore especially suited for the promotion of Antitoxic Immunity, and to TUBERCULIN"M," a happy blend of "A.F." and certain antigens carefully selected from the bodies of the bacilli on account of their freedom from all toxin and their capacity for inciting in the human tissues the formation of antibodies to



the bacteria themselves. A full description of Tuberculin "M" appeared in the British Journal of Tuberculosis for 1919.

 \P Give them a fair trial and you will soon be convinced of their value as has already occurred in the case of many of our specialists.

W. MARTINDALE, 10 New Cavendish Street, LONDON, W. 1

OXFORD UNIVERSITY PRESS

- First Principles of Hygiene. By W. D. STURROCK. Including chapters on Climate, Water, Food, Buildings, and the Prevention of Disease. With 47 figures. Crown 8vo. 2s. 6d.
- A System of Physical Education, Theoretical and Practical. By A. MACLAREN. New edition by W. MACLAREN, revised and enlarged. With 400 illustrations drawn from life. Crown 8vo. 8s. 6d. net.
- Descriptive Catalogue of the Medical Museum of M^cGill University, arranged on a Modified Decimal System of Museum Classification. Edited by MAUDE E. ABBOTT. The publication has begun with:—Part IV, Section I. The Haemopoietic Organs. Catalogue and Didactic Introductions by O. C. GRUNER. Royal 8vo. 10s. 6d. net.
- The Growth of Medicine from the Earliest Times to 1800. By A. H. BUCK. Med. 8vo, with 28 illustrations. 21s. net. (For Yale University Press.)
- Ancient Eugenics: The Arnold Prize Essay for 1913. By A. G. ROPER. Crown 8vo. 3s. net.
- Portraits of Dr William Harvey (Royal Society of Medicine). 20 Portraits with explanatory text, and a list of engraved portraits, busts and statues. Demy 4to. 21s. net.
- Medical Science: Abstracts and Reviews. Edited for the Medical Research Committee by W. Bulloch, W. S. L. BARLOW, J. D. ROLLESTON, S. RUSS, W. G. SPENCER, and F. M. R. WALSHIE. Published monthly. Single numbers 2s. net. Annual Subscription, 21s. post free.

LONDON: HUMPHREY MILFORD, OXFORD UNIVERSITY PRESS, AMEN CORNER, E.C.4