





# THE JOURNAL OF HYGIENE

EDITED BY

GEORGE H. F. NUTTALL, M.D., PH.D.

LECTURER IN BACTERIOLOGY AND PREVENTIVE MEDICINE  
IN THE UNIVERSITY OF CAMBRIDGE,  
LATE ASSOCIATE IN HYGIENE IN THE JOHNS HOPKINS UNIVERSITY, BALTIMORE.

IN CONJUNCTION WITH

JOHN S. HALDANE,  
M.D., F.R.S.

LECTURER IN PHYSIOLOGY IN THE  
UNIVERSITY OF OXFORD

ARTHUR NEWSHOLME,  
M.D., F.R.C.P.

MEDICAL OFFICER OF HEALTH  
OF BRIGHTON

Volume I. 1901



CAMBRIDGE  
AT THE UNIVERSITY PRESS

LONDON: C. J. CLAY AND SONS, AVE MARIA LANE  
AND H. K. LEWIS, GOWER STREET  
NEW YORK: THE MACMILLAN COMPANY  
LEIPSIC: BROCKHAUS

**Cambridge :**  
PRINTED BY J. AND C. F. CLAY,  
AT THE UNIVERSITY PRESS.

## COLLABORATORS.

- ALEXANDER C. ABBOTT, M.D., Professor of Hygiene and Bacteriology, University of Pennsylvania. Philadelphia, Penn.
- J. GEORGE ADAMI, M.D., Professor of Pathology, McGill University, Montreal.
- T. CLIFFORD ALLBUTT, M.D., F.R.S., Regius Professor of Physic, University of Cambridge.
- HERMANN BIGGS, M.D., Pathologist and Director of the Research Laboratory, Health Department, New York City.
- A. WYNTER BLYTH, M.R.C.S., Public Analyst, St Marylebone, London.
- RUBERT BOYCE, M.B., Professor of Pathology, University College, Liverpool.
- W. J. BUCHANAN, M.B., Major I. M. S., Editor of the Indian Medical Gazette, Calcutta.
- W. BULLOCH, M.D., Lecturer on Bacteriology and General Pathology, London Hospital.
- FRANK G. CLEMOW, M.D., Physician to the British Embassy, Constantinople.
- W. COLLINGRIDGE, M.D., Medical Officer of Health, City of London.
- WILLIAM T. COUNCILMAN, M.D., Professor of Pathology, Harvard University.
- A. M. DAVIES, M.D., Bacteriologist, Army Head Quarters, India.
- D. S. DAVIES, M.D., Medical Officer of Health of Bristol.
- SHERIDAN DELÉPINE, M.D., Professor of Pathology, Owens College, Manchester.
- E. K. DUNHAM, M.D., Professor of Pathological Anatomy, The University and Bellevue Hospital Medical College, New York City.
- HAROLD C. ERNST, M.D., Professor of Bacteriology, Harvard University.
- SIMON FLEXNER, M.D., Professor of Pathology, University of Pennsylvania.
- R. H. FIRTH, M.D., Professor of Hygiene, Army Medical School, Netley.
- SIR MICHAEL FOSTER, K.C.B., M.D., F.R.S., etc., Professor of Physiology, University of Cambridge.
- E. H. HANKIN, M.A., Chemical Examiner and Bacteriologist N. W. P. and Oudh, and Central Provinces, Agra, India.
- MATTHEW HAY, M.D., Professor of Forensic Medicine and Public Health, University of Aberdeen.
- LUDVIG HEKTOEN, M.D., Professor of Pathology, Rush Medical College, Chicago.
- WYATT JOHNSTON, M.D., Lecturer on Hygiene, McGill University, Montreal.

- EDWIN O. JORDAN, Ph.D., Associate Professor of Bacteriology, University of Chicago.
- E. KLEIN, M.D., F.R.S., Lecturer on General Anatomy and Physiology, Saint Bartholomew's Hospital, London.
- LORD LISTER, M.D., late President of the Royal Society, etc., London.
- ALLAN MACFADYEN, M.D., Director of the Jenner Institute of Preventive Medicine, London.
- J. J. MACKENZIE, B.A., Professor of Pathology, University of Toronto.
- E. G. MACWEENEY, M.D., Professor of Pathology in the Royal University, Dublin.
- JOHN MCFADYEAN, M.B., Principal and Professor of Comparative Pathology, Royal Veterinary College, London.
- J. C. McVAIL, M.D., President of the Incorporated Society of Medical Officers of Health, Glasgow.
- PATRICK MANSON, M.D., F.R.S., Lecturer on Tropical Diseases, London School of Medicine for Women.
- SHIRLEY F. MURPHY, M.R.C.S., Medical Officer of Health, County of London.
- JAMES NIVEN, M.B., Medical Officer of Health of Manchester.
- J. LANE NOTTER, M.D., late Professor of Military Hygiene, Army Medical School, Netley.
- F. G. NOVY, M.D., Junior Professor of Hygiene and Physiological Chemistry, University of Michigan.
- THOMAS OLIVER, M.D., Professor of Physiology, University of Durham.
- WILLIAM OSLER, M.D., F.R.S., Professor of Medicine, Johns Hopkins University, Baltimore.
- WILLIAM H. PARK, M.D., Professor of Bacteriology and Hygiene, University and Bellevue Medical College, New York City.
- LOUIS C. PARKES, M.D., Lecturer on Public Health, St George's Hospital, London.
- LEONARD B. PEARSON, V.M.D., Professor of Veterinary Medicine, University of Pennsylvania. State Veterinarian.
- WILLIAM H. POWER, F.R.S., Medical Officer to the Local Government Board, London.
- T. MITCHELL PRUDDEN, M.D., Professor of Pathology, College of Physicians and Surgeons, New York.
- ARTHUR RANSOME, M.D., F.R.S., Bournemouth.
- MAZŮCK P. RAVENEL, M.D., Lecturer on Bacteriology, Veterinary Department, University of Pennsylvania, Bacteriologist to the State Live Stock Sanitary Board of Pennsylvania.
- WALTER REED, Surgeon U.S. Army, Army Medical Museum, Washington.
- GEORGE REID, M.D., Medical Officer of Health of Staffordshire.
- JOHN ROBERTSON, M.D., Lecturer on Public Health, University College, Sheffield.
- RONALD ROSS, F.R.S., Lecturer on Tropical Medicine, University College, Liverpool.

## *Collaborators*

v

- M. ARMAND RUFFER, M.D., President of the Sanitary, Maritime and Quarantine Board of Egypt. Alexandria.
- J. BURN RUSSELL, M.D., Medical Officer to the Local Government Board, Edinburgh.
- D. E. SALMON, M.D., Chief of the Bureau of Animal Industry, U.S. Department of Agriculture, Washington, D.C.
- SIR J. BURDON SANDERSON, M.D., F.R.S., etc., Regius Professor of Medicine, University of Oxford.
- F. M. SANDWITH, M.D., Professor of Medicine, School of Medicine, Cairo.
- E. A. DE SCHWEINITZ, M.D., Chief of the Biochemical Department, Bureau of Animal Industry, U.S. Department of Agriculture, Washington.
- WILLIAM T. SEDGWICK, Ph.D., Professor of Biology, Massachusetts Institute of Technology and Biologist to the Mass. State Board of Health, Boston.
- SIR JOHN SIMON, K.C.B., M.D., F.R.S., etc., late Medical Officer to the Local Government Board, London.
- W. J. SIMPSON, M.D., Professor of Hygiene, King's College, London.
- THEOBALD SMITH, M.D., Professor of Comparative Pathology, Harvard University.
- J. LORRAIN SMITH, M.D., Professor of Pathology, Queen's College, Belfast.
- GEORGE M. STERNBERG, M.D., Surgeon General of the U.S. Army, Washington.
- CHARLES HUNTER STEWART, D.Sc., M.B., Professor of Hygiene, University of Edinburgh.
- CHARLES W. STILES, Ph.D., Zoologist, Bureau of Animal Industry, U.S. Department of Agriculture, Washington.
- J. F. J. SYKES, M.D., Lecturer on Hygiene, Guy's Hospital, London.
- JOHN F. W. TATHAM, M.D., General Register Office, Somerset House, London.
- J. ASHBURTON THOMPSON, M.D., Chief Medical Officer of the Government of New South Wales, Sydney.
- E. L. TRUDEAU, M.D., Director of the Saranac Laboratory for the Study of Tuberculosis, New York.
- VICTOR C. VAUGHAN, M.D., Professor of Hygiene and Physiological Chemistry, University of Michigan.
- WILLIAM H. WELCH, M.D., Professor of Pathology, Johns Hopkins University, Baltimore.
- F. F. WESBROOK, M.D., Professor of Pathology and Bacteriology, University of Minnesota, Minneapolis, Minn. Director of the Bacteriological Laboratory of the State Board of Health.
- B. ARTHUR WHITELEGGE, M.D., Chief Inspector of Factories, Home Office, London.
- G. SIMS WOODHEAD, M.D., Professor of Pathology, University of Cambridge.
- ALMROTH E. WRIGHT, M.D., Professor of Pathology, Army Medical School, Netley.
- WALTER WYMAN, M.D., Surgeon General United States Marine Hospital Service, Washington, D.C.

# CONTENTS.

No. 1 (January).

	PAGE
INTRODUCTION by the Editors, accompanied by a Letter from SIR JOHN SIMON . . . . .	1
STUDIES IN RELATION TO MALARIA.	
I. NUTTALL, G. H. F., COBBETT, L., and STRANGWAYS-PIGG, T. The Geographical Distribution of Anopheles in Relation to the former Distribution of Ague in England. (Two Maps). . . . .	4
II. NUTTALL, G. H. F. and SHIPLEY, ARTHUR E. The Structure and Biology of Anopheles. (Two Plates) . . . .	45
KLEIN, E. Pathogenic Microbes in Milk . . . . .	78
LEGGE, T. M. Industrial Lead Poisoning . . . . .	96
HALDANE, JOHN. A rapid Method of determining Carbonic Acid in Air. (One Figure) . . . . .	109
HALDANE, JOHN. The Red Colour of Salted Meat. (One Figure) .	115
SMITH, J. LORRAIN, and HOSKINS, A. PERCY. An Experiment on the Effect of Inhalation of Ethylene . . . . .	123
RITCHIE, JAMES. Artificial Modifications of Toxines, with special Reference to Immunity . . . . .	125
NEWSHOLME, ARTHUR. The Utility of Isolation Hospitals in Diminishing the Spread of Scarlet Fever. (Two Figures) .	145

---



Contents

vii

No. 2 (April).

	PAGE
WALTER MYERS (Portrait) . . . . .	<i>Frontispiece</i>
THOMPSON, J. ASHBURTON. A Contribution to the Aetiology of Plague . . . . .	153
TUNNICLIFFE, F. W., and ROSENHEIM, OTTO. On the Influence of Boric Acid and Borax upon the General Metabolism of Children. (Nine Figures) . . . . .	168
HORROCKS, W. H. A Comparative Study of Varieties of <i>B. coli</i> isolated from "Typhoid" and Normal Dejecta . . . . .	202
BUCHANAN, W. J. A Contribution to the Aetiology of Epidemic Cerebrospinal Meningitis. (One Figure) . . . . .	214
COBBETT, LOUIS. An Outbreak of Diphtheria checked by the Prophy- lactic Use of Antitoxin, and the Isolation of Infected Persons . . . . .	228
COBBETT, LOUIS. The Result of 950 Bacteriological Examinations for Diphtheria Bacilli during an Outbreak of Diphtheria at Cambridge and Chesterton. (Three Plates) . . . . .	235
STANLEY, ARTHUR. The Shanghai Pasteur Institute . . . . .	260
STUDIES IN RELATION TO MALARIA.	
II. ( <i>Cont.</i> ) NUTTALL, GEORGE H. F., and SHIPLEY, ARTHUR E. The Structure and Biology of Anopheles. (One Figure) . . . . .	269
FORD, WILLIAM W. On the Bacteriology of Normal Organs . . . . .	277
IN MEMORIAM: WALTER MYERS; MAX VON PETTENKOFER . . . . .	285

No. 3 (July).

MAX VON PETTENKOFER (Portrait) . . . . .	<i>Frontispiece</i>
THE WORK OF MAX VON PETTENKOFER . . . . .	289
JORDAN, E. O. The relative Abundance of <i>Bacillus coli communis</i> in River Water as an Index of the Self-Purification of Streams. (One Figure) . . . . .	295
TUNNICLIFFE, F. W., and ROSENHEIM, O. On the Influence of Formic Aldehyde upon the Metabolism of Children. (Ten Figures) . . . . .	321

	PAGE
NUTTALL, G. H. F. On the Formation of Specific Anti-Bodies in the Blood following upon Treatment with the Sera of different Animals, together with their Use in Legal Medicine . . .	367
DAVIES, D. S. The Use of the Graphic Method in Tracing the Distribution of Milk-carried Scarlet Fever Illustrated by an Outbreak in Clifton in 1900. (With Chart) . . . . .	388
PARK, W. H. The great Bacterial Contamination of the Milk of Cities. Can it be lessened by the Action of Health Authorities?	391

---

No. 4 (October).

ROGERS, LEONARD. The Seasonal Prevalence of Anopheles and Malarial Fever in Lower Bengal; and the Practical Application of the Mosquito Theory. (One Chart) . . . . .	407
FULTON, JOHN S. The Elkton Milk Epidemic of Typhoid Fever . . . . .	422
MAKGILL, R. H. The Neutral-Red Reaction as a means of detecting Bacillus <sup>a</sup> Coli in Water Supplies . . . . .	430
SAVAGE, WILLIAM G. Neutral-Red in the Routine Bacteriological Examination of Water . . . . .	437
STUDIES IN RELATION TO MALARIA.	
II. ( <i>Cont.</i> ) NUTTALL, GEORGE H. F., and SHIPLEY, ARTHUR E.	
The Structure and Biology of Anopheles. (Two Figures and Three Plates) . . . . .	451
COBBETT, LOUIS. Observations on the Recurrence of Diphtheria in Cambridge in the Spring of 1901 . . . . .	485
INDEX OF AUTHORS . . . . .	501
INDEX OF SUBJECTS . . . . .	503