

# THE JOURNAL OF HYGIENE

EDITED BY

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

EMERITUS PROFESSOR OF BIOLOGY IN THE UNIVERSITY OF CAMBRIDGE

IN CONJUNCTION WITH

SIR J. C. G. LEDINGHAM, C.M.G., M.B., D.Sc., F.R.S.,

Professor of Bacteriology in the University of London,  
Director of the Lister Institute, London.

G. S. GRAHAM-SMITH, M.D., F.R.S.,  
Reader in Preventive Medicine, Cambridge.

MAJOR GREENWOOD, D.Sc., F.R.C.P. (LOND.), F.R.S.,  
Professor of Epidemiology and Vital Statistics in the University of London.

SIR DAVID MUNRO, K.C.B., C.I.E., M.B.,  
Secretary, Industrial Health Research Board, Medical Research Council.

*PUBLISHED QUARTERLY*



LONDON

CAMBRIDGE UNIVERSITY PRESS

FETTER LANE, E.C. 4

CHICAGO: The University of Chicago Press  
(Agents for the United States)

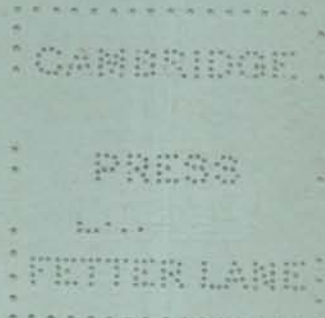
BOMBAY, CALCUTTA, MADRAS: Macmillan

TOKYO: Maruzen Company Ltd.

*All rights reserved*

*Price Fourteen Shillings net*

PRINTED IN GREAT BRITAIN



# The University of Chicago Press

## THE PHYSICAL AND MENTAL GROWTH OF PREMATURELY BORN CHILDREN 22s. 6d. net

By JULIUS H. HESS, GEORGE J. MOHR and PHYLLIS F. BARTELME

"This book probably contains more original research and statistical data than any other book on the subject..."—*Journal of the American Medical Association*.

## ULTRAVIOLET LIGHT AND VITAMIN D IN NUTRITION 11s. 6d. net

By KATHARINE BLUNT and RUTH COWAN. A survey of all vitamin D discoveries, including creation of its effects by ultraviolet light.

## DIET AND EFFICIENCY. A Five-Year Controlled Experiment on Man. 4s. 6d. net

By HARALD G. O. HOLCK. Objective evidence of the effects of certain eating habits.

## THE EPIDEMIOLOGY AND CONTROL OF MALARIA IN PALESTINE 22s. 6d. net

By I. J. KLIGLER. A complete account of successful control measures.

## CHILDBIRTH 13s. 6d. net

By WILLIAM G. LEE, M.D.

## NUTRITION WORK WITH CHILDREN (*Revised edition*) 13s. 6d. net

By LYDIA J. ROBERTS. A splendid survey of the subject of malnutrition,—of its causes, effects, prevention, and treatment.

## THE NEWER KNOWLEDGE OF BACTERIOLOGY AND IMMUNOLOGY 45s. net

Edited by E. O. JORDAN and I. S. FALK. A collection of late researches in the field of bacteriology prepared by the leading eighty research men in the field.

## LABORATORY OUTLINES IN BACTERIOLOGY AND IMMUNOLOGY 7s. 6d. net

By JOHN F. NORTON and I. S. FALK

## FOOD POISONING (*Revised edition*) 11s. 6d. net

By EDWIN O. JORDAN

AGENTS IN GREAT BRITAIN AND THE BRITISH EMPIRE (EXCEPT CANADA)

Cambridge University Press, Fetter Lane, London, E.C. 4

# THE JOURNAL OF HYGIENE

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



CHICAGO: THE UNIVERSITY OF CHICAGO PRESS  
(Agents for the United States)

BOMBAY, CALCUTTA, MADRAS: MACMILLAN

TOKYO: THE MARUZEN COMPANY, LTD.

*All rights reserved*

# THE JOURNAL OF HYGIENE

EDITED BY

GEORGE H. F. NUTTALL, M.D., PH.D., Sc.D., LL.D., F.R.S.  
EMERITUS PROFESSOR OF BIOLOGY IN THE UNIVERSITY OF CAMBRIDGE

IN CONJUNCTION WITH

SIR J. C. G. LEDINGHAM, C.M.G., M.B., D.Sc., F.R.S.  
PROFESSOR OF BACTERIOLOGY IN THE UNIVERSITY OF LONDON,  
DIRECTOR OF THE LISTER INSTITUTE, LONDON

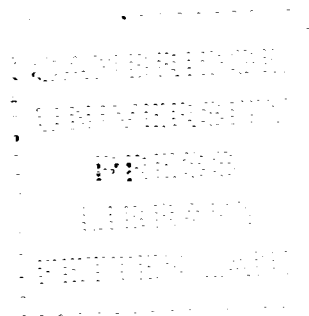
G. S. GRAHAM-SMITH, M.D., F.R.S.  
READER IN PREVENTIVE MEDICINE, CAMBRIDGE

MAJOR GREENWOOD, D.Sc., F.R.C.P. (LOND.), F.R.S.  
PROFESSOR OF EPIDEMIOLOGY AND VITAL STATISTICS  
IN THE UNIVERSITY OF LONDON

SIR DAVID MUNRO, K.C.B., C.I.E., M.B.  
SECRETARY, INDUSTRIAL HEALTH RESEARCH BOARD,  
MEDICAL RESEARCH COUNCIL

VOLUME XXXVII. 1937

CAMBRIDGE  
AT THE UNIVERSITY PRESS  
1937



PRINTED IN GREAT BRITAIN

.....  
KODJERMAN  
YTISROVIBU  
SUSSE  
YSAPELL  
NHAL ADITIN  
.....



# CONTENTS

## NO. 1 (JANUARY 1937)

	PAGE
BROWN, W. A. and ALLISON, V. D. Infection of the air of scarlet-fever wards with <i>Streptococcus pyogenes</i> . (With a Diagram in the Text) . . . . .	1
TWORT, C. C., LYTH, R. and TWORT, J. M. The significance of density, refractive index and viscosity of mineral oils in relation to the type and degree of animal reaction. (With 2 Graphs in the Text) . . . . .	14
MAGEE, H. E. The daily water consumption of adults . . . . .	30
BEATTIE, C. P. and ELLIOT, J. S. Serological diagnosis of enteric in the inoculated . . . . .	36
PETRIE, G. F. The endotoxin of the meningococcus . . . . .	42
WYLLIE, J. Co-agglutination between <i>B. typhosus</i> and <i>B. paratyphosus</i> B . . . . .	70
MILES, A. A. and HALNAN, E. T. A new species of micro-organism ( <i>Proteus melanovogenes</i> ) causing black rot in eggs. (With 1 Figure in the Text) . . . . .	79
PLATT, A. E. A serological study of <i>Haemophilus influenzae</i> . . . . .	98
MITRA, K. Fertility and its relation to social conditions. A study of the vital statistics of London in 1930-2 . . . . .	108
GARDNER, A. D. An international experiment on the Widal-reaction. (With 3 Charts in the Text) . . . . .	124
KLIENEBERGER, EMMY and STEABBEN, DOROTHY B. On a pleuropneumonia-like organism in lung lesions of rats, with notes on the clinical and pathological features of the underlying condition. (With (double) Plate I, containing Figs. 1-22) . . . . .	143

## NO. 2 (APRIL 1937)

ALLISON, V. D. and BROWN, W. A. Reinfection as a cause of complications and relapses in scarlet-fever wards . . . . .	153
KERMACK, W. O. and MCKENDRICK, A. G. Contributions to the mathematical theory of epidemics. IV. Analysis of experimental epidemics of the virus disease mouse ectromelia. (With 4 Figures in the Text) . . . . .	172

	PAGE
MARTIN, W. J. Studies in the declining birth-rate, the Midlands and London . . . . .	188
SIMPSON, J. V. A. Some aspects of open-air education. (With 2 Charts) . . . . .	225
HAWORTH, E. and MACDONALD, A. D. On histamine in cotton dust and in the blood of cotton workers. (With 5 Figures in the Text) . . . . .	234
WILSON, G. S., MINETT, F. C. and CARLING, H. F. The nutritive value of raw and pasteurized milk for calves. (With 1 Figure in the Text) . . . . .	243
MARSH, F. and BUXTON, P. A. Measurements of temperature and humidity between the clothes and the body. (With 2 Figures in the Text) . . . . .	254
SMITH, J. Vaccination of guinea-pigs and human beings against leptospiral infections . . . . .	261
TAKITA, JUNGO. A new type of antigenic variation occurring in the Flexner group of dysentery bacilli. (With 1 Figure in the Text)	271
KERRIN, J. C. and GAZE, H. W. A modified tellurite medium for the detection and isolation of <i>Corynebacterium diphtheriae</i> in routine diagnostic work . . . . .	280
ARDASHNIKOV, S. N. The genetics of leukaemia in man. (With 4 Figures in the Text) . . . . .	286
BAKER, A. Z. and WRIGHT, M. D. Note on the variation in the vitamin B <sub>1</sub> activity of raw wheat germ. (With 3 Figures in the Text) . . . . .	303
WEBB, J. LEWIS. On the occurrence of dysentery-like organisms in the urinary tract of man in Mauritius . . . . .	307
SCHOLTENS, R. TH. Absorption of Vi bacteriophages by typhoid bacilli and paratyphoid C strains . . . . .	315
GREEN, C. A. The serological types of haemolytic streptococci in epidemic scarlatina. (With 2 Graphs) . . . . .	318
PIJPER, ADRIANUS and CROCKER, C. G. The agglutinins of typhoid carriers . . . . .	332
HORGAN, E. S. and MCKINNON, R. M. A comparison of the mesencephalon and hippocampus as sites of election for Negri bodies in rabies . . . . .	340



*Contents*

vii

No. 3 (JULY 1937)

	PAGE
MACLEAN, ALEX. The suprarenal glands in diphtheria. (With Plate II and 7 Graphs in the Text) . . . . .	345
ELLMAN, PHILIP and TAYLOR, H. J. Oxygen and carbon dioxide subcutaneous tissue gas tensions in cases of hypertension . . . . .	369
MORGAN, W. T. J. A conception of immunological specificity . . . . .	372
EDWARDS, PHILIP R. A new Salmonella type possessing a hitherto undescribed non-specific antigen . . . . .	384
MORISON, A. G. and ROBERTS, LLYWELYN. The value of active immunization treatment against diphtheria (With 1 Diagram) . . . . .	388
WATSON, MARION. Studies on the influence of diet on resistance to infection. I. The effect of various diets on the fertility, growth, and survival of mice. (With 3 Figures in the Text) . . . . .	396
WATSON, MARION. Studies on the influence of diet on resistance to infection. II. The effect of various diets on the resistance of mice to bacterial infection. (With 5 Figures in the Text) . . . . .	420
SCHLESINGER, M. and GALLOWAY, I. A. Sedimentation of the virus of foot-and mouth disease in the Sharples-Super Centrifuge . . . . .	445
GALLOWAY, I. A. and SCHLESINGER, M. Purification and concentration of the virus of foot-and-mouth disease by combined centrifugation and ultra-filtration methods. (With 2 Figures in the Text) . . . . .	463
GORDON, J. and WOOD, N. Reversible neutralization by congo red of the anthracidal power of serum . . . . .	471
BAKER, JOHN R., RANSON, R. M. and TYNEN, J. The spermicidal powers of chemical contraceptives . . . . .	474

No. 4 (OCTOBER 1937)

MARTIN, W. J. Studies in the declining birth-rate, England and Wales. (With 2 Maps) . . . . .	489
HOYLE, LESLIE and FAIRBROTHER, R. W. Antigenic structure of influenza viruses; the preparation of elementary body suspensions and the nature of the complement-fixing antigen . . . . .	512
SCHLESINGER, M. and ANDREWES, C. H. The filtration and centrifugation of the viruses of rabbit fibroma and rabbit papilloma . . . . .	521

	PAGE
PULLINGEE, E. J. and KEMP, AUDREY, E. Growth of <i>Streptococcus pyogenes</i> in milk stored at atmospheric temperatures. (With 1 Diagram) . . . . .	527
RAINSFORD, S. G. The sterilization of T.A.B.C. vaccine. (With Plate III) . . . . .	539
NEILL, G. A. W. A simple tellurite-chocolate-agar medium for the typing and isolation of <i>Corynebacterium diphtheriae</i> . (With Plate IV, containing 3 Figures) . . . . .	552
HENNING, M. W. On the variation of the specific phase of <i>Salmonella amersfoort</i> (n.sp.) . . . . .	561
MCCANCE, R. A., LUFF, M. C. and WIDDOWSON, E. E. Physical and emotional periodicity in women. (With Figs. 1-19 in the Text)	571
INDEX OF AUTHORS . . . . .	612
INDEX OF SUBJECTS. . . . .	615