

VOLUME 6, NO. 3

NOVEMBER 1965

GENETICAL RESEARCH

EDITORIAL BOARD

C. H. WADDINGTON (*Chairman*)
CHARLOTTE AUERBACH D. LEWIS
H. GRÜNEBERG G. PONTECORVO
W. HAYES A. ROBERTSON

EXECUTIVE EDITOR

E. C. R. REEVE



PUBLISHED BY

CAMBRIDGE UNIVERSITY PRESS

Bentley House, 200 Euston Road, London, N.W. 1
American Branch: 32 East 57th Street, New York, N.Y. 10022

SUBSCRIPTION £6 net (U.S.A. \$21.00) per annual volume

SINGLE PARTS 47s. 6d. net (U.S.A. \$8.50)

GENETICAL RESEARCH

GENETICAL RESEARCH publishes original work on all aspects of genetics, or in any field of research which has an important bearing on genetics. Papers will be submitted to referees before acceptance. They will generally be printed in order of acceptance. In addition, short notes limited to 1500 words or the equivalent space including figures, etc., may be included if received 3 months before publication date.

EACH ANNUAL VOLUME will consist of three parts (to be published in February, July and November) plus an index.

SUBSCRIPTIONS may be sent to any bookseller or to the Cambridge University Press, 200 Euston Road, London, N.W. 1. Subscriptions in the U.S.A. should be sent to the American Branch of the Press, 32 East 57th Street, New York, N.Y. 10022. The subscription price is £6 net (including postage) for an annual volume of three parts (\$21.00 in the U.S.A.), payable in advance; Separate parts 47s. 6d. or \$8.50 each (plus postage).

NOTES FOR CONTRIBUTORS

CONTRIBUTIONS will be welcomed from scientists of all nationalities, but must be written in English, with an English summary. An additional summary in French, German, Russian or Italian will be accepted. Papers should be sent to the Executive Editor, Dr. E. C. R. Reeve, Institute of Animal Genetics, West Mains Road, Edinburgh 9.

GENERAL. Submission of a paper or note will be taken to imply that it is unpublished and is not being considered for publication elsewhere. Papers published in *Genetical Research* may not be reprinted or published in translation without permission from the Editorial Board. Papers should be as concise as clarity permits, and illustrations kept as few as possible. Attention to the following instructions will assist rapid publication.

TYPESCRIPTS. A top copy and one carbon copy should be submitted. They should be typed with double-spacing, on one side of the paper, leaving margins of about 1½ inches at the left-hand side and head of each sheet. Quarto is preferred to foolscap paper. Heavily corrected typescripts may have to be returned to the author for retyping. Papers should state the name and address of the author (or his proxy) to whom proofs are to be sent. The address of the laboratory at which the work was carried out will be printed with the authors' names at the head of the paper, and changes of address and sources of financial support may be added in footnotes.

A short title should be supplied for running headlines; this must not exceed 50 characters, counting each letter and space as one character.

(continued inside back of cover)

AN INTRODUCTION TO HUMAN GENETICS

H. Eldon Sutton, University of Texas

Emphasizes recent developments in human cytogenetics, biochemical genetics, and the investigative techniques peculiar to research in human genetics. Useful for both medical students and advanced undergraduates taking a one-semester course, this book draws its illustrative material primarily from man.

March 1965

272 pp.

\$6.00 tent.

Biology Studies Series

GENES, ENZYMES, AND INHERITED DISEASES

H. Eldon Sutton, University of Texas

Recent findings on the chemical nature of genes and gene action are reviewed and related to the production of inherited diseases. Emphasis is on the principles of inherited diseases, rather than on cataloging the diseases themselves.

1961

128 pp.

\$4.25

CHEMISTRY AND PHYSIOLOGY OF FERTILIZATION

Alberto Monroy, University of Palermo

Presents available data on the problem of the chemical and physiological processes involved in the activation of the egg at fertilization.

April 1965

160 pp.

\$4.50

Modern Biology Series

GENETICS *Robert Paul Levine, Harvard University*

Emphasis is on recent ideas, developed in an exciting period of explosive growth and major advances.

1962

192 pp.

\$2.15 paper

CELL STRUCTURE AND FUNCTION

Ariel G. Loewy, Haverford College

Philip Siekevitz, Rockefeller University

At long last—a text that unifies such diverse experimental approaches to cell biology as physical biochemistry, metabolism, cytology, biophysics, physiology, and molecular genetics.

1963

236 pp.

\$2.85 paper

MICROBIAL LIFE

William R. Sistrom, University of Oregon

1962

128 pp.

\$1.75 paper

CELL CULTURE AND SOMATIC VARIATION

Morgan Harris, University of California, Berkeley

1964

557 pp.

\$15.00



**HOLT, RINEHART
and WINSTON, inc.**

383 Madison Avenue, New York, N.Y. 10017

**COMMONWEALTH BUREAU OF
ANIMAL BREEDING AND GENETICS**

ANIMAL BREEDING ABSTRACTS

Issued quarterly in March, June, September and December

This journal provides comprehensive coverage of world literature on the reproduction and genetics of laboratory mammals (excluding primates) as well as of farm livestock, poultry, and other animals of economic importance. Theoretical and statistical genetics are covered in so far as these are concerned with principles of general application. In addition to abstracts the journal contains book reviews and review articles.

Recent review articles include "Behavioural responses in farm animals and their relevance to research techniques", by E. S. E. Hafez and D. R. Lindsay; "Genetic aspects of disease resistance", by H. T. Fredeen, "some contributions of the laboratory mouse to animal breeding research," by R. C. Roberts.

*Subscription rate: 140s. per annum
65s. per annum in U.K. and contributing countries*

*Subscriptions may be placed with any major
bookseller or sent to :*

**COMMONWEALTH AGRICULTURAL BUREAUX
CENTRAL SALES BRANCH
FARNHAM ROYAL, BUCKS., ENGLAND**

The Journal of General Microbiology

Editors: B. C. J. G. KNIGHT and A. F. B. STANDFAST

The Journal of General Microbiology is conducted by the Society for General Microbiology, whose aim is to promote the advancement of microbiology by providing a common meeting-ground for those working in all the various specialized fields, including, for example, medical, veterinary, agricultural and economic microbiology. The Society is concerned with the more fundamental aspects of the study of bacteria, viruses, micro-fungi, protozoa and microscopic algae in their various biological activities, its members being united by the common aim of developing scientific knowledge concerning micro-organisms.

*The subscription rate is 80s. net per volume of 3 parts. Single parts 35s. each, plus postage.
Four volumes will be issued each year. Orders should be sent to*

**CAMBRIDGE UNIVERSITY PRESS
BENTLEY HOUSE, 200 EUSTON ROAD, LONDON, N.W.1**

GENETICA AGRARIA

A Journal of "Genetics applied to Agriculture" edited by the Istituto di Zoologia of the University of Pavia.

The Journal is issued four times a year. Price per volume of about 400 pages: from Vol. IX°, Lit. 5,000 or \$8.5; from Vol. XV°, Lit. 6,500 or \$10.5.

Miscellaneous papers, proceedings of special meetings and the Proceedings of the Annual Meeting of the SIGA are published:

- Vol. XV°; 1961, n. 1-2: Proceedings II° National Meeting on: "durum wheat", Foggia (June 1960).
1962, n. 3-4: Proceedings of the VIII° Meeting of the SIGA in Bergamo on: "Breeding for quality in cultivated plants".
- Vol. XVI°; 1963, n. 1-4: Proceedings of the VIII° Meeting of the SIGA (continued) and miscellaneous contributions.
- Vol. XVII°; 1963, n. 1-4: Proceedings of the FAO Meeting on: "Plant exploration and introduction", Rome 1961, edited by Julén.
- Vol. XVIII°; 1964, n. 1-2; 3: Proceedings of the IX° Meeting of the SIGA (Palermo 1963).
- Vol. XIX°; 1965: Proceedings of the X° Meeting of the SIGA (Rieti 1964) and miscellaneous papers (in press).

Orders may be sent to the Managing Editor or placed through booksellers.

Managing Editor: The Acting Director, Istituto di Zoologia, P. Botta,
PAVIA (Italy).

SYMPOSIA GENETICA et BIOLOGICA ITALICA

A Journal of genetics and general biology mainly devoted to the scientific contributions of the "Istituto di Zoologia Lazzaro Spallanzani" of the University of Pavia.

Some volumes are devoted to the "Proceedings" of international meetings organized by the Istituto L. Spallanzani.

- Vol. 1 (1950), Vol. 2 (1951), Vol. 3 (1952), Vol. 4 (1956), Vol. 5, (1957), Vol. 6 (1958-59) Vol. 7 (1960-61), Vol. 8 (1961), Vol. 9 (1962), Vol. 10 (1963), Vols. 11, 12 (1963), Vol. 13: In press.
- Vol. 8 and Vol. 9: PROCEEDINGS ON THE INTERNATIONAL SYMPOSIUM OF EXPERIMENTAL BIOLOGY IN MEMORY OF SPALLANZANI.
Symposia on generation of microorganisms and biochemical evolution—Respiration of tissues—Metabolism and reproduction—Artificial insemination and sexual biology—Digestion, nutrition, symbiosis—Orientation and nervous activities—Circulation—Regeneration, transplants, histocompatibility. single vol. L. it. 6500 or \$10.5
- Vols. 10, 11, 12: PROCEEDINGS OF THE IV CONGRESS UIEIS (UNION INTERNATIONALE ETUDE INSECTES SOCIAUX), Pavia, 1962-63.
- Vol. 10: Symp. 1°: Endocrinology (Lüscher, Schweigër, Karlson, Bernardini-Mosconi, Lukoschus, Schmidt, Jucci).
Symp. 2°: Cast differentiation (Gösswald, Brian, Pain, Simpson).
Sims. 4°: Gregarism and subsociality (Joly, Carlisle, Ellis, Raabe, Atwood, Hamard, Biliotti, Boistel, Manunta, Rabaglio, Bernardini-Mosconi) L. it. 6500 or \$10.5
- Vol. 11: Sect. 4°: Applications (Bonaventura, Schmidt, Schultze-Dewitz, Sampaio, Giordani-Soika, Gay, Pavan, Muller, Sy, Grimalsky, Gallo, Rudnev, Becker, Rui). Sect. 1°: Termites (Richard, Snyder, Noirot, Lüscher, Harris, Krishna, Russo, Kalsoven, Baccetti, Howse, Wilkinson, Ernst, Hocking, Becker, Kushwaha, Springhetti) L. it. 6500 or \$10.5
- Vol. 12: Sect. 2°: Ants (Gösswald, Kloft, Pavan, Kneitz, Cole, Wellenstein, Kannowski, Kusnezov, Poldi, Ronchetti, Halberstadt, Haldane, Mukerji). Sect. 3°: Bees and wasps (Chauvin, Morse, Michener, Strambi, Esch, Husing, Da Costa Cruz, Altmann, Gontarski Vinogradova, Spurway).
Symp. 3°: Symbiosis (Buchner, Koch, Fava, Laudani, Jucci) L. it. 6500 or \$10.5

Orders may be sent to the Managing Editor or placed through booksellers.
Managing Editor: The Acting Director, Istituto di Zoologia, P. Botta, PAVIA (Italy).

COMMONWEALTH BUREAU OF PLANT BREEDING AND GENETICS

SCHOOL OF AGRICULTURE, CAMBRIDGE, ENGLAND

Information on all topics concerned with the improvement of economic plants and microorganisms, in particular the methods and achievements of crop breeding, field trials, new varieties and strains, genetics and cytology, is given regularly in the journal

PLANT BREEDING ABSTRACTS

COMPILED FROM WORLD LITERATURE

Each volume contains over seven thousand abstracts from articles and reports in thirty to forty different languages, also reviews of new books and notices of new journals.

ANNUAL SUBSCRIPTION:

Rate to subscribers in Non-Contributing Countries 140s. (\$21.00)

Rate to subscribers in Contributing Countries 70s. per volume (including indexes)

Order through booksellers or to

COMMONWEALTH AGRICULTURAL BUREAUX
CENTRAL SALES BRANCH, FARNHAM ROYAL, SLOUGH, ENGLAND

INTERNATIONAL ABSTRACTS OF BIOLOGICAL SCIENCES

AIMS AND SCOPE

INTERNATIONAL ABSTRACTS OF BIOLOGICAL SCIENCES attempts to cover the more important papers in experimental biology, approaching the subject from the fundamental point of view, with emphasis on

ANATOMY
BIOCHEMISTRY
BIOPHYSICS
CYTOLOGY

GENETICS
IMMUNOLOGY
PHARMACOLOGY
PHYSIOLOGY

Also covered are BOTANY and ZOOLOGY, treated as experimental subjects; ANIMAL BEHAVIOUR; biochemical and physiological aspects of MICROBIOLOGY and PATHOLOGY; ODONTOLOGY, which includes DENTAL PATHOLOGY and DENTAL ANATOMY.

JOURNALS COVERED

A list of the journals (currently over 500) which are regularly scrutinized by the abstractors is given in the first number of each volume. In the majority of cases an indicative abstract of the paper is prepared, but in a few cases—for instance, if the paper is a preliminary communication or the subject matter is border-line—an expanded title only is given.

The total number of abstracts published in a year exceeds 26,400. Monthly issues contain over 2,200 abstracts each. Three issues and index of subjects and authors constitute a quarterly volume.

*Write for free inspection copy and details of subscription rates,
mentioning this journal*

PERGAMON PRESS Headington Hill Hall, Oxford

JOURNAL OF GENETICS

Editor: S. D. Jayakar, M.Sc.

BHUBANESWAR 3
ORISSA, INDIA.

The Journal of Genetics publishes researches in genetics, as Bateson used that word, i.e., to mean "Heredity and Variation" in his letter of 18/4/1905 to Adam Sedgwick, and "The special physiology of Descent" in "Darwin and Modern Science" in 1909. Primarily a record of Research in the Commonwealth, it includes some outside contributions.

It has been possible to reduce the price of Journal of Genetics to R⁸.55, £4 5s, or \$15 per volume.

Subscriptions are accepted as per volume. Volume 59 is the current volume.

All communications should be sent to "THE JOURNAL OF GENETICS", Bhubaneswar 3, Orissa, India

Annals of Human Genetics

Edited by
H. HARRIS

with the assistance of

JULIA BELL,
R. R. RACE, J. A. F. ROBERTS
C. A. B. SMITH

The *Annals of Human Genetics* publishes original articles which describe observations on human heredity or which deal with closely related genetical and statistical problems

Subscription price, 120s. net per volume
Single issues 35s. plus postage,

CAMBRIDGE UNIVERSITY PRESS

Bentley House, 200 Euston Road, London, N.W.1.

FULL PARTICULARS OF THE

JOURNALS

PUBLISHED BY THE

CAMBRIDGE UNIVERSITY
PRESS

MAY BE HAD FROM

THE MANAGER
CAMBRIDGE UNIVERSITY PRESS

Bentley House
200 Euston Road, London, N.W.1

JOURNAL OF REPRODUCTION AND FERTILITY

The Journal publishes original papers, abstracts of Proceedings, and occasionally reviews and bibliographies, dealing with the morphology, physiology, biochemistry and pathology of reproduction in man and animals, and with the biological, medical and veterinary problems of fertility and lactation. Numbers are issued bimonthly to give two volumes a year.

Papers to appear during 1965 include:

- G. W. DUNCAN and A. D. FORBES. Blastocyst survival and nidation in rats treated with oestrogen antagonists
- R. P. AMANN, H. H. KOEFOED-JOHNSEN, H. LEVI and A. NIELSON. Excretion pattern of labelled spermatozoa and the timing of sperm formation and epididymal transit in rabbits injected with thymidine ^3H
- C. A. JOËL and M. HERZBERG. Glutamic-oxaloacetic transaminase in human semen and reproductive organs
- K. P. BLAND and B. T. DONOVAN. Experimental ectopic implantation of eggs and early embryos in guinea-pigs
- T. SUGIE. Successful transfer of a fertilized bovine egg by non-surgical techniques
- H. M. WEITLAUF and G. S. GREENWALD. A comparison of ^{35}S methionine incorporation by the blastocysts of normal and delayed implanting mice
- N. HODSON. Sympathetic nerves and reproductive organs in the male rabbit
- P. F. KRAICER and M. C. SHELESNYAK. Studies on the mechanism of nidation. XIII. The relationship between chemical structure and biodynamic activity of certain ergot alkaloids
- R. L. BRINSTER. Studies on the development of mouse embryos in vitro. IV. Interaction of energy sources
- M. C. ORGEBIN-CRIST. Passage of spermatozoa labelled with thymidine ^3H through the ductus epididymidis of the rabbit
- T. P. LIN and D. W. BAILEY. Difference between two inbred strains of mice in ovulatory response to repeated administration of gonadotrophins

Editorial correspondence should be sent to the Executive Editor, Journal of Reproduction and Fertility, 8 Jesus Lane, Cambridge, England, and business correspondence to the publishers.

The subscription rate for 1965 is £6 per volume or £12 per year (two volumes). U.S.A. and Canada \$20.00 per volume or \$40.00 per year.

BLACKWELL SCIENTIFIC PUBLICATIONS
BROAD STREET, OXFORD