# GENETICAL RESEARCH

EDITORIAL BOARD

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

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 22, N.Y.

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, 510 North Avenue, Ne<sup>---</sup> Rochelle, N.Y. The subscription price is £6 net (including postage) for an attractional column 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 Submission of a paper or note will be taken to imply that it is unpublished and is not being considered for publication elsewhere.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)

# 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 1964 include:

- M ...UND and B. CAROL. Factors affecting haemocytometer counts of sperm concentration in human semen.
- K. T. KIRTON, H. D. HAFS and A. G. HUNTER. Levels of some normal constituents of bull semen during repetitive ejaculation.
- N. Kovačić. Biological characteristics of pituitary and placental hormones.
- J. C. WALLACE and R. G. WALES. Effect of ions on the metabolism of ejaculated and epididymal ram spermatozoa.
- M. C. Morrissette, L. E. McDonald and R. D. Morrison. Effect of 17α-ace-toxyprogesterone in pregnant rats.
- B. C. WENTWORTH and W. J. Mellen. Active immunity induced and spermatogenesis suppressed by testicular antigen in the male Japanese quail.
- P. F. KRAICER and M. C. SHELESNYAK. Studies on the mechanism of nidation.
- J. C. WALLACE and A. K. LASCELLES. Composition of testicular and epididymal lymph in the ram.
- A. G. Hunter and H. D. Hars. Some physicochemical properties of saline-soluble proteins in bovine spermatozoa.
- P. SOUPART and R. W. Noyes. Sialic acid as a component of the zona pellucida of the mammalian ovum.
- R. D. BAKER and P. J. DZIUK. Semen composition and ejaculation of the boar after pilocarpine administration.
- H. M. DOTT. Results of inseminations with ram spermatozoa in different media.
- M. C. Orgebin-Crist. Delayed incorporation of thymidine <sup>3</sup>H in epithelial cells of the ductus epididymidis of the rabbit.
- A. M. McFarquiar and P. E. Lake. Artificial insemination in quail and the production of chicken-quail hybrids.

Editorial correspondence should be sent to the Executive Editor Physiological Laboratory, Downing Street, 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

# 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

# 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 "The Charolais and Its Use in Crossbreeding" by J. D. Turton; "Synchronisation of Ovarian Cycles in Sheep and Cattle" by D. R. Lamond; "The relation between Body Size, Conformation and Milk Yield in Dairy Cattle" by I. Johansson.

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

### SYMPOSIA GENETICA et BIOLOGICA ITALICA

A Journal of genetics and general biology mainly devoted to the scientific contributions of the "Istitute di Zoologia Lazzaro Spallanzani" of the University of Pavia and of the "Centro Appenninico", a biological station on Mount Terminillo (Rieti).

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 (1963). 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. 1º: Endocrinology (Lüscher, Schweiger, Karlson, Bernardini-Mosconi, Lukoschus, Schmidt, Jucci).
   Symp. 2º: Cast differentiation (Gösswald, Brian, Pain, Simpson).
   Simps. 4º: 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, Rudney, Becker, Ruj). Sect. 1°: Termites (Richard, Snyder, Noirot, Lüscher, Harris, Krishna, Russo, Kalsoven, Baccetti, Howse, Wilkinson, Ernst, Hocking, Becker, Kushwaha, Springhetti)

  Lit. 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).

# GENETICA AGRARIA

A Journal of "Genetics applied to Agriculture" edited by the Istituto di Zoologia of the University of Pavia with the support of the Società Italiana di Genetica Agraria (SIGA).

The Journal is issued four times a year. Price per volume of about 400 pages: from Vol. IX°, L. 5000 or \$8.5; from Vol. XV°, L. 6500 or \$10.5.

Besides other original papers, 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). Reports by Carrante, Jucci, Visco, Conti Dionigi, Maliani, Candura, Casali, Agnesi, Kokolios (Greece), Bonaspetti (Brazil).
  1962, n. 3-4: Proceedings of the VIII° Meeting of the SIGA in Bergamo on: "Breeding for quality in cultivated plants and methods for it". Report (in German) by Schwanitz, Hackbarth;
- (in Italian) by Fenaroli, Bianchi, Meletti, Rognoni, Dionigi, Panella. Vol. XVI°, 1963, n. 1-4: Proceedings VIII° Meetings SIGA in Bergamo (continued). Reports (in English) by Banga and Wood; (in Italian) by Wittmer, Nozzolini, Visonà, Marchesi, Trentin, De Bastiani, Manunta, Scaramella-Petri, Mariani, Bozzini, Zanotti. Miscellaneous contributions (in English) by Bal; (in Italian) by Matassino, Uncini, Chiappini, Maliani Carfagna, Bettini.
- Vol. XVII<sup>o</sup>, 1964, n. 1-4: Proceedings of the FAO Meeting on: "Plant exploration and introduction", Rome 1961, edited by G. Julén. Reports (in English) by Jucci, Purseglove, Ross, Hartley, Ellerström, Yamashita, Oppenheimer, Brieger, Rachie, Stanton, Thomas, Krug, Wykerley, Bartley, Stein, Banga, Pansiot, Boom, Whyte, Julén, Maguire, Rudorf, Erkun, Hawkes, Hudson, Hyland, Hafiz, Yangboonkird, Smitinand, Singh, Granhall, Tinsley; (in French) by Perrin de Brichambaut, Hedin, Angladette, Koechlin, Sauger, Portères, Souty, Barrau; (in Spanish) by Leon, Marzocca.
  - 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 (\$21.00) or 140s.

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

# GENETICS CITATION INDEX

3 specialized indexes to the genetics and related literature with special emphasis on human genetics

> complete in a single 900-page reference volume

for more information, write department 43-1

## INSTITUTE FOR SCIENTIFIC INFORMATION

325 Chestnut Street Philadelphia Pa 19106 / Telephone 215-923-3300

### GENUS

The review of the
ITALIAN COMMITTEE FOR THE
STUDY OF POPULATION PROBLEMS and of the ITALIAN SOCIETY
OF GENETICS AND EUGENICS

edited under the auspices of the
NATIONAL RESEARCH COUNCIL
EDITOR: CORRADO GINI

Contents of volume XIX, n. 2, 1963

ROBERT E. KUTTNER—Eugenic Aspects of Preventive Therapy for Mental Retardation.

CORRADO CINI—Di un'applicazione della transvariazione alla tassonomia (La regola del 75%). I. DALLA VALLE e S. SAGGESE—Iauada del Fezzan:

Caratteristiche demografiche.
GEORGE A. AGOGINO—The Paleo-Indian in North
America.

P. EDUARDO NICOLICCHIA—La situazione demografica di Um-el-Araneb nell'ottobre del 1933. CORRADO GINI—L'America Latina e i futuri sviluppi della Sociologia.

INTERNATIONAL COMMITTEE FOR THE STUDY OF THE HUMAN-LIKE HAIRY BIPEDS

I. T. SANDERSON—Some Preliminary Notes on Traditions of Submen in Arctic and Subarctic North America.

C. R. DORION—Aparecio por tierras de Izabal. M. J. Jurcich—Tarma, el Hombre Salvaja de America.

CHARLES CORDIER—Deux anthropoides inconnus marchant debout au Congo ex-Belge.

I. T. SANDERSON—The Winderwasa or Hairy Primitives of Ancient Europe.

Rassegna:

RASSEGIIA:
CORRADO GINI—Teoria scientifica della cultura e altri saggi.

Recensioni. Bibliografia.

#### GENUS

Accepts scientific articles, papers, notes and communications written in Italian, English, French, German and Spanish in the field of the different sciences related to population problems (Demography, Sociology, Economics, General Biology, Genetics, Eugenics, Anthropology, Social Hygiene, Psychology, Geography).

Orders should be addressed to:

Segreteria del Comitato Italiano per lo Studio dei Problemi della Popolazione – Via delle Terme di Diocleziano 10 – ROMA (Italy).

Lit. 3.600

U.S.A. \$6.00

## A NEW PERGAMON WORK



### **Genetics Today**

In three volumes

Edited by S J Geerts, Genetics Laboratory, Nijmegen

Contains the papers presented at the XIth International Congress of Genetics, held in Scheveningen, The Hague. The complete proceedings of the congress are published in Volumes Two and Three, whilst Volume One contains abstracts of contributed papers, demonstrations and films. The immense importance of this authoritative publication is underlined by the fact that no fewer than 2,500 specialists from all over the world attended the Congress ensuring a rich cross-fertilization of ideas for future investigation and a valuable exchange of research data and techniques.

Offered for sale by

#### Robert Maxwell & Co. Ltd.

International University and Industrial Booksellers Waynflete Building, 4 St Clements, Oxford 4 & 5 Fitzroy Square, London W 1 44-01 21st Street, Long Island City 1, New York Edinburgh Glasgow Lancaster Paris Frankfurt

Pergamon Press books are distributed in the Western Hemisphere and the Philippines by The Macmillan Company, 60 Fifth Avenue, New York 11, N Y Just Published . . .

### **CELL CULTURE AND SOMATIC VARIATION**

Morgan Harris, University of California, Berkeley

This remarkable new text cuts freely across established disciplines to present a clear, complete picture of a dynamic new area. Somatic cell heredity is broadly interpreted to include developmental, genetic, and neoplastic changes in differentiated cells and tissues. Experimental emphasis is on cell culture, and, to a lesser extent, tissue transplantation, with detailed discussions of cell nutrition, population dynamics in cell cultures, malignant transformation, and transplantation of normal tissues and tumors. Contains a listing of 1500 references and over 100 illustrations.

1964

560 pp.

\$15.00

Noteworthy . . .

### **EVOLUTION AND GENETICS: The Modern Theory of Evolution**

David J. Merrell, University of Minnesota

The theory of evolution, with discussion of evidence ranging from geographical distribution to biochemical factors, is fully presented in a book that also outlines the modern theory of the mechanism of evolution and explains the operation of evolutionary forces.

1062

448 pp.

\$6.00

#### A Fresh and Imaginative Look at Life Science

# **Modern Biology Series**

Ten beautiful, beautifully written paperbacks. Singly, each of them gives a complete, easy-to-understand treatment of its particular subject. Together, they create an up-to-the minute text on basic biology.

#### **CELL STRUCTURE AND FUNCTION**

Ariel G. Lowey, Haverford College Phillip Siekevitz, Rockefeller Institute 1963 236 pp. \$2.65

#### **ECOLOGY**

Eugene P. Odum, University of Georgia 1963 160 pp. \$1.75

#### **GENETICS**

Robert Paul Levine, Harvard University 1962 192 pp. \$1.95

#### **EVOLUTION**

Jay M. Savage, University of Southern California, Los Angeles 1963 136 pp. \$1.75

#### ANIMAL STRUCTURE AND FUNCTION

Donald R. Griffin, Harvard University 1962 128 pp. \$1.75

#### THE LIVING PLANT

Peter Martin Ray, University of Michigan 1963 144 pp. \$1.75

#### MICROBIAL LIFE

William R. Sistrom, University of Oregon 1962 128 pp. \$1.75

#### ANIMAL ADAPTATION

Allison L. Burnett, Western Reserve University Thomas Eisner, Cornell University January, 1964 144 pp. \$1.75

In preparation . . .

#### DEVELOPMENT

J. D. Ebert, Carnegie Institute of Washington

#### PLANT DIVERSIFICATION

Theodore Delevoryas, Yale University



In Canada: 833 Oxford Street, Toronto 18, Ontario