PROCEEDINGS

OF THE

ROYAL SOCIETY OF EDINBURGH

PROCEEDINGS

OF

THE ROYAL SOCIETY OF EDINBURGH

Section B (Biology)

VOL. LXX

1967-1969

PUBLISHED BY THE

ROYAL SOCIETY OF EDINBURGH

22 GEORGE STREET

EDINBURGH EH2 2PQ

1969

CONTENTS

No.		PAGE
* 1.	Siphonophora in the Plankton to the North and West of the British Isles. By J. H. Fraser, Marine Laboratory, Aberdeen. (With Fourteen Charts and Three Tables.) Issued March 1, 1967,	I
*2.	Some New Data on "Kylitic" Sills and Associated Picrites in Ayrshire, Scotland. By H. I. Drever and J. G. MacDonald, Department of Geology, University of St Andrews. (With One Plate and Six Text-figures.) Issued March 1, 1967,	31
*3.	The Response of Human Motor Nerve to Rectangular Electric Pulses Applied Through Electrodes Placed on the Skin. By W. G. S. Stephens, Department of Physiology, University of St Andrews. Communicated by Professor A. E. Ritchie. (With Four Text-figures and Five Tables.) Issued June 28, 1967,	49
4.	On the Biology of a herbivorous Fish, the White Amur or Grass Carp, Ctenopharyngodon idella Val. By C. F. Hickling, Tropical Fish Culture Research Institute, Malacca. Communicated by Dr C. M. Yonge. (With Five Text-figures and Ten Tables.) Issued June 28, 1967,	62
* 5.	The Artificial Fertilization and Rearing of the Eggs of Coregonus clupeoides Lacépède. By Peter S. Maitland, Department of Zoology, University of Glasgow. Communicated by Dr H. D. Slack. (With Nine Text-figures and Two Tables.) Issued August 23, 1967,	82
* 6.	Cytological Studies of Stored Product Insects. I. Caryedon gonagra (F.) (Bruchidæ). By Ann R. Sanderson, Department of Natural History, Queen's College, University of St Andrews, Dundee. Communicated by Professor A. D. Peacock. (With Three Plates.) Issued September 13, 1967,	107
7.	Symposium organised by Professor Robert McWhirter. The Biological Effects of Ionizing Radiation. Issued February 2, 1968.	
	The Biochemical Effects of Ionizing Irradiation on Nuclear Function in Animal Cells. By Margery G. Ord and L. A. Stocken, Department of Biochemistry, University of Oxford. (With Three Tables.)	117
	Studies on Chromosome Damage Following in vivo Human Radiation Exposure. By W. M. Court Brown, M.R.C. Clinical Effects of Radiation Research Unit, Western General Hospital, Edin-	
	burgh	125

vi Contents

+	The Response of Human Chromosomes to Ionizing Radiations in vitro Studies. By H. J. Evans, Department of Genetics, Marischal College, University of Aberdeen. (With Eight Textfigures and Three Tables.)	132
	The Relevance of Intra-Cellular Damage to Effects in the Complex Organism. By R. H. Mole, Medical Research Council, Radio-biological Research Unit, Harwell, Didcot, Berkshire. (With One Text-figure.)	152
8.	The Spirit of Science. By Sir Lawrence Bragg. Issued December 1, 1967,	163
9.	A Sceptical Chemist in a Biological Wonderland. By J. N. Davidson, Institute of Biochemistry, University of Glasgow. Issued December 20, 1967,	169
* 10.	The Natural History of Yellow Fever in Africa. By A. J. Haddow, Department of Epidemiology and Preventive Medicine, University of Glasgow, Ruchill Hospital, Glasgow. Issued May 10, 1968,	191
* 11.	On the Binding of Acetic Acid by Proteins. By J. K. Candlish, Department of Biochemistry, Faculty of Medicine, University of Malaya, Kuala Lumpur, and G. R. Tristram, Department of Biochemistry, St Salvator's College, University of St Andrews. (With One Text-figure.) Issued May 3, 1968,	228
* 12.	The Reproduction and Fecundity of the Powan, Coregonus clupeoides Lacépède, in Loch Lomond, Scotland. By Peter S. Maitland, The Nature Conservancy, Edinburgh. Communicated by Dr H. D. Slack. (With Fourteen Text-figures and Five Tables.) Issued March 14, 1969,	233
*13.	Preliminary Cytological Investigation of the Collembolan Hypogastrura viatica (Tullberg 1872). By Ann R. Sanderson, Department of Biological Sciences, University of Dundee. Communicated by Professor A. D. Peacock. (With Two Plates.) Issued March 14, 1969,	265
14.	Abiogenic Information Coupling between Nucleic Acid and Protein, or, how Protein and DNA were married. By Melvin Calvin, Laboratory of Chemical Biodynamics, University of California, Berkeley. (With Fifteen Text-figures and Three Tables.) Issued July 22, 1969,	273
*15.	The metabolism of DNA in the liver during precocious induction of metamorphosis in <i>Rana catesbeiana</i> . By Ailsa M. Campbell, Martita H. Corrance, J. N. Davidson and H. M. Keir, Institute of Biochemistry, University of Glasgow. (With One Table and Six Text-figures.) Issued October 2, 1969.	205

Contents vii

16.	Symposium organised by Sir Michael Woodruff. Anti-lymphocytic Antibody. Issued December 19, 1969,	
	Introduction. By Sir Michael Woodruff, Department of Surgical Science, University of Edinburgh Medical School,	313
	The <i>in vivo</i> Action of Anti-lymphocytic Antibody. By A. M. Denman and Evelyn J. Denman, Rheumatism Research Unit, Canadian Red Cross Memorial Hospital, Taplow, near Maidenhead, Berks. (With Seven Text-figures and Three Tables.)	317
*	The Characterization of Anti-lymphocytic Antibodies. By Keith James, Department of Surgical Science, University of Edinburgh Medical School. (With Five Text-figures.)	329
*	Clinical Aspects of the Use of Anti-lymphocytic Serum. By B. Nolan, Department of Surgical Science, University of Edinburgh Medical School,	341
	Large-scale Production of Anti-lymphocytic Antibody. By D. A. Long, D. C. Edwards, A. W. Phillips and A. J. Woiwod, The Wellcome Research Laboratories, Beckenham, Kent. (With Five	
	Tables.)	346

^{*} The cordial thanks of the Society are due to the Carnegie Trust for the Universities of Scotland for grants towards the cost of the illustrations and tables in these papers.

INSTRUCTIONS TO AUTHORS (continued)

The overall space available for figures and plates is $9\frac{1}{2}'' \times 7\frac{1}{2}''$ in *Transactions* and $7\frac{1}{2}'' \times 4\frac{3}{4}''$ in *Proceedings*.

Photographs should be unmounted glossy black and white prints, marked on the back with the name of the author, number of the figure, and an indication of the top. Prints should not be trimmed or cut out. Authors should suggest the arrangement of the figures on each plate, either by a diagram or a paste-up of rough prints, with indication of any lettering to be inserted.

Lettering must be in black ink in neat and legible style, or lightly written in pencil.

Indicating Lines and Arrows required on wash drawings or photographs should have the point marked by a pin-hole, and must be drawn on the back or on a covering tissue and not on the photograph or drawing. On line drawings such lines should be drawn thin but firmly.

Graphs should be drawn on white Bristol board or on squared paper ruled in faint blue lines: no other colour ruling is suitable. Since blue lines do not appear in reproductions, any cross-lines required must be drawn. If a tracing of a graph constructed on an unsuitable grid is submitted, white tracing paper should be used.

Numerical values. In papers concerned with the biological sciences ALL numerical values must be accompanied by their decimal equivalents.

Tables. Tabular matter must be kept to a minimum. No paper should present both tables and corresponding graphs, except where good reason can be given.

Duplicates. When the author can conveniently do so, it is desirable that duplicates of illustrations should be supplied for the use of the referees.

Proofs of papers will be sent to authors or communicators to the addresses indicated in correspondence or on MSS. The cost of authors' corrections in excess of 5 per cent of the printer's charges for the setting of a particular paper will be charged to the authors. Proofs should, if possible, be returned within one week to The Secretary, Royal Society of Edinburgh, 22 George Street, Edinburgh, 2, and not to the printer. To prevent delay, authors who are abroad should, if possible, appoint someone in this country to correct proofs.

Offprints. As soon as a *Transactions* paper, or the sheet in which the last part of a *Proceedings* paper appears, is ready for press, copies of offprints, in covers bearing the title of the paper and the name of the author, are printed and placed on sale. The date of such separate publication is printed on each paper. Authors of papers will receive twenty-five offprints free, if they so desire. Additional offprints may be obtained at a fixed scale of prices given on a form attached to the first proof. To prevent disappointment, especially if a paper contains plates, authors should, as soon as possible, notify the Secretary of the number of additional copies required.

Indexes. To facilitate the compilation of indexes, and to secure due attention being given to the important points of a paper in Catalogues of Scientific Literature, authors are requested to supply to the Secretary, with the final proofs of papers, a brief index (on the model given below) of the points in a paper which are considered new or important. Indexes will be edited by the Secretary for publication in each volume of the *Transactions* and *Proceedings*.

MODEL INDEX

Houstoun, R. A.—A measurement of the velocity of light. *Proc. Roy. Soc. Edinb.*, A, 63, 1949-50, 95-104. Light, A measurement of the velocity of.

R. A. Houstoun. Proc. Roy. Soc. Edinb., A, 63, 1949-50, 95-104.

Velocity of Light, A measurement of the.

R. A. Houstoun. Proc. Roy. Soc. Edinb., A, 63, 1949-50, 95-104.

Authors are advised, before submitting papers, to consult General Notes on the Preparation of Scientific Papers (2nd Edn., 1965) (Royal Society of London), especially the chapters dealing with symbols, signs, and abbreviations recommended for British Scientific Publications. A copy may be consulted in the Library of the Royal Society of Edinburgh. Personal copies of the General Notes may be obtained, price 5s. 6d. per copy, postage included, from the Executive Secretary, Royal Society of London, 6 Carlton House Terrace, London, S.W.2.

PROCEEDINGS OF THE ROYAL SOCIETY OF EDINBURGH

(Section B)

Volume 70 1969	Part 4	
CONTRIVES		
CONTENTS		
14. CALVIN, MELVIN Abiogenic Information Coupling between Nucleic Acid and Protein, or, how Protein and DNA were married	273-294	
15. CAMPBELL, AILSA M., CORRANCE, MARTITA H., DAVID- SON, J. N. and KEIR, H. M. The metabolism of DNA in the liver during precocious induction of metamorphosis in <i>Rana catesbeiana</i>	295-310	
16. Symposium: Anti-lymphocytic Antibody		
WOODRUFF, SIR MICHAEL Introduction	313–316	
DENMAN, A. M. and DENMAN, EVELYN J. The in vivo Action of Anti-lymphocytic Antibody	317-328	
JAMES, KEITH The Characterization of Anti-lymphocytic Antibodies	329-340	
NOLAN, B. Clinical Aspects of the Use of Anti-lymphocytic Serum	341-345	
LONG, D. A., EDWARDS, D. C., PHILLIPS, A. W. and WOIWOD, A. J.	346-352	

Price 35s. (U.S. \$6.00)

Proc. Roy. Soc. Edinb. B. 70

346-354

Published by the Royal Society of Edinburgh 22 George Street, Edinburgh 2

Large-scale Production of Anti-lymphocytic Antibody

Printed in Scotland by Messrs Neill & Co. Ltd., 212 Causewayside, Edinburgh