

and the one by Hinde on aspects of the control of reproductive development more exciting because they contain fountainheads of new research data. It is disappointing to find certain important subjects of research without representation or inadequately covered; bird migration, for example, is represented only by a single paper treating aircraft-type (APS-31) radar investigations and two papers on homing in pigeons. The latter papers, though, are important if for no other reason than for showing that none of the current hypotheses is able to explain all the phenomena of homing behavior that have been found in experimental studies. These papers could do much to stimulate further investigations that will lead eventually to the resolution of this biological enigma.

The topic of evolutionary avian biology is represented by two excellent discourses by two very able workers, Bock and Stresemann, but one might have hoped for additional coverage of the subject. An examination of the titles of the papers offered in the sectional sessions of this congress reveals several that might well have merited inclusion among the select group. Perhaps some sort of happy medium between publishing all papers delivered at a congress and publishing only those that were invited would be the best policy to follow.

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Cells in Development

Morphological and Biochemical Aspects of Cytodifferentiation. Papers presented at a round-table conference, Valbella, Switzerland, Sept. 1966. E. HAGEN, W. WECHSLER, P. ZILLIKEN, and A. F. GARDNER, Eds. Karger, Basel, 1967 (available from Phiebig Books, White Plains, N.Y.). viii + 271 pp., illus. \$9.40. *Experimental Biology and Medicine*, vol. 1.

Papers presented at a conference on problems of cellular differentiation were compiled to form the first volume of the new series *Experimental Biology and Medicine: A Series of Interdisciplinary Topics*. The topic of this first volume was well chosen, as can be seen from the discussions of cytological, electron microscopic, biochemical, and genetic approaches to problems of cellular differentiation.

The first section of the book is de-

voted to the morphological and biochemical analysis of primary inductions. Over half a century has passed since the classic experiments of Spemann revealed the importance of cellular interactions during early embryonic development. From the time of these discoveries, attempts have been made to study the biochemical mechanisms of this aspect of embryonic development. The limitation of earlier studies was a lack of biochemical technology; the limitation that will always exist is the lack of large quantities of material to work with. To overcome some of these difficulties, factors which influence neural and mesodermal inductions have been isolated from adult tissues. Descriptions of the isolation and partial characterization of these factors, as well as of their ability to regulate primary inductions, are presented along with morphological analyses. The papers presented in this section represent the techniques and procedures, as well as the progress which has been made from the time of Spemann's first discoveries to the present-day approach to problems of embryonic induction. Macromolecular factors have also been implicated in the regulation of growth and differentiation during later stages of embryogenesis. Neuralizing and mesodermalizing factors, for example, influence early cellular determination; nerve growth factor, whose chemical properties are well worked out, stimulates the growth of nerve fibers from sensory and sympathetic ganglia. More recently, erythropoietin has been implicated in the regulation of the terminal cellular differentiation of the reticulocyte. Both the nerve growth factor and erythropoietin exert their influence on cells which have already undergone the initial stages of determination. The mechanism of action of these factors is one of the many interesting approaches to experimental embryology today. Although mechanisms are postulated, there is no evidence regarding the degree of similarity or dissimilarity of the regulatory effect these factors exert.

The importance of an interdisciplinary approach to experimental embryology is stressed throughout this book, especially with respect to biochemistry and genetics. Cellular determination and subsequent stages of cytodifferentiation indicate that genetic expression is under strict regulation. The regulation of nucleic acid and protein synthesis during early embryogenesis

and during organogenesis has been one of the most active subjects of research during the past decade. This is clearly shown by the discussions presented on the regulation of nucleic acid and protein synthesis during the early development of the sea urchin embryo, as well as in reticulocyte, pancreas, lens, and cartilage differentiation. The problems in these cases are quite similar. The authors discuss the regulation of messenger and ribosomal RNA synthesis, the stability of messenger RNA, the initiation of synthesis of tissue-specific structural proteins and enzymes, and the possible control of synthesis of these proteins through transcriptional as well as translational mechanisms.

The papers in this volume are concisely written and provide a good representation of the types of developing systems amenable to biochemical and genetic analyses. This is one of many published symposia and conferences dealing with the biochemical aspects of cellular differentiation. The multiplicity is to be expected, however, in view of the continuing upsurge of interest in experimental embryology. Students of developmental biology as well as those indirectly interested in this field will find this an interesting collection of papers.

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Immunology

Cross-Reacting Antigens and Neoantigens. With Implications for Autoimmunity and Cancer Immunity. Proceedings of a conference, Washington, D.C., May 1967. JOHN J. TRENTIN, Ed. Williams and Wilkins, Baltimore, 1967. xvi + 122 pp., illus. Cloth, \$9.25; paper, \$6.75.

The conference of which *Cross-Reacting Antigens and Neoantigens* is the proceedings was convened to discuss the chemical and immunological relationships between bacterial and mammalian tissue antigens on the one hand and neoantigens that appear following viral infections of cells on the other, and the possible roles of these antigens in some disease states and transplantation immunity phenomena. The 11 formal contributions can be grouped according to three general subjects: (i) the nature and scope of antigenic cross reactivity, predominantly as it relates

to polysaccharide antigens of bacterial origin; (ii) the occurrence and significance of antigenic cross reactions in nature; and (iii) the influence of viruses on tissue antigenicity and the formation of new cellular antigens.

The contributions in the first group emphasize the important role of chemical constitution of polysaccharides in determining their immunological specificity and cross reactions and serve as a broad background for the entire conference. Transplantation antigens appear to be protein in nature, and although the "cross reactions" of proteins are more complicated, it would have been profitable, in a conference concerned with tissue transplantation, to have some discussion of the determinants and cross reactions among proteins. Some applications of *in vitro* cross reactions related to transplantation and autoimmune phenomena are presented in the papers of the second group. That mice, rats, and rabbits share with guinea pigs the ability to develop skin allograft sensitivity after treatment with certain streptococcal antigens was suggested to be related to a similarity between chemical structures in the bacterial and in the mammalian cell membranes. Similarly, investigations of the occurrence of streptococcal antigens immunochemically related to mammalian heart and kidney antigens has led to the view that induction of autoimmunity to heart tissue (rheumatic fever) may result from infection by group A *Streptococcus*.

The role of viral infection in inducing the formation of new mammalian cellular antigens showed that more than one type of new antigen can arise as a result of cell-virus association. The last few papers in the conference dealt with aspects of the phylogeny and biological significance of tissue antigens.

The major contribution of this book is that in it are brought together the presentations and verbatim discussions of about 50 individuals on immunological cross reactions and how they might relate to tissue transplantation. Few new data are presented, and the book is recommended mainly for pointing out the need for more basic information about the biochemical and cellular aspects of transplantation immunity at a time when sporadic practical achievements are being widely hailed.

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Books Received

Ancient Environments. Léo F. Laporte. Prentice-Hall, Englewood Cliffs, N.J., 1968. xii + 115 pp., illus. Cloth, \$5.95; paper, \$2.

An Annotated Bibliography on Tribal Education in India. Compiled and annotated by L. R. N. Srivastava and S. V. Gupta. Tribal Education Unit, Department of Adult Education, New Delhi, 1967. x + 117 pp.

Annuaire Hydrologique de Belgique 1966. Commissariat Royal au Problème de l'Eau. Institut Royal Météorologique de Belgique, Brussels, 1967. xiv + 254 pp., illus.

Beyond History. The Methods of Prehistory. Bruce G. Trigger. Holt, Rinehart and Winston, New York, 1968. xvi + 105 pp., illus. Paper, \$1.95.

The Biological Way of Thought. Morton Beckner. University of California Press, Berkeley, 1968. viii + 200 pp. Paper, \$1.95. Reprint of the 1959 edition.

Bio-Medical Telemetry. Sensing and Transmitting Biological Information from Animals and Man. R. Stuart Mackay. Wiley, New York, 1968. xii + 388 pp., illus. \$12.50.

Botany Made Simple. Victor A. Greulich. Illustrated by Charles C. Clare, Jr. Doubleday, Garden City, N.Y., 1968. 191 pp. Paper, \$1.95.

Communication Theory. Transmission of Waveforms and Digital Information. D. J. Sakrison. Wiley, New York, 1968. xiv + 369 pp., illus. \$12.95.

Communism and the Politics of Development. Persistent Myths and Changing Behavior. John H. Kautsky. Wiley, New York, 1968. viii + 216 pp., illus. \$6.95.

Comptes Rendus. 24th Conference of the International Union of Pure and Applied Chemistry, Prague, Sept. 1967. Butterworths Scientific Publications, London, 1967. 176 pp.

Current Algebras and Applications to Particle Physics. Stephen L. Adler and Roger F. Dashen. Benjamin, New York, 1968. xiv + 394 pp., illus. Cloth, \$12.50; paper, \$5.95.

Dawn of Zoology. Willy Ley. Prentice-Hall, Englewood Cliffs, N.J., 1968. viii + 280 pp., illus. \$7.95.

The Decipherment of Linear B. John Chadwick. Cambridge University Press, New York, ed. 2, 1968. x + 164 pp., illus. \$5.50.

Developments in Theoretical and Applied Mechanics. Vol. 3. Proceedings of the 3rd Southeastern Conference, Columbia, S.C., Mar.-Apr. 1966. W. A. Shaw, Ed. Pergamon, New York, 1968. xvi + 775 pp., illus. \$34.

Electricity and Matter. An Introductory Survey. Norman Feather. Edinburgh University Press, Edinburgh, 1968 (distributed in the U.S. by Aldine, Chicago). viii + 532 pp., illus. \$6.95.

Elementary Quantum Chemistry. Frank L. Pilar. McGraw-Hill, New York, 1968. x + 726 pp., illus. \$15.50.

Elements of Nuclear Physics. Walter E. Meyerhof. McGraw-Hill, New York, 1968. xii + 279 pp., illus. \$9.95.

Elements of X-Ray Crystallography.

Leonid V. Azároff. McGraw-Hill, New York, 1968. xviii + 610 pp., illus. \$15.75.

Fast Reactions and Primary Processes in Chemical Kinetics. Proceedings of the 5th Nobel Symposium, Stockholm, Aug.-Sept. 1967. Stig Claesson, Ed. Interscience (Wiley), New York; Almqvist and Wiksell, Stockholm, 1967. 487 pp., illus. \$27.50.

Galileo. Man of Science. Ernan McMullin, Ed. Basic Books, New York, 1968. xiv + 557 pp., illus. \$15.

The Interpretation of Animal Form. Essays by Jeffries Wyman, Carl Gegenbaur, E. Ray Lankester, Henri Lacaze Duthiers, Wilhelm His and H. Newell Martin, 1868-1888. Translations and introduction by William Coleman. Johnson Reprint Corp., New York, 1967. xxx + 191 pp., illus. \$10.

Interpretation of Electron Diffraction Patterns. K. W. Andrews, D. J. Dyson, and S. R. Keown. Plenum, New York, 1967. xii + 188 pp., illus. \$20.

An Introduction to Animal Biology. Dale C. Braungart and Rita Buddeke. Mosby, St. Louis, ed. 7, 1968. xvi + 368 pp., illus. \$8.25.

Linear Integrated Circuits. Theory and Applications. Jerry Eimbindler, Ed. Wiley, New York, 1968. xiv + 318 pp., illus. \$9.95.

Man-Made Fibers. Science and Technology. Vol. 2. H. F. Mark, S. M. Atlas, and E. Cernia, Eds. Interscience (Wiley), New York, 1968. xii + 493 pp., illus. \$19.95.

The Marvelous Animals. An Introduction to the Protozoa. Helena Curtis. Illustrated by Shirley Baty. Published for the American Museum of Natural History by Natural History Press, Garden City, N.Y., 1968. xviii + 189 pp. \$5.95.

Neurophysiological and Behavioral Research in Psychiatry. Report of a WHO Scientific Group. World Health Organization, Geneva, 1968. 33 pp. Paper, \$1. World Health Organization Technical Report series, No. 381.

New Look at Education. Systems Analysis in Our Schools and Colleges. John Pfeiffer. Odyssey Press, New York, 1968. xxiv + 162 pp., illus. Paper, \$1.

The New Materials. David Fishlock. Basic Books, New York, 1968. xii + 240 pp., illus. \$5.95.

The 1968 World Book Year Book. A Review of the Events of 1967. The Annual Supplement of the World Book Encyclopedia. Field Enterprises Educational Corporation, Chicago, 1967. 622 pp., illus.

Nonlinear Two Point Boundary Value Problems. Paul B. Bailey, Lawrence F. Shampine, and Paul E. Waltman. Academic Press, New York, 1968. xvi + 171 pp., illus. \$9.50.

Nuclear Forces. Introduction to Theoretical Nuclear Physics. Gernot Eder. Translated from the German by Irving Kaplan. M.I.T. Press, Cambridge, Mass., 1968. xii + 349 pp., illus. \$17.50.

Nuclear Matter and Nuclear Reactions. Ken Kikuchi and Mitsui Kawai. North-Holland, Amsterdam; Interscience (Wiley), New York, 1968. viii + 334 pp., illus. \$16. North-Holland Research Monograph.

Optimization in Control and Practice. I. Gumowski and C. Mira. Cambridge University Press, New York, 1968. x + 242 pp., illus. \$10.50.

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