

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