

Book Reviews

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Behavior

CONTROL AND DEVELOPMENT OF BEHAVIOR: AN HISTORICAL SAMPLE FROM THE PENS OF ETHOLOGISTS, ed. by Peter H. Klopfer and Jack P. Hailman. 1972. Addison-Wesley Publishing Co., Reading, Mass. 281 p. Softback; price not given.

This is the editors' second volume of papers of historical interest to the student of ethology. Four topics—"innate release mechanisms," displacement activities, imprinting, and learning—are discussed. Descriptive papers, arranged chronologically, communicate the complexity of one behavioral sequence and the laborious series of experiments leading to our present understanding of it; other papers, which describe attempts to elicit certain kinds of behavior by stimulating neurons or by injecting hormones, are less conclusive. But the conclusion of the book is optimistic. Papers by W. H. Thorpe, N. Tinbergen, and C. G. Beer challenge experimenters to incorporate new advances in neurophysiology, genetics, and developmental biology into their work. This volume is recommended to undergraduates who are contemplating research in ethology.

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Biochemistry

MACROMOLECULES: STRUCTURE AND FUNCTION, by Finn Wold. 1971. Prentice-Hall, Inc., Englewood Cliffs, N.J. 318 p. \$3.50 softback, \$8.75 hardback.

This textbook is another in the "Foundations of Modern Biochemistry" series. Wold says, in the preface: "In this book we discuss the status of the structure-function analysis of biological macromolecules and macromolecular complexes. The ultimate goal of the analysis must be to explain all the functional properties of the molecules in question in terms of their completely defined three-dimensional structure, and the analysis thus contains three separate components: the determination of structure, the determination and quantitation of function, and final correlation of this information into the structure-function model." This is an apt description of what the book is about. Both protein and nucleic acid systems are discussed. A key point is made early: all biologically active proteins must be able to recognize and

bind other substances. This concept is applied to enzymes and to immune, carrier, regulatory, and constructile proteins. The author discusses binding as studied in enzyme kinetics and, by analogy, applies this analysis to other protein systems. Next, structures of several enzymes, as models, are discussed in a way that is strongly supported by the experimental methodology and data from which the structures were deduced. The author skillfully interweaves the information derived from structure studies, activity measurements, and the effect of structure modification on activity in the various enzyme examples. The latter part of the book is devoted to nucleic acid systems in terms of structure studies, transcription of genetic information into ribonucleic acid and translation in protein biosynthesis, replication of deoxyribonucleic acid, and the assembly of all this into an integrated model.

This well-organized, well-written book is really a review of the state of the art as it pertains to structure-function relationships. Each chapter ends with citations of textbooks and reviews relevant to the chapter material; but many other references are included as footnotes. The book has an abundance of clear, useful figures and illustrations. It is fairly priced and is an especially good buy in the paperback version. It is highly recommended for instructors of biochemistry and molecular biology and their graduate students.

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LIFE IN ACTION, by Peter Farago and John Lagnado. 1972. Alfred A. Knopf, Inc., New York. 264 p. \$6.95.

This book is an attempt to explain fundamental concepts of biochemistry with minimal use of such conventional paraphernalia as formulas and equations. Designed primarily for the layman and for scientists who are not biologists, the book makes extensive use of simplified statements, analogies, and diagrammatic illustrations. Experimental evidence and items from the history of biochemistry are used in the development by authors who are professional biochemists. Clearly, they are seriously concerned with the awesome task of sharing biochemical ideas with the general public. The book briefly treats of the scope and methods of biochemistry; cellular organization; proteins, enzymes, and metabolic systems;

genetics; and cellular controls. It ends with a brief perspective on directions of development and the potential contributions of biochemistry.

Because the task is so difficult, it is understandable that the book is only partly successful in achieving its goals. Some major topics are omitted or are so compressed as to be of doubtful comprehensibility. The treatment stresses animal biochemistry; microorganisms and higher plants are neglected. For instance, the central role of photosynthesis is barely hinted at, and the process itself is touched on sketchily in less than two pages. Oversimplification often tempts the authors to teleologic phrasing of biologic functions; for example, the urinary loss of sugar in diabetes is described thus: "If insulin is not present in sufficient quantities, the kidney attempts to take out of the system as much glucose as possible . . ." Despite their sincerity in trying to simplify the exposition, the authors frequently lapse into biochemical terminology or apologize for the lack of scientific rigor of their statements. This could jar the ear of the layman, who is straining to understand material. The illustrations are not entirely satisfactory in their explicatory role and sometimes are so simplified as to be misleading.

Despite such difficulties, the book has major assets. It is written in a bright, attractive style. The authors are competent in their field, and the treatment is generally interesting and up-to-date. The biology teacher may well find this book useful and provocative. A good grounding in biology would negate the difficulties that make the book of questionable value to laymen. In any case, the attempt of biochemists to describe aspects of their science for serious consideration by others is praiseworthy.

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Botany

PLANTS, CHEMICALS AND GROWTH, by F. C. Steward and A. D. Krikorian. 1971. Academic Press, New York. 244 p. \$4.50 (softback).

F. C. Steward probably is best known for his success in developing complete plants from cultured cells. More recently he has directed some of his energy toward the writing of short books for nonspecialists. In this one he and a co-worker have attempted to introduce plant-growth regulators to a wide audience of students, teachers, research workers, and agriculturalists. Although the book is not meant to be an extensive review of the topic, there are good summaries on the kinds of growth regulators, on bioassay systems, on the interactions of regulators, and on the possible roles of plant hormones in the cell. The book