

Book Reviews

• Readers' comments on reviews should be addressed to the Editor.

Animal Behavior

FROM INSTINCT TO INTELLIGENCE: HOW ANIMALS LEARN, by Gloria Kirshner. 1970. Grosset and Dunlap Publishers, New York. 127 pp. \$3.95.

Gloria Kirshner has dexterously reduced a highly complicated subject to a level at which it can be understood and appreciated by young (junior-high age or younger) readers. The casual use of controversial terms—instinct, learning, mind, intelligence—is regrettable, but it would be most difficult to convey to children the subtleties of usage by behavioral scientists. The main virtue of the book is Kirshner's illustration of concepts and principles with up-to-date examples from the research of current investigators. Biochemical aspects of learning, for example, are described in the context of the work of Krech, Rosenzweig, McGaugh, and others, and the independence of some motor behaviors from proprioceptive feedback is illustrated by the Berman studies.

The main deficit of the book is its treatment of human behavior. The commonality of many behavioral principles to man and the other animals receives little emphasis; and many of the author's statements about distinctions between human and animal behavior—for example, "man was born to be free"; "man's ideas do not depend on his environment"; "man faces the problem of free choice"—are made with an implied obviousness that is not only misleading but highly disputable.

The virtues of this book, however, are such that it would be a valuable addition to a junior high school library, especially in view of the scarcity of introductory behavior texts for young readers.

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ANIMAL BEHAVIOR: A SYNTHESIS OF ETHOLOGY AND COMPARATIVE PSYCHOLOGY, by Robert A. Hinde. 2nd ed., 1970. McGraw-Hill Book Co., New York. 892 pp. \$11.50.

This scholarly volume is one of the finest overviews of animal behavior or animal psychology currently available. Encyclopedic in coverage, it contains discussions of and examples from the invertebrates (principally arthropods and cephalopods) as well as the vertebrates, including man. The organization of the voluminous material is not

always clear or easy to follow—discussion of some kinds of behavior will be found in widely separated chapters on very different subjects—but extensive cross references and parenthetical allusions help to overcome this difficulty. There is much valuable material here for the biologist, physiologist, psychologist, and sociologist: ethology is one of the truly interdisciplinary subjects.

The author's writing style, coupled with his comparative-psychology orientation, gave this reviewer the impression of reading a review article in some scientific journal. Almost every paragraph contains two, three, or more citations (author and date) to the bibliography, which takes up 133 pages. The serious reader is also aided by the extensive name-index: one can quickly locate passages referring to Harlow's work on monkeys or to Pavlov's work on conditioning, for example. The subject index is helpful in finding discussions of particular animals.

For whom is this book intended? Being an erudite and detailed compendium of an interdisciplinary subject, it is certainly not for beginners. But this is a cogent reason for recommending it to advanced students of ethology; and it should prove to be a *sine qua non* for graduate students in zoology, psychology, and even endocrinology, not to mention sociology. It will probably find use as a specialized reference in the teacher's personal library or the high school library, insofar as there are student projects that could profitably draw material from this book; as a matter of fact, winning entries in several recent science fairs embodied certain of the techniques and principles presented here.

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Botany

NONSEED PLANTS: FORM AND FUNCTION, by W. T. Doyle. 2nd ed., 1970. Wadsworth Publishing Co., Belmont, Calif. 240 pp. Price not given.

The recent appearance of many paperback books in the field of strictly academic science prompts one to wonder why they are, apparently, so successful. This book, now in its second edition and expanded to include nonseed vascular plants, suggests at least part of the answer. It is not just a brief synopsis lying somewhere between a syllabus

and a more extensive text. It is a well-written, well-illustrated book presenting fine discussions of the structure and function of the algae, fungi, bryophytes, and lower vascular plants. But it is more than this. Doyle includes excellent coverage of some of the more significant findings from the fields of experimental morphology and ultrastructure; his discussion of chloroplast development in *Euglena* is a fine example. It is also gratifying to see attention called to matters needing more research: no student should get the idea that morphology is static, from reading this book.

Not everyone is going to agree with some of Doyle's interpretations or points of emphasis. Certainly, the inclusion of the green algae, the bryophytes, the fern and fern allies, and the seed plants in a single division, the Chlorophyta, is different. Nor will many biologists agree that the major taxonomic categories of "phylum" and "division" are not comparable. And the extensive discussion of the viruses seems unnecessary.

There is only one aspect of this book that is, to me, unfortunate: the tendency of the author to be teleologic. Statements like "*Rhizopus stolonifera* is specialized for life on land" (p. 50) and "The sporangiophore is a remarkable example of cell specialization for function" (p. 51) and "The form of the mature sporophyte is well adapted for its function, which is the production and discharge of spores" (p. 184) are frequent and distract from otherwise good writing. This book appears to be remarkably free of technical errors; only one came to my attention: in fig. 3-11, a Woronin body is labeled but is not explained in the text.

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Cell Biology

CELL BIOLOGY, by Jack D. Burke. 1970. Williams & Wilkins Co., Baltimore. 357 pp. \$9.75.

Burke divides his text into three sections: cell anatomy and physiology, cell metabolism, and nucleocytoplasmic relations. The book is written for advanced undergraduates and for students in the first phase of graduate or professional training. If these students have a good background of several courses in biology, they will find the first section interesting and informative: it is clear and concise and does not expect too much prior knowledge of the details of the subject. The same is true of the section on metabolism if the student has a strong background in chemistry to supplement his biology.

Unfortunately the final section does not come up to the standards set by the first two. The chapter on the theory of the gene is condensed, and the smoothness of the author's style suffers. The