

Book Reviews

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

Behavior

THE BIOLOGICAL CLOCK: TWO VIEWS, by Frank A. Brown, Jr., J. Woodland Hastings, and John D. Palmer. 1970. Academic Press, New York. 102 pp. \$1.95.

This little book presents, lucidly and convincingly, two contrasting but not mutually exclusive explanations of the mechanisms by which living systems maintain rhythmicity. First, Brown reviews, and helps the reader to interpret, the major experiments that led Brown to the conclusion that biologic rhythms are imposed by external factors—if not by obvious stimuli, such as cycles of light and temperature, then by subtle, rhythmic geophysical forces. His suggestions are most persuasive; moreover, he gives the reader a dramatic glimpse of cosmic forces at work. It is only when the chapter ends that one realizes that the material nature of the timing mechanism—the “clock”—is still obscure.

By contrast, Hastings expounds the idea that the timing mechanism is independent of the environment. He shows how the clock may be viewed as a biochemical system involving DNA-RNA-protein-synthesis interactions. As he does so, the form of the clock begins to emerge from the shadows; at least it did so for this reader.

I liked the little book. Two unresolved ways of viewing a biologic phenomenon are delineated, but no reader will be confused by this; rather, he will receive a lesson in the use of hypothesis and prediction in scientific investigation. Science is seen here as a dynamic process rather than an organized body of facts.

In both chapters graphs and other illustrations liberally supplement or summarize the data presented in the text. When carefully presented, charts and tables encourage the reader to participate in the investigative process; it is therefore most unfortunate that Brown failed to note that the legends to a significant number of the illustrations (taken from previous technical papers) in his chapter were larded with errors. Though minor in themselves, these errors nonetheless tend to discourage the reader's assessment of experimental data—an important aspect of the book.

The Biological Clock: Two Views should be of interest to the high school or college teacher who wants to keep informed, and to advanced-undergrad-

uate and graduate students. It assumes a knowledge of biology somewhat too advanced for the typical high school or beginning college student.

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CONTEMPORARY READINGS IN BEHAVIOR, ed. by Cecil E. Johnson. 1970. McGraw-Hill Book Co., New York. 292 pp. \$3.95.

To a person unacquainted with the science of behavior, this compilation of papers by noted behaviorists offers a good introduction. Several of the articles deal with general concepts, such as the motivation of playing and the function of emotion. Sections by Konrad Lorenz comically describe humans who laugh at and pity animals as they unwittingly observe all-too-human characteristics in the beasts. Part of the book describes specific cases, such as wolves in a zoo and polar bears on Arctic icebergs. A reader may discover what sorts of investigations have been attempted by those curious about animal behavior, and he will learn the importance of differentiating studies made in the wild from studies done on captive animals. Certainly this book will stimulate some behavioral observations of one's dog, at least, and will otherwise be interesting reading for the layman.

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ETHOLOGY, THE BIOLOGY OF BEHAVIOR, by Irenaus Eibl-Eibesfeldt. 1970. Holt, Rinehart, & Winston, Inc., New York. 529 pp. \$10.

Eibl-Eibesfeldt, professor at the Max Planck Institute for Behavioral Physiology and a former student of Konrad Lorenz, is a vigorous and convincing proponent of the comparative biologic approach to behavioral study.

His scholarship is awesome. Although the presentation is based on Lorenzian assumptions, Eibl-Eibesfeldt attempts to present all current viewpoints of behavior. The alternative theories are not merely presented: they are discussed and argued, and the findings are integrated, where possible, into the text. This balanced treatment of alternative behavioral theories makes the author's own position a strong one. He does not hesitate to disagree with behavioral paradigms that he considers to be invalid, but he handles disagreement

with appropriate respect for parallel scholarship, and he quotes from primary sources frequently and persuasively.

The reader often feels he is reading the final chapters of a doctoral dissertation. The 62 pages of bibliography are cited by author and date within the text—a practice that aids the reviewing of related literature but, for American students, probably detracts from readability.

The 18 chapters progress from a discussion of the philosophic and historical roots of ethology to a discussion of man. Eibl-Eibesfeldt first identifies what he calls a behavioral “drive mechanism” and then assimilates evidence from comparative studies to illustrate the diversity of ways in which that drive is expressed in the animal world. If evidence seems equivocal he rarely remains neutral; instead, he argues for a preferred interpretation.

It is hard to find fault with a book that bridges gaps between the disciplines of biology, psychology, sociology, and anthropology—especially when there are so few books with which it may be appropriately compared. The book is well illustrated, but its format and appearance are encyclopedic—a quality that falls considerably short of inviting readership. The subject index, of slightly more than four pages, is barely adequate, and the author index, of more than seven full pages, is more than adequate: most American students will probably be unable to appreciate a bias that indexes authorship more fully than it indexes ideas.

Probably the most convincing evidence of the esteem in which I hold the book is that I plan to use it as a textbook this fall.

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ANIMAL BEHAVIOR, by V. G. Dethier and Eliot Stellar. 3rd ed., 1970. Prentice-Hall, Inc., Englewood Cliffs, N.J. 148 pp. \$3.25 softback, \$6.95 hardback.

The problems of what to emphasize and what to exclude are always difficult in a book as short as this, especially when that book is also one in a series. The 12-volume “Foundations of Modern Biology” series was launched several years ago, with the college undergraduate in mind. Revision of most of the books has occurred either once or twice, and the present volume is a second revision of the earlier *Animal Behavior: Its Evolution and Neurological Basis*.

Animal behaviorists disagree sharply about whether their subject should be approached from the viewpoint of ethology, of physiology, or of natural history. They also disagree sharply about the emphasis to be given to social behavior, learning, and the physiologic basis of behavior. I find I dis-