

Book Reviews

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

Behavior

AN INTRODUCTION TO ANIMAL BEHAVIOR, by Peter H. Klopfer. 2nd ed., 1974. Prentice-Hall, Inc., Englewood Cliffs, N.J. 332 p. \$10.95 (hardback).

If one were to offer a course in the history of ethology, this might be an appropriate book to use. Over two-thirds of the text is devoted to an appraisal of ethology as a developing discipline. The author has divided the material into four parts: foundations of ethology, 1850-1900; the structure of ethology, 1900-1970; contributions of related disciplines, 1900-1970; and ethology today. The appendixes include a listing of related articles in *Scientific American*, a listing of journals in which studies of animal behavior are reported, and a list of publications cited in the book.

The general format of the book is inconsistent. Some chapters end with an overview section. Other chapters have occasional paragraphs in which the author attempts to draw conclusions about specific topics. But frequently these are really only summaries. Some chapters lack summaries, overviews, or conclusions. Each chapter includes a "Selected Reading" section which varies in format and apparently in purpose from chapter to chapter.

The author suggests that the book is designed as a "backbone" for an introductory senior or graduate-level course in animal behavior. This implies that extensive supplementary material would be necessary if this book were adopted. The brevity and conciseness with which topics are discussed would bear this out. Unfortunately, the reader is not always given adequate reference for further reading.

Although over 600 references are cited, fewer than ten percent were published since 1970. This fact is congruent with the historical perspective of the book but would seem to do an injustice to contemporary researchers and emerging behavioral theory. If used in a course, supplementary updated material will be necessary.

The strength of the book is the use of nontechnical language. The graduate and even the introductory student of biology will be able to handle the material with ease. Complex explanations and detailed descriptions are carefully avoided. The six-page chapter

which focuses on how behavior is maintained in a population only superficially reviews the selective advantage of behavior (two pages) and other modes of maintenance (two and a half pages). Depth of content is dependent upon the supplementary materials used.

The breadth of the material covered in this book may make it a useful reference book for libraries. Students could use it as a starting point for topical research. The appendixes might be useful for that purpose. However, the prime use of the book will be in introductory courses of ethology.

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THE SOCIAL BEHAVIOR OF THE BEES: A COMPARATIVE STUDY, by Charles D. Michener. 1974. Harvard University Press, Cambridge, Mass. 404 p. \$25.00.

This is a scholarly piece of work that should certainly be made readily available to anybody interested in evolution, socialization, behavior, bees, and/or just casual browsing. It is well written, well organized, well illustrated, well documented, and well thought out. In short, it is a honey of a book.

Part I (four chapters, about 30 pages) provides a concise selected background on superfamily Apoidea, the bees, in preparation for the subsequent chapters that deal specifically with socialization. The nine families of bees contain some 20,000 species, and the degree of social organization exhibited by various taxa ranges from none in most groups to parasocial aggregations in some to primitive organization in a few to a highly-organized social structure in only two tribes in family Apidae: the Meliponini bees (stingless honeybees, five genera) and the Apini bees (the common honeybee, one genus: *Apis*). Thus, the superfamily Apoidea provides excellent materials to trace the evolution of social organization. The author makes excellent use of these materials in Part II (16 chapters, about 220 pages), which constitutes the bulk of the book. After describing the kinds of groupings observed in various taxa (sleeping clusters, aggregations, varying degrees of socialization), he considers the origin, growth, and evolution of aggregations and colonies; he then goes into details on virtually every imaginable aspect of social groups: the

nest, sex ratios, castes, reproduction, division of labor, communication, and so on, and ends Part II with a fine chapter on the evolution of social behavior in bees. As if this weren't enough, the author gives us Part III (10 chapters, over 100 pages) as a bonus: selected natural histories of each of the groups of social bees, ranging from a brief chapter on the little understood Euglossini (Orchid bees) that are intimately involved in the evolution of orchids to a major chapter on our familiar honeybee, *Apis mellifera*.

Clearly, this book is a must for the library shelves. I would also recommend it highly for personal shelves as well, except that the price is a little steep. Still, for the serious student, the book is well worth the price; my own shelf will never be without a copy.

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Botany

BOTANY, by Michael Neushul. 1974. Hamilton Publishing Co., Santa Barbara, Calif. 550 p. \$13.95 hardback.

This college textbook would be of greatest use to serious students of biological studies: it is comprehensive. The concise text is supported by numerous compact and precise line drawings and excellent micrographs and charts. The extra width of the pages allows space for excellent detail and discussion of these illustrations.

The author has arranged the subject matter into four units: cells and plant relationships; the lower plants; the higher plants; and plants and the environment. These units are sufficiently self-contained to allow an instructor to begin with the lower plants, or with plants and the environment, if he chooses. Each unit, made up of several chapters, ends with a summary of the topics dealt with, and also introduces practical questions regarding the application of these topics beyond the study of botany itself. The chapters that make up each unit have a preface, a short historical summary of the topic, and a conclusion.

As the author clearly states, no attempt is made to present a definitive plant classification system nor to make lengthy comparisons between the many existing ones. Neushul's coverage in the book is broad, along with undisputed plants it includes organisms such as bacteria and fungi and also extinct forms of plants. His treatment gives these forms of life the ample consideration they deserve.

Over half the book deals with the lower and higher plants, emphasizing life cycles and evolutionary relationships. Life cycles are diagrammed understandably: they are comprehensive