

The treatments are generally authoritative but due to the constraints of space, and presumably for reasons of simplification for students, some areas are given more detailed and precise treatment than others.

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DALEAE IMAGINES. *An Illustrated Revision of Errazurizita Philippi, Psorothamnus Rydberg, Marina Liebmann, and Dalea Lucanus emend. Barneby, Including All Species of Leguminosae, Tribe Amorphaeae Borissova Ever Referred to Dalea. Memoirs of The New York Botanical Garden, Volume 27.*

By Rupert C. Barneby. *The New York Botanical Garden, Bronx.* viii + 891 p.; ill.; index nominum. 1977.

NEW COMBINATIONS AND NEW TAXA OF MOSSES PROPOSED BY NILS CONRAD KINDBERG. *Memoirs of The New York Botanical Garden, Volume 28, Number 2.*

By William C. Steere and Howard A. Crum. *The New York Botanical Garden, Bronx.* i + 220 p.; no index. 1977.

REVISION OF THE NOSTOCACEAE WITH CONSTRICTED TRICHOMES. *Supplement 57 of Nova Hedwigia.*

By Francis Drouet, J. Cramer, Vaduz. DM 80.--. v + 258 p.; ill.; index. 1978.

THE BIOLOGY OF DIATOMS. *Botanical Monographs, Volume 13.*

Edited by Dietrich Werner. *University of California Press, Berkeley.* \$32.50. ix + 498 p.; ill.; organism and subject indexes. 1977.

This is a book that covers the many diverse attributes of diatoms. Their microstructure is ably photographed and discussed (Chapters 1, 3) as the basic substructure of diatom material. Their special silicic acid metabolism (Chapter 4) with, for example, decreasing organelle content of Si in the order: mitochondrial fraction, chloroplast fraction, vesicle fraction, and microsomal fraction, is presented again as a basic attribute of diatomaceous matter. In the chapter on biochemical composition there are many details on protein, carbohydrate, lipid, chlorophyll, and ash content; the sum of these attributes describe for us part of that entity, the diatom. The excellent chapter on growth in batch and continuous culture gives growth rates at temperature and salinity optima and at light saturation,  $K_s$ , and  $\mu_{max}$  for various species. Additionally, cell production versus nutrient concentration of several species in dialysis culture is discussed. Here, the import may be to evaluate these features as attributes, albeit diversified by specific difference. Next, the ability of diatoms to adapt photosynthetic rate, depending on previous light exposures, temperatures, etc., is treated. The chapter dis-

cussing recent investigations on heterotrophic nutrition points out two opposing attributes of the diatom, clearly exemplified by *Nitzschia angularis* var. *affinis*, which grows well in the dark on just sodium glutamate and glucose as carbon source, though not as rapidly as in the light with  $CO_2$  as carbon source. As an alternate to passive floating the diatom's movements are described under phototaxis, topotaxis, phobotaxis, geotaxis, chemotaxis, thermotaxis, thigmotaxis, and migration; there is also an interesting section on recent theories of locomotion. The thorough discussion of sexualization and its induction emphasizes alternatives to simple division. Finally, there are two chapters on primarily benthic diatoms of fresh and salt water and one chapter on marine planktonic diatoms. Here, for example, experiments are presented in which as many as 160 species accumulate in 8 weeks on small glass slides in fresh water springs or creeks. The well-presented species rosters for major ocean basins in the world demonstrates the multitude of coexisting specific forms of diatoms. Yet can the variety of the diatom's form be an expression of adaptation or selection pressure due to grazing? The book closes with an affirmative view.

The writers are well-known, able investigators. They present their material economically yet with sufficient detail. The book is thorough, and is worthwhile having.

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## ZOOLOGICAL SCIENCES

PRIMATE ECOLOGY: STUDIES OF FEEDING AND RANGING BEHAVIOUR IN LEMURS, MONKEYS, AND APES.

Edited by T. H. Clutton-Brock. *Academic Press, London and New York.* \$41.00. xxii + 631 p.; ill.; subject index. 1977.

This excellent volume summarizes the present knowledge of feeding behavior in primates. Essentially a "state of the art" report, it will be useful reading for graduate students about to embark upon primate field studies and for specialists in other areas who find it nearly impossible to keep abreast of the burgeoning primate literature.

The "first wave" of primate field studies, conducted mainly by workers with an anthropological bent who were seeking insight into the possible behavior of human ancestors, is represented by such books as *Primate Behavior*, edited by I. DeVore in 1965. *Primate Ecology* represents the "second wave" of primate field studies in a comparable manner. The contributors,

approaching their subject with a more zoological outlook, share the belief that many behavioral differences between primate species are ultimately related to such ecological variables as the type of food eaten, and the density, quality, and distribution of food resources.

*Primate Ecology* consists of 17 chapters each covering the feeding and ranging behavior of a particular primate species, two review chapters on intra- and interspecific variation respectively, and three appendices. Much of the material in the first 17 chapters has been published elsewhere. It is, however, of value to have it collected in one place and of even greater value to have the information for all of the species arranged in a uniform format. The very practical appendices cover "Methodology and Measurement", "The Measurement of Dietetic Diversity" and "Field Methods for Processing Food Samples."

Clutton-Brock has done a good job of editing. By requiring the authors to adhere to a common outline and by contributing to the two thoughtful concluding chapters, he has made this book a much more coherent whole than most collections of edited papers.

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**ANIMAL PHYSIOLOGY: PRINCIPLES AND ADAPTATIONS.**  
*Third Edition.*

By Malcolm S. Gordon, in collaboration with George A. Bartholomew, Alan D. Grinnell, C. Barker Jørgensen and Fred N. White. Macmillan Publishing Co., New York; Collier Macmillan Publishers, London. \$15.95 xx + 699 p.; ill.; index. 1977.

This is the third edition of a successful textbook on animal function. It is organized primarily by systems, although some chapters deal with behaviors (feeding-nutrition, metabolism, osmotic regulation), and one is primarily cellular (muscle). My reaction to the earlier editions was mixed; it remains so for this updated and expanded version.

Reservations first: the physiology developed is primarily that of the vertebrates, which both limits and distorts the treatment. Much of the rich variety of adaptive strategies is hidden by this approach. For example, the study of vertebrate respiration will never lead to an understanding of principles of tracheolar respiration nor its impact on cardiovascular and excretory function or body size in insects. The distribution of emphasis among chapters is also affected. Energy metabolism is treated exhaustively in two chapters of about 130 pages. In contrast, nutrition, osmotic regulation, and the organ systems are each about half this length; general endocrinology is covered in 39 pages. This may reflect the distribution of current research activity in vertebrate physiology, but not the importance nor size of the literature in the other areas.

Still, the text has many good features. It covers essentially all aspects of basic physiology, explaining the principles first, then exploring variations with adaptive or evolutionary significance. The treatments of nutrition, circulation, respiration, osmotic regulation, and reproduction are clear and well balanced; those on energy metabolism and sensory physiology are also good, but too detailed. Only the chapter on general endocrinology is poor. Although well written, it is simply too brief and general to be useful. All topics, except hormones, are treated explicitly as experimental subjects, not as revealed dogma. This is appropriate for a book used by advanced undergraduates and graduate students. The new material is well chosen and has been smoothly integrated with the original text. Overall, the book should be useful to the audience at which it is aimed.

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**ANIMAL PHYSIOLOGY. A Series of Books in Biology.**

By Roger Eckert, with Chapters 13 and 14 by David Randall. W. H. Freeman and Company, San Francisco. \$19.95. xv + 558 p.; ill.; index. 1978.

This handsomely published work by Roger Eckert marks yet another entry into the burgeoning ranks of introductory physiology textbooks. Without delving into possible motivations prompting its publication, suffice it to say that this clearly written entry contains excellent illustrations and micrographs, and has a very useful appendix. Three of its fourteen chapters are devoted to cellular physiology (2, 3 and 4: Physical and Chemical Concepts, Enzymes and Energetics, and Permeability and Transport). Both the primary focus and strength of the Eckert text are the central seven chapters which deal, not surprisingly, with the various facets of neurophysiology. Organismic physiology is relegated to the final three chapters (12, 13 and 14: Osmoregulation and Excretion, Circulation of Blood, and Exchange of Gases), the last two of which were written by Randall. These three chapters deal primarily with the physiology of vertebrates, and from my point of view, give short shrift to comparative and environmental physiology.

Chapters 5-11 have the following titles: Ions and Impulses, Nerve Cells and Signals, Receptors and Responses, Integration and Behavior, Muscle and Movement, Cilia and Flagella, and Chemical Messengers. I believe that these chapters constitute the most comprehensive introduction to cellular and integrative neurophysiology that is available for undergraduate students to date. By his clear exposition of the principles of neurophysiology, Eckert adds a new dimension to existing animal physiology texts by filling a void in the environmentally oriented *Comparative Physiology of Animals* by Hill (1976, Harper & Row) and by surpassing the principle-oriented *Animal Phys-*