

Book Reviews

All unsigned reviews were made by the Editor.

General Zoology

THE BIOLOGY OF MARINE ANIMALS, 2nd Ed., J. A. Colin Nicol, 699 pp., \$15.95, John Wiley and Sons, Inc., New York, 1967.

The first edition of this book has been out of print for some time, and copies have been almost impossible to obtain. It is a happy event, therefore, that the second edition of this well-written book has now appeared.

The outline of the book is functional; the first chapters concern ion and osmoregulation, circulation and respiration, nutritional processes (including nitrogen excretion), and nervous function from receptors through effectors. These chapters contain the usual information, although the thoughtful, readable style of writing is distinctly unusual. The reference sections at the end of each chapter are quite complete up to 1965. Thus there is a lag period of about two years. The figures are virtually unchanged from the previous edition. In the vast majority of cases this makes no great difference, since the illustrations were well chosen at the first. But in a few instances, new plates would have been an improvement. For example, better electron micrographs of striated muscle from a marine animal surely exist than the rather old one in Fig. 9.7. Also, since so much time is spent on cilia in this text, micrographs or diagrams illustrating the now well-known structure of these organelles might have been in order.

In addition to the "bread and butter" comparative physiology discussed above, about a sixth of the book is devoted to pigments, color changes, and luminescence. These are the most enjoyable and authoritative chapters in the text. The chapter on associations between animals was surely necessary, but is mostly descriptive. This is not a fault of the author, but is probably more indicative of the state of the art in this area. The final chapter: Skeletons, Shelters and Special Defenses, is an unique and useful *pot pourri* which includes, for example, discussions of toxins, tube construction, and boring animals.

Some readers might notice the lack of a chapter on hormonal integration. The information is not missing; Nicol has preferred to discuss endocrines in the systems they affect. For example, the crustacean eyestalk story is parcelled out amongst neurosecretion (Ch. 10), color changes (Ch. 12), and skeletons (Ch. 15).

As in the previous edition, a useful Appendix, containing formulae for physiological salines, is included.

One can make few serious criticisms of the

book. However, it is regrettable that Nicol has continued the practice of dealing with the cellular functioning of heart muscle cells as a part of the circulatory system. The difficulty is that circulation of body fluids is a process involving the integration of whole organ systems—respiratory, excretory, and nervous—as well as the often muscular piping and pumping components of the circulatory pathway. At a different level of organization altogether are such properties as excitability of the heart, initiation of rhythmical activity, electrical correlates of beating (the electrocardiogram), neuro-muscular pharmacology, and the ionic basis of activity. Clearly, these are properties common to all muscles and could have been discussed in the chapter on effectors. It is noteworthy, in this regard, that data on the physiology and pharmacology of pharyngeal retractors, and various intestinal muscles, are presented in the chapter on *muscle*, and not that on *digestion*. This peculiar treatment of circulation is common to all extant comparative physiology textbooks. It is a trait undoubtedly derived from generations of human physiology textbook writers whose purpose was to teach a healing art, and who thus, rightly, presented a total picture, in depth, of the heart. This practice ought to be eliminated from comparative physiology.

Although Nicol's approach to marine biology is physiological, a student with a good freshman-sophomore background in chemistry, physics, and biology should be able to enjoy it. That is, the reader requires neither an extensive biochemical and biophysical prerequisite, nor the mathematical background which should accompany these. At the same time, its many tables and thorough recent coverage of diverse areas, will make it invaluable to workers in vertebrate, invertebrate, and marine biology. The focus of the book on marine organisms, in some measure, limits its possible use as a classroom text, although it will be an invaluable physiological reference especially for students of invertebrate zoology. However, for courses in comparative physiology in which cellular aspects are *not* stressed, or year-long invertebrate biology courses in which physiology *is* stressed, *The Biology of Marine Animals* may very well be the textbook of choice.

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THE MYSTERIOUS SENSES OF ANIMALS, Vitus B. Dröscher, 255 pp., \$5.95, E. P. Dutton & Company, 1965.

This book is the result of a lifelong interest in the field of animal behavior by one of Ger

many's leading scientific correspondents. The English translation has been competently handled by Eveleen Huggard. It is a book which was written to introduce the layman to the burgeoning field of animal behavior, and in this the author has been eminently successful. The style is easy-going, with a minimum of technical terminology, making the book highly readable. Although most biology teachers have encountered a great deal of the material presented, there will be much that is new.

The author begins by introducing a variety of sensory schemes from bat and dolphin echolocation, to loreal pit heat reception in pit vipers, to prey detection in ichneumon wasps and starfish. Nature's "inventions," such as the nesting behavior of the incubator bird, the "power station" of the electric eel, "speedometers" of flies, and the wind detection device of dung beetles are described. Short accounts give the reader an appreciation for such diverse stratagems as the mating signals of fireflies, gas warfare of bombardier beetles and scorpion-spider, cupid's-dart mating in hermaphroditic snails, web throwing in South African spiders, and trap doors and trip wires employed by other spiders. Several chapters describe territorial behavior in a variety of forms and communal living in prairie dogs and baboons. A more detailed account is given on communication, describing the results of investigations with waterfowl, crickets, fiddler crabs, and honeybees. Included, too, are amazing accounts of orientation in pigeons and cats, and several descriptions of research on instinctive behavior. The book concludes with a chapter on the control of behavior by mechanical manipulation, and even the building of devices to imitate natural nervous systems.

This book should be in high school libraries as recommended reading, for there is a wide variety of behavioral topics presented, which are up to date and easy to read and understand. Certainly, it should stimulate interest in the reader. It is unfortunate that none of the topics is presented in real depth. A great deal was drawn from *Scientific American* articles, and these references are given at the end of the book, along with other sources and suggested readings, many of which are in German. The illustrations leave much to be desired. Although the line drawings are not bad, more could be used, and the photographs generally do little to illustrate text material. These are not serious detractors from the book, which does fulfill the objective intended—an introduction to the mysterious senses of animals.

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COMPARATIVE OSTEOLOGY OF THE SNAKE FAMILIES, TYPHLOPIDAE AND LEPTOTYPHLOPIDAE, James Carl List, 112 pp., Paper, \$3.75, Cloth \$4.75. University of Illinois Press, Urbana, 1966.

Members of the two families of snakes treated in this technical monograph are collectively known as blind snakes, obscure organisms represented in the United States by only two secretive species. The families are very distinct, and, while leptotyphlopids are universally considered to represent an aberrant group of snakes, attempts have been made in recent years to place the typhlopids in a group quite apart from other living reptiles. The author concludes that typhlopids should properly be classified among the snakes and recommends division of the species into two families, Typhlopidae and Anomalepidae. Objections to these conclusions based on a number of technical points can be raised, and it is not likely that they will be accepted uncritically by herpetologists.

The monograph contains 22 plates including over 160 figures. Skeletons of many species not previously illustrated are presented, but unfortunately the figures are rather crudely drawn. Nevertheless, much useful information is contained in the figures and in the 58 pages of text. The latest literature citation is 1960, yet several very important papers have appeared in the last 2 to 3 years. The discussion, in particular, suffers from the inadequate literature treatment.

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INTRODUCTION TO ENVIRONMENTAL PHYSIOLOGY: Extremes and Mammalian Survival, G. Edgar Folk, Jr., 304 pp., \$12.00, Lea and Febiger, Philadelphia, 1966.

It is apparent that the author recognized the magnitude of the "greatness of the design" he undertook in developing this introduction to the physiological interrelations of organisms and the environments. He has assembled interdisciplinary information from natural history, general physiology, and ecology and demonstrated interrelationships through the quantitative techniques of contemporary biology. The book succeeds admirably in introducing the general reader to the "greatness of the design." The text is well written and the author's personal enthusiasm and experience in the laboratory and in the field provide a fascinating narrative style for the book.

This is an innovative book and is an important contribution for the general biologist, for the beginning student not yet aware of the complex-