

arthritis, and aging. The reader understands Schmeck's optimism in viewing immunology as the field that may be "lifting the burden of illness from man."

This book is useful either as a reference work or as a short summary of immunology. The glossary and the list of further readings make it especially valuable to a teacher of biology.

Sister Mara Walton  
Sacred Heart Academy  
Buffalo, N.Y.

**INTRODUCTION TO CHEMISTRY FOR BIOLOGY STUDENTS**, by George I. Sackheim. 2nd ed., 1974. "EMI Programmed Biology Series," Educational Methods, Inc., Chicago. 135 p. \$2.95 (softback).

This popular programmed text, first published in 1966, is designed to help biology students review or learn quickly and efficiently the basic chemistry essential to an understanding of biologic phenomena. This includes atomic structure, isotopes, electron shells, chemical symbols and formulas, ionic and covalent bonding, electrolytes, acids, bases, salts, pH, enzymes, functional groups in organic compounds, carbohydrates, fats, proteins, and oxidation-reduction reactions. The book is well planned and explains concepts clearly. It avoids unnecessary detail.

An insertion between frames 52 and 53 might have clarified the meaning of numerical subscripts in chemical formulas. And, because enzymes are catalysts, frame 139 should contrast enzymes with other catalysts, rather than with all catalysts. These are minor detractions from an otherwise excellent learning program. This book should enjoy even more success than did its predecessor, in introductory-biology courses in high schools and colleges.

Paul G. Jantzen  
Hillsboro (Kan.) High School

**PHYSICS FOR THE LIFE SCIENCES**, by Alan H. Cromer. 1974. McGraw-Hill Book Co., New York. 509 p. \$11.95.

According to the authors, the purpose of this introductory college, noncalculus physics textbook is "To give students in biology, pharmacy, pre-medicine, physical therapy, physical education, and the allied health sciences the physics background they need for their professional work." The book is organized into five general topics: mechanics, properties of matter, wave phenomena, electricity and magnetism, and modern physics. At first glance this organization of the book misleads one into believing that it is a very traditional physics book. A more detailed examination reveals that the large majority of the examples used in the text and in the end-of-chapter questions deal with the life sciences. The usual

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diagram of a lever has its companion diagram of a human arm; an example of a pulley system includes the rigging of a patient in neck traction. The center-of-gravity illustrations include many examples of human beings and other animals in various positions, illustrating the relationship of their centers of gravity to their general stance. Other interesting examples, throughout the book, are included in the sections on (i) scaling, which discusses the sizes of many animals; (ii) energy, which has a paragraph on metabolism and a very enlightening section on the energy required to run; and (iii) fluid flows, which has an explanation of heart and blood pressure. The gases-and-air sec-

tion discusses the operation of a scuba outfit. The subject of surface tension includes the treatment of water transport in trees, and the topic of evolution is discussed in the area of entropy.

One minor criticism could be raised. The book could better be titled "Physics for the Health Sciences"—as the introductory comment on its purpose suggests. No examples or illustrations are given in the general area of ecology, where applications such as radiation balance, energy flow within ecosystems, and other topics could have been added. Nevertheless, because the examples that are used are simple, straightforward ones that do not require any extensive biologic knowledge, they constitute a

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**Zoology**

**KILLERS OF THE SEAS**, by Edward R. Ricciuti. 1973. Walker & Co., New York. 308 p. \$10.00.

Who has not been impressed with tales of the denizens of the deep? Probably nothing is more misunderstood than the sea and its inhabitants. It is a difficult research task to separate fact from fiction, here. In this endeavor, Edward Ricciuti has done a most credible job. He has brought mythology face to face with reality. An experienced scuba diver, he is able to lend personal experience to his research and presentation in an intimate, often amusing manner. He is not above poking fun at himself.

*Killers of the Seas* takes a careful look at each creature that is actually or possibly dangerous. The taxonomic relationships are made especially clear. Various biotoxins found in the creatures are discussed. Except for an explanation of the sodium-pump mechanism, in which the author says that sodium and potassium ions attract one another, the explanations of physiologic phenomena are accurate and would be understandable by most secondary-school students.

The scope of the book is wide: from sharks and whales to sea cucumbers, puffers, and eels. Ricciuti has written a readable, enjoyable book that should be on every biology teacher's shelf.

**James L. Mariner**  
 Fountain Valley School  
 Colorado Springs, Colo.

**THE ECOLOGY AND EVOLUTION OF ANIMAL BEHAVIOR**, by Robert A. Wallace. 1973. Goodyear Publishing Co., Pacific Palisades, Calif. 342 p. \$11.95.

Although only the last chapter deals specifically with evolution, the evolutionary emphasis, as the title suggests, indeed permeates this comprehensive new animal-behavior treatise. This is a lengthy and "loaded" textbook, with double columns and small print, but the writing is very readable and occasionally witty, as well as informative and thought-provoking; and the illustrations are well chosen. The author draws heavily upon current and classic literature, with good referencing and

an exhaustive end-of-book bibliography.

Wallace thoroughly synthesizes most modern aspects of animal behavior; and under these circumstances the book may prove too much of a good thing as an undergraduate textbook on animal behavior. Fortunately, the subject matter has been organized into fairly self-sufficient sections, which include instinct, learning, navigation and orientation, biologic clocks, communication, populations, competition, aggression, and cooperation and sociality, as well as the final chapter on evolution.

This volume would make an excellent addition to a basic biology reference collection, with students and teachers of general biology, animal behavior, ecology, and evolution selecting individual chapters for a detailed exposure to topics of interest.

**Richard G. Beidleman**  
 Colorado College  
 Colorado Springs

**FISHES OF THE WORLD: A KEY TO FAMILIES AND A CHECKLIST**, by G. U. Lindberg. 1974. Halsted Press, John Wiley & Sons, New York, for the Israel Program for Scientific Publications. 550 p. \$42.50.

The Soviet ichthyologist L. S. Berg's *Classification of Fishes, Both Recent and Fossil* (2nd ed., 1955) is the framework, from orders to superfamilies, into which his compatriot G. U. Lindberg has fitted this essential survey (originally published in Leningrad in 1971) of the living marine and freshwater fishes, from *Amphioxus* to pegasusdragons. He uses the recent taxonomic views of J. R. Norman, K. Matsubara, and others to modify the Berg framework somewhat; and he elevates to family rank many of the subfamilies of the widely used "Phyletic Studies of Teleostean Fishes with a Provisional Classification of Living Forms" (1966), by the American ichthyologists P. H. Greenwood, D. E. Rosen, S. H. Weitzman, and G. S. Myers. He accepts D. M. Cohen's tally: the world has 20-22,000 species of fishes in 5,000 genera. Lindberg puts them in 555 families and 62 orders.

The book actually has two keys: to the orders as well as the families. The keys contain nearly 1,000 little drawings of exemplary species and diagnostic structures—drawings that serve very well to give a notion of important genera. The keys are based almost entirely on the gross morphologic characters that a commercial fisherman or a general biologist would readily grasp, without resort to dissection. However, Lindberg accommodates the specialist by giving technical details in brackets. From the keys one is led to the descriptions of families—the "checklist." For each family Lindberg gives taxonomic synonyms (a considerable