the previous editions and retains its section on microorganisms and disease before the section on applied microbiology; but each of the six sections is self-contained enough to be used in any order preferred. The other main sections, preceding the above-mentioned, are on characteristics of bacteria; microorganisms other than bacteria (molds, yeasts, algae, protozoa, viruses, etc.); and control of microorganisms. The book is well printed and well illustrated.

This edition has been nicely revised, and it contains a more-than-adequate amount of information for the beginning student. It is especially useful to the student who has had adequate courses in biology. The book has relatively little on intermediary metabolism (correctly, I think) but a quite adequate treatment of molecular biology. The sections on microbial genetics may appear somewhat simple, but most students obtain this kind of information from courses other than microbiology, so that the amount provided is adequate. The book's greatest weakness is in its taxonomy: the student could not derive any real sense of the important kinds of bacteria from the information given, in spite of the fact that much space throughout the book is given over to taxonomy.

The only adequate test of a book is to teach from it; but, lacking this experience, one may evaluate it by selecting, at random, three or four basic concepts and a like number of newer discoveries and seeing how they are treated. The results of such an evaluation of this book are as follows: gram stain, moderately good; plate count, fair; anaerobes, good; water analysis, good; antibody structure, good; permease factors, phosphoenol pyruvate transport described but not D-lactate; cyclic-AMP, no mention.

The book is an improvement over the second edition. Inasmuch as the latter has become standard in many microbiology courses, I would certainly expect this edition to become the most widely used textbook for elementary courses in the field.

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Textbooks

DISEASE, SEX, COMMUNICATION, BEHAVIOR, by Bruce Wallace. 1972. Vol. 3 of *Essays in social biology.* Prentice-Hall, Inc., Englewood Cliffs, N.J. 331 p. Price not given.

This book is so interesting that I read it straight through, late into the night. It consists of approximately 60% Wallace and 40% other authors, including J. B. S. Haldane, James Michener, Carl Sandburg, Ernest Hemingway, Daniel Defoe, Leo Tolstoy, and Michel de Montaigne. The readings and Wallace's essays are grouped around the four subjects of the title. I wish Wallace had added a fifth, "Death," and had put much of the material from the "Disease" section, along with Haldane's beautiful essay "On Being Finite," into it. (A surprising number of freshman have asked that a discussion of death and dying be included in our general-biology course. It seems to be a subject in which all of us become expert, but it is seldom discussed.)

The humor and grace with which Wallace writes at his best is equal to that of some of his guest authors. Outstanding to me are his "Suicide and Man's Right to Die," "The Biology of Birth Control," "On the Dullness of Scientific Writing," "The Nervous System and Its Organization," and "On Escaping Reality."

I disagree with a couple of Wallace's statements. For example, in the introduction to the section on sex he says, "What can I write for a generation of students whose biology texts since seventh grade have dealt frankly with both the anatomy and physiology of sex?" My own answer is "Plenty!" By and large, college freshman are abysmally ignorant of the rudiments of human reproduction, and accurate junior- and senior-high-school textbooks are rare. (Teachers with savvy may be even rarer—or repressed.) My second argument with Wallace is over some of his comments in "A Word to the Teacher." He says the book was used in a lecture section of 1,000; the course consisted, per period, of 20 minutes of lecture and 30 minutes of "student discussion and questions from the floor." I, too, teach a lecture course of 1,000; and even with an ideal sound system and traveling microphones it ends up with 90% of the "discussion" coming from the prof and the other 10% coming from 0.3% of the students. I find lecture sections of 1,000 are efficient for the lecturer, perhaps; but they in no way substitute for a class of 20 to 30 students when important topics, such as those of this book, really are to be "discussed and questioned."

Books like this one can do a great deal to bridge the communication gap in college biology classrooms. This is the most exciting general-biology book I've seen in a very long time.

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BIOLOGY OF ANIMALS, by C. P. Hickman. 1972. C. V. Mosby Co., St. Louis. 522 p. $9.75 (hardback).

This book has been written for use in elementary zoology courses in college. It is conveniently divided into six parts: structure of matter, biologic organization, functional systems, ecology, reproduction, genetics and evolution, and animal systematics. In many respects the organization is traditional. The chapters on ecology and the ecosystem of man are well presented and stress aspects of zoology often omitted from other books.

The book is well illustrated with numerous two-color diagrams. The only error I found was in the diagram of the structure of DNA: one of the DNA strands is wrongly shown, but this is an error found in many elementary textbooks. Photographs are used primarily in the sections dealing with ecology and systematics.

The book presents an effective introduction to elementary zoology, with a flexible arrangement of material that can be adapted to one's course requirements. The wide range of topics presented makes it useful for most liberal-arts students as well as for biology majors.

John H. Dustman
Indiana University Northwest
Gary

INTRODUCTORY CONCEPTS OF BIOLOGY, by George C. Becker. 1972. Macmillan Co., New York. 351 p. $8.50.

This "new" approach to presenting the fundamentals of biology is designed for the college student with little or no background in biology or chemistry. The author has reverted to a style of

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