

duction to *Bacteria and Their Ecobiology* does achieve its distinct purpose.

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**MICROBIOLOGY AND HUMAN DISEASE**, by George Wistreich and Max Lechtman. 1973. Glencoe Press, Beverly Hills, Calif. 814 p. \$13.95. With instructor's guide, 206 p. (softback), and laboratory exercises (2nd ed.), 252 p., \$5.95 (softback).

The authors' statement in the foreword needs some qualification. "*Microbiology and Human Disease* is not written for the specialist, but for the student who is in need of a broad foundation in microbiology, and who wants to obtain some insight into the role microorganisms play in health and disease," the authors say. But that portion of the book (about 60%) in which are found the principles of microbiology (structure and function, genetics, growth, metabolism, immunology, and so on) is certainly less comprehensive and is severely simplified in comparison with the well-known works of either Stanier et al. (*The Microbial World*, 3rd ed.) or Davis et al. (*Principles of Microbiology and Immunology*). It is doubtful that a student can get a "broad foundation in microbiology" from this textbook without substantial supplementary reading. Perhaps with this in mind, the authors have provided a bibliography of about 300 references, including original papers and other textbooks, arranged in the order of the relevant chapters, at the back of the book and in the instructor's guide. To their credit, the list is quite a good one.

The text is generally well illustrated and indexed, and it contains a 17-page glossary of medical and microbiologic terms. Unfortunately, there are several errors. In the middle of the book there is an atlas of color plates; at least 10 of the 93 figures, many of which depict the results of diagnostic tests, are either mislabeled or misordered. A photograph of a common high-speed refrigerated centrifuge (p. 387) is labeled an "ultracentrifuge." These are examples of items potentially confusing to students. More regrettably, the statement (p. 58) that "The term *fermentation* should never be used in reference to any microbial process, unless the process is performed under anaerobic conditions," is quite misleading. Have the obligately fermentative but facultatively anaerobic lactic acid bacteria recently come into disfavor for providing us with pickles, sauerkraut, cheese, and yogurt?

The sections on disease, including chapters on medical protozoology and helminthic diseases, are written in a manner quite as simplistically dogmatic as is the rest of the book but are certainly more detailed with respect to clinical diagnosis, treatment, and control than are comparable sections in

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either of the two textbooks mentioned earlier.

The laboratory manual is addressed to students in applied medical sciences (as might very well have been done with the textbook). The exercises are more numerous than necessary (which is good) and appear to be workable and clearly explained. Again, emphasis is on medicine and pathogens—not really on general microbiology. For example, the only enrichment medium suggested is nutrient agar. Isolation of organisms from nature is not seriously considered.

Books like this one fail to demonstrate that the fields of microbiology and medicine offer many ideal systems in which one might study some of the fundamental properties of life. They fail to present the essentially investigative approach of the sciences; that is, they fail to examine data and hypotheses critically. Medical technologists need this approach every bit as much as do doctors and potential research scientists.

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## Statistics

**BIOSTATISTICAL ANALYSIS**, by J. H. Zar. 1974. Prentice-Hall, Inc., Englewood Cliffs, N.J. 620 p. \$15.95 (hardback).

The author has produced an introductory, comprehensive coverage of biostatistics in 328 pages. The 292 additional pages are devoted to an appendix of mathematical and statistical tables and the like. Most methods necessary for statistical analyses of biologic data are included in the text. As usual, however, the book contains more material than can be mastered by students in an introductory course in statistics.

The book is well written and easy to read. Numerous examples using biologic research data are provided. I consider it one of the better biostatistics books available for use as a textbook and for reference.

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## Textbooks

**INTEGRATED BIOLOGY**, by L. Hill, D. Bellamy, and I. C. Jones. 1973. Harper & Row, Inc., New York. 267 p. \$6.95 (softback).

With the great diversity of introductory general-biology textbooks available, it is difficult to find one showing sufficient difference to stimulate interest. *Integrated Biology*, originally written in England by Hill, Bellamy, and Jones, was edited by Paul Paolini to better fit the format of a single, one-semester biology course as commonly offered in American institutions. The

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16 chapters effectively survey the field of introductory biology, beginning with the first chapter, which is an abstract of the total book. From here, the authors begin each topic from an historical prospective and then develop the conceptual points of the topic, always building from factual evidence and leading to reasonable hypotheses based on research evidence. The unifying theme of the topics discussed is functional biology, integrating principles of biochemistry and physiology with more traditional zoology and botany. Probable origins are discussed, stressing the unity of chemical origins and mechanism of energy transfer. Organismal systems for maintenance are emphasized without slighting the need to understand systems for the maintenance of species. The authors take an intensive, thorough, no-nonsense approach to topic discussions, being always informative and detailed without overburdening the reader. The text material is supplemented by well-executed diagrammatic presentations, where possible, without using photographs. The text is quite complete, emphasizes vocabulary by use of boldface type, and has a section of appendices for more detailed elaboration of topics, an excellent glossary, and a complete index. Because the book is softback, the cost to students should be reasonable without sacrificing quality of scholarly endeavor or thoroughness of presentation. The only failing I noted was the

sometimes superficial treatment of botanic topics, which is no doubt explained by the zoologic backgrounds of the authors.

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ELEMENTS OF BIOLOGICAL SCIENCE, by William T. Keeton. 1973. W. W. Norton & Co., New York. 583 p. \$9.95.

Currently, more than 50 titles are available for use in introductory collegiate biology programs. Over 90% of these consist of the same content and emphasis, exhibit the same inability to explicate science as a way of knowing or of biology as a science, present the same illustrations and examples, and place the same emphasis on biology as a rhetoric of conclusions. They differ from one another only in the order of their paragraphs and chapters, and they show only minor omissions or exclusions by means of which one can be differentiated from another.

This many "different" volumes continue to survive primarily because enough copies are sold for the publishers to continue them as viable titles. However, only a few can be categorized as academic best sellers. Among these is Keeton's *Biological Science*, now in its second edition. From this 888-page book has been derived this shorter

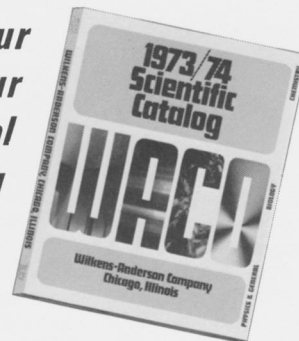
*Elements of Biological Science*, which is a chapter-for-chapter and section-for-section abridgement. It is authoritative, well written, and handsomely produced. Biology books have been weaned away from a plodding phylum-by-phylum parade of organisms; instead, most now follow an organization that begins with chemistry and cells and ends, usually, with ecology and evolution. Keeton differs from this standard pattern only in dealing with evolution before covering genesis and diversity of organisms; therefore, many of the data called for to understand chapter 17 are not presented until chapters 19-22, although the order could be varied, depending on how reading assignments are made.

In spite of evidence for inclusion of relevance, data on which judgments can be based, contemporary problems, the epistemology of science, and the necessity to evaluate scientific data, one looks in vain in the index for words such as hypothesis, theory, abortion, heroin, organic foods; and in the text one finds a single sentence on marijuana and another on LSD. When these items of biologic concern, which currently involve college students deeply, are placed against such index terms as Acraciae, gametangium, osculum, retting, and virion, the relative value of each series in the mind of a textbook author readily can be ascertained. There is a marked difference between what we hear is needed in introductory-

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