Comparing procaryotic and eucaryotic cells, in the first 63 pages the author describes the cellular organelles common to most plants and animals. The life cycle of a typical virus demonstrates why it is not a cell but a cellular parasite. The usefulness to biology and the advantages of the transmission electron microscope, scanning electron microscope, and light microscope are discussed. The next 27 pages cover biologically important weak bonds; energy changes in chemical reactions; free energy; the behavior of acids and bases in water; and buffers.

After a discussion of the importance of carbon to biological structure, the author deals with enzyme kinetics and control mechanisms, the role of ATP in driving coupled reactions, and glycolysis.

Focusing on the role of mitochondria in respiration, the next section covers electron transport, oxidative phosphorylation, and the citric acid cycle. Turning to chloroplasts, the author presents light and dark reactions to photosynthesis.

Initially outlined in the next 35 pages are the features common to most membranes followed by the modifications of membranes of specific organelles. Several models have been proposed for the plasma membrane from studies of red blood cells, bacterial cells, and monomolecular layers of lipid; however no one model seems adequate to describe the structure and composition of all membranes. Functionally, the plasma membrane acts as a passive barrier. Membranes within the cell form channels for the passage of substances from both the nucleus and cytoplasm to the outside of the cell and provide sites for both biochemical reactions and protein, lipid, and carbohydrate synthesis. Membranes are also found within the mitochondria and chloroplasts.

The next 50 pages deal with the mechanism of muscular contraction and the nerve impulse. Although the nerve impulse is electrical, it is transmitted chemically by acetycholine. Ca^{2+} regulates muscular contraction by binding the proteins, troponin and tropomyosin, associated with the actin filaments thus freeing actin to complex with myosin. Actin and myosin (once thought to be unique to muscle tissue) are produced in many types of cells, including some single-celled organisms.

Topics elaborated on in the next 64 pages include the genetic code, mechanism of protein synthesis, and proposed mechanisms of gene regulation in procaryotes and eucaryotes. This is a particularly well written chapter in which much detailed experimental evidence for the nature of the gene has been eliminated. Although the operon theory may explain transcriptional control of certain genes in *E. coli,* if this were the only mechanism, the cells would be cluttered by proteins whose only function would be to control genes. In my opinion, the section on gene regulation in eucaryotes is weak with respect to possible mechanisms of regulation.

In the following section the author explains the mechanism of DNA replication in procaryotes and eucaryotes. Again, much more is known about procaryotes than eucaryotes. Mitosis and meiosis are presented and compared in a chart. The last 25 pages are devoted to mechanisms of cellular differentiation. A change in cellular morphology must be due to epigenetic factors.

Norma M. Martof
Montgomery College
Takoma Park, Md.

PRINCIPLES AND TECHNIQUES OF PRACTICAL BIOCHEMISTRY, ed. by Bryan L. Williams and Keith Wilson. 1975. American Elsevier Publishing Co. (52 Vanderbilt Ave., New York 10017). 256 p. $9.95 softback.

Unlike the more typical British textbook which is wordy and abundant in minutia and detail, this excellent book on contemporary biochemical systems, techniques, and instrumentation is a model in the economy of words. The paperback, although expensive for its size, lack of color, and lack of costly photographs, is a valuable textbook. It is designed for the undergraduate biology student rather than the biochemistry student; but it is the British student the authors have in mind and British students pursue majors like biology in the last years of high school (the 11+), thus they are better grounded for this text.

The principles and analytical techniques are so clearly written however, that American college undergraduates and even honors high school students can understand the contents without "prerequisite" courses in organic, analytical, or physical chemistry.

The book is divided into three main parts: the first deals with basic concepts of biochemistry; the second manages the important separation methods such as centrifugation, chromatography, and electrophoresis; and the third part considers the main methods "for qualitative and quantitative investigation of biological systems." The content of the book for the most part is expressed in SI units, which take a bit of translating for those of us not adept at the conversation of c.g.s. units to System International. Fortunately, a needed and useful conversion table is to be found at the beginning (not the end) of the book.

Although the text covers principles and techniques of biochemistry, it is essentially indispensable for most contemporary biology students who contemplate research. Contributors to the various chapters are from three English polytechnical schools: Lanchester, Hatfield, and Oxford. Suggestions for further reading are concise, up-to-date, and relevant, although there are occasional omissions of classic references such as Moore and Stein, in chromatographic techniques, or Gladstone, in radioistope techniques. There is also considerable chauvinistic attention to British references rather than to other nations' scientists.

The lack of detail mentioned above is valuable in understanding principles and process but handicaps an individual seeking precise chemical quantities, precise temperature, pressure and gaseous atmospheric conditions, and so on. Occasional descriptions such as the one on fractionation of rat liver homogenate do give centrifuge speed and time of weight/volume amounts in molar concentrations of particular suspension media so that even untrained students can produce a "clean" microsomal pellet from a crude homogenate.

Diagrams accompanying various textual explanations are beautifully simple and clear. Here the lack of color or other distracting elements are advantageous to the reader.

Alfred Novak
Stephens College
Columbia, Mo.

Ecology and Environmental Biology

UNDERSTANDING ECOLOGY, by James L. Mariner. 1975. Independent School Press (51 River St., Wellesley Hills, Mass. 02181). 207 p. $3.75 softback.

Teachers who have been looking for an ecology textbook that the average high school student can read and understand should be able to make good use of this book. As the author indicates in his preface, the book is geared to the student who does not intend to be a scientist but will in his daily life make decisions affecting the environment. My own impression is that college students who have used this as a high school textbook will have to spend little time on the principles of ecology in a college level course. Certainly, students who have read this book should be more ecologically minded citizens.

Each of the seven chapters is followed by a "Questions for Discussion" section, an "Investigations and Activities" section that has more materials than one could use, and a "Recommended Reading" list. The clearness of the text plus these additional features make it a book to seriously consider.

The only problems, from my point of view, are minor. I'm not sure all ecologists accept Allen and Bergmann's