Principles of Biochemistry, Second Edition

H. Robert Horton, Laurence A. Moran, Raymond S. Ochs, J. David Rawn, and K. Gray Scrimgeour. Prentice Hall: Upper Saddle River, NJ, 1996. xxix + 801 pp. Figs. and tables. 22.4 × 28.4 cm.

This book follows the format that has become standard for biochemistry texts. Sections begin with short declarative statements of principles that are explained concisely in the following paragraphs. The best chapters proceed in a straightforward and logical manner. The lipids chapter is exemplary. A discussion of molecular structure, beginning with fatty acids, is followed by membrane structure, transport, and signal transduction.

New and up-to-date information is generously included in the text, but there are signs that this was done without careful thought as to its placement or relationship to longstanding principles. For example, site-directed mutagenesis of proteins is introduced before the chemical role of the amino acids at a protein's active site is mentioned. Standard amino acids are defined in the traditional way, those twenty amino acids used as protein building blocks, rather than by reference to the genetic code and their direct incorporation into protein. In the same chapter, however, selenocysteine is mentioned as a surprising discovery without acknowledging that what is surprising is the fact that it has its own codon and tRNA and could, therefore, be considered a twenty-first standard amino acid. An opportunity to emphasize what is truly standard about standard amino acids is missed.

Building on author Rawn's *Biochemistry* (1989), the first biochemistry text to use stereo diagrams, the text uses such diagrams extensively. Often, however, it appears that the images were chosen from what was most readily available rather than what is most pedagogically useful. Complex views of proteins and other macromolecules are abundant, but the authors fail to use a stereo view to illustrate chirality when it is reviewed in an early chapter. Stereo views can be used effectively to illustrate the conformation of coenzymes in protein active sites, but there are no such diagrams in the coenzyme chapter. A minor problem is the lack of an explanation of how to view a stereo diagram. The book includes a stereo viewer but does not instruct students how to view stereo diagrams without such a viewer. This skill, which takes a bit of practice to learn, is becoming increasingly important as stereo views become routine in the biochemical literature. It is a skill that students are unlikely to bring to a biochemistry course but could most appropriately be acquired there.

There are some irritating inconsistencies in rigor in treatment of topics. The introductory chapter on metabolism stands firmly on thermodynamic principles, but the succeeding chapters ignore bioenergetics, classifying reactions as reversible or irreversible without any reference to ΔG° values. There is no explanation of why only the phosphoryl group on carbon number 1 of 1,3-*bis*phosphoglycerate is used to phosphorylate ADP. This, despite the authors' comment that the student should try not to lose sight of major concepts while memorizing details.

The size and level of the book are consistent with one aimed at students taking a one-semester course that is their first exposure to biochemistry, but sometimes the authors' approach seems inappropriate for that audience. In the section on enzyme kinetics, for example, the first experimental approach mentioned is measurement of reaction velocity as the amount of *enzyme* is varied. Students' difficulty with enzyme kinetics often stems from failure to understand that kinetic studies are conducted by varying the concentration of *substrate*, and the authors' approach may give an initial impression that exacerbates this common problem.

The authors have provided an up-to-date treatment of much important information, but the problems mentioned above make the task of transmitting it to beginning students more difficult.

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