

*Biochemistry*

by Lubert Stryer

W. H. Freeman and Company; San Francisco, 1975

xii + 877 pages. \$ 19.95 (Hardback)

This is a honey of a book — for the teacher of basic biochemistry struggling to guide succeeding cohorts of students through 'their maze of so-called facts' to a proper grasp of what his subject is all about. In its way, this book seems to me as innovatory as Baldwin's *Dynamic Aspects* was in the '40s and '50s. In spite of its deceptively simple title and far from unique aims 'to explain the principles of biochemistry and equip the reader with a command of its language and concepts, as well as an appreciation of the processes of biochemistry', it does something which most other recent textbooks of biochemistry do not; it succeeds. It succeeds in putting across basic principles and concepts in a way that is simple and yet sophisticated, with diagrammatic illustrations of the experimental approaches on which many of the established facts are based. How is this success achieved? What gives the special flavour to this book? Not just its superb production, clear print, overgenerous margins, beautiful diagrams and plenty of them, and its prose style which is lucid and precise. Perhaps it is the organization. In spite of its weight, some 800 pages, this is not a comprehensive treatise, nor a textbook in the usual sense. It cannot easily be used to look something up, but rather demands to be read *in toto*; it tells a story.

The contents are organized into 5 major themes, each of which comprises a number of chapters. At the end of each chapter is a summary, a list of questions and selected readings. Theme 1 is 'Conformation' exemplified by relationships between three-dimensional structure of proteins and their biological activities. It includes allosteric properties, enzymes, molecular disease, connective tissue and biological membranes. There is a whole chapter on sickle-cell anaemia as an instance of a disease understood at the molecular level, and the way in which this understanding was gained. The second theme is 'The generation and storage of metabolic energy'. This includes chapters on intermediary metabolism of carbohydrates, fat and amino acids, energy coupling and oxidative phosphorylation. It starts out with an introductory chapter called 'Metabolism, basic concepts and design', which defines metabolism and points out that there are a large number

of reactions but a much smaller number of kinds or reactions, i.e. recurring motifs. It contains five pages of thermodynamics, deals with ATP and group transfer potentials, as well as carriers of groups, radicals and electrons. The concept of energy charge is explained, together with its effects and regulation. Theme 3 is 'Biosynthesis of macromolecular precursors' and includes chapters on the biosynthesis of membrane lipids, steroid hormones, haem, amino acids and nucleotides. Theme 4 is 'Information' and deals with the storage, transmission and expression of genetic information, as well as the control of gene expression, including virus multiplication. The 5th theme is called 'Molecular physiology: the interaction of information, conformation and metabolism in physiological processes'. This includes chapters on membrane transport, hormone action and cell motility and also deals with muscle contraction, immunoglobulin formation and properties and bacterial cell walls.

Within these themes, individual topics are placed in their contexts and some may occur in several chapters, in different contexts. There is thus a certain harking backwards and forwards from one chapter to another, to view a topic from different angles. The author does not shun all repetition, but uses it to bring out and clarify underlying principles and the hierarchical relationships between different topics. In a similar way, several different diagrammatic representations are often used to illustrate an individual concept or point. Perhaps it is this author's way of using more words and more diagrams to bring out essential basic concepts which gives rise to the extreme clarity without being superficial or simplistic. This book does not, perhaps, replace the usual textbooks of biochemistry, at least for most of our University courses, but it could well provide a model for biochemistry courses in our pre-clinical medical curricula.

Although a luxury at present, financially and aesthetically, I feel sure that, if it could be marketed at half the price and half the weight, it would become an essential part of every biology student's survival kit.

Margot Kogut

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