

Book Reviews

Theoretical Biochemistry. Physico-Chemical Principles of Vital Processes. By HANS NETTER. John Wiley and Sons, Inc., New York, N. Y. 1970. xx + 928 pp. 26.5 × 17.3 cm. \$39.50.

Most textbooks of biochemistry emphasize the intricate organic chemical aspects of the subject, since progress in organic chemistry has been largely responsible for the identification in depth of the structure and mode of action of biochemicals. The vibrant and exciting beauty of biochemistry, derived from its organic chemical basis, has had profound repercussions on genetic thinking and has taught us the centrifugal diversification of biochemical structures and reactions at different levels of cellular organization. Throughout such studies we are conscious of the environment of biochemicals and of the multiplicity of their competing reactions. The rate of such reactions is conditioned by many factors which form the physicochemical basis of *any* reaction but are complicated by the biochemical milieu. Most texts treat these factors thoroughly and in proper perspective to the other facets of the subject. The present large book concentrates on physical chemical studies and facts in biochemistry at the expense of other contributions to the field.

Most students entering biochemistry do not have an adequate background in physical chemistry or mathematics. Netter's book gives the elements of physical laws and reactions needed for the understanding of biochemical complications encountered in high-molecular weight compounds and the aqueous colloidal setting of cells and tissues. Explanations range from quantum mechanical discussions of the atoms and valence bonds to the structure of water, the nature of electrolytes, problems of diffusion and the behavior of compounds at interfaces, to the physical structure and reactivity of proteins and nucleic acids. The second half of the book, entitled Dynamics, contains extensive chapters on kinetics, the physical chemistry of biological oxidations, energy production and utilization, mechanisms of photosynthesis, the physics of muscle contraction, and energy transport. Here the mathematics is by no means elementary, and intelligent reading of these sections requires a profound training in advanced calculus.

The author has been a biochemist since 1923 in Kiel, Germany. He first published this book in 1959, and the present English edition constitutes a revised translation. How far this revision has gone, or rather how little it has achieved, may be seen from the bibliography: almost all the references end in the late 1950's, and only a handful of them extend into the early 1960's. It is thus safe to state that the book represents the physical basis of biochemistry of 10-12 years ago. Moreover, many American authors, including Nobel Prize winning biochemists, are not even mentioned once, and the work of others is reviewed only up to 1958. No doubt this book pictures the classical physicochemical approach to biochemistry which existed in the post-World War II days. Those who want to learn about 1970 problems in the field will find little comfort in its factual and dry pages.

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Annual Review of Pharmacology. Volume 10. Edited by H. W. ELLIOTT. Annual Reviews, Inc., Palo Alto, California, 1970. vii + 505 pp. 16 × 23 cm. \$10.00.

The 10th annual volume of this review series will again capture the interest of our readers. It is an authoritative source of the basis of the relationships of drug molecules, and the practical execution of biological test procedures which guide drug design.

Many of the subjects treated in previous volumes are dealt with again now, attesting the continued interest in some of these major fields of pharmacologic research. However, a decade of molecular biology has left a deep imprint on pharmacology, and this is expressed in a proliferation of reviews that read more like chemistry than biology. P. S. Portoghesi presents a critical discussion of stereochemistry and biological activities. B. R. Baker has written another one of his many reviews of his work on using irreversible enzyme inhibitors to glance at the contours of active enzyme sites. Drug metabolism, steroid and catecholamine biosynthesis, and other topics of direct interest to medicinal chemists are presented well. The interaction of antibiotics with model membranes, the pharmacology of viruses, persistent pesticides, and aerospace problems in experimental medicine are relative newcomers to this review series. The perennial Review of Reviews by C. D. Leake, a tribute to pharmacology and medicine by Hiroshi Kurogami, and author, subject, and cumulative indexes (Volumes 6-10) enhance the value of this welcome book.

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Peptides: Chemistry and Biochemistry. Edited by BORTS WEINSTEIN and SAUL LANDE. Marcel Dekker, New York, N. Y. 1970. xv + 538 pp. 23.5 × 16 cm. \$19.50.

The wide use of the amino acid analyzer has automated much of the structure elucidation of peptides and placed the deduction of amino acid sequences in the hands of skilled technical personnel. The increasing application of the solid phase peptide synthesis may lead to an analogous situation in the long run, but the intricacies of group protection, deprotection, maintenance of optical integrity, and other pitfalls of peptide synthesis have not yet been ironed out adequately for such a move. The present book presents a critical survey of methods and difficulties of peptide synthesis, as a documented outgrowth of a symposium held in 1968. This accumulated experience of the contributors should serve well to unify the field and draw others into it who still regard peptide chemistry as a strange branch of organic chemistry.

Interspersed with discussions of peptide synthesis are 7 papers relating peptide structure to biological activity. The reasons d'être of peptide synthesis are the confirmation of peptide structure, arrived at deductively, the joy of such an intellectual achievement, and the exciting possibility of improving upon nature for a given therapeutic application. This has already been accomplished successfully in some instances, and raises a question about the purposefulness of nature where the structure of endocrine peptide hormones is concerned.

A section of the book deals with structural studies of cyclic peptides and other special problems such as steric control of peptide synthesis, allergenicity of some penicillin polypeptides, and the synthesis of actinomycin D. Thus both the expert in peptide chemistry, the medicinal chemist, and the natural products chemist will find much of interest in these pages.

The volume has been prepared by a photo-offset procedure from typescript, and does not meet the criteria of a printed book. Homogeneity of the text and consistency of nomenclature are fair but not perfect. Nevertheless, the editors have tried hard to offer the reader a monograph rather than a collection of papers.

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