Book Reviews

Biological Chemistry

Biogenesis of Natural Compounds. Peter Bernfeld, Ed. Pergamon, London; Macmillan, New York, 1963. xiv + 930 pp. Illus. $28.

In *Science* [**144**, 634 (1964)] there appeared a hypothetical case history of a major work, a symposium volume written by a number of specialists under the editorship of a person charged with assembling and welding the constituent chapters into a coherent whole. The pitfalls attendant on such an operation are made abundantly clear, and the chances of producing a work of lasting significance are appropriately evaluated. That article is entirely pertinent to the present volume. *Biogenesis of Natural Compounds* consists of 18 chapters that deal with various classes of substances; presumably the chapters were written by authorities with ample backgrounds in the areas concerned. But, if one can judge by the voluminous literature citations, either this goal was not always achieved or some of the authors are unduly modest about citing their own work.

The book will be of primary interest to biologists and biological chemists; it contains relatively little that will appeal to organic chemists. Since the majority of the authors are biologists, this was probably unavoidable. In the excellent discussion of the interrelationships of various plant products, heavy emphasis is placed on use of isotopic labels and, to a lesser extent, on the use of microbial mutants in establishing pathways for the construction of the complex molecules. However, more discussion of the nonenzymatic, strictly organic chemistry of the types of precursor under consideration, with some interpretation of these relationships to the proposed biogenetic pathways, would have added much to the comprehensiveness of the volume. Typically, practically nothing is said about the extensive body of knowledge concerned with phenol oxidations, knowledge of which is a key to reaction types in understanding the origin and fate of many naturally occurring phenols and their derivatives. The excellent history of the problems and solutions of plant terpene biogenesis is written from the viewpoint of a biochemist and is little concerned with the examination of the very interesting chemistry and supporting evidence in terpene cyclizations.

In the chapter on alkaloid biogenesis, Leete, one of the few organic chemists actively working in this area, gives a straightforward account of studies and hypotheses that have been put forward in the past. However, there are some notable omissions, of which the most surprising is that of Leete's own work on the biogenesis of ajmaline, work that casts doubt on the shikimic acid route to ring E. Another striking omission is the failure to treat the rather extensive body of information on the origin and interrelationships of riboflavin.

Space does not permit detailed discussion of all the topics presented. Some chapters are mere compilations, with little attempt at critical discussion and appraisal. Others are good. With the exception of a few chapters, the literature is covered only through 1960, although some chapters have supplementary lists of references into 1962. Thus, even before publication, the volume is seriously out of date in many areas.

One particularly annoying facet is the very serious overduplication of material from chapter to chapter—in particular such repetition as the discussion of mevalonic acid and its incorporation into isoprenoid type compounds in the chapters on steroids, terpenes, carotenoids and vitamin A, lipids, and rubber. Similar overduplication is found in the chapters on purine and pyrimidine nucleotides and nucleic acids, and in those on the shikimic acid pathway for producing aromatic acids from nonaromatic precursors in the chapters on phenolic plant products, tannins, lignins, and amino acids. Although the duplication is admitted in the preface, more efficient editing would have removed this source of irritation and at the same time, provided an equally valuable but considerably smaller book.

The book is set in monotype and contains a number of errors, both typographical and otherwise. Despite its shortcomings, it constitutes a valuable compilation of references, but it seems hardly worth the price, particularly for the organic chemist interested in natural products.

ROBERT C. ELDERFIELD
RICHARD G. LAWTON
MICHAEL M. MARTIN
Department of Chemistry, University of Michigan, Ann Arbor

Research in Enzymology

The Enzymes. vol. 7, pt. A, *Oxidation and Reduction.* Nicotinamide nucleotide-linked enzymes; Flavin nucleotide-linked enzymes. Paul D. Boyer, Henry Lardy, and Karl Myrback, Eds. Academic Press, New York, ed. 2, 1963. xxii + 726 pp. Illus. $21.

The volumes in this series are written by leading workers in the field and contain comprehensive critical summaries of the present knowledge of enzymes, with emphasis on their chemistry and mechanism of action. This present volume maintains the high standards set in the preceding volumes of the series. It should be emphasized that these volumes have been much more completely revised than is usually the case with a second edition. The arrangement of subject matter and choice of authors is entirely new.

The contents of volume 7 are as follows: "L-glutamate dehydrogenases" (Carl Frieden); "Alcohol dehydrogenases" (Horst Sund and Hugo Theorell); "α-Glycerophosphate dehydrogenase" (Tadeusz Baranowski); "β-Hydroxyacyl CoA dehydrogenases" (Salih J. Wakil); "Isocitrate dehydrogenases" (Gerhard W. E. Plaut); "Lactate dehydrogenase" (George W. Schwert and Alfred D. Winer); "Malate dehydrogenases" (Ernest Kun); "Oxidation and reduction of nucleotide-linked sugars" (Jack L. Strominger, Reiji Okazaki, and Tuneko Okazaki); "Hydroxysteroid dehy-