

on IV but none on I and II. After hydrolysis, total ninhydrin values corresponded to those obtained for the DNP derivatives.

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BOOK REVIEWS

Advances in Carbohydrate Chemistry. Volume 9. By MELVILLE L. WOLFROM, Editor, R. STUART TIPSON, Assistant Editor, and E. L. HIRST, Associate Editor for the British Isles. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1954. xviii + 426 pp. 16 × 23 cm. Price, \$10.50.

It is most appropriate that this, the latest volume of a distinguished series, should begin with a biographical sketch of the late C. S. Hudson, written by the present editor, M. L. Wolfrom. Not only did Professor Hudson play a major part in the development of carbohydrate chemistry in this country but he was also closely associated in various capacities with this series of reviews from its inception until his death in 1952.

The present volume, like its predecessors, reminds the writer of the medieval *Speculum Alchemiae*, for it is a kind of mirror, a mirror of the state of carbohydrate chemistry, and affords even the most casual reader an opportunity to see what areas of this fertile field are being tilled most intensively. In this light two aspects of the latest volume seem particularly worthy of note. First, several of the contributions illustrate the gratifying extent to which modern theories of the mechanism of organic reactions have been applied in the carbohydrate field and, second, the volume, taken as a whole, caters to a surprisingly broad spectrum of interests. The organic chemist concerned with reaction mechanisms will find a chapter by R. U. Lemieux ("Some Implications in Carbohydrate Chemistry of Theories Relating to the Mechanisms of Replacement Reactions"), one by Clinton E. Ballou ("Alkali Sensitive Glycosides") and a third by Mary Grace Blair ("The 2-Hydroxyglycols"). The worker in natural products will turn especially to Ballou's chapter as well as to one by Dexter French entitled "The Raffinose Family of Oligosaccharides." If he is among the increasing number who deal with the uronic acids, G. O. Aspinall's chapter on "The Methyl Ethers of Hexuronic Acids" will prove a useful compilation of important data which have heretofore been widely dispersed in the literature. He will also find a contribution by Robert S. Teague entitled "The Conjugates of D-Glucuronic Acid of Animal Origin" which will, of course, appeal as well to the biochemist and physiologist. One interest of the sugar technologist is represented by "Color and Turbidity of Sugar Products" written by R. W. Liggett and Victor R. Deitz. The chemist interested in the industrial utilization of carbohydrates will find a contribution by J. V. Karabinos and Marjorie Hindert on "Carboxymethylcellulose" while laboratory workers in several fields will note much of practical value in a review on the "Paper Chromatography of Carbohydrates and Related Compounds" by George N. Kowkabany. The present volume is, incidentally, the first of the series in which an attempt has been made to use the new carbohydrate nomenclature [*Chem. Eng. News*, 31, 1776 (1953)] throughout.

Taken as a whole, this volume, together with the preceding ones, forms a set which is of great utility to chemists generally and invaluable to those specializing in the carbohydrate field.

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The Chemistry of Lipids of Biochemical Significance. By J. A. LOVERN. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1955. xiii + 132 pp. 11 × 17 cm. Price, \$1.75.

This relatively short monograph is intended to give an over-all general picture of lipid chemistry and therefore does not fully cover either subject matter or bibliography. In general only major points are presented with a minimum amount of experimental detail. The monograph brings to focus many important aspects of the lipids in a manner that the reader is not bothered with less important minutiae. Although the text covers lipid structure, preparation and analysis, a considerable portion is devoted to the distribution, dynamic state and biochemical functions of the lipids. Emphasis is placed on the phosphatides. The carotenoids and fat-soluble vitamins are not included in the monograph. It is the opinion of the reviewer that the title of the book might have been more appropriately chosen since a large part of the monograph deals with topics other than lipid chemistry.

The author gives constructive comments on lipid nomenclature and classification and indicates the need for more uniform and discrete terminology. The interrelationships of the various lipid classes are stressed and an attempt is made to integrate the entire lipid subject.

The reader will find the personal comments of the author interesting, helpful and provocative. An excellent evaluation of the various methods of lipid preparation and analysis is presented including an informative discussion on lipid extraction and purification. In addition, there is a stimulating discourse on the limitations of radioactive isotope techniques for the study of lipid metabolism. Topics such as lipid complexes with proteins and carbohydrates, and lipid digestion, absorption and biosynthesis are briefly covered.

The subject matter of the book is well presented and should have particular appeal to those interested in obtaining the essential highlights of the biochemistry of the major lipids. Moreover, the fine integration of the material should make the monograph especially useful to the beginner in the lipid field.

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The Vitamins. Chemistry, Physiology, Pathology. Volume III. Edited by W. H. SEBRELL, JR., Director, National Institutes of Health, Bethesda, Maryland, and ROBERT S. HARRIS, Professor of Biochemistry of Nutrition, Massachusetts Institute of Technology, Cambridge, Massachusetts. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1954. xi + 665 pp. 16.5 × 23.5 cm. Price, \$15.00.

This is the third and last volume of a series. It is, of course, difficult to review adequately one-third without reference to the other two thirds. In the whole series the vitamins are presented in alphabetical order so the biochemist, chemist and clinician, to whom the series is directed,