

of the relative merits of available methods is given. It is to be hoped that, if a second edition of this work is made, that more emphasis will be placed upon methods of analysis.

Chapter 6 on the Reactions of the Pentaerythritols, is short, but, since there are later chapters dealing specifically with nitrates, amines, halides, ethers, etc., this chapter may be viewed upon as a collector of difficultly classifiable compounds. It lists 61 references covering products of oxidation, reduction, pyrolysis and reactions with alkalies and acids, with phosphorus compounds and with metals.

Chapter 7, on the Nitrates of the Pentaerythritols gives a very compact compilation of the processes available for the manufacture of pentaerythritol tetranitrate, lists the physical and explosive properties of PETN and its mixtures with other agents, and refers to its use in medicine. It also refers to nitrates closely related to PETN, such as dipentaerythritol hexanitrate and the higher pentaerythritol nitrates as well as substituted pentaerythritol nitrates. It lists 332 references closely related to PETN.

Chapter 8, covering Amines; Chapter 9, dealing with Halides; Chapter 10, pertaining to Ethers; Chapter 11, on Acetals; Chapter 12, relating to Sulfur-containing Derivatives; and Chapter 13, on Esters, are excellent reviews of the literature related to the subject matter of each chapter. These six chapters discuss more than 600 references and have been very carefully prepared.

Chapter 14, on the Drying Oils, is rather short and attempts to cover a large subject. It serves as a practical guide for processing the pentaerythritols into drying oils and lists 217 pertinent references.

Chapter 15, covering the Rosin Esters, lists 170 references and interprets these in a clear and concise manner.

Chapter 16, on the Polyesters, Alkyd Resins and other Resins, includes 221 references pertaining to alkyds, etc., and, taken in conjunction with the chapters on drying oils and rosin esters, is well worth the price of the book.

The final chapter on Miscellaneous Uses gives unusual uses for the pentaerythritols, such as stabilizers for vinyl chloride and chlorinated paraffin wax; as constituents of fire-retardant coatings as well as a number of surprising applications.

This rather small and attractive volume attempts to cover a large subject. The text has been prepared with great care and discrimination. The style is easy to read and the data have been well documented. It provides a quick review which points out where, if not what, the comprehensive literature contains.

The Author and Subject Indexes appear to be adequate, and the make-up and editing are excellent.

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Fortschritte der Chemie organischer Naturstoffe (Progress in the Chemistry of Organic Natural Products). Volume XIV. Edited by L. ZECHMEISTER, California Institute of Technology, Pasadena. Springer-Verlag, Mölkerbastei 5, Wien I, Austria, 1957. viii + 377 pp. 16 × 23.5 cm. Price, \$16.90. Ganzleinen, \$17.85.

The distinctive features of Zechmeister's "Fortschritte" series are well known to organic chemists, and have been discussed in reviews of previous volumes.

We find the current volume of particular interest because it contains, in addition to the usual authoritative reviews of organic structural problems, a number of chapters of broad significance to biology and even to geochemistry.

Bohlmann and Mannhardt discuss, in the first chapter, the chemistry of the considerable number of naturally occurring acetylenes. Ch. Tamm's chapter deals with the cardiac glycosides, with emphasis on their glycosidic character; the chemistry of the aglycones was discussed by the same author in volume 13 of the "Fortschritte." Brockmann contributes a good summary of the work on hypericin and related pigments. The chapter by Birch on the role of acetate as precursor for various classes of naturally occurring compounds is interesting and stimulating, although it would have benefited by a greater clarity of exposition in several spots. Sobotka, Barsel and Chanley discuss the chemistry of the "aminochromes," the orthoquinonoid dihydroindole oxidation products of adrenaline and related compounds. Morton and Pitt contribute an

extremely interesting account of the visual pigments, which gives an impressive picture of the advances in this field and of the formidable experimental difficulties which face the investigator. The chapter by Harrison Brown, on the carbon cycle, discusses "organic" chemistry on the cosmic scale.

There are undoubtedly a few misprints in the book, for those who enjoy finding them, and we would have enjoyed a chapter written in French. However, the book is an excellent production.

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Purity Control by Thermal Analysis. Proceedings of the International Symposium on Purity Control by Thermal Analysis, Amsterdam, 1957. Sponsored by the I. U. P. A. C. and organized by the Committee on Physico-Chemical Data and Standards. Edited by W. M. SMIT, Director of the Netherlands Central Institute for Physico-Chemical Constants, Utrecht, The Netherlands. D. Van Nostrand Company, Inc., 126 Alexander Street, Princeton, New Jersey. 1957. xii + 182 pp. 17 × 24.5 cm. Price, \$4.75.

This book brings into one place the current ideas of experts in the field of "purity control by thermal analysis." Reported in this book are the latest experimental apparatus and procedures being used in laboratories in different countries: Ubbelohde, University of London, England; Aston, Pennsylvania State University, U.S.A.; Herington, Handley, National Chemical Laboratory, England; Smit, Katerman, University of Utrecht, The Netherlands; Saylor, Glasgow, Ross, Horton, Enagonio, Dixon, Furukawa, Reilly, Henning, National Bureau of Standards, U.S.A.; Keinitz, Badische Anilin and Sodafabrik A.G., Germany; Swietoslowski, Zieborak, University of Warsaw, Poland; McCullough, Waddington, U. S. Bureau of Mines, U.S.A.; Mazee, University of Amsterdam, The Netherlands; Skau, Magne, Mod, U. S. Department of Agriculture, U.S.A.; Barnard-Smith, White, British Petroleum Company, England; Stull, Dow Chemical Company, U.S.A.; Pilcher, Chemical and Petroleum Research Laboratory, Carnegie Institute of Technology, U.S.A.

The discussion covers all phases of the problem of the determination of freezing points and purity from calorimetric methods and from time-temperature freezing and melting experiments.

This book is a recommended reference for all scientists concerned with freezing points and purity of substances.

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Vitamin A. By THOMAS MOORE, Sc.D. (Cantab.) and D.Sc. (Belfast). Dunn Nutritional Laboratory, Cambridge, England. D. Van Nostrand Company, Inc., 126 Alexander Street, Princeton, N. J. 1957. xx + 645 pp. 16 × 23 cm. Price, \$14.00.

This monumental work comprehensively and critically surveys all aspects of vitamin A, including chemistry, physiology, biochemistry, pathology, medicine and spectroscopy. The historical development of our knowledge of vitamin A has been traced in all these diverse fields. In his preface Dr. Moore proposes that a book written by a single author rather than by a number of specialists might present a better balance between various disciplines. The author has succeeded admirably in preparing a book uniform in style, integrated, and exceptionally well-written.

The book begins with a five-page summary of units and nomenclature, a section vital for clear comprehension of the complex nature of vitamin A and the carotenoids. Dr. Moore then continues with an outstanding historical introduction based on his three decades of experience in the field. The next two chapters deal with the estimation and chemistry of vitamin A and the pro-vitamins A. In the opinion of this reviewer, these two chapters are relatively weak, probably because Professor Moore was largely dependent upon published data rather than upon personal ex-

perience. For example, the contributions of Oroslnik to the synthesis of vitamin A have not been cited. In the fields of physiology, biochemistry, pathology and nutrition of vitamin A, the author is at his best, and by citing his own contributions adds authenticity and interest to these sections. Throughout the book more recent findings are interpreted in the light of historical perspective. The interrelationships of vitamin A with a number of special topics are covered, including farm animals, sex and thyroid. In an outstanding chapter, the final one, Dr. Moore assesses our present knowledge of vitamin A and makes some predictions for the future. The book includes appendices summarizing information on bioassay diets and various analytical methods. In view of the wide availability and transitory nature of analytical procedures, their inclusion in this volume seems unnecessary. The comprehensive author and subject indices, covering over forty pages, immensely increase the usefulness of this book.

Perhaps the main criticism should be directed at the publisher rather than the author. This book bears the publication date 1957. Most of the chapters were completed in 1954, apparently, with only an occasional reference to the literature of 1955. Thus this volume at the date of issuance is no longer an up-to-date survey of the field. For example, the elucidation of the structure of neoretinene-*b* as the 4-mono-*cis*-vitamin A aldehyde was reported in 1955, as was also the preparation and identification of the 2,4-*cis* isomer of vitamin A. These two isomers complete the series, and omission leaves the uninitiated in a confused state.

Errors are few. One should point out that the correct molecular weight of carotene is 536.85, which should be rounded off to 537 rather than to 536. In addition, more recent literature should be consulted for elucidation of the correct structures of the various *cis-trans* vitamin A isomers.

This book is a must for every student of vitamin A and should be widely accepted as a reference in courses in biochemistry and nutrition. Professor Moore and the publishers are to be congratulated for having concentrated their efforts on a single vitamin.

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STANLEY R. AMES

Biochemistry of the Amino Acids. By ALTON MEISTER, Professor of Biochemistry, Tufts University, School of Medicine, Boston, Massachusetts. Academic Press, Inc., Publishers, 111 Fifth Avenue, New York 3, N. Y. 1957. xiii + 485 pp. 16 × 23.5 cm. Price, \$10.00.

The numerous definitive contributions to the biochemistry of the amino acids, which have been stimulated in large measure by the availability of isotopic tracers and the increasing interest in the chemistry of the amino acids particularly as they relate to the peptides and proteins, have created a need for an authoritative, compact, yet not unwieldy, presentation of the biochemistry of the amino acids. Under five major headings, namely: "The Natural Amino Acids"; "The Role of Amino Acids in Nutrition"; "General Biochemical and Physiological Considerations"; "Intermediate Metabolism of the Amino Acids" and "Abnormalities of Amino Acid Metabolism in Certain Pathological Conditions," the author presents these subjects with accuracy, essential detail and imagination. Matters worthy of further presentation are thoroughly annotated with literature references to both European as well as American sources. In this rapidly developing area of biochemistry, Meister's book provides a valuable up-to-date reference source for medical students, biologists and chemists in an easily readable, remarkably error-free form.

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JUNE 10, 1958-JULY 10, 1958

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