

## REVIEWS

*The Vitamin Co-factors of Enzyme Systems.* By F. A. ROBINSON. Pergamon Press Inc., 44-01 21st St., Long Island City, NY 11101, 1966. ix + 896 pp. 15.5 × 23 cm. Price \$25.

"The Vitamin Co-factors of Enzyme Systems" is a timely replacement of the author's earlier book, "The Vitamin B Complex," which was published in 1951. Most of the material from the earlier book has been incorporated in the present volume, in addition to a rather extensive collection of recent knowledge concerning the role of the B complex vitamins as enzyme co-factors.

Earlier books on vitamins were concerned principally with their importance in nutrition and deficiency syndromes, but during the past two decades, a considerable number of studies have been conducted to establish the enzyme co-factor function of the vitamin B complex and its role in metabolic processes. Robinson emphasizes this revolutionary new concept of vitamin B activity.

The volume is composed of an Introduction, a Conclusion, and nine chapters dealing with the B complex vitamins, including thiamine, riboflavin, nicotinic acid, pyridoxine, pantothenic acid, lipoic acid, biotin, folic acid, and vitamin B<sub>12</sub>. The chapters on folic acid, vitamin B<sub>12</sub>, and lipoic acid are new additions; *p*-aminobenzoic acid, choline, and inositol are not included in the book because their co-factor function is obscure. Each chapter is divided into subsections for the convenience of the reader. The references which are cited at the end of each section are well selected, but include only those published up to 1963.

The author's discussion of the close inter-relationship between these co-factors and the fundamental basis for the need of these vitamins in proper and sufficient amounts in biological systems is inadequate. His relegation of this area to the 5-page conclusion section may lead the reader to overlook the dynamic aspect of these co-factors acting in biological systems as an interdependent group.

This book is well-organized, the facts are clearly presented, and it serves as an excellent reference source for information about the vitamin B complex.

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*The Chemistry of Heterocyclic Compounds: Multi-Sulfur and Sulfur and Oxygen Five- and Six-Membered Heterocycles. Part I.* By DAVID BRESLOW and HERMAN SKOLNIK. Interscience Publishers, a division of John Wiley & Sons, Inc., 605 Third Avenue, New York, N. Y. 10016, 1966. xxii + 610 pp. 15 × 22.5 cm. Price \$33.00.

Part One of the twenty-first volume in the Weissberger series of "The Chemistry of Heterocyclic Compounds" maintains in quite adequate fashion the

objective of this series to record the definitive chemistry of heterocyclic compounds. The authors' intent "to review the literature selectively and eclectically," establishing what is valid and denying insubstantial claims, has been followed throughout; an authoritative work has resulted.

This volume deals with the preparation, structure, properties, reactions, and uses of the five-membered heterocycles containing sulfur and oxygen; Part Two will cover the six-membered systems. As an indication of the extent of this subject, over 200 parent heterocycles falling within this classification have already been listed in the *Ring Index*. Among the types of cyclic compounds included in Part One are the following: sulfite and sulfate esters of glycols, anhydrides of sulfite esters of 2-hydroxy acids, anhydrides of 1,2-disulfonic acids, trithioles, esters of  $\gamma$ -hydroxysulfonic acids (sulfones), anhydrides of  $\beta$ -sulfocarboxylic acids, sulfonphthaleins, dithioles (cyclic disulfides),  $\alpha$ -lipoic acid derivatives, 1,2-dithiolium salts, dithioacetals of sugars and steroids, and esters of trithiocarbonic acid. Known compounds are exhaustively tabulated, but the literature has been selectively rather than thoroughly summarized. The literature has been reviewed through 1962, which unfortunately predates most of the chemistry known for the 1,3-dithiolium salts.

Physiological properties are noted, but the pharmaceutical chemist will find this volume valuable more for the variety of cyclic systems shown that may be obtained from such common intermediates as glycols and hydroxy acids. Some of these heterocycles have already found use as protective groups in organic syntheses, and many show unique reactivities. A great deal of interest is presently being devoted to these compounds, as judged from the high percentage of contemporary references.

The authors are to be congratulated for a fine job, particularly in regard to interpreting some of the older literature; discussions of crystallographic, spectroscopic, and conformational studies are included. While we must wait for the appearance of Part Two for the index, a ten-page Table of Contents will be found helpful.

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*Nonionic Surfactants.* Vol. I. Edited by MARTIN J. SCHICK. Marcel Dekker, Inc., 95 Madison Avenue, New York, N. Y. 10016, 1966. xxv + 1085 pp. 17 × 24 cm. Price \$43.50.

"Nonionic Surfactants" is the first volume in a series designed to review the current knowledge of surfactants. The size of this volume, in excess of 1000 pages, reflects the rate at which the science and technology of this group of surfactants has grown since their introduction in 1930. The manufacture of nonionic surfactants now constitutes a sizeable fraction of the total production of all surfactants and it seems certain that these agents will find applica-

tion in an ever-increasing number of areas. Certainly, their use in pharmaceutical products as dispersing, emulsifying, solubilizing, and wetting agents has contributed to the formulation advances of the last two decades.

The subject matter is contained in 29 chapters and covers the organic chemistry (432 pages), physical chemistry (379 pages), and analytical chemistry (95 pages) of nonionic surfactants, with a final section of 73 pages devoted to the biology of these compounds. It is gratifying to note that several of the chapters have been contributed by authors from Schools of Pharmacy and the pharmaceutical industry.

Following an introductory chapter, the next twelve chapters deal with the organic chemistry of the numerous classes of nonionic surfactants; the preparative procedures, physical properties, and applications are described in each case. Inevitably, the overwhelming portion of this section is concerned with commercial surfactants. This results in a comprehensive coverage of the technical and patent literature pertaining to these compounds. Commercial trademarks abound in the text but are, annoyingly, omitted from the subject index. The average reader, not familiar with the chemical names of every commercial nonionic surfactant, may therefore have to search through no less than 27 tables scattered throughout the text in order to find a particular surfactant. The last chapter in this section discusses the synthesis of homogeneous nonionic surfactants and is a fitting introduction to the next nine chapters describing the physical chemistry of nonionics, since the more meaningful work in this area invariably requires the use of homogeneous compounds.

The chapters devoted to micelle formation, solubilization, detergency, and foaming are standard presentation of the subject matter. Unfortunately, the chapter supposedly dealing with the physical chemistry of emulsification is quite inadequate, especially in view of the comment, made in the introductory chapter, that one of the major applications of nonionic surfactants is in emulsion technology. Only 22 pages in the whole book are devoted to this topic with just over half a page allotted to the applications of nonionic emulsifiers. In contrast, the remaining chapters on surface films, the thermodynamics of micelle formation, the effect of nonionic surfactants on the stability of dispersions, and the configuration and hydrodynamics of the polyoxyethylene chain are excellent and add much to the value of this section of the book.

Four chapters comprise the third section which reviews the analytical chemistry of nonionic surfactants. Following an introductory chapter, the discussion turns to noninstrumental, instrumental, and separational methods of analysis. These chapters are written in a practical vein and succeed in presenting a logical methodology for achieving the separation and identification of this class of compounds.

The biological aspects of nonionic surfactants are dealt with in the final two chapters of the book. The first of these deals with the biological, pharmacological, and toxicological effects of nonionic surfactants on animals and humans. Much of this material, presented in a concise yet highly factual manner in less than 40 pages, is highly relevant to the contemporary practice of pharmacy. The final

chapter is a necessarily brief account of the biodegradation of nonionic surfactants.

This then is a text covering a wide range of topics associated with nonionic surfactants. On the whole, the subject matter is well presented and the coverage adequate. The book is not written specifically for any one discipline and so no one in the pharmaceutical sciences is likely to find all the text of direct interest. By the same token, it will undoubtedly be of some interest to all those concerned with the science and technology of these compounds. While "Nonionic Surfactants" is not likely to receive a great deal of use as the personal copy of any one individual, it will be a valuable addition to any university or industrial pharmacy library.

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## NOTICES

*Dynamics of Chromatography. Part I: Principles and Theory.* By J. CALVIN GIDDINGS. Marcel Dekker, Inc., 95 Madison Ave., New York, NY 10016, 1965. xii + 323 pp. 15.5 × 23 cm. Price \$11.50.

*Chemical Carcinogenesis and Molecular Biology.* By PASCALINE DAUDEL and RAYMOND DAUDEL. Interscience Publishers, a Division of John Wiley & Sons, Inc., 605 Third Ave., New York, NY 10016, 1966. 159 pp. Price \$7.

*Anticancer Agents.* By FRANCES E. KNOCK. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1967. xix + 272 pp. 18 × 25.5 cm. Price \$15.50.

*Treatment of Psychiatric Outpatients.* By R. R. KOEGLER and N. Q. BRILL. Appleton-Century Crofts, 440 Park Ave. So., New York, NY 10016, 1967. xvii + 223 pp. 14.5 × 21 cm. Price \$6.95.

*Handbuch der Kolorimetrie.* Band III. Kolorimetrie in der Biologie, Biochemie und Medizin. 2. Teil. By B. KAKAC and Z. J. VEJDELEK. VEB Gustav Fisher Verlag, DDR, Jena, Villingang 2/PostschlieBfach 176, Germany, 1966. 496 pp. 17 × 24.5 cm. Price Geb. MDN 49.60.

*Arzneipflanzen.* Part 24: *Aesculus hippocastanum* L. By F. AUSTER and J. SCHAFER. VEB Georg Thieme, Leipzig, Absatzabteilung, DDR-Jena, Villingang 2/PostschlieBfach 176, Germany, 1966. 71 pp. 17 × 24 cm. Price MDN 6.75 Paperbound.

*Hyaluronidase: An Annotated Bibliography.* Part II. (1955-1966). By MYER M. FISHMAN. Technical Service Laboratories, River Edge, N. J., 1966. 88 pp. 21.5 × 27.5 cm. \$5.00 Paperbound.