

compositions is especially skillful. Martin and Rees' interpretation (1954) of the solubility of hydrogen in zirconium might have been included, as well as Takeuchi and Suzuki's discussion (1962) of the plutonium-hydrogen system.

In summary, this succinct volume may be recommended to researchers in the chemistry of metal hydrides, along with a word of caution on its omissions.

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The Alkaloids. Chemistry and Physiology. Volume VIII. The Indole Alkaloids. Edited by R. H. F. MANSKE, Dominion Rubber Research Laboratory, Guelph, Ontario, Canada. Academic Press Inc., 111 Fifth Ave., New York, N. Y. 1965. xv + 861 pp. 16 × 23.5 cm. \$32.00.

This book constitutes the eighth volume of a long-standing, well-known series of treatises on alkaloids and encompasses twenty-two chapters written by twelve knowledgeable authors. While the book covers only the subject of indole alkaloids, its large size and the apparent need for a repeated survey of this field only 5 years after the appearance of an extensive chapter thereon in the seventh volume of "The Alkaloids" bespeak the extraordinary, recent growth of this area of the chemistry of organic natural products.

Since the majority of the chapters are well composed and many reflect the personal research efforts of the authors, the subject matter comes strongly alive. Indole alkaloids represent some of the structurally most complex, monomeric organic compounds. Hence watching the unravelling of the mystery of their molecular labyrinths, the unfolding of the chemistry of their multiple, proximate, functional groups, the chemical resurrection of their bizarre molecular architectures, and the exact retracing of the pathways of their natural births are intellectually stimulating and rewarding experiences. Reading the alkaloid book yields such satisfaction. Furthermore, it creates vistas *inter alia* for new organochemical research program and for tortures of graduate students on new examination questions.

The book contains only a minimal number of mistakes (e.g., CXIX on p 721) and appears to yield exhaustive coverage of the chosen topics. Thus, for example, one of the earliest communications revealing the gross structures of rotundifoline and mitragynol [*Proc. Chem. Soc.*, 206 (1963)] is cited while having been overlooked in a previous review [*Ann. Rept. Progr. Chem.* (Chem. Soc. London), 60, 408 (1963)]. Whereas predictably some discussions have been rendered obsolete already by new research data, the book in general is surprisingly up to date. There is a heavy dose of mass spectrometry, the new plaything of the structure analysis enthusiasts, permeating the book. It can be expected to recede into the background in future volumes of "The Alkaloids" series, as this new research tool is acceptable as commonplace and takes its position alongside all other plebeian methods of instrumental analysis.

The greatest weakness of the book lies in its general organization. There is an extraordinary amount of duplication of discussion by the various authors. (Suffice it to illustrate just one case of wasted effort, Chapter 18; its subject matter is covered largely in Chapter 14.) This problem will only worsen in future volumes unless traditional lines of organization are abandoned. Since the same or structurally closely related alkaloids are constituents of a great variety of plant species, any division of discussion along taxonomic lines must prove to be awkward. Since the book purports to speak mostly to the organic chemist, classification by structure types may be the most efficient method of presentation. A separate listing (perhaps in form of a chapter) of all botanical species to be discussed and their alkaloidal contents could be included.

While the subtitle of "The Alkaloids" implies coverage of both chemistry and physiology, only the first subject has been done full justice in Volume VIII as well as in most previous volumes. Since the pharmacology of alkaloids should not be merely an afterthought of alkaloid chemistry and deserves its own place under the sun as a separate scientific discipline with its own adherents, serious consideration should be given to deletion of the small "physiology" sections in future volumes.

Although the price of the book will preclude its mass purchase by students, no practitioner of alkaloid chemistry can afford to be without a desk copy.

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Fluorine Chemistry. Edited by J. H. SIMONS, University of Florida, Gainesville, Fla. Volume IV. By HAROLD C. HODGE and FRANK A. SMITH, Department of Pharmacology and Radiation Biology and Biophysics, University of Rochester School of Medicine and Dentistry, Rochester, N. Y. Academic Press Inc., 111 Fifth Ave., New York, N. Y. 1965. xviii + 786 pp. 16 × 23.5 cm. \$28.00.

The Volume IV edition of the text entitled "Fluorine Chemistry" is a most misleading title. There is no discussion at all of the chemistry of fluorine. In fact, the authors very frequently misuse the proper nomenclature in not naming fluoride compounds with the most electronegative element last. After some perusal, one notes that Volume IV reflects a series of volumes, all under the same title. Volumes I and II concern themselves with fluorine chemistry *per se*, Volume III with the biological effects of the organic fluorides, and Volume V to new information of fluorine chemistry. It appears that a subtitle to each generic title would have been most useful for explaining the exact contents of each volume.

Volume IV is particularly confusing in the design and use of the tables. One notes that Table 8, for example, is on page 192, while Tables 7 and 9 are on pages 20 and 39, respectively. Capitulation shows that Tables 8, 12, 21, 22, 25, 34, and 56 are at the end of the first chapter and not appropriately placed following the subject matter.

One is confused in correlating the figures with the body of the material. For example, on page 34, the authors refer to Figure 5 in their discussion of fluoride absorption and excretion. Figure 5 appears on page 422 and has nothing to do with either plasma fluoride or urinary fluoride.

The dedication of this volume is to the memory of Kaj Roholm, a most appropriate choice since, as the authors mention, his concepts which were introduced more than 30 years ago now have been substantiated by current research. While this gesture is much deserved, warmly prepared, and stated with much humility, it does seem inappropriate in some ways, since the authors themselves pioneered the basic research in fluorine chemistry along with such notable investigators as McClure at the National Institute of Public Health, Phillips at the University of Wisconsin, Armstrong at the University of Minnesota, and others too numerous to mention. These data, obtained by these latter workers, were not based upon speculation as stated by the authors in reference to the work of Roholm.

The text is divided into two chapters. Chapter 1 concerns itself with the biological properties of inorganic fluorides in both experimental animals and in man. Chapter 2 devotes itself to the effect of fluorides on the skeletal system and the dentition. Under the first chapter an extensive and thoroughly documented discussion is presented concerning both the acute and chronic effects of fluoride toxicity along with the inorganic metabolism of fluoride in the human and animal. The clinical effects of fluoride metabolism are discussed from both an industrial and nonindustrial environment. An appropriate discussion is presented on the biological effect of fluoride on both enzyme systems and in microorganisms.

Little new material is presented in Chapter 2. However, the completeness of the discussion provides the interested reader with a composite picture of previously unrelated facts. An exception to this is the newer concept of the effect of fluoride on the skeletal system with specific reference to the beneficial effect in osteoporosis.

The only serious drawback to this excellent text relates to the dental aspects of the effects of fluoride contained in Chapter 2. While an extensive literature review is presented in table form concerning the effect of many different fluorides attempted for use in the control of human dental caries, little discussion is presented by the authors to relate the advantages and disadvantages, limitations, and beneficial aspects of the variety of different human clinical studies presented. For example, the tables which present human clinical data may lead the noncritical reader to believe that the same results in reducing dental caries are produced by using concentrated fluorides as topical agents once a year, as occur from using stannous fluoride dentifrices three times a day, or a fluoridated water several times a day from birth throughout the first 8 years of life. The chapter on dental caries could have been improved considerably by discussing some of the known limitations of human dental caries studies and what the inexperienced reader should expect in interpreting tables of data listing results without such background information. The discussion on stannous fluoride dentifrices, for example, leads the reader to believe that the efficacy of the stannous fluoride-calcium pyrophosphate dentifrice is of recent vintage. The authors substantiate their feeling "that more data is needed"

by referring to the Bartelstone, *et al.*, report which certainly is not comprehensive and gives no current information. At the time of the writing, the authors recognized that at least two other stannous fluoride containing dentifrices were being considered and have now received Class B ratings by the Council on Dental Therapeutics of the American Dental Association. While the above comments specifically related to the deficiency in the dental caries section, this does not in any way interfere with the excellence of the text. It is felt that the book will have its greatest acceptance among pharmacologists and toxicologists, the latter group having only minor interest in dental research.

Many outstanding sections appear in the text. Of special interest are the sections relative to the accumulative damage of excessive use of fluoride. The book would appear to provide an excellent background for those workers seriously concerned about accumulative fluoride poisoning, in light of increased interest in communal fluoridation, fluoride dentifrices, fluoride-vitamin preparations, and so forth. While no information exists at the present time that the combined use of fluoride as presently being practiced in the United States is anything but beneficial, one needs to be concerned about such effects as new instrumentation provides more accurate estimation of trace element metabolism.

The authors performed an excellent service in providing this material to workers interested in trace metabolism of inorganic elements. The book is highly recommended as a comprehensive collection of papers devoted to fluoride pharmacology and toxicity and is written by highly competent writers.

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Molecular Photochemistry. By NICHOLAS J. TURRO, Columbia University. W. A. Benjamin, Inc., 1 Park Ave., New York, N. Y. 1965. xiii + 286 pp. 16 × 23.5 cm. \$12.50.

It is a strange fact that although in the last 15 years an impressive increase in interest in photochemistry is evident, very few books on the subject have been published. In particular, textbooks on photochemistry have been as rare as unicorns. It follows that the timing is exactly right for the appearance of this book which is meant to be a text for "an introductory course on photochemistry for advanced undergraduates or first-year graduate students."

The book is divided into ten chapters. The first three chapters discuss general principles, electronic excitation, electronic spectra, and electronically excited states. The next two chapters, which together account for one-third of the book, are on the nature of electronically excited states and electronic energy transfer. The sixth through ninth chapters deal with various photochemical reactions which are classified as photoreduction and related reactions, photochemical rearrangements and isomerizations, photochemical cycloadditions, and photochemical fragmentations and related reactions. A short, final chapter, called miscellaneous topics, seems to have been added as an afterthought. There are problems (and solutions) and a list of references at the end of each chapter, as well as an addendum with more problems and references.

To write a textbook in a rapidly growing field, as organic photochemistry is today, must be one of the most challenging assignments that any author can undertake. The present author has squarely faced the challenge and worked out a method of presentation which may not be to the taste of everyone, but should appeal to most students. He has taken a fairly firm position on points which may seem far from settled to a practitioner in the field. However, this detracts little from the stated purpose of this book. A more serious criticism is the meager space that is allotted to experimental

methods (six pages) while a discussion of lasers, which is an esoteric subject to squeeze into a book of this size and scope, runs to four pages!

The book is very well laid out and printed. In the matter of typographical errors, it must set some kind of record. Fortunately, few of these are in the text itself, but the references are so loaded with them that an interesting game can be made of unscrambling them. In just one list of references, at the end of Chapter 4, there are at least eleven errors and misprints!

This book can be heartily recommended to anyone with a desire to be introduced to organic photochemistry.

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BOOKS RECEIVED, June 1966

BERNARD S. BAKER, Editor. "Hydrocarbon Fuel Cell Technology." Academic Press Inc., 111 Fifth Ave., New York, N. Y. 1965. 560 pp. \$21.50.

THOMAS PETER BENNETT and EARL FRIEDEN. "Modern Topics in Biochemistry. Structure and Function of Biological Molecules." The Macmillan Co., 60 Fifth Ave., New York, N. Y. 1966. 186 pp. \$2.95.

R. S. BRADLEY, Editor. "Advances in High Pressure Research." Volume 1. Academic Press Inc., Ltd., Berkeley Square House, Berkeley Square, London, W1, England. 1966. 396 pp. 100s.

B. E. CONWAY and R. G. BARRADAS, Editors. "Chemical Physics of Ionic Solutions." John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 1966. 622 pp. \$25.00.

WILLIAM H. HAMILL, RUSSELL R. WILLIAMS, JR., and COLIN MAC-KAY. "Principles of Physical Chemistry." 2nd Edition. Prentice-Hall, Inc., Englewood Cliffs, N. J. 1966. 576 pp. \$13.25.

WALTER KAUZMANN. "Thermal Properties of Matter." Volume I. "Kinetic Theory of Gases." W. A. Benjamin, Inc., 1 Park Ave., New York, N. Y. 1966. 248 pp. \$8.50.

JOHN L. KICE and ELLIOT N. MARVELL. "Modern Principles of Organic Chemistry. An Introduction." The Macmillan Co., 60 Fifth Ave., New York, N. Y. 1966. 449 pp. \$8.95.

R. H. MARCHESSAULT, Editor. "Small Angle Scattering from Fibrous and Partially Ordered Systems." Interscience Publishers, John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 1966. 165 pp. \$7.00.

T. D. MCKINLEY, K. F. J. HEINRICH, and D. B. WITTRY, Editors. "The Electron Microprobe. Proceedings of the Symposium Sponsored by The Electrothermics and Metallurgy Division, The Electrochemical Society, Washington, D. C., October, 1964." John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 1966. 1035 pp. \$27.50.

HERMANN SCHILDKNECHT. "Zone Melting." Verlag Chemie, GmbH, Weinheim/Bergstr., Germany. 1966. 222 pp. \$9.00.

ROSS STEWART. "The Investigation of Organic Reactions." Prentice-Hall, Inc., Englewood Cliffs, N. J. 1966. 125 pp. \$5.50.

JOHN S. WAUGH, Editor. "Advances in Magnetic Resonance." Volume 1. Academic Press Inc., 111 Fifth Ave., New York, N. Y. 1965. 413 pp. \$15.00.