

of 2.0269, very similar to that of phosphoranyl peroxy radicals, $\text{BO}(\text{RO})_3\text{POO}\cdot$,¹⁴ and quite different from g values for carbon peroxy radicals (2.014 – 2.019).¹⁵ The new radical has, therefore, been assigned the structure $\text{BO}(\text{Ph})_3\text{AsOO}\cdot$.

The kinetics for the decay of $\text{BO}(\text{Ph})_3\text{AsOO}\cdot$ proved to be complex. For example, the half-life at -40° was independent of the radical concentration and decreased

(14) G. B. Watts and K. U. Ingold, *J. Amer. Chem. Soc.*, **94**, 2528 (1972).

(15) K. U. Ingold, *Accounts Chem. Res.*, **2**, 1 (1969).

by a factor of approximately 2 when the triphenylarsine concentration was increased by 20. A full discussion of the kinetics of the decomposition of this radical will be presented in a subsequent full paper.

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Book Reviews*

Comprehensive Treatise on Inorganic and Theoretical Chemistry. Volume VIII. Supplement III. Phosphorus. By J. W. MELLOR. Senior Editor, A. A. ELDRIDGE. John Wiley-Interscience, New York, N. Y. 1971. x + 1467 pp. \$79.95.

This monumental volume is very nearly a self-contained treatise on phosphorus chemistry. It is the sixth installment of supplements to Mellor's classic original work. The growth of inorganic chemistry can be judged by the fact that original Volumes II and VIII have both become three volumes in the Supplement. In addition to the enormous amount of information presented in text, tables, and graphs, one notices an improved organization and a better system of handling references. There are forty chapters, ranging in subject from the history and occurrence of phosphorus to the toxicity of phosphorus compounds. Notable among them is the chapter on the organic derivatives of phosphorus, which, with 250 pages and 2434 references, is a book in itself. The profession of chemistry is deeply indebted to the compilers of such an important volume as this, which must have required a small army of devoted workers.

The index of only ten pages is surprisingly short for a book so large and full of detail. The biggest shortcoming of this work, however, is the one that would have been most easily avoided: there is no indication whatsoever as to when the coverage of the literature ceased! The unsigned and undated preface enlightens us on the fascinating fact that Volume II, Supplement I, was originally called Supplement II, Part I, but gives no hint about how up-to-date the present volume is. Browsing in the long lists of references suggests that the cut-off date was the end of 1967, but whatever it may have been, it is hard to excuse hiding such information in a work of major reference value.

Third Conference on Industrial Carbons and Graphite. Edited by J. C. GREGORY. Society of Chemical Industry and Academic Press, London. 1971. viii + 565 pp. £15.

This volume contains about a hundred papers, all of which are reports of original research and are accompanied by transcripts of the discussions. The latter have undergone substantial editing and, apparently, amplification by the participants, and as a result are actually useful.

Cycloaddition Reactions. Edited by R. GOMPPER (University of Munich). Butterworths, London. 1972. v + 208 pp. \$9.00.

Five of the specially invited lectures given at the Cycloaddition Symposium held in Munich in 1970 are reprinted from Volume 27 of *Pure and Applied Chemistry* in this book. Four are in English (P. D. Bartlett, C. S. Foote, G. M. J. Schmidt, N. J. Turro) and one is in German (H. Bestian).

Genetical, Functional, and Physical Studies of Hemoglobins. Edited by T. ARENDS, G. BEMSKI, and R. L. NAGEL. S. Karger, A. G., CH-4000 Basel, Switzerland. 1971. viii + 293 pp. \$19.20.

This volume contains the Proceedings of the First International Symposium on Hemoglobins, held in Caracas in 1969. The papers are arranged in three groups: Geographical Distribution and

Genetic Problems; Structure and Function; and Physical Studies of the Hemoglobin Molecule. They are well edited and well illustrated and are, in general, reports of original research. The book lacks an index.

XIIIth International Conference on Coordination Chemistry. Plenary Lectures. Edited by L. PAJDKOWSKI (University of Wroclaw). Butterworths, London. 1971. viii + 264 pp. \$20.25.

This volume contains the texts of thirteen lectures, complete with illustrations, tables, and references, given in 1970 at Krakow-Zakopane. All are in English, although many of the lecturers came from non-English-speaking countries.

XXIIIrd International Congress of Pure and Applied Chemistry. Special Lectures. Volumes 1 to 4. Butterworths, London. 1971. Volume 1: vi + 417 pp. \$15.00. Volume 2: vi + 337 pp. \$12.00. Volume 3: v + 121 pp. \$7.50. Volume 4: vi + 540 pp. \$18.00.

These volumes contain the special lectures given at Boston in 1971; all are devoted to some aspect of organic chemistry. In Volume 1 there are three groups of lectures: Application of Quantum Mechanics to Organic Reaction Paths; Intramolecular Rearrangements, Valence Isomerization, and Cycloaddition; Photochemistry. Volume 2 contains the groups General Methods of Synthesis, New Natural Product Syntheses, and Small Rings. Volume 3 is devoted to Medicinal Chemistry and Insect Chemistry (a curious combination). Volume 4 covers Short-Lived Intermediates, Free Radicals and Homolytic Mechanisms, and Ion-pair Processes. All lectures are printed in English, and they contain tables, illustrations, and references; there are no indexes. The anonymous editors and the publishers are to be congratulated in making this material available so promptly.

Organic Solid State Chemistry. Edited by M. D. COHEN (Weizmann Institute for Science). Butterworths, London. 1972. vii + 526 pp. \$17.25.

The plenary lectures of the 2nd International Symposium on Organic Solid-State Chemistry (Rehovot, 1970) are presented in this book. They are extensively illustrated and are accompanied by good bibliographies. There is no index.

Proceedings of the 2nd Conference on Applied Physical Chemistry. Edited by I. BUZAB (Technical University Budapest). Akademiai Kiado, Budapest. 1971. Volume 1, 759 pp. Volume 2, 738 pp. \$28.00.

Volume 1 contains the papers of the 2nd Electroanalytical Symposium and of the 4th Symposium of Oscillometry; Volume 2 is devoted to Chemical Engineering and Pharmaceutical Technology. The reader is not told where and when the symposia were held, or under whose auspices, but the authors appear to be all Hungarian. The papers are reports of original research rather than reviews, and all are in English. There is an author index, but no subject index; the volumes are paperbound.

Selected Constants: Oxidation-Reduction Potentials of Inorganic Substances in Aqueous Solution. By G. CHARLOT (Ecole de Phys-

* Unsigned book reviews are by the Book Review Editor.

ique et de Chimie de Paris), A. COLLUMEAU, and J. C. MARCHON (C.N.R.S.). Butterworths, London. 1971. 73 pp. \$10.50.

This book is published under the auspices of the Electrochemical Commission of the Analytical Chemistry Division of IUPAC. It consists entirely of tables of oxidation potentials, arranged in formula-index order, and a list of references to the sources of the data. Those who have for so long relied on W. M. Latimer's "Oxidation Potentials" will welcome the present book, for it contains information published through 1967, and thus includes potentials for many systems not found in the earlier work.

Problems in Advanced Organic Chemistry. By JERRY MARCH (Adelphi University). Marcel Dekker, New York, N. Y. 1971. viii + 421 pp. \$9.75.

This is a collection of problem sets, in soft cover, designed to accompany the author's text, "Advanced Organic Chemistry" (McGraw-Hill, 1968). The problem sets are organized in content and sequence to follow generally the chapters in the text. Advanced students will find this to be a valuable study guide independent of the text.

The problems, over 800 of them, are carefully chosen, and they represent a wide spectrum of both mechanistic and synthetic organic chemistry. Included are exercises dealing with nomenclature and the chemical literature. Wisely, the author has excluded problems devoted entirely to spectral interpretation; a number of good books are available which feature such problems.

The problems here are taken from the literature; either answers with references or references alone are given. The latter encourages the student to examine the original paper, allowing him to assess mechanistic arguments and to appreciate synthetic design.

While not inexpensive, this is an excellent study guide and a wise investment for the graduate or advanced undergraduate student.

Daniel T. Longone, *The University of Michigan*

The Chemistry of Thallium. By A. G. LEE (King's College, Cambridge). Elsevier Publishing Co., Amsterdam, London, and New York. 1971. xi + 336 pp. \$22.00.

Lee's book on "The Chemistry of Thallium" is, on balance, a very poor effort. Both Lee and his publishers must have been on a prolonged vacation when this book was in the proof stage, for the number and quality of the typographical errors are unbelievable. Authors' names are misspelled, references are incorrect, formulas are miswritten, statements made on one page are contradicted on another—the inevitable result is a sea of confusion. To make matters worse, Lee has relied heavily upon the original literature for his prose. A totally inadequate index further compounds the reader's frustration and irritation.

This book on thallium chemistry is, however, the only one currently available and represents an extremely valuable source of references. It is unfortunately indispensable to workers in the field for that reason alone, but what a shame it is that the only book in this field should be of such indifferent quality!

Edward C. Taylor, *Princeton University*

Machina Carnis. The Biochemistry of Muscular Contraction in its Historical Development. By D. N. NEEDHAM (Cambridge University). Cambridge University Press, London. 1971. xvi + 782 pp. \$55.00.

This book is an enormous, multifaceted review of muscle chemistry and function. History and speculation dealing with this most conspicuous of bodily functions are described, with detailed referencing, from the third century B.C. to the time the book was published. The 140 pages of references make this a valuable source book for both the historian and the current muscle researcher.

Two components of the overall contractile process of muscle are reviewed in extensive detail: (1) the chemistry and mechanics of the contractile protein, and (2) the biochemistry of energy metab-

olism in muscle. These reflect the primary focus of Dr. Needham's interest over the last 40 years. Membrane excitation (electrophysiology) and excitation-contraction coupling are given less extensive coverage. In addition to these broad aspects of muscle biochemistry and physiology, the author has devoted a chapter to each of the following specific subjects: (1) comparative study of striated muscle in vertebrates; (2) effects of denervation and cross innervation; (3) some aspects of muscle disease; (4) invertebrate muscles; (5) vertebrate smooth muscle; and (6) energy provision and contractile protein in nonmuscular functions. Of these, the subject presented in most detail is vertebrate smooth muscle, again reflecting Dr. Needham's own research.

The book is a valuable contribution in that it captures the author's 40 years of intellectual activity in a broad, important and rapidly evolving field. It is not an easy book to read because of the level of detail and the assumption that the reader is familiar with the field. In places in the historical aspect of the presentation the reader may find it difficult to sort out today's "fact" from yesterday's "fiction." Nevertheless, the book presents a valuable overview of the growth of knowledge about muscle and a comprehensive picture of the current state of the art.

David F. Bohr, *University of Michigan*

Subunits in Biological Systems (Biological Macromolecules Series). Volume 5. Part A. Edited by S. N. TIMASHEFF and G. D. FASMAN. Marcel Dekker, Inc., New York, N. Y. 1971. ix + 408 pp. \$26.50.

According to the editors' preface this is the first of several volumes dealing with subunits. Rather than to compose each volume in a logical, predetermined fashion and let the slowest contributor to each volume determine its completion date, the editors decided to publish each volume as soon as a proper number of contributed chapters were available and thus make each volume as current as possible. Because of this policy, it becomes rather difficult to assess the total impact and philosophy of the Subunit section of this series. The present first volume covers a rather broad and miscellaneous range of topics from relatively simple multisubunit proteins, "The Hemocyanins" (by K. E. van Holde and E. F. J. van Bruggen), "Hemerythrin" (by I. M. Klotz), and "Phycocyanins and Deuterated Proteins" (by D. S. Berns), to the much more complex aggregates of "Tobacco Mosaic Virus and Its Protein" (by M. A. Lauffer), "Myosin: Molecule and Filament" (by S. Lowey), "Actin" (by F. Oosawa and M. Kasai), "Structural Components of the Striated Muscel Fibril" (by F. A. Pepe), and "Microtubules" (by R. E. Stephens). As expected from the diversity of the component parts, the treatment and style expressed in the individual chapters as well as the experimental approaches are quite nonuniform. This lack of uniformity turns out to be a great asset to this volume, which actually presents an excellent summary of the general experimental problems associated with structure-function studies on multimeric protein and also a remarkably complete survey of most of the different research tools available for such studies. The breadth of these aspects and the readability of the individual chapters expand the value and usefulness of this volume far beyond the realm of the specific systems discussed. Any person who wishes to obtain a solid, general introduction to the problems and methods involved in the study of multimeric proteins should therefore find this a very useful volume. He may miss some of the fascinating biological aspects of the subunit systems, for example, those associated with regulated enzymes and multienzyme complexes, but these will undoubtedly be the topics of subsequent volumes. In addition, each individual chapter appears to represent a comprehensive and up-to-date picture (most of the chapters include references from the 1970 literature) of the state of knowledge of the specific multisubunit system discussed, and the volume should thus be of value to the specialists as well.

Finn Wold, *University of Minnesota*