

Nouveau Traité de Chimie Minérale. Volume XIX. Ruthénium-Osmium-Rhodium-Iridium-Palladium-Platine. Edited by PAUL PASCAL, Membre de l'Institut, Professeur honoraire à la Sorbonne. Masson et Cie., 120 Boulevard Saint-Germain, Paris 6, France. 1958. xxxix + 954 pp. 17.5 × 26 cm. Price, broché, 8,500 fr.; cartonné toile, 9,700 fr.

Pascal's new treatise was first announced as a set to be completed by 1960 in 19 volumes. No change has been made for the date of completion but elements originally assigned to Volume XI have since been divided to form two volumes instead of one. The treatise will thus consist of 20 volumes when finished, and Volume XIX now includes those elements which were to have been presented in Volume XVIII originally.

In this volume the editor has written an introduction to elements of Group VIII in 20 pages, but material on the individual elements has been written by authors other than Pascal. Charonnat is sole author of material on ruthenium and osmium, while the section on rhodium is the joint work of Poulenc and Ciepka. Iridium is covered by Delepine, and C. Duval has written those parts devoted to palladium and platinum. Some 78 pages are given to palladium and 275 to platinum, while the other elements have an average of about 135 pages each.

Bibliographic references exceed 6,200 in number, but the dates given at the end of the reference sections for the literature searches range from January 1955 to July 1957. The section on platinum has ten bibliographies listed at searches made to January 1, 1957, and the remainder on those made to January 1, 1955. Since comprehensive reference works are seldom read through continuously but rather are consulted for specific information at intervals, it is felt that there should have been more consistency for the dates when the literature was searched. If literature searches for each element had been made to one definite date it would make it somewhat easier for those who consult this volume to determine the point at which no further search had been made. As it is, there are 43 bibliographic sections which would have to be checked as to date.

A comparison with Gmelin shows that Pascal has not given an equal or more comprehensive treatment to the elements concerned in most areas, although he does present more recent material and makes good use of the newer theories.

The high standards observed in volumes of the treatise published previously have been maintained, and this volume will be a welcome addition to the limited number of comprehensive reference works now available on elements of Group VIII.

CHEMISTRY-PHARMACY LIBRARY
UNIVERSITY OF FLORIDA
GAINESVILLE, FLORIDA

ROGER V. KRUMM

Progress in Organic Chemistry. Volume 4. Editor, J. W. COOK, D.Sc., F.R.S., Vice Chancellor, University of Exeter, Fellow of University College, London. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1958. ix + 256 pp. 15.5 × 24.5 cm. Price, \$8.80.

Four of the chapters of this fourth review volume deal with the determination of the structure and the synthesis of natural products, one with theoretical organic chemistry, and one with the synthesis of heterocycles containing Group V elements. The first chapter by F. D. Gunstone summarizes the more recent work in the isolation and the determination of structure and configuration of unsaturated acids from fats and other naturally occurring acid derivatives. Particularly striking have been the advances in knowledge concerning the highly unsaturated acids, the acetylenic acids, and acids containing a cyclopropane ring. General synthetic methods involving acyloins and acetylenic compounds as intermediates, and extensions of the Kolbe anodic coupling are outlined. An interesting correlation of structures is noted in that, for most acids, unsaturation may occur at every third carbon atom if numbered from the methyl group rather than from the carboxyl group.

Chapter 2 by B. and A. Pullman summarizes attempts to use the concept of "free valence" to explain the physical and chemical properties of aromatic compounds. Despite considerable success in correlating a large number of facts, discrepancies between predicted and experimental results

are sufficiently frequent to indicate that the method must be considerably refined before it will be generally useful.

The determination of structure and synthesis of a number of chemically related fungal metabolites is reviewed by W. B. Walley in Chapter 3. All contain an oxygen heterocycle and are subclassified as methylenequinones, pyrones, spirocoumaranones, and depsidones, the last group having a seven-membered lactone-ether ring.

A second group of natural products, the 2-acyl-1,3-cyclohexanediones, is discussed in Chapter 4 by C. H. Hassal. Compounds belonging to this class have been isolated from the resin of the male fern and from Kouso, the dried female flowers of *Hagenia abyssinica*. Both materials have anthelmintic properties. Other chemically related compounds have been isolated from the resin of hops, from lichens (usnic acid), and from the essential oils of species of *Myrtaceae* and *Rutaceae*.

Chapter 5 by A. H. Cook and G. Harris is a rather extensive general review with 484 references dealing with methods for the purification of polypeptides, for estimating their composition and for determining the sequence of the component amino acids. The final sections summarize work on the synthesis of polypeptides by chemical and enzymatic methods.

The last chapter by F. G. Mann deals almost exclusively with recent syntheses of heterocycles containing phosphorus, arsenic, or antimony with carbon. They are grouped under general methods of cyclization by intramolecular dehydration of arsonic, stibonic or carboxylic acids; by dehydrochlorination of chloroarsines; or by quaternization of halogenated tertiary phosphines. Intermolecular cyclizations are grouped under the reaction of di-Grignard reagents or dilithio derivatives with dichlorophosphines, -arsines, or -stibines, and of phosphine- or arsinebismagnesium bromide with dihalogenated compounds; the diquaternization of di-phosphines, phosphinearsines, or diarsines; and the reaction of 1,2-dithiols with dichloroarsines or arsenoxides.

For the most part the various chapters are organized well. All contain references to literature published as late as 1957. Considering the numerous publications now devoted to review, it is surprising and gratifying that so little duplication of effort occurs.

DEPARTMENT OF CHEMISTRY AND CHEMICAL ENGINEERING
STANFORD UNIVERSITY
STANFORD, CALIF. CARL R. NOLLER

Mechanisms of Inorganic Reactions. A Study of Metal Complexes in Solution. By FRED BASOLO, Associate Professor of Chemistry, and RALPH G. PEARSON, Professor of Chemistry, Northwestern University. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1958. xi + 426 pp. 15.5 × 23.5 cm. Price, \$11.75.

The past quarter century has seen a great surge in our understanding of the detailed mechanisms of chemical reactions. However, until recently most of the investigators were organic chemists working in directions suggested by the large mass of empirical information that was already available. These organic chemists were generally unaware of the additional empirical information involving elements far from the upper right hand corner of the periodic table, and the workers in descriptive inorganic chemistry knew little about the techniques that were elucidating organic mechanisms.

Only lately has the communications barrier begun to break down as some organic chemists have become interested in the transition elements and as some inorganic chemists have learned or rediscovered useful ways of looking at chemical reactions.

This book is limited almost entirely to the chemistry of coordination compounds in solution, but the authors point out that this category includes solvated ions and therefore embraces the greater part of inorganic chemistry. Of necessity, the presentation must concern itself with inorganic structure almost as much as with mechanism, and the development relies heavily on the new applications of crystal field theory to atoms containing unfilled *d*-orbitals. This treatment overemphasizes the electrostatic description of structure at the expense of valence bond pictures, but the overemphasis is a deliberate attempt to hasten the time when a satisfactory balance can be struck between these alternative viewpoints.

The discussion seems well designed to speak to the two established disciplines that must be combined to attack this rapidly developing field. The inorganic chemist can find many carefully worked out examples to show the mechanistic information that can (and also that cannot!) be obtained from careful kinetic studies. The mechanistically inclined organic chemist may have to make his own table in order to keep track of abbreviations like bipy, phen, cptdin and EDTA, but he will be introduced to an unexpected wealth of information that gives every indication of yielding to the type of attack he is familiar with. The discussions abound with examples of "unfinished business," but the authors would not be disappointed if this book created an interest that rapidly rendered it obsolete.

DEPARTMENT OF CHEMISTRY
UNIVERSITY OF OREGON
EUGENE, OREGON

RICHARD M. NOYES

Estimation of Thermodynamic Properties of Organic Compounds. By GEORGE J. JANZ, Department of Chemistry, Rensselaer Polytechnic Institute, Troy, New York. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1958. ix + 211 pp. 15.5 × 23.5 cm. Price, \$6.00.

Through the years a number of quite successful methods for the estimation of thermodynamic quantities have been developed and published in the periodical literature. Professor Janz has performed a valuable service in drawing these together in a convenient volume. This approach is particularly important for organic substances in view of the vast number of compounds and the similarity of their component bonds or atomic groupings. In addition to 133 pages of descriptive text, there are 64 pages of tables which will be of particular value to those using the book.

The reviewer noticed remarkably few errors. The signs should be reversed for the last column of Table 4.2 and the term ($R \ln 2$) should be omitted from equation 6.3 and from the accompanying discussion. The explanations of various methods are brief but clear and the author gives the reader guidance about the accuracy to be expected in each case. Teachers of chemical thermodynamics will find interesting applications, particularly in chapter 8, which can be used as a valuable supplement in their courses. Good examples illustrate the distinction between equilibrium and rates of reactions and their interrelationships. Thus this volume will be useful in several respects and is to be welcomed to the literature.

COLLEGE OF CHEMISTRY
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

K. S. PITZER

Research in Photosynthesis. Papers and discussions presented at the Gatlinburg Conference October 25-29, 1955, sponsored by the Committee on Photobiology of the National Academy of Science—National Research Council and supported by the National Science Foundation. Edited by H. GAFFRON, A. H. BROWN, C. S. FRENCH, R. LIVINGSTON, E. I. RABINOWITCH, B. L. STREHLER and N. E. TOLBERT. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1957. xiv + 524 pp. 16 × 23.5 cm. Price, \$12.00.

The main purpose of the Gatlinburg conferences on photosynthesis is to stimulate discussion of current problems among the workers in the field. We are now fortunate in having, in "Research in Photosynthesis," the record of the second of these conferences which was held in 1955 and dealt primarily with the photochemical aspects of the process.

The 67 individual contributions have been divided into six chapters entitled: I "Absorption, Fluorescence, Luminescence and Photochemistry of the Pigments *in Vitro*"; II "Absorption, Scattering, Fluorescence, Luminescence and Primary Photochemical Process *in Vivo*"; III "The Possible Role of Cytochromes"; IV "Dark Reactions"; V "Kinetics, Transients and Induction Phenomena" and VI "Formation and Condition of Chlorophyll in the Living Cell." The rather considerable task of editing and grouping these contributions has been done very well for only in the last chapter is there any noticeable lack of continuity in the subject matter. The papers are uniformly well written and informative, though in several cases they appear to have been extensively revised since the time of the conference. The editors' decision to include the major portions of the spontaneous discussion that followed the papers is especially commendatory for this represents one of the most rewarding aspects of the meetings.

There is, however, another aspect of this book which is not so favorable. Because of the very nature of the conference, the papers are all short, concise presentations of research results which were current at the time. For this reason, a strong case could be made for the point that papers of this kind more properly belong in the scientific journals than in a special volume. Also, the purpose of the Gatlinburg conferences is to stimulate discussion and the very act of recording the proceedings seems out of sympathy with this purpose. Finally, it is unfortunate but often true that the ever increasing number of symposia and other special volumes duplicate rather than expand the presentation of scientific information, though this last objection does not apply to the book under consideration.

Despite these objections "Research in Photosynthesis" will be a valuable record for the specialists in the field and for those whose interests are closely allied to photosynthesis.

BIOLOGY DEPARTMENT
UNIVERSITY OF ROCHESTER
ROCHESTER, NEW YORK

THOMAS PUNNETT

BOOKS RECEIVED

December 10, 1958—January 10, 1959

- J. F. DANIELLI, K. G. A. PANKHURST AND A. C. RIDDIFORD, Edited by. "Surface Phenomena in Chemistry and Biology." Pergamon Press, Inc., 122 East 55th Street, New York 22, N. Y. 1958. 330 pp. \$10.00.
- I. PRIGOGINE, Edited by. "Advances in Chemical Physics." Volume 1. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1958. 414 pp. \$11.50.
- JOHN C. SHEEHAN, Editor-in-Chief. "Organic Syntheses." Volume 38. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1958. 120 pp. \$4.00.
- MELVILLE L. WOLFROM, Editor, R. STUART TIPSON, Associate Editor. "Advances in Carbohydrate Chemistry." Volume 13. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1958. 387 pp. \$11.00.