Nouveau Traité de Chimie Minérale. Volume XIX. Ruthénium–Osmium–Rhodium–Iridium–Palladium–Platine. Edited by PAUL PASCAL, Membre de l'Institute, 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.

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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 Kousso, 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 dichlorphosphines, -arsines, or -stibines, and of phosphine- or arsinebismagnesium bromide with dihalogenated compounds; the diquaternization of diphosphines, 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
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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 coördination 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.