

as reviewing each paper in this issue of the Journal and then writing a single, cogent review for the whole without being too concerned about its parts. With this in mind it is best to review the collection of papers in terms of statistics and to give some consideration to those articles which might have widest interest, and inevitably to those of most interest to the reviewer.

There are 17 papers, plus a brief conclusion by M. Salesse, who organized the symposium. Of these, seven are concerned with reactions of metals (or carbon) with gases or vapors, generally at elevated temperatures; nine deal with corrosion by liquids, mainly high temperature water; and one describes the activities of the Seawater Corrosion Testing Station at Biarritz.

Having made the point above that books such as these are not proper subjects for review it remains to be said that all the papers were of some interest. A few were largely reviewed with the authors' recent thoughts on the matter added. Among these is the introductory paper by Bénard which dealt briefly with the postulates of Wagner, Mott-Cabrera and others and then undertook to relate oxidation rates to chemisorption, diffusion and nucleation. Moore's paper is similar in character but is concerned mainly with the theory of the diffusion process. The other articles on metal-gas systems are original experimental works, the most impressive one to me was Páidassi's paper on the morphology of films formed by oxidation. This is in three parts and considers the problem of precipitation within the film, structure of the film, nucleation, film growth, the effect of the substrate on the film, and the influence of plastic deformation. The papers on corrosion in liquids are almost wholly observational in character except for a review-like article by Berge and Jacquet on the usefulness of the potentiostat in corrosion studies. They also give some preliminary results on work relating microstructure observations with potentiostatic polarization measurements. Intergranular corrosion and stress corrosion cracking of metals and alloys in high temperature liquids are described under a variety of conditions and with numerous photomicrographs by others. Of particular interest is one by Coriou, *et al.*, on the stress corrosion cracking of Inconel in 350° water, apparently ascribable to intergranular effects. LeBoucher, *et al.*, describe experiments which show that chemisorbed sulfur increases the corrosion rate of iron in HCl whereas physically held sulfur or sulfur in the form of sulfide has no effect in this regard. Others will find the paper by Wanklyn on the role of hydrogen in corrosion of zirconium by hot water, or the paper by Plateaus, Henry and Crussard on the relationship of oxide "strength" to intergranular corrosion, or still others, of greater interest. However, as already implied, the only way to determine whether it is advisable to have a copy of the book available for ready reference is to examine it, or at least a table of its contents, and make the decision on the basis of one's own interests.

Mechanically, the book is well done. The figures are clear, the type is legible, and the binding is good. It is, however, 8 $\frac{1}{2}$ × 11 inches, a somewhat awkward size for handling and storing.

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applications. For the industrial physician, much material will have direct use; for the general practitioner, a knowledge of the metabolic products of drugs or of chemicals (from occupational exposures or accidentally) may help to elucidate a puzzling clinical picture.

By restricting his attention to reactions of "foreign" organic molecules, Williams excludes several fields. The intricate biochemistry of normal metabolism is omitted except to discuss reactions of abnormal molecules that follow common pathways or are acted upon by "normal" enzymes. Two other major topics not included are (a) the fate of inorganic compounds, and (b) biosynthesis.

The advances in this field of study since the first edition (1947) may reasonably be described as tremendous. Although parts of the first edition have not been brought forward, Williams has preserved his basic organization, *i.e.*, presenting summaries by classes of compounds: 19 of the 21 chapters are headed by such titles as "The Metabolism of Phenols," "The Metabolism of Heterocyclic Compounds," etc. Chapters are devoted to (a) aliphatic and (separately) aromatic hydrocarbons, alcohols, ketones, acids, amines and derivatives; (b) compounds containing sulfur, arsenic, phosphorus; (c) special groups, *e.g.*, dyestuffs, terpenes and camphors, nitrites, heterocyclic compounds. Within chapters, important compounds or well-studied reactions are treated in some detail. Worthy of note are the discussions of the metabolism of alcohols, chloral hydrate, histamine, adrenaline and related compounds, polycyclic hydrocarbon carcinogens, acetylcysteyl substitution, halogenated aromatic hydrocarbons, aromatic acids, cyanides, azo compounds, sulfonamides, barbiturates. Although not every publication (prior to 1957) has been reviewed or abstracted, references are listed at the end of each chapter to guide a search for additional specific information. A comfort for the non-organic chemist is the profusion of structural formulas, inserted paragraph by paragraph, illustrating many important reactions. Detailed indexes, subject and author, are provided.

There is a deceptive simplicity of presentation. William's command of the subject permits him to tie together in a unified way the gist of complex publications from many laboratories on a large number of compounds. In this field a newcomer could not prepare such summaries by reading the papers. Tabulations of data (some apparently unpublished) and charts of metabolic alterations using structural formulas are synthesized into logical summaries of exceptional value.

A tendency to oversimplify the toxicological aspects is offset by the frequent references to toxicological data, for example, including tables of LD₅₀ values and pointing out toxicological interpretations of metabolic studies.

Biochemists, pharmacologists, toxicologists and medical men will find helpful guidance in this book. It will prove useful for students of chemistry and of biology generally. Indeed, it is hard to suppress superlatives in recommending this needed compendium.

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Detoxication Mechanisms. The Metabolism and Detoxication of Drugs, Toxic Substances and Other Organic Compounds. Second Edition, Revised and Enlarged. By R. TECWYN WILLIAMS, PH.D. (Wales, D.Sc. Birmingham), Professor of Biochemistry in the University of London at St. Mary's Hospital Medical School. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1959. x + 796 pp. 15 × 22 cm. Price, \$19.00.

This massive (796 pp.) little volume attempts successfully to perform a difficult and important task—to bring together in a simplified and condensed but cohesive form an encyclopedic statement of the fates of "foreign" organic molecules in the body. To the biochemist, the metabolism of foreign compounds is a field in which a major upsurge in work began during World War II; this book therefore for the most part presents new material. To the pharmacologist, an understanding of the fate of "drugs and toxic substances" is an essential part of understanding drug action. The metabolic data are consistently interpreted in the light of toxicological

Nouveau Traité de Chimie Minérale. Tome XVI. Fluor, Chlore, Brome, Iode, Astate, Manganèse, Technétium, Rhenium. Edited by PAUL PASCAL, Membre de l'Institut, Professeur Honoraire à la Sorbonne. Masson et Cie., 120, Boulevard Saint-Germain, Paris 6, France. 1960. xxxix + 1195 pp. 18 × 26 cm. Price, broché (2 vol.), 170 NF.; cartonné toile (1 vol.), 185 NF.

Volume 16, on fluorine, chlorine, bromine, iodine, astatine, manganese, technetium and rhenium, continues the major effort to rewrite this famous French series in the light of modern theories and recent results (see THIS JOURNAL, 82, 4121 (1960)). The series is more than just factual in the inorganic sense: it tells the reader where, among all the libraries of France, he may find the journals which are cited; it covers the history of the elements, as well as the ways of obtaining them; and it describes the uses of the elements and their principal compounds. Other compendia do not attempt to do all these things, and yet users will usually agree that at least one reference series ought to do so.

After a short introduction covering general properties of the halogens, some 132 pages are devoted to fluorine and its compounds, 184 pages to chlorine, 110 to bromine, 208 to iodine, and 8 to astatine. The remaining 40% of the book is devoted to the Group VII metals, almost all of it to manganese. As before, the occurrence, metallurgy, and uses of the metals are summarized, as well as their chemical behavior and physical properties. Complete bibliographies follow all the major divisions of the book (that for elementary manganese alone occupies over 11 pages), and there is an extensive alphabetical index as well.

True to its aims, the book utilizes atomic and molecular theory as much as possible to explain and correlate huge numbers of facts. The *kind* of theory introduced will not always meet with approval, as (for example) in the use of box diagrams of the filling of *s*, *p* and *d* orbitals instead of a molecular-orbital or crystal-field approach to such matters as the complexes of manganese. But structural information, equilibrium constants, and spectra are very much in evidence, and the descriptive material is written decidedly in the language of 1950-1960.

The book is printed in an attractive, open, uncluttered style, making it as easy as possible for the foreign reader to find his way. While the size and weight are formidable, the price is not excessive for a resource volume of such impeccable standing. The set of 20 volumes would certainly provide any library with an adequate reference in present-day inorganic chemistry.

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BOOKS RECEIVED

December 10, 1960-January 10, 1961

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