Analytical Chemistry

Titrimetric Organic Analysis. pt. 1, *Direct Methods*. M. R. F. Ashworth. Interscience (Wiley), New York, 1964. xx + 501 pp. Illus. $17.50.

This book, the first part of a two-volume treatise on titrimetric organic analysis, covers direct methods; part 2 will be devoted to indirect methods. Although primarily concerned with titration as an analytical procedure, the volume's use in other fields is mentioned—for example, in physicochemical studies. Emphasis has been placed on providing an extensive bibliography (more than 3300 references). This has limited critical evaluation of the methods and experimental details. Most readers, however, should be able to criticize and evaluate the various methods by consulting the references.

There is a short introduction on definition, types and purposes of titration, and the aim and contents of the book, the latter being divided into sections rather than chapters.

In section 1 the following topics are treated briefly but adequately for a book of this type: measurement of the amounts of reagent and sample, mixing procedure, preliminary reaction yielding an intermediate, realization of a reaction, speed of reaction, avoidance of side and other reactions, end-point (by light absorption, electrical properties, temperature, and other physical properties such as fluorescence, chemiluminescence, flame-emission spectra, optical activity, light refraction, crystal form, density, viscosity, surface tension, freezing point, magnetic susceptibility, nuclear magnetic resonance, dielectric constant, smell, taste, sound, vapor or gas pressure of reaction mixture, and radioactivity), automatic titration, reactions used in the direct titration of organic compounds, and examples.

Section 2 (398 pp.) comprises four-fifths of the book and lists 117 reagents in alphabetical order (with cross references). The list does not include all dyes and surface-active compounds used; only those appearing in several references are given (comparatively unimportant titles are thereby avoided). The examples are given in tabular form with the following column headings: Titration of, Reagent, Solvent or Titration Conditions, End-point, and References.

Section 3 is an alphabetical list of functional groups and compound classes, presented in the form of tables that give the reagent for each example and reference.

The paper, printing, and binding are of good quality. The book, together with its companion volume on indirect methods, will be useful and timesaving to those who wish to use titrimetric methods in organic analysis.

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Botany

Orchids of the Western Great Lakes Region. Frederick W. Case, Jr. Cranbrook Institute of Science, Bloomfield Hills, Mich., 1964. xii + 147 pp. Illus. $7.

Almost every other month the market is flooded with books on orchids, dealing especially with species of horticultural interest, which are written in seemingly great haste and are based on insufficient experience and knowledge. Fortunately, Frederick Case's book does not belong to this unworthy category.

Case's elegant presentation of our native orchids from the western Great Lakes region provides much needed information, especially on ecology and distribution. His ability to discuss and to present technical information in a direct and concise manner, understandable also to nontechnical readers, is one of the great assets of the book. Although he has a fine detailed insight into the complexity of the orchid family, his readers are not confused with unimportant minutiae in the enlightening discussions of the basic structures of flowers, their evolutionary development, and of the significance of structures in adaptation through various pollinating mechanisms for the perpetuation of species.

Much useful information is given in the chapters that deal with such ecological aspects as seed germination and development, soil and habitat relationships, changes in wild orchid populations, and orchids and conservation. The chapter entitled "Growing native orchids" is a unique feature of this book, and the information that it contains can prevent many frustrations for orchid hobbyists.

I cannot fully agree with the ideas expressed in the chapter "The origin and distribution patterns of Great Lakes orchids," but I find the discussion quite stimulating.

The remaining part of the book is devoted to descriptive aspects of the orchids of the region. This includes keys to both genera and species as well as descriptions of each orchid, supplemented by a photograph. The photographic illustrations are all excellent; eight of them are in full color, and all are correctly named, except *Cypripedium* × *Andrewsii* which should be *Cypripedium* × *Favillianum*.

At the end of the book the author presents a very useful set of distribution maps, a glossary, and an index to both Latin and common names.

I wish to congratulate Case for his masterly presentation and to thank him for sharing his knowledge with the botanical world.

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Handbook of Drug Action

Drug Dosage in Laboratory Animals. A handbook. C. D. Barnes and L. G. Eltherington. University of California Press, Berkeley, 1964. xx + 302 pp. Paper, $8.

This long-needed reference handbook on pharmacodynamic and toxicological dosages was compiled from 819 selected references that date from 1880 to 1963 and cover a broad spectrum of literature on drug actions in seven species of laboratory animals. The volume will become as common an inhabitant of desk and shelf in the biological world as the investigator's tea cup. It is *not* a handbook for treating diseases in laboratory animals. The excellent sections on anesthetics and endocrine maintenance and replacement dosages skirt some therapeutic areas and cover them effectively, but this is not the primary purpose of the manual.

Drug responses have been classified according to (i) toxicity data, (ii) primary use or activity, and (iii) secondary uses or activities. A brief treatment of the factors that modify drug responses is included (primarily, this will be useful to students). Drugs are listed according to the World Health

Organization's dictionary, *World Neurology* (September 1961), or the *Merck Index*. Three common names are included and cross-indexed with the official name. Physiological solutions for bathing or perfusing tissues are presented in tabular form in an appendix.

Provision is made in the tabular format of this manual for the addition of supplemental data, and blank pages are provided for the registration of new agents.

Some descriptions of activity are cryptic. "Cardiovascular," or "cardiovascular and respiratory," used advisedly to save space, were inserted in spaces that are large enough for descriptions that would be more enlightening to neophytes or scientists who work in ancillary disciplines.

The list of contributing firms and individuals is impressive, perhaps unique. So is the manual.

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An Editorial Overview

Chemical Reactions of Polymers. E. M. Fettes, Ed. Interscience (Wiley), New York, 1964. xxii + 1304 pp. Illus. $40.

As one of the editors of the series, "High Polymers," it is my duty to keep a watchful eye on each volume of the series and to appraise the value of each of them for the readers from a short-range and long-range point of view. As a result of such a check it became evident that some volumes are highly specialized and, perhaps, even too narrow in scope, whereas others are rather general and, in some cases, perhaps even somewhat superficial. It would appear to me that, of the 20 volumes published in the series to date, none combines breadth and depth as well as this compendium that Fettes has planned and produced. The treatise bristles with details but, nevertheless, maintains perspective. The innocent word "edited," which is used to describe Fette's role in the creation of this book, embraces the choice of the individual chapters, the selection of the best author or authors for each, the specification of each chapter's scope, the integration of all chapters, and the careful polishing of the final manuscript.

Virtually all possible and certainly all important reactions that can be carried out with individual polymers are included in *Chemical Reactions of Polymers*, and in each case there is an introduction to the fundamental aspects of the process, an indication about how the process is carried out, and, finally, a record and complete description of the property changes that can be achieved by each individual reaction. In this manner the reader is informed on the fundamental aspects of polymer reactivity (chapter 1), on reactions of unsaturated hydrocarbon polymers (chapter 2) and of their saturated counterparts (chapter 3). Chapter 4 treats end-group reactions of addition polymers, whereas chapters 5 and 6 are devoted to cellulon and proteins. Interchange and cleavage reactions are presented in chapters 7 and 8, whereas the next chapters contain information on intermolecular reactions (chapter 9), branching reactions (chapter 10), and coupling processes (chapter 11). The other chapters are devoted to somewhat more specialized processes—surface reactions (chapter 12), oxydative processes (chapter 13), mechano-chemical changes (chapter 14), fiber-reactive dyes (chapter 15), and to the chemical finishing of cellulosic fibers.

Fettes, as the result of his efforts, has earned the gratitude of the editors and publishers of the High Polymer Series, but, much more important than that, he can be sure of the approval and indebtedness of all readers and users of his volume.

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Nuclear Power Technology

Plutonium. Mieczysław Taube. Translated from the Polish edition (Warsaw) by Eugeniuez Lepa and Zbigniew Nanowski. Pergamon, London; Macmillan, New York, 1964. vi + 258 pp. Illus. $8.50.

In this book, M. Taube of the Institute of Nuclear Research (Warsaw, Poland) attempts to draw together a concise review of the properties of plutonium which are important with respect to its utilization in nuclear power reactors. Although the general purpose of the book is nowhere explicitly stated, the tenor of the treatment is obviously directed toward emphasizing the importance of the role that plutonium will eventually play in the development of nuclear power, particularly in fast breeder reactors using the uranium-238–plutonium-239 cycle.

In view of the many books, devoted entirely or partially to plutonium, that have been published in recent years—most notably *The Metal Plutonium*, edited by Coffinberry and Miner; *The Chemistry of the Actinide Elements* by Katz and Seaborg; and *Extractive and Physical Metallurgy of Plutonium and Its Alloys* by Wilkinson—one might wonder what particular need the author sought to satisfy. Apparently the work was prompted by the fact that no single volume treats all aspects of plutonium technology, including nuclear physics, chemistry, separations technology, health physics, fuel fabrication, reactor technology, and economics. It is to this formidable task that the author addressed himself. The result is a fairly thorough, largely descriptive review of the literature. But the volume is typical of the books in which authors treat areas of technology that are under intensive investigation in that it is unfortunately out of date in several areas. This factor, together with some apparent delay in the publication of the English translation, results in a book that can be considered a qualitative review of this broad field through 1961.

The subject matter is well organized into six chapters. The first chapter summarizes the properties of the isotopes of plutonium and the methods of production, and compares the fission characteristics of plutonium-239 with those of uranium-235 and uranium-233.

Chapter 2, "Chemical properties of plutonium," treats the basic chemistry of plutonium metal, alloys, and compounds and of plutonium ions in solution. Chapter 4, "Plutonium technology," which includes information closely related to that in chapter 2, describes chemical processes that are used in the recovery and purification of plutonium. Chapter 2 draws heavily on the book by Katz and Seaborg, but it will serve the plutonium chemist as an organized introduction to Russian articles in the field. Chapter 4 contains schematic flowsheets of all the known experimental and production processes for plutonium separation, from the bismuth phosphate process to pyrochemical methods. There is a table in which all known plutonium recov-