cal chemistry who are preparing for careers in the life sciences is much larger than those who plan to become chemists. It is appropriate, therefore, to design modern courses in analytical chemistry so that the importance of the subject to premedical or prebiochemical education will be evident. This is what the author of this textbook has done, and he has done it well.

Not that this is a textbook on clinical chemistry; it is not, although there is a chapter on clinical analysis. It treats most of the subjects ordinarily included in a first course in analytical chemistry (and then some) but stresses the practical importance of the subject to biochemistry and other sciences.

The text is designed for second-year college students majoring in fields outside of, but related to, chemistry. Because the author wanted to keep the book from being overwhelmingly large, but at the same time was eager to at least introduce the student to many of the more recent analytical techniques, he chose deliberately to be more descriptive than rigorously deductive in discussing such familiar topics as ionic equilibria and titration curves. For instance, in Chapter 13 on acid-base titrations, there are no detailed point-by-point derivations of titration curves. Instead, typical titration curves for the several types are presented, and the implications of their salient features are then discussed, including the usual conclusions about the choice of indicator, precision of end point detection as related to acid and base strength, etc. A case certainly can be made that overly rigorous theoretical derivations tend to repel students whose chief interest is outside of pure chemistry, and much can be said in favor of an approach like this one which explains the importance of analytical chemistry in related fields.

In addition to classical topics, modern physicochemical techniques are not neglected. There are discussions of the various chromatographic methods, electroanalytical techniques (including ion-selective electrodes), optical methods (including optical rotatory dispersion as well as spectrophotometry, fluorescence, and atomic spectroscopic methods), kinetic methods (including those based on enzyme catalysis), and radiochemical methods. A chapter on gas analysis emphasizes the importance of this subject in biochemistry. Clinical applications of analytical chemistry are also highlighted in a chapter on automation, which describes several modern instruments for the rapid, automatic analysis of blood and serum samples.

The real test of a textbook is, of course, not how well or how poorly it survives the casual scrutiny of a reviewer prejudiced by experience, but rather how it performs in actual use. In my opinion this book deserves to be put to that test.

New Books

The Raman Effect, Vol 1: Principles. A. Anderson, Ed. x + 404 pages. Marcel Dekker, Inc., 95 Madison Ave., New York, N.Y. 10016. 1971. $28.50

In this first volume of a planned two-volume set on the Raman effect, general principles and techniques are discussed. The opening chapter surveys the historical developments since Raman's discovery in 1928. The remaining chapters cover the theoretical interpretation of the effect, the extension of this theory to crystals where much of the recent work has been focused, instrumental developments and techniques, stimulated scattering, and Brillouin scattering. According to the editor, each chapter is supposed to be written at the level of a "typical graduate student" in either physics or chemistry. There are considerable references to the literature at the end of each chapter.

Surface and Colloid Science, Vol 4. Egon Matijević, Ed. vii + 445 pages. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10016. 1971. $24.95

The contributions to this series are neither supposed to possess the character of *Advances* nor to represent reviews of the author's own work. It is hoped that each chapter will treat a subject critically, giving the historic development as well as a digest of the newest results. The series aims to offer texts and critical reviews which will describe theories, systems, and processes, handle these in a rigorous way, and indicate solved problems and problems which will require further research. Purely descriptive colloid chemistry will be limited to a minimum, and qualitative observations of purely defined systems will be avoided. The subjects covered in this volume are: computer simulation of colloidal systems; physical adsorption, the interaction of gases with solids; convection diffusion in laminar and turbulent hyperfiltration (reverse osmosis) systems; and bimolecular lipid membranes. There are both author and subject indices.

Analytical Metabolic Chemistry of Drugs. Jean L. Hirtz. xvii + 395 pages. Marcel Dekker, Inc., 95 Madison Ave., New York, N.Y. 10016. 1971. $24.50

This book is Vol 4 in the series "Medicinal Research: A Series of Monographs." It was first published in French by Masson & Cie in 1968 under the title, "Les Methodes Analytiques dans les Recherches sur le Metabolisme des Medicaments," in the series "Monographies de Pharmacie." The translation editor is Edward R. Garrett. Rather than taking the pharmacological point of view on the products of drug metabolism, this volume stresses analytical procedures which isolate, characterize, and quantitatively determine minute amounts of metabolites and unchanged drugs in complex biological fluids. The drugs are classified on the basis of their chemical relationships rather than their biological activity. Most modern techniques of analysis are covered, especially different forms of chromatography and spectrophotometry, radioactive isotope labeling, and separation. The bibliography contains over 1000 references, covering about 350 drugs and 650 metabolites.

Extraction of Chelate Compounds. Yu. A. Zolotov. xvii + 310 pages. Keter, Inc., 104 East 40th St., New York, N.Y. 10016. 1970. $20

This book is a translation of the 1968 Russian version. The author states that it is primarily intended for analytical chemists, since chelate extraction has become one of the most frequently used, most efficient, and undoubtedly most promising methods of analytical separation and element concentration. This volume presents the fundamental principles of analytical applications of chelate extraction. Specific subjects treated include the techniques of increasing the selectivity of extraction, ways of effective combination of extraction with subsequent determination methods, characteristic features of the extraction of classes of compounds, and radiochemical methods. Special stress has been put on the general theory of chelate extraction, on extraction of coordination-unsaturated and charged complexes, and on the methods of determination of the composition of the extracted compounds. The author has undertaken the task of interpreting the abundant factual material on extraction of chelate compounds and has formulated certain theoretical concepts which may

facilitate the understanding of the mechanisms involved. The advances to be expected in the near future are also discussed. The book contains a bibliography with 891 references that seem to be predominately to the Russian literature.

Newer Trace Elements in Nutrition. Walter Mertz and W. E. Cornatzer, Eds. xiii + 438 pages. Marcel Dekker, Inc., 95 Madison Ave., New York, N.Y. 10016. 1971. $24.50

This volume presents the proceedings of the International Symposium on Newer Trace Elements, held in Grand Forks, N.D., and jointly sponsored by the U.S. Department of Agriculture and the University of North Dakota Medical School. The first section of the book provides background and introduction to the discussions of individual elements that follow. It deals with the history and philosophy of trace element research and with the mechanism by which the trace element interacts at the molecular level with the various components of metabolism. Subsequent chapters treat the elements chromium, selenium, vanadium, nickel, zinc, and tin in detail. The last part of the book deals with three promising developments in trace analysis in biological materials: emission spectroscopy, gas-liquid chromatography, and spark-source spectrometry. There are numerous references on each topic. The text is "typed."

Progress in Separation and Purification, Vol 4. Edmond S. Perry and Carel J. Van Oss, Eds. xi + 414 pages. John Wiley and Sons, Inc., 605 Third Ave., New York, N.Y. 10016. 1971. $22.50

This volume is part of a continuing series designed to help the practitioner in separation science by providing him with authoritative summaries that organize and condense the vast amount of literature in the field. The contents of this book are: permeability as a phenomenological coefficient; continuous column crystallization; endless belt electrophoresis; hydrocarbon separations with silver(I) systems; parametric pumping; use of liquid anion-exchangers in reversed-phase extraction chromatography; continuous sample flow density gradient centrifugation; and continuous chromatographic refining. The text is "typed."

Inorganic Titrimetric Analysis: Contemporary Methods. Walter Wagner and Clarence J. Hull. xii + 225 pages. Marcel Dekker, Inc., 95 Madison Ave., New York, N.Y. 10016. 1971. $13.50

This book is Vol 1 of "Treatise on Titrimetry," edited by J. Jordan. Its purpose is to provide the practicing chemist with a rapid, handy, up-to-date guide to modern titrimetric methods, giving sufficient information to determine whether a given method is suitable in terms of applicability, specificity, precision, and accuracy as well as the required reagents and instrumentation. Advantages and limitations of various types of titrations are pointed out so that specific methods can be selected for specific problems. The chapters are arranged according to the sequence of elements in the periodic table. For each element and its inorganic compounds, the discussion includes: a concise description of the methods available; a brief survey of applicable earlier and contemporary titrimetric methods; a short section on the recommended contemporary methods; and a selective bibliography of post-1960 methods of titrimetric analysis. The book also features discussions on unusual developments such as redox titrimetry of the noble gas xenon and the determination of trans-uranium elements.

Optical Microscopy for the Materials Sciences. James H. Richardson. x + 692 pages. Marcel Dekker, Inc., 95 Madison Ave., New York, N.Y. 10016. 1971. $29.50

This book presents a comprehensive discussion of modern optical microscopy and photomicroscopy necessary to prepare and examine specimens of a broad range of materials. Methods for preparing specimens of material for optical microscopes that use transmitted or incident light are described. Also included are extensive tables that give specific solutions for chemical and electrolytic polishing and etching of incident light specimens for a large number of materials. The techniques used in the qualitative and quantitative measurements of a specimen under microscopic examination are discussed. Other topics include: photomicrography and photomacrography, laboratory safety, and microscope accessories. This volume should be practical both as a textbook and as a reference. The text appears "typed."

New Books

Water Pollution: Disposal and Reuse, Vol 1. J. E. Zajic. xii + 389 pages. Marcel Dekker, Inc., 95 Madison Ave., New York, N.Y. 10016. 1971. $22.75

Water Pollution: Disposal and Reuse, Vol 2. J. E. Zajic. vii + 257 pages. Marcel Dekker, Inc., 95 Madison Ave., New York, N.Y. 10016. 1971. $16.50

This book, in two volumes, is written for anyone interested in water and its purification. It was specifically designed as an interdisciplinary textbook for a water pollution engineering course in the Environmental Science and Environmental Engineering program at the University of Western Ontario. The text is divided into two approaches to the treatment of wastewater: the biological (predominately in Vol 1) and the chemical (predominately in Vol 2). Of course, there is some overlap, and the two volumes are meant to be treated as a whole. Among the many topics covered are aquatic plant and algae control, filtration, solid waste disposal, biodegradation, electrodialysis, freezing and thawing, solvent extraction, and sterilization and disinfection. All major areas of contamination and purification are dealt with, and theory has been included wherever it has been adequately developed. Each chapter has a bibliography. There are subject and author indices in Vol 2.

Modern Methods of Geochemical Analysis. Richard E. Wainerdi and Ernst A. Uken, Eds. xviii + 397 pages. Plenum Publishing Corp., 227 West 17th St., New York, N.Y. 10011. 1971. $22.50

This volume is part of the continuing series, "Monographs in Geoscience." It outlines the scope and importance of geochemistry with major emphasis on the significant modern methods of geochemical analysis. These methods include: absorption and emission spectrography, atomic absorption, activation analysis, X-ray techniques, polarography, chromatography and ion exchange, radiometric methods, mass spectrometry, and magnetic resonance. These are discussed with the aim of giving the reader an objective view of the advantages, the limitations, and the expected sensitivity of each method. Besides discussions of the different analytical techniques, there are chapters on statistics and chemical analysis and sample preparation. There is a fairly extensive list of references at the end of each chapter.

Chemical Analysis of Additives in Plastics. T. R. Crompton. xi + 162 pages. Pergamon Press, Inc., Maxwell House, Fairview Park, Elmsford, N.Y. 10523. 1971. $20

This text is Vol 46 of the "International Series of Monographs in Analytical Chemistry." It describes classical analytical methods as well as recent work on the application of techniques, such as ultraviolet and infrared spectroscopy, polarography, and thin-layer and column chromatography, used in the qualitative and quantitative examination of additives which are present in both small and large amounts in the various types of polymers now being commercially produced. The types of substances covered include antioxidants, antistatic agents, plasticizers, stabilizers, flame retardants, and expanding agents. Polymerization and polymer processing additives, such as organic peroxides, foaming agents, mold release agents, internal lubricants, and slip and antiblock agents, are also included. The book has been written primarily for chemists, particularly those working in the polymer manufacturing industry and in those industries using plastics as a raw material.

U.S. Government Publications

The following may be ordered prepaid from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, or prepaid from the National Technical Information Service, Springfield, Va. 22151. (Foreign remittances must be in U.S. exchange and should include an additional one-fourth of the publication price to cover mailing costs.)

Activation Analysis: A Bibliography. G. J. Lutz, R. J. Boreni, R. S. Maddock, and W. W. Meinke, Eds. NBS Technical Note 467. 1971. $5.25

This present version of the NBS bibliography on activation analysis, which supersedes previous editions (1968 and 1969), is updated by the addition of more than 1000 new entries. As before, the bibliographical entries identified by accession numbers are given in Part 1. Part 2 gives access to the entries in Part 1 through four indices: author, element determined, matrix analyzed, and technique utilized. Since the literature of activation analysis continues its remarkable growth, it is planned to update and reissue this bibliography annually.