

ceived a special consideration. One of the chapters deals with Ultraviolet Radiation which is coming more and more into prominence in various departments of biology. With the modern trend towards physical chemistry a great deal of attention is paid to an exposition of physical chemical procedures and theories. Throughout the book there are numerous references to most recent articles of importance in biochemical literature and a special emphasis is given to review articles which are of great value to the teacher, physician and investigator. The authors have received coöperation as well as commendation and moral encouragement from some of the leading biochemists in the country. The whole volume is very elegantly gotten up. The use of different type for the text and laboratory directions is very appropriate and the whole volume is profusely illustrated with useful drawings and charts in addition to a number of full-page color plates. Altogether we consider this textbook an extremely useful one to keep on the library shelf of any medical or biological laboratory.

D. I. M.

*Volumetric Analysis* for Students of Pharmaceutical and General Chemistry. Fourth Edition by Charles H. Hampshire. P. Blakiston's Son & Co; Philadelphia. Price \$1.75.

This little book of 125 pages, written for students, is one of the best of its class.

It is refreshing to note the absence of the conventional introductory chapters on Calibration, Weighing, Apparatus, Indicators, Ion Concentration, etc., which surely discourage the beginner and make the task of the instructor doubly onerous. Imagine the impressions made on a beginner when confronted with an incomprehensible mass of technical details such as is customary in many of our books on Volumetric Analysis.

Mr. Hampshire plunges directly into the essentials, that is the practical work, in a simple, direct and comprehensible style, that cannot fail to awaken the interest and understanding of the dullest student.

Every operation is accompanied by its necessary calculations made especially easy, while the use of Empirical Solutions, incomprehensible or rather confusing to many, is adroitly introduced among the first examples.

It has always seemed to me that when introducing something that deviates from the straight and narrow path of the beginner's line of work, it is best to work it in incidentally until comprehended, then dilate. In

other words, do not herald such as new matter under special chapters until later.

All essential points necessary in securing accuracy while handling calibrated vessels are introduced by degrees in the course of the student's work. He is made to note the value of accurate calibration, the proper methods of pipetting and precautions as to temperature.

Five indicators are introduced and applications thoroughly and clearly explained after having previously trained the worker on methyl orange.

Various chapters on Acidimetry, Alkalimetry, Oxidation and Reduction Reactions and Precipitation Reactions are followed by a section on Miscellaneous Reactions. Under this head, we find determinations of mixtures such as sulfuric and oxalic acids with hydrochloric and phosphoric acids, ferrous and ferric iron, boric acid and borax, etc.

Calculations exemplify every titration given including all B. P. chemicals. This affords every variety of titrations known under volumetric analysis.

Mr. Hampshire has entirely eliminated the worn out incorrect term "estimation;" he "determines" his unknowns. The index is rather laconic.

A splendid little book for every pharmaceutical chemist as well as student.

The press work is characteristic of Blakiston.

VIRGIL COBLENTZ.

*Hydrogen Ion Concentration. Its Significance in the Biological Sciences and the Methods for Its Determination*—By Leonor Michaelis, M. D. Professor in the University of Berlin, Resident Lecturer in Research Medicine in the Johns Hopkins University. Volume I, Principles of the Theory, represents the authorized translation from the second revised and enlarged German edition by William A. Perlzweig, Ph.D. of Johns Hopkins University and Hospital. Cloth bound, 6 x 9, publishers, The Williams & Wilkins Company, Baltimore, Md. Price \$5.00.

This book represents a concise and yet comprehensive outline of the theoretical physico-chemical principles of hydrogen-ion concentration. It is to be followed up by two further volumes in which will be presented the methodology and the colloid-chemical physiological and medical applications. From this it will be noted that this edition is presented especially for the consideration of biological readers. The present volume, however, deal-

ing primarily with theories, is of great importance and interest to the modern chemist in general since the applications of hydrogen-ion concentration are developing rapidly in all branches of this science.

In Part I of the book the chemical equilibrium of the ions is discussed, the laws of electrolytic dissociation, the theory of the quantitative determination of acidity and alkalinity, the ionic phases of salt formation and the electrolytic dissociation in non-aqueous solutions.

In Part II the potential differences of ions are considered particularly in the direction in which they are to have a probable physiological bearing. The several groups such as electrode potentials, diffusion potentials, phase boundary potentials, membrane potentials and absorption potentials are discussed.

An interesting phase of the book are the summaries of contents which precede each chapter. These represent abstracts of the work covered in any given chapter, in some cases covering more than a half page and enable one to obtain a bird's-eye view of the subject matter and scope of the particular chapter.

A large number of references are provided, thereby giving the reader a rather complete bibliography on the subject. It might be mentioned that the more recent advances in chemistry, those since the printing of the original German edition of the book have been included in the translation by a number of addenda to the text.

The book therefore offers the subject of ion concentration in a complete and thorough form not only to the research chemist but also to the advanced student. It is not a textbook for the average man studying chemistry but should be of the highest value to the biological and medical research student.

HUGO H. SCHAEFER.

*Textbook of Pharmacy.* By A. O. Bentley. Demy 8 vo., + 540 pp. Illustrated with 103 figures. Published by Baillière, Tindall and Cox, London. Price 15s. net.

The statement has frequently been made in this country, especially by members of the other professions, that pharmacy is nothing but applied botany and chemistry and that there is little justification for treating it as a separate subject in our schools and colleges. These critics point to our textbooks in pharmacy in support of their contention and this is a difficult argument to meet in view of the

fact that nearly all of our textbooks do attempt to cover the fields of botany, chemistry and physics and, in some cases, bacteriology, serology, immunology accounting, store management, etc. It is therefore a pleasure to review a book which deals almost exclusively with real pharmacy and which we as pharmacists may point to in support of our viewpoint.

The author states that the book is intended to cover the requirements in general and official pharmacy of the syllabuses of the Pharmaceutical Society of Great Britain and of the qualifying examinations of the various pharmaceutical societies and boards of the British Empire. The subject of dispensing, including the making of pastilles, tablets, etc., has not been dealt with for the reason that there are other excellent and specially written treatises on these subjects.

The subject matter of the book has been divided into three parts. Part I deals with the commonly employed pharmaceutical operations. Part II is concerned exclusively with the preparations of the British Pharmacopœia and Part III covers the additional subjects in pharmacy that are contained in the syllabuses for the Pharmaceutical Chemist Qualifying Examination of the Pharmaceutical Society of Great Britain and the B. Pharm. Examination of the University of London. These subjects are the preparation of vaccines, sterilization, surgical dressings and enzymes.

A special feature of the book which distinguishes it from our textbooks on pharmacy is that a number of practical exercises have been included. At the end of every chapter in Part II there is given a number of exercises which are intended to give the student practice in making the different types of preparations discussed.

The book is by an experienced teacher of pharmacy and is well written. While it cannot serve as a text in our schools of pharmacy, because of the fact that it is based on the British Pharmacopœia, yet it should find a place in our pharmaceutical libraries as a reference book and there is much material in it which recommends it to the practicing pharmacist.

A. G. DUMÉZ.

*Edible Oils and Fats. Their Chemistry and Examination, Their Substitutes and Adulterants.* By G. D. Elsdon, B.Sc., F. I. C., Liverpool. D. Van Nostrand Company, New York. 521 pp. Price \$12.50.