

NEW BOOKS

Pœms. By "OPIFEX." The Chemical News, Ltd., Merton House, Salisbury Square London, E. C. 4, 1928. 105 pp. 12 × 19 cm. Price, 5 shillings.

We do not know who Opifex is, but in sending a copy for review he admits that he is a member of the American Chemical Society.

The initial four pages are given up to an amusing historical record in quatrains that tells what Democritus, John Dalton, Clerk Maxwell, Frankland, J. J. Thomson, Curie, Rutherford, Moseley, G. N. Lewis, Langmuir, Bohr and the Braggs did to the atom. The author had not got to Schroedinger and Heisenberg by the time he wrote it. There is a translation of verses read at a Weihnachts-kneipe at Zurich with Alfred Werner in the chair, in praise of chemistry; also a metrical protest against the misuse of the word chemist, a letter in verse to the editor and a Hymn to the author's Alma Mater. These take up sixteen pages that serve as preface to eighty-eight more pages of lyric appeal for religious faith. The author discusses in a single form of verse: "Intelligence," "Its Source," "Ignorance," "The Universe," "The Heavens," "The Earth," "Life," "Truth," "Mathematics," "Knowledge," "Light," "Smallness," "Man," "The Soul," "Ethics," "The Ancients," "Religion," "Sorrow," "Love," "Work," "Philosophy," "Unsolved," "Psychology" and "God."

A comprehensive list indeed. But most of it, somehow, sounds familiar. And the ringing lines that march with majesty into the memory, there to abide, have failed to register with the present reviewer.

E. H.

A Comprehensive Treatise on Inorganic and Theoretical Chemistry. Vol. VIII. Nitrogen, Phosphorus. By J. W. MELLOR, D.Sc. Longmans, Green and Company, 55 Fifth Avenue, New York, 1928. x + 1110 pp. 156 figs. 25 × 16 cm. Price \$20.00.

This volume is another monumental contribution. It is not only replete with references to the literature and with the most recent and detailed information about nitrogen and phosphorus, but it also maintains a just historical perspective regarding the contributions to our knowledge of these important elements. Moreover, it achieves the rare distinction of being an interesting and readable dictionary!

This latest volume will be welcomed eagerly by those who use the earlier volumes of this series, which now—having covered two-thirds of the elements—is approaching completion. It is dedicated by the Author, "To the Privates in the Great Army of Workers in Chemistry: their Names have been Forgotten; their Work Remains."

ARTHUR B. LAMB

Elementary Physical Chemistry, adapted from a *Treatise on Physical Chemistry*.
By HUGH S. TAYLOR, D.Sc. (Liverpool), Professor of Physical Chemistry, Princeton University. D. Van Nostrand Company, Inc., Eight Warren Street, New York, 1927. ix + 531 pp. 108 figs. 14 × 22 cm. Price \$3.75.

The purpose and scope of this text are best indicated in the words of the author: "The present volume attempts the presentation of material suitable for an introductory course in modern physical chemistry. It is adapted from the two volume 'Treatise of Physical Chemistry' which appeared under the author's editorship some three years ago. A need has been felt in several quarters for a single volume of a more elementary nature which should follow the general lines of development in the larger treatise, without, however, its details. This book is offered in response to such a demand."

The main topics and their arrangement are indicated by the chapter headings: The Atomic Concept of Matter; Energy in Chemical Systems; The States of Aggregation, I. The Gaseous State; II. The Liquid State; III. The Crystalline State; The Velocity and Mechanism of Gaseous Reactions; The Directions of Chemical Change; Solutions, Part I; Homogeneous Equilibria; Heterogeneous Equilibrium; Electrical Conductance and Ionization; Ionic Equilibrium, I. Weak Electrolytes; II. Strong Electrolytes; Photochemistry; Colloid Chemistry.

The book represents a notable departure from most texts which have appeared under a corresponding title. The changing emphases in physical chemistry are taken into account and certain traditional material has given place to topics of recent interest. This is particularly true of the presentation of chemical kinetics and the concepts fundamental to it, where the treatment is excellent, as might be expected from the eminent position of the author in this field.

The author relies upon present-day practice of teaching in courses in general chemistry much of the elementary physical chemistry that has generally occupied a considerable space in texts upon the latter subject. He, therefore, carries the student farther into the subject than would otherwise be possible. He assumes a knowledge of mathematics, including the calculus, saying, "Any teacher who would advise his students that he can attain to an understanding of the science as now developing without the mathematical knowledge required in the present volume is, in the opinion of the author, doing an ill service to his pupils." This attitude surely needs no defense. The day is past when a man can become a chemist with but a smattering of preparation in mathematics and physics.

It is to be regretted that the table of electronic structure of atoms given in Chapter I should be that of Bohr rather than the later arrangement of Main Smith and Stoner, which is given, but only for noble gases. It

might be suggested, also, that the form of the periodic system given on page 10 should be changed to one corresponding better to atomic structure.

In the opinion of the reviewer, the sections dealing with thermodynamics are weaker than the rest of the book. Chapter VIII upon solutions could be improved. The treatment here is traditional rather than critical. Twelve pages are devoted to osmotic pressure, and the gas law for osmotic pressure is taken as defining an ideal solution. Molecular weight is calculated from vapor pressure lowering, not by the aid of Raoult's law but of a less accurate osmotic pressure relation. The third law of thermodynamics is sufficiently important to have a better treatment than that given in the chapter upon homogeneous equilibria.

The chapter upon heterogeneous equilibrium is particularly good, as is also the chapter upon photochemistry. This latter constitutes one of the few adequate presentations of this very important subject.

The book inevitably shows some traces of its origin as an abridgment of a larger work, but the net result of this is doubtless profit rather than loss. The reviewer takes pleasure in recommending it cordially to the attention of teachers of physical chemistry.

J. H. HILDEBRAND

Chemical Affinity. By L. J. HUDLESTON, Lecturer in Physical and Inorganic Chemistry at the University College of Wales, Aberystwyth. Monographs on Inorganic and Physical Chemistry, edited by ALEXANDER FINDLAY, D.Sc. Longmans, Green and Company, 55 Fifth Avenue, New York, 1928. vii + 138 pp. 5 figs. 15 × 22 cm. Price \$2.75.

This book gives a comparatively brief and well written discussion of Thermodynamics with special reference to chemical reactions. The scope of the work may be indicated most conveniently by the chapter headings: Energy and its Transformations (First and Second Laws of Thermodynamics); Entropy; Free Energy; Solutions; The Nernst Heat Theorem and Third Law of Thermodynamics; Applications. Although it does not contribute anything new to the science or give a critical and comprehensive analysis of the evidence for the newer theories, it will be useful to students as an introduction to the more extensive treatises of Lewis and Randall or of MacDougall or to the works of Gibbs, and therefore deserves a place in every college library. The binding is poor.

GRINNELL JONES

Veröffentlichungen aus dem Kaiser-Wilhelm-Institut für Silikatforschung. (Publications from the Kaiser Wilhelm Institute for Silicate Research.) Edited by Dr. Wilhelm Eitel. Gebrüder Borntraeger, W 35 Schöneberger Ufer 12 a, Berlin, 1928. vi + 262 pp. 55 figs. 19 × 26.5 cm. Price, unbound, 28 M.

This volume is the first of a series of collected publications of the Kaiser Wilhelm Institute for Silicate Research founded, in 1926, under the direction of Wilhelm Eitel. The twenty articles which it contains have all

been previously published elsewhere, for the most part in the *Zeitschrift für Kristallographie* and in the *Zeitschrift für anorganische und allgemeine Chemie*. The articles have not, strictly speaking, been reprinted here but are simply separately furnished by the original publishers and bound together in the present volume.

Most of the articles are concerned with the crystallographic analysis by means of x-rays of various minerals and of a few organic substances, but the longest article (84 pages) and the one of the most general interest is by E. Herlinger and is entitled "Concerning the Newer Developments of Geochemistry." This article reviews in a thorough fashion the recent work on the elementary composition of the earth and on the chemical transformations which have taken place both in the interior parts of the earth and in its crust.

The volume should constitute a useful collection for mineralogists, chemists and geologists interested in the chemistry and physics of the silicates. It is dedicated to "Adolf von Harnack, the Tireless Promoter of Research."

ARTHUR B. LAMB

Handbuch der biologischen Arbeitsmethoden. (Handbook of Biochemical Methods.)

Edited by Professor Dr. EMIL ABDERHALDEN, Director of the Physiological Institute of the University of Halle an der Saale. Abt. III, Physikalisch-chemische Methoden, Teil B, Heft 4. Urban and Schwarzenberg, Friedrichstrasse 105, Berlin N 24, Germany, 1927. 126 pp. 60 figs. 18 × 25.5 cm. Price, M 7.

The book comprises three articles on recent developments in methods of colloid research, as applied to biological chemistry. The first on "Electrodialysis" by Mona Spiegel-Adolf discusses with some detail the methods and apparatus used by recent investigators. Ten pages are devoted to an enumeration of applications of electrodialysis, during the last five years. Many of these are quite outside the field of biology. The article by Arne Tiselius on "Methods of Determining the Mobility and Charge of Colloid Particles," describes especially methods developed and used at Upsala for measuring the mobility of protein solutions by the moving boundary method. The article includes a good discussion of the theory of cataphoresis, and of the precautions which are necessary in order to get reliable measurements of mobility. The final article by Svedberg on "Molecular Weight Determinations of Proteins by Centrifugation" summarizes his brilliant researches in this field. It includes a development of the theory and fundamental equations for the method, a description of the apparatus as developed, with numerous illustrations, and the results obtained with hemoglobin and egg albumin. The conclusive way in which the method has shown that hemoglobin solutions contain only particles of molecular weight 66,800 illustrates what a help it will be in the study of other proteins.

NORMAN D. SCOTT