

(Academic Press, Inc., N. Y., 1950), which has been published in four parts and contains chapters by over eighty authors. What such a work gains in comprehensiveness and usefulness as an ultimate source of references, it lacks in orderly organization, readability and freedom from repetition. Such works—with the exception of certain well-written chapters—are too detailed, or sometimes simply too imposing to serve adequately as textbooks for students. Thus, a new demand for up-to-date, preliminary or introductory textbooks is being created in fields that have never required them before.

It is a pleasure to find a new work by a single author that covers so thoroughly and well a field as vast and complex as enzymology. Prof. Hoffmann-Ostenhof's book was designed to meet an acute need for a modern German textbook on the enzymes. There is no question that the present volume will fill that need admirably. With respect to scope and coverage, this book is especially noteworthy. Prof. Hoffmann-Ostenhof has managed to keep abreast of and evaluate developments in all of the myriad departments of enzymology that have taken place in America, England, Europe and Asia. Few textbooks can boast, at the time of publication, of as exhaustive a review of the available international literature as this one can.

The first seventeen chapters (170 pages) deal with the history of the subject, with the physicochemical nature of enzymes, their synthesis and specificity, and with enzyme kinetics and thermodynamic considerations. The following thirty-one chapters constitute a catalog of the known enzymes, their properties and reaction mechanisms. In a final chapter of 57 pages the author attempts to portray the role of enzymes in intermediary metabolism, their operation in biochemical sequences and cycles, and their organization in cellular organelles. Such a short chapter cannot pretend to deal adequately with the dynamic aspects of interactions of enzyme systems *in vivo*. This small proportion of space devoted to dynamic considerations in such a large work points up the fact that the book is primarily concerned with enzyme statics, which is justifiable, of course, on the grounds that it is the logical prerequisite for a study of metabolism and cytochemistry at the biological level.

In order to cover so much material within the confines of one volume of 772 pages, the author's style is necessarily concise and condensed. Nevertheless, German-reading students of biochemistry and metabolism will probably find the book rewarding. Unfortunately, however, the price of the book seems prohibitive.

The author is to be congratulated for his success in carrying out such a difficult assignment and in making an important contribution to the international literature of biochemistry.

DEPARTMENT OF BIOLOGY
THE UNIVERSITY OF ROCHESTER
ROCHESTER, N. Y.

ARNOLD W. RAVIN

Borderland of the Unknown. The Life Story of Gilbert Newton Lewis, One of the World's Great Scientists.
By ARTHUR LACHMAN. Pageant Press, Inc., 130 West 42nd Street, New York 36, N. Y. 1955. viii + 184 pp. 14 × 20.5 cm. Price, \$3.00.

In the words of the author, this book is "chiefly about Gilbert Lewis" but it includes a considerable amount of *apologia* by the author and much digression. The book is best characterized as an account of the chemistry department at Berkeley in the middle years as viewed from the vantage point of the Faculty Club. It is largely anecdotal in character and those who knew Lewis will recognize the anecdotes as authentic. However, the book does not live up to its pretentious title.

Some years ago a biographer attempted to humanize Willard Gibbs and only succeeded in making both parties appear foolish. Dr. Lachman has done the same thing for Lewis and succeeded too well. The emphasis on Lewis's rather puckish sense of humor seems to diminish his stature as a man and a scientist.

The relation of G. N. Lewis to Willard Gibbs could be the subject of an interesting study. Though he came long after Gibbs he was still his immediate successor and a voice crying in the wilderness, as it were. It is easy to see why he did not use the notation of Gibbs in thermodynamics. But Lewis did not choose to follow the method of Gibbs and

this loss of continuity with the great master seems to mar what is otherwise a great work.

Lewis was a non-conformist, even a rebel, as is shown by his resignation from the National Academy. It would be interesting to speculate as to what extent he was affected by his early academic experience at Harvard. His career was a great achievement but in view of his temperament it was inevitable that he would experience disappointment and frustration. This is not to his discredit. He did not suffer fools gladly.

There are those who think that G. N. Lewis was the greatest American scientist after Willard Gibbs and it is to be hoped that eventually a less casual account will be given of his scientific career.

NOYES LABORATORY
UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS

W. H. RODEBUSH

Elektrolytische Abscheidung und Elektrokristallisation von Metallen. By HELLMUTH FISCHER, Ph.D., Hon.-Professor an der Techn. Hochschule, Karlsruhe. Springer-Verlag, Reichpietschufer 20, Berlin W 35, (West-Berlin), Germany. 1954. xii + 717 pp. 16.5 × 23.5 cm. Price, Ganzleinen DM 72.-.

This book truly constitutes a monumental piece of work standing alone among a vast research literature which Dr. Fischer is the first one to have assembled for presentation in a single volume devoted to the fundamentals of electroplating and electrocrystallization. For the technical aspects of the subject the literature is rather rich (see for instance "Modern Electroplating" published by John Wiley and Co. under the auspices of the Electrochemical Society). The amount of material covered in Dr. Fischer's book is so huge that the presentation is occasionally bound to be a somewhat empirical enumeration of facts and theories. Nevertheless the completeness and up-to-date character of this treatise are admirable and the author displays perfect versatility and ease in the presentation of the many different aspects of his subject. The students of physical chemistry, electrochemistry, metallography and science of metals in general, crystallography, surface chemistry, galvanoplasty, electrometallurgy and of a number of other engineering subjects will all find valuable material in this book and will owe a debt of gratitude to Dr. Fischer for having found the time and energy to write it.

The book is divided into four main parts: 1. Electrochemistry, with six main subdivisions: Fundamentals and definitions. The electric double layer. The diffusion film at the cathode. The mechanism of cathodic plating. The effect of inhibitors. Distribution of lines of current and effect of depth. 2. Electrocrystallization, with four subdivisions: Kinetics of the crystallization process. Mechanism of electrocrystallization. Growth patterns of polycrystalline deposits. Codeposition of non-metals in the cathodic metallic deposits. 3. Chief properties of cathodic metallic deposits, with seven main subdivisions: Bright metallic deposits. Inner stresses in cathodic deposits. Hardness of deposits. Electric resistance. Adherence. Corrosion behavior. Structure and properties of electrolytically deposited alloys. 4. Conditions for deposition and properties of various metals and alloys, with eight main subdivisions corresponding to metals considered in groups (Pb, Sn, Ti-Bi, Sb, As-Ag, Cu, Au-Zn, Cd-Fe, Co, Ni); Cr is considered alone and in great detail, the last two sections being devoted to the conditions of preparation of coatings of the classical Cu-Zn alloys and of the various alloys with Sn.

All the subdivisions of the four main parts are systematically divided in numbered paragraphs, some of which are further divided, with the result that, through the 10-page Table of Contents, the reader can locate easily what he needs in the midst of this abundant fare.

The authors' index of 9 packed pages shows how completely and recently the literature has been covered. A detailed subject index of 56 pages concludes this very fine volume. The printing and quality of paper are excellent.

The reviewer strongly suggests that an English translation of Dr. Fischer's book be made available as soon as possible.

UNIVERSITY OF OREGON
EUGENE, OREGON

PIERRE VAN RYSELBERGHE

Inorganic Reactions and Structure. By EDWIN S. GOULD, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn 2, New York. Henry Holt and Company, 383 Madison Avenue, New York 17, N. Y. 1955. viii + 470 pp. 16 × 24 cm. Price, \$6.50.

The chemistry curriculum in most colleges has undergone during the past quarter century a gradual metamorphosis. The subject is now largely presented as the development and application of theoretical principles. The descriptive material which remains is used mainly as a fortification of these principles. We teachers are strongly tempted to treat casually the more mysterious facts of nature and to emphasize the phenomena which lend themselves to ready explanation on the basis of theory. While this change in approach to the subject is not on the whole undesirable, it has led to a rather serious deficiency in the student's factual knowledge of the chemical reactions of the elements and compounds. The author of this book has been keenly aware of this lack in the training of chemists.

One of the two main objectives of this book is to rectify this situation in the field of inorganic chemistry. It is intended as a text for a course to be given to students in the latter part of their undergraduate training or to graduate students who have had no inorganic chemistry other than that normally included in introductory courses. The other purpose of the author is to acquaint the student with the applicability and limitations of modern structural theory. The level of the presentation is for those who have had courses in qualitative and quantitative analysis but have only average background in college mathematics and physics.

Rather more than half of the text is devoted to the presentation of theoretical matter and physical background. The subjects include atomic structure, energy levels, valence bond, bond energies, covalent bond lengths, electronegativities, ionic crystals, stereochemistry and acid-base theory. There are also chapters on X-ray studies, the use of magnetic susceptibility, dipole moments and molecular spectra in structural studies, nuclear chemistry, and nomenclature in inorganic chemistry. Interspersed throughout these discussions are chapters dealing with the chemical properties of representative elements. The author's reason for arranging the topics in this way is to avoid overdoses of either theoretical or descriptive material, but it is suggested that the order of presentation could be changed without serious consequences.

Suggestions for supplementary reading are given at the end of each chapter. About 80% of the suggestions are page references to standard treatises or other text books. Most of the other references are to review articles. A set of questions is also provided with each chapter. The author warns the student that full benefit from the text is to be achieved only by working the problems. A table of approximate oxidation potentials and a table giving some numerical constants of the elements are included as appendices.

The impression gained on reading this book is that the author has covered the theoretical parts adequately but has not come through with a satisfactory treatment of chemical reactions. In too many instances it is assumed that the student is already familiar with the methods of preparation of compounds and with their properties, or he is referred to more advanced works. The reactions which are discussed in detail are mostly those which can be "explained" as nucleophilic reactions. The structural features of compounds are often discussed without any indication of how the compounds may be prepared. Too often, the reader is confronted with paragraphs dealing with several ideas each expressed in the baldest form. In this way, the author has been able to cover a great many phenomena in a few lines but the result is more an outline for study than material to study.

The sets of questions accompanying each chapter are in general well stated and provocative. Some of them are in the nature of puzzles which may be of doubtful value. Many of the questions are concerned with analytical separations. It is unlikely that the average student would be able to answer many of the questions on inorganic preparations without recourse to sources other than the text. Not a few of the questions dealing with applications of theory require that the student use equations which have not been derived.

The effectiveness of the text in accomplishing its purpose is somewhat diminished by the grammatical style adopted by its author. Sentences are run together, and parenthetical statements abound. The text has not been very carefully edited. The shape of an ion is described on p. 150 as "a round-based truncated pair. . . which is joined to another pair-shaped atom." On p. 79 the wrong formula is given for acetic anhydride in an equation which is not balanced and does not give the correct products. All of the figures are line drawings in which the perspective is not always clear. A line is missing from the figures for $\text{Be}(\text{C}_2\text{O}_4)_2^{-2}$ and for graphite. The figure representing the structure of diamond is not very useful.

The complete absence of reference other than the supplementary reading list is, according to the author, justified because students at this level have little inclination to consult the original literature. It would have been a great convenience, however, to many teachers to have been supplied with this information. It is not always easy, for instance, to distinguish reaction mechanisms given in the text which have been supported by experimental work and those which merely appear reasonable to the author.

In spite of these shortcomings, the book should prove a useful addition to textbook literature. It furnishes an outline for study which touches on most of the important phenomena of inorganic chemistry.

UNIVERSITY OF CONNECTICUT
STORR, CONNECTICUT

ROLAND WARD

BOOKS RECEIVED

September 10, 1955—October 10, 1955

WILLIAM BAND. "An Introduction to Quantum Statistics." D. Van Nostrand Company, Inc., 250 Fourth Avenue, New York 3, N. Y. 1955. 342 pp. \$6.00.

ULRICH DEHLINGER. "Theoretische Metallkunde." Vol. 13. Springer-Verlag, Reichpietschufer 20, Berlin W 35 (West-Berlin), Germany. 1955. 250 pp. Ganzleinen DM 27.—

JESSE P. GREENSTEIN AND ALEXANDER HADDOW (edited by). "Advances in Cancer Research." Volume III. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1955. 369 pp. \$8.50.

ERNST A. HAUSER. "Silicic Science. A Review of the Colloid Scientific Properties and Phenomena Exhibited by Matter Composed Essentially of the Element Silicon." D. Van Nostrand Company, Inc., 250 Fourth Avenue, New York 3, N. Y. 1955. 188 pp. \$12.50.

I. PRIGOGINE. "Introduction to Thermodynamics of Irreversible Processes." Charles C. Thomas, Publisher, 301-327 East Lawrence Avenue, Springfield, Illinois. 1955. 115 pp. \$4.75.

G. K. ROLLEFSON, Editor, and R. E. POWELL, Associate Editor. "Annual Review of Physical Chemistry." Volume 6. Annual Reviews, Inc., Stanford, California. 1955. 515 pp. \$7.00 (U.S.A.); \$7.50 (elsewhere).

M. CANNON SNEED AND ROBERT C. BRATED, Editors. "Comprehensive Inorganic Chemistry." Volume IV. Part I. "Zinc, Cadmium, and Mercury." By Howard M. Cyr and The Editors. Part II. "Scandium, Yttrium, and the Lanthanide Series." By Thomas D. O'Brien and The Editors. D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, New Jersey. 1955. 193 pp. \$5.00.

A. F. TROTMAN-DICKENSON. "Gas Kinetics. An Introduction to the Kinetics of Homogeneous Gas Reactions." Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1955. 322 pp. \$8.00.

L. ZECHMEISTER, Editor. "Progress in the Chemistry of Organic Natural Products." (Fortschritte der Chemie organischer Naturstoffe). Volume XII. Springer-Verlag, Mölkerbastei 5, Wien 1, Austria. 1955. 550 pp. \$19.00; Ganzleinen, \$19.80.