BOOK REVIEWS

Chemistry and Biology of Proteins. By FELIX HAUROWITZ. Professor of Chemistry, Indiana University, Bloomington, Indiana. Academic Press, Inc., Publishers, 125 East 23rd Street, New York, N. Y., 1950. xii + 374 pp. 16 × 23.5 cm. Price, $5.50.

Amino Acids and Proteins. Compiled and edited by DAVID M. GREENBERG, Professor of Biochemistry, University of California, Berkeley, California. Charles C. Thomas, Publisher, 301–327 East Lawrence Avenue, Springfield, Illinois. 1951. ix + 950 pp. 17 × 26.5 cm. Price, $15.00.

Chemie der Eiweisskörper. by Professor Dr. ERNEST WALDSCHMIDT-LEITZ, Munchen. Ferdinand Enke, Publisher, Hasenbergsteige 3 (14a) Stuttgart-W, Germany, 1950. viii + 187 pp. Price, DM 16; in the United States, $3.81.

The nearly simultaneous publication of these three books is one manifestation of the intensity of interest in protein chemistry today. Each differs from the others in its objectives and its achievements.

Haurowitz has undertaken a general introductory text on proteins, "understandable to graduate students of chemistry and of the biological sciences." Major emphasis is laid on the problems of the structure of proteins, on their biological functions—as enzymes, hormones, antigens, antibodies, viruses, structural elements of cells and tissues—and finally, in the last two chapters, on the biosynthesis of proteins. After a brief introduction, the author discusses the isolation, purification and determination of proteins; hydrolytic cleavage and amino acid composition; the size and shape of protein molecules; the electrochemistry of amino acids, peptides and proteins; interaction of proteins with water; internal structure of globular proteins, including the number of peptide chains per protein molecule, the nature of the terminal amino groups, the dielectric properties and dipole moments of proteins, and an extensive discussion of denaturation. This is followed by chapters on various classes of proteins—albumins, globulins, scleroproteins, conjugated proteins, enzyme and hormone proteins, toxins. There is a chapter on interactions of proteins with other substances, and one on the role of proteins in immunological reactions. The book concludes with the two chapters dealing with intermediary metabolism of amino acids and proteins and with protein biosynthesis. The chemistry of amino acids and peptides is discussed only as it related to protein composition and structure.

Into this relatively brief book, intended as an introduction to the subject, Haurowitz has packed an astonishingly large range of information. Moreover, he has given detailed references to the original literature throughout—each chapter contains at least 50 references, some more than 150. Some work published as recently as the beginning of 1950 is discussed. From the nature of the ground to be covered, the presentation is scrappy in places, but on the whole the author succeeds in telling a coherent story, into which he has put a good deal of his own thinking. The errors detected by this reviewer were few and generally minor (a fundamental thermodynamic equation is misprinted on p. 134 but the correct form is given two pages later). Some passages are quite speculative—notably the discussion on denaturation in Chapter VII, and the proposed mechanism for the biosynthesis of proteins in Chapter XVII. The speculation here is stimulating and, in Chapter VII, it is for the most part well grounded on a large body of established experimental evidence. Altogether this book should prove of great value to many students and investigators who wish a satisfactory introduction to the present state of protein chemistry.

Greenberg's "Amino Acids and Proteins" is constructed on a much larger scale. It is in large measure a Californian product; at least fourteen of the eighteen contributors were residents of that state when the writing of the book was begun, and twelve are still there. Amino acids and peptides are treated extensively; the first four chapters are entirely devoted to these smaller molecules, and several later chapters are largely concerned with them. E. E. Howe discusses the structure and properties of amino acids; H. S. Olcott gives an extensive account of the methods for their quantitative determination; S. Archer describes the preparation of amino acids and peptides; J. C. Reid and B. M. Tolbert provide a brief but useful chapter on the synthesis of isotopically labeled amino acids; and M. S. Dunn and L. B. Rockland discuss isolation of amino acids. These chapters are well done, and are comparable in scope and quality with other reviews that have appeared in the recent literature. H. L. Fevold discusses classification, purification and isolation of proteins, with a good general discussion of fractionation procedures. This chapter concludes with a fairly detailed description of twenty different protein preparations, most of which lead to crystallized products. H. P. Lundgren and W. H. Ward give a thorough discussion of molecular size of proteins, especially the osmotic pressure, diffusion and sedimentation measurements; experimental methods are discussed in great detail, and a valuable table gives molecular weights of 251 proteins determined by many different methods, as well as other physical data. D. M. Greenberg gives a good discussion of amphoteric properties, and of metallic complexes of proteins and amino acids; there is a short appendix to this chapter, on binding of anions, by I. M. Klotz. Criteria of purity, discussed by C. H. Li, include electrophoresis, solubility, sedimentation, diffusion, and biological activity. H. Fraenkel-Conrat covers well the chemical reactions of proteins, including a brief discussion of denaturation; and H. J. Almquist also does well with nutritional applications of amino acids. D. H. Campbell and F. Lanni present a valuable and thoughtful discussion on the chemistry of antibodies. Greenberg covers a variety of biochemical applications of proteins and peptides, including blood proteins, hormones, toxins, antibiotics and viruses. H. Tarver writes the comprehensive concluding chapter on intermediary metabolism, with more than 700 references.

The general level of the chapters in the book is high. Surveying the treatise as a whole, however, one notices some important gaps. Almost nothing is said of the shapes of protein molecules, or of the methods for determining them, apart from a few incidental remarks in the chapter by Lundgren and Ward. Their chapter, however, is concerned essentially with molecular size, not shape. Such important methods as light scattering receive only the barest mention. Above all there is no discussion of interatomic distances and bond angles in amino acids and peptides, or of the evidence concerning the configuration of the peptide chains in fibrous and corpuscular proteins. This is a matter of such burning interest to protein chemists today that its omission comes as a shock. (Parenthetically one may remark that some of the world's most eminent authorities on these matters are to be found within the boundaries of California). It is indeed stated in the preface that "topics requiring advanced mathematical treatment have not been included." This criterion would properly exclude such subjects as streaming birefringence, or details of X-ray diffraction studies, but it certainly need not exclude the fundamental spatial relations which must underlie all protein specificity. In this respect the short book by Haurowitz gives a more adequate picture of the fundamentals.

Most or all of the contributions to Greenberg's book were apparently prepared originally in 1947–1948, added passages being inserted later to cover further developments. Thus the preparations of amino acids described in Chapters III A refer for the most part to the DL forms; the powerful new methods of resolving them by asymmetric enzymatic hydrolysis of the acylated derivatives are mentioned only in brief footnotes to one or two other chapters. Yet these methods have made pure synthetic D- and L-amino acids available on a scale previously impossible, and they have thus markedly diminished the relative importance of the isolation methods for amino acids described in Chapter IV. However, taking due account of all these criticisms, the book remains a valuable contribution, and most workers seriously concerned with protein chemistry will wish to have a copy available.

The monograph by Waldschmidt-Leitz is the briefest of the three books reviewed here, being about half the length of Haurowitz's book. The emphasis is on proteins and amino acids as chemical substances; the physical chemistry of the subject is discussed very briefly, and physiological aspects receive even less emphasis. Methods of protein fractionation also are touched on very lightly. As the author indicates in his foreword, the book is aimed especially at the German reader, cut off during the war and to some extent thereafter from the knowledge of scientific developments in the outside world. Therefore, there is considerable discussion of recent developments, with numerous references to the original literature. However, the book is not merely a survey of recent advances, but deals largely with work previous to 1940. The first three chapters deal with the general properties of amino acids, peptides and proteins, the fourth with chemical reactions and enzymatic splitting of proteins, the fifth with problems of protein structure and the sixth and longest with a descriptive characterization of various classes of proteins, illustrated by discussion of various individuals within each class. The whole has the character of a thoughtful and well documented essay. The literature is covered to the end of 1948, though with some omissions of important work, not surprising in view of the author's statement in the foreword of the difficulties under which he labored in gathering the material. The chapter on protein structure devotes, it seems to this reviewer, too much time to certain hypotheses which are now of historical interest only. However, the critical judgment of the author on these matters is sound, and the fundamentals of polypeptide chain configuration are briefly but adequately discussed.

American or English students of protein chemistry are not likely to find in Waldschmidt-Leitz's book much that they do not know already, but in general it tells well the story it sets out to tell, and should serve the purpose envisioned by the author.

UNIVERSITY LABORATORY OF PHYSICAL CHEMISTRY RELATED TO MEDICINE AND PUBLIC HEALTH
HARVARD UNIVERSITY
BOSTON 15, MASSACHUSETTS
JOHN T. EDSALL

The Identification of Molecular Spectra. Second Edition Revised. By R. W. B. PEARSE, D.Sc., F.R.A.S., Assistant Professor and Reader, Imperial College, London, and A. G. GAYDON, D.Sc., Warren Research Fellow of the Royal Society, Imperial College, London. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y., 1950. xi + 276 pp. 20 × 27.5 cm. Price, $8.50.

This is a much expanded second edition of a book which first appeared in 1941. The purpose remains that of facilitating the identification of spectra; that is, helping the practical spectroscopist, who has before him a plate with band spectra on it, to identify the molecules responsible for the bands. There are three parts: the first lists in order of wave length (2000 to 10,000 Å.) the principal bands which may be found; the second and main part lists by molecules the various band systems which are covered; and the third brief part gives some useful practical hints and a collection of reproductions of spectra.

As in the first edition, the emphasis is completely away from theory. The assignments of the various transitions are given, where known; but the main effort is to give data on wave lengths, on excitation conditions and on the appearances of the bands. An exception is made in favor of nitrogen, probably arising from Dr. Gaydon's long interest in this perplexing molecule; in the new edition an energy-level diagram is given.

Those readers who have the first edition will want to know if the second edition is much different. It is. A great deal of new material has been added—the number of pages has increased from 221 to 276—and this includes new systems and quite a few new molecules. Moreover, changes have been made in the assignments of a number of systems of doubtful origin. Comparison of the two editions leads to the feeling that our knowledge of fluoride molecules has increased in the last ten years, as well as our knowledge of polyatomic spectra.

We may be of service by pointing out what the book is not. It is not an exhaustive bibliography of band spectra. Actually the references in all cases are few in number, and in some cases are surprising in choice; presumably the authors chose the references which in their opinion best describe the appearance of the bands and the excitation conditions. It is not a critical review of all the data on all band spectra. In the more commonly occurring cases, the authors have obviously sifted various reports, and often have examined the spectra themselves; but the data on many less common bands have clearly been taken directly from the literature. However, they have attempted to include all recorded diatomic systems, and the more common polyatomic bands.

To the practical spectroscopist such a compilation is clearly useful, and the first edition served its purpose very well. The second edition improves and brings up to date that work.

UNIVERSITY OF MINNESOTA
MINNEAPOLIS, MINN.
BRYCE L. CRAWFORD, JR.

Ion Exchange Resins. By ROBERT KUNIN AND ROBERT J. MYERS, Rohm and Haas Company, Philadelphia, Pennsylvania. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y., 1950. xi + 212 pp. 16 × 24 cm. Price, $4.75.

The authors state in the preface to this book that they have attempted to assemble, digest and classify a principal portion of the presently available information on ion exchange resin chemistry. About one-fourth of the book is devoted to a discussion of the theory, about one-half describes various applications of ion exchange and the remainder is a description of laboratory methods in ion exchange technology.

The various theoretical treatments are described in this book much too briefly, and in a completely non-critical manner. While it must be recognized that the theory of these systems is just beginning to receive serious attention, still a more adequate treatment of such information as is available would be preferred.

The description of the properties of various resin systems is very useful, and contains considerable unpublished information. A more general use of the distribution coefficient rather than the symmetry number would have improved the presentation. The preparation of several of the earlier types of exchange resins is given in detail. The remainder of the book treats many applications of these resins, their operating characteristics and describes laboratory techniques for their evaluation as regards practical problems.

An excellent bibliography of 615 references has been compiled. Many of the older papers which concern inorganic exchangers, but which point up important similarities or describe useful experimental techniques, are included.

In this book the authors have attempted a compilation rather than an evaluation of the field. As such, the book is extremely useful, and will certainly serve to stimulate further research in this field.

DEPARTMENT OF CHEMISTRY
POLYTECHNIC INSTITUTE OF BROOKLYN
BROOKLYN, NEW YORK
HARRY P. GREGOR

Vitamins and Hormones. Advances in Research and Applications. Volume VIII. Edited by ROBERT S. HARRIS, Professor of Biochemistry of Nutrition, Massachusetts Institute of Technology, Cambridge, Massachusetts, and KENNETH V. THIMANN, Professor of Plant Physiology, Harvard University, Cambridge, Massachusetts. Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y., 1950. xi + 342 pp. 16.5 × 23.5 cm. Price, $6.80.

As the editors point out in the Preface, "Vitamins and Hormones," needs no special introduction to the scientific public. Volume VIII contains 8 valuable reviews—4 on subjects related to vitamins and 4 related to hormones.

The first review by the Zuckers on "Animal Protein Factor" and Vitamin B_{12} will be welcome to many workers since it is one of the first comprehensive reviews on this subject. Previous volumes have carried reviews on the newer hema-

topoietic factors including PGA and this paper includes much of the recent work on anemia factors as well as early interesting background. Unfortunately, the complete chemical structure of vitamin B_{12} could not be reported in this review.

Henry Sherman reviews the interrelationship between pyridoxine and fat metabolism but of necessity concludes that the exact nature of this interrelationship is still not known.

Van Wagtendonk and Wulzen present a detailed summary of their work as well as that of a few other workers on the anti-stiffness factor for guinea pigs. Again, they admit that the structure of this factor is one of the many unanswered questions in this field.

Mitchell covers only the current investigations on vitamins and metabolism in neurospora since several previous reports have been published on this subject, although not in "Vitamins and Hormones."

It is gratifying to find a review on relaxin by Hisaw and Zarrow. It was in 1926 that Hisaw first postulated that the relaxation of the symphysis pubis was under the control of a hormone.

Courrier presents an interesting review on the functional relationships between estrogen and progesterone.

Volume VII contained two chapters on the hormones of the posterior lobe of the pituitary prepared by Stehle and in this volume Stehle concludes his discussion on the action of these hormones.

The last chapter should be of definite interest to chemists—especially those interested in steroid chemistry since it covers steroid configuration. Aside from this chapter an extensive amount of chemical data is not included but one must admit that the work of many chemists will be required before the complete understanding of the compounds and reactions discussed in this review will be understood.

As usual, the valuable author and subject indexes are included.

DEPARTMENT OF BIOCHEMISTRY
UNIVERSITY OF WISCONSIN C. A. ELVEHJEM
MADISON 6, WISCONSIN

The Chemistry of the Acetylenic Compounds. Volume II. The Acetylenic Acids. By A. W. JOHNSON, M.A., Ph.D., A.R.C.S., University Chemical Laboratory, Pembroke Street, Cambridge, England. Longmans, Green and Co., 55 Fifth Avenue, New York, N. Y. 1950. xxvii + 328 pp. 14.5 × 22.5 cm. Price, $10.00.

This volume is a systematic and detailed compilation of the information on acetylenic acids published up to the end of 1948. An appendix covers the literature of 1949 in so far as 1949 publications were available in England in time for inclusion in the volume. The subdivision of the subject matter is similar to that of the previous volume on Acetylenic Alcohols, the order of treatment being as follows: Part I. Compounds containing one acetylenic bond and one carboxyl group. Part II. Compounds containing one acetylenic bond and more than one carboxyl group. Part III. Carboxylic acids containing more than one triple bond. Part IV. Non-carboxylic acetylenic acids. The discussion of the acids taken up in Parts I–III follows the sequence: Historical; Nomenclature; Natural Occurrence; Methods of Formation; Physical Properties; Reactions involving (a) the Carboxyl Group, (b) the Triple Bond, (c) the Free Ethinyl Group, (d) the Whole Molecule.

It is evident that the author has made a careful review of the literature of his subject. The clear organization and presentation of the information make the volume readily usable as a reference work. The table of contents is detailed, being practically a page-by-page topical outline of the text. Much of the data is summarized in numerous tables. The use of expanded structural formulas and the diagramming of reaction sequences enable the reader to grasp quickly the facts presented. References are conveniently listed at the end of each section. In addition to the subject index, there is a formula index of the known acetylenic acids, which gives, with literature references, the common physical constants of these compounds.

DEPARTMENT OF CHEMISTRY
UNIVERSITY OF ROCHESTER R. W. HELMKAMP
ROCHESTER 3, NEW YORK

Plant Biochemistry. By JAMES BONNER, Kerckhoff Laboratories of Biology, California Institute of Technology, Pasadena, California. Academic Press, Inc., Publishers, 125 East 23rd Street, New York, N. Y. 1950. xvii + 537 pp. 16 × 23.5 cm. Price, $6.80.

The claims for this work are that it will "synthesize the widely scattered literature concerning the biochemistry of higher plants" and "integrate the available information within the framework of general biochemistry." Even though the work may fall short of these aims it will be used by teachers and students, if only because in very recent years it has no near rival.

The book was written as a text and reference work "for the advanced student of the plant sciences" and for "students, at the advanced undergraduate level, of biochemistry who are interested in plants and of chemistry who are interested in natural products."

The present spate of "Advances" in special fields, Annual Reviews, Symposia and texts on special aspects of Plant Biochemistry already furnishes the research worker and advanced student with an embarrassment of riches. Therefore, many of the chapters which are of most general interest are somewhat anticlimatic: they tell little that is new or that has not been said elsewhere. In contrast, however, stands the chapter on plant proteins which makes full use of some of the original work from the author's laboratory.

Many of the chapters use a wealth of structural formulae which may be unnecessary for the informed reader and deceptively facile for those who are not familiar with biochemistry as a laboratory science. One looks in vain however for the chemical properties, tests and reactions of many of the metabolites whose formulae so liberally cover the pages and behind this impressive facade the critical evidence is somewhat thin.

The book is organized into six parts and thirty chapters. Each chapter concludes with a few general references and a generous list of particular citations. This is an excellent feature but there are, however, some curious omissions, to mention but a few.

Baldwin's admirable book on Dynamic Aspects of Biochemistry (1948) is not listed either as a general work or as supplementary reading for particular chapters. But reference is made to the obsolete books, neither of them classics, by Thatcher (1921) and Kostychev (1931).

The chapter on the cell wall draws heavily on its crystallographic structure but without any reference to the work of R. D. Preston.

In 132 pages on nitrogen compounds and metabolism there is only one casual reference to the applications of chromatography both on paper and on columns.

The formulae of glutamine and asparagine are given but not their strikingly different chemical properties so that they may seem to be more or less interchangeable, whereas, they often play different physiological roles. This is the dilemma of much modern plant biochemistry. Progress is made by the laboratory investigation of the properties, behavior, analysis of the constituents of plants and tissues: too much of biochemical writing can devolve into the facile manipulation of formulae.

Botanists will see some errors. A section headed "Primary Cell Walls" deals with grass coleoptiles and sunflower hypocotyls. The bulk analysis of the latter can have little to do with the "Primary Wall" of the plant anatomist and though the coleoptile grows by cell elongation its walls consist of a secondary deposit of cellulose on the "Primary Wall" proper. For the biochemists who will read the book it behooves the botanist to be accurate on such points.

The chapter dealing with "growth substances" redefines these—somewhat narrowly—as substances concerned mainly with cell extension and it proceeds to deal with the so-called auxins. Describing indoleacetic acid as the best known of the "native plant growth substances" the account goes on to treat of the Auxin-a and Auxin-b (p. 443 and 452) of Kögl and others. Few would perceive that the isolation of these substances has not been repeated, or repeatable, by either the original workers or by other laboratories. The biochemistry of indoleacetic acid and its homologs is of course on a much more sure foundation. One wonders, however, what use there can be in yet another repetition of the formulae for Auxins-a and -b? Are these substances credible except in Pasadena and in Holland? Surely students ought to be spared these formulae until the substances

have been confirmed and shown to have some real role in plants.

There is another curious side light on plant growth substances. Between 1937 and 1939 the author of the book was a co-author in a group of at least 4 papers on a growth substance to which the name traumatin was given and the constitution 1-decene-1,10-dicarboxylic acid assigned. The word traumatin, however, does not appear in the book. What are we to conclude? Do these results no longer stand: since the omission can hardly be unpremeditated? If so why was the reader not so informed? A glance at the author index shows that the book is not usually reticent concerning contributions from the author's laboratory.

Despite the industry and ability of its author this book lacks balance. It would have accomplished more if it had attempted less. When it leans too heavily upon animal biochemistry or fails to be critical enough of some of the concepts and evidence that it documents, it reflects, but does little to counteract, prevalent deficiencies in the important field of plant biochemistry.

DEPARTMENT OF BOTANY
CORNELL UNIVERSITY F. C. STEWARD
ITHACA, NEW YORK

Protein and Amino Acid Requirements of Mammals. Edited by ANTHONY A. ALBANESE, Nutritional Research Laboratory, St. Luke's Hospital, New York, N. Y. Academic Press Inc., Publishers, 125 East 23rd Street, New York 10, N. Y., 1950. x + 155 pp. 16 × 23.5 cm. Price, $4.00.

The objective of this concise monograph is to describe and evaluate the techniques currently employed in the determination of the protein and amino acid requirements of mammals.

The first article, "Some Species and Age Differences in Amino Acid Requirements" by Dr. H. H. Mitchell of the University of Illinois presents the author's theory of protein metabolism with supporting experimental evidence. In an attempt to combine into one picture the facts and the modern theories concerned with the metabolism and assimilation of protein, the author has prepared a very useful diagrammatic illustration.

The second article, "Methods of Measuring the Nutritive Value of Protein Hydrolysates and Amino Acid Mixtures. The Rat Repletion Method" by Douglas V. Frost of the Abbott Laboratories, offers a critical summary of the various methods that have been proposed for assaying protein quality. Special attention is given to methods which have been used in recent years to assay liquid protein hydrolysates devised for therapeutic use, with particular emphasis being placed on the rat repletion method. Especially noteworthy to students in this field is the newly acquired role of the non-essential amino acids. Recent evidence indicates that the essential amino acids are not readily metabolized to provide sources of nitrogen for synthesis of non-essential amino acid nitrogen, and that various of the non-essential amino acids as well as ammonium salts and urea may actually serve better than the essential amino acids themselves for general synthetic purposes.

The third article, "The Laboratory Evaluation of Amino Acid Mixtures and Protein Hydrolysates" by Robert H. Silber and Curt C. Porter of the Merck Institute for Therapeutic Research deals mainly with the problems involved in devising amino acid mixtures and protein hydrolysates suitable for both oral and parenteral administration in clinical medicine. A significant amount of hitherto unpublished data is given.

The fourth article, "Dietary Proteins and Synthesis of Tissue Proteins" by Bacon F. Chow of The Johns Hopkins University presents data, mainly from the author's own studies, to demonstrate that the synthesis of tissue proteins depends not only on the presence of the essential amino acids in adequate amounts but also on the dietary proteins from which these are supplied as well as a nutritional factor or factors ("directive substance"), at present unidentified.

The fifth and final article, "The Protein and Amino Acid Requirements of Man" by the editor of this book, Anthony A. Albanese of St. Luke's Hospital, New York City, presents a general summary of protein and amino acid metabolism. Although the emphasis is on the qualitative and quantitative amino acid requirements of humans, those of other species (including the avian species which is not indicated in the title of the book) are given for comparison.

For those who are and will be concerned in the future with this highly important field of nutrition and biochemistry, this little book contains a wealth of information. Numerous tabular data bring into focus many of the points the authors are attempting to emphasize. The book demonstrates the many advances that have been made during the past several decades in the understanding of the role of dietary protein and its constituent amino acids in the vital economy. More important, however, in the mind of this reviewer, are the challenges it poses for future research workers. The first two articles are especially recommended.

The format and type of this monograph make it very readable. Each article is preceded by a detailed and useful table of contents, the headings of the latter being used as subheadings throughout the body of the presentation, thus, making information readily accessible. Very few errors were noted. The most significant appears to be the omission of the amino acids, leucine and glycine, from the growth requirements of chicks in the first column of Table II on page 120. The confusion over the accepted spelling for the amino acid tryptophan is apparent and was either overlooked or ignored by the editor of this volume. It is spelled with a terminal "e" in the first and fourth articles. One other minor but annoying inconsistency is the absence of a zero in front of the decimal points of decimal fractions in the second article on pages 52 and 53.

DEPARTMENT OF BIOCHEMISTRY AND NUTRITION
CORNELL UNIVERSITY HAROLD H. WILLIAMS
ITHACA, NEW YORK

BOOKS RECEIVED

May 10, 1951–June 10, 1951

ROGER ADAMS (Editor-in-Chief). "Organic Reactions." Volume VI. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1951. 517 pp. $8.00.

THEODOR BERSIN. "Kurzes Lehrbuch der Enzymologie." Akademische Verlagsgesellschaft, Geest and Portig K.-G., (10b) Leipzig C1, Sternwartenstr. 8, Germany. 1951. 274 pp. geb. 19.20 DM.

ALFRED BURGER. "Medicinal Chemistry." Volume I. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1951. 577 pp. $10.00.

WILHELM EITEL. "Silicate Melt Equilibria." Translated from the German by J. G. Phillips and T. G. Madgwick with the collaboration of R. B. Sosman. Rutgers University Press, New Brunswick, New Jersey. 1951. 159 pp. $5.00.

MORRIS B. JACOBS (Editor). "The Chemistry and Technology of Food and Food Products." Second Revised Edition. Volume I. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1951. 832 pp. $12.00.

F. F. NORD (edited by). "Advances in Enzymology and Related Subjects of Biochemistry." Volume XI. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1951. 471 pp. $9.00.

E. H. ERICH PIETSCH (edited by). "Gmelins Handbuch der anorganischen Chemie." (Gmelin's Handbook of Inorganic Chemistry). Eighth edition. System-Number 68, Platinum. Issued by the Deutsche Chemische Gesellschaft. Verlag Chemie, GMBH, Hauptstrasse 127, 17a Weinheim an der Bergstrasse, Germany. 1951. pp. 719–854. DM 36.–.

DAVID ALLEN SHIRLEY. "Preparation of Organic Intermediates." John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1951. 328 pp. $6.00.

HENRY H. STORCH, NORMA GOLUMBIC, AND ROBERT B. ANDERSON. "The Fischer–Tropsch and Related Syntheses Including a Summary of Theoretical and Applied Contact Catalysis." John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1951. 610 pp. $9.00.