
 NEW BOOKS

Lehrbuch der organisch-chemischen Methodik. (Textbook of the Methods of Organic Chemistry.) By Dr. HANS MEYER, Professor der Chemie an der deutschen Universität zu Prag. Dritter Band, Synthese der Kohlenstoffverbindungen. (Third volume, Synthesis of Organic Compounds) Part 1. Offene Kette und Isocyclen. (Open Chain and Isocyclic Compounds.) Verlag von Julius Springer, Schottengasse 4, Vienna, Austria, 1938. In two sections, xv + 1483 pp. 18 × 25.5 cm. Price, RM. 135; bound, RM. 139.50. Part 2. Heterocyclen. (Heterocyclic Compounds.) Verlag von Julius Springer, Schottengasse 4, Vienna, Germany, 1940. In two sections, xxi + 1684 pp. Price, RM. 177; bound, RM. 182.

With the appearance of the sections on heterocyclic compounds, Hans Meyer's Lehrbuch is brought to completion. The third volume consists of a first part covering open chain and isocyclic (carbocyclic) compounds, which appeared in 1938, and a second part covering heterocyclic compounds which appeared this year. Each part is published in two halves to avoid excessive bulk but the pagination is continuous through the two sections.

The subject matter of the "Synthese der Kohlenstoffverbindungen" is limited strictly to methods of synthesis, which the author defines to include "lengthening or branching of the carbon chain, ring closure, ring expansion or contraction, and ring opening." No consideration is given to physical properties or chemical reactions of the important individual compounds as this would entail repetition of material that has appeared in the second volume of the series.¹ The result is an excellent and comprehensive handbook or compilation of synthetic methods and not a general treatise.

The method of presentation is quite different from that used in Houben-Weyl's Arbeitsmethoden or in any other treatise on methods of organic synthesis. Compounds are classified according to the system used in the fourth edition of Beilstein's Handbuch. Under each class of compounds there is given first a survey of the general methods of preparation and a comprehensive list of examples of specific applications from the lower to higher members of the series, including straight and branched chain structures. The lists of examples are so complete that a worker seeking to use a general method to obtain a compound not actually described can usually find reference to a closely related structure. This is a valuable feature since one is often obliged to make a tedious literature survey for such information.

The general section is followed by a "Description of Syntheses" listing the more important individual members of the class, and including a very concise survey of particular methods that have been used for each individual. The style in these sections is condensed to the extreme and abbreviations are used, so that a surprising amount of information is given in very little space. Under epi-

bromohydrin, for example, one finds among the entries: "1,3-Dibromopropanol, 98 proz. fein gepulv. Ca(OH)₂, Wasser 15 Min. schütteln. Bei 40–45° dest. Dann weiter bei 10 mm. Kühler unter –5°. A:89%." All of the methods are not given in as great detail, and in many cases only the reagents are specified. The general section gives cross references to the descriptions, and both sections give full citations to the original literature. Part One contains references to publications in 1937 and Part Two to publications in 1939.

Since the more recent literature (since 1919) has been included, these volumes contain material that is not found in the latest sections of Beilstein's Handbuch. Each of the two parts is provided with an excellent subject and name index.

In a book of this broad scope containing not less than twenty thousand references it is inevitable that some typographical errors will appear, but a random testing of several pages revealed only one error (in the concentration of a reagent).

In view of the extensive field covered in this volume and the restrictions imposed by space limitations, it is not surprising to observe that certain types of compounds have been dealt with very briefly or omitted entirely. The direct methods for the main functional groups are covered quite thoroughly and adequately; indirect methods involving a series of intermediates are not included as a whole, but broken up into smaller parts. Classes of compounds that are regarded as functional derivatives in the Beilstein system are treated incidentally or omitted entirely. This group embraces alkyl and aryl halides, nitro compounds, sulfonic acids, thiols and other sulfur functions, ethers, acetals, acid chlorides, esters, amides, nitriles, etc. The conversion of a main functional group into a functional derivative falls outside the author's definition of synthesis. This type of transformation is usually accomplished by simple methods, and many of these procedures are treated in the first and second volumes of the series in connection with the identification of organic compounds.

These volumes on organic synthesis are not intended for the elementary student. An inexperienced reader would be confused by the wealth of material, the concise style of the descriptive parts, and the troublesome German abbreviations. This work will be of great assistance to intermediate and advanced students, and to researchers who are constantly confronted with synthetic problems that require a combing of the literature.

JOHN R. JOHNSON

Theoretical Quantitative Analysis. By LOUIS WALDBAUER, Ph.D., Associate Professor of Analytical Chemistry, State University of Iowa. The Blakiston Co., 1012 Walnut St., Philadelphia, Pa., 1940. x + 248 pp. 37 figs. 15 × 22 cm. Price, \$2.75.

In this little book the author has devoted sixteen chapters to a selection of the theory appropriate for a

(1) Reviewed in THIS JOURNAL, 56, 251 (1934).

course in Quantitative Analysis, under the headings: Atomic and Molecular Structure, Errors, Significant Figures and Computations, Analytical Calculations, Activity, Precipitation, Oxidation and Reduction, Reactions, Volumetric Standards, Voltaic Cells and Electrode Processes, Origin of the Electromotive Force, Standard Electrodes, Oxidizing Potentials, Electroanalysis, Indicators, Buffer Solutions, Recent Advances, Application of the Theories in Practice. The literary style and method of presentation are those of the experienced teacher; the treatment of the many topics is brief and matter-of-fact, with frequent use of formulas and mathematics, and includes a rather heavy ratio of modern atomic, solution and electrochemical theory as compared to old-fashioned quantitative principles. In keeping with the title, the text is devoted to underlying theory, no laboratory procedures being given, and very little information relevant to the determination of individual elements or ions. The author doubtless presents this sort of material directly in lectures, but the lack of it will render the book unacceptable to some otherwise possible users. By way of faults, the publisher and author do not seem to have cooperated very well in the fields of design, style and editing; mechanically, the paper, presswork and binding are good but typographically the book is unattractive and far from well done. The standard text type is slightly too large for the page size, the large italic capital running heads overpower the rest of each page, the full text type formulas overbalance the text, some of the diagrams are too large and the tabular set-ups could have been improved. Coming to styling and editing, the one shows lack of thought and the other sketchy execution, both together permitting such things as: abbreviations without periods, "aluminium" but no other English spellings, unnecessary use of quotation marks on symbol letters, irregular styling of footnotes, unattractive abbreviations (such as GEW for gram equivalent weight), excessive use of formulas in the text instead of spelling out the names, double and triple superior minus signs on negative ions allowed to run together into a solid line, double salt formulas poorly set up, and many similar details. These flaws and a liberal scattering of typographical errors serve to distract attention from the author's good work, and are chargeable in the main to the publisher rather than to the author.

ALLEN D. BLISS

An Introduction to Organic Chemistry. By IRA D. GARARD, Ph.D., Professor of Chemistry in the New Jersey College for Women, Rutgers University. Second edition. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y., 1940. xi + 389 pp. 15 × 23.5 cm. Price, \$3.00.

This is a real revision of one of the few books deliberately designed for a one-semester course. A modest laboratory manual is included between the same covers. The author has evidently experienced the sense of futility which so often follows a so-called "laboratory lecture." One using this volume has no call to experience the same frustration for the lecture is unnecessary, if the students will but read carefully. The directions are clear and explicit, as-

tonishingly detailed, in fact, yet, happily, are lacking in redundancy.

The text proper is characterized by its remarkable conservatism. While one can, in these days, ignore the electron in organic chemistry, the wisdom of doing so is, at least, debatable. In the scope of its information, this volume, in general, meets the minimum needs; important topics are, of course, eliminated in any really condensed presentation and each writer may well decide for himself what he will omit. Well-chosen questions and selected lists of interesting periodical articles are appended to the several chapters. Some avoidable errors and inconsistencies are readily discernible. For example, the two statements concerning the solubility of dimethyl ether (p. 17 and p. 71) are difficult to reconcile; although in one of his references the author presents the term "glycoside" (p. 224) he persists elsewhere in using the less acceptable term "glucoside," even when sugars other than glucose are in combination (p. 222). The structure of muscarine, whatever it may be, is certainly not that represented here (p. 249). The statement that methylene iodide has the greatest density of "any" liquid except mercury (p. 108) is obviously one, the accuracy of which would benefit by some hedging. A more careful use of superlatives and comparatives (pp. 85, 191, and 212) would help students who may later be called upon to use the English language to express exactly shades of meaning.

The chief impression left with the reviewer is that this is a very good, very conservative, one-semester text, accompanied by a splendidly prepared, highly satisfactory, brief laboratory manual. The publishers have maintained their usual high standard of book-work.

G. ALBERT HILL

Kingzett's Chemical Encyclopedia. A Digest of Chemistry and its Industrial Applications. Edited by RALPH K. STRONG, Ph.D., Professor of Chemistry and Chemical Engineering, Rose Polytechnic Institute, Terre Haute, Indiana, Contributing Editor on Chemistry, "Van Nostrand's Scientific Encyclopedia"; with foreword by Sir Gilbert T. Morgan, O.B.E., F.R.S., D.Sc., LL.D., Mason Professor of Chemistry, University of Birmingham, England. Sixth edition. D. Van Nostrand Company, Inc., 250 Fourth Avenue New York, N. Y., 1940. x + 1088 pp. 15.5 × 23 cm. Price, \$14.00.

The second edition of this Encyclopedia was reviewed in the Journal in 1922. Repeated new editions have appeared in the interval, whereby this excellent and widely used handbook has been kept abreast of the rapid development of chemical science. Some time before the death of the original author, Mr. C. T. Kingzett, Sir Gilbert Morgan undertook the preparation of the present sixth edition, but as a result of his sickness and subsequent death the revision was entrusted to Dr. Ralph K. Strong, professor of chemistry and chemical engineering at the Rose Polytechnic Institute, as editor-in-chief. This work, therefore, which had already won many friends in this country, has now become in a sense a joint English and American undertaking.

The present edition fills some 1088 pages as contrasted with the 539 of the second edition. Sir Gilbert Morgan

in a foreword points out that in addition to the necessarily great expansion of the present edition of the Encyclopedia due to the increased amount of *materia chimica*, there has also been a great strengthening of it on the physicochemical side, for example, by the insertion of phase diagrams, charts on the use of indicators, etc. The advances in chemical engineering also find reflection in the large amount of additional space given to the subjects of solvents, materials of construction, chemical apparatus and chemical economics. In spite of the expansion, it would seem that the goal of the original author, namely, to prepare a "digest of chemistry and its industrial applications, in a form which should be useful as a work of reference by all classes of the community," has not been lost sight of.

ARTHUR B. LAMB

Explosions- und Verbrennungs-vorgänge in Gasen. (Explosion and Combustion Processes in Gases.) By Dr. sc. nat. WILHELM JOST, Professor in the Physical-Chemical Institute of the University of Leipzig. Verlag von Julius Springer, Linkstrasse 22-24, Berlin W9, Germany, 1939. 608 pp. 277 figs. 16 × 24.5 cm. Price, RM. 46.50; bound, RM. 49.50.

The contents of the book are divided into three parts: chapters 1-7, theoretical and experimental material on ignition and propagation of flame; chapters 8-11, chemical kinetics of several fuel reactions and material on reactions in electrical discharges particularly pertaining to ignition; chapters 12-13, combustion in Otto and Diesel engines.

Chapters 1 and 2 on Self-Ignition and Spark Ignition contain a broad discussion of the utility and limitations of purely thermal considerations in describing conditions for ignition, much of the second chapter being original with the author. Although it is recognized that ignition temperature, defined as a characteristic of mixture composition alone, is non-existent, an appendix on this subject by L. von Müffling follows chapter 1, thereby satisfying a certain demand for a knowledge of ignition temperature values under specified experimental conditions. In support of the author's explanation of Guest's result that a higher temperature is required to ignite methane-air mixtures on platinum than on nickel, attention may be called to another observation of Guest that quantities of carbon monoxide and formaldehyde are formed using nickel but not platinum. These products are typical of the gas phase chain oxidation of methane.

Chapter 3 on Flame Propagation is naturally arranged by separation of the progress of the flame into its two components, namely, burning velocity (variously called fundamental flame speed; transformation velocity) and gas movement. Attention is drawn to the theoretical difficulties of describing the attachment of the flame to the orifice of the Bunsen burner, pointing to the need of investigations of the flow of gas from the burner. The influence of gas motion on flame propagation is discussed and some general deductions regarding it are arrived at from considerations of stability of curved flame surfaces. In presenting the theory of flame propagation the author brings out the measure of success as well as the weakness of the thermal theory, and after stating the requirements de-

manded of an exact theory, which are as yet impossible to meet, turns to a brief discussion of the theory of Lewis and von Elbe which was the first attempt to link the chemical mechanism and diffusion of chemically active species with flame propagation. The chapter is concluded with a discussion of limits of inflammability and the effect of inhibitors.

Chapter 4 considers explosions in closed vessels with local ignition, particularly the case of central ignition in a spherical vessel extensively treated by Mache.

In chapter 5 on Detonation the author presents the well-known treatment of the theory and adds his own interpretation of the "spin."

Chapter 6 deals with flames of not premixed gases. The essential conclusions of Burke and Schumann on diffusion flames are derived by a simplified treatment.

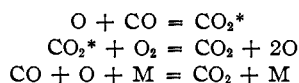
In chapter 7 methods of measuring flame temperatures, their calculation, and the various spectroscopic investigations on flame are summarized. Sole credit for the line reversal method should be given to Féry while Bauer first proved its validity, corrections which apply also to the book of Lewis and von Elbe.

The part on Chemical Kinetics is introduced by chapter 8 in which the elementary theory of gas kinetics and the simple theory of chain reactions and its application to the process of explosion are treated, the chain theory being illustrated by some well-known examples.

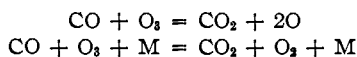
This is followed by a treatment of the hydrogen-oxygen reaction (chapter 9). The investigations of the explosion limits and the reaction in the non-explosive region are presented comprehensively and are discussed, as far as possible, with the aid of generalized mechanisms. Then follows consideration of the specific reaction mechanism. Recognizing that the chain carriers of the reaction are atoms and radicals, the author summarizes the atom and radical reactions that have been investigated, mostly at room temperature, and the observations and measurements of radical concentrations in flames. The author then discusses the theory of explosion limits of which the upper limit is of greatest interest. The treatment of the latter as given by Kassel and Storch and Lewis and von Elbe was based on the mathematical formulation of the condition for an isothermal branched chain type of explosion which admits only reactions of the same order with respect to the chain carriers, in this case first order. Professor Jost objects to the omission of second order chain breaking reactions and carries the kinetic calculations through with the inclusion of the second order chain breaking reaction (a) $2\text{HO}_2 = \text{H}_2\text{O}_2 + \text{O}_2$ and the competing first order chain continuing reaction (b) $\text{HO}_2 + \text{H}_2 = \text{H}_2\text{O}_2 + \text{H}$, arriving at the same theoretical explosion condition as the previous workers. This means, however, that the actual explosion condition still remains determined by a system of first order chain carrier reactions, a result which is not changed by the introduction of any conceivable second order chain carrier reaction. The reason for this is that if these second order chain breaking reactions and first order chain continuing reactions, for example (a) and (b) above, were allowed to influence the position of the limit appreciably, that influence could only be in the nature of a thermal effect with its dependence on vessel conditions of which the upper explosion limit is

quite free. Thus, Professor Jost's development is not actually in conflict with the treatment of the upper limit as originally given; the only point of difference is the kinetics of the slow reaction above the upper limit, which according to his scheme would be purely homogeneous but which in reality depends on vessel factors with chains being broken at the wall. It may be remarked that the author's preference for reaction (a) over the reaction involving the destruction of HO₂ at the wall is based on some numerical estimates published by Jost and von Müffling with which the reviewer disagrees. Second order chain carrier reactions must, of course, occur but the physical picture is such that in the region of the upper limit, as the process accelerates to explosion, their rates are initially so small, due to the small chain carrier concentration, as to be negligible, and they can become appreciable only when the process is out of control; whether or not the process will go out of control is entirely determined by first order chain carrier reactions. For this reason one cannot concede the author's objection (page 322) that "if (for formal reasons), no explosion would occur with a second order chain breaking reaction, certainly no explosion should occur with the much faster first order chain breaking reaction."

Chapter 9 is concluded with the reaction between carbon monoxide and oxygen. Concerning the catalysis by water vapor it may be mentioned that the reactions suggested on page 330, supplemented by one involving the destruction of HO₂ at the wall, form a scheme which is fully consistent with the kinetic data of Hadman, Thompson and Hinshelwood, and that the effect of iodine in eliminating both the oxygen inhibition and the influence of vessel size may be accounted for if the surface destruction of HO₂ is overshadowed by a reaction in the gas phase such as HO₂ + I₂ = OH + I₂O. For the upper explosion limit, here, too, the author hesitates to accept the formal procedure of admitting only first order chain carrier reactions mentioned above in connection with the upper explosion limit of hydrogen and oxygen. The phenomena are so similar, however, that again it will hardly be possible to find a generalized mechanism other than that of an isothermal branched chain explosion; and since water vapor has no effect on the limit, the choice of specific schemes, whether of energy or material chains, becomes rather limited. In fact, it seems to be narrowed to a choice between Semenov's scheme, *viz.*



which involves the binary association of O and CO to form excited CO₂* having a fairly long life-time and a rather specific mode of energy transfer between it and O₂, and the material chain proposed by Lewis and von Elbe. In the latter scheme the essential reactions are



Reactions involving the molecule CO₃ are not essential for the formal representation of the limits but the limit condition requires that the binary reaction between CO and O₃ to form O₂ must be considered small compared with the above similar ternary reaction for which there is no additional theoretical support at present.

Chapter 10 continues the subject of ignition by electric sparks started in chapter 2. Here the question is taken up by which mechanisms the local explosion itself is produced. The evidence points to the conclusion that the production of active particles like atoms and radicals is much more important than temperature rise or ionization.

The maze of observations and theories of hydrocarbons is presented in chapter 11. To aid the uninitiated a vantage point is provided both by the introductory remarks and a digest of the theory in the last section d which permits the mind to order a number of salient facts by means of specific reaction mechanisms. Otherwise the author has set himself the task of critically reviewing, with frequent constructive suggestions, the many published investigations in the following order: (a) combustion in the flame; (b) slow oxidation; (c) ignition, particularly at high pressures. Space does not permit discussion of some individual phases of this chapter to which the reviewer is attracted.

Chapter 12 deals with combustion in the Otto (gasoline) engine. The main subject of the chapter, the knocking process, is introduced with the aid of engine flame photographs and pressure diagrams, and various means of combating knock are enumerated. In connection with power loss during knocking combustion, consideration might be given to the increased heat transfer to the wall due to rapid gas motions. The chapter presents an excellent bird's-eye view of the subject of knock but the fundamental chemical processes responsible for knock still remain obscure.

The last chapter on the Diesel engine discusses the contributions of physical and chemical processes to the ignition lag of the injected fuel. The view is expressed that future progress with Diesels will probably be made in the direction of design rather than of fuel chemistry, in contrast to the situation with Otto engines.

It has been a pleasure to study Professor Jost's book and to have the benefit of his independent thought on this important and expanding subject.

BERNARD LEWIS

Annual Review of Biochemistry. Vol. IX. Edited by JAMES MURRAY LUCK and JAMES H. C. SMITH. Annual Reviews, Inc., Stanford University P. O., California, 1940. ix + 744 pp. 16 × 23 cm. Price, \$5.00.

In these threatening days of August, 1940, a reviewer cannot afford to overlook the international character which a volume such as this should reflect. He may well have been impressed by the cosmopolitan nature of earlier numbers. For instance, Volume I, published back in 1932, had a total of thirty articles out of which only fourteen had their origin in the United States, the remainder being fairly evenly distributed through continental Europe and Great Britain. The present 1940 volume is sadly lacking in this respect, continental Europe being unrepresented except for four reviews by Scandinavian authors. The British contribute five, and the remaining seventeen of the total of twenty-six originate in the United States. Does the fact that five of the latter originate in Berkeley indicate a still more westerly trend of civilization?

The custom which the editors have followed of rotating a subject between the many schools occupied with its dif-

ferent aspects is a wise one. Another question of policy might be raised. Many reviewers apparently feel that they should present the reader with a literature survey, mentioning, if possible, every pertinent paper published during the period covered. On the other hand, there occasionally appear really critical reviews of the advances and trends in a field or in one phase of it. The policy of rotation mentioned above is admirably suited to give the reviewer additional scope, enabling him to cover in this manner several rather than a single year's development. The present writer would suggest that the latter procedure be followed more frequently, fully realizing that too frank criticisms might frequently lead to fisticuffs.

The subject matter of this volume is not radically different from that of earlier volumes. Of particular interest is the new chapter on the application of radioactive indicators in biology, contributed by Professor Hevesy. For other topics the reader may be referred to the original.

W. F. ROSS

An Introduction to Organic Chemistry. By ALEXANDER LOWY, Ph.D., Professor of Organic Chemistry, University of Pittsburgh, and BENJAMIN HARROW, Ph.D., Professor of Chemistry, City College, College of the City of New York. Fifth edition. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y., 1940. xv + 400 pp. 15.5 × 23.5 cm. Price, \$3.00.

Another edition attests to the popularity of this well-known textbook on Organic Chemistry. Among the changes noted are the introduction of questions at the end of each chapter and the addition in the appendix of a table of Latin and Greek roots used in chemical terminology. The new work on the vapor phase nitration of aliphatic hydrocarbons is mentioned. The chapter on carbohydrates has been rewritten, although no mention is made of the furanose form of glucose. In keeping with the present interest in substances of biological importance, the chapter on vitamins and hormones has been expanded and contains the formulas of E and K.

D. E. WORRALL

Organic Reagents Used in Quantitative Inorganic Analysis By WILHELM PRODINGER, Ph.D. Translated and amended from the second German edition by STEWART HOLMES, New York State Research Institute of the Saratoga Spa. Nordemann Publishing Co., Inc., 215 Fourth Avenue, New York, N. Y., 1940. xiv + 204 pp. 16 × 23.5 cm. Price, \$3.00.

This translation makes available in English Prodinger's monograph on "Organische Fällungsmittel in der quantitativen Analyse," the first edition of which appeared in 1937 [reviewed in THIS JOURNAL, 59, 2479 (1937)] and the second in 1939. Reagents added to the second edition include dimethylglyoxime, phenylarsenic acid and thio-urea; in conclusion, a few additional organic compounds are listed which may be useful as precipitating agents for certain special determinations.

The English edition represents a fairly literal translation of the German. Unfortunately, it does not read smoothly in many places, but this does not seem to detract from its

accuracy. Meticulous organic chemists may take exceptions to the way certain structural formulas have been written; but admittedly some of these lack experimental proof. Revision has been made in a few instances, and two sections have been added by the translator: one on 8-hydroxyquinoline ("Oxine") and another on the ammonium salt of α -nitroso-naphthylhydroxylamine ("Neocupferron").

Systematic studies in the field of metallo-organic complex compounds and their application in analytical chemistry undoubtedly will lead to interesting and valuable results. This English edition of Prodinger's book will be a helpful adjunct to all who are interested in organic analytical reagents.

JOHN H. YOE

BOOKS RECEIVED

September 10, 1940–October 10, 1940

HOMER ADKINS, S. M. MCELVAIN and M. W. KLEIN. "An Introduction to the Practice of Organic Chemistry in the Laboratory." Third edition. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York, N. Y. 294 pp. \$2.50.

S. BHAGAVANTAM. "Scattering of Light and the Raman Effect." Andhra University, Waltair, India. 333 pp. 22s. or Rs. 15 net.

J. J. A. BLEKKINGH, JR. "De Invloed der Fijnheid van Verdeling op de Stabieleit van gekristalliseerde Stoffen." Drukkerij Broekhoff N. V. v/h Kemink en Zoon Domplein 2, Utrecht, Holland. 123 pp.

LOUIS J. CURTMAN and SYLVAN M. EDMONDS. "Calculations of Qualitative Analysis." The Macmillan Co., 60 Fifth Avenue, New York, N. Y. 156 pp. \$2.00.

WILFRID FRANCIS. "Boiler House and Power Station Chemistry." Longmans, Green and Co., Inc., 55 Fifth Avenue, New York, N. Y. 203 pp. \$4.50.

FREDERICK H. GETMAN. "The Life of Ira Remsen." Journal of Chemical Education, Publishers, Easton, Penna. 172 pp.

SAMUEL GLASSTONE. "Textbook of Physical Chemistry." D. Van Nostrand Co., Inc., 250 Fourth Avenue, New York, N. Y. 1289 pp. \$10.00.

ERNST A. HAUSER and J. EDWARD LYNN. "Experiments in Colloid Chemistry." McGraw-Hill Book Co., Inc., 330 West 42nd St., New York, N. Y. 178 pp. \$2.00.

T. P. HILDITCH. "The Chemical Constitution of Natural Fats." John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y. 438 pp. \$6.50.

R. A. McCANCE and E. M. WIDDOWSON. "The Chemical Composition of Food." The Chemical Publishing Co., Inc., 148 Lafayette St., New York, N. Y. 150 pp. \$2.50.

J. F. THORPE and M. A. WHITELEY. "Thorpe's Dictionary of Applied Chemistry." Fourth edition, Vol. IV. Longmans Green and Co., 55 Fifth Avenue, New York, N. Y. 603 pp. \$25.00.