NEW BOOKS

General Chemistry for Colleges. By B. SMITH HOPKINS, Professor of Inorganic Chemistry in the University of Illinois. D. C. Heath and Company, 285 Columbus Avenue, Boston, Massachusetts, 1930. x + 757 pp. 242 figs. 14.5 × 22 cm. Price, $3.72.

This is an excellent text for beginning classes in colleges and universities. While in arrangement it is like most American texts and therefore displays no marked originality, yet the writing has been well done and in some respects the book is an improvement over other texts. One of the main difficulties which the teacher of beginning chemistry encounters is to make his course adapt itself not only to the average student but also to the above average student. In the introduction attention is called to the cross references which encourage the student who is willing to do that sort of thing to make comparisons and to do independent thinking. The book also has references which call attention to the practical applications of chemistry. This arrangement enables the practical minded student to go out into the literature with a minimum of difficulty and initiates him, as it were, into the research attitude toward his work. The book proper is prefaced by two chapters of interesting historical matter. Following this we have the conventional arrangement of topics and of material which is carried throughout the rest of the text. The writer is to be congratulated upon the early introduction of the idea of equilibrium, which is perhaps the most important of the conceptions presented to the beginning student. It is questionable however whether atomic theory ought to be postponed to as late a point as is indicated by the position in the book. It has always seemed to the reviewer that a statement at least of atomic theory should be given early in the course and that this theory should be established by its application to the laws and phenomena which are discussed later.

The question may be raised whether or not the use of the term "plus and minus valence" in connection with the balancing of oxidation and reduction equations does not create a wrong impression regarding valence. If the word polar number should be substituted for plus and minus valence (as suggested by Bray), the objection to giving valence a minus value would be obviated. Dr. Hopkins has made some steps toward clearing up the inconsistencies of the old idea of partial dissociation which for an elementary class is still a very difficult task. He seems to have gone as far as is possible under the circumstances. The periodic arrangement suggested is simple and clear, and is to be commended as against some efforts which have been made to involve too many factors in the table.

The chapter on the structure of atoms, crystals, etc., might as well have been put anywhere else in the book as where it is. The information is apparently not made use of later; in fact what little use is made of the work on crystals comes earlier in the text. It is apparent however that any

chapter of this type which is put into a book on freshman chemistry is put there largely for the purpose of including interesting material, not because of its direct value to the student. Inasmuch as practically every text written in recent years has contained this material either as a part of the text or in an appendix, its inclusion can hardly be criticized.

The book is well illustrated and contains many valuable diagrams. The chapters on the metals are exceptionally well done. All of the elements are included in the discussion at least by means of brief notes and the text is entirely up to date in this respect. It is to be noted that production figures are given for the various elements and important compounds, which always adds interest to the discussion of chemical substances. Taken as a whole the book is to be considered as one of the best of our modern American chemistries.

P. A. BOND

Leçons de chimie analytique. (Textbook of Analytical Chemistry.) By ALCIDE JOUNIAUX, Professor in the Faculty of Sciences of the University of Lille. Librairie Scientifique Hermann et Cie., 6 Rue de la Sorbonne, Paris, France, 1931. viii + 350 pp. Illustrated. 16 × 25 cm. Price, 60 fr.

The title of this book seems too general for its content. The author has presented only gravimetric and electrolytic analysis. A supplement on volumetric methods is perhaps planned, but there is no clear indication of this intent. Electrometric and other physicochemical methods are also passed over in silence.

The book is divided into four parts: (I) (100 pages) a general discussion of standard gravimetric operations; (II) (130 pages) a systematic review of methods for the various cations and anions; (III) (50 pages) gravimetric organic analysis; (IV) (30 pages) electrolytic analysis.

The first part includes a very interesting discussion of common ion effect and complex formation and of the physical state of precipitates, adsorption and colloidal phenomena. The treatment of the other general topics is less original. The discussion of errors and averaging is very brief and simple, and there is no mention of methods of sampling, of the properties of different types of laboratory ware, of the purity of reagents or of methods of preparing the solution for analysis.

The author's method of arrangement is as follows. Under "1st group metals" he treats successively Ag^+, Cl^-, Br^-, I^-, CN^-, SCN^-, $Fe(CN)_6^{4-}$, $Fe(CN)_6^{3-}$, ClO_3^-, IO_3^-, IO_4^-, ClO_4^-, mixed halides, Hg^{++}, $PO_3^{\equiv}$, HCO_2^- and Pb^{++}. In other words, not only the cations but the anions which may be precipitated with their aid are included. In this first treatment of the analysis of lead, only the gravimetric sulfate method is given, apparently on the assumption that no interfering substances are present other

than organic or mineral acids. Later, under the copper group, we find a brief mention of the separation of lead from the other metals, with no discussion of contamination by bismuth, alkaline earths or silica. Finally, in the last section, the electrolytic separation of lead from other metals and its determination by electrolysis are described. The treatment throughout is very brief, and seems insufficiently detailed and documented to be a safe guide even for the analyst who is interested only in gravimetric methods. Even for beginning students, working on carefully prepared solutions, the detail seems inadequate, as for example in the treatment of the gravimetric determination of copper as oxide (which seems to be the favorite method for copper), no mention is made of contamination by the alkali hydroxide used as precipitant, and no procedure is recommended which would reduce the error from this cause. Many of the newer organic reagents for the metals are discussed briefly. The section on electrolytic methods is relatively satisfactory.

In summary the reviewer feels that the omission of volumetric procedures and the inclusion of so much organic analysis constitute an undesirable choice of material for a beginner's text, while for such a text there is little advantage in the inclusion (without thorough discussion) of numerous methods for each ion. On the other hand, if the work is intended as a reference book for practical analysts, the omission of volumetric methods, the somewhat uncritical choice of gravimetric methods, and the lack of documentation and critical discussion, constitute serious defects.

NORRIS F. HALL

Lehrbuch der Thermodynamik für Studierende der Chemie und verwandter Wissenschaften. (Textbook of Thermodynamics for Students of Chemistry and Related Sciences.) By A. MAGNUS, Professor at the University of Frankfort-on-Main, Akademische Verlagsgesellschaft m. b. H., Schlossgasse 9, Leipzig C 1, Germany. 1929. xii + 288 pp. 23 figs. 16 × 24 cm. Price, unbound, RM. 16; bound, RM. 18.

This is an interesting and useful book. There is a brief and excellent mathematical introduction. After a discussion of the ideal gas and the van der Waals' equation, the first and second laws are developed in the classical manner and applied to chemical problems by the use of the usual thermodynamic functions. The explanations are full and seem to be the result of the author's own study; the student will doubtless find welcome help in the comprehension of details on which many books are silent.

There are sections on the van Laar–Richard Lorenz treatment of equilibrium in condensed systems, on entropy and probability, thermodynamics of radiation, and the specific heats of solids in relation to quantum theory.

There is a chapter on the Nernst heat theorem, developed in the Nernst manner (rather than the simpler manner of G. N. Lewis). Here the

Planck formulation ($S = 0$ at $T = 0$) is stated to go a step further than the Nernst formulation ($\Delta S = 0$ at $T = 0$), in affirmation of Nernst's distinction, which the reviewer is unable to appreciate. Theodore W. Richards is not mentioned for his basic experimental contribution. The American work on supercooled liquids and the consequent limitation of the principle to pure crystalline solids are not discussed. In general, the author has drawn too much on German sources, and the book, at least to an American reader, seems to bear a very strong impress of nationality.

The author has not always been careful with regard to the historical inferences that would be drawn from his statements. Thus the Gibbs fundamental equation is discussed without reference to Gibbs, but (page 191) as "an equation, which Planck has called a canonical equation." Admirers of Gibbs will learn with surprise (page 200) that he devised an arrangement involving moving semipermeable membranes, for mixing gases reversibly, but will hardly regard this as compensation, if indeed they regard the statement as complimentary to Gibbs. The author discusses not only the thermodynamic potential ($U - TS + pV$), but also the therefore superfluous function obtained by dividing this by minus the temperature, which he calls as usual the Planck function, although it is one of Massieu's characteristic functions, as noted by Gibbs, who preferred the function $U - TS + pV$.

L. J. GILLESPIE

Photo-electric Cells and their Applications. A Discussion at a Joint Meeting of the Physical and Optical Societies, June 4–5, 1930. Edited by JOHN S. ANDERSON, M.A., D.Sc., F.Inst.P. Published by The Physical and Optical Societies, 1 Lowther Gardens, Exhibition Road, South Kensington, London, S. W. 7, England, 1930. 236 pp. Illustrated. 18 × 26 cm. Price, 12 s./6 d. to non-members.

These thirty-one papers by experts from England, America and continental Europe will interest chiefly those who make and use photo-electric cells, including selenium cells. After an introductory lecture by Professor H. S. Allen, on the "Early History of Photo-Electric and Selenium Cells," there follows: one paper on a theory of selective photo-electric emission, ten papers on the manufacture, characteristics, testing and use for sound reproduction, eleven papers on various phases of photo-electric photometry, three papers on other applications including biology, four papers on the amplification of varying photo currents. The general discussion which concludes the volume is perhaps as interesting as any single paper. It would seem desirable to have included a greater number of papers by experts in the science of photo-electric action. It would also seem that the subject matter and price would warrant something better than a paper cover binding.

J. A. BECKER

Alcoholometry. An Account of the British Method of Alcoholic Strength Determination. By FRANCIS G. H. TATE, Government Laboratory, London. With historical introduction by the author in collaboration with George H. Gabb. Published by His Majesty's Stationery Office, Adastral House, Kingsway, London, W. C. 2, England, 1930. xviii + 93 pp. Illustrated. 15.5 × 24.5 cm. Price, 5 s. net.

This work is largely an historical description of the development of the hydrometer as applied to the determination of alcohol in potable spirits. The historical portion of the work is very complete and is very interesting to those who may be doing work of this character. There are several very fine reproductions of early types of hydrostatic balance and several early hydrometers, some of which are 200 years old at present. The book contains an interesting chapter on the standardization of hydrometers. One chapter, two and one-half pages in length, is devoted to the use of the refractometer in connection with the hydrometer in order to obtain a correct alcohol percentage when the spirit is "obscured" with sugar or similar substances.

HERMANN C. LYTHGOE

Organic Syntheses. An annual publication of satisfactory methods for the preparation of organic chemicals. Vol. XI. Edited by CARL S. MARVEL, with ROGER ADAMS, W. H. CAROTHERS, H. T. CLARKE, J. B. CONANT, HENRY GILMAN, C. R. NOLLER and F. C. WHITMORE. John Wiley and Sons, Inc., 440 Fourth Ave., New York, 1931. vii + 106 pp. 15.5 × 23.5 cm. Price, $1.75.

The eleventh annual volume of "Organic Syntheses" has appeared, as usual, in good time. The list of preparations which have been supplied by an unusually large number of contributors and checked by the self-sacrificing board of editors is as follows: acrolein acetal, α-aminoisobutyric acid, 1-amino-2-naphthol hydrochloride, 1,2-naphthol-4-sulfonic acid, azoxybenzene, α-bromoisovaleric acid, bromomesitylene, β-chloropropionaldehyde acetal, citraconic anhydride and citraconic acid, cyanogen bromide, 2,4-diaminotoluene, ethyl ethylenetetracarboxylate, ethyl phenylcyanopyruvate, ethyl pimelate, fumaric acid, *dl*-glyceric aldehyde, *dl*-glyceric aldehyde acetal, heptaldoxime, *n*-heptylamine, *p*-iodoaniline, isodurene, itaconic anhydride and itaconic acid, mesaconic acid, 3-methylpentanoic acid, α-naphthoic acid, *n*-pentane, symmetrical and unsymmetrical *o*-phthalyl chlorides, isopropyl thiocyanate, thiobenzophenone, *o*-toluic acid, triethylcarbinol.

E. P. KOHLER

Kleines Praktikum der Kolloidchemie. (Brief Laboratory Manual of Colloid Chemistry.) By PROF. DR. WOLFGANG OSTWALD, University of Leipzig, with the coöperation of Dr. P. Wolski and Dr. A. Kuhn. Seventh edition. Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany, 1930. xii + 174 pp. 21 figs. 15 × 23 cm. Price, unbound, RM. 3.60.

The first edition of this book was published in 1920. This was soon followed by the second and third editions, then after a limited revision and

the addition of some fifteen experiments, a fourth edition appeared in 1922. This latter edition was translated into English by Kugelmass and Cleveland and was published by E. P. Dutton and Company, New York (1924) under the title "Practical Colloid Chemistry." Subsequent editions, including the present one, have appeared practically unchanged. The general topics covered come under the following heads: I, Preparation of Colloidal Solutions; II, Diffusion, Dialysis and Ultrafiltration; III, Surface Tension and Viscosity; IV, Optical Properties; V, Electrical Properties; VI, Experiments with Gels; VII, Adsorption; VIII, Coagulation, Peptization and Related Phenomena. All told, there are 183 individual experiments which are described in commendable detail and are well distributed over the above-mentioned general topics. In addition, a brief treatment is given of certain commercial colloids and of methods of capillary analysis.

The author has taken care to include only such experiments as can be carried out with comparatively simple apparatus, such as can be found in almost any chemical laboratory. This feature will be appreciated by those who are about to introduce a laboratory course in colloid chemistry. For use in well-established courses a greater number of strictly quantitative experiments would materially enhance the value of this book.

F. E. BARTELL

Jahrbuch der organischen Chemie. (**Yearbook of Organic Chemistry.**) By Professor DR. JULIUS SCHMIDT, Stuttgart. Vol. 15, 1928. Verlagsbuchhandlung von Franz Deuticke, Vienna, Austria, 1930. xvi + 245 pp. 17.5 × 25.5 cm. Price, unbound, M. 24; bound, M. 27.

The fifteenth volume of Schmidt's *Jahrbuch*, dealing with the developments in organic chemistry during 1928, is similar in character to its predecessors. Since this is the most extensive survey of its kind it is a great pity that it cannot be made more useful by bringing it more nearly up to date.

E. P. KOHLER

The Microbiology of Starch and Sugars. By A. C. THAYSEN and L. D. GALLOWAY, Oxford University Press, 114 Fifth Avenue, New York, 1930. viii + 336 pp. 14.5 × 22 cm. Price, $8.50.

This book is a companion volume of "The Microbiology of Cellulose, Hemicelluloses, Pectin and Gums" written by Thaysen and Bunker and published in 1927. As stated in the preface, the book has been written for the research worker. It is an excellent monograph, bringing together in compact, correlated form a great mass of valuable information appearing in botanical, bacteriological, chemical and technological journals. In reviewing this bulk of literature it is hardly possible to avoid omissions and errors, but those that have been noted were, for the most part, of minor importance.

The material in the book is divided into five parts: Part I deals with the constitution and microbiological hydrolysis of starch, glycogen, inulin, the tetra-, tri-, and disaccharides, and the glucosides. The discussion includes a consideration of the enzymes present in the hydrolyzing organisms. Brief descriptions of saké and soya manufacture are given, also the Amylo process for alcohol production, and the biological manufacture of indigo and gallic acid. In discussing the action of actinomycetes on saccharose, the authors state on p. 49 that "generally speaking, however, saccharose cannot be regarded as a carbohydrate favoring the growth of actinomycetes." No mention is made of the monograph on the actinomycetes by R. Lieske, Leipzig, 1921, in which the statement is found that "Sucrose is a good C source for all actinomycetes, but it appears to be assimilated without being inverted by an exoenzyme." In Chapter III the authors question the evidence for a direct fermentation of saccharose. Thus on p. 41 in criticizing the work of Gayon and Dubourg, who observed that certain mannitol-producing bacteria could ferment saccharose readily without producing mannitol, but yielded considerable quantities of this alcohol when acting on fructose, the authors advance the argument that fructose as liberated from saccharose might act differently *in statu nascendi* from the fructose from which the mannitol bacteria yielded mannitol. While Gayon and Dubourg present direct experimental evidence, the authors offer no data for their assumption. In the mind of the reviewer the burden of proof rests with the authors. In citing the papers on this subject, no reference is given to Müller-Thurgau and Osterwalder [*Centr. Bakt.*, 2 Abt., **48,** 10 (1917–1918)] and Stiles, Peterson and Fred [*J. Biol. Chem.*, **64,** 649 (1925)], who substantiated Gayon and Dubourg's observations.

In Part II, consisting of nine chapters, the authors have adopted the Kluyver and Donker "working theory" of microbiological fermentation to explain the mechanism of the fermentation of monoses. It is unfortunate that the signs in the explanatory text, pp. 86–89, giving a method of constructing a balance sheet for the action of a particular organism on glucose, do not correspond with those of the accompanying table. On p. 133 the authors give an excellent classification of the lactic acid bacteria, namely, "The safest subdivision of the lactic acid bacteria remains at present the division based partly on their morphological characters and partly on their mode of action on fructose, whether they are capable of producing mannitol or not." In listing *Cl. acetobutylicum* as one of the names used to designate the commercial butyl alcohol organism, p. 147, the authors omit the paper on which the name is based [McCoy, Fred, Peterson and Hastings, *J. Infect. Dis.*, **39,** 457 (1926)]. In the list of products of a typical fermentation of starch by the acetone–butyl alcohol organism, p. 159, no mention is made of ethyl alcohol, although it is well known that this substance makes up 8–10% of the fermentation products.

Part III is a short section dealing with the microbiological synthesis of glycogen, starch, fat and mucus.

Part IV presents a discussion of the microbial flora and general microbiology of grain and flour, sizing materials, adhesive pastes, dough and bread. Part V similarly deals with sugar manufacture and storage.

Among the numerous fungi mentioned in the book, the ubiquitous *Penicillium glaucum* occupies a prominent place. It is unfortunate that the authors did not mention that this is an indeterminate species; a term which most investigators agree does not accurately describe any species of mold and which should be abandoned.

The book, as a whole, is well written and the Index of Authors and Subject Index facilitate easy reference to the original papers given at the ends of the various chapters. The book is a valuable addition to the reference shelf of every worker in the field of fermentation.

L. M. PRUESS

Entstehung, Veredlung und Verwertung der Kohle. (Origin, Processing and Utilization of Coal.) Edited by K. A. REDLICH, J. C. BREINL and H. TROPSCH. Verlag von Gebrüder Borntraeger, W 35 Schöneberger Ufer 12a, Berlin, Germany, 1930. vii + 359 pp. 86 figs. 16 × 25 cm. Price, unbound, M. 30; bound, M. 33.

This volume is based on a series of lectures given at the Deutsche Technische Hochschule at Prague, by leaders in different fields of coal technology and research. These lectures have been expanded and published in this book as the following separate papers: "Relation between Properties of Coal and its Geological History," by Dr. W. Petrascheck, Professor of Geology, Montanistischen Hochschule, Loeben, 21 pages. "The Representation of the Degree of Coalification (the Rank of Coal) by the Ternary Diagram and its Application to Coal Processing," by Dr. H. Apfelbeck, Director of Lanzer Kohlen-A.-G. Falkenau a.d.E., 40 pages. "The Present Status of our Knowledge of the Chemical Constitution and Origin of Coal," by Dr. H. Tropsch, Director of the Coal Research Institute, Prague, 20 pages. "The Drying and Carbonization of Brown Coal," by Dr. R. Heinze, Director, Kohlenverschwelungs-A.-G. Halle a.d.S., 157 pp. "The Synthesis of Organic Compounds Derived from Gases Obtained from Coal," by Dr. H. Tropsch, 53 pp. "The Economic and Energy-Economic Significance of Coal," by Dr. Kothny, Professor, Deutsche Technische Hochschule, Prague, 17 pp. "Combustion of Solid Fuels," by Dr. H. Löffler, Vienna, 11 pp. "The Szikla-Rozinek Process of Pulverized Coal Firing," by Dr. A. Rozinek, Budapest, 14 pp. "Theoretical Fundamentals of Mechanical Combustion Control," by Dr. J. C. Breinl, Professor, Deutsche Technische Hochschule, Prague, 17 pp.

From a chemical point of view, the outstanding contribution is the article by Tropsch on the Synthesis of Organic Compounds from Gases

Derived from Coal. This paper is the first well-digested review of the world literature on this important subject. It fills an urgent need. No one is more competent for this job than Tropsch, and it is hoped that it is a forerunner of a comprehensive monograph. The paper is replete with original references to American, British and French, as well as German work and covers the purification of gases for synthetic purposes, the separation of the components of coke-oven gas by liquefaction and fractional distillation, the chemical utilization of ethylene, the pyrolysis of methane and higher hydrocarbons, the partial oxidation of methane, and the synthesis of hydrocarbons and alcohols from water gas. The chemist will also be interested in Apfelbeck's examples of the use of ternary diagrams in expressing the relation of the elementary composition of coal to its classification and properties, and in Tropsch's excellent review of the chemical constitution of coal, in particular the work of recent German investigators. The geologist's point of view on the origin and metamorphism of coal is well presented by Petrascheck in his paper on the Relation between Properties of Coal and its Geological History. The paper by Heinze on the Drying and Carbonization of Brown Coal contains a discussion of the colloidal nature of these high moisture coals that is of special interest in connection with the utilization of American lignites. However, the section on carbonization does not apply to American lignites because of their leanness with respect to oils and tars. The other papers in the volume are of an engineering nature.

A. C. FIELDNER

Alkylperoxyde und Ozonide. Studien über peroxydischen Sauerstoff. (Alkyl Peroxides and Ozonides. Studies on Peroxide Oxygen.) By Dr. ALFRED RIECHE, Lecturer in Chemistry at the University of Erlangen. Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany, 1931. viii + 172 pp. 14 figs. 15 × 23 cm. Price, unbound, RM. 10.

A monograph that does not contain long lists of compounds which are treated as if they were museum specimens, that aims to be selective rather than comprehensive, critical rather than objective, is a refreshing novelty in modern chemical literature. And when it deals with subjects so actively under investigation as are peroxides, autoxidation and ozonides, it is certain to be useful to many who find it difficult to keep abreast of the numerous and widely scattered publications on these subjects.

Dr. Rieche explains that his little treatise naturally assumed its present form because it represents an expansion of his "habilitationsschrift." It begins with a survey on alkyl peroxides, the class which is most significant in biochemical oxidations and which has received the most attention in recent years. This section includes a discussion of the formula of hydrogen peroxide and an account of all peroxides that can be regarded as substitu-

tion products of hydrogen peroxide in which one or both of the hydrogen atoms have been replaced by alkyl, hydroxy alkyl and alkylidene groups. It also includes an interesting chapter on autoxidation—its role in biochemical oxidations, in the explosion of mixtures of oxygen and hydrocarbons, and in the chemistry of free radicals.

A second section deals with the investigation of peroxides by optical methods—refraction and absorption in the ultraviolet. Here the author adopts Fajans' interpretation of refraction and frequently employs electronic formulas "in order to be able to formulate matters that cannot well be represented in terms of the classical doctrine of valence."

A final section containing a chapter on ozonization as a source of peroxides and another devoted to general conclusions complete the volume. In this concluding chapter the author, with some reserve, expresses the opinion that there are two kinds of alkyl peroxide: the well-known type which is related to the common form of hydrogen peroxide, and another—"alkyl oxoxides"—of which no representative has been isolated but which can be inferred from the behavior of many substances toward activated oxygen.

This little treatise can be heartily recommended to all who are interested in these important subjects.

E. P. KOHLER

Bioassays. A Handbook of Quantitative Pharmacology. BY JAMES C. MUNCH, Director of Pharmacological Research, Sharp and Dohme; Pharmacologist, Bureau of Biological Survey, U. S. Department of Agriculture. The Williams and Wilkins Company, Mt. Royal and Guilford Aves., Baltimore, Maryland, 1931. x + 958 pp. 15.5 × 23.5 cm. Price, $10.00.

Chemical knowledge of some of the most important drugs used in medicine has not advanced to a point where it is possible to determine by chemical analysis whether they are of suitable strength and purity to be used in the treatment of disease. This is the case, for example, with the most important drugs used in diseases of the heart and in child-birth, the various gland products and vitamins. In many cases, however, such information may be obtained by experiments upon lower animals and in some cases upon isolated organs (for example, the heart).

So important have some of these biological assay methods become that they are included in the U. S. Pharmacopoeia, the legal standard for medicines sold in the United States. The Health Committee of the League of Nations also has a committee on this subject in order to secure international uniformity in the case of a number of important drugs. Some of the methods are also indispensable in the detection of powerful poisons.

This volume of Dr. Munch is by far the most complete and authoritative work on this subject which has appeared in any language. The enormous

amount of work which has been done on this subject is evident from the fact that the author states that he has consulted 17,000 references; 5000 of these are cited in the volume. The work is, however, much more than a compilation; the author concludes each chapter with a critical summary of the data presented and an expression of his own views based upon years of experience in this field.

Not only is the work remarkably complete and well illustrated but it seems to be peculiarly free of errors of any kind; the motto of the publishers, "Sans Tache" seems to be justified (although "Cod Liver Oil" does not appear in the index).

It is safe to predict that this volume will for many years be the recognized authoritative work on this important subject.

REID HUNT

BOOKS RECEIVED

March 15, 1931—April 15, 1931

KASIMIR FAJANS. "Radioelements and Isotopes: Chemical Forces and Optical Properties of Substances." The George Fisher Baker Non-Resident Lectureship in Chemistry at Cornell University. McGraw-Hill Book Company, Inc., 370 Seventh Ave., New York. 125 pp. $2.50.

WALTER FEITKNECHT. "Über topochemische Umsetzungen fester Stoffe in Flüssigkeiten." Fortschritte der Chemie, Physik und physikalischen Chemie, Band 21, Heft 2. Verlag von Gebrüder Borntraeger, W 35 Schöneberger Ufer 12a, Berlin, Germany. 56 pp. Subscription, M. 5.20; separate, M. 7.

ALCIDE JOUNIAUX. "Leçons de Chimie Analytique." Librairie Scientifique Hermann et Cie., 6 Rue de la Sorbonne, Paris, France. 350 pp. 60 fr.

JAMES KENDALL. "Smith's Introductory College Chemistry." The Century Co., 353 Fourth Ave., New York. 555 pp. $3.25.

ICHIRO MIYAGAWA. "Pyritic Oxidation in Relation to Spontaneous Combustion of Coal." Reprinted from the *Memoirs of the College of Engineering*, Kyushai Imperial University (Vol. V, No. 5), Fukuoka, Japan. 103 pp.

OSCAR W. UNDERWOOD. "Drifting Sands of Party Politics." The Century Co., 353 Fourth Ave., New York. 411 pp. $3.50.

JOHN P. PETERS AND DONALD D. VAN SLYKE. "Quantitative Clinical Chemistry." Volume I, Interpretations. The Williams and Wilkins Company, Mt. Royal and Guilford Aves., Baltimore, Maryland. 1264 pp. $12.00.

ERICH RABALD. "Werkstoffe. Physikalische Eigenschaften und Korrosion." Band I, Allgemeiner Teil. Metallische Werkstoffe. Band II, Nichtmetallische Werkstoffe. Verlag von Otto Spamer, Heinrichstrasse 9, Leipzig C 1, Germany. Part I, 976 pp. Part II, 392 pp. RMk. 128, unbound; RMk. 135, bound.

GÉZA SCHAY. "Hochverdünnte Flammen." Fortschritte der Chemie, Physik und physikalischen Chemie, Band 21, Heft 1. Verlag von Gebrüder Borntraeger, W 35 Schöneberger Ufer 12a, Berlin, Germany. 68 pp. Subscription, M. 6.80; separate, M. 9.