

phase is a solid solution of the two components and that on freezing the mixtures behave as though they were pure substances. The values in column 4 of the table show that the freezing point is a linear function of the specific gravity to 20% (H₂O) but a deviation outside our

experimental error is perceptible at 40%. The experiments are being extended to more concentrated mixtures.

DEPARTMENT OF CHEMISTRY
COLUMBIA UNIVERSITY
NEW YORK, N. Y.

VICTOR K. LA MER
W. C. EICHELBERGER
H. C. UREY

RECEIVED DECEMBER 26, 1933

NEW BOOKS

Great Men of Science. A History of Scientific Progress.

By PHILIPP LENARD. Translated from the German by H. Stafford Hatfield. The Macmillan Company, 60 Fifth Avenue, New York. 389 pp. Price, \$3.00.

This volume presents brief and sympathetic accounts of the lives and contributions of sixty-six great figures in the history of Science. It starts with Pythagoras, Euclid, Archimedes and Hipparchus, and concludes with Stefan, Boltzmann, Hertz and Hasenöhrl. As Professor Andrade points out in the Introduction—"It is not often that one who, like Professor Lenard, has won for himself an assured place in the history of science, undertakes a systematic appreciation of the work of his predecessors, of the kind which we have before us in this book. . . . In these studies of great men by Professor Lenard the reader will find a vivid sympathy, a generous enthusiasm and an illuminating criticism which bring out in lively fashion both the personality and the secret of the scientific greatness of the subject."

Out of the sixty-six scientists there are fourteen who can be reasonably classified as chemists—namely, Boyle, Black, Scheele, Priestley, Cavendish, Klaproth, Dalton, Gay-Lussac, Davy, Berzelius, Faraday, Bunsen, Hittorf and Crookes. It is of particular interest to the chemists of today to have the achievements of these men measured against the background of Science as a whole.

The portraits that accompany the biographies are arresting. The author's remark in the Preface is no overstatement—"Let anyone who has a sense for portraits examine the plates of this volume. . . he will find from this examination a spiritual profit, an introduction to a world of clearer and more natural thinking."

We must be grateful to the translator for making this inspiring book more easily accessible to English readers. Unfortunately, while the meaning is in general clear, the diction is frequently awkward and laborious.

ARTHUR B. LAMB

Modern Alchemy. By WILLIAM ALBERT NOYES, University of Illinois, and W. ALBERT NOYES, JR., Brown University. Charles C. Thomas, 220 East Monroe Street, Springfield, Illinois, 1932. ix + 207 pp. 15 × 23 cm. Price, \$3.00.

Under the picturesque title of *Modern Alchemy* the authors, father and son, have given us an excellent philosophical survey of the more important modern theories

of the structures of atoms and their relations to chemical activity. Modern transmutations of elements and typical instances of advances in industry and medicine under the influence of chemistry are presented in an interesting way. The latter are the modern equivalents of the twin objectives of the alchemist of old, wealth and health.

In the chapter on valence the reviewer believes that a valuable opportunity has been missed by the insistence on "potential polar" valences as opposed to actual polarity. Two different electrical systems of different positive kernel charge and different space relations can have the same attraction for pairs of negative electrons holding them in chemical union only in the rare cases where the sizes of charges and distances compensate each other. For the majority of combinations, this is not so. Surely, the structures : $\ddot{N} : (\ddot{Cl})_3$ and : $P (\ddot{Cl})_3$ for the trichlorides

of nitrogen and phosphorus give a summary of the striking chemical differences between these two substances, which neither the old structures NCl_3 and PCl_3 , nor those used on pages 107 and 108 of the present text, do. In the opinion of the reviewer, the general application of this rational type of partial polarity as distinguished from ionic polarity, will ultimately play the same leading role in elucidating the chemical behavior of non-electrolytes in the organic and the inorganic fields, as the theory of ionization has accomplished for electrolytes.

The chapter on the effect of radiation on chemical systems is particularly timely and is an excellent presentation of a subject that has become of such moment in the intimate study of atoms and molecules.

The volume should prove of great value to advanced students in the sciences. General readers with a thoroughly good foundation in physics and chemistry would find it extremely interesting.

JULIUS STIEGLITZ

Physico-Chemical Methods. By JOSEPH REILLY, Professor of Chemistry, National University of Ireland, and WILLIAM NORMAN RAE, Professor of Chemistry, University College, Colombo; with a foreword by F. G. Donnan. Second edition, revised. D. van Nostrand Company, Inc., 250 Fourth Ave., New York, 1933. xv + 822 pp. 586 figs. 16.5 × 23.5 cm. Price, \$8.00.

The second edition of this well-known standard work on physico-chemical methods seems to the reviewer a very

successful effort to bring this useful volume up to date. The material has been reorganized to some extent, corrections have been made and several new chapters have been added. These latter include the following topics: Centrifuges, Oscillating Pumps (for circulating gas in a closed system), Glass-Blowing, Micro-Molecular Weight Determinations, Separation of Gases by Solution, The Raman Effect, Microphotometry, The Thermionic Vacuum Tube, Hydrogen Ion Determination-Glass Electrode Method, Dielectric Constant and Notes on Electrical Units and Batteries. In all some eighty pages have been added to the original volume. However, the somewhat larger page used in the present edition means that the actual increase in the amount of material is somewhat greater than indicated by this number of pages.

Some of the chapters are very brief, containing much less material than one might wish to find on the topic. This however can scarcely be considered a criticism as the volume is large as it stands. Fortunately many references are given enabling one easily to go into a subject more thoroughly. A more serious criticism has to do with the departure in places from the plan of giving general methods. Thus much of the theoretical discussion on "Colloids" would seem more appropriate to a text on colloidal chemistry. A similar comment might be made on the chapter on rates of reaction, a large share of which has to do with specific experiments in which the methods employed are largely analytical. Such material would perhaps be more in place in a laboratory manual to be used for purposes of instruction. On page 3 appears the statement, "If we regard the degree of accuracy of ordinary volumetric work as not exceeding 1 part in 1000, and we wish to make up a litre of normal oxalic acid, no useful purpose will be served by weighing out 63 grams of the crystals with a greater accuracy than $\frac{1}{200}$ th of a gram." The remainder of this chapter is a very useful discussion of "Errors of Observation." On page 696 the statement is made, "The best results seem to be obtainable by the use of the Vreeland oscillator." No mention is made in this chapter of vacuum tube oscillators which, at least in America, have largely displaced the Vreeland oscillator.

The criticisms mentioned above pertain to but a very small fraction of the book and therefore do not seriously affect its usefulness. The great variety of subjects treated, the large number of methods discussed under each subject, and the generous number of excellent illustrations make the volume invaluable to research workers in physical chemistry.

HENRY E. BENT

Quantitative Analysis. By EDWARD G. MAHIN, Ph.D., Professor of Analytical Chemistry and Metallurgy in the University of Notre Dame. Fourth edition. McGraw-Hill Book Company, Inc., 330 West 42d St., New York, 1932. xv + 623 pp. Illustrated. 14 × 21 cm. Price, \$4.00.

The three parts of this book cover the material commonly presented in three different courses in analytical chemistry, (a) introductory quantitative analysis, (b) instrumental methods, and (c) technical analysis. The chapter headings of Part II are: Determination of Density and Specific Gravity, Heat of Combustion, Index of

Refraction, Optical Rotation, and Hydrogen Ion Concentration. Part III includes chapters on Rock and Cement Analysis, Fuels, Oils, Fats and Waxes, Water, Steel and Alloys, Agricultural Materials, and The Fire Assay.

Obviously it was necessary to select only a few typical determinations in each of the various divisions for the detailed treatment necessary to give laboratory experience in that field. This material is well chosen and the procedures given are such as appear in the usual technical books.

The discussions of the theory of the procedures read as if these were all on a sound scientific basis with an adequate explanation available for each of the various details. Actually, however, much of the theory is derived from the procedures in question rather than from independent experimental studies of the factors involved. This situation is illustrated by the following specific instances.

Pp. 22-23. Recrystallization takes place to only a minor extent in the usual digesting of precipitates, the main purpose being to allow time for reasonable completeness of precipitation. P. 40. In connection with ignition of precipitates, if the volatilized combustible material from the paper burns with a flame above the crucible there will be appreciable mechanical loss in the case of light fluffy precipitates. P. 79. Contrary to implication silver chloride shows the same increase in solubility with hydrochloric acid as with sodium chloride. P. 87. 25% H_2SO_4 is a very concentrated reagent to use even dropwise if one wishes to add sulfate radical slowly. P. 167. The definitions of atomic and molecular weights disregard the existence of isotopes. P. 222. The electrons in such a radical as sulfate can hardly be regarded as "free." P. 235. 0.2 g. of $CaCO_3$ is converted to CaC_2O_4 then dissolved in 10 to 15 ml. of 25% H_2SO_4 and diluted to 50-75 ml., giving a clear solution, yet according to the solubility product principle (p. 20) a precipitate of $CaSO_4$ should form.

The errors or inconsistencies noted show the difficulty of a laboratory man keeping up with the incidental aspects of his subject. This does not detract seriously from the value of the book as an introduction to laboratory methods over a wide range of analytical chemistry, but it does give the theory of the subject a less satisfactory treatment than is possible and desirable.

The book should inspire the teacher who knows only the few standard procedures covered in an introductory course to expand his acquaintance with the analytical field. At the same time it should help the beginning student to realize the breadth and importance of quantitative analysis, so that the time-consuming daily operations will seem less like drudgery than real training in valuable technique.

R. K. MCALPINE

Die Adsorption von Gasen und Dämpfen an festen Körpern. (The Adsorption of Gases and Vapors on Solid Substances.) By H. DOHSE and H. MARK. Akademische Verlagsgesellschaft m. b. H., Markgrafstrasse 6, Leipzig C 1, Germany, 1933. 116 pp. 53 figs. 17.5 × 25 cm. Price, M. 12.

This book is written primarily from a theoretical standpoint. The greater portion of the discussion concerns the simpler forms of adsorption phenomena, which are

the most suitable for this purpose. The treatment is concise, and will not eliminate the necessity of consulting the original presentations of the various theoretical lines of attack. Probably the most useful service which the authors here perform is to set forth very clearly the fundamental relationships between these lines, producing a well-integrated survey of the present state of the subject. Electrical and quantum-mechanical treatments are discussed in some detail, as well as activated adsorption. There is a brief summary of the primary experimental methods used for equilibrium and thermal measurements. The subjects of adsorption of mixtures and rates of adsorption are also touched upon.

In brief, this is an up-to-date guide-book, not an exhaustive treatise.

A. S. COOLIDGE

Elementary Laboratory Experiments in Organic Chemistry. By ROGER ADAMS, Professor of Organic Chemistry in the University of Illinois, and JOHN R. JOHNSON, Professor of Organic Chemistry in Cornell University. Revised Edition. The Macmillan Company, 60 Fifth Avenue, New York, 1933. xiii + 363 pp. 20 figs. 15 × 22.5 cm. Price, \$1.90.

Experimental Organic Chemistry. International Chemical Series. By JAMES F. NORRIS, Massachusetts Institute of Technology. Third Edition. McGraw-Hill Book Company, Inc., 330 West 42d Street, New York, 1933. xiii + 233 pp. 23 figs. 14.5 × 21 cm. Price, \$1.50.

An Introduction to the Practice of Organic Chemistry in the Laboratory. International Chemical Series. By HOMER ADKINS, Professor of Chemistry, The University of Wisconsin, and S. M. McELVAIN, Associate Professor, The University of Wisconsin. Second Edition. McGraw-Hill Book Company, Inc., 330 West 42d Street, New York, 1933. ix + 224 pp. 8 figs. 14.5 × 21 cm. Price, \$2.25.

With these three books before him a blind man could safely be entrusted to select the laboratory manual for a class in elementary organic chemistry. Each volume contains a representative list of experiments. The recent trend toward the use of butyl alcohol instead of ethyl alcohol, as a starting material for class work, is evident. There is also a tendency among writers of laboratory manuals to include relatively little analytical work. The increasing appreciation of the importance of organic qualitative and quantitative analysis, and the desirability of having these subjects covered in a separate course is apparent.

The Adams and Johnson volume has perforated pages, printed on one side only, which may be removed and pasted in student notebooks, or the blank pages may be used for note purposes. An interesting feature of this book, helpful to pedagog and student alike, is a time requirement list appended to the experiments.

The Norris manual gives in considerable detail information concerning the handling of small quantities of organic materials, and also stresses the chemistry of many naturally-occurring substances. This book should appeal particularly to those whose interests lie in the botanical and physiological fields.

Adkins and McElvain's manual is the most novel of these three. It embraces a simple laboratory manual as well as a relatively detailed account of several of the more important reactions, encountered in organic chemical experimentation, together with illustrative experiments. A notably valuable chapter on organic chemical literature is a most commendable feature of this book.

All three of the manuals are characterized by excellent book work.

G. A. HILL

Physikalisch-chemisches Taschenbuch. (Physico-Chemical Handbook.) Edited by C. DRUCKER and E. PROSKAUER, with the Coöperation of Many Contributors. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany, 1932-1933. 13.5 × 19 cm. Vol. I, viii + 546 pp. 292 figs. Vol. II, viii + 481 pp. 183 figs. Price, Vol. I, M. 27.50; bound, M. 29. Vol. II, M. 15; bound, M. 17.

These two volumes have been written as an aid to those who are working in the joint field of physics and chemistry. They will be of particular value to those who wish quickly to become oriented in either the theoretical background or the experimental technique of some branch of physics or chemistry. References to the literature make it possible, when necessary, for one easily to pursue a topic in greater detail.

In presenting each topic definitions are usually presented first. These are followed by the formulation of the theory and then a section devoted to the theory of the experimental measurements. Finally a short description of various experimental methods is given. The first volume includes: The Structure of Matter, Optics, Electricity and Magnetism. The second volume includes: Micromechanics (gases and crystals), Macromechanics (chiefly the physical properties of systems not included in the first volume), Chemical Statics and Dynamics (equilibrium and kinetics), Thermochemistry, Systematic Inorganic and Organic Chemistry and an Appendix including Dimensional Analysis and Conversion Factors.

One cannot but be impressed by the scope and thoroughness of this work. In spite of the large number of topics included, however, the publishers have succeeded in producing volumes of very convenient size. The type and paper are excellent. The illustrations and diagrams of apparatus give a great deal of detail and the large number of tables give many useful data. In the opinion of the reviewer these volumes are very successful in serving the purpose for which they were written.

HENRY E. BENT

Nachweis und Bestimmung organischer Verbindungen. (The Detection and Determination of Organic Compounds.) By Dr. HANS MEYER, Professor of Chemistry at the German University at Prague. Verlag von Julius Springer, Linckstrasse 23-24, Berlin W 9, Germany, 1933. xii + 426 pp. Illustrated. 17.5 × 26 cm. Price, RM. 32; bound, RM. 35.

The second volume of Hans Meyer's "Lehrbuch der organisch-chemischen Methodik" deals with the detection and determination of individual organic compounds. The

first volume¹ dealt with general methods and reagents; a third volume is to treat synthetic methods.

The present volume includes, as an introduction, a brief survey of more recent methods and reagents for the preparation of derivatives. The main section of the book is a tabulation of specific information for a list of 585 compounds. The selection of the individuals to be included has been effected with great care and as a result the list includes practically all of the common organic substances.

The information tabulated for the individuals includes the following data: (I) molecular formula, condensed structural formula, molecular weight, percentage composition, melting point, boiling point; (II) test reactions, and check list of derivatives suitable for purposes of identification and their melting points; (III) quantitative determination; (IV) tests for purity, and, in many cases, methods of separation from other substances. Where information concerning micro methods is available, this has also been included.

This volume is extremely useful as a handbook of analytical constants. The author has assembled pertinent information which, previously, the research worker or organic analyst has been able to obtain only after a thorough literature search. The fact that many important papers on the preparation of derivatives have appeared relatively recently has made this a tedious task. The author has included citations to the original literature for all methods and physical constants, and has carried the references up to 1933.

(1) Reviewed in *THIS JOURNAL*, **53**, 4465 (1931).

JOHN R. JOHNSON

Katalytisch-organische Arbeitsmethoden. (Catalytic Processes in Organic Chemistry.) By MAX FRANKEL, Jerusalem. Abt. I, Chemische Methoden. Teil 12, Hefte 1-3 (Allgemeine chemische Methoden, Ergänzung zu Abt. I, Teil 2), Abderhalden, "Handbuch der biologischen Arbeitsmethoden." Urban and Schwarzenberg, Friedrichstrasse 105 B, Berlin N 24, Germany, 1932. 493 pp. 41 figs. 17.5 × 25.5 cm. Price, RM. 29.

In this comprehensive résumé of catalytic processes in organic chemistry, the first 200 pages are devoted to (1) a general discussion of catalysis and catalysts, (2) catalytic hydrogenation in the gaseous system at ordinary and reduced pressures and to (3) catalytic hydrogenation in liquid phase at ordinary and at high pressures. A detailed description of various types of apparatus and of the preparation of the various forms of catalysts, especially platinum and palladium is included. Numerous experiments illustrating the reduction of various types of organic compounds are submitted.

Succeeding chapters are devoted to (1) catalytic dehydrogenation, (2) catalytic oxidation, (3) catalytic addition reactions, (4) catalytic substitution of halogen, (5) catalytic removal of water, (6) catalytic elimination of halogen acid, which includes the consideration of the Friedel and Crafts, the Ullmann and the Zincke reactions, (7) catalytic isomerization which includes the rearrangement of stereoisomers, racemization, rearrangement of aliphatic halides,

terpenes, etc., (8) catalytic acyl wandering in the aromatic series, which includes a consideration of the Fries reaction, (9) the rearrangement of N substituents to the ring such as is found in the benzidine and semidine rearrangements and the Beckmann rearrangement, (10) polymerization of all types.

In attempting to cover such a broad and important field of work, much of it must necessarily be presented in brief form. Moreover, it would be impossible to hope to cover all catalytic processes. The author apparently has reviewed carefully the scientific literature and selected the most important articles (references are given), and has arranged a description of the material in a clear and logical way. He has not, however, attempted to give references to the voluminous patent literature which, indeed, includes so many exceedingly important catalytic methods of general as well as of practical interest that it can hardly be neglected by one interested in the use of certain types of catalytic reactions. For example, such relatively well-known catalytic reactions as the oxidation of naphthalene to phthalic anhydride with vanadium oxide as catalyst, or the oxidation of benzene to maleic anhydride are not mentioned.

Nevertheless, the volume gives the reader an excellent background of catalysis in organic chemistry. The part devoted to the catalytic reduction with platinum and palladium is particularly well presented and will be useful to anyone not familiar with the various catalysts and who desires to use them in investigational work. Sooner or later every organic chemistry research man would have occasion to refer to this treatise and will find much of value in it.

ROGER ADAMS

Die Alkaloide. Eine Monographie der natürlichen Basen. (The Alkaloids. A Monograph of the Natural Bases.) Part II, by Dr. GEORG TRIER, Lecturer at the Technical High School of Zürich. Second, revised edition. Verlag von Gebrüder Borntraeger, W 35 Schöneberger Ufer 12a, Berlin, Germany, 1931. xi + 705 pp. 17.5 × 26.5 cm. Price, unbound, RM. 42.

A study of the completed monograph justifies the high expectations expressed by the reviewer [*THIS JOURNAL*, **50**, 1828 (1928)] after having read the first section of the work. The completed treatise should be included in all libraries catering to the field of natural products.

The Table of Contents and Index, which were missing in Part I, naturally are now included and are as complete as could be desired. The reviewer discovered, however, that there can be a disadvantage in a Table of Contents from the standpoint of a prompt review in that it encourages reference to selected topics and thus counteracts the sustaining interest referred to in his previous review. He read Part I in one night but required a month for a conscientious reading of Part II, a remark which may suggest to Editors a plan for securing prompt reviews. A related plan is applied in "*Die Annalen der Chemie*": The lengthy articles appearing therein contain no convenient section devoted to "Conclusions" or "Summary," with the result that every organic chemist reads the dissertations from beginning to end.

Trier's "Die Alkaloide" attempts to cover the history, biochemistry, analytical and structural chemistry and the pharmaceutical, pharmacological, toxicological and therapeutic aspects of the alkaloids and related bases. To the average writer such an endeavor would appear hopeless in a work limited to only a thousand pages. Naturally considerable judgment had to be exercised in limiting the various aspects of the work, but the author has accomplished just what he set out to do and has allotted proper proportions to the various subdivisions of the subject.

The book is more than a reference book since the author reproduces not merely what is in the literature but assumes the responsibility of selecting and correlating items which he deems most important and of freely expressing his own viewpoints. In the introduction he recognizes the possibility that he may come in conflict with the "fixed opinions" of others but fortunately this prospect does not deter him from giving us *himself* as well as a compilation of the literature.

Much work still remains to be done in the field of alkaloidal research. In another place, "Fighting Disease with Drugs" (Williams and Wilkins, 1931) p. 137, the reviewer expressed himself to the effect that a hundred skilled chemists could easily find enough important work remaining to be done in the alkaloidal field to keep themselves busy (with adequate replacements in the ranks, of course) for a hundred years. Even so, the alkaloidal field is at a plateau level that permits an occasional summary like the one under consideration without promptly becoming out of date. This cannot be said yet of two other important groups of naturally-occurring products, namely, the vitamins and the hormones. Although they are mentioned briefly in this monograph—in the body of the work when a close alkaloidal relationship is apparent, and also in a special section on imperfectly known bases (pp. 796-860)—the author has wisely avoided an attempt to cover these two fields in detail. Even so, in the forty-page section on hormones there is presented a wealth of information in which even a specialist in the field can find items that he failed to glean from the rapidly expanding literature.

The present monograph is really the second edition of the well-known work published in 1910 under the same title by Winterstein and Trier, both of the Eidgenössischen Polytechnischen Schule of Zürich, although the former volume of 340 pages has been expanded to 1061 pages. The plan for the "Special Part" is the same in that the chemically known alkaloids are classified according to chemical structure whereas the less well-known members are placed in botanical groups. The "General Part" which is now found near the end of the work contains valuable sections on the relation between constitution and occurrence of natural bases (pp. 861-897) and on the relationship between structure and physiological action (pp. 897-950). The Supplement (pp. 985-1022) contains important references to recent researches presented in proper relation to the main part of the monograph.

Dr. Georg Trier is to be congratulated on this valuable contribution to the literature on alkaloids.

OLIVER KAMM

Alkaloide. (Alkaloids.) By REINHARD SEKA, Graz Abt. I, Chemische Methoden, Teil 11, Heft 6 (2. Nachtrag zu Abt. I, Teil 9), Abderhalden, "Handbuch der biologischen Arbeitsmethoden." Urban and Schwarzenberg, Friedrichstrasse 105 B, Berlin N 24, Germany, 1933. 356 pp. 17.5 × 25.2 cm. Price, RM. 19.

This second supplement to the Schmidt-Grafe text of 1920 (Abt. I, Teil 9) covers developments in the alkaloid field for the five-year period since 1927 when the first supplement (Abt. I, Teil 11, Heft 3) appeared. The alkaloids are arranged according to nuclear structure in eight major divisions and in the ninth section miscellaneous bases, mostly of unknown constitution, are considered. For the alkaloids of known structure, the volume offers a valuable summary of new reactions, new syntheses, and analytical methods; for those of partly known or disputed structure the new evidence available is presented quite completely and to a certain degree critically. The collection and orderly interpretation of the numerous and complicated investigations on strychnine, brucine and vomicine is particularly timely, as is the less complete section dealing with the morphine group. The detailed experimental directions which claimed so much space in the previous volumes have been omitted to advantage.

L. F. SMALL

The Physiological Effects of Radiant Energy. By HENRY LAURENS, Ph.D., Professor of Physiology in the Tulane University School of Medicine, New Orleans, Louisiana. American Chemical Society Monograph. The Chemical Catalog Company, Inc., 330 West 42d St., New York. 610 pp. Illustrated. 15.5 × 23.5 cm. Price, \$6.00.

The author treats the subject of the physiological effects of radiant energy from three main points of view. First he discusses the physics of radiant energy, then its effects, and third its mode of action. In all cases the requirements of a student attempting to familiarize himself with this field are cleverly anticipated so that the volume might serve equally well the research worker desirous of securing information on literature and technique, or the student interested more in immediate results and the conclusions arrived at to date.

True to its title the greater part of the book, namely, 393 out of the 610 pages, deals with the physiological effects of radiant energy. These are discussed under separate chapters devoted to the effects on the skin, on wounds, on the eye, on the circulatory system, and on the blood, with primary emphasis being given to metabolism—which is discussed in 6 distinct chapters. Three additional chapters totaling 79 pages are devoted to photodynamic sensitization, tuberculosis, and to the effects on microorganisms, toxins, enzymes, etc. A final chapter of 8 pages bears testimony to the paucity of information on the mode of action of radiant energy on living organisms.

Of interest to plant physiologists should be the fact that some 24 pages are devoted to the effect of radiant energy on the growth of plants. The process of photosynthesis is treated very cursorily in the space of a few pages. In consonance with current interest the antirachitic action of radiant energy acting directly, as well as indirectly, upon

the animal body receives detailed attention in 85 pages. In this space the physics and chemistry of vitamin D, as well as its physiological and pathological effects, are discussed.

A very commendable feature of the book is that the author has drawn generously upon original publications for illustrations, graphs, and direct quotations of findings and conclusions. This gives the volume an authoritative standing which is commonly sacrificed by book makers when they attempt to draw their own conclusions from work scattered over many fields. It can be safely said that Dr. Laurens through the authorship of this volume has made a very significant contribution to the advancement of our knowledge on radiant energy.

HARRY STEENBOCK

BOOKS RECEIVED

November 15, 1933–December 15, 1933

- WALTER BADER. "Die Technik der chemischen Operationen." B. Wepf & Cie., Verlag, Eisengasse 5, Basel, Switzerland. 416 pp. Frs. S. 18; bound, frs. S. 20.
- G. S. CALLENDAR AND F. E. HOARE. "Correction Tables for Use with Platinum Resistance Thermometers." Longmans, Green and Co., 55 Fifth Ave., New York. 12 pp.
- ARCHIBALD SCOTT COUPER. "On a New Chemical Theory, and Researches on Salicylic Acid." Alembic Club Reprint No. 21. Gurney and Jackson, 33 Paternoster Row, London E. C. 4, England. 45 pp. 2/6.
- KARL K. DARROW. "Elementare Einführung in die Quantenmechanik." Translated from the English by E. Rabinowitsch. Verlag von S. Hirzel, Königstrasse 2, Leipzig, Germany. 123 pp. RM. 6.
- PIERRE DAURE. "Introduction a l'Étude de l'Effet Raman. Ses Application Chimiques." Éditions de la Revue d'Optique Théorique et Instrumentale, 165 Rue des Sèvres, Paris 15^e, France. 90 pp. Fr. 18.
- P. DEBYE. "Struktur der Materie. Vier Vorträge." Verlag von S. Hirzel, Königstrasse 2, Leipzig, Germany. 50 pp. RM. 3.
- ARNOLD EUCKEN. "Grundriss der physikalischen Chemie." Fourth edition. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany. 699 pp. RM. 27; bound, RM. 29.
- K. FAJANS AND E. SCHWARTZ, Editors. "Elektrochemie." Teil II, Band 12, 2 Teil. "Handbuch der Experimentalphysik." Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany. 483 pp. RM. 38; bound, RM. 40.
- ALEXANDER FINDLAY. "Introduction to Physical Chemistry." Longmans, Green and Co., 55 Fifth Ave., New York. 492 pp. \$3.00.
- O. GERNGROSS AND E. GOEBEL. "Chemie und Technologie der Leim- und Gelatine-fabrikation." Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany. 535 pp. RM. 34; bound, RM. 36.
- W. HANLE, H. ULICH AND W. FLECHSIG. "Elektrische Leitfähigkeit." Eucken-Wolf, Hand- und Jahrbuch der chemischen Physik, Band 6, Abschnitt II. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany. 342 pp. RM. 32.
- TE-PANG HOU. "Manufacture of Soda, with Special Reference to the Ammonia Process." American Chemical Society Monograph. The Chemical Catalog Co., Inc., 330 West 42d St., New York. 365 pp. \$8.00.
- D. KRÜGER. "Zelluloseazetate und die anderen organischen Ester der Zellulose." Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany. 391 pp. RM. 20; bound, RM. 21.50.
- ANDRÉ MARCELIN. "Oberflächenlösungen, Zweidimensionale Flüssigkeiten und monomolekulare Schichtungen." Translated from the French by Rudolf Köhler. Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany. 158 pp. RM. 8.
- R. H. A. PLIMMER. "Organic and Biochemistry." Fifth edition. Longmans, Green and Co., 55 Fifth Ave., New York. 624 pp. \$7.50.
- H. POSE AND R. WIERL. "Positive Korpusskularstrahlen." Eucken-Wolf, Hand- und Jahrbuch der chemischen Physik, Band 6, Abschnitt III. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany. 284 pp. RM. 28.
- ALFRED STOCK. "Hydrides of Boron and Silicon." The George Fisher Baker Non-Resident Lectureship in Chemistry at Cornell University. Cornell University Press, 124 Roberts Place, Ithaca, N. Y. 250 pp. \$2.00.
- ALFRED WAGNER. "Aromastoffe. Kurzes Handbuch für die Aroma-, Alkoholfreie-getränke-, Riechstoff- und Spirituosen-Industrie." Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany. 322 pp. RM. 20; bound, RM. 21.50.
- P. WENGER AND G. GUTZEIT. "Manual de Chimie Analytique Qualitative Minérale." Georg & Cie., S. A., Librairie de L'Université, Genève, Switzerland. 496 pp. S. frs. 16.
- "Report of Pharmaceutical Chemistry Sub-Committee." Codex Division. The Pharmaceutical Press, 23 Bloomsbury, London W. C. 1, England. 51 pp.