

death, showed no hydrocyanic acid present. The material showed no marked decomposition.

A portion of the stomach wall, about one square inch in area, taken when the analysis was begun four days after death, extracted with 0.4% hydrochloric acid gave a solution which did not dissolve fibrin. A solution from a stomach wall where death has been due to natural causes will ordinarily do so after that length of time.

M. P. CRAM.

BOWDOIN COLLEGE, BRUNSWICK, MAINE.

CORRECTION.

THE MOLECULAR REARRANGEMENT OF TRIARYLMETHYL-HYDROXYLAMINES AND THE "BECKMANN" REARRANGEMENT OF KETOXIMES.

BY JULIUS STIEGLITZ AND PAUL NICHOLAS LEECH.

Through an oversight in the final editing we have given (Vol. XXXVI, p. 297) the proportions by weight of aniline hydrochloride and chloroaniline hydrochloride obtained in the rearrangement of parachlorophenyl-diphenylmethylhydroxylamine. The molal ratios are:

Line 24, 28% chloroaniline, 72% aniline.

Line 29, 31.5% chloroaniline, 68.5% aniline.

Line 30, 28% chloroaniline, 72% aniline.

The provisional conclusion based on these results (p. 287), that "roughly two-thirds" of the substance rearranges to form aniline and one-third to form chloroaniline is little affected by this correction.

CHICAGO, Feb. 7, 1914.

NEW BOOKS.

A Textbook of Chemistry. By WILLIAM A. NOYES, Director of the Chemical Laboratory of the University of Illinois. Henry Holt & Co., New York, 1913. xv + 602 pp. 13.5 × 20.5 cm. Price, \$2.25.

This new text by Professor Noyes marks a decided step forward in the presentation of the facts and theories of general chemistry. The brief introduction and very early entrance upon equations (p. 21) are special features of the book. The usual discussions on the gas laws follow in close order with good illustrations, but, in the minds of the great majority of chemists, it is doubtful if Avogadro's hypothesis (here called a law) would be construed as other than an hypothesis. It is pleasing to note the absence of the term "equivalent weight," a term that has too long outlived its usefulness and only served for the confusion of the beginner. Graphical formulas meet with an early introduction, simplifying remarkably such discussions as the Weldon process for chlorine. The chapter on the Periodic System is introduced just after chlorine and preceding the chapter on the halogen family (Chapter X). It is surprising

that the oxygen acids of bromine receive so little mention and the oxides and oxygen acids of iodine none at all. The formulas, ClO_2 and NO_2 , represent dioxides and not peroxides, if our accepted definition, likewise acceded to by the author, is correct. The Phase Rule, first discussed in the study of water, is made to serve the student in the study of chlorine hydrate, plaster of Paris, and in other instances. Furthermore an interesting exposition of the electron theory is made to explain the formation of sulfurous and sulfuric acids from their anhydrides, the phenomena of ionization, the formation of ammonium salts and the functionary properties of the metals. It is well, however, for the elementary student that the paragraphs on the Phase Rule, at least, are marked with an asterisk and left to the discretion of the instructor. At the end of Chapter XI on sulfur a number of the figures representing crystal systems are inverted and others show poor alignment; the term "regular" system is a misnomer for cubic system—all systems are regular. Chapters XII to XV include a systematic study of the elements of group V of the Periodic System, whereas chapters XVI to XX are given over to the study of carbon and its derivatives, with chapter XXI concluding the study of the elements of group IV. The careful attention given to the ionization of hydrogen sulfide (pp. 167-70), and of orthophosphoric acid (pp. 250-2), as well as to colloidal solutions (pp. 262-3) and to a method for the determination of the atomic weight of an element (p. 130), deserve especial praise. Professor Noyes suggests the term "Formular" (p. 183) for solutions containing per liter one formular weight. This seems indeed more desirable than the oft-used "molar" in that the exact formula, simple or polymeric, upon which the solution is based, must also be given. In no text on general chemistry does the subject of carbon receive such full and ample treatment as is contained in these few chapters. The alcohols, aldehydes, ketones, acids, carbohydrates, amines, dyes, alkaloids, and proteins receive a brief but systematic and clear presentation, and contribute greatly to the store of knowledge which should be readily accessible to a student undertaking the study of a truly "general" chemistry. Chapter XXII introduces a study of the metals in relation to the non-metals; here also is to be found an excellent discussion on the role of indicators. The subject of amphoteric electrolytes might better have been given a short discussion, with illustrations, at this point in order to avoid repeated definitions at every recurrence throughout the text (pp. 206, 265, 483, 499). In the chapters on the metals (XXIII to the final XXXIII inclusive) many recent discoveries have been described. Thus, together with brief descriptions of all the rare metals and their uses we find also stated: A new method for preparing aluminium oxide from clay, the fireproofing of cotton goods, Werner's theory for the two isomeric hydrates of chromic chloride and also for the cobalt amines, the improvements in the open hearth

process for steel, the detection of nickel as nickel dimethylglyoxime, etc. Throughout the text, numerous questions are submitted to the student. These, we fear, too often must find answers in larger reference volumes. Thus the difference in action of sulfuric acid toward potassium bromide and potassium chloride is noted, but the final and more complicated reaction toward potassium iodide is made a problem for the student (p. 145). The author, moreover, is inclined to open discussions upon certain classes of compounds before any actual description of the several members. For example, the hydrides of Group V are studied in connection with phosphine; again the properties of antimony and bismuth sulfides are discussed with arsenic sulfide, etc. These and many of the theoretical considerations stamp the text as one primarily for the advanced student—such discussions necessarily broadening his knowledge and extending his vision over the field as a whole; but for the student without previous training his all too short powers of vision are more than likely to be strained and he himself lost in an interminable forest. For such, however, the volume will admirably serve as a reference text. It is to be regretted that the many citations to the literature are placed in the body of the text instead of in the less conspicuous footnote. The exercises at the end of the chapters are excellent, comprising a wealth of material alike instructive to all. In the exercises on pages 156–9 the method of constructing graphical formulas is given with a clearness and detail found in but few texts. Indeed, this volume by Professor Noyes stands unique among texts on general chemistry in the wide application made of graphical formulas; a question open often to objections if too far pressed but one that can hardly fail to appeal to the students' imagination and to impress where other means have failed. The text is comparatively free from misprints, well indexed, clearly printed and serviceably bound.

W. J. HALE.

Mesure de la vitesse de la lumière. Etude optique des surfaces. Mémoires de LEON FOUCAULT. Paris: Armand colin. pp. 122, 12 × 20 cm. Paper. Price, 1.30 francs.

This publication is volume II of the series of scientific classics published under the direction of H. Abraham, H. Gautier, H. Le Chatelier and J. Lemoine. The pamphlet presents a brief biographical sketch of Foucault and his original researches on the velocity of light and on optical surfaces. It is gratifying that these classical papers are thus made available to a larger circle of scientists. Their content is, of course, primarily of interest to the physicist.

L. KAHLLENBERG.

Mendelejeff's Periodic System of the Elements. By JOHN NESBIT SWAN, Monmouth College, Monmouth, Illinois. Price for sample copy \$0.10, 100 copies for \$5.00.

The symbols and atomic weights of the elements arranged in the periodic

system are printed on a card 35 cm. square, with the thought that students might have these cards in their rooms and that frequent reference to such a card would be useful.

W. A. N.

Eau oxygénée et ozone. Mémoires de THENARD, SCHOENBEIN, DE MARIGNAC, SORET, TROOST, HAUTEFEUILLE, CHAPPUIS. Paris: Armand Colin. pp. 111, 12 X 20 cm. Paper. Price, 1.20 francs.

This is volume III of the series of scientific classics just mentioned. The editors have rendered a real service in thus bringing together and presenting in an attractive form the masterly work of Thenard on hydrogen peroxide, and the papers of Schoenbein, Marignac, Soret, Troost, Hautefeuille and Chappuis on ozone. These papers have appeared in the *Comptes Rendus* and the *Annales de Chimie et de Physique*. Besides presenting the original researches, the publication contains a brief biographical note of each author. The very interesting letters of Schoenbein to Arago, and of Marignac to Dumas are also presented. These classical researches which have thus become available to many readers in an attractive form, should certainly prove to be a source of inspiration to students of chemistry. The editors are to be congratulated upon their work.

L. KAHLLENBERG.

From the Letter-Files of S. W. Johnson. Edited by his daughter, ELIZABETH A. OSBORNE. Yale University Press, 1913. pp. 292. \$2.50 net.

Rare indeed in the biographical contributions of the present day are the instances where the letters and papers of a distinguished man of science are either available or suitable to give a comprehensive picture of his personality. Biographies are, as a rule, individual estimates fortified here and there by the more objective impressions which surviving fragments of what the subject has said or done may afford. With commendable judgment and critique Mrs. Osborne has succeeded in making the selections from the letter-files of her honored father tell the story of his aspirations and his struggles in the varied fields of effort that he entered. They bring into relief his trials and victories in the days when modern chemistry had its beginnings in America; they give an impression of the character and temperament of a man with a high purpose, and of the surroundings and circumstances in which he chose to live and work. Out of a wealth of material represented by long treasured human documents, interspersed with the discriminating explanatory narrative of a devoted admirer of scientific work, has been spun the account of how young Americans entered the world of scientific endeavor two generations ago. We get glimpses of Erdmann, Liebig, von Kobell and other worthies in their European homes. Then follows the story of some of the early struggles of the school of science at Yale. But the chief interest centers in the foremost activity with which the name of Professor Johnson is to be associated, namely, the propaganda and unflagging campaign resulting

in the establishment of the system of Agricultural Experiment Stations in the United States. The Station started in Connecticut in 1877, and of which Professor Johnson was the first director, was the earliest permanent organization of the kind in America, the forerunner of the splendid movement which has prepared the way for the application of scientific methods and results to the improvement of Agriculture. No man has felt more keenly than Professor Johnson that the professional agriculturalist trained in science is "the indispensable instrument for the agricultural salvation of our country." Two of Professor Johnson's books: "How Crops Grow" and "How Crops Feed" have probably been more widely read than any other American work on Agricultural Chemistry. They were devoted to the belief that "agricultural chemistry has ceased to be the monopoly of speculative minds and is well based on a foundation of hard work in the study of facts and first principles."

A few references of this sort must here suffice to recall the debt which chemistry in America owes to the modest yet forceful writer and organizer, the chemist and science-preacher who died in 1909. This biographical volume is the engaging narrative of a useful career, certain to bring cheerful recollections to the older chemists and engender inspiring reflection among the younger workers of this country. LAFAYETTE B. MENDEL.

Jacobus Henricus van't Hoff; sein Leben und Wirken. VON ERNST COHEN, Professor an der Reichs-Universität zu Utrecht. Mit zwei Gravüren und 90 Abbildungen. pp. 638. Leipzig: Akademische Verlagsgesellschaft m. b. H., 1912. Price, 16 Marks.

This life of van't Hoff by his long-time assistant and friend, Ernst Cohen, is literally a "labor of love." Cohen knew van't Hoff as few others have known him, and here plays somewhat the role of Boswell to his master.

The characteristics which marked the subsequent career of van't Hoff— independence of thought and action—early manifested themselves. The modern writers appealed to this Dutch youth more than the ancient; and he seems to have been greatly influenced by Byron, Burns and Heine.

In chemistry, van't Hoff's originality soon began to assert itself. He went to Bonn at the age of 20 to work with Kekulé, who was then at the height of his career; but the chemistry of Kekulé did not appeal to van't Hoff; it did not appear to him to lead anywhere. It dealt systematically with the beginning and end of chemical reactions, but disregarded the intermediate stages, which, to van't Hoff's mind, were the most important.

Van't Hoff, after a short stay with Kekulé, in Bonn, and Würtz in Paris, returned to Holland to work out his own chemistry. The result was that at the age of 22 he published a brochure of eleven pages in Dutch, which was the beginning of stereochemistry, or chemistry in three dimensional space, and which was destined to become the philosophy of the chemistry of carbon.

His next great work was in connection with the velocity and equilibria of chemical reactions; and this was followed in 1887 by what is now regarded as van't Hoff's greatest contribution to science; the applicability of the gas laws to the osmotic pressure of solutions.

It is worth noting that van't Hoff, being born in 1852, had published three epoch-making contributions to chemistry when only thirty-five years old.

The book in question deals not only with these, but with the lesser contributions of van't Hoff to chemical science. Cohen's life of van't Hoff is written in that clear and interesting style, for which its author is distinguished. The genuine enthusiasm and admiration of the student for his teacher, of the coworker for his master, not only one of the very greatest chemists, but one of the greatest men of science of all times, pervades the entire work and gives to it a peculiar life and charm.

HARRY C. JONES.

Theories of Solutions. SVANTE ARRHENIUS. pp. xx and 247. Yale University Press, \$2.25 net. (Second printing.)

This volume contains the Silliman lectures delivered by Arrhenius at Yale in 1911; its scope is best indicated by the chapter headings: Short History of the Theory of Solutions; The Modern Molecular Theory; Suspensions; The Phenomena of Adsorption; The Analogy between the Gaseous and the Dissolved State of Matter; Development of the Theory of Electrolytic Dissociation; Velocity of Reactions; Conductivity of Solutions of Strong Electrolytes; Equilibria in Solutions; The Abnormality of Strong Electrolytes; The Doctrine of Energy in Regard to Solutions. In these lectures the author tries "to exhibit such facts as have not in a higher degree attracted the attention of the authors of text-books in this branch, and thereby to give a broader and more complete view of the exceptionally fertile field which we cultivate." From this, and from the above list of headings, one would expect to find the whole subject treated with a breadth of view not usually found in discussions of this general topic; and this expectation the reader will find to be amply realized. In any critical survey of such a controversial field, there are sure to be individual differences of opinion on points the definite elucidation of which will require further, and appropriate, experimental work; but the reviewer knows of no better presentation of the subject matter, and of none in which the relations between so many different lines of evidence are marshalled and the substantial concordance of the conclusions derived from these various lines so well shown forth. The value of the book is enhanced by a bibliographical list, covering twelve pages and containing many references not commonly known, and by good indices of subjects and authors.

JOHN JOHNSTON.

Radioaktive Substanzen und ihre Strahlungen. By E. RUTHERFORD. Akademische Verlagsgesellschaft: Leipzig, 1914. p. 642.

This book constitutes Vol. 2, of the *Handbuch der Radiologie* edited by Dr. Erich Marx of the University of Leipzig. Vol. 1 on "Die Ionisation der Gase" will shortly be issued. Vol. 3, "Die Glimmentladung, die Kathoden und Röntgenstrahlung, und der lichtelektrische Effekt," and Vol. 4, "Theorie des Elektrons und der Röntgenstrahlung" will appear later. The present volume is a straight translation of Rutherford's "Radioactive Substances and their Radiations," without changes or additions of any kind. This book is now too well known to require further description. The translation was made by Prof. Marx under the supervision of Prof. Rutherford.

R. B. MOORE.

Metallographie. Ein ausführliches Lehr- und Handbuch der Konstitution und der physikalischen, chemischen und technischen Eigenschaften der Metalle und metallischen Legierungen, von DR. W. GUERTLER. Privatdozent an der Königl. Technischen Hochschule zu Berlin. Erster Band: Die Konstitution. Heft 7-12, pp. i-iv, 449-1177. Berlin, Verlag von Gebrüder Bornträger.

In these volumes, which have appeared from time to time during the past year the author brings to a conclusion the first volume of his treatise on the constitution of the metals and their alloys. He has proceeded in the same orderly manner and has discussed critically and with great thoroughness the equilibrium diagrams of all those metals not treated in the first six parts (Review, *THIS JOURNAL*, 35, 221). In undertaking such an enormous task the author is to be congratulated on making such excellent progress. It is natural that some parts of the work may not contain the last word, as is the case with the brasses but in a subject which is developing so rapidly this is to be expected.

Heft 7 concludes the zinc alloys, considerable discussion being given to the brasses and to the alloys of zinc with Ag, Au and the platinum group of metals. The alloys of Cd with Cr, Mn, Fe, Co and Ni and with Ag, Au and the platinum group are discussed; also the amalgams of the group Cr, Mn, Fe, Co, Ni, and Cu, Ag, Au and the platinum group.

In Chapter IX, the author discusses the binary alloys of the group Tl, Pb, Bi with each other and with members of the group Hg, Cd, Zn and Mg; and in Chapters X-XII, the commercially important group of alloys of Pb, Sn and Sb with the other metals. The interesting group of alloys of As, P, Te, Se, and S with the metals is treated in Chapters XIII-XVII. It is much to be regretted that the author decided not to include with this group the oxides.

Heft 12 is devoted to a table of contents, a most satisfactory index with many cross references, and a general index of all systems, classified by the symbols of the elements.

HENRY FAY.

Quantitative Chemical Analysis. By CHARLES M. ALLEN, Head of Department of Chemistry, Pratt Institute, Brooklyn, New York. (One of a series of "Loose Leaf Laboratory Manuals" edited by J. M. JAMESON, Pratt Institute.) New York: John Wiley & Sons, Inc. Copyright, 1913. Paper covers, 21 × 26 cm.

In paper covers and bound together by a couple of paper fasteners, we have here directions for some thirteen exercises in quantitative analysis accompanied by a like number of sheets of test questions and problems to correspond. Each set of directions consists of perhaps 5 or 6 pages, and each set of exercises thereon of perhaps 1 or 2 pages, bringing the number of pages in the example before us to about 86. The publishers announce that "single pamphlets and problem sheets are furnished if desired," and point out that the size of the sheets is the same as that of an ordinary typewritten page; so that any teacher is at liberty to synthesize from these printed and from his own typewritten sheets, collected within an ordinary notebook cover, as heterogeneous and flexible a manual as he may wish, including nothing extraneous to the work of his own course. This idea has certainly some points to recommend it.

The titles of the "pamphlets" are these: general processes of gravimetric analysis, analysis of barium chloride, of magnesium sulfate, of potash alum, of limestone, general processes of volumetric analysis, analysis of acids and alkalis, of hardness in water, of iron ore, of chlorine in bleaching powders, determination of oxidizing power of pyrolusite, of sulfur dioxide in sulfite and also of hydrogen peroxide. The publishers state that other analyses are in preparation.

There are those of us who are greater purists in terminology, and who make more of a fetish of high accuracy even with beginners; but both directions and test questions are very clear and practical; they are well printed and well illustrated, upon a serviceable paper; and their teachable character is likely to commend itself to many. ALAN W. C. MENZIES.

Quantitative Analysis in Practice. An Introductory Course Designed for Colleges and Universities. By JOHN WADDELL, Ph.D., Assistant Professor of Chemistry, School of Mining (Queen's University), Kingston, Canada. P. Blakiston's Son & Co., Philadelphia, 1913. 162 pp. Price, \$1.25 net.

The book contains 36 pages of well written preliminary discussion, followed by 24 pages of directions for the analysis of pure salts ($\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, and CaCO_3). Then follow 84 pages devoted to rapid methods of an industrial character (Cement, Limestone, Clay; Coal; Copper; Alkalimetry; Bleaching Powder; Iron Ore; Water; Iron and Steel; Lead Ore; Nickel and Cobalt Ore; Zinc Ore; Bronze). A prominent feature is the attempt to give the student some idea of the time required for the various analyses. The remaining pages contain appendices on the Balance and Weights, Calibration of Measuring Vessels, Electrolytic

Dissociation and the Mass Law, Analytical Factors, Logarithms, and an Index.

The directions in the book are clear and concise, and with very few exceptions (*e. g.*, Nickel and Cobalt Ore) the methods are well chosen. Those who believe in this character of work for an introductory course will doubtless find the book eminently satisfactory. G. MCP. SMITH.

Der heutige Stand der Synthese von Pflanzenalkaloiden. By H. BAUER. Friedrich Vieweg und Sohn in Braunschweig. viii + 144 pp. Price, bound, 5 Mark 20 Pf.

This booklet is the fifty-first volume of a collection of works on special subjects from natural science and mathematics, published under the title "Die Wissenschaft." The first eight pages are devoted to the history, distribution and general physical and chemical properties of the alkaloids, and include Pictet's hypothesis of the origin and chemism of the plant bases, together with a table of the color reactions of the more important representatives of this group of compounds. In the following eight pages those reactions are discussed which are of especial value in clearing up the constitution of alkaloids. The reactions mentioned are: saponification, hydrolysis, distillation with zinc dust, fusion with alkali, detection and determination of CH_3O and CH_3N , determination of the function of oxygen, oxidation and exhaustive methylation. The alkaloids whose synthesis has been realized are divided into five groups: pyridine, tropane, isoquinoline, purine, and hydroxyphenylalkylamine bases. In the sixth chapter the mutual transformation of certain alkaloids is described, and the last chapter treats of the syntheses of such substances as are obtained in the decomposition of some alkaloids.

The treatment of the subject, while, brief, is very clear, and each synthesis is supplied with a full list of references to original literature. The workmanship of the book is good, and the price very low.

The size of the book gives only an inadequate idea of the value of its contents. The book should be in the library of every chemist interested in this medicinally and technically important group of natural products.

H. M. GORDIN.

Weitere Beiträage zur Behandlung der Nephritis und verwandter Erscheinungen. VON MARTIN H. FISCHER. Sonderabdruck aus *Kolloidchemische Beihefte*, Band IV. Dresden und Leipzig, 1913. Theodor Steinkopff. 70 pp. Mk. 3.60.

This is one of a series of monographs which have appeared as supplements to *Kolloid-Zeitschrift*. It presents a discussion of the treatment of nephritis from the standpoint of the author's theory concerning the colloidal changes in the kidney which occur in this pathological condition. As nephritis is held to be a consequence of an acid intoxication the treatment is essentially a chemical one, consisting mainly in the injection of a hypertonic salt solution containing sodium carbonate. The theory

and the practice of the method are fully described, and a considerable list of cases is referred to for illustration and proof. J. H. LONG.

F. Löhnis, *Vorlesungen über landwirtschaftliche Bakteriologie & Gebrüder Borntraeger*. Berlin. pp. viii — 398. Price, \$1.14.

In writing his "Vorlesungen," the author was avowedly guided by the wish to prepare a volume that would be serviceable, not only as a text-book for schools of college and university grade, but also as a ready reference book for the technically trained reader. That he has admirably succeeded in his purpose is indicated even by a superficial study of the book. Dr. Löhnis has brought together and presented in a very readable form the important facts of agricultural bacteriology. His treatment of the subject matter shows familiarity with almost everything of importance published of late in this rapidly expanding branch of bacteriology. The author is to be commended also for his lucidity of treatment and his skill in selecting references in support of his conclusions. While bearing in mind the broad principles on which agricultural bacteriology has developed, he is not indifferent to the applied phase of the subject. He tells us that, "the practical value of agricultural bacteriology lies mainly in the fact that it teaches the farmer how to make use of bacteria and molds in a manner most likely to assure success."

There are those who will disagree with the author as to the scope of agricultural bacteriology. He would exclude from this field, the microorganisms known to be pathogenic to plants, and he would pass in silence bacteria found in the water supplies in rural districts. American bacteriologists are often inclined to include a discussion of these organisms in treatises on agricultural bacteriology.

The first fourteen chapters of the book (pp. 1-212), constitute its "general" part and deal with the morphology and physiology of microorganisms. The important divisions of this portion of the book include the form, structure, development and classification of microorganisms; the life processes of microorganisms; the culture and suppression of microorganisms; and the physical and chemical changes produced by microorganisms. The remaining eleven chapters constitute the "special part." The special part is given over to a discussion of the bacteriology of foods and dairy products, and of the bacteriology of manure and soil.

The book is remarkably free from typographical errors, and from the standpoint of craftsmanship is a credit to the publishers.

JACOB G. LIPMAN.