

of the base and the respective salts: (a) *bromo-quinaldine zinc chloride*, colorless needles, soluble in water, m. p. 268°; (b) *bromo-quinaldine stannic chloride*, colorless leaflets, insoluble in water; (c) *bromo-quinaldine mercuric chloride*, colorless needles, soluble in water, m. p. 245°; (d) *bromo-quinaldine picrate*, yellow leaflets insoluble in alcohol, crystallized from acetone, m. p. 207°.

The above preparations were carried out during the course of an investigation on the modifications in photographic sensitiveness brought about by the introduction of bromine in the benzene ring of the quinaldine nucleus of pinaverdol and pinacyanol.

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NEW BOOKS.

Tables of Physical and Chemical Constants and Some Mathematical Functions. Fourth edition. By G. W. C. KAYE, O. B. E., M. A., D. Sc., The National Physical Laboratory, and T. H. LABY, M. A., Professor of Natural Philosophy, The University of Melbourne. Longmans, Green and Company, 39 Paternoster Row, London; Fourth Avenue and 30th Street, New York; Bombay, Calcutta and Madras. 1921. iii + 161 pp. 16.5 × 25 cm. Price \$4.00.

The selection of data to be included in a small handbook of convenient size and moderate price to be used both by physicists and chemists is a difficult problem. The fact that a fourth edition of these Tables, first published in 1911, has now appeared is evidence that the selection there made was a wise one. Nevertheless, the Tables are much more complete from a physical than from a chemical standpoint. For instance, information as to chemical equilibria, electromotive forces, the vapor pressures of solutions, and reaction velocities is almost wholly lacking. We are sure that a still wider usefulness for the book could be secured by a revision and extension of its chemical data.

A number of alterations and additions have been made in this issue. Matter relating to the figure of the earth, the absolute determination of the acceleration of gravity, and more extended tables of the relative value of that constant have been added. The chemical data have been recalculated, using the international atomic weights. Some 700 additions and alterations in the physical constants of chemical compounds have been made. The authors state that the published values of these constants have been critically examined, and what appear to be the more accurate values for the chemical compounds included in these pages, have been used. Many of the heat tables have also been revised and amplified. The modernity of the book is demonstrated by the addition of tables of atomic

numbers, spark-gap voltages, X-ray wave lengths and terrestrial magnetic constants. The effect has been to increase the size of the book by 8 pages.

All told, this book represents a surprisingly complete and satisfactory collection of natural constants in a small bulk and a convenient form. It is unfortunate, but doubtless unavoidable, that the price has been fixed at nearly three times as much as that of the first edition.

ARTHUR B. LAMB.

The Principles of the Phase Theory. By DOUGLAS A. CLIBBENS, PH. D., Lecturer in Inorganic and Physical Chemistry in the University of London, King's College. Macmillan and Co., Limited. St. Martin's St., London, 1920. xx + 383 pages. 15 × 22.5 cm. Price \$10.00.

The title of this book, "The Principles of the Phase Theory" is misleading. Not only is there no discussion of the fundamental thermodynamic principles which underlie that portion of the study of heterogeneous equilibrium usually treated under the Phase Rule, but also there is no suggestion that there are such fundamental principles. The subtitle, "Heterogeneous Equilibrium between Salts and their Aqueous Solutions" is more truly descriptive, and the book will prove useful to those interested in this particular portion of the application of phase theory, and restricted to English texts.

The reviewer cannot agree with the author that "... a thorough study of the condensed system offers the easiest path to a true understanding of the methods of the Phase Theory," and believes that the reader who is unfamiliar with the subject, for whom the book is avowedly written, would have a clearer grasp of the equilibrium relations in systems in which hydrates are formed if the changes in pressure in the various univariant systems were coördinated with the changes in temperature and composition. The author frequently finds it necessary to disregard this limitation to condensed systems; for example, in order to explain the important process of isothermal evaporation. This process, as well as the relation of the condensed system to the isobaric saturation curve, would be understood more easily if a few isobars were included.

The chapters deal with condensed binary, ternary, quaternary and quinary systems, and the concluding chapter with graphical methods. The author does not have the gift of clear exposition, and devotes many pages to the detailed discussion of obvious geometrical relationships. The entire chapter on ternary systems is an example. It is hard reading, even for one familiar with, and interested in, the subject, and could be improved by elimination of much of the detailed discussion. The final chapter on graphical methods seems redundant. Its material either has been, or should have been, treated in preceding chapters, so that it becomes merely a further exercise in geometry. Indeed, to the reviewer it seems that this book carries to an extreme the too common tendency of writers on Phase

Rule to devote much space to geometry, without giving a hint as to the thermodynamical justification of the geometry. The paucity of literature references is surprising.

GEORGE W. MOREY.

Allgemeine Photochemie. General Photochemistry. BY PROF. DR. phil. et chem. J. PŁOTNIKOW, Director of the photochemical Research Laboratory at the Aktiengesellschaft für Anilinfabrikation Berlin-Treptow; o. Prof. and Direktor of the Chemischen Instituts at the former Kaiserlichen Universität at Moscow. Walter de Gruyter and Company, Berlin and Leipzig. 1920. 729 pp. 68 fig. 24 × 16 cm. Price \$7.00.

According to the preface of this book, the author, a Russian recently domiciled in Germany, began 10 years ago to write a complete encyclopedic handbook of photochemistry, but the political upheaval in Russia and his personal misfortunes prevented the full attainment of this end and he has had to be content with this volume of 700 odd pages, which in the subtitle he describes as a hand- and text-book, for the research, study and practice of photochemistry.

Irrespective of the book itself, this preface will command the interest and sympathy of future generations of students of photochemistry. It tells how the author, formerly Professor at and Director of, the Chemical Institute at the Imperial University of Moscow, began to write this book in the summer of 1917 on his country estate in the province of Riasau in Russia. The revolution started; day after day he saw the followers of Kerensky plunder and destroy the farm and estate to whose development he had devoted years of effort. His country library was destroyed in order to manufacture cigarettes! Then came the Bolshevik outbreak and he was obliged to flee to Moscow where only by selling his furniture and his scientific library, book by book, could he keep his family and himself from starvation. Finally even these means failed, and he and his family made their way to the Ukraine, but he was soon forced to flee from this refuge, at last reaching Germany in 1918, where he found assistance and relief among his scientific and industrial friends. During all this time he kept working on his book and succeeded in getting the manuscript safely to Germany and completing it there.

The book is divided into four parts. The first part, introductory in nature, discusses photochemical valence and the sensitivity of substances to light; states the fundamental laws of photochemistry, discussing the influence of temperature on the photochemical processes; classifies light reactions and gives a short tabular statement of the historical development of the subject.

The second part discusses the practice and theory of photochemical kinetics, catalysis and equilibria. The discussion of the practice or technique is brief, since this has been covered fully in the author's earlier

volume on that subject. The discussion of the mathematical theory is based largely on the author's independent development of his own theoretical views.

The third part, which constitutes the bulk of the book, is a detailed catalog and discussion of all the more important known photochemical reactions. Inorganic and organic reactions are discussed separately; those in the former group being classified according to the significant elements arranged in the order of the periodic system.

The fourth part of the book is devoted to the applications of photochemistry, chiefly photography of course, and this is by far the most sketchy and unsatisfactory part of the work.

The book as a whole will surely be of great usefulness to the students and investigators of photochemical subjects. It is impossible to form any judgment as to the permanent value of the theoretical treatment, but it cannot but be stimulating. The unified treatment of the whole subject, and the collection of photochemical reactions are certain to be valuable. The book suffers from too subjective a point of view. This is brought out perhaps too emphatically by the observation that in his tabulation of important events in the recent history of photochemistry only five entries since 1915 appear; they all refer to publications by the author, the present volume representing the culmination. Certain important aspects of the subject have also been given far too scanty attention. Thus the recent work of Marcelin and of W. C. M. Lewis is not mentioned; that of Perrin is dismissed with four lines of discussion.

Whoever reads the preface cannot, however, but view these blemishes with understanding and sympathy.

ARTHUR B. LAMB.

Die Welt der vernachlässigten Dimensionen. By WOLFGANG OSTWALD. Fifth and sixth editions. Theodor Steinkopff, Dresden and Leipzig, 1921. pp. xii + 253. 23 × 16 cm. Price 7 shillings.

The fourth edition was sold out in six months and we now have the fifth and sixth editions simultaneously, which seems a contradiction in terms. Merely as a matter of curiosity one would like to know how many editions can be issued simultaneously. Perhaps the author uses editions and thousands synonymously.

The author believes that this continued demand means that the book has become, or is going to become, an "Introduction to Colloid Chemistry." The reviewer does not quite see how a book which is in the form of lectures delivered in the winter of 1913-14 can be kept in that form and also up to date. The size of the book has increased 32 pages.

WILDER D. BANCROFT.

Oedema and Nephritis. A Critical, Experimental and Clinical Study of the Physiology and Pathology of Water Absorption in the Living Organism. BY MARTIN H. FISCHER, M. D., Eichberg Professor of Physiology in the University of Cincinnati. Third and enlarged edition. John Wiley and Sons, Inc., New York; Chapman and Hall, Limited, London, 1921. xvi + 922 pp. 217 fig. 15.5 × 23.5 cm. Price \$10.00 (60s. net).

As the author informs us in the preface, he has left this third edition virtually unaltered in respect to every statement contained in the two preceding. He has, however, made a number of additions. These comprise a more detailed development of the concept of the hydrophilic colloid, observations on the swelling of aleuronat, further experiments on the swelling of gelatin in non-acid media, a discussion of the nature of the increase and decrease in hydration capacity of the proteins, a more extensive presentation of the author's conception of secretion, experimental evidence regarding the distinction between swelling and "solution" of colloids and on the behavior of proteins in the presence of buffer mixtures, renewed emphasis on the non-relationship, as the author holds, between disease of the kidney and the generally accepted signs, symptoms and complications of nephritis, additional suggestions regarding the treatment of nephritis, and an even more positive insistence upon the purely infectious origin of vascular disease and chronic interstitial nephritis.

In brief this book deals in very striking fashion with the bearings of colloid chemistry upon the problems of the relations of water to living matter. Its arrangement and printing are excellent, and its literary style clear, interesting and forcible, especially forcible for the author states his views with overwhelming positiveness. The polemical tone is doubtless in part at least a reaction to the acerbity with which some of Fischer's theoretical ideas were attacked and his practical deductions combated when first presented. But even his critics must concede that he was in many points essentially right, and that he was one of the first investigators to recognize the important part which, as nearly everyone now realizes, is played by the colloidal properties of living matter. Fischer may justly complain of the way in which certain methods of treatment (*e. g.*, sodium hydrogen carbonate for acidosis, and gum-saline after hemorrhage) which were criticized as unsound when presented by him some years ago have recently been brought forward by others without adequate credit to him who first suggested them. The reviewer once heard one of Fischer's critics state in a discussion before a scientific assembly that he, the critic, "refused to muddy his thoughts with colloids". Fischer has thrown much light upon a "muddy" field.

On the other hand, the tenacity with which Fischer defends every detail of any position which he has once taken must be admitted as a marked defect in this work. Even admitting that the author's own ideas were originally completely correct and may now be reprinted verbatim, it is

doubtful whether he himself would hold that the entire general background of information available in the literature when he first wrote was correct. Some of the work of others which he quoted as affording foundation and background for his own work must have been partly erroneous or now need re-interpretation. For example, it is highly probable now that the only acid which ever occurs free in any appreciable concentration in a living tissue is carbonic acid.

In the next edition of this work the leading rôle may well be taken with ever increasing confidence by colloids, but many of the conceptions which were generally prevalent, but vague or incorrect, a decade ago should now be discarded, and the author's own work should be presented against a background newer and more specific.

YANDELL HENDERSON.

Lehrbuch der Cellulosechemie. Für Studierende an technischen Hochschulen und Universitäten sowie für Cellulose-Fachleute. By DR. EMIL HEUSER, a. o. Professor of Cellulosechemie at the Technischen Hochschule at Darmstadt. Gebrüder Borntraeger, Berlin, 1921. vii + 188 pp. 3 figs. 16.5 × 25.5 cm. Price M 32.

The volume, as stated in the introduction, has been written in response to a long felt need on the part of students of chemistry, paper-making, textile chemistry and related subjects, no book having hitherto been published on this subject. According to the author such a work should contain a brief, critical review of the important experimental facts and their bearing on the problem of the constitution of cellulose.

The difficulties surrounding the presentation of such a complex subject as cellulose chemistry have been satisfactorily overcome by a division of the subject under the six headings of (A) Alkali Cellulose, (B) Ester Formation, (C) Ether Formation, (D) Oxidation, (E) Decomposition Reactions, and (F) Constitution, each of which has been handled in a critical and illuminating manner. The treatise seems to be noticeably free from printer's errors. "Triglukose," p. 76, should evidently read "Trimethylglukose."

So marked is the present activity of scientific workers on the subject of the constitution of cellulose that the last chapter will probably stand in need of early revision.

The volume can be heartily recommended to all students of chemistry and especially to those interested in commercial progress in the field of cellulose products. No technical chemist can afford to disregard the scientific work at present being carried out in the various countries relating to the constitution of cellulose, for in the acquirement of this knowledge lies the surest road to new developments and progress in all branches.

HAROLD HIBBERT.