

NEW BOOKS.

The Chemical Effects of Alpha Particles and Electrons. By SAMUEL C. LIND, Ph.D., Physical Chemist, U. S. Bureau of Mines. American Chemical Society Monograph Series. The Chemical Catalog Company, Inc., 1 Madison Avenue, New York, U. S. A., 1921. 182 pp., 7 figs. 23.5 × 15.5 cm. Price \$3.00.

The first numbers of the American Chemical Society's Monograph Series will meet an inspection which will not be accorded their successors. Hence it is gratifying to see as the second of the series this able and scholarly treatise on a subject which otherwise would hardly have found a publisher.

Much in it will be new to most chemists. It deals with work which is midway between chemistry and physics, and thus has attracted only a relatively small number of investigators who are masters of both. Chemists have too generally regarded it as physics, and indeed the methods of physics are largely in evidence. Yet it is one function of that science to furnish ever new tools for the fundamental investigations of other sciences and, since the time of Lavoisier's use of the balance, chemistry has taken on new vigor with each successive adaptation of the physicist's methods. The active chemist must keep his eyes open to such possibilities, as the work of Ramsay and of Lind testifies, and as every reader who feels the inspiration of this book will admit; for we have here the application of an entirely new form of energy to the production of chemical reactions, and energy in a uniquely measurable and mechanically definite form. We are largely free from thermodynamics and statistical averages. The energy input is mechanically visible, and gives great promise of a mechanical visualization of the course of the reaction produced. The observation is intimate.

The first three chapters are devoted to an exposition of the physics involved—radioactivity and the nature of gaseous ionization. The next three record early studies of radiochemical action in gases and liquids. Then follow three chapters on the mechanism of radiochemical reactions, and in particular, the relation between gaseous ionization and chemical action, which has been the special problem of Dr. Lind himself, and which furnishes the most promising generalization in this subject, namely that for most reactions a single pair of ions corresponds to the transformation of one molecule. The exact study of the relation between ionization and consequent reactions still has a long future.

There follows an equally interesting discussion of the photochemical equivalence law. The still doubtful subject of action by positive rays and recoil atoms is discussed in Chapter XI, and the book closes with a review of Rutherford's work on the disintegration of other atoms by α particles.

It should be noted that the chemical effects of electrons are hardly touched on, the vast amount of study on reactions in the various types of electron discharge being quite without the scope of this book. Indeed, the

reactions which are discussed are merely the most promising because the most intimately known of all the reactions which are produced by gaseous ionization. Chemists still need a careful analysis of the whole subject of electron effects.

Dr. Lind has given us a readable, authoritative, and complete discussion of his subject. He deserves the thanks of American chemists.

GERALD L. WENDT.

Priestley in America, 1794-1804. By EDGAR F. SMITH, University of Pennsylvania. P. Blakiston's Son and Company, 1012 Walnut Street, Philadelphia, Pennsylvania. 1920. i + 173 pp. 12 × 18.5 cm. Price \$2.00 Net.

On the evening of the fourth of June, 127 years ago, the 60-year old Joseph Priestley, a passenger in the good ship Sansom, landed in New York. Of the earlier life in England of this man, who was primarily an educator and a theologian, and not a chemist, but who, like his friend Franklin, was many-sided and had an intense curiosity regarding the secrets of nature, Thorpe has given us an adequate picture.¹

In this book Dr. Smith gives us an account of the last 10 years of Priestley's life, a record of especial value not only to chemists but to all interested in the religious thought, educational ideas, and politics of this period. Contemporary letters, newspapers, and pamphlets are drawn upon largely for the story of this decade, and the excerpts throw an interesting light not only upon Priestley but upon the young republic in its experimental stage.

Priestley was warmly received on his arrival in New York as a chemist and as a leader who stood for political and religious freedom. Among the welcoming addresses was one from the Tammany Society of New York which will be to many a revelation regarding that organization. His influence was soon felt in education, and to American science the prestige of the discoverer of oxygen and the founder of pneumatic chemistry gave new impetus.

He was the friend and correspondent of Silliman of Yale, Mitchell of Columbia, McLean of Princeton, Thomas Cooper, professor of Chemistry at the University of Pennsylvania and at Carlisle, Woodhouse and the other Philadelphia chemists.

The most certain contribution to experimental chemistry from his laboratory in Northumberland was the preparation of carbon monoxide (1799), the constitution of which was clearly shown by Clément and Dé-sormes in 1801, but much of his scientific energy was spent in the defence against his American critics of his beloved phlogiston theory to which he clung to the last.

¹ "Joseph Priestley," T. E. Thorpe, London, 1906.

The author deals lightly with Priestley's political views. That he was a caustic critic is evident. He was out of patience with the public measures of the country. He disliked them as much as he did those of England, but added "here the excellence of the constitution provides a remedy, if the people will make use of it, and if not they deserve what they suffer."

President Adams had joined in welcoming Priestley to the new world, but they were too diametrically opposed both in religion and politics, and the friendship waned, assisted possibly by the fact that Priestley's friend Cooper was sentenced to prison in 1801 for libeling the President.

Priestley, the teacher, had many valuable ideas on education and his letters to his friend Thomas Jefferson, with whom he had much in common are decidedly interesting. They have much to do with the founding of the new college which the latter contemplated for the State of Virginia, but no inducements could win Priestley back to his early profession, and his modesty regarding his own attainments and ability as an instructor in chemistry is shown in a very candid letter refusing the professorship of Chemistry at the University of Pennsylvania.

His greatest interest was in religious matters, and he can be regarded as the first great exponent of Unitarianism in the country. By word and pen he was constantly engaged in theological discussion and exposition, a field which he regarded as his great life work. The rôle of Priestley, as a metaphysician and materialist, the exponent of a new philosophy, has been little touched upon in this volume.²

In this memoir of Joseph Priestley, Dr. Smith has made a valuable contribution to the history of chemistry in America and has fulfilled in a delightful way the wish of Harriet Martineau in her *Retrospect of Western Travel*.

"Of his retirement in America we have many particulars, but still not enough. Enough can never be learned of the course of life of one whose more homely virtues were now put to the severest test, after those which are commonly esteemed more lofty had well stood their trial."³

F. B. DAINS.

Practical Biological Chemistry—"Guide pour les Manipulations de Chimie Biologique."

By GABRIEL BERTRAND and PIERRE THOMAS of the Institute Pasteur. Translated from the third edition by Hector A. Colwell, M. B., D. P. H. Harcourt, Brace and Howe. New York, 1921. xxxii + 348 pp. 61 figures. 14 × 22 cm.

While the title of this volume implies its dedication to Biological Chemistry, the authors have been by no means restricted to this field. Chapters are devoted to the isolation and detection of the alkaloids, to the elements

² Prof. Woodbridge Riley ("American Thought," 1915, p. 100); "American Philosophy, The Early Schools," 1917, p. 107.

³ "Retrospect of Western Travel," by Miss Martineau. p. 178.

of microbiology, glucosides, essential oils, and the description of the terpenes. Further, scattered throughout the text are a large number of directions for qualitative and quantitative procedures which, strictly speaking, fall far outside the range of Biological Chemistry.

The grouping of the subjects is widely different from that usually adopted in text-books written in English, and while the system gives the student a varied experience, there is not the same degree of logical development of the science which might result from a profound rearrangement of the subject matter. The grouping of the "Estimation of Tannin in Tanning Material" and of the "Ethereal Sulfates in the Urine" is but one illustration chosen at random. As is to be expected a relatively large amount of space is devoted to the sugars, but the quantitative methods, outside of the use of the polariscope, are confined to those suggested by the senior author. In the same way exception may be taken to the determination of such important compounds as urea, only the hypobromite method being discussed and that by means of the Bertrand method, without mention of the several other types of apparatus. The chemistry of the blood is largely ignored, that of the urine most imperfectly treated, such methods as are described being chiefly historical in interest. The newer colorimetric and nephelometric methods are not touched upon.

The translator states in his preface that the somewhat diffuse character of the subject matter is of value, as it is thus able to reach the physician, physiologist, bacteriologist, botanist, agriculturist, and those who are applying science to the furtherance of commercial enterprise. In the reviewer's opinion this constitutes a decidedly negative feature, as to cover these fields adequately means a work of far greater scope than that under consideration. Furthermore, it would mean for each of the workers listed above the necessity of searching through a considerable amount of material not germane to any of the problems arising in his special field in order to find the small amount of pertinent information.

In spite of the comparatively recent date of issue the book reminds one most strongly of those spuriously compendious treatises designed for the use of medical students in which was attempted a conspectus of the entire fields of chemistry and physics. As these encyclopedic volumes have been gradually replaced by specialized texts, so this book would seem to have been superseded by the very excellent and not over-bulky texts now available in the several fields. For the more comprehensive and exhaustive study such treatises as Abderhalden's "Biochemischen Arbeitsmethoden" are available.

In conclusion it may be said that the translation is apparently an excellent one, being clear and terse.

ALLAN WINTER ROWE.

The Chemistry of Synthetic Drugs. Third edition, revised. By PERCY MAY, D.Sc. (Lond.), F.I.C. Longmans, Green and Company, Fourth Avenue and 30th Street, New York, 1921. xv + 248 pp. 14 × 22.5 cm. Price, \$4.25 net.

This new edition of "The Chemistry of Synthetic Drugs" is practically identical with the second edition. It is unfortunate that in putting out a third edition, more effort has not been made to bring it up to date, by mentioning a number of substances which have excited considerable interest among chemists and which have proved of value to medical men, even though some of these substances could not yet be called large sellers from a commercial standpoint. In particular might be mentioned "Thyroxin," the trade name for the essential constituent in thyroid gland extract. Still another is "Apothesin," the hydrochloride of γ -diethyl-amino-propyl cinnamate, a local anesthetic used in place of procaine. It is true that this substance is inferior to procaine, but the fact that it is sold in large quantities and widely distributed makes it deserving of mention. No reference is made to benzyl benzoate or to other benzyl esters which have found such a wide and successful use in the United States as anti-spasmodics. This list could be extended to include several others of less importance which have, however, become large items in the lists of various manufacturers, such as "Oxyl-Iodide," the hydro-iodide of cincophen, "Chloroxyl," the hydrochloride of cincophen, and "Mercurochrom," the disodium salt of dibromo-hydroxy-mercury-fluorescein. All of these substances are synthetics which have attracted more especial attention in the United States during the last three years. Undoubtedly others of real and permanent importance have been discovered and marketed in European countries, but a knowledge of them has not yet become general in this country.

The new points in this edition are a page devoted to a description of "eccaine," a new local anesthetic of complex nature made from certain decomposition products of cocaine, and a few additional sentences of which one concerning mustard gas and a second concerning trinitrotoluene may be mentioned.

For those who are not acquainted with this book by Percy May, it may be said that it presents in a concise and readable form the fundamental facts about the majority of important synthetic drugs and extracted substances which have proved valuable in the medical profession. Methods of preparation are discussed and uses noted. The book may be highly recommended to any one who wishes to acquire a general knowledge of this field.

ROGER ADAMS.

Organic Medicinal Chemicals (Synthetic and Natural). By M. BARROWCLIFF and FRANCIS H. CARR. Industrial Chemistry Series, edited by Samuel Rideal. D. Van Nostrand Company, 8 Warren Street, New York, N. Y. 1920. xiii + 331 pp., 24 figures. 14 × 22 cm. Price, \$4.00.

This volume deals with a phase of the chemistry of medicinal drugs

which has never before been emphasized and will be very useful to organic chemists and to pharmacologists who desire to know how the substances which he uses are produced on a large scale. The authors deal very briefly indeed with the pharmacological action of the substances considered and the book is in no sense a text-book of pharmacology. However, the pharmacological statements are in the main sufficiently accurate. The writers discuss briefly in connection with each type of drug the relation of chemical constitution to pharmacological action. The main emphasis is placed upon the methods of large scale production, and the text contains many figures illustrating the types of apparatus used. The book should tend to stimulate the interest of the organic chemists in the synthesis of medicinal substances and also interest of students in the methods used in the large scale production of organic medicinal drugs.

A. S. LOEVENHART.

Chemistry Review Book—Including Recent Examination Questions. By M. H. KESSEL, B.S., Science Master in the Clark School for Concentration, New York City. Globe Book Company, New York, 1921. 96 pp. 16 figures. 15.5 × 23 cm. Price, \$0.67.

This little book is a careful compilation of definitions, equations, and laws together with very brief statements in regard to properties, uses, and processes which the student is most likely to need in preparing for an examination in chemistry. In this field the book will probably serve a useful purpose. It is the best of its kind that we have seen.

N. HENRY BLACK.