NEW BOOKS

August Kekulé. By Richard Anschütz. Vol. I. **Leben und Wirken.** (**Life and Work.**) Vol. II. **Abhandlungen, Berichte, Kritiken, Artikel, Reden.** (**Communications, Reports, Criticisms, Articles, Addresses.**) Verlag Chemie, G. m. b. H., Berlin W 10, Germany, 1929. Vol. I. xxiv + 708 pp. 120 illustrations. Vol. II. xvi + 960 pp. Illustrated. 17.5 × 25 cm. Price, M. 120.

Thirty-three years ago, Richard Anschütz at the request of Emil Fischer began the preparation of what was at first intended to be a "Nachruf" of Kekulé for the *Berichte* of the German Chemical Society. Through the years, this has become the masterly biography which is now before us.

No one could have been better qualified for this task than was Anschütz. He came to Bonn in 1875, at the height of Kekulé's intellectual and scientific activities, to be Kekulé's lecture assistant. He came from Darmstadt, Kekulé's home city, and this biography was completed in that city. He remained with Kekulé as assistant, pupil, associate and friend until Kekulé's death in 1896.

The biography is divided into two volumes. The first is devoted to the life and work of Kekulé, while the second contains a complete compilation of his publications, some one hundred and twenty-five in number, and of his addresses. The author has not made the mistake of writing one account of Kekulé's life and another separate discussion of his scientific contributions. Kekulé's scientific activities, like those of every great scientist, were the dominating events of his life, and Anschütz has wisely and skilfully woven them into the fabric of his biography.

And Kekulé's life offers a splendid opportunity for a biographer! Kekulé was a student of Liebig at Giessen, of Dumas, Wurtz and Gerhardt in Paris, an assistant of von Planta in Switzerland and of Stenhouse in London. He was Privatdocent at Heidelberg in Bunsen's time, Professor at Ghent at Stas' solicitation and finally Professor at Bonn. This wide experience in the leading countries of Europe brought Kekulé into contact with practically all the great figures in the chemical science of the second half of the nineteenth century. Again, Kekulé was a protagonist both experimentally and theoretically in the most important developments of chemistry during his period. Anschütz has taken full advantage of these exceptional opportunities, and the biography is not only an excellent account of Kekulé's life and achievements but an illuminating study of the development of chemistry during these important years.

The biographer's task was further lightened by the fact that Kekulé was an inveterate collector; he collected butterflies, plants, minerals, chemical preparations and photographs of his teachers, friends, fellow-workers and pupils. He preserved letters written to him by his colleagues, to the number of several thousand. These have added greatly to the interest of the biography. Many of the photographs are of particular in-

terest because they represent the contemporaneous youthful appearance of their subjects, as contrasted with the more usual photographs taken in maturer years.

In addition to Kekulé's already published contributions, this biography contains new material of much historical interest, for instance, the "Cassirte Kapitel zur Geschichte der Benzol Theorie und der Valenz Theorie," which Kekulé prepared in reply to the violent attacks of Kolbe but which his friend Volhard dissuaded him from publishing; also an account, previously unpublished, of Kekulé's lecture on the structure of pyridine, given before the German Chemical Society at the celebration of the twenty-first anniversary of the Benzol Theory.

All told, this biography is indeed an outstanding achievement. It is not merely the labor of a lifetime by a devoted friend, but it is also a critical presentation of Kekulé's contributions toward the solution of the great chemical problems of his time, written by an eminently qualified scholar. Anyone interested either in the development of the theories of valence and of the structure of organic substances, or in the great figures of our science during this period, should not fail to read this excellent biography.

ARTHUR B. LAMB

Smith's College Chemistry. By JAMES KENDALL, F.R.S., Professor of Chemistry in the University of Edinburgh. Revised edition. The Century Co., 353 Fourth Ave., New York, 1929. xii + 759 pp. 179 figs. Illustrated. 14.5 × 22 cm. Price, $3.75.

In this revision of what is probably the most commonly used of the Smith texts, Dr. Kendall has made many improvements. The most noticeable of these is the rearrangement of topics so as to introduce the atomic theory early in the book. At the same time, the chapter on atomic weights and crystal structure has been expanded and improved. This has enabled him to give explanations of chemical action in modern terms practically from the beginning. Early mention is also made of the ion and a simple explanation of electrolysis is given at its first mention.

While Dr. Kendall has not yet given up the old system of ionization, he has explained much more clearly the reasons for the newer view. We still suggest as in a previous review that if the subject be taken up according to the modern standpoint from the beginning, the idea of complete dissociation will be as easily grasped as the older one. It is not necessary to give to a beginner the mathematics of Debye and Hückel any more than it is necessary to accompany a statement of the old theory with its mathematical treatment in order to make it intelligible.

The distinction between primary and secondary products of ionization is still not sharply drawn, although the inaccurate statement of the original texts has been avoided.

The book is printed on larger pages and through the introduction of new matter has been considerably expanded.

There are many new illustrations which add to the attractiveness of the book. The line drawings, however, for some reason do not appear to print as well as formerly, possibly because they have been complicated by shading.

Taken altogether the book is the best we have seen since the edition of 1916 and a decided improvement on Dr. Kendall's first revision of the Chemistry for Colleges.

P. A. BOND

A Laboratory Outline of Smith's College Chemistry. By JAMES KENDALL, F.R.S., Professor of Chemistry in the University of Edinburgh. Revised edition. The Century Co., 353 Fourth Ave., New York, 1929. vii + 198 pp. 32 figs. 14.5 × 22 cm. Price, $1.50.

This laboratory manual, which is designed to accompany the College Chemistry and the Inorganic Chemistry by the same author, is much like its predecessors. Some additional experiments have been inserted and new questions have been added in places where closer reasoning regarding the experiment has seemed desirable. The size of the pages has been increased slightly in order that the student may be able to use the blank interleaves to a better advantage. References are to both the College and Inorganic Chemistry.

P. A. BOND

Anorganische Chemie. Ein Lehrbuch zum Weiterstudium und zum Handgebrauch. (Inorganic Chemistry; a Textbook for Advanced Study and for Reference.) By DR. FRITZ EPHRAIM, Professor at the University of Berne. Fourth revised and enlarged edition. Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany, 1929. xii + 809 pp. 81 figs. 16.5 × 24.5 cm. Price, unbound, RM. 28; bound, RM. 30.

In spite of the relatively short time that has elapsed since the appearance of the last edition (1923) of this book, there have been noteworthy advances in our knowledge both of descriptive and of theoretical inorganic chemistry. Thus no fewer than five new elements have been discovered—Hafnium, the higher homolog of manganese, Masurium and Rhenium, Illinium the last missing rare earth metal and Protactinium. Even more striking advances have been made in our knowledge of the structure of the atom and of the relationships of the elements.

To give adequate consideration to this new material the present edition is about 10% larger than the preceding one; it has also been extensively revised, particularly in the introductory sections dealing with the structure of the atom and the periodic system of the elements, and in the later sections dealing with halogeno salts, the compounds of the metals with one another, the fourth group of the periodic system and the rare earths.

The book maintains its emphasis on the descriptive rather than the theoretical aspect of the subject. It succeeds, better than any other text of its size with which I am familiar, in presenting the innumerable discrete facts of descriptive inorganic chemistry in a correlated and easily comprehensible form. The appearance of translations of this book into English, Spanish and Italian is an evidence of the well-deserved appreciation which it enjoys.

ARTHUR B. LAMB

A Text-book of Inorganic Chemistry. Edited by J. NEWTON FRIEND, D.Sc., Ph.D., F.I.C. Vol. X. **The Metal-ammines.** By MISS M. M. J. SUTHERLAND, D.Sc., F.I.C., Royal Technical College, Glasgow. J. B. Lippincott Company, Philadelphia, 1928. xxvi + 260 pp. 15.5 × 23 cm.

The ammines of cobalt and of chromium are widely known and have been described systematically, for instance in the Seventh Edition of the Gmelin-Kraut Handbook. The ammines of the other metals have not been so adequately considered.

The present volume describes the ammines of all the metals and in the order in which the metals occur in the Periodic System, thus keeping this volume in line with the others of the Series. There are also brief introductory chapters on the history and general characteristics of the metal ammines.

This volume should be useful to those concerned with these interesting substances.

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