much smaller surface and is considerably lighter. When filled it weighs from 35–40 grams. The method of filling obviates all danger of contact between the solution and the rubber connections. C. E. WATERS.

BUREAU OF STANDARDS, WASHINGTON,
September 29, 1910.

NEW BOOKS.

A Manual of Volumetric Analysis, Treating on the Subjects of Indicators, Test-papers, Alkalimetry, Including Assay of Drugs by Titration, Acidimetry, Analysis by Oxidation and Reduction, Iodimetry, Determinations by Precipitation, and by Color Comparison. By VIRGIL COBLENTZ, PH.D., Pharm. M., F.C.S., Professor of Chemistry in the New York College of Pharmacy. Second edition, revised, completely reconstructed and enlarged by Anton Vorisek, Phar. D., Professor of Analytical Chemistry in the College of Pharmacy Columbia University, in the City of New York, with 37 illustrations. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1909.

"Denn was man schwarz auf weiss besitzt kann man getrost nach Hause tragen." While this suggestion was given by Mephisto to what was presumably a German student, the average American student does not have the time, or at least he thinks he has not the time to take notes for the purpose of taking them home. Neither is he content, as a rule, with such a large text as Sutton or Mohr that can be consulted in the departmental library. He is happiest when he has a textbook that does not contain much more than his immediate necessities demand.

This manual of volumetric analysis meets such a demand and meets its acceptably. Considerable information is crowded between the two covers.

In the first edition the ionic theory was applied to indicators only. In this the second edition it "has been extended to chemical reactions other than those of the indicators." Evidence of this extension is rather scarce in the text, being restricted mainly to a few pages in the chapter devoted to "Determinations by Neutralization."

"The didactic system (H = 1,000) of atomic weights used in the first edition has been dropped and replaced by the atomic weights of the International Committee of Atomic Weights. However, the rounded value of H = 1.01 for the official value 1.008 was adopted "to shorten long fractions and to facilitate calculations."

The book will, no doubt, continue to find many friends among students and teachers. EDWARD KREMERS.

History of Chemistry. By SIR EDWARD THORPE. Two volumes, 16mo., illustrated. Vol. 1, pp. xii + 195; Vol. 2, pp. vii + 202. New York: and London: G. P. Putnam's Sons. Price, cloth, 75 cents per volume.

These two volumes by the author of "Essays in Historical Chemistry" form a part of a series of books on the "History of the Sciences," the

"History of Astronomy" by George Forbes having previously appeared.

In the study of the natural sciences there is perhaps no part that is more commonly slighted or neglected than their history. Unfortunately this is still especially true of the history of chemistry. The study of the history of the development of the natural sciences is not only intensely interesting, but it offers rare opportunity to acquire breadth of view and culture, for the growth of scientific thought and methods is most intimately connected with the progress of mankind. No one can really fully appreciate what we know of chemistry without at least a rudimentary knowledge of the history of that science. But very few students of chemistry have read the monumental work of Kopp on the history of chemistry from cover to cover, indeed not many have read through the less comprehensive books like those of Ernst von Meyer or Ladenburg. Most students are so much engrossed with the work of mastering the science itself that they neglect its history, a study of which would not only clear up many difficult points, but would act as a source of inspiration for further vigorous efforts.

The present brief history of chemistry may be highly recommended to the student. It is written in a clear, interesting style, which can not fail to captivate the reader. The first volume traces the history from earliest times to the middle of the nineteenth century, and the second volume treats of the period from 1850 to the present day. The author presents the origin and growth of chemical views and theories as based upon experimental investigation. Considering the space allotted, he has succeeded very well on the whole, though to be sure it was necessary to greatly curtail many of the interesting phases of the history of the science. The volumes contain twenty-five portraits of noted chemists. Some of these have been printed for the first time. One of the special features of the volumes is that they contain many short biographical sketches of men prominent in the development of chemical ideas. In these sketches the author is at his best, as indeed one would expect from his "Essays in Historical Chemistry," which are classics. If any criticism is to be made on the books, it would be that these biographical sketches occupy too much space as compared with that devoted to the tracing of the development of chemical theories.

It is to be hoped that these volumes will stimulate renewed interest in the history of chemistry. May they act as an inspiration to the student of science and lead him to delve further into the more exhaustive treatises on chemical history, a study of which is indispensable to every one who really desires a thorough understanding of the chemical facts, laws, and theories that have thus far been accumulated.

The books are neatly bound in cloth, the paper is good and the print clear. LOUIS KAHLENBERG.

Neuere Anschaungen auf dem Gebiete der anorganischen Chemie. By PROF. DR. A. WERNER. Second Edition. Braunschweig: Friedrich Vieweg und Sohn. 1909. pp. xv + 292. Price, 9 Marks; bound, 10 Marks.

To the average chemist only a limited time is available for familiarizing himself with the details of developments in lines other than his own. The appearance of the first edition of this book in 1905 was therefore welcomed by all who had become interested in the remarkable work of Werner and his co-workers, yet who had gotten only a hazy idea of the subject, on account of the enormous mass of material appearing constantly in the journals. Since then the number of contributions to the literature has not grown less, rather has it increased. This has been due to the extension of the views developed from the study of the metal-ammonia compounds to the hydroxy compounds, basic salts, acids, bases, hydrolysis, dyestuffs, and the difficult but successfully exploited field of the polynuclear compounds. Consequently a new edition of the book has become necessary, and in this second edition the author has brought together in concise form, and with full bibliography, all of the later developments in this fascinating chapter of inorganic chemistry.

Based upon the experience gained from the first edition, the arrangement of the matter has been greatly improved, making the book much more readable to those unfamiliar with the subject.

The new edition shows clearly the development of the author's views concerning valence. His attitude from the outset has been that of one who puts forth no final solution of a problem, but rather a working hypothesis based upon a clear insight into relations among a mass of compounds hitherto considered inarticulate. His hypothesis of "secondary" or "auxiliary" valences has indicated the way for experimental work leading to the discovery of many new compounds, explained the constitution of many old ones, and demonstrated relations hitherto unrecognized. Doubtless, as the author himself believes, the final truth concerning these compounds has not yet been revealed; but certainly his views and work constitute a most important step toward that truth.

The diversified character of the developments in this complex subject can be understood only when it is known that the author, while possessing a fine scientific imagination, is also an indefatigable worker in the laboratory; that while interested primarily in inorganic, he is equally at home in physical and in organic chemistry.

It is to be hoped that at some early day Prof. Werner will publish a laboratory manual embracing the preparation of typical compounds in each important group, and especially the methods employed in passing