

The book is well printed and illustrated, containing portraits of Moissan, Priestley, Davy, Rutherford, Lavoisier, Dalton, Wöhler, Liebig, Bunsen and Mendelejeff. It will prove interesting to every teacher of the science and particularly to those who train beginners.

EDGAR F. SMITH.

A TEXT-BOOK OF ORGANIC CHEMISTRY. BY WILLIAM A. NOYES, Professor of Chemistry in the Rose Polytechnic Institute. New York: Henry Holt & Co. 1903. 534 pp. Price, \$1.50.

Among the short text-books of organic chemistry, this appears as a refreshing innovation. Of the extent of but 534 12mo. pages, it manages to compass the relationships of carbon compounds remarkably well. This is done by masterly grouping, and by a prudent distribution of stimulating reading matter. The style of statement is clear, direct and somewhat less technical than the prevalent language of organic chemistry, but the subject is often carried beyond the range of a beginning student of carbon compounds. Some parts of the book seem best adapted to the understanding of those who have already made things in the organic laboratory or have otherwise found their own way in the labyrinth of carbon combination. The question of its use in lectures not preceded by the student's laboratory work is one to be settled by the teacher in actual trial.

Without doubt the book is made the more clear and simple to any learner in that he is given the full benefit of the latest conclusions of research. Every part is freshly written in the light of the present. As instances may be mentioned, the explanation of alcohol and phenol reactions as those of hydroxides on pages 128, 143 and 283; the definition of acids on page 221; the possible structure of crystallized oxalic acid on page 250; esterification in general on pages 279-282; ethers compared with hydroxyl compounds as to their boiling-points on page 284; isocyanide structure on page 305; compounds of a single carbon atom on page 313; the reactivity of halogen compounds of carbon on page 390; the "strength" of organic bases on page 424.

In the division of subject-matter, the hydrocarbons, both aliphatic and aromatic, are brought first into 65 pages, then alcohols with phenols and their ethers are given 44 pages, the aldehydes, ketones and quinones 48 pages, the acids, aliphatic and aromatic, 52 pages. Nitrogen compounds have their more distinct introduc-

tion among the derivatives of the acids. The hydroxy and ketonic acids in 43 pages are followed by the carbohydrates in 22 pages. The descriptive chemistry of halogen compounds is very briefly given, still later.

The work is eminent throughout for its comparative presentation of corresponding reactions and structures, including those seldom grouped together. It is in this way that the attempt modestly acknowledged first in the preface is measurably realized "to present the fundamental facts of organic chemistry for the use of those beginning the subject." But it is in the consolidation of aliphatic and aromatic chemistry that, as said in the preface, "the most radical departure" of the author is made, in the adoption of what appears to him "a more fundamental and logical classification."

That the binary division of carbon chemistry, in use for about thirty years, is suffering numerous complications may be noted by glancing through the outline of ring systems, as in M. M. Richter's "Lexicon," or by a survey of any such class as the terpenes. Many of us who teach have for some time been compelled to present evidence of closed chain structure along with that of open chains, that the student's mind may have the benefit of contrasts and relationships from the first. And it is always a question, how many parallel relations can be carried together with advantage in a given teaching method.

The question has been less serious, when it has been asked, shall the poly-derivatives be all taken along with those of monovalence through the round of oxygen and halogen and nitrogen union, or shall the mono-derivatives be first taken carefully through the stages by themselves? Now the graver question is before us, shall we study together the like derivatives of all the leading orders of hydrocarbons, comparing them all with each other first as hydroxyl compounds, before entering upon their ethers, and so on? Whatever the answer may be in the interest of logical arrangement, to be adopted in handbooks, or in the compilation of abstracts, the teacher will find the necessity of repetition. In organic chemistry the arrangement of matter in the text is seldom found to be just the best consecutive order for presentation in class-work, and this the teacher must decide upon for himself.

As a compact system of the relationships of carbon compounds, having regard to those of greatest interest, within the compass of a

primary text, this work appears to the present writer to be a very valuable contribution. The consolidation of the aliphatic and aromatic divisions is an experiment in the literature well deserving to be made, and we owe thanks to the author.

The tabulation of derivatives is such as to be suggestive to the teacher and convenient for the learner. Much of it is unique, as that of aldehydes and ketones at page 170. At the close of each chapter is a list of the related laboratory exercises. The introductory chapters upon purification, analysis, and molecular weights, and upon the various physical determinations are excellent.

A. B. PRESCOTT.

NOTES ON METALLURGICAL ANALYSIS. BY NATHANIEL WRIGHT LORD, E.M. Second edition rewritten and greatly enlarged. Metallurgical Laboratory, Ohio State University, Columbus, Ohio. Price, \$2.50.

The first edition of this work was written for the use of the students in the Ohio State University, and the second edition has been enlarged to a manual covering the greater part of the methods in use in steel works laboratories. Besides the analysis of iron and steel, it contains a chapter on sampling and short descriptions of methods for the assay of copper and zinc ores.

The descriptions of the methods chosen are, as a rule, clear and in sufficient detail, and references are given in many instances to the original papers, which will prove valuable where reference libraries are within reach.

There is no index and as the running head-lines consist of the title of the book, reference to the subject-matter is difficult. There are comparatively few illustrations, and the appearance of the book is poor and lacking in finish.

ANDREW A. BLAIR.

QUANTITATIVE CHEMICAL ANALYSIS BY ELECTROLYSIS. BY PROF. ALEXANDER CLASSEN, PH.D., Privy Councillor, Director of the Laboratory of Electrochemistry and Inorganic Chemistry in the Royal Institute of Technology at Aachen. Authorized translation, fourth English from the fourth German edition, revised and enlarged, by BERTRAM B. BOLTWOOD, Ph.D., formerly Instructor in Physical and Analytical Chemistry in the Sheffield Scientific School of Yale University. New York: John Wiley and Sons. 1903. 8vo. vii + 315 pp. 102 illustrations. Price, \$3.00.

The name of Professor Classen is so indissolubly connected with the development of electrochemical analysis, and the earlier editions of this book are so favorably known that the present one