Book 5 (288 pages) deals mainly with the reduction of hydrocarbons and includes the action of free hydrogen upon hydrocarbons, the retrosubstitution of halogen derivatives, and the general applicability of concentrated hydriodic acid as a powerful reducing agent for carbon compounds of all kinds, a method which was discovered by the author in 1857 and particularly investigated and developed by him in 1868.

Book 6 (80 pages) is devoted to studies upon the oxidation of hydrocarbons. It treats of the following topics: the oxidation of hydrocarbons in general; new methods for the synthesis of organic acids; the oxidation of allylene and of other hydrocarbons; the limited oxidation of hydrocarbons; the synthesis of bibasic acids from hydrocarbons; the oxidation of organic acids and of the benzene hydrocarbons; the use of potassium permanganate as an oxidizing agent; closing with a discussion of the camphors and the true function of ordinary camphor.

Book 7 (87 pages) is taken up with the experiments upon the synthesis of alcohols from hydrocarbons. It includes the synthesis of ordinary alcohol from ethylene, of isopropyl alcohol from propylene, of ethyl iodide from ethylene; the history of the synthesis of alcohols; the direct combination of olefines with hydracids; the synthesis of methyl, normal propyl, and isoamyl alcohols, and the isomerism of alcohols. Also, the characterization of alcohols by the direct formation of their esters, a method first applied successfully to borneol and cholesterine, whose structure was then unknown, and later to glycerine and the various saccharine principles, leading to the discovery of polyatomic alcohols and the establishment of the general system of classification for organic chemistry.

MARSTON TAYLOR BOGERT.

THE ELEMENTS OF QUALITATIVE ANALYSIS. BY W. A. NOYES, PH.D. Fifth Edition. New York: Henry Holt and Company. 1901. iv + 101 pp. Price, 80 cents.

The fifth edition of this book is practically the same as the fourth with the exception of that portion in which the detection of acids is considered. This part has been rewritten according to the methods proposed by Abegg and Herz, but their methods have been systematized, elaborated, and extended.

The book consists of an introduction dealing with the general

procedure such as precipitation, filtration, etc., and a discussion of that part of the theory of solutions relating to analytical operations; Part I, which deals with the systematic procedure for the detection of the metals, including a table of reactions of the various metals and acids with the usual reagents; Part II, which deals with the systematic analysis for the metals and the procedure for the analysis and detection of the acids; a special part which treats briefly of the qualitative analysis of water, iron, and gold and silver ores.

In regard to the introductory chapter it has been the experience of the reviewer that the theory of solutions relating to analytical chemistry cannot be properly taught by means of a chapter of this nature. It would seem to be much preferable to introduce the subject as the author has done, and then to present throughout the text examples *apropos* to the subject in hand, thus impressing upon the student's mind the applications and the significance of the theory. As it stands at present the student will be entirely absorbed by the "finding" of some particular element, and not upon the conditions by which this may be best accomplished.

Parts I and II are arranged practically according to the method originally adopted by Fresenius, which involves the use of numerous cross references and on this account is more or less confusing and is not so convenient as the direct statement of procedure. A noticeable omission is that of the Marsh test for arsenic which appears only in one of the tables of reactions and thus the enormous importance of this test is not emphasized. The method for the separation of calcium, barium, and strontium, while entirely satisfactory, is not so delicate as the ether alcohol method which has been shown to be very accurate.

The generally satisfactory nature of the book is indicated by the fact that it has already passed through four editions.

HENRY FAY.

THE LABORATORY COMPANION TO FATS AND OILS INDUSTRIES. By DR. J. LEWKOWITSCH, M.A., F.I.C. London: Macmillan and Co. 1901. xi + 147 pp. Price, six shillings.

With the exception of five pages of introductory matter this volume consists of tables. For methods of work and for full explanation of the tables, one must refer to the author's "Chemical Analysis of Oils, Fats, and Waxes," second edition, 1898.