macy and so also is the absence of any indications of the industrial value of substances. It would have been more logical either to include more such material or else to omit the small amount now included.

It is perhaps hardly necessary to mention that the book has no alphabetical index, a time-saving device which seems to be appreciated by very few French writers. H. W. HILLYER.

AN INTRODUCTION TO CHEMISTRY. BY D. S. MACNAIR. London: George Bell & Sons. 1902. xii + 187 pp.

This is an admirable example of that class of text-books to which Professor Alexander Smith refers in his "Teaching of Chemistry in the Secondary School" under the heading of "The Nature Study Method." No reference is made to the atomic theory, but formulae and equations are freely used, being treated "solely as a short-hand expression of the proportions by weight in which the elements are found by experiment to combine." All but a few of the experiments (intended to be performed by the teacher) are within the capabilities of boys of fourteen or fifteen.

A. M. PATTERSON.

CHEMISTRY BY OBSERVATION, EXPERIMENT AND INDUCTION. A LABORATORY MANUAL FOR STUDENTS. BY J. I. D. HINDS, PH.D., Professor of Chemistry in the University of Nashville. New York: John Wiley & Sons. 1902. 12mo., viii + 192 pp. Price, 75 cents.

This laboratory manual is divided into four parts: In the first part, consisting of 25 pages, there is a description of the commoner forms of laboratory appliances and some instruction in manipulation. The second part, 9 pages, contains instructions and questions on specific gravity, electrolysis, specific heat and the reduction of gas volumes to normal conditions. The third part, 8 pages, entitled "theoretical chemistry" deals with chemical and physical changes, elements and compounds, acids, bases and salts. The fourth part, 144 pages, is devoted to descriptive chemistry. The elements and compounds are prepared according to the directions given and the student's attention is called to the salient properties of the substances he has made by a number of questions. The book serves also as a laboratory note-book, as sufficient space is left in the text for the written answers to the questions. In the opinion of the reviewer the book would have been improved by the introduction of some accurate quantitative experiments illustrating some of the general laws of chemical combination. Also an

elementary exposition of the theories of solution, ionization, etc., would not have been out of place. EDWARD H. KEISER.

A TEXT-BOOK OF QUANTITATIVE CHEMICAL ANALYSIS. BY FRANK JULIAN. St. Paul, Minn.: The Ramsey Publishing Co. 1902. 604 pp. Price, $6.00 net.

"This volume is intended for the aid of students who, having a fair acquaintance with the elements of general chemistry, can devote a limited time to quantitative analysis concurrent with or following the usual qualitative course; and as an introduction to the monographs on special departments of technical analysis....."

"In Part I, after outlining the general principles of the art, there are described the operations of solution, precipitation, etc., and the appliances commonly employed for the purposes." In Part II is found "a graded series of exercises chosen with a view to illustrate the leading principles in analysis....." In Part III technical analysis and special methods are considered. Part IV contains "Notes on the Methods of Analysis," while an appendix offers a discussion of "certain phases of the important subject of the practice of technical and industrial analysis."

This brief summary may serve, perhaps, to give an idea of the scope of the book. It seems hardly probable that it will be serviceable to students, who "can devote only a limited time to quantitative analysis," nor to "those who are content to remain permanently at routine analysis," but to young men who wish to become chemists, to more advanced students, who are anxious to broaden their horizon, and to the technical chemists, who have regard for something beyond their daily duties, it can not fail to be helpful.

Although it lacks, necessarily, the detail of special monographs or of extended works like those of Boeckman, Allen, and others, there is scarcely a similar book of moderate size, in which so many valuable suggestions can be found.

Among the topics treated with exceptional fulness are the following: Attributive Methods, Calculation of Analyses, Errors and Precautions, Colorimetry, Proximate Organic Analysis, Notes on the Methods of Analysis.

One may question the usefulness of this book as a laboratory guide, another may prefer a different selection of exercises for the illustration of the principles of analysis; others may hold opinions