

sulted in its preparation and that this has been done with a thoroughness and intelligence essential to a valuable compilation of this kind. The arrangement of such material is difficult. While that presented in this volume has the disadvantage of separating some experiments that have a common interest, it appears to combine the greatest number of desirable qualities. The matter relating to each subject is well brought together in the index.

E. E. SMITH.

THE ARITHMETIC OF CHEMISTRY. BY JOHN WADDELL. New York: The Macmillan Co. 1899. viii + 133 pp. Price, 90 cents.

This is the best elementary text-book upon chemical arithmetic, or stoichiometry, we have yet examined. The general mistake made by most books of this class is to attempt too much and to explain too little. Formulas and rules are used too frequently, and too many problems are to be solved by simply substituting for  $a$  or  $b$  its numerical value. In Mr. Waddell's book the explanations are clear, and the laws upon which the solutions of the problems depend are plainly stated. The ground covered by the book is not extensive, but the most important chemical problems, such as the calculation of weights, the solution of chemical equations, the volume of gases, the calculations in volumetric analysis, the deduction of formulas from percentage composition, etc., receive a generous share of attention. Among the examples given for solution are many selected from the examination questions of the leading American and British colleges.

RICHARD K. MEADE.

### BOOKS RECEIVED.

Bulletin No. 18. Sugar Beet Investigations in 1898. 24 pp. Bulletin No. 19. Miscellaneous Analyses (strawberries, peas, wines, foods, poisons, fertilizers, and potable waters). 24 pp. University of Idaho Agricultural Experiment Station, Moscow, Idaho. 1899.

A Short History of the Progress of Scientific Chemistry in Our Own Times. By William A. Tilden. London, New York, and Bombay: Longmans, Green & Co. 1899. x+276 pp. Price, \$1.50.

Die aetherischen Oele. Von E. Gildemeister und Fr. Hoffmann. Bearbeitet im Auftrage der Firma Schimmel & Co. in Leipzig. Mit vier Karteu und zahlreichen Abbildungen. Berlin: Verlag von Julius Springer. 1899.

Report on Investigations to Determine the Cause of Unhealthy Conditions of the Spruce and Pine from 1880-1893. By A. D. Hopkins. 265 pp.