

the delicate instruments employed, conduct of the work of collecting data, method in detail of working up results from the logs and indicator diagrams, and methods of adjustment of system of test to character of engines and boilers in hand.

A second part presents the details of tests of simple, compound and triple expansion engines, summaries of the work, and a review in which are given his deductions as to magnitude and character of internal thermal wastes, effects of varying engine-speeds, steam-pressures, super-heating, condensing, and the relative values of the types of engine described, effects of steam-jacketing and of reheating in multiple-cylinder engines and of variations of proportion. The pressure diagrams taken with the indicator from the steam-chest or the steam-pipe of the engine constitute a rare collection of useful data. Sample indicator-diagrams are given from all the engines and are admirably reproduced by the engraver. The book is printed upon heavy calendared paper and is a good piece of work.

The deductions and conclusions of the author are likely to be very helpful to the practitioner and there still is left for the reader the opportunity to study out many interesting, and some valuable, practical and scientific facts, laws and important conclusions.

R. H. THURSTON.

Experimental Chemistry. By LYMAN C. NEWELL, Ph.D. (Johns Hopkins); Instructor in Chemistry in the State Normal School, Lowell, Mass. Boston, D. C. Heath & Co. 1900. Price, \$1.10.

The aim of this book as expressed in the preface is 'to provide a course in chemistry which shall be a judicious combination of the inductive and deductive methods.' The author has selected representative experiments and has left many of the properties, of the substances experimented with, to be determined in the laboratory by the student. A number of simple quantitative experiments and problems are given and several features are added which give considerable choice in the selection of topics for discussion. A number of subjects, suggested by the experiments, are given for discussion in the laboratory and a number of

classroom exercises, in the shape of subjects concerning the historical and descriptive side of chemistry, suggest different phases of the science upon which emphasis can be laid. The book is clearly written and the explanations are sharp and to the point, and it will no doubt prove of value in normal schools and colleges. A teachers' supplement accompanies it.

J. E. G.

The Arithmetic of Chemistry. By JOHN WADDELL, B.Sc. (London), Ph.D. (Heidelberg), D.Sc. (Edin.), formerly assistant to the Professor of Chemistry in Edinburgh University. New York, The Macmillan Co. 1899. Pp. 136.

This book is intended to assist students in overcoming the difficulties they encounter in making chemical calculations. After describing the methods of calculating simple and complex weight relations, the author devotes chapters to the volume of gases, calculations involving weight and volume, calculations of analytical analysis and of formulæ. An appendix contains tables which may have to be consulted in making the calculations. In each chapter the principle is clearly explained by a number of examples, and a variety of problems taken from examination papers of different universities are given, which can be solved by the student. One who has worked through this book should have a good grasp of the principles involved.

J. E. G.

Die Chemie im täglichen Leben. Von PROFESSOR LASSAR-COHN. Vierte Verbesserte auflage. Hamburg, Leopold Voss. 1900. 4 Marks.

Few popular works on chemistry have earned recognition in as short a time and in such degree as this. Not a text-book, its popularity is solely due to its acceptance by the general reader. The first edition appeared in December, 1895, an English translation by M. M. Patterson Muir, with title, 'Chemistry in Daily Life,' being published shortly after by the J. P. Lippincott Co. Since then a Russian and an Italian translation have appeared, and also a second English edition, while translations into Servian, Portuguese, Bohemian, Swedish and Polish are announced.