rent efficiency, transference of ions, etc.; preliminary experiments; calculation of necessary power; and lastly about forty pages of "practical part" including as a practical problem the working of an arsenical copper liquor. The book will be useful in every laboratory where any electrochemical work is done. It is almost needless to add that a translation by Dr. Smith is well done.

Dr. Jones' book, as indicated by its title, is confined to those three physical-chemical methods which find most frequent application in the laboratory. The descriptions of the freezing-point and the boiling-point methods are each preceded by a brief historical sketch and a theoretical discussion of the method, including the processes of calculation. Under the application of the freezing-point method to the determination of molecular weights, the apparatus of Beckmann and its manipulation is carefully described, and in its application to the measurement of electrolytic dissociation, the method of work with the author's apparatus is given. Similarly under the boiling-point method the apparatus of Beckmann, Hite, and that of the author are described, and a detailed account of the method of carrying out a determination follows. Under the conductivity method, the theory is also first discussed and then its application to the measurement of electrolytic dissociation. This book thus brings together in brief space the essentials of theory and practice of these three methods, and is a valuable guide to students in laboratories of physical chemistry.

Both books are of excellent typography, have very complete tables of contents, and neither has an index.

JAS. LEWIS HOWE.

PRACTICAL EXERCISES IN ELECTROCHEMISTRY. BY DR. FELIX OETTEL. Translated by EDGAR F. SMITH, Professor of Chemistry in the University of Pennsylvania. Twenty illustrations. Philadelphia: P. Blakiston, Son & Co. 1897. vii + 92 pp. Cloth. Price 75 cents.

Electrochemistry is becoming year by year of more importance and assistance to the analyst and manufacturer, and any work, historical or descriptive, that adds to our knowledge of the subject is to be commended. The book in question is no more than its name indicates, but it is all that it indicates, for the exercises and examples given are not only practical and simple, but are

most clearly and lucidly set forth. As the translator says in his preface, "The examples given are not only simple, but they are also types of definite processes." Starting with suggestions as to current sources and general apparatus, there follow chapters on the testing and calibration of measuring apparatus, the influence of current density, concentration, temperature, etc., upon the fall of bath-pressure in the electrolyte, influence of current density and concentration on the course of reactions, application of gas analysis to electrochemical reactions, experiments with a diaphragm, metal precipitations with soluble and insoluble anodes, experiments with molten electrolytes, and with multipolar electrodes. The last chapter on organic electrolysis is by Prof. Dr. K. Elbs. The book should be used by all teachers and students in this field and Dr. Smith is to be thanked for giving us this excellent translation.

W. WALLEY DAVIS, JR.

LABORATORY EXPERIMENTS ON THE CLASS REACTIONS AND IDENTIFICATION OF ORGANIC SUBSTANCES. BY ARTHUR A. NOYES, PH.D., and SAMUEL P. MULLIKEN, PH.D. Easton, Pa.: The Chemical Publishing Co. 1897. 8 vo. 28 pp. Price 50 cents.

The authors have collected and thrown into the form of a series of laboratory experiments the various characteristic reactions for different classes of carbon compounds. Workers in organic chemistry gradually acquire a familiarity with these reactions, but the authors have performed a distinct service to the teachers of organic chemistry in bringing them together, where the beginning student can find them, and in emphasizing their importance from an analytical standpoint. This little book might be called the beginning of a qualitative analysis for the carbon compounds, a field which is not yet far advanced.

From this point of view the writer is inclined to regret that the authors did not extend their work beyond the limit of its present twenty-eight pages and make it a more complete collection of the reactions that can be used for the identification of different classes of organic bodies, and supply it with an index so that it would be of use to more advanced workers as well as to the beginners in organic synthesis. The book should find a place in every organic laboratory.

G. M. RICHARDSON.