

## NEW BOOKS.

THE ELEMENTS OF PHYSICAL CHEMISTRY. By J. LIVINGSTON R. MORGAN. New York: John Wiley & Sons. Price, \$3.00.

The third edition of this excellent work has been enlarged from 362 to 522 pages, brought to date, and revised with a view to making its subject appeal to the student as being a tool with which he may obtain results useful for other than simply theoretical purposes.

The revision of the text seems satisfactory: a rapid survey detected no more serious omission than the leaving of the mixture of alcohol and water in a class from which the experiments of W. A. Noyes removed it in 1901. The unnumbered equations on page 6 are true only in one case, which is not specified. Some of the problems on the less recent subjects need further revision. In problem 15, after a question as to the partial pressures in a mixture of gases, we read, "Ans.  $H = 1.164$ ,  $O = 1.164$ , and  $N = 0.774$ ;" and can only say with the humorist, "this is 2 mutch." The signs of equality involve absurdities, and the use of symbols of the elements as abbreviations of their names is quite out of keeping with the scholarly dignity of the text. In a few cases like this, denominate numbers are printed as abstract numbers. After problem 16, asking the specific gas constant of nitrogen, we read, "Ans. 3007 gr. cm." for 3007 grams per sq. cm. In problem 17, the atomic weight of nitrogen is given as 14.073 and that of hydrogen as 1.032; the answer given is actually that computed from these numbers.

The book is a well rounded and balanced presentation of its subject, and may be heartily commended, either for use in the class-room, or for reading without the aid of a teacher.

EDWARD W. MORLEY.

THE ELECTROLYTIC DISSOCIATION THEORY WITH SOME OF ITS APPLICATIONS. AN ELEMENTARY TREATISE FOR THE USE OF STUDENTS OF CHEMISTRY. By HENRY P. TALBOT, PH.D., Professor of Inorganic and Analytical Chemistry, and ARTHUR A. BLANCHARD, PH.D., Instructor in Inorganic Chemistry at the Massachusetts Institute of Technology. New York: The Macmillan Co. 1905. 82 pp. Price, \$1.25 net.

This little volume comes quite opportunely to fill a real want which has been felt by a number of those who have to present

the first- and second-year chemistry in our universities and technical colleges. In it an attempt is made to bring together in concise form the more important of the general principles which underlie the detailed laboratory work of the student during this period, together with enough illustrative examples to bring the theory home to him in his daily work.

As the authors point out in the preface, they have often had to decide between simplicity of statement on one side and accuracy, or at least completeness, on the other. As to just where this line should be drawn is naturally a question which will find almost as many answers as there are teachers of the given field. With this in mind the authors have evidently held the idea of simplicity and brevity uppermost, leaving those who prefer a more rigorous limitation of the general statements of the science to amplify the text in the lectures and discussions which should accompany such a course, thus making the book more flexible as regards its adaptation to existing conditions. This is certainly to be commended, the wide-awake teacher always preferring to amplify rather than expurgate. The book is divided into the following chapters: I. Evidences of Electrolytic Dissociation Afforded by a Study of the Properties of Solutions (20 pages); II. The Law of Mass Action and the Chemical Behavior of Electrolytes (25 pages); III. Electrolytic Solution Pressure (5 pages); IV. Oxidation and Reduction (6 pages); V. The More Common Ions and Their Characteristics (14 pages); VI. Experiments Illustrative of the Theory of Electrolytic Dissociation and Some of its Applications (9 pages).

The treatment throughout is from the kinetic and mechanistic standpoint, the general laws of energetics being left for a later period. Chapter I takes up briefly freezing-point depression, conductivity, osmotic pressure, migration phenomena and chemical activity. Chapter II brings out the importance of solubility, volatility, and ionization with regard to reversible reactions, making free use of the conception of solubility product. The relations of strong and weak acids and bases, hydrolysis and effect of a common ion are then discussed. In Chapter III the solution pressure of both metals and non-metals is dealt with. Chapters IV and V are mainly devoted to expression of the familiar ideas of qualitative analysis in the language of the dissociation theory, including the writing of ion equations. Chapter

VI contains sixteen simple experiments requiring a minimum of special apparatus to illustrate the foregoing text, together with appended questions intended to set the student thinking.

One adverse comment which the reviewer has to make is on the treatment of the semi-permeable membrane which the authors compare (pp. 7 and 8) with a fish net, distinctly, committing themselves to the idea of large molecules of solute and small molecules of solvent. This can hardly be accepted as up-to-date even for elementary work. Experience shows that the conceptions of the "membrane" as an intermediate layer of substance in which the "solvent" is itself moderately soluble but the "solute" is practically insoluble is easily grasped by the student, and gives him a far more useful analogy for the purposes of chemical instruction.

The work as a whole is well done, being clearly expressed and up-to-date and deserves a hearty welcome from the teaching force concerned.

F. G. COTTRELL.

ANNUAL REPORTS OF THE PROGRESS OF CHEMISTRY FOR 1904. Issued by the Chemical Society. Vol. I. London: Gurney and Jackson. New York: D. Van Nostrand Co. 1905. 280 pp. Price, \$2.00 net.

This is the first of a series of reports which are to be prepared and published each year under the auspices of the Chemical Society of London. The subjects treated in the present volume, together with the names of the reviewers, who will be seen to be men well-known in their respective departments, are as follows: General and Physical Chemistry, by James Walker; Inorganic Chemistry, by P. Phillips Bedson; Organic Chemistry—Aliphatic Division, by H. J. H. Fenton; Organic Chemistry—Aromatic and Other Cyclic Divisions, by Julius B. Cohen; Stereochemistry, by William Jackson Pope; Analytical Chemistry, by Alfred Chaston Chapman; Physiological Chemistry, by William Dobinson Halliburton; Agricultural Chemistry and Vegetable Physiology, by John Augustus Voelcker; Mineralogical Chemistry, by Arthur Hutchinson; Radioactivity, by Frederick Soddy.

Speaking generally, the progress of the last year is presented in these reports in a far more readable form than is usual in such reviews, which are apt to deteriorate into annotated bibliographies of publications. Special mention should be made of the article on radioactivity, which is not confined to the work