

plete, but the results proved conclusively that the water-soluble portion, which crystallized in octahedra, was nearly pure potash alum.

HARRY F. KELLER.

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*Rapid Determination of Molybdenum in Steel.*—It has been found to be an improvement on the method previously described,<sup>1</sup> to use only 0.8 gram of drillings, and to make the precipitation in 200 cc. of the solution instead of 300 cc., taking only 100 cc. of the filtrate for reduction and titration. In this way an evaporation requiring more time than all the rest of the analysis put together is dispensed with. Reduction and titration should take place in small, and not in large volume of solution, on account of reduction not always being complete in the latter case, as is proved by the fact that Brakes<sup>2</sup> finds it necessary to use the old Emmerton factor. But if the separation be made in 200 cc. of solution, ammonia may not be used because the separation is an incomplete one with this reagent when made in a small volume of solution. The caustic soda solution is most easily made by dissolving 1 pound in 2000 to 2100 cc. water. 100 cc. of this solution is used in a determination.

Another improvement in the method (Brakes) is to expel the nitric acid used for the solution of the steel by adding 3 cc. of concentrated sulphuric acid and evaporating to fuming. The complete expulsion of the nitric acid is very important, and care must be taken that none remains on the cover, since nitrous acid or other reducing compounds are formed when a solution containing nitric acid is passed through the reductor. The results obtained by Brakes<sup>3</sup> indicate that chromium does not interfere with the determination when a sulphuric acid solution is used.

GEORGE AUCHY.

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## NEW BOOKS.

ELEMENTARY CHEMISTRY. BY L. M. DENNIS AND F. W. CLARKE. New York: The American Book Company. 1902. 340 pp. LABORATORY MANUAL to accompany the above. 254 pp. Interleaved.

The matter treated in this book is essentially the same as that to be found in most other works of its class. The mode of treatment is not especially novel. It is in fact less so than in several

<sup>1</sup> This Journal, 24, 273.

<sup>2</sup> J. Soc. Chem. Ind., 21, 832.

<sup>3</sup> Loc. cit

recent High School texts. Thus the atomic and molecular theories make their *début* within ten pages from the beginning, while the principle of definite proportion is reached on page 59. Even when this law appears, the phraseology suggests a dogma rather than a result of observation. Instead of demonstrating the building up of an equation from quantitative experiments, the authors show (p. 69) how, given the equation, we may calculate the results of an experiment *before* its actual performance.

The "two-volume law" (p. 96), which is not a "law" (that is, a general truth) at all, as the writers themselves tacitly acknowledge later, is used as the foundation of an elaborate proof that if we take the molecular weight of a compound and halve it, we get the density. This derivation of facts from theoretical considerations is typical of the way in which the principles of the science are handled in the book. Presently the compounds of carbon are used for illustration and the molecular weights of  $\text{CH}_4$ ,  $\text{C}_2\text{H}_4$ ,  $\text{C}_2\text{H}_2$ , etc., are shown to give the densities when they are divided by 2. The authors add: "In a similar way we can investigate the volatile compounds of other non-volatile elements, and prove that the two-volume law above indicated is of universal application." They have overlooked the fact that in taking the molecular weights 28 and 26 for ethylene and acetylene they were assuming the very law which they afterward hold their illustration to have proved. The maintenance of the distinction between fact and theory is the most difficult task of the teacher of chemistry. Even trained chemists find it hard. It seems to the reviewer that the present book fails to make this distinction sufficiently clear. The promise of inductive and rational treatment made in the preface is belied by much of the contents, and that at the most vital points.

The book is marred by the presence of a number of incorrect or unfortunately worded statements, such as, that when iron burns in oxygen, the melted *metal* drops to the bottom of the bottle; that ozone has a suffocating odor; that hydrogen peroxide contains "exactly twice as much oxygen" as water; that "as a solvent, water far *exceeds* every other liquid known"; and so forth. The laws "govern" regally instead of existing only so long as they are "good". The resurrection of the electrochemical series of Berzelius is strange in view of the fact that modern research has given us the means of placing the elements in the order of *chemical*

activity. Fortunately, or unfortunately, the explanation is so befogged with statements about electro-negativeness and electro-positiveness that no application, correct or incorrect, to chemical behavior is likely to be made.

The laboratory manual covers a great deal of ground. A few questions are appended to each experiment. Some quantitative experiments are given, but they are at the end of the book.

The typography, illustrations, and binding of both books are excellent.

ALEXANDER SMITH.

DISINFECTATION AND DISINFECTANTS. A PRACTICAL GUIDE FOR SANITARIANS, HEALTH AND QUARANTINE OFFICERS. BY M. J. ROSENAU, M.D. Philadelphia: P. Blakiston's Son and Co. 353 pp. Price, \$2.00 net.

The author of this book is connected with the United States Marine Hospital Service, as Director of the Hygienic Laboratory, and has had abundant opportunity to observe practically what he has written about. The work is divided into six chapters of which the first three treat of the various disinfecting agents in general use. The opinions of the author in discussing the applicability and relative merits of the substances considered seem eminently sound and practical. The fourth chapter deals with means for destroying insects which carry diseases. The fifth chapter gives clear directions for disinfection of houses, ships, railway cars, furniture, clothing, books, etc., and is very satisfactory. The sixth and last chapter deals with the question of disinfection after special diseases, and for each one the most efficient treatment is suggested. The book is illustrated and is well printed. On the whole it may be recommended to those in need of information in this direction.

J. H. LONG.

DIE ZERSETZUNG STICKSTOFFFREIER ORGANISCHER SUBSTANZEN DURCH BAKTERIEN. BY DR. O. EMMERLING. Braunschweig: Friedrich Vieweg und Sohn. 141 pp. and 7 plates. Price, 4 marks.

This little book describes the important group of decompositions usually classed as fermentations in which the active agents are not true ferments, in the modern sense of the word, but bacteria. The best known examples of such reactions are the acetic, lactic, butyric and gummy fermentations, in which carbohydrates or their derivatives are the materials on which the bacteria work. The author discusses these changes and several