

ceivable, however, that the method will, unfortunately, find favor in the eyes of some on account of its positiveness and because it is, perhaps, easier to teach dogmatically than to appeal always to the student's judgment and to be prepared with a rational knowledge of facts and their connection to meet convincingly any keen doubter's questions.

The axiomatic statements are not always correct, as, for instance, when it is said on p. 60 that "the atomic weight of an element may be defined as that quantity which combines with one atom of hydrogen" (!) On p. 5 we have the statement that "in gases the molecules repel one another". On p. 61 we have "it has been found that for most substances that can be volatilized without decomposition the vapor density referred to hydrogen is just half the molecular weight"—it would be interesting to know what the exceptions are. Questionable statements are very numerous.

The second object of the book, *viz.*, to serve as a reference book, seems to the reviewer to be more worthy of success than its first object. The descriptive part is good. It includes quite a large number of historical facts and it gives briefly methods of preparation and manufacture for a large number of compounds. The newest important methods are, however, frequently missing. For instance, the absence of any mention of the electric methods of preparing alkalis, chlorates and hypochlorites and of the contact method of manufacturing sulphuric acid is noted. There is a good index.

CHICAGO, October 20, 1902.

JULIUS STIEGLITZ.

ACHT VORTRÄGE ÜBER PHYSIKALISCHE CHEMIE. GEHALTEN AUF EINLADUNG DER UNIVERSITÄT CHICAGO, 20. bis 24. Juni, 1901, von J. H. VAN'T HOFF. BRAUNSCHWEIG : F. Vieweg und Sohn, 1902. 15 × 18 cm. 81 pp. Preis : geheftet Mk. 2.50.

These eight lectures, delivered on the occasion of the decennial celebration of the founding of the University of Chicago, are divided into four groups, each consisting of two successive discourses. The subjects treated are the relation of physical chemistry (1) to chemistry, (2) to the industries, (3) to physiology, and (4) to geology. The author considers that the new developments of physical chemistry rest upon the theory of solutions, being essentially an extension of Avogadro's hypothesis to solutions,

and upon the application of thermodynamics, especially of the Carnot-Clausius principle, to chemical problems. The theory of solutions and the dissociation theory of Arrhenius receive consideration in the first and third groups of the lectures, which give a good brief presentation of the theories and what is claimed for them, without, however, even suggesting that there are now many facts known that do not support these hypotheses. Concrete illustrations are given throughout the entire discourses, which are of the character of general outlines. The brief, concise presentation of the author's splendid researches on natural salt deposits is especially interesting and instructive, particularly so because the work was accomplished without the aid of the theory of solutions and the Arrhenius hypothesis. On the part of those readers who do not have an elementary knowledge of physical chemistry, these lectures will require careful study in order to be fully comprehended.

LOUIS KAHLBERG.

**THE CHEMISTRY OF THE TERPENES.** By DR. F. HEUSLER, Privat-docent of Chemistry in the University at Bonn. Authorized translation by DR. FRANCIS J. POND, Assistant Professor in the Pennsylvania State College. One vol., 457 pp. Carefully revised, enlarged, and corrected. Philadelphia : P. Blakiston's Son and Co. 1902. Price, \$4.00.

The word terpene seems first to have been used by Kekulé. Such words as terebentene, terebene, terpilene, etc., were coined by French chemists to designate the hydrocarbon now known as pinene and its isomers into which it could be converted, *e. g.*, by heat or acids. Some of these terms acquired a generic as well as a specific meaning. The advantage of a word without a double meaning must have been apparent when Kekulé suggested the word terpene, for it soon came into general use.

However, since Baeyer extended the principles of the Geneva Congress nomenclature to the terminology of the terpenes, the word terpene has also acquired a double meaning. On the one hand it is still used in its larger sense comprising all hydrocarbons  $C_{10}H_{16}$ ; on the other, its use has been specialized, restricting it to those hydrocarbons  $C_{10}H_{18}$  which are tetrahydro-derivatives of cymene. It is in the former, broader sense in which the term is used in the book before us.

Although substances containing all the way from one to twenty