

It would take up too much space to give anything like a full résumé of the contents of this interesting digest of progress. I must content myself with calling attention further to excellent articles on zinc, pyritic smelting, metallography, mine timbering, alloys as solutions, ore dressing, liquefied carbonic acid gas and magnetic separation. The volume ends with a number of statistical tables.

EDWARD HART.

INORGANIC CHEMISTRY, WITH THE ELEMENTS OF PHYSICAL AND THEORETICAL CHEMISTRY. BY J. I. D. HINDS, PH.D., Professor of Chemistry in the University of Nashville. New York : John Wiley and Sons. 1902. 8vo. viii + 566 pp. Price, \$3.00.

The book, as stated in the preface, is intended to supply a rather complete text-book on inorganic chemistry for colleges and universities; and a handy reference book for all students and teachers of chemistry. Opinions should not differ widely as to how well the author has accomplished either of these objects. As far as the former is concerned, the method adopted is almost entirely that of the most objectionable style of dogmatic instruction: laws, hypotheses, definitions are laid down in axiomatic fashion, with scarcely a hint of the broad experimental basis on which they have actually been developed; structural formulas are used from the very beginning with never a word as to the facts which led to their introduction and use; much effort is expended towards making methods of calculation go by rule rather than by reasoning. The reviewer has looked in vain, repeatedly, for the fundamental laws of definite and multiple proportions (!). A discussion of them is promised on p. 57 but diligent search in all but the later chapters of the descriptive part and in the index failed to lead to their discovery!

In a word, not one particle of the beauty of the inductive method, to which chemistry owes its successful development and all its fascination, is left. The student is asked to accept, to believe; his faith and memory are appealed to and cultivated at the expense of his faculty of reasoning and his power of judging at first hand. It is a source of wonder to the reviewer whether any student's interest in chemistry can survive this method of instruction, and how any inherent power of inductive reasoning from fact to hypothesis and law can escape positive destruction. It is con-

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,