NEW BOOKS.

ELEMENTS OF MODERN CHEMISTRY. BY CHARLES ADOLPHE WURTZ. Fifth American Edition. Revised and enlarged by Wm. H. Greene, M.D., and Harry F. Keller, Ph.D. 12 mo. pp. 788. Philadelphia: J. B. Lippincott & Co., 1895.

On the whole, this is a very good text-book, well adapted to the needs of high schools and general use in colleges, as its popularity proves. From the reviewer's standpoint, however, it possesses two distinct faults. First, the disproportionately large space given to organic chemistry. This part of the subject is full of very important information, but it has taken on too much of the style of a dictionary and too little of the analytical method of a treatise. The result is 360 pages of material which by judicious generalization should have been condensed to half that amount, in order to correspond in size to the rest of the book. For instance, two pages are given to describing succinic acid, and yet barely a single page each to barium, strontium or cadmium, with all their compounds; the derivatives of urea take five pages, while the subject of chemical energy and thermochemistry is disposed of in just half that space. Secondly, the lack of true inductive reasoning in establishing the probability of the atomic theory. The introductory pages on chemical theories and laws contain the "Articles of Faith" of the atomic theory, very clearly stated, but it must be said that the theory itself is virtually taken for granted. For instance, speaking of forming ferrous sulphide by melting iron filings and sulphur together, it is said, "After cooling it is perfectly homogeneous, neither iron nor sulphur can be recognized. Both have disappeared as such." This is perfectly true, and according to experience. But, a few lines further we have: "It cannot be admitted that these two substances are confounded in the molecule, or that the effect of the combination of sulphur with iron is an interpenetration of the two bodies, so intimate that they both disappear in what might be called a homogeneous mixture." The student might very naturally inquire why it could not be admitted, since such an admission would coincide so well with the facts as far as we know them; and the only answer that

could be made would be, "It would not agree with the atomic theory." The student might well say, "So much the worse for the theory!"

We note the absence of thermochemical data, the most important of which might well serve for illustrating the general relations of the elements to each other and to the acids. In the chapters describing the metals and their compounds, many of the simple blowpipe tests for identifying the elements are omitted, and for some common elements no qualitative tests at all are given. The table of the melting-points of the metals needs revision. The electrolytic method of refining copper cannot now be spoken of as expensive. The mineral Edisonite, spoken of as a form of titanic oxide, has been proved to be rutile. Among the methods of manufacturing caustic soda, bleaching powder, and potassium chlorate, the electrolytic methods are not mentioned—as they surely should be.

On the other hand, the numerous revisions to which the text has been subjected have ensured the almost certain accuracy of the facts presented and the absence of mistakes. The revision up to date has been done in a way which reflects great credit on the revisers. Granted that the teacher will remedy the faults first spoken of by cutting down much of the detail of the organic chemistry and presenting the atomic theory in a more logical manner, and we may pronounce the book the best elementary text-book of chemistry of the year.

JOSEPH W. RICHARDS.

JUSTUS VON LIEBIG, HIS LIFE AND WORK. By W. A. SHENSTONE. 12mo. pp. 219. $1.25. New York: Macmillen & Co.

Liebig's personality was an interesting one. His life was one of earnest purpose and hard work. He was a many-sided man, and his influence was felt in many directions. In investigation, as a man of affairs and as a popular teacher, Liebig's work has been of use to his kind. Of the brilliant chemists of his day—Graham, Dalton, Wöhler and Dumas, among others—his career is the most interesting. Liebig's work began in Gay Lussac's laboratory where in connection with his work on the fulminates he discovered isomerism. In 1824 he went to Giessen, and in 1852 to Munich. "Liebig was essentially a pioneer in science.