objections to present theories are stated with greater distinctness. While he recognizes the great fertility of Arrhenius' hypothesis, he says: "The return of electrochemism which is so evident in the supporters of the hypothesis of electrolytic dissociation, and the notion of a splitting up of atoms into electrons, in my opinion only complicate and in no way explain so real a matter as the chemical change of substances." His call for a theory which accounts for the chemical process of solution will find a ready response, yet his own conception as before fails to fit the facts in any such detailed way as to carry conviction.

In more than one place, the author takes occasion to assert emphatically his disbelief in a primary matter, however strongly some of his own discoveries would seem to point in that direction. "The more I have thought on the nature of the chemical elements, the more decidedly have I turned away from the classical notion of a primary matter, and the hope of attaining the desired end by a study of electrical and optical phenomena."

Perhaps the most remarkable thing in the book is Mendeléeff's attempt to identify the ether with the lightest of all gases and the first member of the zero group, of enormous molecular velocity, molecular size correspondingly minute, and devoid of combining power. Inasmuch as this conception is largely the result of extrapolation over a long range, the conclusions are correspondingly hazardous. Minor errors in a work of this character scarcely deserve a place in a review of this scope.

EUGENE T. ALLEN.

COURS DE CHIMIE. A L'USAGE DES ETUDIANTS DU P. C. N. PAR R. DE FORCRAND. Paris: Gauthier-Villars. 1905. Vol. I, 325 pp. Vol. II, 317 pp. Price, 10 Francs.

In these volumes the author presents a course in chemistry, that he proposes to teach in one year, allowing three lessons to each week. Forty-eight pages in the first volume suffice for a discussion of general principles, laws, etc.; then follows a systematic treatment of the *metalloids* and *metals*. Organic chemistry occupies two-thirds of the second volume, while the remaining 100 pages give an outline of analytical chemistry.

This work may be of value to the special class of students for which it was written, but for general use it leaves much to be desired. Certainly many teachers will object to a discussion of general principles before any of the simple facts of chemical action

have been learned. The treatment of the topics is frequently so meagre that even an advanced student would have difficulty in comprehending it. The periodic law, the ionic theory, the Kjeldahl method for the determination of nitrogen and many other important subjects are either not mentioned, or are skilfully concealed. There are so many good text-books in English, French and German, that this new candidate for favor seems unlikely to secure a prominent place. L. B. HALL.

THEORETICAL CHEMISTRY FROM THE STANDPOINT OF AVOGADRO'S RULE AND THERMODYNAMICS. By WALTHER NERNST. Revised in accordance with the fourth German edition by R. A. LEHFELDT. xxiv + 771 pp. London: Macmillan & Co.; New York: The Macmillan Co. Price, $3.75 net.

No English translation of this standard work upon the general principles of chemistry and upon physico-chemical relations has appeared since shortly after the issuance of the first German edition in 1893. Since that time the original work has been so much modified and extended that the former translation has become entirely antiquated, and that the present one may be regarded as substantially a new book. It is, therefore, not worth while to review in detail the differences between the two publications. It will suffice to call attention to the fact that the English reader has now available to him a translation of the most recent edition of one of the leading German works upon theoretical chemistry—a work which is of great value for purposes of reference, and which as a textbook is especially suited to the somewhat advanced student who wishes to make a fairly thorough study of the subject. The translation of the portions of the book added or rewritten since the first edition is fairly satisfactory; that of the original portion, which unfortunately was only partially revised by the new translator, is often scarcely intelligible. A. A. NOYES.

STUDIES IN GENERAL PHYSIOLOGY. By JACQUES LOEB, formerly of the Department of Physiology in the University of Chicago; Professor of Physiology in the University of California. Decennial Publications of the University of Chicago, Second Series, Volume XV. In two volumes. Chicago: The University of Chicago Press. 1905. 782 pp. Price, $7.50 net.

The appearance in book form of the brilliant work of the author along the lines of general physiology will be welcomed by physiologists and other scientific men, who are in touch with physiological literature. So many popular accounts have appeared from sensational journalists, without Loeb's knowledge or consent, that