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

many would like to know exactly what he has accomplished. We have here a republication of 28 of the most important original articles, which appeared from the author from 1889 to 1902, in various German and American journals. Preliminary notices and communications, which appeared in collaboration with assistants and students, have been omitted in this publication. The German articles have been translated into English. It is, of course, impossible to discuss Loeb's work within the limits of this review, but the fields of his activity may be gathered from the following general topics: Heliotropism, heteromorphism and geotropism in animals; regeneration, the part played by the nucleus in cell oxidation; salt action; fertilization. It is interesting to note that Loeb has received the inspiration for much of his work from two related sciences. His beautiful early work on heliotropism and geotropism was apparently inspired by the corresponding work of Sachs on the botanical side. He showed that the laws laid down by Sachs for sessile plants hold perfectly for some of the lower forms of animal life as well. From this work the investigations on heteromorphism, regeneration, will and instinct developed. Then again, his work on salt action was apparently stimulated by the rise of the ionic theory of solution. Decidedly the most striking and far-reaching of his experiments are those on parthenogenesis, which are certainly epoch-making. He succeeded in producing normal larvae from the unfertilized eggs of the sea urchin. He found that an increase in the concentration of the sea-water as well as slight changes in the reaction could bring about this parthenogenesis. Later, the experiments on artificial parthenogenesis were extended to annelids. The subjects are written up in such a broad and highly suggestive way as to make them most readable. Loeb is at present too young and too vigorous an investigator to have his place among physiologists assigned to him, as we know not what he has in store for us. His work has, however, placed him in the foremost rank as an investigator, and his influence has been widely felt in physiology and the related sciences. This work would be a valuable addition to any physiological or biological library.

A. S. LOEVENHART.

FIRE ASSAYING NOTES. By F. P. DUNNINGTON, School of Analytical Chemistry, University of Virginia. 1905. Easton, Pa.: Eschenbach Printing Company.

This pamphlet is in the nature of a syllabus, no doubt designed