Although it appears not at all unlikely and not without precedent that oxygen may, according to conditions of concentrations and speeds of reactions, sometimes enter into combination through free valences of molecular oxygen, sometimes through atomic or ionic oxygen, the last, and probably the lesser product of progressive dissociation, according to

$$O_2 \rightleftarrows {}^{+\,+}_{-\,-}\!\!-O-O-\!\!{}^{-\,-}_{+\,+} \rightleftarrows O + O.$$

so that both theories may ultimately prove to be well-founded, nevertheless to-day Traube's theory is much the stronger of the two on the basis of experimental evidence, and many important oxidation processes have been proved to conform to it and others, such as the combustion of hydrogen in the oxy-hydrogen flame, are possibly processes of the same kind. Under these circumstances Engler and Weissberg's book is a timely and valuable summary and elucidation of a mass of facts and observations from the point of view of the predominant theory. It is to be hoped that we shall soon have an equally good book bringing together the investigations on the second great problem of oxidation, its dynamics, especially from the point of view of physico-chemical measurements of oxidation cells, free energy and the catalysis of oxidation reactions. JULIUS STIEGLITZ.

ELECTROCHEMISTRY. BY R. A. LEHFELDT. New York: Longmans, Green and Co. 1904. 268 pp. Price, $1.60.

This forms one of the eight text-books on Physical Chemistry edited by Sir William Ramsay.

Chapter II, on "The Relation of Chemical Constitution to Conductivity", was ably prepared by T. S. Moore and is very complete in itself.

The book as a whole is very carefully written by authors who show that they are perfectly familiar with the developments of the science. The work fulfils to the letter the wish of the editor of the series, that the subject be brought up to date. It is properly confined to the principles and theories of electrochemistry. Matters pertaining more particularly to other physical properties, such as osmotic phenomena, etc., are briefly but clearly touched upon. The technical side of the subject is also not given much weight.

The work has been well prepared for students and investigators, as distinct from readers and experimenters, and it covers practically

all the important work on this portion of Physical Chemistry, both theoretical and experimental, which has been published.

The thermodynamic principles and the dependent calculations of the electromotive force of cells are very clearly given and illustrated. It might be considered bold to introduce some of the present theoretical work into a so-called text-book, such, for example, as the electron theory, which has been advanced so rapidly by the work of J. J. Thomson in connection with conductivity in gases, and that of Drude in the case of metallic coduction, but the reviewer believes that the way in which these subjects are treated could hardly be improved, and that in the use of the book students cannot fail to be attracted by the complaisant fearlessness of the author. This will do much to advance the correct and to correct the imperfect in recent theories. A few useful tables have been appended to the work.

The text-book should be a very satisfactory one for use in classes in electrochemistry. It is certainly sufficiently advanced and completely put together to satisfy the needs of the most advanced classes studying this subject. W. R. WHITNEY.

TEXT-BOOK OF GENERAL PHYSICS FOR HIGH SCHOOLS AND COLLEGES. By JOSEPH S. AMES, PH.D., Professor of Physics and Director of the Physical Laboratory in the Johns Hopkins University. The American Book Company, 768 pp. Price, $3.50.

Professor Ames gives us in this volume an excellent text-book written in the conviction "that the most important element in a course of instruction in physics is a text-book which states the theory of the subject in a clear and logical manner so that recitations may be held on it." In the opinion of the reviewer the "attempt to give a concise statement of the experimental facts on which the science of Physics is based, and to present with these statements the accepted theories which correlate or 'explain' them" is eminently successful. The book is a good specimen of the bookmaker's art and is remarkably free from errors of all kinds. A few inaccuracies of statement, however, have been noticed. Referring to p. 246, it may be said that the ordinary method of obtaining solid carbon dioxide is to invert the cylinder and allow the liquid to escape. The triple point for carbon dioxide is about —57° and 5 atmospheres pressure, whence it follows that —80° cannot, as has been done on p. 276, be said to be the boiling-point of the liquid.