

magic crystal in England; Tycho Brahe at Uraniborg, and other noted and notorious figures march across the stage. There are passages describing the observatories, alchemical laboratories and pharmacies of the sixteenth century, and with them are appropriate full-page illustrations which make the descriptions more real. There are also reproduced recipes for nauseous and complex remedies whereby all diseases may be healed, and directions, couched in alchemical language, for the transmutation of base metals into gold. To any student of the history of science the volume is well worth reading. It occupies a place by itself in scientific literature.

F. W. CLARKE.

REFLECTIONS SUGGESTED BY THE NEW THEORY OF MATTER. BY the RIGHT HON. ARTHUR JAMES BALFOUR, M.P. New York: Longmans, Green & Co. Paper, 24 pp. Price, 38 cents.

This little pamphlet is a reprint of the presidential address delivered before the British Association for the Advancement of Science at Cambridge, last August. The point of view of the author is largely given in the following quotation. Speaking of the physicist, he says: "He seeks for something deeper than the laws connecting possible objects of experience. His object is physical reality; a reality which may or may not be capable of direct perception; a reality which is in any case independent of it; a reality which constitutes the permanent mechanism of that physical universe with which our immediate empirical connection is so slight and so deceptive."

W. A. NOYES.

DIE HETEROGENEN GLEICHGEWICHTE VOM STANDPUNKTE DER PHASENLEHRE. BY H. W. BAKHUIS ROOZEBOOM. Zweites Heft: Systeme aus zwei Komponenten. Erster Teil. Braunschweig: Friedrich Vieweg und Sohn. 1904. 14×22 cm.; xii+465 pp. Price, 12.50 marks.

This number deals with two-component systems in which only one liquid phase is possible and in which only the pure components occur as solid phases. To the majority of chemists the methods of determining the solid phases will be one of the interesting chapters. Among these methods the first is the orthodox one of removing the solid phase and analyzing it. This is the one to be employed wherever possible and this is practically the only one used to any extent by inorganic and organic chemists to-day. This method is not applicable for metals, and an examination of the structure under the microscope is the only really reliable way of coming to a correct conclusion. Some conclusions can

also be drawn from a study of the electromotive force of alloys, but this is not a very reliable method. While the author mentions the measurement of conductivity as a means of studying alloys, this method is not at present of the slightest value. Among other methods are the determinations of densities and heats of formation. These last four methods, as well as Tammann's cooling-curve method, are not accurate enough to be of anything more than historical interest.

The section on solubility curves should be of interest to the general chemist, who ought also to read the chapter on polymorphism. While the essential characteristics of monotropic and enantiotropic substances were discussed under one-component systems, the behavior in solutions is, of course, treated in this number.

The author has brought in quantitative and qualitative relations throughout. It remains to be seen whether this is wise. We distinguish sharply between qualitative and quantitative analysis. Since the phase rule is essentially qualitative it seems to the reviewer that the subject can be treated more clearly by the application of the phase rule to qualitative equilibrium followed by the study of quantitative relations classified according to the phase rule. The answer to this, of course, is that no one has ever written a book in which quantitative equilibria were discussed according to the phase-rule classification and that most physical chemists do not know how it should be done.

WILDER D. BANCROFT.

THE ELECTRIC FURNACE. BY HENRI MOISSAN, Membre de l'Institut, Professor of Chemistry at the Sorbonne. Translated by A. T. DE MOULPIED, B.Sc. (Lond.), M.Sc. (Vict.), Ph.D. Assistant Lecturer in Chemistry in the University of Liverpool. London: Edward Arnold. 1904. Octavo, xi+307 pp. Price, \$2.75.

This is the second translation of Moissan's "Le Four Électrique", which has appeared in English within a year, each having a preface by the author. The present book contains 13 pages of matter not in Lenher's translation, including descriptions of the carbide of samarium, the silicides of vanadium and cerium, and the borides of silicon. The translator's English is smooth, and the presswork of the book is excellent. Unlike the Lenher translation, it has an index, but it lacks a bibliography. The necessity for a second translation of a work, which could hardly be expected to have more than a limited sale, is, however, not apparent.

JAS. LEWIS HOWE.