

## BOOK REVIEWS

**Fourth International Congress of Refrigeration, London, June, 1924.** By H. KAMMERLINGH ONNES.—This volume covers the matter presented by Prof. Onnes in his capacity as President of the International Institute of Refrigeration. There are some 25 titles covering scientific investigational work carried out at Leiden or in some way in collaboration with the Leiden Laboratory. The articles are generally rather full summaries, in English or in French, of work which has been or will be published in full elsewhere. Ten of the papers are concerned with the study of the properties of gases at low temperatures, so continuing a line of investigation pursued at Leiden for many years. Liquid-vapor conditions, the thermometer scale and fixed points, superconductivity magnetic properties,—all at low temperatures—are all represented.

Probably the most interesting paper is that by H. Kammerlingh Onnes in which is described their latest work on superconductivity. The outstanding discovery is that the current in a superconducting material (lead) is confined to its initial path, even though subjected to considerable outside force tending to displace it in the conductor. It suggests at once that the electrons are in some way restrained from leaving their paths. The fact should prove of considerable importance in both electron and electric theory. Eduard Jijdo, Leiden, 1924.

J. R. ROEBUCK

**The Theory of Optics.** By SCHUSTER and NICHOLSON. This is the third edition of a book by Schuster appearing in its first edition in 1904 and in a second edition in 1909. Originally a thorough introduction to the field of optical theory, the present work is much improved by numerous modifications and the addition of some new material. Greater preciseness and clarity is, on the whole, the important result secured by the changes made in the discussion of previous topics. Several new section headings are incorporated in the original chapters. Among the topics thus added are Lummer Plates, Earth Tides, Heterochromatic Photometry, Measurements of Star Diameters, Series Spectra, Aether drift, and the Michelson and Morley Experiment.

Two additional chapters presumably written largely by Nicholson have been included, in the first of which the application of the quantum theory to emission spectra has been briefly but on the whole clearly discussed. The reader who has had no previous acquaintance with the principles discussed under the heading Black Body Radiation will doubtless find the arguments in that section hard to follow. As noted by the authors it is little more than an outline of the subject. The introduction here of the phrase "conditionally periodic system" (p. 361) the meaning of which is not explained until late in the next chapter is unfortunate. The last chapter deals with the Dynamical Theory of Spectra. It is a concise treatment of an extensive subject and will doubtless serve better as an excellent summary for the initiated rather than as an introduction for the beginner.—Pp. XV+397. Price \$5.50, Longmans, Green and Co., 1924.

R. C. GIBBS