This volume is the third that has been published, containing the papers read, and the discussions regarding them, at the Congress of 1921. The two former volumes were entitled *La Théorie des Rayonnements et les Quanta*, published in 1912, and *La Structure de la Matière*, published in 1921. From the titles of these volumes it will be seen that the three congresses that have already been held have been concerned with questions that are of the greatest interest in the present state of physical science.

The volume under review begins with a paper on the *Theory of electrons*, by Lorentz, and includes a discussion of effects due to the rotation of electrons. Sir Ernest Rutherford reports on the structure of atoms with particular reference to the interpretation of his experiments on atomic disintegration as a result of collisions between atoms and rapidly moving $\alpha$-particles. The experimental results, which, at present, can be interpreted only with the aid of the hypothesis of energy quanta, $h\nu$, are described by de Broglie. Kamerlingh Onnes has two reports; one on paramagnetism at low temperatures, considered from the point of view of the constitution of the elementary magnets, and a second report on the superconducting state of metals, considered with reference to the Rutherford-Bohr atomic model. Sir W. H. Bragg reports on the result of measurements of the intensity of Röntgen rays reflected from diamond. Experiments on the angular momentum accompanying magnetization, in iron and nickel, which result in observing only half the effect to be expected if the elementary magnets are electrons circulating in closed orbits, are described by de Haas. Finally, there are two papers on the quantum theory; one by Bohr on its application to atomic problems, and another by Ehrenfest on Bohr's principle of correspondence.

A valuable feature of this volume, as well as the preceding ones, is the discussions following the various reports. These discussions, sometimes raising additional difficulties, and sometimes bringing out alternative views and new results, serve to show, not only how far from finality is the solution of these fundamental problems, but also the immense progress that has been made in recent years in proposing such problems for solution.

E. P. ADAMS

*Bessel Functions.* By A. Gray, G. B. Mathews and T. M. MacRobert. London, Macmillan, 1922. xiv + 327 pp.

This is a second edition of the classical treatise of Gray and Mathews prepared by Andrew Gray and T. M. MacRobert. The general plan of the original treatise has been retained but many changes of detail have been made. The analytic work at the beginning of the book has been rewritten and a collection of examples has been added to each of the first seven chapters. More than half of the book is devoted to physical applications, the topics treated including vibrating membranes, hydrodynamics, steady flow of electricity and heat, propagation of electro-magnetic waves, and diffraction. At the end of the book is a collection of tables and a bibliography of the more important treatises and memoirs.

H. B. PHILLIPS