

requisites were supplied before the close of the century. Here and abroad, the term electron, introduced by Dr Johnstone Stoney<sup>1</sup> about ten years ago, has been generally accepted to denote the ultimate particle of electricity, the atom of electricity—positive or negative—of Helmholtz. Mathematical theories have been worked out independently abroad by Prof. H. A. Lorentz<sup>2</sup> of Leyden, and in this country by Dr Joseph Larmor<sup>3</sup> of Cambridge.<sup>4</sup>

55.  
The term  
"electron."

<sup>1</sup> See 'British Association Report,' 1891, p. 574, "On the Cause of Double Lines in Spectra," by G. Johnstone Stoney: "The lines of the spectrum of a gas are due to some events which occur within the molecules, and which are able to affect the ether. These events may be Hertzian discharges between molecules that are differently electrified, or they may be the moving about of those irremovable electric charges, the supposition of which offers the simplest explanation of Faraday's law of electrolysis. . . . Several considerations suggest that the source of the spectral lines is to be sought not in the Hertzian discharges, but in the carrying about of the fixed electric charges, which, for convenience, may be called the electrons."

<sup>2</sup> Prof. Lorentz's principal writings are the two memoirs, "La Théorie électromagnétique de Maxwell et son Application aux Corps mouvants" (Leyden, 1892), and "Versuch einer Theorie der electrischen und optischen Erscheinungen in bewegten Körpern" (Leyden, 1895). His first labours, indeed, go back to the year 1880.

<sup>3</sup> Dr Larmor's principal publications are, "A Dynamical Theory of the Electric and Luminiferous Medium" ('Philos. Transactions,' 1894);

Part ii., "Theory of Electrons," 1895; Part iii., "Relations with Material Media," 1898; and his Adams Prize Essay, "Æther and Matter, a Development of the Dynamical Relations of the Æther to Material Systems on the Basis of the Atomic Constitution of Matter" (Cambridge, 1900). Dr Larmor's several shorter papers and addresses, to which I shall refer, are very helpful as introducing one into this novel domain of science.

<sup>4</sup> A little later than Lorentz and Larmor, Dr Wiechert of Königsberg began (in 1896) a series of publications on the same subject, with the aim of making the Maxwellian conceptions more definite. With him, also, the problem narrows itself down to a reconciliation of the continuity of the ether with the atomic nature of ponderable matter, and of the electrical charges attached to it. His views, together with a historical analysis of the labours of his great predecessors, Coulomb, Ampère, Biot and Savart, Neumann, Faraday, Maxwell (including the formal simplifications introduced into Maxwell's scheme by O. Heaviside, Hertz, and Poynting), Von Helmholtz, and H. A. Lorentz, are very concisely set out in a memorial essay entitled 'Grund-