Sir John Sealy Townsend [6B30]

Entry in Who was Who 1951 – 1960

TOWNSEND, Sir John Sealy Edward, Kt., *cr.* 1941; M.A. Dublin; Hon.D.Sc. Paris; F.R.S. 1903; Hon. Fellow of New College, Oxford; *b.* Galway, 7 June 1868; 2nd *s.* of Prof. Edward Townsend; *m.* 1911, Mary Georgiana, O.B.E. 1957, *d.* of P. F. Lambert, Co. Galway; two *s.* *Educ.:* Trinity Coll., Dublin. Formerly Demonstrator Cavendish Laboratory, Cambridge, Fell. of Trinity Coll., Cambridge, Wykeham Professor of Physics, Oxford. Chevalier de la Légion d'Honneur; Member: Institute of France, Academy of Science; Franklin Institute. *Publications:* contribs. to Scientific Journals and Societies on Electrical subjects; Treatises on: Theory of Ionisation of Gases by Collision; Electricity in Gases; Electricity and Radio Transmission; Electrons in Gases; Electromagnetic Waves. *Address:* 55 Banbury Road, Oxford. [*Died* 16 *Feb.* 1957.

TIMES MONDAY FEBRUARY 18 1957

SIR J. TOWNSEND

STUDY OF ELECTRICAL PHENOMENA

Sir John Townsend, F.R.S., formerly Wykeham Professor of Physics in the University of Oxford, died at Oxford on Saturday at the age of 88.

John Sealy Edward Townsend was born in Galway on June 7, 1868, and educated at Trinity College, Dublin. He went to Cambridge in 1895 soon after Sir J. J. Thomson's election to the Cavendish professorship and in time to become his second research student, Lord Rutherford, as he was later to become, being the first. The two students became great friends and Townsend, in addition to his own work, often assisted Rutherford in his experiments on the detection of electro-magnetic waves. Townsend was appointed a demonstrator in the Cavendish, and was successful in winning the Clark Maxwell Studentship, becoming also a Fellow of Trinity.

He went to Oxford in 1900 to fill the newly established Wykeham Professorship of Physics with a fellowship at New College. At the time no laboratory for his own use was available and he was accommodated first in the Observatory and later in the University Museum until, in 1910, the Drapers Company built the electrical laboratory. In the 1914-18 War he volunteered for a wireless unit which was training to assist the Russian Army, and when this scheme was abandoned, undertook wireless research for the Royal Naval Air Service.

In his young days Townsend was keen on hunting, and the timetable of his routine lectures was arranged so as not to conflict with the normal hunting programme. He had all the Irishman's love of argument, possessed a stock of characteristic anecdotes, and occasionally spoke in Congregation, making speeches at once contentious and amusing, though the humour was not always intentional. In the laboratory, he never had more than about half a dozen research students at a time, with the result that he took a great personal interest and even pride in them all believing that even his geese were swans. But he had very definite scientific beliefs, and woe betide any students who tried to explain his observations by theories which ran counter to his professor's. He took little interest in the development of physics outside his own line, and when any new theory appeared his first instinct was to attempt to prove it wrong, his point of view both in science and politics being strongly conservative. Surprisingly enough, though, it was largely due to his efforts—in the face of considerable opposition—that the Oxford Engineering School was founded. He rarely went to scientific meetings outside Oxford and this fact, together with his scientific conservatism, may explain why his work, excellent and fundamental though it was, attracted less recognition than it deserved. He became a Fellow of the Royal Society in 1903, and was knighted in 1941.

Townsend's main interest throughout his life lay in the phenomena of electrical conduction in gases, and he was one of the first to measure the charge on the electron. His pioneer work in this field led to his formulation of the theory of ionization by collision, which attributes the electrical conductivity of a gas in an electric field to the cumulative production of charged ions by the impact on the gas molecules of electrons and ions energized by the field. The first stage of ionization, by electrons only, is a process stable in time, but when the electric field is increased so that the positive ions also produce ions by collision with the molecules, the current rises without limit and a spark passes. This was the prelude to a great deal of work, which continued throughout his active life, on the movement of electrons through gases, leading among other developments to the first indication of the existence of abnormally long mean free paths. His experiments and conclusions were incorporated in his classical treatises on the subject.

He married, in 1911, Mary Georgiana, daughter of Peter F. Lambert, of Castle Ellen, co. Galway, by whom he had two sons.

SIR JOHN TOWNSEND

Professor William Wilson writes:—

May I add a little to the obituary notice of the late Sir John Townsend? His great achievement was something more than the direct experimental determination of the elementary ionic charge (the charge on an electron, for example): it was the discovery of the peculiar device which enabled this to be done—namely, the observation of the behaviour of charged drops of water in an artificially produced cloud. His method was repeated, with trivial modifications, by his teacher. J. J. Thomson, later Sir Joseph Thomson, and by Harold Wilson, and finally perfected by the great American physicist, R. A. Millikan, who carried out observations on individual charged drops of oil. It is only fair to Townsend to say that this work of his was one of the most outstanding contributions to physical science of the last 100 years.

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