Davisson, who was born in Bloomington, Illinois, on October 22, 1881, took his degree in the University of Chicago in 1908. R. A. Millikan was there at the time and claimed with pride to have directed him towards physics. Davisson then went to Princeton, where he took his Ph.D., and his first published paper appeared in 1909 from Princeton. In 1911, working under O. W. Richardson, then a professor at Princeton, he published another paper on the emission of positive ions from heated salts of the alkali ion and established that they are singly ionized atoms of the metal. In the same year he married one of Richardson's sisters. He then went as instructor to the Carnegie Institute of Technology. His connexion with the laboratory where his life-work was done started as a consequence of the First World War. In 1917 he went to what is now the Bell Telephone Laboratories, then part of the Western Electric Company's organization, to take up a temporary post; he stayed there until 1946.

His war-time work was concerned with the physics of the then new thermionic valves and vacuum technique. After the War he continued to work on the fundamental principles of thermionics and was allowed a free hand in choosing his researches to an extent unusual in those days in an industrial laboratory. He was the first to show experimentally that the variety of Richardson's formula, which in fact makes the electron follow the Fermi–Dirac electron statistics (not then discovered), is preferable to the original form. He also did work which turned out to be of considerable commercial importance on oxide-coated filaments.

Davisson's discovery of electron diffraction arose from a study of the scattering of electrons, and the production of secondary electrons, from metals. The first paper on nickel, with C. H. Kunsman, appeared in *Science* during November 1921. It described surprisingly sharp peaks of reflected electrons which Davisson considered could be explained by scattering (classical, of course) from two shells of electrons. In 1925, after studying some other metals, he returned to nickel. Until then, the experiments had all been on ordinary polycrystallic metals; but by an accident the specimen became oxidized and in restoring the surface by heating was changed into an aggregate of only a few crystals. There was a complete alteration in the pattern of scattering and the former theory had to be abandoned. He was inclined at first to replace it by one of 'transparent directions' of the lattice; but, partly as a result of a visit to the British Association meeting at Oxford, he came to believe that the effect was connected with the new theories of de Broglie and Schroedinger. As a result of a careful search, he and Germer found the first electronic beams in positions which could be explained in this way on January 6, 1927. The consequences of this work of Davisson and Germer are well known, but it is not always realized what a supreme experimental feat these early experiments were. The slow electrons of the order of 150 volts which were used are most difficult to handle, and if the results are to be of any value the vacuum has to be what would still be considered good, and was then quite outstanding. In fact, very few experimenters have since been successful with the method; much faster electrons are used when electron diffraction is employed for the study of surfaces.

In 1937 Davisson shared with me the Nobel Prize in Physics for this discovery.

In the 30's Davisson was interested in electron optics, and with C. J. Calbick could claim the discovery of the principle of the electrostatic lens. During the Second World War he worked on the cavity magnetron. In 1946 he retired from the Bell Telephone Laboratories on reaching retiring age, and was appointed research professor in the University of Virginia and lived at Charlottesville until his death. He leaves a wife, three sons and a daughter. Among many other honours he was awarded the Hughes Medal of the Royal Society.

Davisson was a man of exceptionally lovable character. Slight in build and with a hesitant manner of speaking, which made him seem shyer than he really was, he had a delightful sense of humour and was full of fun. Though he worked most of his life in an industrial laboratory, he was essentially an individualist. Yet he had the reputation of being very accessible in the laboratory and most helpful to all who consulted him. Among those who had close contact with him at the Bell Laboratories are Lee Du Bridge, Merle Tuve, Philip Morse and William Shockley.

GEORGE THOMSON

Mr. J. L. Baker

JULIAN LEVETT BAKER was, when he commenced in 1900, the first chemist appointed to a London brewery. Born in 1873, he had trained at Finsbury Technical College and had worked as a chemist for the Beetroot Sugar Association before brewing became his life-work.

From the first, he energetically studied the many possibilities of improvement in brewing which science could suggest at that time, and in the course of his work he published some fifty papers—a number of them inspired by his original studies on sugars. In 1905, he also published a concise and readable book on "The Brewing Industry".

In 1904 he was joined by Henry Everard Hulton, and the two engaged in the work of the brewery and in numerous scientific studies. It was a memorable collaboration which lasted for thirty-four years until Hulton's death—at which time Baker wrote: "Throughout the long years no shadow was ever cast over an enduring friendship".

Indeed, all Baker's pursuits created something of a record for length. He was an original member at the formation of the Institute of Brewing in 1904 and was a vice-president for forty years (1918–58). He was a scientific editor for forty-two years—first of *The Analyst* (1907–20) and then of the *Journal of the Institute of Brewing* (1920–49); while his service with Watney, Combe, Reid and Co., Ltd., lasted for forty-six years.

His merits were recognized by the award in 1948 of the Horace Brown Medal of the Institute of Brewing.

Baker's interests and energies were not confined to brewing aspects of chemistry, for, besides his editorship of *The Analyst*, he was honorary secretary of the London Section of the Society of Chemical Industry from 1903 until 1909 and its chairman in 1919.

In his retirement, Baker, lovingly tending his garden, outlived his contemporaries to recall to later generations with graciousness and charm something of the marked individuality and wide culture which a band of young London scientists had displayed so outstandingly in the early part of this century.

He died on January 29. He is survived by his two sons and his daughter.

L. R. BISHOP

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