

Lloyd, Humphrey

(1800–1881)

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Lloyd, Humphrey (1800–1881), physicist and university administrator, was born on 16 April 1800, at Dublin, the eldest son of the [Revd Bartholomew Lloyd \(1772–1837\)](#), later provost of Trinity College, Dublin, and his wife, Eleanor McLaughlin. Having received his early education at Mr White's school, Dublin, he entered Trinity College, Dublin, in 1815, gaining first prize, out of sixty-three competitors, at the entrance examination, then entirely classical. He profited greatly from the renaissance in mathematical education initiated at the college by his father. Following a brilliant undergraduate career, during which he obtained a scholarship in 1818, he graduated BA in 1819, taking first place and the gold medal for science, and proceeded MA in 1827, and DD in 1840. He became a junior fellow in 1824 and a senior fellow in 1843. He devoted himself especially to scientific studies and in 1831 succeeded his father as Erasmus Smith's professor of natural and experimental philosophy. During his tenure of this chair he sought successfully to improve the position of physical science in the university. Following the abolition of celibacy rules for fellows, he married, in July 1840, Dorothea, only daughter of the Revd James Bulwer, rector of Hunworth-cum-Stody, Norfolk. They had no children.

In physical optics Lloyd made a number of noteworthy contributions. The first of these, in December 1832, was the experimental proof of existence of conical refraction in a crystal of aragonite following a prediction arising from a mathematical investigation of the Fresnel wave surface in biaxial crystals by his colleague William Rowan Hamilton. He demonstrated two species of conical refraction and established the law governing the polarization of the rays. Of significance also was the preparation of a substantial report, *'The progress and present state of physical optics'* (*Report of the British Association for the Advancement of Science*, 1834). Another success followed shortly afterwards (published 1837) when he demonstrated the interference of light passing directly from a luminous source with that coming from the same source but reflected at an angle of incidence of nearly 90° from a plane surface. This variation of Fresnel's famous twin-mirror experiment was regarded as further proof of the correctness of the wave theory of light of which Lloyd was an ardent supporter. He also investigated the phenomena of light incident on thin plates. In 1841 he submitted a communication on the subject to the British Association and in 1859 he described his complete investigation of the phenomena to the Royal Irish Academy.

Investigation of the earth's magnetic field was Lloyd's primary research interest from the mid-1830s. Working under the aegis of the British Association he achieved prominence in the field of instrumentation. Having devised a method for measuring dip and relative intensity with a single instrument, he carried out, in collaboration with Edward Sabine and James Clerk Ross, a magnetic survey of Ireland in 1834 and 1835. In the two following years this work was extended to Scotland, England, and Wales. At the end of 1835 he established contact with Carl Friedrich Gauss of Göttingen, who, in developing the theory and technique of absolute measurement of the earth's field, had established geomagnetic investigation on a new foundation.

Lloyd resolved to join the organization of observing stations established by the Hanoverian mathematician over the northern hemisphere. An observatory was built at Trinity College, Dublin, in 1837–8 and fitted out with instruments of Lloyd's design, operating on Gaussian principles and constructed for the most part by Thomas Grubb of Dublin. This became the prototype for a series of similar observatories in Britain and the colonies, established, on the recommendation of the Royal Society, by the government and the East India Company. These, like the Antarctic expedition (1839–43) led by Ross, were provided with instruments similar to those of Lloyd, and the observers received practical training from him at Dublin. This worldwide network of observing stations superseded Gauss's earlier organization and many continental stations joined the association. In all thirty-three observatories were established or re-equipped with instruments of Lloyd's design and the work was continued for nine years (1839–48). For the Arctic expeditions of Sir John Franklin in 1845 and of Sir John Richardson and Sir James Ross in 1848 Lloyd designed an instrument to be used by travelling observers and by mariners.

Many papers which Lloyd wrote on these and other subjects, such as meteorology, are to be found in the *Reports* of the British Association and in the *Transactions* and *Proceedings* of the Royal Irish Academy. Of the latter body he was president from 1846 to 1851, and in 1862 he was awarded its Cunningham gold medal. He resigned his chair of natural philosophy in 1843, on his accession to a senior fellowship in Trinity College. In 1862 he became vice-provost, and in 1867 provost of the college. He was president of the British Association in 1857, when it met in Dublin, a fellow of the Royal societies of London and Edinburgh, and an honorary member of many other learned societies of Europe and America. In 1855 the University of Oxford conferred on him the degree of DCL.

Lloyd journeyed on at least four occasions to the continent. Accompanied by Sabine, he visited Berlin, Leipzig, and Göttingen in the autumn of 1839, and met important scientists such as Gauss, Wilhelm Weber, and Alexander von Humboldt. Following his marriage in the second week of July 1840 Lloyd and his wife travelled through Switzerland, northern Italy, Tyrol, and Bavaria. They visited observatories at Milan and Munich, and joined the meeting of the Italian Physical Society at Turin in September before reaching the Brussels observatory about 24 October. In the summer of 1841 he travelled with his wife to Paris to study the French system of training engineers. On a further tour with his wife he visited Berlin in early October 1849 as president of the Royal Irish Academy and was received there by von Humboldt. In 1874 the emperor of Germany awarded him the Order of Merit.

In university administration, and in educational and ecclesiastical policy, Lloyd was a man of firm principle who was open to reform and innovation. In 1860 he published anonymously a pamphlet entitled *Is it a Sin?* in which—diverging from the majority view held by his fellow Irish Anglicans—he advocated participation, at least in principle, of the Irish church in the national education board that was concerned with the organization of primary education in Ireland. This led to an invitation in the same year for him to join the board but he declined. The biggest issue he had to face as provost of Trinity College was the political pressure for change in its status following the enactment of Gladstone's Irish Church Act of 1869 (effective, 1 January 1871) that disestablished the episcopal Church of Ireland. It was evident to him that the educational advantages hitherto enjoyed by members of his church would have to be shared by protestant dissenters and the majority Roman Catholic population. He welcomed the passing of the University of Dublin Tests Act in 1873, which abolished remaining religious tests in the college, in preference to legislation that might have partitioned the endowments of the college among several denominational colleges and transferred its university powers to a nominated senate.

Lloyd was a leading member of the general synod of the disestablished Church of Ireland and he contributed in the 1870s to debate on the revision of the church prayer book, particularly on the issue of absolution. His views on this subject, published in pamphlets entitled *Doctrine of Absolution* (anonymous, 1871), and *The Power of the Keys* (1873), were close to those of the evangelical, anti-sacerdotal wing of the church.

Lloyd, like his father, may be regarded as a progressive educator of the nineteenth century. His scientific philosophy was firmly Baconian and his commitment to the scientific method and the central role of experiment was already evident in his *Two Introductory Lectures on Physical and Mechanical Science* of 1834. He was primarily responsible, in 1850, for the introduction of the first science moderatorship (equivalent to Cambridge tripos) in experimental physics and was the founder of a tradition of scientific research, particularly in physics, within the University of Dublin. He contributed to the advancement of science and engineering education in the university, the instrumental in the establishment of the school of engineering that opened in November 1841, and helped to create chairs of geology and mineralogy and of applied chemistry. His mature philosophy of education is revealed in a pamphlet, *Brief Suggestions in Reference to the Undergraduate Curriculum in Trinity College*, published anonymously in 1869, in which he stressed the importance of mental training, of preparation for professional life, and of a broad and varied curriculum combined with a freedom of choice for advanced students. He advocated that English language and literature, and the sciences, should occupy a more prominent place at the expense of mathematics and classics that had previously dominated undergraduate studies.

Lloyd died at his residence, Provost's House, Trinity College, on 17 January 1881. He published, in addition to a circular for directors of magnetic observatories and university addresses and lectures, a total of eight textbooks or monographs and sixty-four papers (three jointly with others) on scientific topics (including reports to the British Association). A translation of his *'The progress and present state of physical optics'* (*Report of the British Association for the Advancement of Science*, 1834) was published in Berlin (1836). His more important publications include *A Treatise on Light and Vision* (1831), *The Elements of Optics* (1849), and *Treatise on Magnetism, General and Terrestrial* (1874).

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Archives

- RS
- TCD, corresp. and papers
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- CUL, letters to Sir George Stokes
- RS, corresp. with Sir John Herschel
- RS, corresp. with Sir Edward Sabine, etc.
- TCD, corresp. with Sir William Hamilton
- TNA: PRO, letters to Lord Cairns, PRO 30/51
- TNA: PRO, letters to Sir Edward Sabine, BJ 3
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Likenesses

- A. B. Joy, bust, repro. in G. Sarton, 'Discovery of conical refraction, etc.', *Isis*, 17 (1932), 154
- A. B. Joy, marble bust, TCD
- C. J. Ovenden, portrait, TCD; repro. in T. O'Raifeartaigh, *The Royal Irish Academy: a bicentennial history, 1785–1985* (1985), 215
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- wood-engraving (after photograph by Chancellor & Son of Dublin), NPG; repro. in *ILN* (5 Feb 1881)

Wealth at Death

under £14,000: probate, 16 March 1881, *CGPLA Eng. & Wales*