

Haughton, Samuel

(1821–1897)

- T. D. Spearman
- <https://doi.org/10.1093/ref:odnb/12616>
- Published in print: 23 September 2004
- Published online: 23 September 2004



Samuel Haughton (1821–1897)

by Sarah Purser, 1883

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Haughton, Samuel (1821–1897), geologist and physiologist, was born on 21 December 1821 in Carlow, Ireland, the second of three sons of Samuel Haughton (1786–1874), merchant, and his wife, Sarah (*d.* 1861), who was the daughter of John Hancock, a linen merchant from Lisburn. The Haughtons were descended from a Quaker family established in Ireland during the Cromwellian settlements. Samuel was brought up within the Church of Ireland, as his father had withdrawn from active membership of the Society of Friends at the time of his marriage, but his upbringing undoubtedly reflected the Quaker tradition to which so many of his relatives and close family friends adhered. Growing up in the Carlow countryside, in the fertile and attractive valley of the River Barrow, stimulated his interest in natural history and the environment: this interest was further encouraged by the local rector, whose school in Carlow the boy attended.

Haughton entered Trinity College, Dublin, in 1838. He studied mathematics, obtaining a gold medal in 1843, and was elected to fellowship the following year. The fellowship examination was a formidable one and it was quite unusual to succeed, as Haughton did when he was only twenty-two, at the first attempt. His early scientific work was in mathematical physics. A paper entitled 'On the laws of equilibrium and motion of solid and fluid bodies', published in the *Cambridge and Dublin Mathematical Journal* in 1846, won him the Cunningham medal of the Royal Irish Academy and he published various other papers on fluid dynamics and wave propagation. From his teacher and colleague James MacCullagh he had also acquired an interest in the refraction of light within crystalline media. This led him to a wider interest in mineralogy and it was presumably on the basis of this that he was deemed eligible for appointment to the chair of geology which became vacant in 1851. He was professor for thirty years until he was required to resign on becoming a senior fellow in 1881. Throughout that time he was diligent in promoting and developing his subject.

Haughton's geological work encompassed a wide span including aspects of regional geology, stratigraphy, palaeontology, mineralogy, petrology, and structural geology. He calculated the age of the earth on the basis of sedimentary thicknesses and estimated rates of deposition. His first results suggested about 2000 million years but he subsequently revised this result, reducing it by a factor of ten. Climatic change was another of his interests; in this context he calculated the effect of geological changes on the direction of the earth's axis, carried out detailed calculations of solar radiation, and also examined the effect of ocean currents on climate. He examined the distortion of fossils, drawing conclusions from this about rock development, and carried out chemical rock analyses. He established the Trinity Mining Company, which in 1854 opened a copper mine at Ardtully in co. Kerry, but this venture was not a commercial success. He was an expert on tides, correlating and analysing observational data from Irish coastal stations and producing detailed tables. Later he carried out similar analyses of data from the Arctic seas. He used his tidal calculations to throw light on the sequence of events at the battle of Clontarf in 1014 and to examine the evidence at a murder trial which had taken place ten years previously.

Fellows of Trinity College were normally required to take holy orders and Haughton was ordained a priest in the Church of Ireland in 1847. Although not obliged to undertake any particular pastoral function, he took his orders seriously and preached regularly throughout his life. Many of his sermons were published: these display his robust and confident religious faith. His view of the world, profoundly shaped by his firmly held, biblically founded religious beliefs, was one with which Darwin's evolutionary theories did not appear to be reconcilable.

In 1859 Haughton, although by that time well established as a professor and a scientist of recognized standing, chose to become a medical student and, while still retaining his fellowship and his chair, pursued the Trinity medical course for three years, graduating MB in 1862. It is said that as a boy he had the idea that he might one day work as a medical missionary in China; this may have been a factor in drawing him towards his medical studies, but it is likely that his primary motivation was scientific. Studies of animal fossils had stimulated an interest in the anatomy and physiology of vertebrates and Haughton used his training in anatomy to pursue this through an ongoing investigative programme of detailed dissection. His investigations were not limited to human subjects. Drawing on material available from the Dublin Zoo, of which he had become a council member in 1860, he compiled data from over a hundred dissections of large animals. One account describes how, when a hippopotamus died, he rushed to the zoo armed with saws and butcher's knives and spent forty-eight hours dissecting the huge beast.

Haughton's particular interest in these comparative anatomical studies was to understand the detailed basis of muscular action. He became convinced that the very different modes of organization of limbs and muscles in the wide range of animal species which he had examined could all be explained in terms of the principle of least action, which he took from mathematical physics and reformulated in the following terms: that the muscular action is organized in such a way that the work done in performing a particular limb movement is less than would be the case for any alternative form of muscular arrangement. These conclusions, and the detailed basis for them, were set out in his book *Animal Mechanics*, published in 1873. One conclusion which he drew from this work was that, as far as bones, muscles, and joints are concerned, the permanence and stability of each species is absolutely secured. He was quite satisfied that his studies lent no support to the Darwinian postulate that the similarities found to exist in the bones, muscles, and joints of animals may be explained by common descent from a supposed common ancestor. It was clear to him that each limb and its mode of action had been planned by a foreseeing mind.

One application of Haughton's physiological studies which gained him some notoriety was his investigation of the practice of execution by hanging. In a paper published in 1866 in the *Philosophical Magazine* he put the case on humane grounds for a significantly longer drop than was normally used, so as to ensure instantaneous death. He derived a formula for the length of drop as a function of the weight of the unfortunate 'patient' (as the doomed individual is described in the paper). The scientific interest in the vertebrates went hand in hand with a genuine affection for animals. Haughton's dog, shown with him in Sarah Purser's portrait, was a constant companion. The zoo, which he served as secretary and later as president, was a special interest. The building known as the Haughton House was erected after his death by public subscription in recognition of his outstanding services.

Although Haughton never engaged in clinical practice, he none the less exercised a major influence on Irish medicine. In 1863 the Trinity board appointed him registrar of the medical school, a post he held for fifteen years during which time he introduced substantial reforms despite a sometimes strained relationship with the clinical professors. He also represented the university on the General Medical Council. He served on the board of Sir Patrick Dun's Hospital for thirty-four years, becoming its dominant figure. It was his initiative that led to the extension of the hospital from a purely medical one to include surgical as well as obstetric and gynaecological services. To encourage students in their clinical work he endowed clinical prizes and medals in both medicine and surgery, leaving the residue of his estate for that purpose.

The fact that Trinity graduates were particularly successful in obtaining coveted positions in the Indian Civil Service was significantly due to Haughton and his colleague J. A. Galbraith, who introduced courses to prepare candidates for the Indian Civil Service competitive examination. Haughton and Galbraith also collaborated in writing a series of elementary manuals on various topics in mathematics and physics, and at Haughton's initiative the college established a lectureship in pathology in 1895, and erected a building to house that activity. He was deeply interested in education at both school and university level. He contributed to the public debate in the 1860s on the future of the Irish universities: he maintained that Trinity College should continue to be linked with the Church of Ireland, but was not averse to the setting up of a college for Catholics and dissenters should a genuine demand for this become evident. Haughton was also an active member of the Royal Irish Academy, to which he had been elected in 1845, and was its president from 1886 to 1891. He was elected to the Royal Society in 1858, and received various other honours including honorary degrees from Bologna, Cambridge, Edinburgh, and Oxford.

Haughton's wife, Louisa (1828–1888), *née* Haughton, was a half-first cousin—her father and his were half-brothers. They had four sons and two daughters, one of whom died in infancy. Louisa died in 1888 and Haughton died at his home at 12 Northbrook Road East in Dublin on 31 October 1897. Following a funeral service in the college chapel his remains were buried in the family plot at Killeshin church, just outside Carlow, on 3 November.

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Likenesses

- S. Purser, oils, 1883, TCD [see illus.]
- S. Purser, oils

Wealth at Death

£5422 7s. 5d.: probate, 25 Jan 1898, *CGPLA Ire.*