

Henderson, Thomas

(1798–1844)

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Henderson, Thomas (1798–1844), astronomer, was born in Dundee on 28 December 1798, the youngest of the family of two sons and three daughters of Thomas Henderson, a tradesman, and his wife, Isabell Rollo. When he was young his father died. He was sent first to Dundee grammar school, then in 1811 for two years to the high school, where, under the rector, Thomas Duncan (later professor of mathematics at St Andrews University), he distinguished himself in all his studies and received his first instruction in mathematics, natural philosophy, and chemistry. Like his elder brother, John, who became a noted advocate in Edinburgh but died at the age of only thirty-eight, Thomas was destined for a legal career, and when he was fifteen he entered the office of Mr Small, a Dundee solicitor, where his brother had been a partner. Six years later he moved to the office of a writer to the signet in Edinburgh, where his abilities earned the friendship and patronage of James Gibson Craig, on whose recommendation he was appointed secretary, first to the judge John Clerk, Lord Eldin, then to the earl of Lauderdale, and finally to Lord Advocate Jeffrey.

Astronomical interests

Henderson's interests in astronomy undoubtedly began in early life, but in Edinburgh he had access to the observatory of the Astronomical Institution on Calton Hill, where he was encouraged by Captain Basil Hall, professors John Leslie and William Wallace, and others to make use of the modest equipment: the transit telescope and clock and the Troughton altazimuth instrument. His official duties also took him to London for months at a time, where he made friends with several astronomers, notably Sir James South, who gave him full use of his Campden Hill observatory. However, since he had poor eyesight, perhaps a squint, Henderson's observing abilities were limited, so he set out to master the mathematics of practical astronomy—the reduction of observations and the computations of eclipses, occultations, and comet orbits. In 1824 he communicated to Dr Thomas Young, secretary to the board of longitude, an amended method of calculating the occultation of a fixed star by the moon. He received the thanks of the board, and his method was published in the *Quarterly Journal of Science, Literature and the Arts* (18, 1825, 343–7) and in the *Nautical Almanac* for the years 1827 to 1831. His paper to the Royal Society 'On the difference of meridians of the royal observatories of Greenwich and Paris' (*PTRS*, 117, 1827, 286) added to the reliability of Sir John Herschel's result by the detection and elimination of a small error and recalculation of the entire process. In a number of subsequent papers on the reduction of observations and on ephemerides he demonstrated the method of determining probable errors then in common use in Germany but not in Britain. A list of moon-culminating stars for Captain John Ross's Arctic expedition in 1830 earned him the gratitude of the Royal Astronomical Society (RAS), of which he became a fellow in 1832. Meanwhile he continued

his legal duties and refused all payment for his astronomical calculations, although he was devoting much of his small income to supporting his mother and sisters.

In December 1828 Dr Robert Blair, the long-absent regius professor of practical astronomy at Edinburgh, died. Dr Young and Basil Hall supported Henderson as his successor, but Blair had for forty-three years treated the post as a sinecure, and the government was unwilling to appoint a new man until the effectiveness of the office was ascertained. In the following June Young himself died; he had earlier indicated in a document to Professor Rigaud of Oxford that he knew of no person more competent to succeed him as superintendent of the *Nautical Almanac* than Henderson. However, the post reverted to the astronomer royal, John Pond, who offered Henderson a share in the duties, with remuneration. He declined but continued to assist Pond with data.

Astronomer at the Cape

On the death of Fearon Fallows in 1831 Henderson was regarded as one of the best candidates to direct the government observatory at the Cape of Good Hope. He was reluctant to leave Britain, and accepted only at the persuasion of his friends. He arrived at the Cape in April 1832 and with one assistant, Lieutenant Meadows, embarked upon a prodigious work programme including between 5000 and 6000 observations of the places of southern stars (later presented to the RAS as a catalogue of 172 stars); a marginally better estimate of the moon's parallax (57 minutes, 1.8 seconds of arc); the places of Encke's and Beila's comets; the transit of Mercury of 5 May 1832; Jupiter's satellites; lunar occultations; and a series of observations of Mars at opposition, by which he later deduced, by comparing data from Greenwich, Cambridge, and Altona, a solar parallax of 9.125 seconds of arc, higher than the then accepted 8.8. These observations were made with indifferent instruments—a 10 foot Dolland transit telescope and a mural circle by W. and S. Jones—which were both suffering from the ravages of the climate. Henderson, exhausted and ill, resigned in May 1833, having written to Thomas Maclear (his successor) that he had had enough of government neglect, Meadows's bickering, and the 'dismal swamp among slaves and savages'. He returned to Edinburgh to reduce his Cape observations, meanwhile subsisting on a £100 pension from his legal firm.

Henderson's most striking result was the series of observations of the bright double star α Centauri, whose large proper motion had been pointed out to him by Manuel Johnson at St Helena. A residual error of about 1 second of arc was, after further observations of its right ascension by Maclear at the Cape, concluded to be the star's parallax (later estimates gave 0.75 seconds of arc), but was not announced as such to the RAS until January 1839 (Henderson, 61–8). This, however, was two months after the announcement by Friedrich Wilhelm Bessel of Königsberg of the parallax of 61 Cygni, for which he was given the RAS gold medal. Henderson had been over-cautious because there had been spurious parallaxes before. Later he announced possible parallaxes for Sirius and other southern stars, most probably illusory. Despite this he and Bessel became firm friends and holidayed in Scotland together.

Astronomer royal for Scotland

In 1834 an arrangement had taken place whereby the Astronomical Institution of Edinburgh's 'scientific observatory' on Calton Hill was made over to the university and to the government to be run as a public establishment under a principal observer who would be jointly regius

professor and astronomer royal for Scotland. Henderson, with the support and encouragement of South, George Biddell Airy, Francis Baily, Sir Thomas Brisbane, and others was elected on 18 August 1834 to be the first holder of the post (at £300 per annum), which was no longer a sinecure. He lost no time in commencing to measure the positions of stars and planets with the Fraunhofer transit circle and the Troughton mural circle, and with the help of an assistant, Alexander Wallace, made some 60,000 observations in ten years. The board of visitors, which included the astronomer royal, Airy, was lavish in praise of Henderson's labours and insisted on a speedy publication of the results. The first five quarto volumes of the *Edinburgh Astronomical Observations* (for results 1835–9) were published by Henderson, and the rest appeared after his death, mostly produced by his successor, Charles Piazzzi Smyth. Later investigations showed large systematic errors on account of the unexpectedly high coefficient of expansion of the sandstone transit piers. Henderson found little time for teaching, but sometimes deputized in mathematics or physics for ailing colleagues. He was elected fellow of the Royal Society of Edinburgh in 1834 and of London in 1840.

On 16 November 1836 Henderson had married Janet Mary (1807–1842), the eldest daughter of the well-known Edinburgh optician Alexander Adie, but her death in December 1842 only weeks after the birth of their only child, Janet Mary Jane, came as a great shock to a man already weakened by a worsening heart complaint. Worn out by the workload and by the daily climb up Calton Hill from his official residence at 1 Hillside Crescent, he died of heart failure on 23 November 1844 at 1 Hillside Crescent and was buried in Greyfriars churchyard. A commemorative tablet survives on the wall of Calton Hill observatory.

The author of seventy papers, Henderson had considerable mathematical ability but was not an innovator; he cultivated the methods of Bessel and Struve whom he admired. His weak constitution was aggravated by devotion to his work and his experience of typical government neglect of his two observatories.

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