Biographical Encyclopedia of Astronomers

Brown, Ernest William

Born Hull, England, November 29, 1866

Died New Haven, Connecticut, USA, July 22, 1938

Ernest Brown is chiefly remembered for his outstanding work in celestial mechanics, more specifically his meticulous researches into the complex intricacies of lunar theory. He was the only surviving son of wealthy farmers William and Emma Martin Brown; he had two sisters, and a brother who died in infancy.

Educated at East Riding College, Hull, Brown quickly showed an aptitude for mathematics, and in 1884 won a scholarship to Christ's

College, Cambridge. There he studied under George Darwin, with whom he developed a friendship that lasted until the latter's death in 1912. Indeed, it was Darwin who urged him to study George Hill's papers on the theory of the Moon

That was in the summer of 1888. Brown had by then spent a year in postgraduate study at Cambridge. The suggestion set the pattern of his scientific career. For the next 20 years, little else occupied his professional mind, and although in the remaining 30 years his interests broadened to embrace independent problems including the stellar version of the three-body problem, the numerical verification of solar perturbations in the Moon's motion, the motion of bodies near Lagrangian points, and the general theory of the Trojan group of asteroids—lunar theory by far remained his favorite subject. He rarely ventured outside the realm of celestial mechanics

Brown received his B.A. as sixth wrangler in 1887. He became a fellow of Christ's College in 1889; that same year, on 11 January, he was elected a fellow of the Royal Astronomical Society. Brown obtained his M.A. in 1891. That year, he left his native shores for the United States to take up an appointment as instructor of mathematics at Haverford College; two years later, he became professor of mathematics. Distance, however, could not diminish Brown's strong affection for his old *alma mater*, and part of almost every summer he returned to Cambridge, frequently staying at the Darwin residence, even long after Darwin's death

Brown received his D.Sc. in 1897 and became an honorary fellow of Christ's College (1911). He was elected a fellow of the Royal Society (1897) and awarded its Royal Medal in 1914. Other honors Brown received include the Gold Medal of the Royal Astronomical Society (1907), the Pontécoulant Prize of the Paris Academy of Sciences (1910), and the Bruce Medal of the Astronomical Society of the Pacific (1920). The Watson Medal of the United States National Academy of Sciences (1937), an institution of which he was elected a member once he became an American citizen, was one of his more cherished awards, possibly because it did not specifically relate to his work on lunar theory but rather to his contributions to other aspects of celestial mechanics.

Brown did not intend to develop a completely new lunar theory when he started his investigation of the Moon's motion Rather, it evolved as he became more familiar with the entire field and acquainted himself with the various methods available for use in its study. Systematic development began in 1895, with the results published in five parts in the *Memoirs of the Royal Astronomical Society* (1897–1908). Brown always gave Hill his full and proper

share of the credit for his solution to the main problem, but although he followed Hill's example and assumed the Sun, the Earth, and the Moon to be of spherical form, with the center of the Earth-Moon system performing an elliptical orbit around the Sun, "it would be unfair... to consider his work merely a routine application of Hill's methods" (Brouwer, "Obituary," 302). The objective was nothing less than a new determination of each coefficient in longitude and in latitude with greater completeness and accuracy than his predecessors had found.

Among the few lunar motions that had evaded elucidation was the comparatively large fluctuation in mean longitude. Simon Newcomb had attributed the discrepancy to irregularities in the rate of rotation of the Earth. If that were so, Brown argued, similar fluctuations should be present in the observed mean longitude of other bodies in the Solar System. His investigation of transits of Mercury seemed to verify the supposition, but not enough to convince him of its reality. Brown devoted much thought to the problem; in 1926, after rejecting several possibilities, he concurred with Newcomb, attributing the apparent discrepancy to irregular variations in the Earth's rate of rotation. The construction of new tables of the Moon's motion, rendered with the incomparable assistance of Henry B. Hedrick, followed directly after completion of the theory. In 1907, Brown became professor of mathematics at Yale University, where he was, in succession, Sterling Professor of Mathematics (1921–1931), the first Josiah Willard Gibbs Professor of Mathematics (1931/1932), and professor emeritus.

Brown reached an agreement with Yale to undertake the cost of production of his tables. *Tables of the Motion of the Moon*, printed by Cambridge University Press, appeared in three volumes from Yale University Press in 1919. They contained 660 pages of tables and text, with explanations of their use. Although they included nearly five times more terms than Peter Hansen had used in his tables, they were more convenient to use, and in 1923 were incorporated into most national ephemerides for calculating the Moon's position.

As a young man, Brown was a keen mountaineer and traveled extensively. He was an accomplished pianist and fond of music. He read widely, but as he got older, he developed a taste for detective stories. Brown never married and made his home with his unmarried sister, who sadly predeceased him by about two years. Long-standing bronchial troubles precipitated early retirement in 1932 and shadowed his last six years

Richard Baum

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