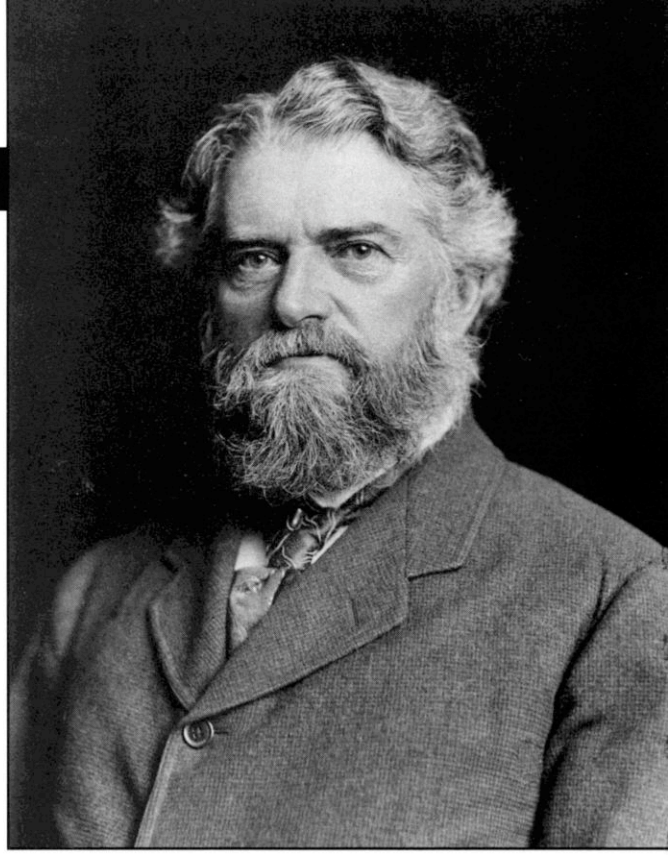
Bruce Medalist Profiles



Editor's Note: For the A.S.P.'s Centennial Meeting in 1989, astronomer/historian Joseph Tenn prepared a beautiful exhibit, displaying the portraits of the winners of our Bruce Medal. This prize, one of the most coveted in the field of astronomy, is given each year to an astronomer who has made outstanding contributions to science over the course of his or her lifetime. The exhibit was so popular that we asked Dr. Tenn to provide us with capsule biographies of the Bruce Medalists to accompany the photographs in *Mercury*. We begin the series with the very first recipient in 1898, who happened to be the mentor of the A.S.P.'s founder and first president, Edward Holden.

Simon Newcomb: The First Bruce Medalist

Joseph S. Tenn
Sonoma State University

Simon Newcomb
12 March 1835 — 11 July 1909
1898 Bruce Medalist

(Photograph c. 1895, courtesy of Mary Lea Shane Archives of Lick Observatory, University of California, Santa Cruz)

The first recipient of the A.S.P.'s Catherine Wolfe Bruce gold medal was an easy choice. The most honored astronomer in the world during the late 19th century, Simon Newcomb was widely considered the leading scientist of his time in the United States. His life story was much like those of the heroes portrayed by his contemporary, Horatio Alger.

At age eighteen Newcomb, with no money and little education, made his way on foot from his native Nova Scotia to the United States, where he became a country school teacher. Later he found employment as a computer with the Nautical Almanac Office, then in Cambridge, Massachusetts, and in his spare time earned a B.S. at Harvard. After working at the U.S. Naval Observatory (USNO) he became director of the Nautical Almanac Office, which in his later years was placed under the USNO.

Newcomb's specialty was celestial mechanics. His program could be divided into three parts: (1) Using Newton's laws of motion and gravitation, and the best available data on masses and distances, determine the motions of solar system bodies taking into account all of the perturbations due to their mutual attraction. (2) From these orbits compute apparent motions in the sky, where only two of the three coordinates (right ascension and declination, not distance) can be directly measured. (3) Compare with the best observations, suitably reduced to eliminate such distractions as the observer, the instruments, and the motion of the Earth. If there was any discrepancy, both theory and observations would be recomputed.

During his tenure at the Nautical Almanac Office, Newcomb redetermined all of the fundamental constants (such as the speed of light and the constant of precession) and re-analyzed all of the observations made at the principal observatories of the world since 1750. By poring over occultation data (that is, precise timings of when the Moon covered or uncovered a star in the sky) at the Paris Observatory he was able to extend the theory of the motions of the Moon back to 1675. Newcomb also computed the theoretical motions for all the planets except Jupiter and Saturn, which he assigned to George W. Hill. The re-analysis of the motion of the Moon was completed by Ernest W. Brown after Newcomb's death. The result of this enormous labor was great improvement in the precision of *The American Ephemeris and Nautical Almanac*, the essential book for navigators, timekeepers, and even geographers laying out the boundaries of the western states and territories.

Newcomb supervised a large staff of computers; in the 1890s the USNO had by far the largest budget and staff of the world's observatories. Some of Newcomb's tables were used in the preparation of the ephemeris as late as 1984, long after the replacement of human computers by electronic ones.

Three times Newcomb provided im-

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portant guidance on the construction of the world's largest telescopes. He worked with Alvan Clark and Sons in designing the USNO's 26-inch refractor, helped Otto Wilhelm Struve plan the 30-inch refractor for the Pulkovo Observatory near St. Petersburg, and served as principal scientific advisor to the trustees who carried out James Lick's bequest to build the 36-inch Lick refractor in California.

Newcomb wrote profusely on mathematics, economics, and numerous other subjects; he wrote popular books and articles and textbooks at all levels. He headed many organizations, including the American Mathematical Society and the American Astronomical Society, of which he was the first president. A dynamic and intimidating individual, he was highly successful as a leader, in the sense that he got things done, but he was more feared than liked. ■

For further reading

Tenn, Joseph S., "Simon Newcomb: A Famous and Forgotten American Astronomer," *Griffith Observer*, Nov 1987, p. 2.

Newcomb, Simon, *The Reminiscences of an Astronomer*. 1903, Houghton Mifflin & Co. One of very few full-length autobiographies by astronomers.