Gaposchkin, Cecilia Helena Payne-

(1900–1979)

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- https://doi.org/10.1093/ref:odnb/41256
- Published in print: 23 September 2004
- Published online: 23 September 2004
- This version: 04 October 2007

Gaposchkin, Cecilia Helena Payne- (1900–1979), astronomer, was born at Holywell Lodge, Wendover, Buckinghamshire, on 10 May 1900, the eldest of the three children, two girls and a boy, of Edward John Payne (*d.* 1904), a London barrister, and his German-born wife, Emma Leonora Pertz, an art copyist. Her father died when she was only four years old. She received her early education at a small private school in Wendover; while at home she imbibed a love of art, music, and literature that never left her. When Cecilia was twelve the family moved to London, where she attended St Mary's College, Paddington, before being sent for a final year to St Paul's Girls' School, from which she won a scholarship in natural sciences to Newnham College, Cambridge. She went up to Cambridge in 1919 at the age of nineteen. A high point in her student life was a lecture by A. S. Eddington describing observations of the deflection of light by the sun during the total eclipse of 1919, the confirmation of Einstein's theory of relativity. Cecilia Payne determined there and then to become an astronomer. She received kindly encouragement from Eddington himself, as well as E. A. Milne and others; her first published piece of research, on a problem of stellar motions set by Eddington, was carried out in those undergraduate days. However, the traditional avenue to a career in astronomy in Britain, through mathematics, was not open to her. L. J. Comrie advised that the United States would be her best chance, and after a lecture in London he introduced her to Harlow Shapley, director of the Harvard College observatory at Cambridge, Massachusetts, who agreed to accept her.

Cecilia Payne took part two of the Cambridge tripos in physics in 1923 and, supported by a fellowship, moved to Harvard in the same year to begin research under Shapley. She was to remain at Harvard for the rest of her life. Using the observatory's collection of spectrograms taken at Harvard and at its southern station in Peru, she re-examined stellar spectra in the context of current theoretical predictions. In 1925 she became the first astronomer at the observatory to be awarded a PhD degree (from Radcliffe College) with a thesis on *Stellar Atmospheres*, published as the first of the Harvard Monographs (1925). The work demonstrated that, contrary to generally held ideas, the abundances of the chemical elements in the universe of stars are essentially uniform.

Cecilia Payne stayed on at Harvard in an undefined post attached to the famous group of women workers headed by Annie J. Cannon: the appointment of a woman at a more senior level would not have been countenanced by the university authorities. It was only in 1938 that she and Miss Cannon were appointed to the rank of 'astronomer', her own official designation being 'Phillips astronomer of the Harvard observatory'. She continued her spectroscopic work with research on luminous stars, described in her second book, *Stars of High Luminosity* (1930).

Cecilia Payne's later career was taken up almost entirely with the subject of variable stars, on which she published numerous papers, chiefly in the observatory's own bulletins, and several books. From the time of her marriage in 1934 most of this work was carried out in collaboration with her husband, Sergey Ilarionovich Gaposchkin (1898–1984), a Russian astronomer whom she had met in Germany in 1933 and whom she had helped to obtain entry into the United States. Between them the Gaposchkins performed an enormous volume of research on variables of all kinds. Their book *Variable Stars* (1938) became a standard reference in this field. They masterminded a huge programme, carried out with the help of a team of assistants, of identifying and measuring variable stars on photographic plates, a task that required well over a million individual observations. This was followed in the 1960s by a similar project, entailing two million brightness estimates, on the variable stars of the Magellanic clouds.

Throughout this period Cecilia Payne-Gaposchkin was actively involved in university teaching. She was made a full professor in 1956, the first woman to achieve this rank, but, though the appointment represented a landmark in the history of academic women at Harvard, it was a long overdue promotion in her case. After retirement from her university chair in 1966 she remained affiliated to the Smithsonian Astrophysical Observatory (as the observatory was called following reorganization) and continued her research until 1976. She published her last scientific paper and her last book in 1979.

In 1936 Cecilia Payne-Gaposchkin was elected a member of the American Philosophical Society. Other honours and prizes followed, including the Henry Norris Russell lectureship of the American Astronomical Society in 1977. Among several honorary degrees was an ScD from the University of Cambridge in 1952. Cecilia Payne-Gaposchkin was a tall woman, dignified in bearing, awe-inspiring to her students, but described as warm and generous by her colleagues. She combined an intensely busy scientific life with the hectic activities of home and family. The Gaposchkins had two sons and a daughter; the daughter and one of the sons became astronomers. In her last years Cecilia Payne-Gaposchkin recorded a small volume of highly readable memoirs, published after her death by her daughter. She died in Cambridge, Massachusetts, on 7 December 1979. She bequeathed her body to science and was buried in the graveyard of the Tufts medical school, Tewksbury, Massachusetts.

Sources

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