

## Fleming, Williamina Paton

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Fleming, Williamina Paton

(b. Dundee, Scotland, 15 May 1857; d. Boston, Massachusetts, 21 May 1911)

*astronomy.*

Mrs. Fleming's father, Robert Stevens, a craftsman whose shop sold picture frames, died when she was seven; her mother was Mary Walker Stevens. After a public school education in Dundee, she married James Orr Fleming on 26 May 1877, and they immigrated to Boston at the end of 1878. Shortly thereafter the marriage fell apart, and Mrs. Fleming found it necessary to support herself and her infant son, Edward Pickering Fleming, who was born 6 October 1879. In 1881, after a period of domestic work for Edward C. Pickering, the new director of the Harvard College Observatory, she became a fulltime copyist and computer at the observatory itself.

At that time Pickering had just embarked on an extensive program of celestial photography. Through her studies of the objective prism spectrum plates, usually in collaboration with Pickering, Mrs. Fleming became the leading woman astronomer of her day. Her suspicions aroused by the spectral peculiarities she observed, she discovered more than 200 variable stars and ten novae—the latter being a significant fraction of the twenty-eight novae recorded up to the time of her death.

Her most important contribution was the classification of 10,351 stars in the *Draper Catalogue of Stellar Spectra* (published as volume XXVII of the *Annals of Harvard College Observatory* [1890]). The spectra were organized into seventeen categories, lettered from A to Q, but 99.3 percent of the stars fell in the six classes A, B, F, G, K, and M. Although it was a great advance over the four types into which Angelo Secchi had visually classified about 4,000 stellar spectra, Mrs. Fleming's system was soon to be enormously refined at Harvard by Annie Jump Cannon.

Mrs. Fleming's keen eyesight, remarkable memory, and industrious nature enabled her to advance to a position of considerable authority at the observatory, so that ultimately she gave assignments to a corps of a dozen women computers. In 1899 she was appointed curator of astronomical photographs, and by 1910 she had examined nearly 200,000 plates. In 1906 she became the fifth woman member (honorary) of the Royal Astronomical Society. Dorrit Hoffleit has written, "Sparkling and friendly though she was, her reputation as a strict disciplinarian lived after her, and as late as the 1930's elderly ladies who had worked with her in their youth still regarded her with awe."

## BIBLIOGRAPHY

Mrs. Fleming's principal work appeared in the *Annals of Harvard College Observatory*, including an important paper, "Stars Having Peculiar Spectra," published posthumously in vol. **56** (1912).

Most published biographical material derives from the obituaries by Annie Jump Cannon, in *Astrophysical Journal*, **34** (1911), 314–317; Edward C. Pickering, privately printed (1911), repr. in *Harvard Graduates Magazine*, **20** (1911), 49–51; or from the sketch by Grace A. Thompson, in *New England Magazine*, **48** (1912), 458–467

The best biography, incorporating some new material, is Dorrit Hoffleit, in *Notable American Women* (Cambridge, Mass., 1971).

Owen Gingerich