

THE SCIENCE OF LIGHT

BY MEREDITH BARTMON

At the beginning of the 20th century, female astronomers at Harvard significantly shaped humanity's knowledge of the stars. The work of Henrietta Leavitt, Annie Cannon, and Williamina Fleming illuminated our understanding of our place in the universe.



HARVARD OBSERVATORY

When Henrietta arrived at Harvard in 1895, Williamina and the other women of the college observatory were systematically cataloguing the night sky. The ever-growing campus featured huge telescopes that allowed astronomers to photograph the stars.

"SEVEN HOURS A DAY, SIX DAYS A WEEK... THEY BENT TO THEIR EXAMINATION TASKS, ONE WITH A MAGNIFYING GLASS POISED OVER A GLASS PLATE, AND THE OTHER HOLDING A LOGBOOK...RECORDING THE SPOKEN OBSERVATIONS OF HER PARTNER. A HUM OF NUMBERS AND LETTERS PERVADED THE COMPUTING ROOM."

- from The Glass Universe by Dava Sobel

STAR PLATE

Star plates are mostly photographic negatives: clear glass sheets scattered with dark specks of stars. Each of Harvard's half a million plates contains as many as 100,000 stars.

STAR SPANKER

The one-by-three-inch glass star spanker is used to measure brightness by comparing newly photographed stars with previously printed magnitude examples. Henrietta called it a fly spanker because it resembled a fly swatter but was "too small to do a fly much damage."

MAGELLANIC CLOUDS

Henrietta was tasked with cataloguing variables (blinking stars) in a section of sky which included the Magellanic Clouds, densely packed star clusters which would later be identified as galaxies. Henrietta discovered 900 new variables in the first few months of 1905.



Annie examines a Star Plate in a specially designed wooden stand, which holds the plate at a forty-five-degree angle. A mirror affixed to the flat base caught daylight from the computing room's big windows and directed illumination up through the glass.

"My friends say, and I recognize the truth of it, that my hearing is not nearly as good when absorbed in astronomical work."
—Henrietta Swan Leavitt



Image from a user manual for an Acousticon Carbon Hearing Aid, circa 1902

HEARING AID

The work of the Harvard computers required fastidious attention to detail. Henrietta, who had significant hearing loss, once said that she was assisted in this rigorous work by the ability to tune out the noise around her.



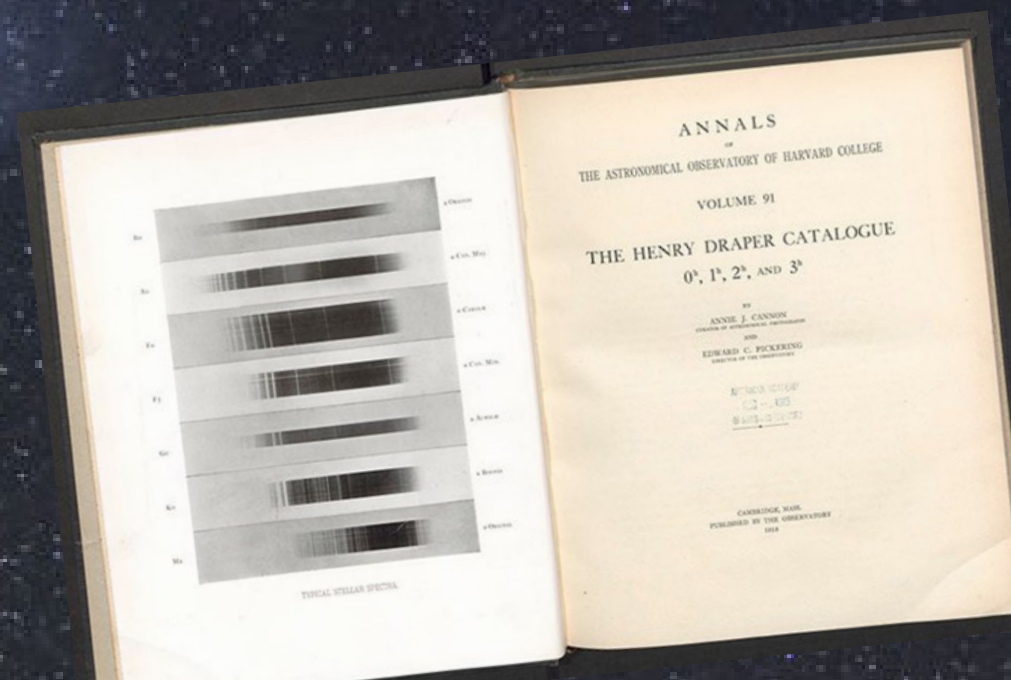
Observatory Director Edward C. Pickering felt it would be unseemly to subject a lady to the fatigue and cold of telescope observing. However, Annie would become the first female assistant ever commissioned to examine spectra nightly by telescope.

GREAT REFRACTOR

Harvard's team of male astronomers stood in domed observatories on clear nights painstakingly positioning telescopes. The temperature in the open domes was the same as outside, making winter especially difficult.



Annie operating the 13-inch Boyden telescope.



DRAPER CATALOGUE

The work of Harvard's female computers to classify 225,300 stellar spectra was started by Williamina in the 1880s and continued into the 1940s by Annie. The invaluable Henry Draper Catalogue, almost exclusively funded by Henry's widow Mary Draper, is an astronomical testament to women's contribution to our knowledge of the universe.