dentally, observational astronomers. Their greatest discovery, a classic case of serendipity, was of the white dwarf companion of Sirius. The Clarks were trying to ascertain how long the light of Sirius was perceptible before the star itself came into view from behind the corner of a building. Alvan Graham noticed the Pup for 3 seconds before the appearance of its much brighter companion.

This slim volume is meaty, interesting, and copiously annotated. A short introduction is followed by a 35-page biographical outline of Alvan Clark and his two sons. Part 2 (74 pp.) is a catalogue of astronomical instruments made and remade by the trio. An appendix lists Alvan Clark's paintings. The book is strongly recommended to professional and amateur specialists in telescopes and in the history of astronomy.

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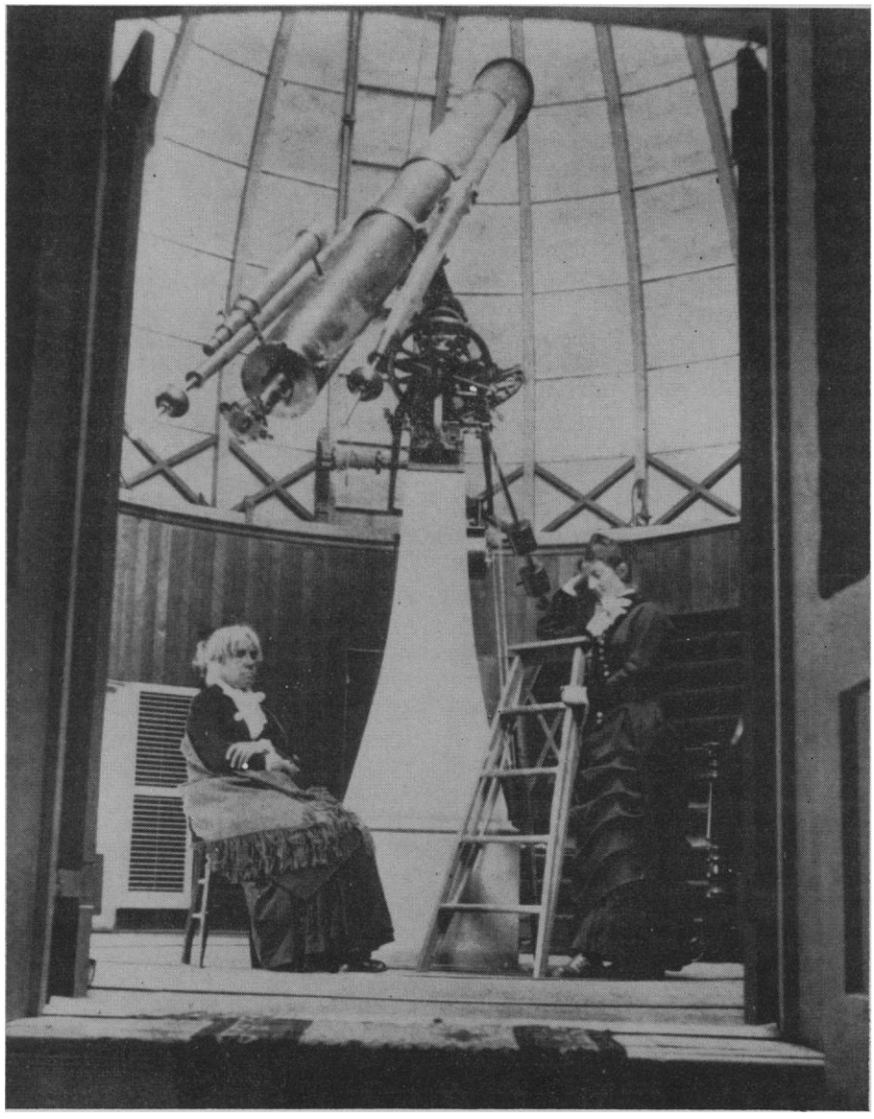

A scene at the Vassar College Observatory. Maria Mitchell (1818–1889), seated, was the first woman astronomer in the United States. She was the first professor of astronomy and director of the Vassar College Observatory and was a great and inspiring teacher there for more than 20 years. Mary W. Whitney (1847–1921), standing, was in the first freshman class at Vassar College (1865) and became director upon Maria Mitchell's death. She was the teacher of Antonia Maury, whose fundamental researches in spectral classification eventually resulted in the great Henry Draper Catalogue. The 12½-inch Fitz refractor in the picture had a wooden tube. Alvan Clark and Sons refigured the lens to such a degree that they considered the telescope one of theirs. This telescope was retired in 1963 to the Smithsonian Institution. [From *Alvan Clark and Sons: Artists in Optics*]

Tales of Astrophysics

Through Rugged Ways to the Stars. HARLOW SHAPLEY. Scribner, New York, 1969. 180 pp., illus. $6.95.

Starting with his boyhood on a farm in Missouri, Shapley tells his life story in whimsical style—how he worked as a newspaper reporter aged 16, tried to major in journalism at the University of Missouri, and took astronomy as a second, "blind" choice. Younger scientists will follow avidly his description of graduate work on double stars with Henry Norris Russell at Princeton in 1911 and his work on Cepheid variables at Mount Wilson in 1913. The stories of George Ellery Hale, Walter Adams, and the many others at Mount Wilson from 1913 to 1921 are full of warmth, but revealing in their descriptions of social behavior, scientific reliability, physical hardship, and other aspects of these men's lives.

Through these recollections, the enormous stride made in measuring distances of clusters and galaxies develops like a detective story with Shapley playing the part of Nero Wolfe. The story culminates in the "courtroom scene" of the Great Debate on the sizes of galaxies in Washington in 1920. Against the advice of Russell and others, Shapley then "gave up" his research career to become director of the Harvard College Observatory. With the principal exception of Annie Jump Cannon, the subjects of his Harvard stories are living astronomers, and Shapley rightly notes that during his tenure (1921 to 1961) Harvard was the most active astronomical training ground in the world. He describes Harvard's southern station, first in Peru, then in South Africa, and the strategy of moving it in 1927, the studies of the Magellanic Clouds, the cataloging of galaxies, the discovery of dwarf galaxies in Sculptor and Fornax, and the construction of two new 61-inch telescopes in Massachusetts and Argentina.

Other reminiscences cover Shapley's interest in flowers and ants, his part in establishing the National Science Foundation, UNESCO, and several observatories, his postwar visit to Russia, his help in rebuilding the Poulkovo Observatory, and his difficulties with the Un-American Activities Committee. No reader can help marveling at Shapley's extraordinary energy and activity.

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