PAUL WILLARD MERRILL
1887–1961

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Although he had for years suffered from the tortures of arthritis and had, at times, endured serious physical afflictions, the death of Paul W. Merrill on July 19, 1961, was a severe shock to his associates and a major loss to the science of astrophysics to which he had given 50 years of devoted service. Heart failure followed an operation for an intestinal difficulty.

Born in Minneapolis on August 15, 1887, Paul Willard Merrill lived nearly all his life in California. His father, who was a minister of the Congregational Church, served in several different places before moving to the Pacific Coast.

In his college days at Stanford University, Paul had taken a serious interest in the physical sciences and in mathematics. Following his graduation in 1908 he joined a United States Coast and Geodetic Survey crew as an assistant in Central California, but his interest in astronomy soon prevailed and he became an assistant and fellow at the Lick Observatory on Mount Hamilton. He was able to carry on graduate work in Berkeley where, in 1913, he received his Ph.D. degree. Much of his time was given to observing and measuring stellar spectrograms of the great Lick radial velocity program. He quickly recognized areas of particular interest and published 10 papers on spectroscopic binary orbits, P Cygni spectra, emission-line stars of early type, and nebular lines in stars.

On September 12, 1913, he married Ruth Currier with whom, for almost 50 years, he shared with complete understanding and common purpose an abundant life. Their home was ever a delightful focus of hospitality for their many friends and associates. Ruth and a son Donald still survive.

Merrill then transferred to the University of Michigan as instructor. With the reflector there he continued spectroscopic observations of variable and bright-line stars.

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After three years at Ann Arbor he accepted a position as physicist at the Bureau of Standards. Infrared photography by the use of plates dyed with dicyanin was in its infancy and had been used very little for the spectra of stars. Merrill arranged with E. C. Pickering to use the 24-inch reflector and objective prism of the Harvard College Observatory in February 1917 to photograph the spectra of stars of various spectral types. With plates that he himself sensitized with dicyanin, wavelengths beyond 8000 Å were easily reached. Various molecular bands of long wavelengths were found and identified for the first time. During World War I he made use of these tested techniques for photographing from airplanes and made numerous flights from Langley Field. He also made valuable contributions to the optical design of airborne cameras.

In 1919 Merrill joined the staff of the Mount Wilson Observatory. There he was able to give his time largely to the spectrographic problems of the stars; chief among these were the emission lines of the hot stars, the spectral behavior of the long-period variables, and the infrared spectra of stars. In these fields he was a pioneer. He was always on the alert for a clue to the underlying causes of the various phenomena seen.

Satisfactory explanations in terms of moving envelopes were forthcoming to account for the changing lines of early-type stars but in the cool long-period variables the origin of the emission was positively located at a level below the chromosphere. The source of the energy and the more general theory of the behavior of these variables at different phases, different cycles, and in variables of different classes are yet obscure although many valuable observational data were obtained.

In addition to his unequaled investigations of the bright-line B-type stars and the enigmatic long-period variables, some of his other outstanding achievements at Mount Wilson are:

Interferometer observations of the orbit of Capella.

Definite identification of zirconium in S-type stars.

Catalog of B and A stars with bright hydrogen lines.

Discovery of diffuse interstellar absorption lines.

Explanation of the anomalous fluorescent intensities of Fe I lines in Me variables (with A. D. Thackeray).

Discovery of technetium in S-type stars.

Merrill's various investigations at Mount Wilson are described in more than 250 technical papers, and in book form—*The Nature of Variable Stars* (1938), *Spectra of Long-Period Variable Stars* (1940), *Lines of the Chemical Elements in Astronomical Spectra* (1956), and *Cosmic Chemistry* (in press).

As editor of the research publications of the members of the observatory staff he won their respect and gratitude. He was also called to serve as associate editor of the *Astronomical Journal* and as a member of the editorial advisory boards of the *Astrophysical Journal* and *Sky and Telescope*.

For his important contributions to our understanding of the nature and behavior of the stars Paul Merrill was awarded high honors by his colleagues in various scientific societies. As a member he gave unsparingly of his time and sound judgment to several societies and was elected to high office in most of them. He was chosen Henry Draper Medalist (1945) of the National Academy of Sciences and Russell Lecturer (1955) of the American Astronomical Society. The Astronomical Society of the Pacific is particularly indebted to him for his loyal service. He contributed more than 100 papers to the *Publications*. His popular lectures and 14 *Leaflets* were of exceptional interest to the laymen. In 1946 he was awarded the Bruce Gold Medal.

In addition to his astronomical interests, Merrill had a real concern in political affairs which he frequently affirmed in no uncertain terms. As a member of the Board of Directors of the City of Pasadena he made a thorough study of the municipal problems of the day. He recognized the fundamental place of religion in life and conscientiously served his church in numerous capacities. In his younger years he often played tennis and always kept up a lively interest in sports. For him life was full of charming facets, but in intellectual challenges he was at his best. His personality was characterized by his firm adherence to principles of reason and integrity. As a friend he was loyal and generous. He was an entertaining conversationalist and his presence at social gatherings was much sought after.

In the field of astrophysics, Paul Merrill holds a high place. He detested shallow thinking and unfounded conclusions. He will be long remembered for his tireless industry and for his consistent lifetime efforts to interpret the behavior of the stars.