

John Campbell's task—to complete and correct the image of Rutherford in the eyes of his compatriots—was no mean one. And if, in these labors, he has produced something that will add new lore and piquancy to the image that we all have of one of the great creators of modern physics (and chemistry), then we can all be grateful that he has labored so long and so faithfully and produced this biography sui generis.

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Henry Norris Russell: Dean of American Astronomers

David H. DeVorkin
Princeton U. Press, Princeton,
N.J., 2000. \$49.50 (499 pp.).
ISBN 0-691-04918-1

David H. DeVorkin, curator of the Smithsonian Institution's National Air and Space Museum and author of various works on space science, has turned his scholarly attention to Henry Norris Russell, a gradually fading yet seminal figure in early 20th-century astronomy. DeVorkin's *Henry Norris Russell: Dean of American Astronomers* is a solid, assiduously researched, and thoroughly documented work. For its rather stolid style, however, it will, unfortunately, probably not be read as widely as it ought.

Russell was born in 1877 in the cloistered Long Island, New York, village of Oyster Bay, where his father, Alexander Gatherer Russell, a Presbyterian minister, attracted to his congregation such luminaries as Theodore Roosevelt Sr. It was from his mother, Eliza Hoxie Norris Russell, and his maternal grandmother, Maria Schaeffer Hoxie, that young Henry inherited his gift for mathematics. (Maria distinguished herself as the first recipient of a mathematics medal from the Rutgers Female Institute.) Henry Russell attended private school in Princeton, New Jersey, then enrolled in the "local" university there.

Russell graduated from Princeton University with honors in 1897 and remained on campus to take his doctorate three years later. Although well respected for his erudition, the youth was little envied by his classmates, coming across to them as a largely one-dimensional figure who was subjected to good-natured teasing as he scurried, preoccupied, from classroom to classroom. Later, during a stint at the University of Cambridge, George Darwin, the Plumian Professor of

Astronomy and fifth child of the great evolutionist, classified Russell's as "a grinding mind." Occasionally, when the press of studies and research became too great, Russell suffered mental breakdowns, the first of which occurred following the completion of his doctoral dissertation: "The General Perturbations of the Major Axis of Eros by Action of Mars." After he made the acquaintance of the similarly afflicted George Ellery Hale, founder of the Yerkes, Mount Wilson, and Mount Palomar Observatories, the two astronomers entered into long conversations about the origins and pathology of their debilitating illnesses.

DeVorkin takes great pains to establish his subject as a pioneer in the fledgling field of astrophysics. He covers in detail the period following Russell's acceptance in 1905 of a post as instructor and, in 1912, the directorship of the observatory at Princeton. From then on, Russell passed the better part of 60 years researching most of the major problems associated with the new science, garnering every major honor and accolade along the way. Among his many contributions was the development of a theory of stellar evolution that fit the known data like a glove. This research acted as a stimulus to other astrophysicists, including Arthur Eddington, and it was in the context of this work that Russell, together with Ejnar Hertzsprung, created the Hertzsprung–Russell diagram, which charted the luminosity of stars as a function of their surface temperatures. Russell's early work on binary stars, much of it conducted with the assistance of his gifted protégé Harlow Shapley, led to the first systematic analysis of the variation of light received from these eclipsing bodies. In the 1920s, when he was at the height of his powers, Russell initiated a series of quantitative investigations on the absorption-line spectrum of the Sun that enabled scientists to determine the abundance of various chemicals in the solar atmosphere. Intrigued by the microcosm as much as by the macrocosm, he teamed with fellow spectroscopist Frederick A. Saunders of Harvard University to devise the theory of L–S coupling to explain spectra produced by atoms having more than one valence electron.

Much of this and more was well beyond the ken of amateur astronomers, to say nothing of people who harbored only a casual interest in the stars. Consequently, in the spring of 1900, Russell began writing a column on astronomy for *Scientific American*,

a labor of love that would span more than four decades and one that, besides reaching a larger, more general audience, had the benefit of serving as a therapeutic outlet for its frequently agitated author.

DeVorkin's biography is easily the most authoritative work on Russell's science—a full quarter of the book is devoted to bibliography, endnotes, and related materials. It will be welcomed by scholars with an interest in the major astronomical problems of the 20th century, most particularly those associated with astrophysics. However, as the story of a great scientist, it is painfully slow going and fails to command reader interest by an artful integration of Russell's life and times, or to provide a sense of the thrill of discovery in the most exciting century of astronomy yet. This, coupled with prose too technical for an all-too-brief glossary to overcome, means that *Henry Norris Russell* will find few readers among the very kind of lay audience to which its subject reached out over the course of 40-odd years.

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