John Stanley Plaskett

The Twenty-Seventh Bruce Medalist

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When Canada's first national observatory opened in 1905, John S. Plaskett (1865–1941) was a junior member of the staff. He soon took charge of the astrophysics program and made the country a major force in astronomy by developing instrumentation, proving Jan Oort's theory of galactic rotation, and leading the drive for a second national observatory.

John Stanley Plaskett, born Nov. 17, 1865, died Oct. 19, 1941. Plaskett received the ASP's Bruce Medal in 1932 for his research achievements. Photo courtesy of Alan Batten, Dominion Astrophysical Observatory, National Research Council of Canada.

John Plaskett was a re-entry student. Today, many students begin their higher education late and work full-time, but this was unusual in the 1890s. Yet Plaskett, the mechanician in charge of physics apparatus at the University of Toronto, enrolled as a student at 30. Attending but a few lectures, he earned his bachelor's degree with honors four years later.

He had come a long way since his father's death, when "Jack," the oldest of 10 children, dropped out of school at 15 to manage the family farm in Ontario. Throughout his childhood Jack Plaskett had been the family tinkerer, inventor, and mechanic, rigging up static-electricity generators, lathes, and crossbows.

There was little astronomy in Canada at that time. A government report in 1898 stated (erroneously) that there were only two working telescopes, both 6-inch refractors, in the entire country. Yet Canada, like the United States, needed astronomers. Parliament could decree that the boundary between Alberta and Saskatchewan would be the 110th meridian, but only astronomical measurements could locate that meridian on the ground. In 1899 the government appropriated funds to establish the Dominion Observatory (DO) in Ottawa. Plaskett joined the staff as a mechanic in 1903, two years before the observatory formally opened. Put in charge of an expedition to observe a solar eclipse in 1905, he bought or built the necessary cameras, spectrographs, and other instruments. The day turned out cloudy. Still, from a later perspective the expedition was a success: When the observatory opened that year, Plaskett was no longer a mechanic; his new title was astronomer.

As the only member of the staff interested in astrophysics — everyone else was working on timekeeping, surveying, or geophysics — Plaskett was put in charge of an excellent 15-inch refractor equipped with photometer, spectrograph, and solar camera. Immediately he began improving the instruments: stiffening the spectrograph to reduce flexure, opening its slit to obtain more light, controlling temperature with heaters and fans, and patiently varying every parameter. He also started writing to the directors of leading observatories, including George E. Hale (May/June 1992, p. 94) at Mount Wilson near Pasadena, Calif. and W. Wallace Campbell (March/April 1992, p. 62) at Lick near San Jose, Calif. Older than Hale, and just 3 1/2 years younger than Campbell, Plaskett was taking up astronomy at a much later age.

In 1906, Plaskett wrote Campbell asking about the practical details of measuring the wavelengths of spectral lines, a field in which Campbell was the world's leader. Eager to see the experts and their equipment for himself, Plaskett visited leading observatories in the United States that summer. Radial-velocity measurements, which Plaskett was planning to make, were essential to theorists in their efforts to determine the location and motion of the solar system with respect to the Galaxy (see "Jacobus Cornelius Kapteyn," September/October 1991, p. 145). Such measurements were also the only direct way to determine the masses of stars: The velocities of spectroscopic binaries oscillate at a rate that depends on their masses.

Favored by DO director William F. King, Plaskett enlarged the astrophysical staff and moved forward on many fronts at once. Indeed, in the first 10 years of the observatory, almost every addition to the staff was in Plaskett's department. Ironically, it was the one department that did not fill any of the pragmatic

needs for which the observatory was built.

On the Map

By 1910 Plaskett was taking spectrograms with his 15-inch telescope in less time than the Yerkes observers in Wisconsin needed with their 40-inch, the world's largest refractor. That year, Hale invited Plaskett to the International Union for Solar Cooperation meeting in Pasadena. There, Plaskett was made a member, alongside such famous scientists as Campbell and Karl Schwarzschild (November/December 1991, p. 179), of international committees for cooperation in radial-velocity studies, spectral classification, and solar rotation. Plaskett was putting Canadian astronomy on the map.

His visit to Mount Wilson and its new 60-inch reflector, the largest telescope in the world, made a great impression on Plaskett. Afterward he wrote Campbell, "I have been making some tentative moves towards securing a large reflector for radial velocity work." A natural politician as well as an instrument-builder, Plaskett arranged for letters and resolutions in support of a new reflector from leading astronomers and scientific societies. Just eight years after the dedication of the DO, King could write Campbell, "You will be glad to learn that the Minister of the Interior has given his consent to the construction of a large reflecting telescope to be installed in the best astronomical situation in Canada."

After Victoria, British Columbia was selected as the best site in Canada for the new Dominion Astrophysical Observatory (DAO), Plaskett personally persuaded the provincial premier to contribute the land and a road. He drew up the specifications for a 72-inch reflector, worked with the manufacturer (Warner and Swasey) on the design, and rejoiced when the mirror blank left Belgium just days before the German invasion in 1914. It took another series of letters from influential astronomers, but Plaskett was appointed the observatory's first director. World War I delayed the 100-inch Hooker telescope on Mount Wilson, and for a few months in 1918 Plaskett had the largest telescope in the world. After the completion of the Hooker, the 72-inch was the second largest until 1935, when Plaskett retired just as the Victoria reflector was demoted to third place — by another Canadian telescope. In 1993 the 72-inch was officially named for Plaskett.

In Victoria, Plaskett continued to measure radial velocities and determine the orbits and masses of spectroscopic binary stars, but he did not expand in new directions. How could he, with just three astronomers on the staff? Observing every third night did not leave much time for analysis or planning, and the observatory had students only in summers.

In addition to finding the most massive pair of stars known, Plaskett made two major contributions to astronomy. In 1927 Jan Oort in the Netherlands extended some ideas of Bertil Lindblad and constructed a model of galactic rotation. In Oort's model, the Galaxy consisted of several separate subsystems, each orbiting at its own rate around the same center. Confirming the theory required observations of the radial velocities of distant stars. Plaskett had the data in hand. He and a junior colleague, Joseph A. Pearce, had already measured radial velocities of many O and B stars, which are luminous enough to be observed at great distances. Plaskett provided the data that confirmed the theory and indicated a direction for the galactic center within 1 degree of where Oort had predicted (and within a few degrees of where Harlow Shapley had found the center of the system of globular clusters a few years earlier). Oort wrote Plaskett that he was "surprised at the accuracy with which your rich and homogeneous material... confirms the rotation effect. I had not expected that so much important material would so soon be available."

Plaskett's other great discovery was the proof that clouds of interstellar gas caused the "stationary lines" of ionized calcium observed in the spectra of hot stars, so called because they do not share in the orbital motions observed in other lines from stars in binary systems. It was a big step forward in what would later become a major field of astronomy, the exploration of the interstellar medium.

Kinder, Gentler

Although Campbell was his role model in scientific work, Plaskett was a kinder, gentler director. He saw no need to have his name on every observatory publication, and he and his wife, Reba, were kind to young astronomers. In 1931 Plaskett hired one young Canadian astronomer, Frank Hogg, but acquired *two* new Harvard-Radcliffe Ph.D.s, as Helen Sawyer Hogg later told historian David DeVorkin: "When we got to Victoria, the director, Dr. J.S. Plaskett, was exceedingly wonderful to me. It turned out to be the Depression and the Canadian government rule was ironclad that both husband and wife could not be employed, and I understood that perfectly. Dr. Plaskett got money, $200 a year, from the National Academy of Sciences, which he paid me for my full-time work as an assistant."

The $200 paid for a full-time maid and Plaskett gave Hogg, who was to become one of Canada's leading astronomers and popularizers, as much time on the 72-inch as she wanted. Shortly after the birth of their daughter, she resumed observing:

"As I was nursing her, this meant that she had to come to the dome with us for the night, which resulted in some worldwide publicity because the Astronomer Royal of England, Sir Frank Dyson [March/April 1993, p. 49], paid a visit to the dome. A jovial individual and traveler and a great story teller, Dyson loved to tell how, as he mounted the stairs to the observing floor of the dome, he heard a whimpering and exclaimed, 'What's that?' and Dr. Plaskett calmly replied, 'Oh, that's the Hoggs' baby in its basket on the platform by the pier.'" ***m***

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