Reviews

Pauper & Prince: Ritchey, Hale, and big American telescopes

by Donald E. Osterbrock


It would be reasonable to suppose that two great pioneers in astronomy, each a specialist in his own field, would have formed a long-lasting relationship for the benefit of a common cause. In the case of George Willis Ritchey and George Ellery Hale this was initially true, but within a few years the collaboration turned sour and led to lifelong estrangement.

Ritchey was born in 1864 into an Irish immigrant family, and learned his skills in the family furniture business and through his studies in design, draughtsmanship and science at Cincinnati University. He made his first telescope in 1882, and in 1888 moved to Chicago, where he established his own laboratory and workshop. Hale's background was completely different from Ritchey's, his father having accrued a large fortune from the manufacture of elevators for the skyscrapers built after the great fire of Chicago. Hale developed an interest in science when quite young, and his renowned smooth tongue first came into operation when at the age of fourteen he persuaded his father to buy him a telescope. But classical astronomy did not appeal to him – he wanted to carry out research in the new science of astrophysics. Within a few years he had his own fully-equipped physical laboratory, including his newly-invented spectrohelioograph, and in 1891 was provided with an observatory equipped with a 12-inch refractor, all this and much more being paid for by his father.

After their first meeting in 1890 Ritchey and Hale worked together for several years. Ritchey made several mirrors, including a 24-inch f/4 which was later completed and installed at Yerkes Observatory, for which Hale was instrumental in obtaining the funds. Ritchey was appointed to the staff, and with the 24-inch reflector and the 40-inch refractor he continued the photographic programme which he had begun with the 12-inch. Both Hale and Ritchey had a firm belief in reflectors as the great telescopes of the future, and before work had even begun on the 40-inch refractor Hale had already drawn up plans for a 60-inch reflector. He was intent on establishing an observatory in California, an idea which came to fruition with the building of Mount Wilson Solar Observatory, funded by a grant from the Carnegie Institution of Washington. The first instrument installed there was the 24-inch 60-foot focus Snow telescope with its high-dispersion spectrograph, and by 1908 the 60-inch reflector – built by Ritchey – was ready for use. But again, Hale was thinking far ahead, as he had already succeeded in obtaining funds from J. D. Hooker for a 100-inch mirror.

The enmity between Hale and Ritchey first arose in 1908. Hale's research programme conflicted with Ritchey's photographic programme and his preoccupation with the design and improvement of telescopes – and the latter was jealous of anyone using 'his' 60-inch. But there were many other disagreements, and Hale had the full support of his assistant director, W. S. Adams. With the completion of the 60-inch and delays with the 100-inch, Ritchey was considered to be of little use. The situation grew worse over many years until, accused of 'disloyalty', he was dismissed without pension in 1919, soon after the completion of the 100-inch. For a while later he lost the entire crop of his lemon ranch in Azusa, and was left without money, income or job. In 1924 he went to France, where he spent the next few years making mirrors and working on plans for very large telescopes, including a 960-inch.

Hale was determined that Ritchey's work should not be recognised. He avoided any mention of Ritchey's name and vetoed many awards and honours for which he was nominated. Hale himself was the recipient of several medals and awards, and was instrumental in the founding of the IAU and the California Institute of Technology. He became very powerful, and few dared to oppose him. Ritchey was forgotten in America.

In 1909 Ritchey had met Henri Chrétien, and together they worked on the design of Ritchey's new optical system incorporating hyperboloidal primary and secondary mirrors. This system produces a large coma-free field ideal for photography, but with the disadvantage of a focal curve instead of a plane, so that curved photographic plates must be used. Ritchey decided that the 100-inch should be such a system, but Hale and Adams were totally opposed to it. The first Ritchey–Chrétien telescope – a 20-inch – was made in France in 1927, and the first to be used in America was a 40-inch which Ritchey made for the US Naval Observatory after his return in 1930, although it was not entirely successful. This led to more conflict, and he was eventually banned from the observatory and ordered to remove all his equipment from his workshop and office. He finally moved back to Azusa, where he spent the last few years of his life writing. At the same time, Hale had been working on plans for the 200-inch reflector for Mount Palomar, but he died eleven years before its completion.

Hale and Ritchey were both visionaries. Hale's plans for large telescopes came to fruition, and were superseded by Ritchey's optical designs; today, many modern observatories are equipped with Ritchey–Chrétien reflectors.

Donald Osterbrock, a research astronomer at Lick Observatory and formerly its director, has here produced an exciting account of these long and complex relationships, much of which is based on archival material and interviews with people who knew Ritchey. It is a story of brilliant minds, wealthy benefactors, ambition, egocentrism, pride and jealousy; of phenomenal successes, and of tragic failures. It is also a vivid reminder that human frailties can be overcome in the quest for scientific and technological achievement.

R. A. Marriott
R. A. Marriott is the Association's Curator of Instruments.

Other Books received

(Mention here does not preclude a fuller review later.)


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