Biographical Encyclopedia of Astronomers

Cayley, Arthur

Challis, James

Born Braintree, Essex, England, 12 December 1804

Died Cambridge, England, 3 December 1882

James Challis was a Cambridge University astronomer best known for his failure to discover Neptune in the summer of 1846. Educated at Cambridge, where he was a senior wrangler, Challis was elected a fellow of Trinity College in 1826. He became a *protégé* of the strong-willed and domineering George Airy after Airy became director of the Cambridge University Observatory in 1828. In 1830, Challis was ordained and also assumed the position he was to hold until the end of his life, Plumian Professor of Astronomy. He married the following year. On Airy's appointment as Astronomer Royal in 1836, Challis succeeded to the observatory directorship

By all accounts, Challis was an honest, hard-working man who seems to have aspired to nothing more than to do his duty. While this bank clerk's mentality served him well in some ways, it would tell against him when he had his greatest opportunity to discover Neptune, whose existence had been surmised by Challis's younger colleague, John Adams, and by Urbain Le Verrier.

At first, Challis's search was delayed by his attempt to catch up on the reduction of a horde of comet observations; the first part of 1846 had been rich with comets, including, most notably, 3D/Biela, which broke apart. When Airy urged haste upon him, he took up the search in a thorough but plodding fashion. The instrument used was the 12-inch telescope Airy instructed Challis to use the Northumberland refractor at Cambridge and sweep a generous band of the zodiac, 30° long by 10° wide, centered roughly on the position given in the paper Le Verrier had published in the Comptes rendus on June 1. His observations would have been suitable for drawing up a star map, and he later claimed that if only he had one, he might have succeeded. Ironically, he did have one, although he did not use it. Challis had found Hour XXII of the Berlin Academy star map, by Friedrich Argelander, in the Cambridge Library before starting his search; it covered part of the region in question, including that in which the planet was actually passing. Thus, his excuse was disingenuous to some degree.

In the course of routine observations, Challis actually recorded the planet twice, on 4 and 12 August 1846, but failed to recognize it since he did not compare the observations. He reported to Airy in early September that the work was slow and would not be completed that year. Challis was always vastly overworked—with teaching and maintaining his ambitious meridian program with the mural and transit circles—and he did not proceed with enthusiasm in his additional task, in which he never had any confidence.

In the end, the actual discovery of the planet was made by Johann Galle at Berlin on 23 September 1846, on the basis of Le Verrier's calculations. Before news reached England, Challis missed yet another—his last chance to make an independent discovery. He had been urged to look for a small disk among the stars, based on Le Verrier's This recommendation was included in his last published paper in the Comptes rendus, which appeared on August 31, 1846. While sweeping, Challis noted one star that appeared to have a disk. But he was called away to tea, and by the time he had a chance to return to the telescope, the sky had clouded over.

Soon afterward, Challis learned from England's John Hind, the first astronomer in England to knowingly see the planet, that "Le Verrier's planet is now discovered" and that "our searches are now needless." One can only imagine that he must have been devastated.

Challis made no friends in France when he and Adams proposed their own names for the new planet—Oceanus—as if they had a right to the privilege of naming it. The name originally proposed by the French, Neptune, was adopted. In the postdiscovery inquest, Airy and Challis had to defend themselves against what started out as university squabbles but soon became a national and then an international scandal. Airy mounted as effective a defense as possible; Challis, in the end, was made to look like a bumbler, which probably served him well. He was deemed too insignificant to go after

Challis gave an account of his role that was dignified and notable, at least, for its honesty. He summed up his attitude about Adams's and Le Verrier's mathematical positions of the unknown planet: "It seemed so novel a thing to undertake observations in reliance upon merely theoretical deductions, and while much labour was certain, success appeared very doubtful." Challis was not hounded to the degree that Airy was post-Neptune-mortem

Challis seems to have been a thoroughly likeable personality; he embodied the ideals of Victorian astronomy, which emphasized routine observations and duty. An unstinting and productive worker, he wrote over 200 papers on mathematical, physical, and scientific subjects and published 12 hefty volumes of *Observations Made at the Observatory of Cambridge* (1832–1864). Except for the notable lapse of 1846, Challis seems to have been a singularly faithful observer at his post. He was succeeded by Adams as director of the observatory in 1861, but continued to occupy the Plumian Chair until his death.

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Selected References

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