TOMBAUGH'S STAR: A HISTORICAL TALE OF THE CATACLYSMIC VARIABLE TV CORVI

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Abstract

While doing research for my 1991 biography of Clyde Tombaugh, discoverer of Pluto, I found evidence that he had discovered a probable nova in Corvus. Since this was an unusually high galactic latitude for a nova, I tried to find confirming evidence for his 1931 observation. Although my results were negative for 1931, I did find nine additional outbursts in my search through several hundred Harvard patrol plates. I observed the variable, now called TV Corvi, in outburst for the first time visually on March 23, 1990, and several times since then.

1. Introduction

When Clyde Tombaugh began blinking his two photographic plates he had exposed on March 23, 1931, he had no idea what discovery awaited him. He was on the trail of Trans-Neptunian planets, but was on the alert for anything unusual.

At 11:00 on the morning of May 25, 1932, more than two years after he discovered Pluto, Tombaugh's scan revealed a bright 12th magnitude star on one of his two plates; none appeared on the other. It appeared to be a nova at a high galactic latitude. Although the astronomer reported the discovery to his superior, Carl Lampland, there is no evidence that the announcement of the nova was ever forwarded beyond Lowell Observatory.

2. Reconfirming Tombaugh's discovery

In 1988, while writing a biography of Tombaugh, I visited Lowell to inspect the notes he had written on the back of each plate envelope. I found the notes he had made on that plate envelope from long ago: "One nova suspect," his plate notes read, " T 12 [meaning Temporary object No. 12] near southwest corner of plate, magnitude about 12.... No trace of object on plates of March 20 and 17, 1931.... Evidently a very remarkable star to rise from 17 or fainter to 12 in 2 days time. This object was discovered on May 25, 1932, at 11:00 AM."

Since the nova appeared on only one photographic plate, I needed to confirm it, but time constraints kept me from doing so until the summer of 1989. Visiting the massive photographic plate collection at the Harvard-Smithsonian Center for Astrophysics, I checked for plates near the time of the Tombaugh observation. There was a plate, but it did not record stars as faint as the nova was at the time. I then looked at other sample Corvus plates from different times. As I expected, nothing unusual appeared. But on the tenth plate was Tombaugh's star, as bright as it was in 1931. That plate was exposed in the late 1970s, decades after the original discovery.

With mounting excitement I decided to check every one of the more than 260 patrol plates of Corvus in the Harvard collection. After three days of searching, I had evidence of nine outbursts in addition to Tombaugh's find. The final confirmation was a visual one. For nearly 70 nights I checked the star, either visually with my 16-inch reflector, photographically through a Schmidt telescope, or with a CCD system. The long search and wait finally ended on March 23, 1990, 59 years to the day after the first Tombaugh plate. I pointed my telescope toward Corvus, not far from R Corvi, and saw Tombaugh's star in outburst.

3. Conclusion

Although the star is now officially known as TV Corvi, I propose that we call it Tombaugh's star in honor and memory of the man who first detected it. On its next observed outburst in June 1991, astronomer Steve Howell and others observed it using the International Ultraviolet Explorer satellite. Based on a long series of observations they conducted, they suspect that the system consists of two stars, a small white dwarf and a larger star. They also conclude that the stars rotate around each other in just two hours (Howell *et al.* 1995).

Reference

Howell, S. B., Szkody, P., Sonneborn, G., Fried, R., Mattei, J. A., Oliversen, R. J., Ingram, D., and Hurst, G. M. 1995, *Astrophys. J.*, **453**, 454.