

Unearthing History: The Rediscovery of MSU's Forgotten Observatory

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While installing hammock posts near Wills House on the northernmost corner of campus this May, Michigan State University's Infrastructure Planning and Facilities (IPF) employees dug into what appeared to be an old concrete slab. They proceeded to reach out to MSU's Campus Archaeology Program (CAP), who work closely with IPF to monitor MSU's cultural materials. CAP went to work digging a survey of nearly 40 1-meter-deep holes in the vicinity. Aside from the concrete slab, these 'shovel test' pits exposed large cobblestones that had been laid with crude concrete. This clearly unnatural discovery prompted further investigation—what had been found?

Old campus maps revealed that the site was close to the location of a long-vanished astronomical observatory. Could the test holes have unearthed its foundation? The observatory had been built in 1880 atop a circular foundation with an inner diameter of 14-feet 8 inches and a 16-foot outer diameter, partly by students working under the guidance of Professor Rolla C. Carpenter. Previously, Professor Carpenter, who taught mathematics, civil engineering, astronomy, and French, had led students in observation on the roof of College Hall. The construction of an observatory allowed an opportunity for astronomy courses and observation to occur at the same location, giving students a stronger sense of a unified identity with their university. Beneath its rotating roof, it housed an 1879 5-inch Alvan Clark telescope, set upon an equatorial mount from R. and J. Beck (Smith 2019).

Following the shovel test pits, CAP opened a square 1x1 meter excavation unit and—to confirm the size and curvature of the stone feature matched that of the old observatory foundation—a second, slightly smaller excavation unit. These excavations revealed an encouraging congruence between the size and shape of the excavated feature and historical descriptions of the observatory. Moreover, shovel testing also revealed a linear subsurface feature, which was tentatively identified as the road that can be seen running alongside the observatory in a 1913 map of campus. The concrete slab originally discovered by IPF appears to be unrelated to the structure.

Additionally, a survey conducted on August 9th has provided more evidence that this structure is the old MSU observatory: the State Cultural Resources Specialist of Michigan, Dr. Duane Quates, used Ground-Penetrating Radar (GPR) to reveal the shape of the foundation. GPR uses microwave radiation to detect potential objects and artifacts beneath the soil, producing a density map of the surveyed area. After compiling many lines of GPR data, Dr. Quates' result was a circular foundation around 16-feet in diameter! Given this survey and the previous discoveries, CAP is confident that the site of the 1880 observatory has been found, and there are plans to unearth the entire foundation for further study during a CAP field school in summer 2024.

The old MSU observatory was used as a teaching facility from its construction into the early 20th century. This observatory was published at least once, in an 1885 sunspot study, but there is otherwise little indication that the structure was used for formal research. In the winter of 1912, the window on the building's dome was left open, damaging equipment. Three years later, the remaining equipment was damaged in a burglary. Campus course schedules, maps, and building inventories suggest that the building was demolished sometime in the early 1920s,

likely as a result of the extensive damage that occurred over the previous decade. However, all was not lost. In the early 1970s, Professor Thomas Stoeckley and graduate student Robert Miller rediscovered the 5-inch telescope in what was then the Physics and Astronomy building, and it is now on display at MSU's Abrams Planetarium.

The successor to the old MSU observatory was built in 1969 to the south of the university's main campus, and a 24-inch reflecting telescope was installed in 1970. This observatory has seen several upgrades since and has come far from the little 16-foot observatory on north campus! Today, the research conducted at the observatory is semi-automated, using a motorized dome and telescope with an Apogee Alta U47 CCD to capture images of astronomical objects. The observatory is open to the public twice a month for tours, activities, observing, and conversations with local astronomers and astronomy students. Undergraduates at MSU actively use this observatory to research a large variety of astronomical objects, including but not limited to novae, exoplanets, and asteroids, and multiple papers have come out of the observatory just in recent years. But, maybe even this observatory will become obsolete as MSU's Department of Physics and Astronomy continues to grow. Only the future will tell!

Smith, H. A. 2019, *Stars Over the Red Cedar*, Chapbook Press, pp. 7-30.