

DAILY SOLAR OBSERVATIONS AT MOUNT WILSON OBSERVATORY AND SOLAR ECLIPSE EXPEDITIONS: SHAPING EACH OTHER IN THE EARLY TWENTIETH CENTURY

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In the early twentieth century, how did a solar astrophysical observatory and solar eclipse expeditions shape each other? Mount Wilson Observatory (MWO), founded in 1904 by astrophysicist George Ellery Hale in Southern California, was one of the leading centers of solar astrophysical research. Skilled astronomers who had access to large telescopes, spectrographs, and spectroheliographs carried out daily observations of the sun to study its physical characteristics, such as solar rotation or composition. Nevertheless, solar eclipse expeditions were still important to the MWO astronomers. Examining the period from MWO's founding to the 1923 solar eclipse expedition, I argue that the two had a synergetic relationship scientifically and socioculturally. Results from daily observations and their limitations enabled astronomers to refine their scientific programs for eclipse expeditions and vice versa. For example, observational data from the lower chromosphere from MWO enabled astronomers to focus on observing the solar corona during the short moments of a solar eclipse. Using the observatory's facilities, scientific workers were able to increase their work efficiency - timewise and costwise - in preparing for eclipse observations. Furthermore, because astronomers considered eclipse expeditions as temporary and their locations exotic and sometimes remote, these perceptions contributed to them regarding MWO as an established scientific center that was neither an exotic frontier nor a remote place.