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Lick Observatory, California, and 20th Century Leadership in Optical Astronomy

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With the establishment of the Lick Observatory on Mt. Hamilton in California in 1888 it was immediately established that an observatory located on a relatively high site far from city lights was a far superior location for optical astronomy than the previously common city locations. A few years after its beginning, astronomers at Lick convincingly demonstrated the clear advantage of the reflecting telescope for astrophysical research. Not only was a reflector achromatic over all wavelengths, but it could be made with a small focal ratio that provided high photographic speed. Furthermore, since light did not pass through the optic and it could be supported from behind, it could easily be made in large sizes. Over the first half of the 20th century the establishment of the Mt. Wilson and Palomar Observatories expanded California's dominance in optical astronomy. Also with the new larger telescopes came major progress in the in design of focal plane instrumentation that allowed these telescopes to be superb tools for astrophysical research. The California observatories of the 20th century were largely independent of Federal funding for operations. Their facilities were were maintained and mostly used by their permanent staffs. This led to a style of doing forefront research that was highly effective, as both long-term survey-type programs and more speculative investigations with less-clear payoffs at the outset could be supported. Also the, the close connection of the scientists doing the research to the development of the telescopes and instruments they used for their research conferred advantages. At present, this style of doing astronomical observational research is a relatively small fraction of all this kind of research. At the end of the 20th century the California pioneering advancement in ground-based optical astronomy was repeated with the creation of the Keck Observatory. A joint project of the University of California and the California Institute of Technology, this observatory features two 10-m telescopes, current the largest general-purpose optical/infrared telescopes in the world. However, California skies were abandoned in favor of a much superior site in Hawaii.