mined with the photographic zenith tubes of the U. S. Naval Observatory at Washington, D. C., and Richmond, Florida, and Ephemeris Time was determined with the dual-rate moon camera at Washington.

The comparison of Universal Time with the cesium standard at the National Physical Laboratory, Teddington, England, made by comparing frequency from month to month, showed a uniform deceleration from September 1955 to January 1958. During this interval the length of the day increased by $0^{\circ}001$.

In February 1958 an unexpectedly large change in speed occurred within a short time. Analysis of the daily PZT results for time, referred to the cesium standard at the Naval Research Laboratory, Washington, indicated that a decrease of $0^{\circ}0003$ in the length of the day occurred in an interval of two weeks or less; how much less cannot be determined.

Observations made since June 1952 with the dual-rate camera at Washington have been reduced, but corrections for the irregularities in the profile of the moon have not yet been applied. The preliminary results indicate that about 1953 a change in acceleration in rotation of the earth occurred.

*U. S. Naval Observatory,
Washington, D. C.*

Meinel, A. B. Report on the Kitt Peak Observatory.

On March 14, 1958, the National Science Foundation announced the selection of Kitt Peak as the site of the National Astronomical Observatory, culminating three years of intensive search.

The area examined for possible sites included six western states centered upon Arizona. All possible areas were examined in Southern California, Arizona, New Mexico and parts of Nevada, Utah and Texas.

The general region of southwestern United States was selected because of the high percentage of clear skies that is found in this area.

Preliminary reconnaissance of possible sites was made by examination of rocket photographs, principally those taken on the Viking flights. This examination was followed by an aerial reconnaissance of the entire region. Extensive photographs were obtained. The aerial reconnaissance narrowed the group to 150 sites.

A ground examination of the sites succeeded in eliminating all but a dozen sites. Sites were rejected for a variety of reasons relating to the practicability of testing and erecting an observatory facility.

Early assessment of meteorological factors, rainfall, cloudiness, dust, and the artificial factors of smog, smoke, vapor trails and city lights enabled five sites to be selected for initial testing. The sites were Chevelon Butte, south of Winslow in latitude 35° ; Summit Mountain, south of Williams in latitude 35° ; Hualpai Mountain, south of Kingman in latitude 35° ; Kitt Peak, southwest of Tucson in latitude 32° ; all four in Arizona; and Junipero Serra Peak, near Monterey, California, in latitude 36° .

The first year of site testing led to the elimination of Chevelon Butte, Summit and Junipero Serra. Mormon Mountain, south of Flagstaff, in latitude 35° was added, but actual testing was limited to Slate Mountain, north of Flagstaff, for practical reasons. The California site was discontinued because of the desire to have an observatory site complimentary to the weather conditions affecting the California observatories.

At present on Kitt are two excellent 16-inch photometric telescopes, and modern living quarters housed in a quonset building. Bids have been received for the construction of the 36-inch telescope facility. It is expected that the telescope will be in operation in October 1959. Engineering is proceeding on the 80-inch telescope facility and the casting of the 84-inch ribbed Pyrex mirror is underway. It is expected that the 80-inch telescope will be nearing completion in December 1960.

*National Astronomical Observatory,
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Mikesell, A. H. Observations of stellar scintillation from moving platforms.

Scintillation amplitude, at frequencies around 250 cps, varies with speed of winds aloft. Its values, when observed through rectangular or multiple apertures, also vary with the orientation of these apertures relative to the wind-direction. If scintillation is introduced within particular layers in the atmosphere, such layers may best be sought from bases within the atmosphere. Preliminary data indicate that the observed amount of scintillation depends less upon motion of the observer relative to wind than upon his height relative to the tropopause.

By means of wind-tunnel tests with winds at speeds up to those represented by Mach 1, I found that serious seeing disturbances, but no scintillation, are produced in simulated starlight by air turbulence adjacent to the observer. Then I found that observations from airplanes at altitudes up to 14,000 feet yield values of scintilla-

tion comparable to those on the ground, with possibly a moderate dependence upon observer motion. Plane-borne equipment near the tropopause, however, showed definite dependence upon either the observer's height or motion or both. A balloon flight in an open gondola to 41,000 feet, which is 5000 feet above the tropopause, was an attempt to vary only height of the observer, with his motion depending only upon ambient winds. The gondola rotation seriously exceeded expectations and the guiding capabilities of my equipment, but I noted with naked eye that no star higher than 3° above my tropopause-defined horizon showed any scintillation. Scintillation for higher stars appeared as the balloon was allowed to descend into the troposphere, affecting stars at uniformly increasing altitudes until, before the 20,000 foot level was reached, all stars appeared to twinkle in a manner essentially identical with that seen from the ground, except for an absence of color scintillation. Most of the night was spent in the 12,000 to 15,000 foot region, from which the moon, Jupiter and Saturn appeared excellently defined through a 3.5 inch, 160 power telescope.

The gondola can probably be stabilized inexpensively, since its only noticeable motion was a rotation incurred by the distribution of large weights on long radii from a single, very flexible, line of support. On a flight scheduled for August 1958 apparatus developed by Dr. A. A. Hoag will be used to make quantitative photographic tests of seeing in the manner of those used for relocation of the Lund Observatory.

*U. S. Naval Observatory,
Washington, D. C.*

Miller, Walter J. and Wachmann, Arthur A.
A new galactic Cepheid of unusually long period, VV 48.

Vatican Variable 48 is a galactic Cepheid whose period is $54^d.3313$. It is located in Vulpecula, at the southern tip of the Cygnus cloud, nearly 2° north of the galactic equator and about 2° southeast of β Cygni. Its exact position is $19^h31^m13^s.25$, $+26^\circ12'32''.7$ (1900.0). The photographic range of VV 48 is from 13.56 to 14.45 mag. On the basis of 314 Harvard, Vatican, Palomar and Hamburg Observatory plates, the light elements of VV 48 are:

$$\begin{aligned} \text{J.D. max.} &= 2433147.80 + 54^d.3313E. \\ &\pm .34 \quad \pm .0053 \end{aligned}$$

The early Harvard and recent Hamburg obser-

vations span an interval of over 20,000 days or 370 complete cycles.

The broad maximum or slight shoulder on the descending branch is characteristic of W Virginis stars or Population II Cepheids of comparable period. The blue and red Palomar Sky Survey plates, taken successively on the same night, show that VV 48 is only slightly reddened, and that there is a rich and very even concentration of stars in the field around VV 48. If a total photographic absorption of 1.0 mag. is assumed, the distance of VV 48 would be about 16,000 pc and its height above the galactic plane would be 500 pc. This variable is the galactic Cepheid of longest known period. We recommend VV 48 to the spectrographic observers, since spectral-type and radial-velocity determinations would be decisive in classifying the star and determining its real distance from us.

Identification charts, light curves and more detailed photometric data on VV 48 and on 11 other Cepheids will be published in *Ricerche Astronomiche* of the Vatican Observatory, 6.

*Astronomical Laboratory,
Fordham University,
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Mohler, Orren C. and Dodson, Helen W.
Observation of solar "points."

There is a type of object on the sun visible through a Lyot $H\alpha$ filter and photographed on hydrogen and calcium spectroheliograms that is the source of the spectroscopic feature called "hydrogen bombs" by Ellerman (1917) and "moustaches" by Severny (1956). These objects were observed through the filter by Lyot (1944) and called by him "points." We shall adopt his nomenclature because it indicates the small size and usually circular shape of the phenomenon. Points are identified by their characteristic spectrum, viz., brilliant emission streaks extending several angstroms on either or both sides of $H\alpha$ but not crossing it. Emission on the violet side is generally more intense than that on the red.

At the McMath-Hulbert Observatory points are observed by two methods. (1) They are seen visually in a Lyot- $H\alpha$ filter and then placed on the slit of the vacuum spectrograph for definitive identification and spectrographic study. (2) The points are recorded on series of 15 spectroheliograms made at different wave lengths, systematically spaced within $3\text{\AA}$ on either side of the center of $H\alpha$ or the K-line. Points are photographed with especial ease on K spectroheliograms.