sistency of $\pm 40\%$. Confirming observations were taken on the nights of March 10–11, 1960 and August 16–17, 1960. The above flux is a factor of 0.8 of that obtained by C. R. Lynds at Green Bank at a wavelength of 21 cm (C. R. Lynds, private communication) and a factor of 0.31 of that obtained by T. A. Matthews at Cal Tech at a wavelength of 31 cm (J. G. Bolton, 12th General Assembly of URSI, London, 1960). These values suggest a non-thermal radio component from the planetary nebula. However, the possible uncertainties in the absolute values makes this inference highly uncertain. More accurate absolute measurements are needed in this wavelength range.

A North-South Asymmetry in Location of Solar Sources of Great Geomagnetic Storms.

BARBARA BELL, *Harvard College Observatory*.—At the 106th meeting of the Society, the author presented evidence that, in the years 1937–1959, a major flare in the northern solar hemisphere had about four times greater probability than a similar southern flare of being followed within three days by a great magnetic storm. This concentration of great-storm sources in the solar north occurred about equally in each of the three sunspot cycles, No. 17, 18, and 19.

Evidence for a preferred hemisphere for great-storm sources in earlier cycles has now been examined. Most of the data for this study were taken from the Royal Greenwich Observatory's "Sunspot and Geomagnetic-Storm Data, 1874–1954." The Greenwich data reveal that over 50% of the total observed spotted area, and over 50% of the great spots ($A \geq 500$), occurred in the solar north in cycles 14–18, and in the south in cycles 12 and 13. Earlier data, in part from published records of Spoerer, in part generously made available by A. S. Milsom from his work with unpublished drawings of Schwabe, indicate that the solar north was the more spotted in cycles 8 and 9, and south in cycles 10 and 11.

Regarding geomagnetic activity, a substantial majority of the great storms apparently came from northern active centers in cycles 16–19, and from southern centers in cycles 10, 13 and 14; the two hemispheres contributed about equally in cycle 15; cycles 11 and 12 are probably, but less clearly, south-dominant. In most of the earlier cycles, as in 17–19, the degree of asymmetry in location of storm sources is increased when the lower limit for what shall be called a "great storm" is raised. Usually, the hemisphere that is more spotted in a given cycle produced more of the great storms; but not always, for the two curves are not perfectly in phase. The asymmetry in location of great-storm sources does not appear proportional to, and far exceeds in magnitude, the asymmetry in spottedness.

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Changes in the Periods of RR Lyrae Stars in Omega Centauri.

EMILIA PISANI BELSERENE, *Rutgers Observatory, Columbia University, New York, New York*.—This is the continuation of a study, begun by W. C. Martin (*Ann. Sterrewacht Leiden* 17, part 2, 1938), of period changes in the globular cluster Omega Centauri. There are, on this program, 32 of his 68 stars, all RR Lyrae variables of subclasses *a* and *b*, with regularly repeating light curves. For these 32 stars, as well as for the others, Martin had found increasing periods to predominate. The average rate of change was $+5 \times 10^{-10}$ days per day, or about 0.2 days per million years. The new observations, in 1947–8 and in 1956–8, provide two new epochs for the determination of periods. For the 32 stars the mean period was

0^d.6608544 from 1896 to 1933,
0.6608580 from 1931 to 1935,
0.6608584 from 1933 to 1947,
0.6608600 from 1947 to 1957.

Thus the new observations confirm the trend detected by Martin. The average rate of change of period, over the whole time interval, is $+4 \times 10^{-10}$ days per day. Individual values range from -31×10^{-10} to $+52 \times 10^{-10}$; the question arises as to the possibility that the trend is only apparent, resulting from the chance distribution of the extreme values. This does not appear to be the case, however. The rates of change show a frequency distribution with a reasonably narrow maximum at $+3 \times 10^{-10}$. It is not very likely that this distribution arose through chance selection of a sample from a population whose average period is constant. Unless some unsuspected systematic error is at work, then the periods of these regular RR Lyrae stars tend to increase with time.

The Light Variation and Orbital Elements of AK Herculis.

L. BINNENDIJK, *Flower and Cook Observatory, University of Pennsylvania*.—Photoelectric observations are presented of 520 yellow and 518 blue magnitudes of AK Herculis made during one night in 1959 and ten nights in 1960. The observations of four successive nights of exceptionally good quality in June 1960 showed definitely that there was an interval of constant light during the minima of 35-minutes' duration.

The orbital solution shows that primary minimum is caused by annular eclipse and secondary minimum by total eclipse. The curvature of the eclipse curve around the time of primary minimum is slight which indicates a small coefficient of limb darkening for