analysis of two clusters with fairly similar heavy element abundances. The clusters compared here are M3 and M13, using the observations of Sandage (1962), and stellar models by Demarque and his collaborators. The result is that M13 is relatively helium rich, and apparently younger. The helium enrichment seems fairly probable, but the age difference is possibly an expression of the inadequacy of the now outdated observational material.

An upper limit to the helium abundance in M13 comes from Traving's analysis of the atmosphere of the B2 star Barnard 29, for which $X=0.80$, $Y=0.20$. This helium abundance is comparable with the excess now found for M13 relative to M3.

If major variations in the helium content of globular clusters are real, much of the helium in our galaxy is not cosmogenic. If it has been produced in stars, a substantial fraction of the mass of our galaxy has been cycled through stars before the formation of population II. Such cycling would be useful in theories for explaining the massive heavy element enrichment of the globular clusters near the galactic center. Since helium enrichment would be expected to result from mass-loss processes, its enrichment would not necessarily be accompanied by heavy element enrichment.

Observations of 3C345 and Other Sources for Variability. K. S. YANG AND J. R. DICKEL, *University of Illinois*.—The 400-ft radio telescope of the Vermilion River Observatory at the University of Illinois is being used in a continuing program for monitoring various quasars and other sources for possible secular variations at a frequency of 610.5 MHz. Because the radio telescope is a transit instrument and also because of other commitments for the use of the telescope, it is not practical to monitor many discrete sources on a regular basis for short-term variations. Nevertheless, the permanence of the structure and the operating conditions make it an ideal instrument for measurements of long-term variations.

The sources 3C345 and 3C196 have each been observed several times over the $2\frac{1}{2}$ yr since June 1963 and the sources 3C186, 3C208, 3C216, 3C286, and 3C287 have all been monitored for periods of more than a year. None of the sources shows a variation greater than the observational uncertainty. The source 3C345 which has been decreasing in intensity at higher frequencies (Dent, W. A., *Science* **148**, 1458, 1965) has an antenna temperature of 2°K with an uncertainty of $\pm 14\%$ for a single measurement. Five measurements over the time baseline of $2\frac{1}{2}$ yr show that the flux density of 3C345 changes by less than $\pm 8\%$ per year. Secular variations of all other sources on the list were seen to have, if at all,

a maximum variation of $\pm 10\%$ per year. Future observations over an extended period are planned to improve these limits. This work was sponsored by the Office of Naval Research under Contract No. 1834(22).

Visible and Near-Infrared Spectrophotometry of Saturn's Rings. ROBERT L. YOUNKIN AND GUIDO MÜNCH, *Jet Propulsion Laboratory and Mount Wilson and Palomar Observatories*.—Measurements of the narrow-band spectral energy distribution of the rings of Saturn have been made at the Mount Wilson Observatory using the 60-in. reflector and the Fastie-Ebert spectrometer. Spectral scans from 0.51 to $1.1\ \mu$ were made of a segment of the rings at the western end of the semimajor axis.

The energy distribution was determined at 54 points in this wavelength region. The color sensitivity of the system was determined from scans of α Lyr and the α Lyr energy distribution of Oke. The relative reflectance of the rings was calculated by use of the solar intensity values of Labs and Neckel, converted to solar flux by the ratios of Minnaert.

The reflectance of the rings is very nearly constant from 0.78 to $1.05\ \mu$. Shortward of this region it falls slowly to $0.60\ \mu$, then more rapidly to a value at $0.51\ \mu$ some 0^m45 below the maximum. There is a slight decrease in reflectance (0^m03 – 0^m05) from 1.05 to $1.08\ \mu$. This is marginally outside of the experimental error. Owen has recently reported a drop in the reflectance of the rings from 1.04 to $1.09\ \mu$, which he identified as due to water ice. This drop was determined on the basis of a drop in the ratio of the intensity of the rings to the intensity of Saturn in this region. Separate measurements at Mount Wilson of the reflectance of Saturn show a continuous strong absorption from 0.97 to $1.04\ \mu$. This unfortuitous coincidence yields a large drop in the ratio beyond $1.04\ \mu$ which will completely mask any possible ice absorption which by the results above will be only a few percent at most.

Helium 10830 Å Absorption in Late-Type Stars. HAROLD ZIRIN AND ARTHUR H. VAUGHAN, JR., *Mount Wilson and Palomar Observatories, Carnegie Institution of Washington, California Institute of Technology*.—Spectrograms of some 40 selected stars with infrared magnitudes $J \leq 3$ have been obtained using an RCA type C70071 image converter tube (furnished by the Carnegie Image Tube Committee) at the 144-in. coudé spectrograph camera of the 200-in. telescope. The spectra were photographed with an $f/1$ transfer lens. The plates have a dispersion of $8.4\ \text{\AA}/\text{mm}$ and cover a range of about $150\ \text{\AA}$. The longest exposures for unwidened spectra