coated with aluminum. These small secondary mirrors will change the focal ratio from the primary $f/4$ to $f/145$. Flat mirrors on the declination and polar axes will be similarly coated and mounted in the telescope. However, the off-telescope, stationary polar flat, which reflects the light horizontally towards the coudé spectrograph, will consist of a quartz totally reflecting prism in contact with a calcium fluoride-quartz lens which will change the focal ratio to $f/30$. There will be two such anti-reflection coated lens-prisms mounted on a turret.

A 40% increase in light flux is expected.

Neutral Hydrogen Self-Absorption in a Cold Cloud. KURT W. RIEGEL, *University of California, Los Angeles.*—Twenty-one-centimeter line observations indicate the presence of an unusual cloud of cold neutral hydrogen which absorbs line emission from hotter hydrogen behind it. The dark cloud, at $l=9\overset{\circ}{.}8$, $b=-0\overset{\circ}{.}1$, has not been mapped entirely, but it appears to cover an area of at least 1 sq deg of the sky. On the basis of (a) the large observed angular diameter and (b) the low observed radial velocity of +7 km/sec with respect to the local standard of rest, it is concluded that the cloud is of the order of 1 kpc from the sun. The temperature of the neutral hydrogen in the cloud must be less than 38°K. Absorption of W31 continuum radiation permits a solution for the cloud temperature, 15–20°K.

Flux Densities of Radio Sources at 22.25 MHz. R. S. ROGER AND C. H. COSTAIN, *Dominion Radio Astrophysical Observatory.*—A survey of radio sources at a frequency of 22.25 MHz has been carried out at the Dominion Radio Astrophysical Observatory. Flux densities have been obtained for a first group of 210 sources. For approximately 80% of these, the new flux densities confirm the straight-line spectra determined previously at higher frequencies, and permit more accurate determinations of the spectral indices. About 6% of the sources show evidence of low-frequency components with steeper spectral indices. The flux densities are less than one would predict from higher frequency measurements for approximately 12% of the sources. Of the 30 known quasars in the list, only about 6 show departures from straight-line spectra at 22.25 MHz.

Radio Sources and Elliptical Galaxies. D. H. ROGSTAD AND R. D. EKERS, *Owens Valley Radio Observatory.*—One hundred ninety-one E and S0 noncluster galaxies with known redshift have been surveyed for radio emission at a frequency of 2640 MHz. The observations support the hypothesis that an elliptical galaxy must have an absolute photographic magnitude brighter than −20 to be a strong radio source. A comparison of the results of this survey with observations of radio galaxies in rich clusters indicates that cluster membership does not enhance the probability of an elliptical galaxy being a radio emitter. In addition to the strong radio sources, several E and S0 galaxies were found to have weaker radio emission associated with them, but their absolute radio luminosity was still on the order of 100 times larger than the radio luminosity of detected spiral galaxies.

Evolutionary Effects in the Rotation of Supergiants. JEFFREY D. ROSENDHAL, *Kitt Peak National Observatory.*—Recent observational studies on the compatibility of the observed axial rotation of stars and currently accepted theories of stellar evolution have shown that for giants of luminosity classes II and III earlier than spectral type F angular momentum is conserved. However, the most luminous supergiants of all spectral types show P Cygni emission features suggesting more or less continuous mass loss and hence probable angular-momentum loss throughout their evolution.

In this investigation, we have examined the rotation of early-type supergiants in order to see if angular momentum has been lost. Coudé spectrograms of 64 Ia and Iab supergiants in the spectral range O9.5–A5 have been obtained using the 84-in. reflector of the Kitt Peak National Observatory. A statistical procedure has been used to separate the contributions to the line broadening arising from axial rotation and large-scale turbulence. The expected rotation for various groups of supergiants has been predicted using theoretical evolutionary tracks.

The principal results are: (1) At all spectral types in the range B0–A5 both rotation and macroturbulence contribute to the observed line broadening. In the early B stars rotation is as important a broadening agent as large-scale mass motion. In the middle B and A stars turbulence dominates, but there still is an appreciable contribution from rotation. (2) In spite of the fact that the stars observed seem to be losing mass, there is no strong evidence for significant angular-momentum loss.

Solar Iron Abundance. JOHN ROSS, *University of California, Los Angeles.*—The solar photospheric abundance of iron is investigated by synthesizing selected Fe I and Fe II profiles. Dependence on the model employed, microturbulent velocity, van der