sistent measurements were made of six stars. They ranged in separation from $0''.25$ to $1''.0$, and in the difference of magnitudes of the two components from 0.2 to 2.5 magnitudes. The measures for these stars are compared to measures made with a Michelson-Anderson interferometer and with the values computed from the orbit when this is known.

*Physics Department,
The Johns Hopkins University,
Baltimore, Md.*

Slettebak, Arne. Rotational velocities of B8-A2 stars.

As a part of a larger program of measuring rotational velocities for the brighter early-type stars, spectrograms of B8-A2 stars brighter than the fifth magnitude are now being obtained at the Perkins Observatory. The object of this investigation is to provide a catalogue of rotational velocities and make a statistical study of axial rotation in stars of this group.

Spectrograms of over three-fourths of the 150 stars included have been obtained with the two-prism spectrograph attached to the Perkins 69-inch, giving a dispersion of 25 Å/mm at $H\gamma$.

The graphical method of Shajn and Struve,¹ in which a line contour from a non-rotating star is used to derive rotationally-broadened line profiles, is being employed. Comparison of the contour as observed in a rotating star with the set of computed contours gives a lower limit to the star's rotational velocity. In this investigation, the $\lambda 4481$ line of $MgII$ has been chosen, with Sirius as the standard non-rotating star.

At least two spectrograms of each star are being taken, and the internal consistency of the measures appears to be good. The agreement between the Perkins rotational velocities and those obtained by Elvey,² for 13 stars, is satisfactory, the Perkins results running generally somewhat higher because of the inclusion of limb darkening in the construction of the computed line profiles.

The largest rotational velocity measured to date in this group is 340 km/sec for the B8 main-sequence star α Leonis.

The shell star 14 Comae Berenices, underlying star of spectral type A5, which is presumably close to the critical rotational velocity at which material is thrown off at the star's equator, has a measured $v \sin i$ of 220 km/sec, relatively small as compared with the B-type shell stars.

A number of giants among the early A's exhibit relatively large axial rotation, among

them the standard A3 II-III star, γ Ursae Minoris, which has a measured rotational velocity of 180 km/sec.

1. *M. N.* **89**, 222, 1929.
2. *Ap. J.* **71**, 221, 1930.

*Perkins Observatory,
Delaware, Ohio.*

Smith, Elske V. P. and H. C. van de Hulst. Interstellar polarization by absorbing particles.

The optical theory of long, circular, slightly absorbing cylinders is applied to test the hypothesis that such particles are responsible for the observed polarization. Among the requirements imposed by the observations on any theory of the interstellar polarization are the facts that the amount of the polarization is independent of the wave length and that there is a certain correlation with the reddening. This correlation is such that the reddening is always present when polarization is observed, though the converse is not true.

The theory for cylinders is analogous to the Mie theory of scattering by spheres. The efficiency factor for extinction varies with the direction of the electric vector of the incident light. The extinction is greatest when the electric vector is parallel to the cylinder axis, and least when it is perpendicular. The ratio of the greatest to the least efficiency factor can be considered to define the amount of polarization.

In computing the efficiency factors of cylinders we sum over the coefficients of extinction which appear in the solution of the scalar wave equation. These coefficients are in turn calculated from certain phase angles. The phase angles had already been calculated previously¹ for some real refractive indices. Our problem was to calculate the efficiency factors for slightly absorbing cylinders. A representative refractive index for such particles is $m = 1.50 - 0.10i$, for which the imaginary part is small. The computations were greatly simplified by using the results for real refractive indices and calculating the changes of the phase angles with small changes in the index. A graphical method of solution was used.

Curves are given for theoretical extinction of particles with the refractive index $1.50 - 0.10i$ for the electric vector parallel and perpendicular to the cylinder axis, respectively. These curves follow an approximate $1/\lambda$ law such as that observed for the reddening. These particles could therefore produce the observed reddening. Curves were also calculated by Mr. Grootendorst and