their use over the use of the total magnitudes of clusters is that the measures involve only stellar images.

In seven globular clusters of the Large Cloud and three in the Small Cloud the brightest thirty or forty stars have been measured, referred to sequences established photoelectrically to the fifteenth magnitude and photographically to the eighteenth. From the means, we derive for the Large Cloud a distance modulus of 19.05, with an internal mean error of less than 0.1 mag. The systematic errors, due to uncertainties in the faint magnitude sequences and in the zero point for cluster-type variables, are of course larger. The Small Cloud's clusters require further study, but a provisional modulus is 19.2. With a correction for space absorption estimated at 0.4 mag., the distance of the Large Cloud is 175,000 light years, and the correction factor for the extragalactic distance scale is 2.2.

The foregoing correction of the zero point for the classical Cepheids requires the abandonment of the zero point calculated from the space motions, such as that obtained at Mount Wilson fifteen years ago by R. E. Wilson; but H. Mineur's subsequent analysis of proper motions and radial velocities has produced a zero point for classical Cepheids which approaches that obtained from the integrated magnitudes and from the bright stars in the globular clusters of the Magellanic Clouds.

1. *Harv. Obs. Monograph* No. 2, 160, 1930.

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Slettebak, Arne. Axial rotation in the F-type stars.

For the past few years a study of stellar axial rotation has been under way at the Perkins Observatory. The aim of this study is to determine the relationship between axial rotation and the spectral types and luminosities of the early-type stars. The Fo-Go phase of this program, although not yet complete, is discussed here because of its rather interesting results.

Observationally, this program consists of determining rotational velocities and spectral types for the brighter stars of Draper types Fo-Go, using Perkins spectrograms of dispersion 27 Å/mm at $H\gamma$. Line contours of $Fe\ I\ 4071$ in 12 representative stars have been determined and rotational velocities measured by the usual graphical method. These have then been used as standards to estimate visually the rotational velocities

for the remainder of the stars. Of the stars considered, 48 are standards in the new Morgan-Keenan system of spectral classification while the remainder were classified at the Perkins Observatory on the same system.

The principal results obtained are the following:

(1) Although no significant axial rotation ($v \sin i < 20$ km/sec) appears to exist in main sequence stars later than F5, some stars of intermediate luminosity show appreciable line broadening through spectral type Go at least, and probably G2. The Go III standard 31 Comae has $v \sin i = 75$ km/sec, and the G2 III star π Cephei has $v \sin i = 70$ km/sec, though the latter may have partially turbulence-broadened lines. This effect of luminosity on the cutoff point of axial rotation is brought out in the following table.

Type	Number of Stars	$v \sin i$ (km/sec)	
		Luminosity Class V	Luminosity Classes III, IV
F0-F2	25	32	75
F3-F7	28	5	32
F8-Go	15	0	26

(2) On the average in the range Fo-Go, the stars of intermediate luminosity have greater axial rotation than the main sequence stars, as may be seen from the above table. This luminosity effect on axial rotation is opposite to that found for the B8-A2 stars, in which the main sequence stars possess the greater axial rotation.

(3) Axial rotation in the Fo-Go stars appears to exist in some stars of high luminosity. Most notably, the F2 II standard, 22 Andromedae ($v \sin i = 65$ km/sec), and the F5 II-III star, π Pegasi ($v \sin i = 125$ km/sec), possess considerable axial rotation. Several stars of luminosity class Ib appeared to have slightly broadened lines on the Perkins plates, but this is highly uncertain in view of the dispersion used. Also, it is possible that any broadening in the lines of Ib stars is largely due to turbulence.

(4) No significant difference in axial rotation between Miss Roman's strong- and weak-line stars was detected in the sample considered.

The results reported here are substantially in agreement with those obtained by Dr. George Herbig, of the Lick Observatory, in an investigation which the writer was not aware of when the present work was in progress. I am indebted to Dr. Herbig for sending me a copy of his paper, delivered at the A.S.P. meeting in June of this year.

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