Shapley, Harlow. The distance of the Magellanic Clouds.

A revision of the distances of external galaxies is proposed on the basis of a discussion involving new photoelectric magnitude sequences and new small scale plates that permit improved estimates of the apparent magnitudes of the globular clusters in the Magellanic Clouds. Investigations of extragalactic systems at Mount Wilson-Palomar, Lick, Harvard, and other observatories have for some time indicated the probable necessity of such revision, and Dr. Baade reviewed many of the arguments at the Rome meeting of the International Astronomical Union in September, 1952. The revision is opposed not too convincingly by the proper-motion data on bright galactic Cepheids, but has important counter-balancing advantages. The revision harmonizes the radio-actively measured age of the earth's crust with the now nearly doubled age of the expansion of the metagalaxy; it provides twice as much time or more for the stellar evolution in spheroidal galaxies that is suggested by the Whitford-Stebbins color-excess effect; it lowers the mean density of classical Cepheids to the advantage of Cepheid theory (pointed out in discussion by Aller and Schwarzschild); in approximately doubling the distances and diameters of the Magellanic Clouds and of nearly all other external galaxies, it brings our system down from its superior dimensional position among galaxies; it is consistent with the spectral and distributional differences discussed by Joy and Mrs. Gaposchkin between classical and W Virginis-type Cepheids in the Milky Way system and in its globular clusters; and by halving the expansion speed at a given distance it roughly doubles the calculated ages of galaxies and permits accordingly more time for the development of our Milky Way, its clusters, and "young" high-luminosity stars. The distances and dimensions within our galaxy are not affected, except for the classical Cepheids.

This proposed revision of extragalactic dimensions on the basis of globular-cluster magnitudes is of course still provisional. The full discussion will appear in the *Proceedings of the National Academy of Sciences.*

Harvard College Observatory,
Cambridge, Mass.

Slettebak, A. The spectra and rotational velocities of the bright stars of type B8-A2.

The present investigation is a part of a larger program of studying axial rotation in the brighter stars of early type, with the view of obtaining the dependence of axial rotation on spectral type and luminosity among these stars. The stars of Draper type B8-A2 are here considered.

Spectrograms of 178 stars were obtained with the 69-inch reflecting telescope of the Perkins Observatory, a dispersion of about 27 A/mm at $H\gamma$ being utilized. Observationally, two data must be accurately obtained from the plates: spectral types and rotational velocities. The spectral types and luminosity classes were estimated for all normal stars on the Morgan-Keenan-Kellman system. Equatorial rotational velocities multiplied by the sine of the inclination of the axis of rotation were determined for all stars by comparing observed profiles of the *Mg*II 4481 line in each star with a set of profiles computed by the graphical method of Shajn and Struve. The sharp-lined stars Sirius and Vega were selected as non-rotating standard stars and used to compute the comparison profiles. The $v \sin i$ for any given star was the mean of two independent determinations, since two spectrograms of each star were measured. A comparison of the measured $v \sin i$'s with the earlier values of Elvey for a number of stars in common shows good agreement. A similar comparison with Miss Westgate's values shows considerable scatter, however, and a systematic difference as well, in the sense that the values here reported run higher than Miss Westgate's values.

The following table gives a breakdown of the results by class of star:

Sp (mkk)	n	$\overline{v \sin i}$ (km/sec)	$\bar{v}$ (km/sec)
B8–A2 V	87	137	174
B8–A2 III–IV	24	73	93
Peculiar A	16	41	52
Metallic-line	6	40	51
Supergiants	9	<26	<34

Thirty-six stars are not included by virtue either of being earlier in type than B8, later than A2, or having peculiar spectra. The third column gives the mean observed equatorial rotational velocity for the group while the last column is the mean true equatorial velocity under the assumption that the axes of rotation are randomly distributed. It is evident from the above table that the B8-A2 stars consist of a number of sub-groups from the point of view of axial rotation, which should be considered separately. The values of $\bar{v}$ for the peculiar-A, metallic-line, and supergiant stars are not too meaningful in view of the small samples considered; it can only be said that these groups have relatively little axial rotation. Of particular interest, however, is