means of six comparisons with star L in Harvard Standard Region C4. For the reduction of the blue and yellow magnitudes to the international system the formulae given by Bart J. Bok and Priscilla F. Bok¹ were used. This is justified because the data which they used were obtained during the same period of time, and in four instances during the same night, as the observations in the Large Magellanic Cloud. The magnitudes and colors used for the stars in C4 were taken from this same source.

C4 Sequence Star	P_{gp}	P_{vp}	C_p
G	8.62	8.95	-0.33
K	9.53	8.50	+1.03
L	9.76	9.49	+0.27

From the internal consistency of the comparisons it is found that the probable error of the measured magnitude of a sequence star is .01 for the stars brighter than 13 mag. and .02 for the fainter stars. The magnitudes of five of these stars were measured photographically by Jenka Mohr.² The comparison of these two sequences follows:

Star	P_{gp}	C_p	m_H	Δm
7	12.24	+ .35	12.1	+ .14
9	12.66	+ .83	12.7	- .04
11	13.07	+ .50	13.2	- .13
14	13.53	+ .03	13.5	+ .03
15	14.04	+ .34	14.1	- .06

The difference in zero-point of these two magnitude scales is found to be $-.01 \pm .03$ (p.e.). There is no indication, from these limited data, of a difference in scale or color equation.

1. A Photoelectric Sequence of Magnitudes and Colors for Selected Area 141. 1951.
2. *Ann. Harv. Coll. Obs.* **105**, 237, 1937.

Princeton University Observatory,
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Weston, Edwin B. Polarization of the reflection nebula NGC 7023.

Quantitative measures of the polarization of NGC 7023 have been made on a pair of plates obtained with the 82-inch McDonald reflector and kindly lent to the author by Dr. W. T. Whitney. The plate scale was nearly nine times that used by Gliese and Walter¹ in a similar study of this nebula. This pair of plates showed that the polarization varied remarkably from feature to feature in the nebula, but the largest radial polarization values reported by Gliese and Walter were not confirmed. Measured radial polarization values ranging from -5 to +20 per cent were common for most features. No

evidence was found for values exceeding +30 per cent. From measurements of a number of points in the nebula for which Gliese and Walter tabulated radial polarization values, it was found that their values averaged $2\frac{1}{2}$ times those reported here.

1. *Zs. Astroph.* **29**, 94, 1951.

University of Michigan,
Ann Arbor, Mich.

Whipple, Fred L. On meteor masses and densities.

For a number of years the two-station photographic meteor data have been used in the determination of density, ρ , in the upper atmosphere. A comparison of the rocket determinations of pressures, densities, and temperatures in the region of the White Sands Proving Ground in New Mexico with the determinations by meteors made nearby at the Harvard stations now provides a completely independent check on the theory and numerical constants involved in the meteor theory. Tentative reductions by Dr. L. Jacchia compared with the combined upper atmospheric data by rocket techniques suggest a systematic correction of -0.1 in $\log \rho$ to the determinations by meteors.

It is now possible to reverse the procedure and adopt the rocket determinations of ρ in order to establish the masses or densities of meteors. Basic is the drag equation:

$$\frac{dv}{dt} = - \frac{\Gamma A_0}{\rho_s^{2/3} m^{1/3}} v^2 \rho$$

in which the meteoric velocity is given by v , the density of the meteoroid by ρ_s , the mass of the meteoroid by m , the drag coefficient by Γ , and the dimensionless shape coefficient by A_0 ($A_0 = 1.21$ for a sphere).

The quantities v , dv/dt and ρ may be considered as accurately determined statistically. The product ΓA_0 has now been well established by the work of J. S. Rinehart, W. A. Allen and W. C. White of the Naval Observatory Test Station at Inyokern, California. Their values for irregularly shaped iron and aluminum pellets to velocities of 6 km/sec are $\Gamma = 0.42$ and $A_0 = 1.70$. There is every reason to believe that the drag coefficient will not change much in the range of observed meteoric velocities and that the shape factor will be typical for irregularly shaped masses such as meteoroids.

With these constants one can then derive