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tern across the objective. Since the velocity of the objective image can be determined from its displacement during the known exposure time, the velocity of the pattern required to give the observed inclination of the bands can be readily calculated.

The direction of pattern motion was found to be parallel to the bands, in agreement with the interpretation of earlier photoelectric observations.

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Johnson, Hugh M. The absorption of light in M31.

The appearance of some extragalactic nebulae seen edge-on suggests that a thin layer of absorbing matter extends beyond the bright stars in the equatorial plane. In M₃₁ spiral arms including gas have been observed 114' from the nucleus, while scattered hot stars and O-associations extend 150' (Bowen 1946) or 25 kpc at the distance that $I^{\circ} = IO$ kpc. Dust and neutral gas should extend at least as far in the equatorial plane, but hydrogen has not been detected at 21 cm, and most globular clusters in the system are unreddened to the $\frac{1}{4}$ -mag. accuracy of most known colors (Baade and Mayall 1951).

The writer has used counts of background nebulae from a Lick astrograph plate centered on M₃I, to try to detect absorbing matter in its neighborhood. N. U. Mayall's counts in a 10' mesh were kindly furnished by C. D. Shane, and field corrections given by him and Wirtanen (1954) were applied to them. Using the coordinate system of Hubble (1929) an area within the ellipse $X^2 + 16Y^2 = a^2$, $a = 1.5^{\circ}$, was excluded. The area A pertinent to M₃₁ lies between the mesh boundaries closest to that ellipse and the ellipse with $a > 1^{\circ}5$. The table gives the logarithm of the number of nebulae N in areas A = 2and 8 square degrees, the range of distance r in kpc on the above scale, and the mean and dispersion σ of the logarithms of counts in *n* distinct plate areas equal to A outside the excluded central ellipse.

A	r	n	$\log N(A)$	$\log N$	σ
2	15-22	17	2.27	2.21	0.08
8	15-35	4	2.85	2.82	0.04

Consider the alternative models of a uniform absorber in the equatorial plane of M31, or

opaque arms that occult the fraction f of the otherwise transparent area A. Then the optical thickness of the uniform layer normal to the equatorial plane may be as much as $(\sigma/0.6)/4$, or 0.03 mag. photographic, to correspond to the dispersion of counts in the formula $\log N(m) =$ const. + 0.6 m. In the same way $f = I - I0^{-\sigma}$, or a few per cent. The radial spread of HII regions in the spiral arms of M31 (Baade and Mayall 1951) is a few per cent of the interarm distance, so arm-type absorption appears to be compatible with the counts in A. The two absorption models may correspond to a prevalent old (disk) or young (arm) Population I. It seems unlikely that scattering of starlight by particles in the M31 disk can help make its count-brightness ratio lower than the count-brightness ratio of NGC 205 (Baum and Schwarzschild 1955).

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Office), p. 165. Baum, W. A. and Schwarzschild, M. 1955, A. J. 60, 247. Bowen, I. S. 1946, *Carnegie Yearb.* 45, 18. Hubble, E. 1929, *Ap. J.* 69, 103. Shane, C. D. and Wirtanen, C. A. 1954, *A. J.* 59, 285.

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Keenan, P. C. and Teske, R. G. The spectrum of R Geminorum at its unusually bright maximum in 1955.

R Geminorum, which is one of the brightest long-period variables having a nearly pure S-type spectrum, normally reaches a visual magnitude near 7.1 at maximum. In 1955 the maximum occurred early in March, about 20 days ahead of the predicted date, and the greatest brightness was 6.6 or 6.7 mag. Spectra covering the range from 5000 A to 8500 A were obtained with the coudé spectrograph of the 100-inch reflector at Mount Wilson both at, and slightly before, maximum.

At the bright maximum the temperature, as indicated by the level of excitation of the spectrum, was slightly higher than at a normal maximum. Near magnitude 7.4 on the rising branch of the light curve the 1955 spectrum was similar to that usually observed when the star is several tenths of a magnitude brighter. Thus this Se star behaved much like an Me variable, such as Mira, at its brightest maxima.

Among the few strong lines of ionized elements which are observed in the red part of the spectrum of R Gem are those of the heavy metals Ball and Lall. Several resonance lines of the