have been re-solved using equations of the following form:

$$\Delta\alpha = (-.557 a \sin \Omega - 15 b \cos \Omega)\Delta N \\ + (15 b \sin \Omega - .557 a \cos \Omega)N\Delta\theta,$$

$$\Delta\delta = (-.037 a' \sin \Omega - b' \cos \Omega)\Delta N \\ + (b' \sin \Omega - .037 a' \cos \Omega)N\Delta\theta.$$

where $\Delta\theta$ represents the phase angle of any lag; a , a' , b and b' are the Besselian star constants; and N is 9^m.210. The results are given in the table. The residuals indicate considerable uncertainty in the results, but it seems important to present them. The large residuals are due, partly to poor distribution over the period of the moon's node, and partly to large accidental range in the observations. A later Washington series is to be examined.

The quantity $\Delta\theta = +0^{\circ}.11$, if real, means a lag of two days in the principal term of the nutation.

These observations are satisfied by the nutation:

$$\Delta\alpha = +9''.202 A + ''018 B, \\ \Delta\delta = +9''.202 A' + ''018 B',$$

where A , B , A' , and B' are the coefficients of ΔN and of $N\Delta\theta$ given above.

1. *M. N.* 108, 209, 1948.
2. *A. J.* 50, 125, 1943.

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Nassau, J. J. and D. A. MacRae. A study of the galactic structure in a clear region in Cygnus.

The present investigation is a part of a general program, at the Observatory, dealing in a broad sense with the study of the fluctuations of the stellar luminosity function. The field under investigation has an area of 11 square degrees with a center at R.A. = 20^h0^m and Dec. = 38^o0'. It is relatively free from space absorption with the exception of about one square degree near its southern boundary.

The photographic and photo-red magnitudes and spectra of 1230 stars were determined. Beginning with Fo and later, all stars with few exceptions were classified either giants or dwarfs up to the limiting photographic magnitude of 12.15. For stars brighter than 11.0 four luminosity classes were used.

The mean value of interstellar absorption in the clear region was derived from 683 stars and

found equal to 0.53 mag. per kiloparsec. The color excess of the stars in the obscured region seems to indicate that an interstellar cloud sets in at about 500 parsecs with a maximum value of about 0.6 mag. over and above the general absorption of the region. This result however is provisional as our present data are limited to 75 stars only.

The division of the stars with giants and dwarfs in each spectral group indicates a rapid decrease in the ratio of dwarfs to giants from Fo-F5 group to G8-K3 group. In the former group we have about 90 per cent dwarfs while in the latter about 5 per cent.

Space densities, corrected for absorption, for all the spectral groups were computed for the stars in the relatively clear region. The densities have been used to compute a luminosity function at distances of 100, 200, 400 and 600 parsecs and show no significant differences between the four regions. Likewise no significant difference exists where our results are compared with the standard van Rhijn luminosity function, with one exception at absolute magnitude between -1.5 and +1.0. Here the maximum excess in our case in the log $\varphi(M)$ is 0.3.

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O'Connell, D. J. K., S. J. RY Scuti, an eclipsing binary of the V444 Cygni type.

A photographic light curve of RY Scuti was obtained from estimates on 774 plates taken at Lembang and Riverview observatories. The writer was at the time unaware of the work done on this variable by S. Gaposchkin¹ and Popper.² The period agrees well with Gaposchkin's. The ranges at primary and secondary minimum are 0.52 and 0.47 mag. respectively. The ellipticity constant, z , and the reflection constant, b , were determined from the light curve as 0.31 and 0.01 respectively.

Primary minimum is much wider than secondary, the ratio of the widths being 1.76. Secondary minimum is 0^d.11 earlier than the midpoint between two primary minima. It would follow that the eccentricity of the orbit is 0.27 and the longitude of periastron 268^o. On the other hand, Popper's radial velocity measures are altogether inconsistent with such a large orbital eccentricity. These apparently conflicting photometric and spectroscopic observations can be reconciled, if one assumes that the broadening of primary minimum is caused by an "atmospheric eclipse"