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*Princeton University,
Princeton, N. J.*

Smith, Elske v. P. and Henry J. Smith. Distribution of M and carbon stars in the southern Milky Way.

With the ADH telescope and objective prism, infrared spectrum plates have been obtained covering a band 3° wide along the galactic equator between longitudes 180° and 360° for the purpose of detecting and studying the distribution of M-type stars and carbon stars. Fifteen supplementary centers at latitudes $+2^\circ$ and -2° were included to smooth out the effects of irregular absorption. This survey is partly an extension of a survey carried out by Nassau, Blanco and Morgan, in the north.¹

Spectral classification has been based on stars classified in the LF 3b field in Cygnus by Nassau and van Albada,² as well as on short exposures of stars in the Mount Wilson Catalogue of Spectroscopic Parallaxes.³ The limiting infrared magnitude of the survey is probably a little fainter than ten.

A total of 2186 stars of spectral type M 5.5 and later were found, of which fourteen were previously known. New carbon stars numbering 165 were discovered, as well as four previously known. As observed in the northern hemisphere, the distribution of M stars discloses nearby local obscuration and a general decrease in density towards the anticenter. The number of M stars per square degree increases with small fluctuations from 1.1 at longitude 185° to 7.2 at 300° . The density then falls off due to the great rift in Scorpius-Sagittarius. The C stars, on the other hand, reach a maximum of 0.5 per square degree at longitude 215° , not far from the Carina aggregate of Type I objects, and then drop off gradually. This observed difference in distribution tends to confirm the suggested assignment of M stars to population Type II and the C stars to Type I.

1. *A. J.* 57, 21, 1952.
2. *Ap. J.* 109, 391, 1941.
3. *Ap. J.* 81, 187, 1935.

*Boyden Station,
Harvard College Observatory,
Bloemfontein, South Africa.*

Smith, Henry J. Nova Tucanae, 1952.

On a blue spectrum plate on the Small Magellanic Cloud made with the ADH telescope on December 21-22, 1952, there appears a spectrum typical of a nova. Data obtained from direct photographs indicate that this object is a nova that reached maximum on December 19-20, 1952, and fluctuated rapidly between magnitude 11.0 and 11.5 on that night. This maximum magnitude is in accord with previous Small Cloud novae. The nova faded at least 7.5 magnitudes in nine months, which is characteristic of a fast nova.

The spectrum on the discovery plate greatly resembles that of Nova DQ Herculis on December 13, 1934, which is reproduced in Stratton's Atlas. The Balmer lines $H\beta$ through $H8$ are broad and diffuse, with intense broad emissions on their red edges. In addition, several weak emissions may be present, particularly HeI 4027 and 4471, $MgII$ 4481, and $HeII$ 4686 or CII 4650. McLaughlin remarks that the premaximum emission spectrum of DQ Herculis is unique among novae. Although the spectrum discussed here was made two days after maximum, the similarity to Nova Herculis is striking. One might suggest that this new nova is a second example of a premaximum emission spectrum, which has persisted somewhat longer than in the case of DQ Herculis.

*Boyden Station,
Harvard College Observatory,
Bloemfontein, South Africa.*

Strömgren, B. Spectral classification through photoelectric photometry in narrow wavelength regions.

In continuation of previous investigations on spectral classification through photoelectric photometry with interference filters a method of two dimensional classification of B, A and F stars based on measures of the strength of $H\beta$ and of the Balmer discontinuity has been developed.¹

An index measuring the strength of $H\beta$ is determined with the help of interference filters with maximum transmission at 5000Å, 4861Å, and 4700Å, respectively, while measures through filters with maxima at 4500Å, 4030Å, and 3550Å yield an index measuring the Balmer discontinuity. Both indices are practically uninfluenced by interstellar reddening. The half-width of the $H\beta$ filter is 35Å, the other filters have half-widths around 100Å.

Measures were made with a photoelectric photometer attached to the 82-inch reflector of the