

The circular field of 21 square degrees has its center at R.A. = 2000^hm and Dec. = +38° (1950). Stars of 13.5 infrared magnitude and brighter were examined. In all, twenty-two carbon stars were discovered, of which four were already listed in the previous survey of 2.2 square degrees.² Since carbon stars are usually variable, we conclude that there is in this region in Cygnus a minimum of one such star per square degree to the limit reached by the survey. Table 2 gives the 1855 co-ordinates and spectral groups of the eighteen new carbon stars.

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THE SPECTRUM OF THE LIGHT OF THE NIGHT SKY DURING THE RECENT SUNSPOT MAXIMUM

A few spectrograms of the light of the night sky were obtained at Hyderabad, India, during the recent sunspot maximum, in order to see whether any deviations from the normal could be noticed. The spectrograph employed in this investigation contained a

TABLE 1

Wave Length (Angstroms)	Intensity (Author)	Intensity (Babcock)	Wave Length (Angstroms)	Intensity (Author)	Intensity (Babcock)
6364.....	40	10	5443.....	5	.....
6300.....	60	40	5405.....	3	.....
5963.....	2	0	5233.....	2	.....
5893.....	30	7-45	4886.....	2	2
5775.....	10	0	4760.....	3	.....
5755.....	20	.....	4475.....	5	.....
5730.....	23	.....	4354.....	8	.....
5699.....	8	.....	4277.....	5	.....
5577.....	150	100			

single dense flint prism of the constant-deviation type, with the camera lens working at $f/4.0$ and the collimator of 14 inches focal length. The instrument had a mean dispersion of 120 Å/mm in the 5200 Å region. The comparison spectrum used is from a mercury arc. All the exposing was done on clear moonless nights with a slit width of 0.4 mm and the collimator pointed in a southeasterly direction at an altitude of 25°. The exposures were started 2½ hours after sunset and stopped 2 hours before sunrise; consequently, there could not have been any interference due to twilight or dawn. Two exposures of the order of 100 hours each were made on Kodak Super Panchro Press plates during the months of March and April, 1947. The plates were measured by means of a comparator while minute details of band structure were studied from the microphotometric records. A number of fine details can be discerned from the microphotometric records, but these are not visible to the unaided eye on the plates. Most of the peaks measured from the microphotometric records coincide, however, with the large number of radiations discovered by Cabannes and Dufay,¹ and thus the possibility of their presence due to photographic emulsion irregularities may be ruled out. Table 1 gives a list of the prominent lines seen visually along with the relative intensities. The intensities measured by Babcock² are also listed in the table.

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¹ *C.R.*, 198, 306, 1934.

² *Pub. A.S.P.*, 51, 47, 1939.

Figure 1 shows the microphotometric record of one of the spectrograms obtained. The usual predominant features, viz., the forbidden transitions of [O I], 5577, 6300, and 6364 Å, as well as the D lines of Na I are very distinct, the intensity of the sodium lines being somewhat less than that of the red oxygen line. This might be expected from the work of Babcock; for, according to him, the sodium lines are very weak relative to the rest of the spectrum in summer. A broad band of intensity nearly equal to the D lines of sodium can be seen in the region near 5700 Å. Four components at wave lengths 5699, 5730, 5755, and 5775 Å can be easily seen. This band may be glimpsed on a few reproductions of spectrograms obtained by Cabannes and Dufay as well as Babcock but is totally absent on those taken by Slipher.³ An observed doublet of appreciable intensity at wave lengths 5405 and 5443 Å is, however, extraordinarily weak on the spectrograms of Elvey, Swings, and Linke,⁴ as well as Babcock's, while it cannot be detected at all on reproductions of Slipher's spectra.

Four bands observed at 5405, 5442, 5755, and 5963 Å are in coincidence with the members of the first positive system of nitrogen. Of these, 5405, 5442, and 5755 Å are very intense, being members of the intense bands found on either side of the green auroral line. Among them, 5442 and 5755 Å are also found in active nitrogen. The Vegard-Kap-

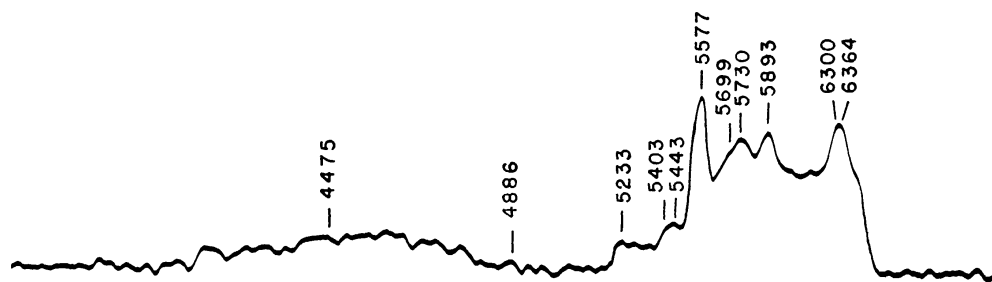


FIG. 1.—Microphotometric record of night-sky spectrogram

lan system as well as the second positive system of nitrogen are not quite conspicuous on these spectrograms, which merely show a broad continuum in the blue and violet with a few lines of appreciable intensity.

The possibility that the large intensity of the two broad bands found on either side of the green auroral line may have originated from auroral activity may be ruled out because of the low geomagnetic latitude (8°) of Hyderabad, together with the large azimuth of the direction in which the collimator was pointed. It is interesting to note that the spectrograms of the McDonald investigators, as well as Babcock's, which showed the bands faintly, were taken in 1939, when sunspot numbers were a minimum. The enhanced intensity may probably be due to the intense solar activity during the recent sunspot maximum.

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³ *M.N.*, 93, 657, 1933.

⁴ *Ap. J.*, 93, 337, 1941.