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AN INTERESTING EPISODE IN THE HISTORY OF CH CYGNI

Periods of activity of CH Cyg observed so far lasted from September 1963 till August 1965, then from June 1967 till the end of 1970, and the latest outburst began in May 1977 and has not ended yet. In the quiet state CH Cyg has a usual spectrum of the M6III type. During outbursts this late type spectrum is veiled by a blue continuum extending far into ultraviolet, and numerous emission lines of hydrogen and ionized metals appear. In all the three observed outbursts forbidden lines were seen belonging to FeII, OI ($\lambda 6300$), SII ($\lambda 4069$), and only once, in 1968, the line $\lambda 5007$ [OIII] appeared (Hack, Selvelli). When the star returned to its normal phase in December 1970 it showed a normal M6III spectrum with weak emissions in H α and H β (Faraggiana and Hack). We began our observations of CH Cyg in 1974, more than 3 years after the end of the previous active period. That year 4 spectrograms were obtained on August 15 and 17 with a grating spectrograph attached to the 70 cm reflector of the Main Astronomical Observatory of the Ukrainian Academy of Sciences. The spectrograms have dispersion $1.68 \cdot 10^5$ and cover the wavelength range 6800 - 3800 Å. They revealed the presence of several emissions in the otherwise quite normal M6III spectrum without any trace of the blue continuum. Table I gives laboratory wavelengths of the emission lines, their identification and intensities relative to the intensity of the underlying continuum. Such a spectrum has not been observed in CH Cyg, the more so in quiet periods. The line $\lambda 3869$ of double ionized neon has never been observed in this star either. Apart from $\lambda 5007$ no other lines of the multiplet OIII 1F are seen on our spectrograms, though it would be very difficult to notice the line $\lambda 4959$ in a very sharp intensity leap in TiO $\alpha(1.0)$ band

Table I

Emission lines in the spectrum of CH Cyg in 1974

λ lab Å	Identification	Intensity
6562.82	H α	1.74
6300.23	OI 1F	1.18
5006.84	OIII 1F	1.45:*
4861.33	H β	2.18:*
4340.47	H γ	1.19
4068.62	SII 1F	1.33
3868.74	NeIII 1F	1.62:

* lines $\lambda 5007$ and $\lambda 4861$ are situated in strong absorption bands of TiO, and the local continuum for them is traced with great uncertainty because of low photographic density in those bands.

head at $\lambda = 4957\text{\AA}$. Thus, taking into account the photographic plate noise the ratio of intensities of OIII auroral and nebular lines can be evaluated: $I_{4363} / (I_{5007} + I_{4959}) \ll 0.06$. This ratio is ~ 0.3 for symbiotic stars (Boyarchuk) while it is of the order of 0.01 for planetary nebulae (Aller and Liller).

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References:

- Aller, L., Liller, W., 1968, In "Stars and Stellar Systems", vol. VII, "Nebulae and Interstellar Matter", chap.9, p. 527.
 Boyarchuk, A., 1970, In "Eruptive Stars", Moscow: Nauka Press, p. 151.
 Faraggiana, R., Hack, M., 1971, Astron. and Astrophys., 15, 55.
 Hack, M., Selvelli, P.L., 1981, "The Nature of Symbiotic Stars", Proc. IAU Colloq. No. 70, ed. by Friedjung and R. Viotti, p. 131.