A BINARY MODEL FOR THE SYMBIOTIC STAR V 1329 CYGNI

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This emission-line object was discovered by Kohoutek in 1969. Its light curve was subsequently reconstructed since 1891. Before 1964, the object fluctuated at around 15^m, with occasional deep minima as deep as 2.3^m. Its spectrum was late M. In 1964 the object brightened up to 14^m and then it reached 11.5^m in the middle of the year 1966. Since 1966 the object has been slowly decreasing in brightness. Stienon et al. (1974) suggested that the photometric behaviour prior to the outburst could be explained in terms of an eclipsing binary with a period of 960 days. This is now confirmed by the analysis of the post-outburst photometric data and independently by the investigation of the radial velocities of the emission-line component. We have derived the following spectroscopic elements: Period = 950.07^d; γ = 37 ± 6 km/s; K_1 = 62 ± 8 km/s; f(M) = 23 $M_\odot$; $a_1 \sin i$ = 1160 $R_\odot$. We propose a binary model for the symbiotic object consisting of a bright red giant M5 II with a mass of 25 $M_\odot$, and of a very hot compact star of 1 $M_\odot$. Line profiles of the nebular lines as well as Balmer lines suggest the existence of ejected "polar caps" and an equatorial ring around the hot component, much like in novae. It seems that the hot component accretes the material from the giant via strong stellar wind. Changes in the accretion rate can cause the observed optical fluctuations. The major outburst in 1964-1966 was probably caused by a shell flash which also ionized the expanding nebula surrounding the hot component.

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