THE U GEMINORUM STAR, EY CYGNI, AND
A PROBABLE ECLIPSING STAR, V839 CYGNI

ANN T. PIENING
Maria Mitchell Observatory
Nantucket, Massachusetts

Abstract

Observational data are collected and discussed for EY Cygni, a U Gem variable. A partial analysis of the short period variable, V839 Cygni, suggests that it is an eclipsing binary.

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During the summer of 1977, while working as a research participant under the direction of Dr. Dorrit Hoffleit, I investigated two variables in Cygnus.

EY Cygni, discovered in 1927 by Hoffmeister, is classified as a U Geminorum variable with a period of 240.0 days (Kholopov and Efremov 1976). However, analysis of Nantucket plates, Harvard plates of the series DNB, I, IR, MC, and RH, and published observations (AAVSO 1953-60, Campbell 1938, Campbell 1939, Kholopov and Efremov 1976, Koyama 1936) show this period to be only an average cycle-length for the star. Figure 1 exhibits the irregularity in the occurrence of maxima. In an attempt to relate the eight recorded maxima, a number of periods between 180^d and 300^d were tested and rejected. The 240^d period was found to represent the average interval between the irregularly spaced observed maxima.

Of the eight maxima recorded since 1927, the first and the last were observed on Nantucket plates to reach $11^m.0$ and $11^m.2$, respectively. Harvard plate series DNB yielded a magnitude estimate of 11.0 for the last maximum. The six intermediate maxima are listed by Kholopov and Efremov (1976). In addition, observations of the maximum which occurred at JD 2427950 are given by Koyama (1936). Figure 2 represents all available observations of the recorded maxima. The observed amplitudes of the successive curves range from 1.5 to 3 magnitudes. The maxima recorded at JD 2427950 and JD 2440030 exhibit an approximate 30^d duration. The absence of a regular period, the range of outbursts, and the duration of maximum lead to a full confirmation of the U Geminorum classification of EY Cygni.

I also observed a short period variable, V839 Cygni. No previous period has been determined for this variable, which is recorded in The General Catalog of Variable Stars to be of the RR Lyrae type. Analysis of some 900 Nantucket plates, however, leads me to believe that V839 Cygni is an eclipsing binary with an approximate period of 5.3 days. Further computations must be made before this period or classification can be confirmed.

REFERENCES

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Kholopov, P.N., and Efremov, Yu. N. 1976, Peremennye Zvezdy, 20, No. 3(147), 280.
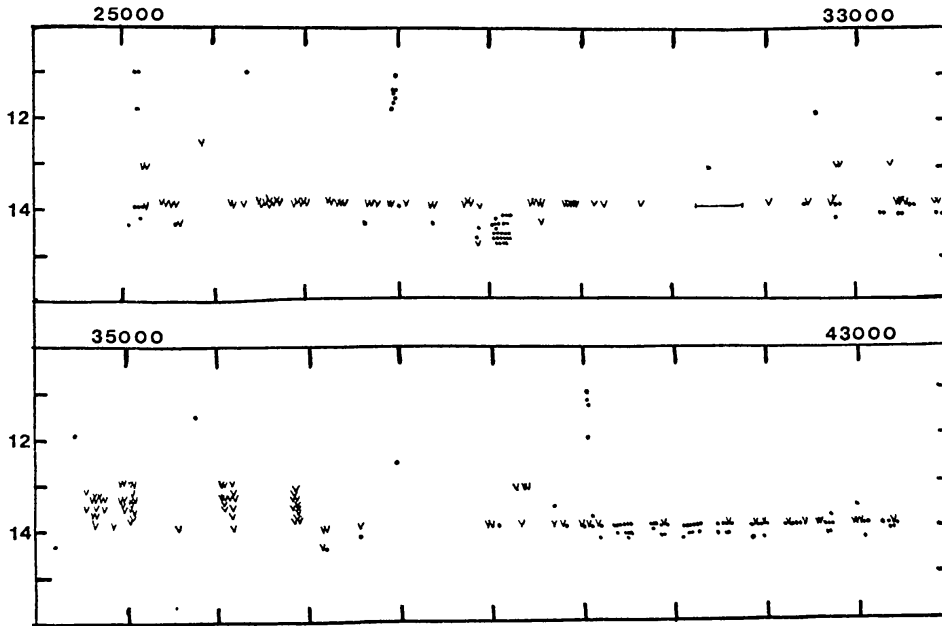Koyama, A. 1936, Astron. Nachr., 259, 246.

Figure 1. Light curve of EY Cygni ($19^h50^m44^s$, $+32°5.9'$), illustrating the irregular intervals between maxima. Solid line between JD 31000 and 32000 denotes concentrated observations. Scale: 1000^d/unit.
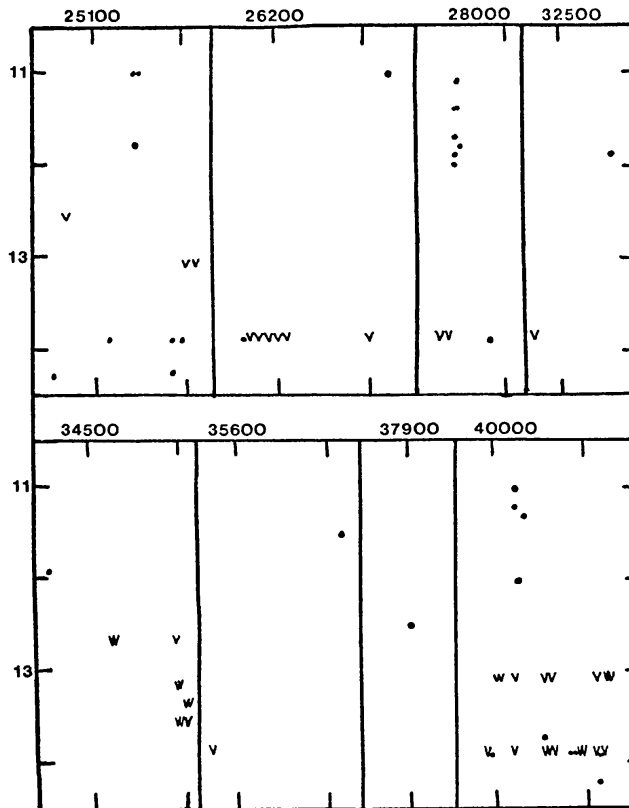

Figure 2. All available observations of recorded maxima. Varying amplitude of maxima and approximate 30^d duration of maximum is evident. Scale: 100^d/unit.

61