

BULLETIN 920

The following tables give the date, Julian Day, and the photographic magnitude of the novae on all available plates.

Table I

Nova Zwicky

Date	JD 2,433	Mag.	Date	JD 2,433	Mag.
Jul 15	478.28	12.3	Aug 16	510.22	13.8
16	479.24	10.9	18	512.32	14.2
17	480.22	10.3	19	513.29	14.0
31	494.26	11.1	Sept 3	528.24	14.7
Aug 1	495.22	10.8	7	532.20	14.8
14	508.22	13.8	Oct 5	560.27	14.8

Nova Zwicky was not seen on any of three MF plates taken on July 10-11, 11-12, 14-15, so that it must have been fainter than magnitude 16 on those dates. It was, however, still clearly visible on a 30-minute A plate taken on October 5-6 and was estimated as brighter than magnitude 15 at that time. This plate was the last one taken before the dismantling of the Bruce telescope.

Table II

Nova Haro

Date	JD 2,433	Mag.	Date	JD 2,433	Mag.
Jul 31	494.26	9.5	Aug 14	508.23	9.0
Aug 1	495.22	8.0	16	510.24	9.0
5	499.37	7.1	18	512.34	9.6
6	500.21	8.3	19	513.32	9.6

Nova Haro was not seen on a Bruce plate of July 14-15, nor on MF plates of July 15-16. There were no plates of the region between that date and July 31-August 1 when it was of magnitude 9.5. After its rise it dropped suddenly from $m = 9.5$ on August 19-20 to below the plate limits on subsequent plates. The next plates of the region taken September 3-4 and 7-8 show three faint stars in the region of the nova with magnitudes between 16.0 and 16.5. These stars were also seen on plates taken before the rise of the nova, but their images were completely covered by the image of the nova during the time of its appearance. As there is no observable change on our plates in the relative brightness of the three stars, it is not possible to decide if any one of them is the nova.

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ON THE LIGHT CURVES OF RX LIBRAE AND TV CANIS MAJORIS

By M. K. Vainu Bappu

RX Librae: The variability of *RX Librae* was discovered by Breslin and has been studied by Wells and by Parenago. From 24 observations Parenago (N.N.V.S., 3, 106, 1931) deduced a period of 24.95 days. The range of variation was from $11^m.6$ to $13^m.7$ pg, with a value of $M - m = 10.2$ days or 41% of the period. The star was also included in Joy's (Ap.J., 86, 363, 1937) study of the radial velocities of Cepheids; a velocity curve was derived from six properly spaced observations.

Nearly 340 estimates were made on patrol plates taken with 3-inch Ross cameras at both northern and southern Harvard stations during the years 1927-1948. Four comparison stars were used and the estimates of brightness were made in terms of arbitrary steps, these steps being later transferred to magnitudes by comparison with the sequence for RR Librae, previously established in the course of the Milton Bureau survey. Parenago's period was initially adopted and the correction to this period determined from the observations of the maxima. The final elements derived are

$$\text{Max} = \text{JD } 2431910.^d13 + 24.^d932E.$$

The observations were arranged in order of increasing phases as determined from the new period and the mean light curve was derived by determining the mean value of the brightness and phase for groups of ten such observations. Figure 1 shows the mean light curve along with Joy's velocity curve reduced to the present epoch. The phase lag between the minimum of brightness and of velocity of approach is

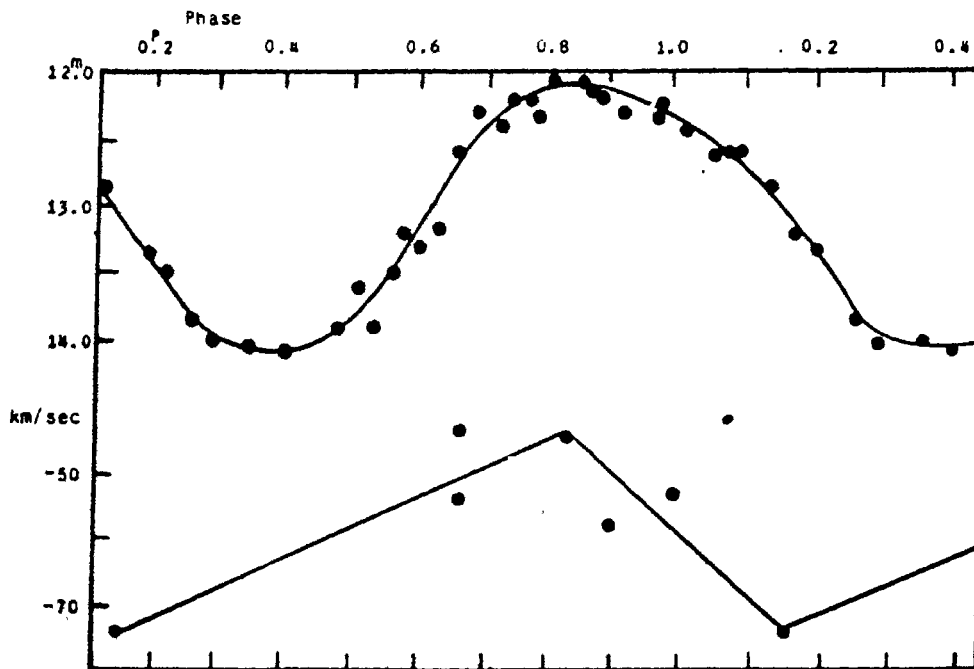


Figure 1.

Light and Velocity Curves of RX Librae

large, being 0.43 P; the corresponding lag between maximum brightness and maximum velocity is 0.32 P. The variation in light is from 12^m.1 to 14^m.1. A slight hump appears on the descending part of the light curve. From the shape of the light curve we see, therefore, that RX Librae falls into the class of W Virginis stars, a fact well confirmed by its distance from the galactic plane of over a thousand parsecs.

TV Canis Majoris: The star was first studied by Florja (Tashkent Circ., No. 15, 1933), who determined a period of 4.6693 days, with a visual range in light variation from 10^m.8 to 11^m.3. It is included in Joy's (Ap.J., 86, 363, 1937) list of Cepheids, and a velocity curve has been derived from seven measures.

The star was estimated on 240 plates taken with the RB and RH 3-inch patrol cameras during the years 1928-1948. Six comparison stars were used, the estimates of brightness being made in terms of steps of brightness, which were later converted into magnitudes by way of the Milton Bureau sequence

for *W Canis Majoris*. A correction to Florja's period was determined from the observed maxima, but it amounted to only 0.0005 days. The maxima could be represented by the relation

$$\text{Max} = \text{JD } 2426652^{\text{d}}.695 + 4^{\text{d}}.6698\text{E}.$$

A mean light curve determined from this period is shown in Figure 2, along with Joy's velocity curve.

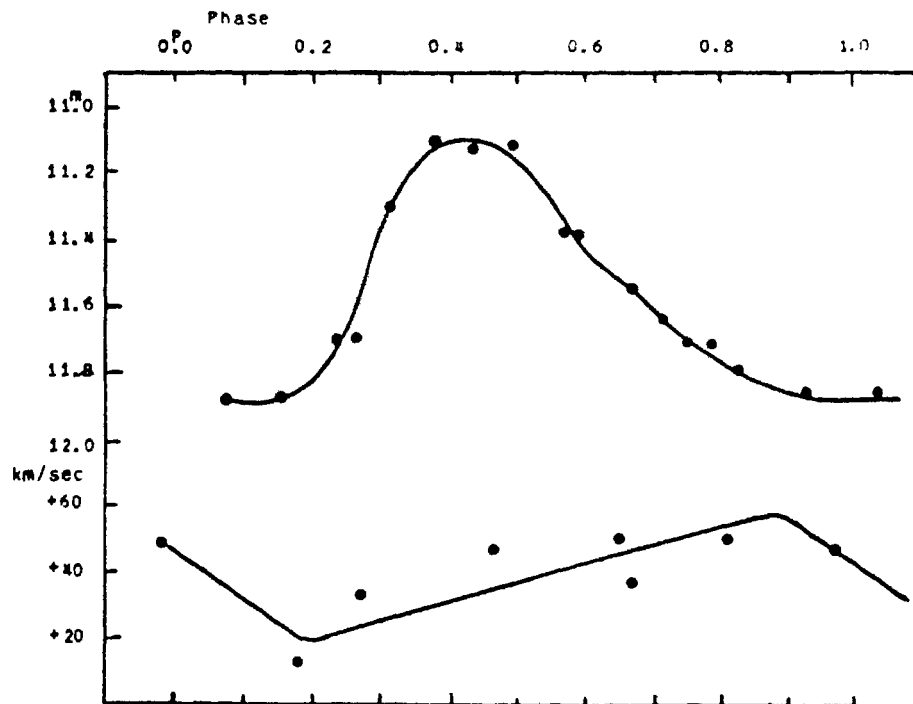


Figure 2.

Light and Velocity Curves of TV *Canis Majoris*

The maximum and minimum in radial velocity occur considerably earlier than the corresponding points in the light curve. A slight hump appears in the light curve on the decline from maximum, a feature somewhat uncommon in classical Cepheids of this period.

The author is indebted to Drs. S. and C. P. Gaposchkin for their valuable help and advice.

OBSERVATIONS OF SIX CEPHEID VARIABLES IN CYGNUS

By Margaret Olmsted

During the course of investigation of the absorption in a field in Cygnus through a study of the colors of previously known faint Cepheid variables (B. J. Bok and M. Olmsted, *H.R.*, 212, 1, 1949), photographic light curves were obtained for five Cepheids from observations on about 40 plates taken with the Jewett-Schmidt telescope at Oak Ridge in 1947 and 1948.

These variables appear also on about 17 plates of the 12-inch Metcalf series each year from 1943 through 1948 and on a few in 1926-1928, as well as on a few plates taken in 1935 with the 8-inch Ross telescope. After the Metcalf plates had been shipped to the Vatican Observatory, W. J. Miller, S.J.