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Wright, K. O. A spectrographic study of the eclipsing binary 32 Cygni.

This system, which has long been known to consist of a bright, late-type, K5 primary star and a fainter early-type secondary, was discovered to be eclipsing and similar to ζ Aurigae by McLaughlin¹ in 1949. An orbit had been computed by Cannon² from Ottawa observations taken between 1910 and 1917; it was placed on the Victoria observing program in 1936 in order to improve the orbital elements. Miss Hoffleit³ found that the period must be about 1141 days from early Harvard plates taken in 1890 and 1896. From Victoria observations of the chromospheric K line before and after the 1949 eclipse, the time of mid-eclipse seems to be at J.D. 2,433,224.0 and the duration of totality about fourteen days; from these data the period 1140.8 days is obtained. Ninety-six Victoria one- and two-prism plates and fifty-three Ottawa plates were measured for radial velocity. Least-squares solutions were made which gave the following elements:

	Victoria	Ottawa
e	0.274 \pm 0.015	0.31 \pm 0.05
ω	216° 6' \pm 3' 3"	188° \pm 12°
T	JD 2,433,126.8 \pm 8.7	JD 2,420,456.6 \pm 33
K_1	16.65 \pm 0.32	16.8 \pm 0.9 km/sec
V_0	- 6.12 \pm 0.17	- 10.8 \pm 0.6 km/sec

Intensity traces of the composite spectrum in the region $\lambda\lambda 3700-4030$ obtained with high-dispersion grating plates, 4.5 A/mm, were compared with similar traces of γ Draconis, which is also a K5 giant. Differences between the intensities of the composite spectrum and γ Draconis were taken to represent the early-type component of 32 Cygni. The hydrogen lines of the secondary star are readily visible on these difference plots. Estimates of their radial-velocity displacements give a value for the semi-amplitude, K_2 , of 47 km/sec which, combined with the Victoria value of K_1 , leads to minimum masses, $m \sin^3 i$, of 20 \odot and 7 \odot for the primary and secondary stars. The only other lines in addition to hydrogen which appear in the secondary spectrum are those of helium at $\lambda 3820$ and $\lambda 4026$, and possibly $\lambda 4009$. The K-line of Ca II at $\lambda 3933$, if present, is weaker than the helium lines, though the pres-

ence of emission cores in both 32 Cygni and γ Draconis makes this measure unreliable. However, the weakness of the K line indicates that the spectral type of the secondary component is B8 or earlier.

This system is quite similar to that of ζ Aurigae though the secondary spectrum is less readily detectable. However, McLaughlin⁴ has suggested that atmospheric effects before and after eclipse last longer for 32 Cygni than for ζ Aurigae and therefore further study of this system seems desirable at the time of the eclipses.

1. *Harv. Announcement Card* No. 1043, 1949.
2. *Pub. Dom. Obs. Ottawa* 4, 151, 1918.
3. *Harv. Announcement Card* No. 1045, 1949.
4. *Ap. J.* 111, 449, 1950.

*Dominion Astrophysical Observatory,
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Zirin, Harold. An objective prism study of peculiar A stars.

A number of peculiar and metallic-line A stars were found in a survey of A stars made with the twelve-inch Metcalf refractor and a 13° prism (85A/mm). Twenty-one areas, each 5° \times 7°, centered on Kapteyn's Selected Areas, were covered down to magnitude 9.5. In all, 58 peculiar and metallic-line A stars were found, of which 13 are questionable. The percentage of peculiar stars in classes B9-A3 was found to be 10 per cent. In north galactic latitudes the frequency appeared to be only 4 per cent, whereas in southern latitudes it is 15 per cent. The stars BD + 15°4071, +44°341, and +43°318 are probably spectrum variables.

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TITLES OF ADDITIONAL PAPERS PRESENTED AT THE MEETING IN WASHINGTON, D. C.

- Frenkiel, F. N. and Martin Schwarzschild. On the turbulence spectrum of the solar photosphere.
Goldberg, Leo. Experimental f -values for CH.
Lippincott, Sarah Lee. Astrometric study of the binary Kruger 60.
Morgan, H. R. New star places, and the precession.
Olivier, C. P. Further results on EZ Aquilae.
Payne-Gaposchkin, Cecilia. Spiral arms in the extragalactic nebulae.
Pierce, A. K., Leo Goldberg and Laurence Aller. The He I absorption line λ 10830 in the solar spectrum.
Schwarzschild, M. and L. Spitzer, Jr. Velocities of type I stars.
Van Biesbroeck, G. The orbit of Nereid, Neptune's second satellite.