stars tends to modify the nature of the absorbing material so that it can no longer absorb $\lambda 4430$. An examination of the spectrum of several fainter O stars which are considerably reddened indicates that the interstellar band is systematically weakened and suggests that there are regions around the hottest stars which are not favorable to the production of $\lambda 4430$.

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Petrie, R. M. The orbital elements and apsidal motion of AR Cassiopeiae.

Orbital elements for this eclipsing binary system have been determined at five epochs covering an interval of thirty-four years. The earliest orbit is based upon 67 spectrograms obtained at the Allegheny Observatory in 1908-9. The mean values of the fixed elements are as follows:

$$\begin{aligned} e &= 0.247 \pm .006, \\ K &= 55.4 \text{ km/sec} \pm 0.3, \\ V_0 &= -13.8 \quad \quad \pm 1.0. \end{aligned}$$

The anomalistic period is found to be $6^d.066522 \pm 0^d.000003$. Spectrophotometric measures of line intensities yield the spectral type of the primary star, which is B4, while its spectroscopic absolute magnitude is -1.3 .

The values of ω show that the line of apsides is advancing, the observed values being,

Mean Date	ω
1909	6.0 ± 3.2
1935	23.8 ± 8.4
1935	30.2 ± 4.5
1941	33.2 ± 4.8
1943	36.3 ± 3.8

From the above values it is found that ω is well represented by a linear relation as follows:

$$\omega = -1.72 + 0.872(t - 1900.0),$$

and from this the period of apsidal motion is found to be 413 years.

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Yowell, Everett C. The primary and secondary periods of AR Herculis.

AR Herculis is a cluster-type Cepheid variable of the eleventh magnitude. It was discovered by Ceraski in 1926. Detre and Balazs made a comprehensive study of the light curves and of the primary and secondary periods in 1939. The present study was an attempt to improve the periods given by Detre and Balazs by making use of Dr. Sergei Gaposchkin's observations taken from all Harvard plates on which this star is visible.

A total of 959 observations were available; the earliest was taken on March 4, 1899, and the latest was taken on September 12, 1941. The results of the analysis show a sharp break in the primary period about 1925, and a similar sharp break in the secondary period at about the same time. The possibility of a secular variation cannot yet be ruled out. The primary period before 1925 was found to be $0^d.4700345$; the corresponding secondary period was $0^d.463092$. The primary period since 1925 was found to be $0^d.4700187$; the corresponding secondary period is $0^d.463125$. Thus the secondary period increased twice as much as the primary period decreased.

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