

NOTES FROM OBSERVATORIES

BRIGHT VARIABLE STARS IN SOUTHERN HEMISPHERE (SECOND LIST)

by

A. W. J. Cousins
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The following list is in continuation of that published in the 1951 October issue of *The Observatory* (Vol. 71, p. 199). The "Bright Star Programme" has now been completed and the list includes the remainder of the stars found (or previously known) to vary with a range of 0^m.05 or more. These stars occur among 413 stars observed south of the equator and 62 between 0° and + 6°. The same criteria were adopted as previously and the list is presented in the same form.

Several well-known variable stars are included without any range being given as they were not actually observed. In the case of Zeta Phoenecis only one observation was significantly fainter than the rest, and some other known eclipsing variables have been omitted because no variation was observed. Epsilon Coronae Australis has been more extensively observed than the rest (See *M.N. Astronomical Society of S.A.*, 9, 90, 1950 and 10, 88, 1951). The spectrum has diffuse lines characteristic of a W Ursae Majoris star.

It is now possible to form some idea of the prevalence of variability amongst the bright stars. The original observing list included 873 stars south of + 6° declination whose H.R. (visual) magnitude is 5.0 or brighter and as a result of this selection some stars of late spectral type (with large colour indices) have photographic magnitudes fainter than 6.5. These stars were too faint to be observed satisfactorily with the equipment used for this programme and have been omitted from the following discussion.

Fifteen well-known variable stars were included in the list but not observed. These include five stars of long period type, six Cepheids, two eclipsing and two irregular variables. No other star was observed to vary by as much as half a magnitude.

The distribution among the spectral types (omitting stars fainter than 6.50) is as follows:—

H.D. Spectral Type	Number of stars observed	Number of Variables	Percentage Variable
O—B5	205	27	13
B8—A5	207	5	3
F, G	170	{ 6 Cepheids 5 Others	{ 4 3 } 7
K	223	6	3
M	34	{ 5 Long period 8 Others	{ 15 23 } 38
All	839	62	7.4

The list must inevitably be incomplete—especially as regards variables of the Algol type—and does not include some twenty or thirty suspected

variables although it is probable, from statistical considerations, that a large proportion of these are true variables. The present series of observations was not sufficiently extensive to confirm the variability of individual cases where the range of variability is small.

The small amount of skewness of the frequency curve of the standard deviations of the observations suggests however that the great majority of stars remain very constant in light. The conclusion to be drawn from the present study is that not more than 10 per cent of the bright stars vary (other than by occasional eclipses) through a range of $0^m.04$ or more over a period of several years.

Observations of stars in the E regions confirm the absence of variability amongst the stars in general. Some of the stars observed three or four years ago by the Fabry method have recently been re-observed photo-electrically. Known and suspected variable stars were purposely omitted, and for only three other stars did the two magnitude determinations differ by more than $0^m.03$. The average difference for the remaining 104 stars is only $0^m.008$.

G.C.	B.S.	Name	H.D.	Spect.	Variation		Remarks
				Revised	Max.	Min.	
1387	338	ζ Phe	B8		3.63	—	Eclipsing
2303	555	ψ Phe	Mb	M6	6.12	6.24	Var. Rad. Vel.
2796	681	ο Cet	M5e	M6e	—	—	Long period
3979	1003	16 Eri	Mb	M3	5.46	5.52	
5179	1338	γ Dor	F5		4.38	4.44	
20195	5586	δ Lib	Ao		—	—	Eclipsing
21982	6084	σ Sco	B1	B1	2.76	2.81	M.N. III, 340, 1951
22117	6118	χ Oph	B3p	B3e	4.32	4.45	Var. Rad. Vel.
22157	6134	α Sco	Ma + A3	M1	3.00	3.16	Antares
22677	6247	μ' Sco	B3p	B3n	2.50	2.60	Eclipsing
22730	6262	ζ' Sco	B1p	cB1e	5.00	5.05	
24135	6616	X Sgr	F8	G4	—	—	Cepheid
24605	6742	W Sgr	F8p	G0	—	—	Cepheid
24856	6812	μ Sgr	B8p	cB8e	3.80	3.85	Var. Rad. Vel.
25580	7020	δ Sct	F0	F4	4.86	5.01	Var. Rad. Vel.
25735	7066	R Sct	Kop		—	—	Irregular
25823	7074	λ Pav	B2	B3n	3.62	3.69	See Gascoigne Obs., 69,
25930	7107	κ Pav	cF5p	cG4	—	—	Cepheid [30, 1949]
26038	7152	ε CrA	F5		5.01	5.24	Eclipsing
26697	7342	ν Sgr	B8p + F2p		4.33	4.45	Var. Rad. Vel.
27763	7650	62 Sgr	Mb	M4	6.29	6.38	
28979	7951	3 Aqr	Ma	M3	6.32	6.40	
30252	8260	ε Cap	B5p	B5pe	3.98	4.03	Var. Rad. Vel.
30491	8322	δ Cap	A5	A7s	3.03	3.10	Var. Rad. Vel.
30844	8402	ο Aqr	B5p	B6ne	4.57	4.65	
31685	8636	β Gru	Mb	M6	3.94	4.06	
6713	1811	ψ Ori	B2	B2	4.07	4.15	Var. Rad. Vel.
24500	6712	66 Oph	B3		4.39	4.46	
27517	7570	η Aql	Gop	F9p	—	—	Cepheid