NOTES FROM OBSERVATORIES

Bright Variable Stars in Southern Hemisphere
(*First List*)

by

A. W. J. Cousins

The "Bright Star Programme" commenced at the Cape Observatory in 1945 to provide accurate photographic magnitudes for about eight-hundred stars south of the equator with H.R. magnitudes 5·0 or brighter is now nearing completion and it seems an appropriate time to present a first list of stars that appear to be variable. The present survey covers 400 consecutive stars on the working list.

The observations are being made by the Fabry method using Ilford Special Rapid plates and a blue colour filter and the equivalent wavelength is somewhat shorter than that of the international photographic system. The standard error of an observation made under favourable conditions is about ± $0^m·012$ and for three-quarters of the stars the standard deviation for unit weight is ± $0^m·015$ or less. Few stars were observed less than six times and suspected variables usually received extra attention.

G.C.	B,S.	Name	Spect. H.D.	Spect. Revised	Variation Max.	Variation Min.	Remarks
5617	1463	ν Eri	B2	B2s	3·38	3·52	Var. rad. vel.
5661	1492	R Dor	M7		—		Long period.
6234	1663	η^2 Pic	K5	M2	6·73	6·82	
6655	1788	η Ori	B1	(Bok)	2·85	3·03	Eclipsing.
6944	1922	β Dor	F5p	cF6	—		Cepheid.
7898	2212	δ Pic	B1	B1n	4·13	4·28	Var. rad. vel.
9059	2580	o′ CMa	K2p	cK5	5·76	5·94	
9276	2646	σ CMa	K5	Mo	5·49	5·58	
9293	2648	19 Mon	B3	B3n	4·47	4·54	
9604	2748	L^2 Pup	M5e	M5e	—		Long period.
9608	2745	27 CMa	B5p	B5e	4·02	4·15	Var. rad. vel.
9734	2781	29 CMa	Oe	Oqs	4·4	4·8	Eclipsing.
9736	2782	30 CMa	Oe5	Oqs	3·90	3·96	Var. rad. vel.
10802	3129	V Pup	B1p	B2n	—		Eclipsing.
11026	3187	—	K0	K5	6·70	6·80	
11034	3185	ρ Pup	F5	cF5	3·04	3·19	Var. rad. vel.
11149	3225	—	K5	Mo	6·32	6·38	Var. rad. vel.
11208	3240	—	B3	B3n	4·60	4·71	
12138	3498	f Car	B3	B3ne	3·92	4·02	
13192	3816	R Car	M5e		—		Long period.

G.C.	B.S.	Name	Spect. H.D.	Spect. Revised	Variation Max.	Variation Min.	Remarks
13462	3884	l Car	Go	G7		—	Cepheid.
14133	4050	q Car	K5		5·15	5·21	
14185	4063	—	Ko	M2	6·37	6·44	
14489	4140	p Car	B5p	B5ne	2·85	3·02	
14611	4163	U Hya	Nb	N2		—	Irregular.
14762	4200	w Car	K5	M1	6·50	6·60	Var. rad. vel.
15818	4441	o′ Cen	F8p	cG4	6·11	6·34	Var. rad. vel.
16176	4530	μ Mus	K5	M2	6·44	6·65	
16584	4621	δ Cen	B3p	B3ne	2·14	2·20	
16724	4656	δ Cru	B3	B3	2·25	2·31	
16764	4671	ϵ Mus	Mb		5·85	5·99	Var. rad. vel.
17179	4798	α Mus	B3	B5n	2·17	2·24	
17516	4902	ψ Vir	Mb	M3	6·50	6·64	
17959	5002	—	Ko	K6	6·54	6·60	
18084	5034	—	B3	B3n	5·91	6·07	
18239	5080	R Hya	M7e	M8e		—	Long period.
18666	5192	g Cen	Mb	M6	5·79	5·87	
18667	5193	μ Cen	B2p	B3e	2·68	2·77	Irregular (Hogg-*H. C.* 451).
19453	5395	τ' Lup	B3	B3	4·10	4·14	
19656	5440	η Cen	(B3p (A2p	B3ne	1·83	1·95	Var. rad. vel.

The stars are identified in the above table by their numbers in the "General Catalogue" and in the "Yale Catalogue of Bright Stars". The Beyer or Flamsteed designation is added where available. The fourth and fifth columns give the spectra type according to the "Henry Draper Catalogue" and the revised type from the "Publications of Lick Observatory", Vol. XVIII. The following two columns give the range of variation as observed, the limits being defined by several observations and not by individual values. The extreme range was rarely less than $0^m{\cdot}10$. The remarks column indicates those stars previously known to be variable in light or radial velocity.

The criterion for inclusion in the list is that the observations show a range of variation exceeding $0^m{\cdot}05$. Faint stars and others which for any reason might be expected to be subject to larger uncertainties of measurement were treated more stringently. One star having a smaller range is included because it was at one time used as a standard star and an unusually large number of observations makes the variation reasonably certain.

For the well-known variables, β Doradus, l Carinae (Cepheids), R Doradus, L2 Puppis, R Carinae, R Hydrae (Long periods), U Hydrae (irregular) and V Puppis (eclipsing) no limits of variability are given as these stars were omitted from the observing list. Other known variables,

mainly of Algol type, are not included because the observations failed to show any certain variation. The supposed irregular variable N Velorum showed no variation.

There appear to be at least 40 variable stars among 400 stars—or one out of ten on an average. It will be noticed that nearly half the stars are of spectral type B5 or earlier and that only four (including two Cepheids are of an intermediate type earlier than Ko. The southern Milky Way is noted for the number of bright stars of early type and about one-third of the stars considered are in this category. Variability is roughly twice as prevalent amongst them as amongst the remainder of the stars, including the red stars where instability is generally recognised.

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Photographic Magnitudes of the Brightest Stars.

by

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In the George Darwin Lecture last October Professor Stebbins drew attention to the disagreement between the magnitude of Sirius as measured by himself photoelectrically and the generally-accepted (H.R.) visual magnitude. (*M.N.*, **110**, 424, 1950). A note in the *B.A.A. Journal* (**61**, 165, 1951) refers to this result and remarks on the lack of accurate magnitudes of other bright stars. This prompts the advance publication of some results of the Cape "Bright Star Programme" and the associated photoelectric colour observations.

The table gives the photographic magnitudes and provisional colour indices of 23 stars of visual magnitude 2·0 or brighter and of one other star observed by Stebbins.

Name	B.S. Magnitude	Cpe	Pg Magnitude	C.I.
Sirius	− 1·60	− 0·19	− 1·64	− 0·24
Canopus	− 0·73	− 0·04	− 0·79	− 0·05
α Centauri	0·40	+ 0·47	0·25	+ 0·58
Rigel	− 0·08	− 0·22	− 0·11	− 0·27
Procyon	0·66	+ 0·12	0·57	+ 0·15
Achernar	0·07	− 0·34	0·06	− 0·42
β Centauri	0·10	− 0·42	0·10	− 0·52
α Crucis	0·25	− 0·43	0·26	− 0·53
Spica	0·46	− 0·43	0·47	− 0·53
Antares	2·99—3·16	+ 1·50	2·65—2·82	+ 1·86
Fomalhaut	1·12	− 0·08	1·06	− 0·10
β Crucis	0·73	− 0·41	0·73	− 0·51
γ Crucis	3·47	+ 1·26	3·18	+ 1·56
ε Canis Maj.	1·01	− 0·32	1·00	− 0·40
λ Scorpii	1·11	− 0·41	1·11	− 0·51