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THE RADIAL VELOCITIES OF 374 STARS

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THE RADIAL VELOCITIES OF 374 STARS

THE stars contained in this publication complete the observation of all stars in regions 6 x 6 degrees square whose centres are the Kapteyn regions in the northern hemisphere. The photographic magnitude limit was set at 7.59. In an earlier publication from this observatory velocities were furnished for areas 4 x 4 degrees square and the present list extends this area to 6 x 6 degrees. With very few exceptions the spectrograms have been secured with the 12½-inch camera which gives a dispersion of about 66 A per mm. at Hγ. Observation was begun about March 1939 and completed in May 1942. No changes in the methods of observation or measurement and reduction have been made and systematic errors should be the same for the present list of stars as for the first list of 500.

Between the two lists there are now 122 stars which have been observed at other observatories. A comparison of these yields the results in Table I. The various columns in this table are:

1. Type.
2. No. of stars available for comparison when list of 500 was published.
3. Algebraic residual of these.
4. Probable error.
5. No. of stars now available.
6. Algebraic residual based on the new more extensive comparison.

TABLE I

Type	No. Stars	Alg. Residual	p.e.	No. Stars	Alg. Residual
B	5	−2.9	0.8	13	−2.0
A	9	−0.4	1.3	45	+0.1
F	14	+0.3	0.5	23	+0.4
G	10	+2.3	0.7	13	+2.2
K	17	+0.2	0.3	24	+0.3
M	4	+2.5	0.2	4	+2.5
All types	59	+0.40		122	+0.33

The observation and measurement, as in the last programme, have been undertaken by the members of the staff conjointly. Owing to war conditions the staff has been changing quite frequently and many have contributed to the final results—F. S. Hogg, P. M. Millman, J. F. Heard, G. H. Tidy, A. F. Bunker, W. F. M. Buscombe, W. S. Armstrong, G. F. Longworth, R. M. Cunningham,

Miss R. J. Northcott, Miss E. M. Fuller. My thanks are especially due to Miss R. J. Northcott who has watched over the measurement and broken in so many new hands to the task of measuring and to Mr. G. F. Longworth who has taken a major part in the observations and kept the telescope in good running order.

The results for all the stars are included in Table II in which the columns have the following meanings.

1. The serial number in the Henry Draper catalogue.
2-3. The right ascension and declination for the epoch 1900.0.
4. The visual magnitude from the H.D. catalogue.
5. The H.D. type.
6. The type as estimated from our spectra. The criteria for estimating the type has been made as simple as possible and agree in general with the Harvard system and more particularly with the system adopted at Victoria as given in the Transactions of the International Astronomical Union, Vol. 5.

   For the A-type—A0, K 0.1 times Hδ; A2, K 0.4 times Hδ; A5, K 1.2 times Hδ; A9, K 2.0 times Hδ. In the F-type attention was centered on the line 4227; F3, 4227, 0.1 times Hγ; F7, 4227, 0.8 times Hγ; F8, 4227 = Hγ; G0, 4227, 3 times Hγ. For the later types the absolute intensity of 4227 was compared with typical spectra from G0—K8 and for the M-type the strength of the titanium oxide bands was used as a criterion.
7. The velocity of the star, i.e., the weighted mean velocity from all the plates if the velocity seemed constant or the variation small or not reasonably certain. Those stars in which the variation was fairly definitely established are marked "Var."
8. The probable error of the mean computed by the formula

$$\text{P.E.} = 0.845 \frac{\Sigma V}{n\sqrt{n}}$$

9. The number of plates.
10. The minimum and maximum number of lines measured.
11. The average probable error of a plate. The probable error of each measure was computed from the agreement of the lines when the plate was measured. $\bar{e}$ is the mean of these for the various measures.
12. Published velocities at other observatories. W refers to the Mount Wilson lists in Ap. J., Vol. 87, p. 516 and Vol. 88, p. 35;

V, the Victoria lists, D.A.O. Publications, Vol. VI, No. 10 and Vol. VII, No. 1; P, the Pulkova list, Pub. Pulkova Obs., Ser. II, Vol. XLIII.

13. References. R indicates that there is a note to this star at the end of the table. III indicates that the velocities as determined from the individual plates will be found in Table III. In this column also reference is made to a number of stars which show a considerable range. Such stars are indicated either by * or by a number. In the former case the velocity is uncertain, the range being judged due to the poor character of the spectrum for measurement. In the latter case the velocity range is indicated by the number and the star is judged to have a greater range than the character of the lines would lead one to expect.

The velocities for the stars which are variable are shown in Table III. There are 37 of these stars; 1 in 10 was judged to be variable. With the low dispersion employed, the velocity variation is not established unless it is about 30 km. or more. Column 1 gives the H.D. number, right ascension and declination for 1900, visual magnitude and type; Column 2, the Julian date and fractional part of the day; Column 3, the measured velocity and repeat measures; Column 4, the number of lines measured; Column 5, the probable error of the plate as indicated by the agreement of the various lines; Column 6, the measurer, N—Miss R. J. Northcott, F—Miss E. M. Fuller, T—G. H. Tidy, B—A. F. Bunker, C—R. M. Cunningham, Bs—W. F. M. Buscombe, Y—R. K. Young, L—G. F. Longworth, A—W. S. Armstrong.

TABLE II

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity	Ref.
	h m	° ′										
448	00 03.9	+17 40	5.69	K0	K0	− 20.1	0.6	4	15–27	1.5	− 23 9 ± 1.2 W	
487	04.3	45 50	7.00	B9	B9	− 07.2	2.2	6	3–5	5.0		
743	06.7	47 36	6.30	K0	K4	+ 15.5	1.2	5	14–23	1.9	+ 17.1 ± 0.2 V	
1359	12.7	75 43	7.12	B9	B8	− 05.0	1 0	5	3–4	5.0		
2739	25.8	43 24	6.64	B8	B8	− 07.4	1.2	5	3–6	3.6		
2888	00 27.1	+42 57	6.43	A0	B9	− 23.8	3.6	6	3–4	8.5	− 19.9! V	R
3264	30.7	48 00	7.42	A0	B2	Var.		4	6–14	3.4		III
3881	36.3	59 23	7.35	A3	A6	Var.		6	7–21	2.9		III
3924	36.7	58 13	6.13	B9	B9	− 03.5	2 3	5	4–8	3.1		
4362	40.9	59 02	6.49	G5	G7	− 15.5	0.7	4	20–26	2.0		
4666	00 43.6	+77 25	6.75	A5	A6	− 15.9	1.3	5	10–15	4.5		
5343	50.2	57 26	6.43	K2	K3	− 29.3	1.1	4	19–27	1.1		
5526	52.0	45 18	6.24	K0	K0	+ 06.1	0.7	5	13–24	1.3	+ 5.4 V, + 5.2 P	
5551	52.2	63 11	7.7	B2	B1	− 51.5	2.4	5	6–11	3.2	− 51 W	
5596	52.6	45 03	7.17	A3	A3	− 19.5	1.3	6	8–14	4.2		
5638	00 53.0	+46 31	6.75	A0	B2	Var.		7	7–13	3.5		III
5764	54.2	47 29	7 00	B8	B2	− 04.6	0.7	4	6–12	3.1		
5813	54.6	57 50	7.15	A3	A3	− 04.8	2.0	4	4–8	4.9		
5944	55.8	57 17	6.74	A2	A2	− 09.3	0.8	4	7–13	3.2		
6676	01 02.4	57 44	5.70	B8	B8	− 04.4	2.4	4	4–6	4.2		

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity	Ref.
	h m	° ′										
8272	01 17.0	+57 37	6.45	F5	F5	+07.0	0.5	4	10–19	2.0		
8671	20.4	42 57	6.08	F5	F5	+30.4	1.0	8	9–16	1.4	+29.1 ± 0.8 V	
8710	20.8	43 11	6.93	F2	F2	+06.6	1.6	7	6–13	3.2		
8862	22.3	43 32	6.56	B9	B9	Var.		6	4–9	3.0		III
9800	30.7	47 49	7.26	F0	F0	−06.5	0.9	5	12–19	2.7		
11884	01 51.7	+46 36	6.53	K0	K0	−06.1	0.8	5	12–28	1.9		
13201	02 03.9	16 46	6.43	F5	F3	+10.5	0.9	4	9–17	2.1		
14739	17.5	17 09	7.26	A2	A2	−09.7	1.5	6	3–12	6.2		
15365	23.3	45 34	6.77	G5	G8	+35.0	0.8	4	11–28	1.5		
15510*	24.7	45 57	6.97	A5	A6	−11.3	2.7	6	6–12	5.4		
15579	02 25.3	+46 09	7.06	F2	F2	+22.7	1.4	5	7–15	2.5		
15814	27.5	14 36	6.07	F5	F8	Var.		5	15–19	1.5	−3.3 W, Sp. B, P	III
16108	30.2	41 58	6.72	B8	B9	−16.0	0.7	5	3–4	3.4		
16780	36.3	47 51	6.56	G5	G5	−04.1	0.7	4	15–26	1.4		
16855	37.1	43 07	6.66	A2	A2	Var.		6	12–26	1.8		III
17086	02 39.5	+60 09	6.68	A5	A5	−14.6	1.3	5	20–23	1.9		
17088	39.5	57 19	7.54	B2	B5	−42.6	2.2	4	7–10	2.5		
17330	41.8	29 17	7.19	B9	B6	−03.2	1.0	5	6–12	2.7		
17591	44.3	63 00	6.94	G0	F8	−11.2	1.1	5	16–22	1.5		
17688	45.2	60 03	7.36	A3	A6	+01.8	1.3	4	18–24	1.7		

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity	Ref.
	h m	° ′										
17818	02 46.5	+48 09	6.51	K0	K2	+00.1	1.2	4	20–25	1.5		
17922	47.7	42 11	7.01	F5	F8	+25.5	1.0	5	9–20	2.7		
18040	48.8	47 56	7.20	A2	A2	−08.5	3.0	6	3–4	3.7		*24, R
18155	49.8	46 45	6.13	K0	K2	−12.2	0.3	4	11–19	2.3		
18876	57.1	62 38	7.42	B8	B5	−02.9	1.6	4	5–9	2.6		
19789	03 05.9	+12 40	6.44	G5	G6	+11.7	0.5	5	18–27	2.0		
20193	09.6	32 29	6.34	F0	F2	+10.6	1.1	4	10–18	1.8	+13.7 V, +14.4 P	
20277	10.5	31 49	6.05	K0	G5	+17.5	1.8	5	15–19	1.6		
20367	11.5	30 46	6.53	G0	G0	+05.3	1.0	5	15–19	1.5		
20500	12.8	12 28	7.64	B8	A0	+15.1	1.4	6	3–11	3.0		
21051	03 18.7	+12 17	6.22	G5	K0	+21.5	1.7	5	13–27	2.3		
21203	20.2	59 54	6.48	B8	B9	+03.8	3.7	6	3–5	6.5		*
21427	22.2	59 02	6.06	A0	A2	+08.9	1.5	6	3–6	3.1	+21.1 V	
21540	23.4	46 42	7.00	B8	B8	+05.4	0.8	4	3–6	2.5		
21541	23.4	14 39	7.32	A0	A0	+07.1	1.5	5	2–5	4.7		
21590	03 24.0	+16 25	7.02	A0p	A0p	+00.4	1.8	5	5–7	2.7		
21641	24.5	47 31	6.77	B9	B9	+14.0	2.4	5	3–5	4.5		*R
21700 s.p.	25.0	27 23	8.0	B9	A0	+16.5	2.2	5	2–6	4.0		R
21700 n.f.	25.0	27 23	7.8	B9	A0	+06.7	3.0	5	3–5	3.8		
21743 f.	25.3	27 14	6.54	A0	A0	+02.2	2.4	6	3–5	3.8	+7.8 V	R

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity		Ref.
	h m	° ′											
21769	03 25.5	+ 58 26	6.27	A2	A3	+ 07.4	1.6	5	11–19	2.9	+ 3.4	V	
21794	25.7	57 32	6.41	F5	F5	− 68.0	0.8	4	7–18	1.6			
21844	26.2	47 36	6.69	F0	F2	+ 37.8	0.8	5	9–18	2.5			
21970	27.4	75 24	6.38	G5	G5	+ 28.9	1.1	4	18–23	1.6			
22402	31.2	42 15	6.30	B8	B8n	− 01.9	3.1	7	2–6	9.0			*33
22521	03 32.2	+ 42 13	6.95	G0	F8	− 39.2	2.0	4	14–24	1.9			
22766	34.5	28 27	6.86	A0	A0	+ 10.0	1.5	6	2–7	5.1			
22860	35.2	28 23	6.89	B9	B9	+ 04.4	0.8	6	4–7	4.4			
24701	50.5	43 02	7.20	A0	A0	− 00.6	2.7	7	3–5	5.5			
28354	04 23.2	27 10	6.61	A0	A0	+ 19.0	3.1	6	2–3	5.1			*30
28447	04 24.1	+ 27 55	6.64	G5	G3	+ 23.5	1.5	4	14–21	1.8			
28459	24.2	32 14	6.19	B9	B9	+ 18.9	2.7	6	2–3	7.0			
29224	31.0	27 43	7.38	A0	B8	− 03.5	3.1	7	2–5	6.7			*32
29537	34.0	29 47	6.92	F0	F1	+ 24.3	1.4	4	13–15	3.6			
29646	35.0	28 25	5.68	A0	A0	+ 23.0	1.9	6	2–5	5.0	+ 25.2	V	
31151	04 48.3	+ 61 36	6.90	G0	G5	− 20.4	1.5	4	19–23	2.0			
31590	52.0	73 55	6.00	A2	A0	− 13.7	1.9	6	3–5	5.1	− 2.2*	V	
32784	05 00.5	62 21	6.74	A5	A7	− 03.0	1.0	5	15–19	1.8			
31441	05.2	62 59	6.74	F0	F0n	− 16.6	0.9	5	6–15	4.4			
34021	09.2	12 25	7.5	A0	A0	+ 15.5	1.1	4	3–7	9.6			*

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	$\bar{e}$	Pub. Velocity		Ref.
	h m	° ′											
34109	05 09.9	+85 35	6.55	A0	A0	−15.2	4.7	4	3–4	5.0			*32
34250	10.9	28 49	6.89	F0	F0	+01.3	1.4	5	11–22	2.5			
34255	11.0	62 33	5.88	K2	K2	−05.9	0.9	5	18–22	1.9	−05.3	W	
34384	11.9	28 41	7.25	A3	A5	−23.9	1.8	4	13–18	2.8			
35544	20.4	43 17	6.75	A0	A0	−01.8	4.0	5	3	6.3			*37
35761	05 21.9	+42 12	6.76	G5	G5	−09.6	0.9	4	16–20	1.7			
35802	22.2	17 10	6.04	K5	K5	−22.0	0.8	4	16–20	1.8			
35815	22.3	62 55	7.46	A0	A0	+12.4	1.2	6	6–12	3.2			
35956	23.2	12 29	6.81	F8	F8	+09.0	1.7	4	11–16	1.4			
36104	24.2	12 12	7.00	B8	B5	+11.2	3.0	4	3–7	6.7			
36162	05 24.7	+15 17	5.78	A2	A2	−15.6	2.0	7	3–4	7.4	−06.6*	V	*
36404	26.4	42 02	6.30	B8	B8	+00.1	2.6	4	3–9	3.4			
36425	26.5	31 48	7.26	A2	A2	+04.5	1.3	5	3–4	3.9			
36484	26.9	32 44	6.50	A0	A2	Var.		4	9–14	2.2			III
36859	29.6	27 36	6.47	K0	K5	Var.		5	13–25	2.4			III
37136	05 31.2	+61 53	6.65	A5	A5	−16.0	1.0	5	5–16	3.0			
37366	33.0	30 50	7.52	B5	B3	Var.		5	7–9	3.2			III
37519	34.1	31 18	5.96	B8	B9	−08.3	3.2	6	3–4	5.4			*
37574	34.4	32 51	6.80	F8	F5	−10.3	2.3	5	6–17	2.2			20
37646	35.0	29 26	6.75	A0	B8	Var.		6	3–5	6.7			III

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity		Ref.
	h m	° ′											
37647	05 35.0	+29 27	7.45	A0	A0	+18.1	1.5	5	3-5	3.7			
38258	39.4	47 26	7.38	B8	A0	−03.9	1.4	5	3-6	2.8			
38358	40.1	42 30	6.41	K0	K2	−15.3	1.8	6	13-20	2.0			20
39863	50.2	45 53	6.56	G5	G5	+03.8	1.0	4	18-22	1.3			
40143	52.0	45 37	6.60	A0	A2	−13.0	2.6	5	3-5	2.7			22
42180	06 04.2	+14 52	7.29	B9	B9	+15.1	3.5	5	3-6	5.2			*41
42476	05.8	17 24	6.91	A0	A0	+28.1	2.2	5	2-5	2.9			
42477	05.8	13 40	5.86	A2	A0	+11.4	3.2	5	3-4	6.2	+11.6	V	
43335	10.6	17 12	6.47	K0	Ma	+39.4	1.6	5	7-18	2.5			
43537	11.7	28 02	7.42	A0	A0	+10.6	1.0	4	7-11	2.6			
43646	06 12.2	+29 49	6.86	A0	A0	+10.7	0.7	4	4-7	2.3			
43819	13.2	17 21	6.17	B8	B9	+03.1	2.2	5	3-8	2.5			21
44071	14.7	29 25	6.91	F0	F2	−10.5	1.1	4	9-18	1.8			
44234	15.6	17 49	6.46	K0	K0	+11.4	1.2	4	12-22	2.1			
44497	17.0	12 37	5.97	F0	F2	+18.2	1.8	5	12-31	2.5			
45192	06 21.0	+32 38	6.43	K0	K0	+58.2	1.6	6	10-20	2.4			18
45504	22.7	27 02	6.49	F5	F5	−06.8	0.5	4	11-18	1.4			
45757	24.2	17 59	7.33	A0	A0	+35.3	2.2	4	3-5	9.2			*
45899	25.1	32 14	6.91	B9	B8	−04.4	1.7	4	5-6	4.0			
46148	26.6	15 47	7.13	F5	F8	Var.		4	8-20	2.2			III

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity	Ref.
	h m	° ′										
46641	06 29.4	+32 22	7.23	A2	A2	+15.3	2.9	5	3–8	3.4		
47256	32.6	27 53	7.20	A2	A4	+41.0	1.4	6	5–21	2.8		
47731	35.0	28 18	6.54	K0	K0	−06.5	1.5	4	17–20	2.0	−3.8 ± 0.3 W	
50384	47.9	45 57	6.48	K0	G7	+31.7	1.9	5	12–21	1.7		
50551	48.7	57 41	6.13	K2	K2	−53.9	1.2	4	20–23	1.3		
50658	06 49.1	+46 25	5.80	B8	B8	−42.1	1.3	5	3–4	5.2		
50763	49.5	46 49	6.03	K0	G8	+40.0	2.0	4	18–25	1.1		20
51418	52.2	42 26	6.61	A0	A0	−23.5	1.9	5	6–8	3.9		R
54901	07 05.6	15 30	7.26	F0	F2	Var.		5	13–18	2.3		III
56222	11.1	31 53	6.68	B8	B9	+21.7	1.1	4	4–8	5.4		
56386	07 11.7	+31 09	5.98	B9	B9	+33 2	4.3	5	3–5	4.4		*36
57069	14.6	29 55	7.11	A2	A2	+03.6	1.5	6	3–6	8.9		*
58244	19.7	32 06	6.81	A0	A0	−15.1	2.8	6	2–3	9 0		*
58917	22.6	62 43	6.77	A0	A0	+00.5	1.6	7	3–7	5.0		
59033	23.1	61 58	6.75	G5	G5	−00.8	1.2	4	20–23	1.3		
59150	07 23.6	+14 34	7.04	A3	A0	−07.3	1.7	5	3–6	8.0		*
59152	23.6	12 58	6.59	A5	A5n	+25.0	3.1	5	5–10	5.7		
59764	26.4	12 53	6.59	G5	G8	+60.0	1.1	5	13–24	2.4		
60293	28.7	60 44	6.86	A0	A0	−12.7	2.6	5	3–4	4.6		
60406	29 2	61 46	7.17	F5	F5	−41.2	0.8	5	10–18	2.1		

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	$\bar{e}$	Pub. Velocity		Ref.
	h m	° ′											
61295	07 33.5	+32 14	6.14	F0	F2	Var.		5	16–24	1.9	+31.4 ± 0.4	P	III
63887	46.1	71 57	7.52	A0	A0	Var.		4	1–4				III
64106	47.2	47 38	6.38	K0	G8	−60.6	1.2	4	13–21	1.8			
64958	51.3	44 15	6.47	K0	K0	−48.3	1.5	5	13–26	1.8			
67959	08 05.3	14 56	6.14	A0	A2	+23.6	1.1	6	4–14	2.1	+20.2	V	
68332	08 06.8	+14 19	6.40	A5	A8	−10.4	2.0	4	13–17	2.7	−9.7	V	R
68703	08.5	17 58	6.43	F0	F0	−03.8	1.5	4	19–21	2.5			
70566	17.6	32 38	7.48	A3	A3n	−03.4	1.9	5	4–7	4.8			
70843	19.1	17 32	7.04	F5	F7	−15.5	0.8	4	12–19	1.7			
71150	20.7	27 16	6.32	A2	A3n	−29.4	2.1	4	3–7	3.6			R
71151	08 20.7	+27 16	6.30	A2	A3n	−32.4	1.5	5	3–10	4.0			
71537	22.9	33 02	6.60	A0	B9n	−12.2	3.1	5	3–4	4.3			*
72392	27.5	47 28	6.62	A0	A0	−19.5	1.3	5	3–7	5.6			
72778	29.6	42 56	6.98	A2	A2	−30.5	2.4	4	11–23	2.7			
73596	34.1	32 19	6.11	F2	F2	+12.0	1.4	5	8–22	3.0			
73971	08 36.1	+47 16	6.21	G5	G5	−06.0	0.6	4	16–23	1.4			
74057	36.6	32 13	7.04	F8	F8	−00.4	1.1	7	6–18	3.6			
74292	38.1	32 26	6.92	A2	A3n	−09.4	1.2	5	6–12	4.1			
74546	39.5	28 48	7.24	F2	F3	+02.1	3.2	5	9–16	3.1			*22
75486	45.2	62 20	5.72	F0	F0n	−31.3	2.3	7	5–23	3.0			*27

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity	Ref.
	h m	° ′										
75487	08 45.2	+ 59 26	6.08	F0	F0	+ 09.1	1.1	5	14–34	1.5		
75556	45.6	12 23	6.14	K0	K0	+ 58.9	1.6	6	14–20	2.1		
76704	52.7	46 09	6.61	A0	A0	+ 02.0	1.7	7	3–5	6.8		
77986	09 00.6	16 15	7.27	B9	A0	+ 00.9	4.6	6	2–4	8.2		*
78661	04.4	11 58	6.16	F0	F0	− 16.3	1.5	6	7–17	3.4		
79929	09 11.8	+ 27 51	6.53	F5	F5	Var.		6	9–16	2.4		III
80064	12.5	11 55	6.29	A0	A2	− 01.8	2.5	5	10–20	3.1	− 06.8 V	
80390	14.4	57 08	5.98	Mb	Mb	+ 21.0	1.3	7	7–20	2.5		
80580	15.6	32 41	6.58	A0	A2	+ 07.7	3.1	6	2–4	5.3		
80652	15.9	17 02	6.79	A5	A8	+ 04.7	1.6	5	6 17	3.2		
81702	09 22.2	+ 56 41	6.94	F2	F2	− 02.8	1.0	6	7–13	2.2		
81995	24.1	45 12	7.12	A5	A5	Var.		5	10–17	2.9		III
82191	25.4	27 50	6.59	A0	A0	Var.		6	5–14	4.0		III
84004	37.0	32 44	7.18	F2	F2	+ 04.5	2.9	6	7–12	3.6		23
84005	37.0	30 35	6.68	A5	A5n	+ 00.2	2.5	6	3–14	3.4		
84107	09 37.7	+ 30 27	5.73	A2	A2s	+ 14.6	0.7	6	8–24	2.6		
84123	37.8	42 31	6.82	A3	A3	+ 15.3	1.8	7	16–32	2.4		20
86166	51.7	45 53	6.50	K0	K0	+ 06.1	1.3	6	11–22	1.9		
89239	10 12.6	27 55	6.46	B9	B9	+ 05.7	2.5	7	3–6	7.9		
90602	22.6	45 43	6.49	K0	K0	− 03.1	1.4	5	12–25	1.8		

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity	Ref.
	h m	° ′										
91130	10 26.2	+ 32 54	5.83	B9	B9	− 10.9	1.7	5	3–6	5.8		
92278	34.2	47 22	7.30	A2	A2	− 08.3	2.0	5	3–7	5.8		
92371	34.8	28 02	6.93	A2	A0n	+ 05.9	3.8	8	3–5	10.5		*
93286	41.2	60 38	7.22	F0	A8	Var.		6	13–22	2.1		III
93847	44.9	56 46	7.34	B9	A0s	− 06.9	0.9	4	9–22	2.0		
93859	10 45.0	+ 57 07	5.76	G5	G5	+ 15.6	0.9	5	11–29	1.5	+ 15.6 ± 1.3 W	
93875	45.1	59 51	5.66	K0	K0	− 13.6	0.7	4	16–29	1.6	− 20.2 ± 0.5 W	
97214	11 06.5	14 56	6.29	A5	A5	+ 03.2	1.4	5	11–19	2.4	+ 7.5 V	
98547	15.2	17 52	6.87	A0	A2	− 01.8	4.2	4	3–5	6.1		*
99004	18.5	17 42	7.03	A2	A3	− 01.7	1.8	5	7–9	5.3		
99302	11 20.5	+ 27 19	7.15	A2	A3	Var.		7	14–21	2.6		III
99607	22.5	45 07	6.86	F0	F2	+ 16.7	1.2	5	13–22	1.7		
99983	25.1	57 17	6.96	F0	F2	− 03.5	1.2	5	5–15	4.2		
100054p	25.7	60 15	8.0	A5	A5	− 15.5	3.0	7	4–10	5.3		R
100054f	25.7	60 15	8.0		A2	Var.		6	10–18	2.0		III
100518	11 29.0	+ 11 35	6.46	A2	A0	− 04.1	1.8	4	12–20	2.3	− 9.7* V	
101091	32.9	32 27	7.13	F2	F2	− 13.4	1.7	5	10–15	2.7		
101133	33.2	47 23	6.25	F2	F2	− 23.9	0.5	5	13–28	1.7	− 25.7 V	
101620	36.5	41 48	6.84	F5	F5	− 08.3	1.5	4	12–16	1.5		
102056	39.6	29 13	6.98	A0	A0s	− 09.3	1.1	6	3–12	2.3		

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity		Ref.
	h m	° ′											
102555	11 43.2	+28 59	7.21	F2	F2	+17.2	1.1	5	12–18	1.7			
102589	43.5	29 21	7.05	A2	A2	−06.8	1.8	5	5–10	4.7			
103483	49.9	47 02	6.46	A0	A2	−08.4	3.6	6	3–8	5.1	−16.9	V	R -
103498	50.0	47 01	6.81	B9	A0	−08.6	2.3	4	7–13	2.1	−8*	V	
103676	51.2	27 15	6.87	F2	F0	+09.3	1.7	5	10–17	2.8			
104904	11 59.7	+86 08	6.38	F5	F5	+07.0	0.7	4	17–23	1.1			
105262	12 02.1	13 33	7.00	B9	B9	+42.0	2.5	4	3–6	4.0			
106053	07.1	78 00	6.64	A0	A2	−15.8	2.3	6	2–7	5.0			
106223	08.2	30 51	7.46	A2	A2	−18.2	2.3	8	3–9	4.5			30
108399	22.1	72 29	6.44	K0	K0	+08.7	0.8	6	18–25	1.8			
108714	12 24.3	+17 53	7.52	A0	A0	+01.4	1.8	4	8–12	3.4			
109979	33.9	45 46	7.09	F2	F2	+07.4	1.9	4	8–14	2.1			
110093	34.6	86 17	7.07	F0	F0n	−12.4	2.2	4	9–16	2.9			
110500	37.5	46 25	6.94	A2	A2	−09.2	2.0	6	10–23	4.5	−8.9	V	
120817	13 46.7	42 40	7.48	A2	A2	−16.1	4.0	6	5–11	5.4			*36
123845	14 04.9	+16 05	6.67	F5	F5	−00.6	1.5	6	6–16	3.1			
124586	09.4	31 40	7.25	A0	B8	−10.5	1.6	9	3–6	3.7			
124587-8	09.4	29 35	6.76	F0-A2	F0-A2	−08.8	0.3	4	18–27	1.5			R
124883	11.0	28 12	7.16	A2	A2	−05.0	2.2	6	10–30	3.4			
127539	26.9	18 05	7.16	F5	F5	−21.8	1.3	5	10–15	2.4			

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity	Ref.
	h m	° ′										
128660	14 33.1	+43 16	6.70	F8	F8	−02.0	1.4	5	11–18	2.3		
132560	54.7	58 02	7.13	F2	F5	−10.0	0.9	6	13–17	2.3		
132890	56 5	62 04	7 04	A2	A2	−00.1	3.8	7	3–8	7.1		*
133161	57 9	16 26	6.99	G0	G0	−33.0	1.2	4	19–29	2.2		
133388	59 1	60 36	5.89	A2	A2	−09.5	1 9	6	3–9	4.1		
136831	15 17.7	+12 56	6.20	A0	A0	+06.7	3.7	7	3–5	4.7		*40
138406	26 8	62 05	6.79	A0	A2s	Var.		6	14–32	2.2		III
140084	36 7	76 46	7.52	A2	A2	+20.0	2.2	4	3–5	7.0		*
140117	36.9	58 14	6.46	K0	K2	−06.7	0.7	5	20–25	1.3		
140139	37 0	44 11	7.12	F0	F2	−23 9	2.9	8	7–23	4.1		
143802	15 57.4	+85 35	7.05	A5	A5	−11.5	3.3	3	11–15	2.5		
144839	16 02.8	13 36	7 18	F2	F2n	−30.0	4.5	7	5–14	4 7		*33
145082	04 0	47 46	6 58	A0	A0	−09 5	3.3	6	2–5	3 5		*
145976	08 7	26 56	6.37	F2	F2	−09 0	0.7	5	13–18	2.5		
148317	22.1	16 12	6 77	G0	G0	−33 5	0.9	4	9–15	2 0		
150010	16 33.2	+72 49	6.45	K0	K0	−32.1	1.1	5	16–25	1.6		
152224	47.0	32 44	6.26	K0	K0	Var.		7	8–25	2.0		III
152303	47.5	77 41	6.01	F2	F2	+05.5	1.2	4	10–13	1.8		
153720	56.0	75 34	6.84	F0	F0	Var.		4	8–17	3.0		III
153845	56.8	77 00	7.19	F0	F2	−02.0	0 9	5	14–21	1.8		

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity	Ref.
	h m	° ′										
153897	16 57.1	+27 21	6.37	F5	F3	−32.7	0.8	5	11–21	2.9	−31.3 ± 1.3 V	
154099	58.3	73 17	6.24	A5	A3n	Var.		5	3–9	6.0		III
154181	58.8	74 26	7.17	F5	F5	−09.3	0.6	4	9–16	1.6		
154528	17 00.9	77 48	6.66	A0	A0	Var.		5	5–7	4.0		III
155513	07.0	61 17	6.69	F5	F5	−07.5	0.8	5	13–22	1.8		
158013	17 21.7	+57 05	6.55	A2	A2	Var.		5	17–33	1.7		III
159870	31.9	57 38	6.17	F2	F5	+00.8	1.4	5	11–20	1.8		
160486	35.1	43 40	7.14	A2	A2	+12.9	0.9	4	10–12	2.7		
160740	36.5	44 04	7.19	A2	A2	−31.2	2.2	7	3–6	5.7		
161959	43.4	28 58	7.36	A0	A0	−40.0	3.3	7	2–7	9.1		*
163466	17 51.2	+60 25	6.82	A2	A5	−16.7	0.7	5	8–24	3.7		
165398	18 00.7	27 06	7.16	A2	A3	+05.5	2.5	6	8–20	3.5		20
165623	01.8	42 57	7.20	A0	A2	−21.6	2.6	5	8–13	2.6		
165910	03.2	13 03	6.46	A0	A0n	−19.5	2.9	7	1–6	4.9	−10*V, −21.4 P	*
166435	05.5	29 56	7.01	G0	G5	−12.7	1.5	5	13–22	1.4		
166868	18 07.5	+29 39	7.46	A2	A2	−07.3	1.7	6	3–6	6.0		*
166976	08.0	12 22	7.27	F0	F0n	−32.9	2.7	6	4–10	5.7		*
167944	12.4	12 02	7.13	F5	F5	+01.9	3.1	4	10–17	2.1		23
168440	14.6	12 30	7.34	B8	B2	−01.6	1.6	5	6–10	3.1		
173415	40.1	47 29	6.89	A2	A2	−18.0	1.4	5	12–21	2.5		

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	ē	Pub. Velocity	Ref.
	h m	° ′										
174881	18 47.7	+28 39	6.43	K0	K0	−20.8	2.2	6	13–25	2.0	−23.3 ± 1.1 V	
175443	50 3	27 47	5 82	K2	K2	+16 3	1.1	5	11–24	1.6		
176466	55 3	32 59	6 85	A2	A2	−40.5	3.5	6	3–4	3.9		*38
176669	56.3	42 52	7.54	B8	B8	−21.9	0.9	4	5–9	3.3		
177152	58.4	44 14	7.42	B9	B9	−20.0	2.8	5	3–5	7.6		*
177459	18 59 7	+17 24	6.63	F5	F4	−64.6	2.5	5	6–18	3.2		
177595	19 00 3	27 10	7.05	B9	B9	−13.9	3.2	5	3–6	2.7		*
177599	00 3	15 35	6.84	A0	A0	−15.0	1.1	5	3–5	5.3		
177931	01.6	45 45	6.82	B9	B9	−10.5	0.7	6	3–6	3.5		
177983	01.8	15 42	7 24	A5	A5	−14 4	1.3	5	11–24	3.2		
178512	19 03 8	+12 57	6 97	B8	B5	−10.8	2.5	6	5–8	4.0		
178634	04.3	59 08	7.46	A2	A3	−11.8	1.2	5	8–23	2.3		
179586	08.1	17 50	7.22	F0	F0	−34.3	0.9	4	9–22	3.2		
180316	11.0	27 46	6.69	B8	B5	Var.		5	4–8	3.8		H1
180553	11.9	27 17	6.26	B9	B8	Var.		5	5–8	5.0		
180613	19 12.1	+31 04	6.75	B9	B3	+08 0	0.8	5	5–13	3.0		
180844	13.0	32 57	7.01	B5	B5	−28 8	2.4	4	4–9	4 2	−31 5 ± 0.8 V	
181119	14.1	30 50	6.48	A0	A0	−25 0	3 9	5	4–5	3.8	−27 7* V	R
181566	15 9	63 02	6 91	F5	F5	−00 3	1.4	5	14–19	2.4		
182010	17 6	17 34	6.84	A0	B5	−09 6	3.8	5	3–6	5.1		*40

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	$\bar{e}$	Pub. Velocity	Ref.
	h m	° ′										
182190	19 18.4	+57 28	6.10	Ma	Ma	−21.7	1.5	3	10–23	2.1		
182440	19.6	57 33	6.50	K2	K2	+07.6	0.9	4	16–25	1.3		
183262	23.6	17 38	6.87	A2	A2	−05.1	2.1	6	11–33	2.9		22
183339	24.0	57 49	6.46	B8	B8	−22.9	2.2	6	4–10	4.1		
184602	30.2	45 50	7.40	A2	A2	−23.6	3.6	5	5–11	5.0		
184905	19 31.5	+43 43	6.58	A0p	A0p	−09.1	1.8	5	4–7	3.6	−10.0 V, −11.7 P	
186760	41.3	57 46	6.31	F8	F8	−21.6	1.3	4	15–18	1.8		
187372	44.6	47 39	6.24	Ma	Ma	+07.8	1.0	5	10–22	2.3		
187748	46.5	59 10	6.66	G0	G0	−02.8	0.3	4	16–24	1.2		
188074	48.3	47 09	6.24	F0	F0	−21.9	1.5	4	14–16	3.2	−13.7 V	
188876	19 52.2	+32 48	7.24	A0	B8	−18.6	3.0	5	3–5	4.8		
189377	54.6	41 59	6.48	A2	A2	−04.1	1.9	5	2–5	3.8	−12.5 V	
190165	58.6	45 11	7.52	A2	A2	−17.9	1.7	4	21–32	1.9		
190323	59.3	14 42	6.86	F8p	F8g	+27.2	1.4	5	11–24	2.4		
190338	59.4	16 51	6.83	A2	A2	−29.3	2.9	4	6–11	5.5		
190405	19 59.7	+17 26	6.77	F8	F5	−17.6	0.7	5	7–17	2.9		
190887	20 02.0	12 39	7.23	F2	F2n	−04.3	2.4	4	10–21	3.2		
191855	06.9	30 29	6.72	B9	B9	−14.9	2.0	5	5–12	3.3		
192684	11.0	32 33	6.71	B9	A0	−31.5	1.6	5	3–8	4.0		
192954	12.6	15 33	7.34	B9	A0p	+19.5	2.2	4	4–7	2.7		R

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	$\bar{e}$	Pub. Velocity	Ref.
	h m	° ′										
193265	20 14.3	+ 72 34	7.11	F0	F0n	− 02.8	1.8	5	6–15	4.2		
193579	15.8	17 29	6.04	K5	K5	− 30.0	1.9	5	7–24	2.5		
194688	21.9	17 01	6.17	K0	K0	− 16.4	1.2	4	15–19	1.4		
196133	30.3	44 50	6.62	A0	A2	Var.		5	3–13	2.9		III
196216	30.8	43 01	7.04	F2	F2	− 07.4	1.4	4	10–18	2.1		
196359	20 31.8	+ 44 03	7.23	F0	F0n	− 14.8	2.3	5	4–26	4.7		
196687	33.9	42 38	7.06	A0	B8	− 10.6	1.2	5	2–6	3.6		
196833	34.8	43 58	6.57	B8	B8	− 19.7	0.8	5	4–8	4.0		
196865	35.0	47 43	6.64	G5	G5	− 23.9	0.6	4	20–32	1.3		
198195	43.6	42 03	7.06	B9	B9	− 21.2	1.7	5	2–7	6.4		
198480	20 45.5	+ 42 35	7.26	B8	B8	− 11.9	3.5	5	3–7	6.7		*
198690	47.0	42 01	7.20	B8	B8	− 24.6	1.9	5	2–5	3.8		
199154	50.2	47 53	7.09	A5	A5	− 23.2	0.7	4	9–21	1.7		
199355	51.6	42 08	6.89	B9	B5	− 23.3	3.2	5	5–8	4.5		
199890	54.9	47 13	7.25	B8	B8	− 22.8	0.9	3	2–10	2.4		
200039	20 55.9	+ 75 32	6.21	G5	G5	− 24.1	1.2	4	15–20	1.6		
200407	58.2	43 47	6.72	A2	A2s	− 08.8	1.5	4	14–24	2.1		
201032	21 02.0	62 59	7.26	A5	A5	Var.		5	18–24	1.7		III
201114	02.5	47 39	7.50	A0	A0	− 17.4	3.1	5	4	4.0		
201269	03.3	47 47	7.50	A0	A0	Var.		5	4–6	3.9		III

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	$\bar{e}$	Pub. Velocity	Ref.
	h m	° ′										
201345	21 03.9	+33 00	7.76	B0	B0	+20.3	2.8	5	5–11	5.4		*
201344	03.9	59 01	7.30	A0	A0	+10.0	3.2	4	3–6	4.3		* *
201429	04.4	59 29	7.52	A0	A0	−12.6	2.2	5	4–11	6.6		*
201888	07.4	62 53	6.50	B8	B5	−25.6	1.9	5	5–8	2.8	−21.9* V	
201908	07.5	77 43	5 90	B9	B9	Var.		5	3–5	4 0		III
202313	21 09.9	+30 33	7.56	A0	A0	Var.		5	3–11	3.6		III
202345	10.1	71 50	6 96	F5	F5	−10.3	1.6	4	10–17	1.8		
202505	11.2	78 15	7.36	A2	A2	−15.2	0.7	4	5–10	4.7		
202519	11.3	57 53	7.02	A0	A2	−05.4	1 7	5	3–7	5.2		
203015	14.5	17 24	6.63	F2	F2	+04.8	1.1	5	6–14	2.9		
203836	21 19.6	+86 37	7.36	A3	A3	−03.6	3.0	4	3–6	5.1		*
203991	20.5	18 02	7.47	A0	A0	−03.1	2.9	4	3–5	11 0		* *
204211	22.0	62 34	7.20	A0	A0	−12.2	1.9	4	3–4	8 0		*
204231	22.1	57 39	7.06	F8	F8	−41.3	0 9	5	12–22	1.7		
206212	35.5	45 43	7.58	B9	A0	−17.3	1.7	5	3–6	4.1		
206182	21 37.3	+57 08	7.08	F5	F5	−22 7	0.8	4	10–18	1 7	−13 to −32 W	
207978	48.0	28 20	5.62	F5	F2	+20.2	1.2	4	10–13	2 1	+16.3 W, +18.0 P	
207990	48.1	61 09	7.13	A2	A2	−30.4	0 7	4	8–18	2.5		
208878	51.1	42 46	7.38	B9	B8	−22.6	1.9	4	3–5	4.6		
209149	56.1	32 33	6.46	F5	F5	−01.6	1.4	4	11–15	2.5		

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	$\bar{e}$	Pub. Velocity	Ref.
	h m	° ′										
209439	21 58.3	+32 54	6.87	A3	A3	−08.2	3.1	5	3–11	5.6		
209993	22 02.2	44 46	6.08	A2	A2	−03.9	2.2	5	2–4	4.1	−01.9 V	
210170	03.4	17 04	6.98	A0	A0	Var.		5	3–6	6.3		III
210208	03.7	42 27	7.52	B9	B9	Var.		5	2–6	7.9		III
211139	10.0	29 04	7.10	F5	F5	−16.1	1.9	5	8–16	2.3		
211460	22 12.1	+28 41	6.75	G5	G5	−37.5	1.0	4	11–19	2.4		
211474	12.2	29 35	7.59	B8	B8	−34.6	2.6	5	5–8	4.5		
212670	20.9	17 57	6.40	K0	K0	+23.3	1.0	5	18–23	2.0		
214557	33.9	45 19	7.07	F8	F8	−35.9	1.7	5	7–16	2.0		
214558	33.9	44 40	6.45	F8	G0	−04.0	1.6	7	10–18	1.8		
214946	22 36.7	+44 29	7.12	A5	A2	Var.		9	10–21	3.5		III
216562	48.8	30 14	7.46	A2	A2	−28.2	5.8	5	2–7	9.0		*
216716	50.0	30 56	7.41	A0	A0	−08.9	2.5	4	3–4	4.2		
216851	51.3	43 02	7.68	B5	B5	−20.1	1.3	5	4–5	6.0		
217695	57.4	47 24	7.50	A0	A0	−04.4	2.6	5	5–8	3.2		
218525	23 03.6	+44 01	6.36	A0	A2	−01.8	1.2	5	5–16	3.0	+4.7 V, −1 to +14	
219361	10.1	27 32	6.95	A0	A0	+01.1	0.8	5	4–10	2.1		
219699	12.8	30 29	7.16	F0	F0	−27.0	1.2	6	9–17	3.7		
221142	24.4	85 52	6.61	F0	F0n	−12.9	2.3	4	11–20	3.2		
221215	25.0	71 11	6.54	A0	A0	−17.8	1.7	4	3–10	3.6		

TABLE II—*Continued*

Star H.D.	α (1900)	δ (1900)	Vis. Mag.	Type H.D.	Type D.D.O.	Velocity Km./sec.	P.E.	Plates	Lines	$\bar{\epsilon}$	Pub. Velocity	Ref.
	h m	° ′										
221405	23 26.8	+77 20	7.04	A0	A0	−01.6	1.6	4	3–6	3.1		
221537	27.9	77 15	7.08	A0	A0	−05.2	3.2	4	3–4	8.0		*
221829	30.4	85 38	7.18	A5	A3	−24.4	3.6	4	3–9	6.4		*
222143	33.0	45 39	6.56	G5	G5	+00.4	1.3	4	22–26	1.5		
222207	33.5	41 57	6.79	B9	B9	Var.		5	3–5	4.0		III
222407	23 35.2	+63 10	6.85	A2	A2	−18.0	1.1	4	7–15	2.2		
222416	35.3	44 31	7.47	B9	B9	−20.4	2.5	5	4–7	2.5		*23
222514	36.2	57 17	7.22	A0	A2	+07.5	1.4	5	13–25	2.2		
222555	36.5	46 18	7.25	B9	B5	−08.7	3.2	5	3–9	3.8		30
222642	37.3	44 13	6.90	F0	F0	+04.8	1.1	4	15–19	2.5		
223057	23 41.2	+62 45	7.54	A0	A0	−03.2	2.6	5	3–8	4.8		
223386	44.0	59 25	6.38	A0	A0	−19.1	2.6	5	5	3.3	−13.3 V	
224380	52.3	47 43	7.46	A0	A0	−12.2	2.8	5	2–4	5.6		
224890	56.5	73 03	6.52	A0	A2	−09.2	2.5	7	9–27	2.6		27
225093	58.3	72 36	7.52	A2	A2	Var.		8	5–16	3.5		III

NOTES TO TABLE II

H.D.

2888 - Wide faint λ3933, poor hydrogen and λ4481 are all the lines measurable on our spectra. Announced as a binary by Victoria, range − 8.5 to − 44.3 km./sec. with a mean − 19.9. Our plates show almost the same range but have a mean − 23.8. The velocity of the system, if the variation is real, might be taken as − 22 km./sec.

18040 - λ3933 is strong but fairly good for measurement; hydrogen lines are fair; λ4481 faint. Victoria results range from + 28.1 to − 6.7. Mean of all plates, Victoria and Toronto, is + 10.5 km./sec.

21641 - Extremely wide diffuse hydrogen; very faint K line; 4471, 4481 faint and diffuse; Hβ has an emission core; agreement of plates better than to be expected and velocity is probably uncertain to 10 km./sec.

21700 - This and the following star form a wide double, separation about 44″. They are given in the A.G. catalogue as nos. 1713-14 but are not listed in Aitken's catalogue. Boss' catalogue of proper motions does not note the two stars. The spectra of the two stars are not identical, the s.p. star having sharper lines.

21743 - This is the fainter component of a double star, separation 11″. The two spectra are identical. Victoria publishes velocities + 0.5 and + 7.8 for the two components.

51418 - On three of the plates the lines are diffuse and look doubled but not resolved; on other two plates the lines are fairly sharp but give discordant results.

68332 Numerous but rather fuzzy lines. Victoria has 3 plates showing range − 15 to + 8.

71150 - This star and the next form a wide double. The stars have a common proper motion.

100054p - This and the following star is Aitken no. 8191 with a common proper motion. The following star seems to be variable. The average velocity of five plates is − 10.5 km./sec. for the following star.

103483 - 3 plates taken at Victoria give a range − 28 to − 7. Our own plates extend this range to + 4. Possibly variable. The lines are rather poor.

124587-8 This star is A9174, separation 1″.8. The spectrum in general looks like F0 but on well exposed plates K is sharp and about the strength of A2 type.

181119 - Poor spectrum for measurement. Victoria for four plates obtains range − 8 to − 47 with a mean of − 27.7. Our own plates range from − 9 to − 36.

192954 - Spectrum is peculiar. It is listed in H.D. as B9. Our spectra do not show any helium lines. Spectrum looks like α Cygni type.

TABLE III

Star H.D.	J.D. 242.... or 243....	Vel. Km./sec.	Lines	P.E.	M	Remarks
3264	9508.848	− 05.0	6	3.4	L	Sharp H and K, hydrogen
$00^h\ 30^m.7$		− 02.2	9	2.9	T	and helium.
48° 00′	9878.802	− 26.7	11	2.7	N	
7.42 B2		− 25.3	14	2.8	B	
	9905.697	− 35.6	7	3.0	N	
		− 30.7	5	4.8	A	
		− 35.1	10	3.9	C	
	0249.772	− 00.9	7	3.7	L	
		− 01.2	6	3.3	C	
3881	9539.766	+ 57.8	8	4.1	N	Numerous metallic lines
$00^h\ 36^m.3$	9852.851	+ 87.2	23	1.9	A	which are of only fair
59° 23′		+ 80.6	11	2.3	N	quality. The last plate
7.35 A6	9858.815	+ 00.6	21	2.9	B	is weak.
	9899.747	+ 52.9	18	3.3	B	
	9934.647	− 08.6	18	2.6	N	
	0018.512	+ 11.1	7	4.0	N	
5638	9503.803	+ 51.2	7	2.4	N	Sharp K line which does
$00^h\ 53^m.0$		+ 52.2	6	1.8	B	not seem to be inter-
46° 31′	9517.778	− 15.3	10	1.6	T	stellar. Numerous good
6.75 B2	9635.453	− 46.6	12	4.6	Bs	lines of helium and good
	9883.822	− 56.8	10	2.4	N	hydrogen.
		− 54.5	12	1.1	A	
	9901.766	+ 19.2	10	5.2	A	
	9919.670	+ 67.1	8	4.5	L	
		+ 52.1	8	8.1	L	
	9929.667	+ 35.1	11	2.9	B	
8862	9501.837	+ 12.5	5	2.2	B	Sharp K line and good
$01^h\ 22^m.3$	9571.652	+ 09.5	4	3.0	B	hydrogen. Helium lines
43° 32′	9867.863	− 33.3	5	2.3	N	and 4481 are weak.
6.56 B9		− 19.8	9	1.7	B	
	9905.737	− 00.2	7	2.6	Bs	
	0008.507	− 00.4	4	5.0	Y	
	0327.649	− 14.2	7	3.6	C	

TABLE III—*Continued*

Star H.D.	J.D. 242.... or 243....	Vel. Km./sec.	Lines	P.E.	M	Remarks
15814	9146.851	+ 16.2	16	2.3	T	Usual sharp lines. Mt.
$02^h\ 27^m.5$	9507.885	+ 11.8	15	1.9	N	Wilson velocity is −3.3
14° 36′	9867.896	+ 06.4	15	0 7	B	± 0.2. Pulkova pub-
6.07 F8	9916.744	+ 21.5	19	1.3	B	lishes as a binary, range
	0282.754	+ 08.6	16	1.5	N	− 12 to + 15. Our observations seem to confirm variability.
16855	9224.660	+ 13.8	16	2.3	B	Many very fine lines
$02^h\ 37^m.1$	9550.807	+ 26.5	26	1.7	B	Range is rather small to
43° 07′	9883.871	+ 29.9	25	1.8	L	be sure of variable
6.66 A2	0036.487	+ 09.2	12	1.7	Bs	character. The mean
	0261.781	+ 15.0	20	2.2	N	velocity is + 19.2 ± 2.6.
	0323.627	+ 16.1	13	1.8	N	
36484	9525.918	+ 38.6	9	2.9	B	Many fine lines. The
$05^h\ 26^m.9$	0029.624	+ 37.8	14	3.1	Bs	third plate is very weak.
32° 44′	0060.528	+ 17.4	4		B	
6.50 A2	0258.920	+ 47.4	14	1.7	Y	
	0289.875	+ 11.3	11	1.8	A	
		+ 12.7	9	1.2	Y	
36859	9311.578	− 30 7	11	2.8	Bs	
$05^h\ 29^m.6$		− 26.6	13	1.7	T	
27° 36′	9556.851	− 10.4	23	1.7	B	
6.47 K5	9918.895	− 02.2	20	2.3	N	
		− 01.3	25	2.1	Bs	
	0072.540	− 14.1	19	3.3	N	
	0388.585	+ 10.6	14	3 2	N	
37366	9571.778	+ 34.9	7	3.2	Bs	Good hydrogen and heli-
$05^h\ 33^m.0$	9583.754	+ 55 8	6	3 0	T	um. K is interstellar.
30° 50′	9952.837	+ 31.2	6	1.7	Bs	
7.52 B3	0316.843	+ 35.5	8	6.2	C	
	0388.604	− 38 8	9	2 6	N	
		− 28.3	7	2.7	C	

TABLE III—*Continued*

Star H.D.	J.D. 242.... or 243....	Vel. Km./sec.	Lines	P.E.	M	Remarks
37646	9620.681	+ 31.1	5	3.6	T	Only fair hydrogen and
$05^h\ 35^m.0$	0061.542	+ 7.3	3	13.	B	faint K. 4026 is seen.
29° 26′	0064.549	+ 14.8	3	14.	B	Published as variable by
6.75 B8	0066.521	− 01.7	4	5.2	B	Victoria + 23 to + 57.
	0282.947	− 19.5	3	1.3	N	Our observations con-
	0402.590	+ 27.9	3	3.3	N	firm the variability.
46148	0368.744	− 04.2	18	2.2	Y	Many fine lines. Range
$06^h\ 26^m.6$	0402.647	− 18.3	8	1.1	C	rather small. The mean
15° 47′	0410.603	− 02.1	13	3.3	N	velocity is − 13.4 ±4.3.
7.13 F8	0415.590	− 29 0	20	2.0	N	
54901	9584.903	+ 35 0	13	3.0	T	
$07^h\ 05^m.6$	9621.800	− 13.1	18	2 1	B	
15° 30′	0323 876	+ 59.5	13	2.5	C	
7.26 F2	0365.726	+ 64 4	14	1.7	Y	
	0388 697	− 09 2	18	2.4	Y	
61295	9212 956	+ 30.4	16	1.9	T	Many fine lines. Pulkova
$07^h\ 33^m.5$	0060.662	+ 10.0	21	2.5	B	publishes velocity +31.4
32° 14′	0095.541	+ 14.2	24	2.0	B	±0.4 which combined
6.14 F2	0340.827	+ 15.7	22	1.8	N	with our results leaves
	0373.751	+ 20.5	16	1.4	N	little doubt of the vari-
						able character. Our
						mean velocity is + 18.2
						± 2.2.
63887	0359.828	− 116.0	1		Y	Double lines which are
$07^h\ 46^m.1$		+ 66.0	1			hard to separate with
71° 57′	0376.739	− 84.6	1		Y	our dispersion. Lines
7.52 A0		+ 11.5	1			are sharp.
	0442.581	+ 06.7	4	4.9	Y	
	0443.565	+ 116.0	3	2.6	Y	
		− 83.0	3	3.1		

TABLE III—*Continued*

Star H.D.	J.D. 242.... or 243....	Vel. Km./sec.	Lines	P.E.	M	Remarks
79929	8950.682	+02.6	16	3.6	P	Many fine lines.
09h 11m.8	9363.541	+19.0	9	1.8	T	
27° 51′	9370.583	−03.6	11	1.9	T	
6.53 F5	9685.714	+18.3	10	3.5	A	
		+18.0	14	1.2	Bs	
	9726.585	+16.7	16	1.9	A	
		+18.0	16	1.7	Bs	
	9734.635	+17.0	9	4.1	B	
81995	9290.796	−05.2	11	1.6	T	Good lines.
09h 24m.1	9637.833	+53.7	8	3.3	L	
45° 12′		+51.7	10	4.0	Bs	
7.12 A5	0002.943	−09.6	17	3.1	N	
	0102.602	+18.8	12	2.2	B	
	0367.806	+20.5	12	3.3	Y	
82191	9341.699	−17.8	8	7.5	T	Undoubtedly double line binary, though the lines are hardly resolved on our plates. Lines are sharp on 4th and 5th plates, almost resolved on last plate.
09h 25m.4	9385.570	−06.8	6	4.7	T	
27° 50′	0029.776	+34.3	5	5.9	Bs	
6.59 A0	0073.618	+03.0	14	2.4	B	
	0087.583	+10.9	14	2.7	B	
	0367.821	−30.0	5	4.2	N	
93286	9035.621	−20.0	19	2.9	P	Many fine lines.
10h 41m.2	9361.650	−00.2	13	2.8	P	
60° 38′	9393.592	+12.7	17	3.2	A	
7.22 A8		+06.2	13	1.1	P	
	9400.580	−17.9	17	1.8	T	
	9770.601	−20.0	22	1.8	B	
		−18.3	28	1.6	A	
	0055.782	−02.6	17	1.5	N	

TABLE III—*Continued*

Star H.D.	J.D. 242.... or 243....	Vel. Km./sec.	Lines	P.E.	M	Remarks
99302	9278.897	+11.6	18	2.4	T	Many very fine lines.
$11^h\ 20^m.5$	9289.893	+27.2	29	2.0	Bs	
27° 19′		+21.6	21	1.9	T	
7.15 A2	9303.868	+07.7	20	1.9	T	
	9403.578	+07.5	10	5.1	T	
	9625.912	+00.7	19	2.2	B	
	0438.725	−02.0	14	1.5	Y	
	0444.623	−03.8	17	2.5	C	
100054 f	9729.736	−00.9	10	2.8	N	Many fine lines.
$11^h\ 25^m.7$	0114.617	−24.3	18	2.0	C	
60° 15′	0376.859	−20.9	13	1.7	Y	
8.0 A2	0383.844	−22.8	10	2.7	Y	
	0429.721	−02.4	17	1.6	N	
	0431.667	+11.9	17	3.3	C	
		+04.1	21	1.3	A	
138406	8994.809	−18.4	22	2.4	MR	Many very fine lines.
$15^h\ 26^m.8$		−14.3	23	1.4	N	
62° 05′	9396.728	+06.1	16	1.6	T	
6.79 A2	9441.609	−02.4	14	2.0	T	
	9676.976	+01.6	18	2.1	N	
	9684.912	−05.6	16	2.3	N	
	9784.604	+09.1	19	1.5	N	
152224	9041.738	−10.5	25	1.9	P	
$16^h\ 47^m.0$		−14.2	14	1.7	T	
32° 44′	9048.771	−30.0	18	2.5	P	
6.26 K0	9391.816	−19.0	19	2.3	T	
	9748.804	−19.5	22	1.4	Bs	
	9812.647	−74.2	11	2.8	L	
	0113.788	−24.1	29	0.9	A	
	0493.780	−25.2	8	2.2	Y	

TABLE III—*Continued*

Star H.D.	J.D. 242.... or 243....	Vel. Km./sec.	Lines	P.E.	M	Remarks
153720	9386.860	− 12.0	8	3.7	T	Lines are double on last plate.
16h 56m.0	9400 817	− 15.1	19	1.8	T	
75° 34′	9414 773	− 03.4	13	5.0	T	
6.84 F0		+ 02.5	11	2.4	Bs	
	0055 942	− 12 8	17	3 7	N	
	0114 785	− 74.9	17	2.3	A	
		+ 70.0	13	4.5		
154099	9408 735	− 18.3	6	3.1	T	Victoria has 3 plates − 5 to − 25. This makes total range 42 km. but velocity variation is not certain. Lines are rather fuzzy.
16h 58m.3	9447.597	− 12.6	7	4.3	T	
73° 17′	9799.631	− 10.6	9	5.6	B	
6.24 A3	9808.649	+ 15.4	4	8.4	B	
	0134.828	+ 16.8	3	8.8	L	
154528	9362.879	+ 39.8	5	4.2	T	Good K line and fair hydrogen.
17h 00m.9	9742.843	− 33.9	5	3.0	T	
77° 48′	9799.679	+ 70.6	7	5.2	B	
6.66 A0	0067 910	− 34.5	5	4.1	B	
	0507 771	− 63.0	6	3 7	Y	
158013	9382.834	− 40.3	14	2 9	T	Many fine lines.
17h 21m.7	9759.823	+ 07.0	21	1 7	Bs	
57° 05′	9817 669	− 15.0	33	1.2	Bs	
6.55 A2	9824.658	+ 12.0	20	1.2	B	
		+ 18 7	17	1.3	Y	
	0132.822	− 09.5	22	1 6	C	
180316	9383 874	+ 10 3	7	1.8	T	Fair hydrogen and helium.
19h 11m.0	9777 839	− 48 0	6	5.2	B	
27° 46′	9820 738	− 50.4	4	7 8	Y	
6.69 B5	0226 583	+ 00 1	8	5 3	C	
	0257 528	+ 32.5	5	0 8	N	

TABLE III—*Continued*

Star H.D.	J.D. 242.... or 243....	Vel. Km./sec.	Lines	P.E.	M	Remarks
196133	9595.439	+ 02.8	5	4.2	N	Sharp faint lines.
20h 30m.3	9827.753	− 40.5	3	2.6	Y	K very sharp.
44° 50′	9874.637	− 08.6	13	1.8	B	
6.62 A2	9906.556	− 22.0	4	2.9	Y	
	0292.532	− 08.5	11	3.2	Y	
201032	9858.729	+ 30.9	19	1.4	B	Many fine lines.
21h 02m.0	9947.469	+ 13.7	18	1.6	B	
62° 59′	0239.749	+ 47.5	21	1.8	F	
7.26 A5		+ 54.3	22	1.5	C	
	0287.558	+ 03.7	24	2.1	N	
	0324.510	+ 17.8	21	1.7	N	
201269	9460.820	+ 00.1	6	0.9	T	Good K line, hydrogen,
21h 03m.3	9838.777	− 17.5	6	4.8	Bs	good 4481.
47° 47′		− 11.5	4	2.6	A	
7.50 A0	9877.698	+ 03.6	4	5.6	B	
	0316.503	+ 03.7	6	4.1	N	
	0333.535	− 30.3	6	5.5	N	
201908	9509.712	− 11.2	4	4.1	T	Fair K, hydrogen and
21h 07m.5	0227.649	− 39.2	3	6.0	A	4481.
77° 43′		− 34.7	4	0.6	N	
5.90 B9	0323.465	− 22.3	4	3.6	N	
	0327.435	− 11.7	5	4.1	N	
	0359.441	− 04.9	3	5.7	N	
202313	9468.782	+ 04.1	6	3.9	T	Fair K and hydrogen.
21h 09m.9	9512.650	− 17.6	5	6.3	B	Silicon 4128-30 are pres-
30° 33′	9937.597	+ 10.2	5	2.6	N	ent.
7.56 A0		+ 15.3	5	4.3	B	
	0282.565	− 02.1	11	3.1	N	
	0349.501	− 14.6	3	1.3	N	

TABLE III—*Continued*

Star H.D.	J.D. 242.... or 243....	Vel. Km./sec.	Lines	P.E.	M	Remarks
210170	9507.735	− 04.5	5	4.6	N	Lines only fair but range seems too large for constant velocity.
22h 03m.4	9524.683	− 07.8	4	8.5	N	
17° 04′	9607.451	− 05.4	4	3.5	B	
6.98 A0	9828.824	− 24.8	3	4.1	A	
		− 36.5	6	6.8	N	
	9883.696	− 36.3	5	6.0	N	
		− 40.8	4	10.2	A	
210208	9508.674	− 20.2	2	4.8	T	Lines are poor and while range is large, velocity variation is not well established.
22h 03m.7	9853.795	+ 50.5	3	6.4	N	
42° 27′	0208.819	− 12.3	3	6.5	C	
7.52 B9	0223.755	− 01.8	6	14.8	C	
	0280.602	+ 22.1	5	7.2	Y	
214946	9527.683	− 95.2	11	3.8	N	Double line binary; rather difficult with our dispersion.
22h 36m.7		+ 104.6	4	2.3		
44° 29′	9528.721	− 29.5	14	2.3	B	
7.12 A2	9537.677	− 35.5	9	4.4	B	
	9612.510	− 95.7	11	2.8	N	
		+ 43.8	3	4.9		
	9817.847	+ 25.9	10	6.4	F	
	9824.848	− 97.1	12	1.9	N	
		+ 80.8	10	8.7		
	9862.748	−113.3	11	4.0	N	
		+ 55.8	11	1.6		
	9903 665	− 92.1	11	2.6	N	
		+ 105.2	5	8.8		
	9921.560	− 40.1	17	3.9	F	

TABLE III—*Continued*

Star H.D.	J.D. 242.... or 243....	Vel. Km./sec.	Lines	P.E.	M	Remarks
222207	9481.798	+ 19.4	4	7.1	N	Fair K and 4481.
$23^h\ 33^m.5$		+ 28.2	3	1.6	B	Hydrogen rather poor.
41° 57′	9501.796	− 39.3	3	1.6	B	
6.79 B9	0256.697	− 15.4	5	6.4	C	
	0326.571	− 40.3	4	5.1	Y	
	0315.536	− 08.6	5	2.1	N	
225093	9981.521	+ 90.8	6	3.6	N	Double lines, intensities
$23^h\ 58^m.3$		− 117.6	6	3.9		nearly equal and the
72° 36′	0284.700	− 132.0	7	2.3	N	components cannot be
7.52 A2		+ 121.5	4	3.0		distinguished on spec-
	0293.685	− 19.4	14	2.6	N	trum. Velocity of sys-
	0314.619	− 20.2	16	1.8	N	tem seems to be about
	0316.574	− 19.9	13	3.1	N	− 18 km./cec.
	0323.592	− 132.4	5	10.	N	
		+ 98.6	6	5.3		
	0324.557	+ 95.0	6	8.3	N	
		− 133.1	8	6.2		
	0349.544	+ 135.8	6	7.0	Y	
		− 153.9	7	7.5		

Richmond Hill, Ontario.

September, 1942.