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MAGNITUDES AND COLORS FOR 833 NORTHERN AND SOUTHERN STARS *

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Abstract. Photoelectric observations of the magnitudes and colors determined with the Lick Observatory 12-inch refractor and the 9-inch Oddie refractor of the Australian Commonwealth Observatory, during the course of several programs, are gathered into the present catalogue of 833 stars. Observations of some ten per cent of these stars were published in 1950 (Eggen, 1950a), but additional measures of all but a few have been made since that time. The magnitudes and colors of the nine Polar Sequence stars, NPS 6, 2r, 4r, 10, 13, 8r, 16, 19, and 12r, determined by Stebbins, Whitford and Johnson, are used as standards for defining the $(P, V)_R$ system. The previously published results for members of the Pleiades, Praesepe, Hyades, and Coma Berenices clusters are not included but will be discussed separately.

Observations. The observations may be grouped into three seasons:

Mt. Hamilton: 1948, July, to 1949, Dec., or "89";

Mt. Stromlo : 1951, Apr., to 1952, Mar., or "S";

Mt. Hamilton: 1952, Apr., to 1953, Dec., or "23."

A description of the major items of equipment is summarized in Table 1. The photometer used in seasons "89" and "23" is similar to that already described (Eggen, 1950b), except for the addition of a Fabry lens to insure deflections independent of small guiding errors.

The transmissions of the filters and of the 12-inch objective (Miczaika, 1954) were measured with a quartz monochromator, and the overall response of the various objective-filter-multiplier combinations is shown in Table 2 and Figure 1. The transmission of the 9-inch objective is assumed to be similar to that of the 12-inch.

The amplifiers were designed and constructed by Dr. G. E. Kron and are characterized by extreme linearity, high gain, and high stability. The linearity of each amplifier was checked several times during the observing season, and the calibration of the amplifier gain, which depends only upon the ratio of resistances, was checked at least once a week and often after each night of observing. The maximum deviations from line-

arity amounted to less than one per cent. As a further check on the stability of the amplifiers and the overall sensitivity of the equipment, measures of a radium standard were taken on the average of once per hour during the course of stellar observations.

The taking and the reduction of the observations was carried out in the manner previously described (Eggen, 1950b). The 16 stars, β Ari, α Cet, β CMi, κ Hya, ρ Leo, ϵ Vir, ζ Vir, α Oph, β Oph, γ Oph, δ Aql, β Aql, HD 217732, α Peg, HD 218155, and γ Psc were used as extinction and standard stars during one or more seasons. In addition, most of the stars in the catalogue with weight greater than 3.0 were used on one or more occasions as secondary standards. The closing errors, for each circuit around the sky in all three seasons, starting and ending with HD 217732, α Peg, and HD 218155, were less than 0.02 mag.

Color systems. The yellow magnitudes and blue-yellow color indices determined during the three seasons and reduced to no atmosphere are designated as follows: m and C with the season subscripts 89, s, or 23. To avoid a preponderance of negative signs, all the colors were arbitrarily increased by 1.000 mag. The same multiplier, designated 1P21-c, was used in all three seasons and the same pieces of filter glass were used in seasons "S" and "23."

The significant difference between the filters used in season "89" and those used in seasons "S" and "23" is the violet cutoff of the blue

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TABLE I. SUMMARY OF THE PHOTOMETRIC EQUIPMENT

Season	D.C. amplifier	Multiplier	Filters	Telescope	Recorder
89	G.E. Kron <i>Electronics</i> August, 1948	1P21-c 90v/stage	Corning Nos. 5330 and 3385	12-inch refractor	Esterline- Angus recording milliammeter
S	G.E. Kron <i>A.p. J.</i> 115, I, 1952	1P21-c 100v/stage	Corning Nos. 5562 and 3385	9-inch refractor	Esterline- Angus recording milliammeter
23	G.E. Kron <i>A.p. J.</i> 115, I, 1952	1P21-c 110v/stage	Corning Nos. 5562 and 3385	12-inch refractor	Brown recording potentiometer

filters, which is at about $\lambda 3400$ for the Corning glass No. 5330 used in season "89" and at about $\lambda 3700$ for the piece of No. 5562 used in seasons "S" and "23." The result of this small change in ultra-violet cutoff can be seen in the upper part of Figure 2A, which shows the relationship between the colors obtained for the 96 stars observed in both seasons "89" and "23." The straight line represents the transformation equation:

$$(C_{23} - 0.659) = 0.905 (C_{89} - 0.422), \quad (1)$$

or

$$C_{23} = +0.277 + 0.905 C_{89} \\ \pm 0.003 \pm 0.002 \text{ (p.e.)}$$

This equation was derived from only the stars with $C_{89} > -0.05$ (that is, with $C_{23} > +0.23$). For the bluer stars the relationship becomes non-linear and, perhaps, multi-valued. Observations of some 100 stars with $C_{89} < -0.05$ made in season "89" have been omitted from the present catalogue. Most of these stars, however, have been reobserved in seasons "S" or "23." The probable error of one color difference, $C_{23} - C_{89}$, after applying equation (1), is ± 0.009 mag.

The comparison of the magnitudes m_{89} and m_{23} is shown in the lower part of Figure 2A. The probable error of one difference, $m_{89} - m_{23}$, is

± 0.027 mag. There is no appreciable color or relative scale difference between the two series of magnitudes.

A comparison of C_{23} and C_s for the 42 stars common to the two seasons is shown in Figure 2B. The linear relationship is given by

$$(C_{23} - 0.487) = 1.021 (C_s - 0.575), \quad (2)$$

or

$$C_{23} = -0.100 + 1.021 C_s \\ \pm 0.003 \pm 0.003 \text{ (p.e.)}$$

The constant difference of 0.1 results at least partly from the use of 110 volts/stage for the multiplier in season "23" as compared to 100 volts/stage in season "S". The small scale factor represents a difference in transmission of the 12- and 9-inch objectives. The probable error of one difference, $C_{23} - C_s$, is ± 0.009 mag., which is the same as that found above for the difference $C_{23} - C_{89}$.

A comparison of the magnitudes obtained in season "S" with those of season "23" is also shown in Figure 2B. The probable error of one difference, $m_{23} - m_s$, is ± 0.025 mag. Figure 2B shows no appreciable effect of a color or relative scale difference between the two sets of magnitudes.

Collecting the probable errors of one difference obtained from the intercomparison of the magnitudes and colors of the three seasons, we have:

$$\begin{array}{ll} m_{23} - m_{89}, \pm 0.027 \text{ mag.} & C_{23} - C_{89}, \pm 0.009 \text{ mag.} \\ m_{23} - m_s, \pm 0.025 & C_{23} - C_s, \pm 0.009 \\ \text{Mean } \pm 0.026 & \text{Mean } \pm 0.009 \end{array}$$

Since the observations in all three seasons appear to be of equal accuracy, we shall ignore any error introduced by the transformation equations (1) and (2) and compute the average probable errors for each season as follows:

$$\begin{array}{ll} \text{p.e. in magnitude} = \pm 0.026/\sqrt{2} = \pm 0.018 \text{ mag.} \\ \text{p.e. in color} = \pm 0.009/\sqrt{2} = \pm 0.006 \text{ mag.} \end{array}$$

Figure 1. The overall response of the various objective-filter-multiplier combinations used.

Figure 2. The relationships between the various magnitude and color systems discussed in the text.

The magnitudes and colors determined in seasons "89" and "S" have all been reduced to the system defined by the photometer used in season "23." The results are designated m and C in the fifth and seventh columns of the catalogue in Table IV.

In July, 1950, an informal meeting held in Pasadena led to the adoption of the magnitudes derived by Stebbins, Whitford and Johnson (1950) for the nine stars NPS 6, 2r, 4r, 10, 13, 8r, 16, 19, and 12r, as standards for future photoelectric work at the Lick, Washburn, and Mount Wilson-Palomar Observatories. Following Kron (1951), we shall use the symbols V and $(P-V)$ to designate the visual magnitudes and color indices on this system.

TABLE II. TRANSMISSION OF OBJECTIVE-FILTER-MULTIPLIER COMBINATIONS

Corning λ	5330	5562	3385
3300	0.00	—	—
3400	0.05	—	—
3500	0.15	0.00	—
3600	0.26	0.02	—
3700	0.39	0.14	—
3800	0.54	0.32	—
4000	0.65	0.53	—
4200	0.60	0.55	—
4400	0.43	0.49	—
4600	0.38	0.46	—
4700	0.29	0.38	0.01
4800	0.22	0.27	0.22
5000	0.11	0.11	0.36
5200	0.05	0.02	0.36
5400	0.02	0.00	0.31
5600	0.01	—	0.21
5800	0.00	—	0.14
6000	—	—	0.09
6200	—	—	0.04
6400	—	—	0.01

TABLE IIIa. NATURAL MAGNITUDES AND COLORS FOR POLAR STANDARDS

NPS	BD	C	m
6	+89°13	+0.114	7.17
2r	+88°112	+1.453	6.67
4r	+88°114	+0.980	8.38
10	+89°03	+0.202	9.15
13	+89°29	+0.305	10.27
8r	—	+0.997	10.59

TABLE IIIb. MAGNITUDES AND COLORS OF THE POLAR STANDARDS

NPS	$(B-V)$	$(P-V)_{E,J}$	$(P-V)_E$	$(P-V)$	$(P-V)_{SWJ}$	$\Delta(P-V)$	P_J	P_E	$\bar{P}$	P_{SWJ}	ΔP
6	+0.181	+0.063	+0.049	+0.055	+0.06	-0.005	7.14	7.19	7.16	7.15	+0.01
2r	+1.569	+1.503	+1.506	+1.505	+1.56	-0.055	7.93	7.91	7.92	7.90	+0.02
4r	+1.063	+0.978	+0.991	+0.985	+1.02	-0.035	9.21	9.19	9.20	9.24	-0.04
10	+0.287	+0.173	+0.145	+0.16	+0.12	+0.04	9.20	9.24	9.22	9.17	+0.05
13	+0.345	+0.233	+0.257	+0.245	+0.24	+0.005	10.49	10.47	10.48	10.51	-0.03
8r	+1.096	+1.012	+1.010	+1.01	+1.02	-0.01	11.42	11.41	11.42	11.43	-0.01
16	+0.482	+0.375	—	+0.375	+0.32	+0.055	11.56	—	11.56	11.56	0.00
19	+0.572	+0.469	—	+0.47	+0.41	+0.06	12.67	—	12.67	12.66	+0.01
12r	+1.352	+1.278	—	+1.28	+1.27	+0.01	13.79	—	13.79	13.80	-0.01

$$\text{Difference} \begin{cases} +0.007 \dots \dots \dots \text{systematic} \dots \dots \dots 0.00 \\ 0.030 \dots \dots \dots [\text{average}] \dots \dots \dots 0.020 \end{cases}$$

Values of m and C for six of the nine polar stars that define the (P, V) system were compared with the magnitudes and colors given by Stebbins, Whitford and Johnson. The resulting linear transformation equations are,

$$(P-V) = -0.075 + 1.088C, \quad (3)$$

$$V = m - 0.01 - 0.18C. \quad (4)$$

The values of $P = V + (P-V)$ and $(P-V)$ determined for these six stars during the present work are given in Table IIIb. Table IIIa contains the BD numbers and the values of C and m for the stars observed at Lick. Also in Table IIIb are the colors, $B-V$, and P magnitudes given by Johnson and Morgan (1951 and 1953) for all nine polar standards. The values of $(P-V)_{E,J}$ were obtained from $B-V$ with equation (6), which is derived below from the 122 stars observed by Johnson and Morgan that are also contained in Table IV.

Although the values of C are relatively free of radiation to the violet of $\lambda 3800$, the international colors, $P-V$, are not, and equation (3), therefore, represents only the *linear* relationship between the two systems. The true relationship is non-linear, as has been shown by Johnson, but it is very poorly defined. We have adopted the compromise of fitting the colors, C , to the zero-point and scale of the polar stars by (3), and then defining the resulting color system by all the stars in Table IV. This system, which we shall call the $(P-V)_E$ -system, may be thought of as one comparable to the international system freed of the ultraviolet.

The catalogue. The catalogue of magnitudes and color indices on the $(P, V)_E$ -system for 833 stars is in Table IV. An asterisk after the number in the first column calls attention to a note at the end of the table. For stars brighter than 6.5 visual magnitude the constellation name with the Flamsteed number or Bayer letter is given when available, otherwise the number in *Harvard Annals* 50. For the fainter stars the number in

TABLE IV. THE CATALOGUE OF MAGNITUDES AND COLOR INDICES

HD or BD	Name	α (1900)	δ	C	AD	m	AD	V	P - V	No. in	Wt.	Sp	Ref
		h m								89 S 23			
55	CC 5	0 00.3	-68°23'	+0.933	4	8.69	2.0	8.51	+0.940	5	1.6	K0	1
432	β Cas	0 03.8	+58 36	+0.266	7	2.33	1.0	2.27	+0.214	3	1.2	F2 IV	2
496	ϵ Phe	0 04.3	-46 18	+0.940	7	4.07	0.8	3.89	+0.948	5	1.6	K0 III	3
693	6 Cet	0 06.2	-16 01	+0.406	6	4.94	1.3	4.86	+0.367	3	1.2	F6 V	6
886*	γ Peg	0 08.1	+14 38	-0.270	6	2.83	0.8	2.87	-0.369	2	1.0	B2 IV	2
1326*	ADS 246AB	0 12.4	+43 27	+1.347	0	8.15	3.0	7.90	+1.390	3	1.2	M1V, M6V	2
1581	ζ Tuc	0 14.9	-65 28	+0.504	9	4.33	0.3	4.23	+0.473	3	1.2	G0 V	3
2151	β Hyi	0 20.5	-77 49	+0.538	2	2.86	0.7	2.75	+0.511	3	1.2	G1 IV	3
2261*	α Phe	0 21.3	-45 51	+0.989	1	2.52	0.4	2.33	+1.001	2	1.0	K0 III	3
2475	HR 108	0 23.4	-20 53	+0.502	9	6.53	2.5	6.43	+0.471	4	1.4	G0	1
2880*	ADS 450	0 27.0	-5 44	+0.764	10	8.67	2.2	8.52	+0.756	5	1.6	dG8	4
2884/5*	β Tuc	0 27.0	-63 31	-0.055	6	3.76	1.0	3.76	-0.135	4	1.4	A2, B9	1
3003*	HR 136	0 28.1	-63 35	-0.024	7	5.15	2.3	5.14	-0.101	4	1.4	A2	1
3196*	13 Cet	0 30.1	-4 09	+0.465	6	5.27	0.5	5.18	+0.431	2	1.0	F8 V	6
3359*	-49°138	0 31.3	-49 41	+0.674	5	8.55	2.2	8.42	+0.658	3	1.2	K0	1
3405*	Cin 76	0 31.8	-49 41	+0.538	8	6.90	1.8	6.79	+0.511	4	1.4	G5	5
3443*	ADS 520	0 32.2	-25 19	+0.633	7	5.70	2.5	5.58	+0.614	7	1.8	dG7	4
3651	54 Psc	0 34.2	+20 43	+0.784	5	6.01	1.0	5.86	+0.778	5	1.4	K0 V	2
3690*	55 Psc	0 34.7	+20 53	+0.980	6	5.56	0.7	5.37	+0.991	2 2	2.0	dG7	4
3823	60 Tuc	0 35.7	-60 01	+0.468	1	5.98	0.5	5.89	+0.434	2	1.0	G0	1
4128	β Cet	0 38.6	-18 32	+0.954	10	2.18	1.0	2.00	+0.963	4	1.4	K0 III	6
4614*	η Cas	0 43.0	+57 17	+0.493	8	3.54	1.9	3.44	+0.461	2 3	2.2	G0 V	2
4628	HR 222	0 43.1	+4 46	+0.800	6	5.89	1.8	5.74	+0.795	3 3	2.4	dK4	4
4747	CC 59	0 44.4	-23 46	+0.774	1	7.26	2.8	7.11	+0.767	2	1.0	dG7	4
5015	HR 244	0 47.1	+60 34	+0.471	5	4.88	3.0	4.79	+0.437	3 2	2.2	F8 IV	6
5133*	CC 62	0 48.1	-30 54	+0.824	6	7.29	0.7	7.13	+0.822	3	1.2	dK5	4
5286*	36 And	0 49.6	+23 05	+0.940	6	5.60	1.5	5.42	+0.948	4	1.4	sgK1	4
6186	ϵ Psc	0 57.8	+7 21	+0.892	8	4.42	0.4	4.25	+0.895	3 2	2.2	K0 III	6
6582	μ Cas	1 01.6	+54 26	+0.610	2	5.27	0.5	5.15	+0.589	2 2	2.0	G5 Vp	2
6595*	β Phe	1 01.6	-47 15	+0.806	6	3.42	3.0	3.26	+0.802	2	1.0	G8 III	3
7693*	CC 89	1 11.6	-69 21	+0.838	4	7.36	0.0	7.20	+0.837	2	1.0	G5	1
7788*	κ Tuc	1 12.4	-69 24	+0.382	5	4.95	1.8	4.87	+0.340	2	1.0	F6 V	3
7804*	89 Psc	1 12.6	+3 05	+0.029	4	5.16	1.6	5.14	-0.043	3 2	2.2	A3 V	7
7983	Cin 167	1 14.1	-9 27	+0.524	3	8.97	0.3	8.87	+0.495	3	1.2	dG0	4
8688	-28°433	1 20.1	-28 21	+0.431	5	7.83	1.0	7.74	+0.394	2	1.0	G0	1
8651	HR 408	1 20.2	-42 01	+0.966	7	5.63	1.0	5.45	+0.976	3	1.2	K0	1
9138	μ Psc	1 24.9	+5 38	+1.276	8	5.08	1.6	4.84	+1.313	3 2	2.2	K4 III	6
9270	η Psc	1 26.1	+14 50	+0.906	10	3.76	1.1	3.59	+0.911	3 2	2.2	G8 III	2
9540	Cin 209	1 28.5	-24 41	+0.776	6	7.06	1.0	6.91	+0.769	2	1.0	dG8	4
9770*	-30°529	1 30.4	-30 25	+0.802	6	7.26	2.8	7.11	+0.797	3	1.2	K4	5
10360/1*	p Eri	1 36.0	-56 42	+0.769	1	5.24	2.0	5.09	+0.762	3	1.2	G5, G5	1
10476	107 Psc	1 37.1	+19 47	+0.765	10	5.38	-0.7	5.23	+0.757	3	1.2	K1 V	2
10538	HR 498	1 37.6	-37 20	-0.063	13	5.74	2.8	5.74	-0.144	2	1.0	A0	1
10700	τ Cet	1 39.4	-16 28	+0.639	8	3.64	2.8	3.51	+0.620	2 6 2	3.7	G8 Vp	2
10780	HR 511	1 40.4	+63 22	+0.697	13	5.74	1.3	5.60	+0.683	3	1.2	dK0	4
11443*	α Tri	1 47.4	+29 06	+0.392	5	3.52	2.3	3.44	+0.351	3 3	2.4	F6 IV	2
11636*	β Ari	1 49.1	+20 19	+0.088	5	2.73	---	2.70	+0.021	St	2.0	A5 V	2
11803*	ADS 1538	1 50.7	+1 21	+0.486	5	6.11	1.5	6.01	+0.454	3 3	2.4	dG0	4
11937	χ Eri	1 52.0	-52 07	+0.766	2	3.76	1.0	3.61	+0.758	2	1.0	G5 IV	3
12311	α Hyi	1 55.6	-62 03	+0.196	4	2.85	2.3	2.80	+0.138	3	1.2	F0 V	3
12929	α Ari	2 01.5	+22 59	+1.057	4	2.20	0.3	2.00	+1.075	3	1.2	K2 III	2
13372*	5 Tri	2 05.6	+31 03	+0.068	13	6.31	0.8	6.29	-0.001	3	1.2	A0	1
13445	HR 637	2 06.3	-51 19	+0.713	4	6.24	3.0	6.10	+0.700	2	1.0	dG5	4
13594*	ADS 1709	2 07.6	+47 02	+0.326	8	6.15	1.7	6.08	+0.280	3	1.2	F5 V	6
13974*	δ Tri	2 10.8	+33 46	+0.519	5	4.98	1.5	4.88	+0.490	3 3	2.4	G0 V	-2
14412	HR 683	2 14.5	-26 25	+0.633	0	6.43	0.0	6.31	+0.614	2	1.0	dK0	4
14802	κ For	2 18.0	-24 16	+0.531	8	5.26	0.0	5.15	+0.503	2	1.0	dG1	4
15318	ζ^2 Cet	2 22.8	+8 01	-0.084	5	4.28	2.8	4.28	-0.166	3 2	2.2	B9 III	2
15371	κ Eri	2 23.3	-48 09	-0.155	3	4.27	2.7	4.29	-0.244	3	1.2	B8 III	3
16046	ω For	2 29.5	-28 40	-0.078	2	4.92	2.8	4.92	-0.160	3	1.2	B9	1

TABLE IV—Continued

HD or BD	Name	α (1900)	δ	C	AN	m	AD	V	P - V	No. in 89 S 23	Wt.	Sp	Ref
16160	HR 753	2 30.6	+ 6°25'	+0.873	12	5.99	0.8	5.82	+0.875	2 3	2.2	dK4	4
16582	δ Cet	2 34.4	- 0 06	-0.248	8	4.03	1.9	4.06	-0.345	5 2	2.6	B2 IV	2
16619*	ADS 2028	2 34.7	- 0 17	+0.588	10	7.89	3.0	7.77	+0.565	6 5	3.3	dG4	4
+2°418*		2 37.3	+ 2 57	+1.176	1	10.36	0.5	10.14	+1.205	2	1.0	K7	5
16895	θ Per	2 37.4	+48 48	+0.412	5	4.20	2.9	4.12	+0.373	3 3	2.4	F7 V	2
16970*	γ Cet	2 38.1	+ 2 49	+0.071	4	3.48	1.5	3.46	+0.002	2	1.0	A2 V	7
17051	ι Hor	2 39.1	-51 14	+0.486	3	5.52	0.5	5.42	+0.454	2	1.0	F5	1
17094	μ Cet	2 39.5	+ 9 42	+0.258	9	4.31	2.2	4.25	+0.206	3 2	2.2	F0 IV	2
17925	HR 857	2 47.7	-13 11	+0.786	6	6.18	1.6	6.03	+0.780	2 4	2.4	dK0	4
18604	λ Cet	2 54.4	+ 8 31	-0.132	11	4.66	2.0	4.67	-0.218	2 2	2.0	B5	1
18884	α Cet	2 57.1	+ 3 42	+1.520	5	2.77	-	2.49	+1.579	StSt	4.0	M2 III	2
19373	ι Per	3 01.8	+49 14	+0.515	6	4.16	2.3	4.06	+0.485	3 3	2.4	G0 V	2
19445*	CC 209	3 02.5	+25 59	+0.382	4	8.12	0.0	8.04	+0.340	4	1.4	A4p	4
20010*	α For	3 07.8	-29 23	+0.453	6	3.95	3.8	3.86	+0.418	5	1.6	F6 V	3
20121	HR 968	3 08.9	-44 47	+0.337	14	6.06	1.5	5.99	+0.291	2	1.0	F2	1
20365	29 Per	3 11.5	+49 51	-0.099	7	5.17	0.8	5.18	-0.183	5	1.6	B3 V	2
20391	+49°900	3 11.7	+49 24	+0.081	6	7.97	0.6	7.95	+0.013	5	1.6	A1 V	2
20418	31 Per	3 12.0	+49 43	-0.095	7	5.05	0.6	5.06	-0.178	5	1.6	B5 V	2
20475	+48°885	3 12.6	+48 32	+0.388	4	9.30	0.7	9.22	+0.347	3	1.2	F2 V	2
20630	κ Cet	3 14.1	+ 3 00	+0.597	9	4.93	1.4	4.81	+0.574	4 4 4	4.2	G5 V	2
20766*	ζ^1 Ret	3 15.6	-62 58	+0.551	8	5.62	1.0	5.51	+0.524	4	1.4	dG0	4
20781*	-29°1229	3 15.8	-29 08	+0.729	8	8.57	2.7	8.43	+0.718	3	1.2	K0	5
20782*	-29°1231	3 15.8	-29 12	+0.564	15	7.45	0.0	7.34	+0.539	2	1.0	G0	5
20794	82 Eri	3 15.9	-43 27	+0.633	10	4.35	2.0	4.23	+0.614	4	1.4	G5 V	3
20807*	ζ^2 Ret	3 16.0	-62 53	+0.491	2	5.31	1.7	5.21	+0.459	3	1.2	G2 V	3
20809	HR 1011	3 16.1	+48 51	-0.103	7	5.34	0.0	5.35	-0.187	3	1.2	B5 V	2
20902	α Per	3 17.2	+49 30	+0.400	3	1.90	1.7	1.82	+0.360	3	1.2	F5 Ib	2
20961	+47°817	3 17.8	+47 32	+0.084	14	7.66	0.8	7.64	+0.016	4	1.4	A0 V	2
21070*	+89°3	3 18.9	+89 41	+0.202	6	9.15	2.0	9.10	+0.145	3	1.2	A9	7
21071	HR 1029	3 18.9	+48 45	-0.104	10	6.08	1.5	6.09	-0.188	4	1.4	B6 V	2
21091	+47°821	3 19.1	+48 02	+0.002	5	7.52	1.0	7.51	-0.073	4	1.4	A0 V	2
21181	+47°828	3 20.0	+47 52	-0.049	8	6.84	1.5	6.84	-0.128	4	1.4	B9 V	2
21197	CC 232	3 20.1	- 5 41	+1.038	12	8.04	0.3	7.84	+1.055	3	1.2	dK6	4
21278	HR 1034	3 20.9	+48 43	-0.119	6	4.99	1.1	5.00	-0.205	5	1.6	B3 V	2
21362	HR 1037	3 21.7	+49 31	-0.083	6	5.61	2.0	5.61	-0.165	3	1.2	B6 V	2
21364*	ξ Tau	3 21.7	+ 9 23	-0.103	2	3.69	2.2	3.70	-0.187	8	2.0	B8	1
21375	+48°927	3 21.8	+48 44	+0.074	12	7.51	1.2	7.49	+0.006	4	1.4	A1 V	2
21398	+47°835	3 22.0	+47 58	-0.024	6	7.38	1.5	7.37	-0.101	4	1.4	B9 V	2
21428	34 Per	3 22.2	+49 10	-0.135	5	4.68	1.0	4.69	-0.221	4	1.4	B3 IV	2
21479	+48°933	3 22.7	+48 53	+0.051	4	7.34	0.5	7.33	-0.020	2	1.0	A2 V	2
21480	+48°930	3 22.7	+48 50	+0.256	6	8.58	1.5	8.52	+0.203	4	1.4	A7 V	2
21481	+47°840	3 22.7	+47 38	+0.071	13	7.68	1.5	7.67	+0.002	4	1.4	A0 V	2
21699	HR 1063	3 25.0	+47 41	-0.134	10	5.46	1.7	5.47	-0.221	2	1.0	B8 III	2
+13°565*		3 25.9	+13 15	+0.416	0	8.84	1.0	8.76	+0.378	2	1.0	F8	7
22049	ϵ Eri	3 28.2	- 9 48	+0.810	7	3.86	2.0	3.70	+0.806	3 2 2	3.2	K2 V	2
22124*		3 28.8	+31 41	+0.354	0	6.73	1.0	6.66	+0.310	2	1.0	F0	1
22192	ψ Per	3 29.4	+47 51	-0.094	8	4.26	0.3	4.27	-0.177	3	1.2	B5p	1
22195	+31°619	3 29.4	+31 21	+0.342	6	6.92	0.5	6.85	+0.297	2	1.0	F0	1
22401	+47°865	3 31.2	+47 15	+0.007	17	8.45	1.0	8.44	-0.068	2	1.0	A0 V	2
22484	10 Tau	3 31.8	+ 0 05	+0.482	4	4.37	1.0	4.27	+0.449	2	1.0	F8 V	6
22496	-48°1011	3 31.9	-48 46	+1.150	19	8.79	2.0	8.57	+1.176	2	1.0	K7	5
23249	δ Eri	3 38.5	-10 06	+0.861	2	3.66	0.5	3.50	+0.862	3	1.2	K0 IV	2
23817*	β Ret	3 42.9	-65 07	+1.034	6	4.00	2.0	3.80	+1.050	3	1.2	K0	1
24293*	-65°187	3 46.8	-65 08	+0.579	2	7.95	1.7	7.83	+0.555	2	1.0	G0	1
24512	γ Hyi	3 48.8	-74 33	+1.460	10	3.53	3.0	3.26	+1.513	2	1.0	M2 II-III	3
24916*	ADS 2894	3 52.5	- 1 26	+1.005	15	8.21	3.4	8.02	+1.018	5 3	2.8	dK5	4
26842*	ADS 3082	4 09.6	+31 27	+0.483	8	7.42	0.8	7.32	+0.451	4	1.4	dG0	4
26965	40 Eri	4 10.7	- 7 49	+0.740	3	4.55	2.0	4.41	+0.730	2	1.0	dK0	4
27022*	HR 1327	4 11.2	+64 54	+0.737	7	5.37	3.0	5.23	+0.727	3	1.2	G2 III	7
27274	CC 291	4 13.3	-53 34	+0.970	12	7.80	0.0	7.62	+0.980	2	1.0	K0	1
27290	γ Dor	4 13.4	-51 44	+0.302	11	4.33	3.0	4.27	+0.253	2	1.0	F5	1
28093	η Ret	4 20.8	-63 37	+0.854	2	5.42	2.0	5.26	+0.854	2	1.0	K0	1
28343	+21°652	4 23.1	+21 40	+1.022	2	8.58	2.0	8.39	+1.037	3	1.2	dM1	4
28485*	80 Tau	4 24.4	+15 25	+0.271	10	5.62	1.1	5.56	+0.220	2 3	2.2	A6n	4
232979	Cin 594	4 29.8	+52 42	+1.219	4	8.89	1.0	8.66	+1.251	2	1.0	K7	5

TABLE IV—Continued

HD or BD	Name	α (1900) δ	C	AD	m	AD	V	P - V	No. in 89 S 23	Wt.	Sp	Ref
29139	α Tau	4 30.2 +16°19'	+1.405	5	1.04	1.0	0.77	+1.454	5	1.6	K5 III	2
29587	CC 300	4 34.5 +41 57	+0.532	10	7.36	0.7	7.25	+0.504	3	1.2	dG2	4
29697	Cin 605	4 35.5 +20 43	+0.986	9	8.21	1.0	8.02	+0.998	4	1.4	K4	5
+18°683	CC 303	4 37.0 +18 47	+1.304	8	10.18	1.5	9.94	+1.344	3	1.2	M3	5
29875	α Cae	4 37.3 -42 03	+0.251	7	4.53	2.3	7.48	+0.198	3	1.2	F2	1
30501	CC 304	4 43.1 -50 14	+0.805	8	7.70	1.0	7.55	+0.801	2	1.0	G5	1
30849	CC 307	4 44.4 +45 41	+0.501	8	7.12	3.0	7.02	+0.470	4	1.4	dF9	4
30852	π Ori	4 44.4 + 6 47	+0.376	8	3.24	3.3	3.16	+0.334	3 3 2	3.4	F6 V	2
30810*	ADS 3475	4 45.7 +10 54	+0.470	10	6.84	1.0	6.75	+0.436	2 4	2.4	dF7	4
30836	π Ori	4 45.9 + 5 26	-0.234	10	3.67	2.0	3.70	-0.330	2 2	2.0	B2 III	2
+49°1280*		4 50.8 +49 42	+1.248	4	10.07	1.0	9.84	+1.283	2	1.0	M0	7
31501	Cin 634	4 51.3 +34 07	+0.653	7	8.26	1.5	8.13	+0.636	2	1.0	dG8	4
32147*	HR 1614	4 55.9 - 5 52	+0.960	14	6.38	2.5	6.20	+0.969	2 2	2.0	dK5	4
32343	11 Cam	4 57.4 +58 50	-0.124	2	5.16	0.0	5.17	-0.210	2	1.0	B3p	1
32357	12 Cam	4 57.5 +58 53	+1.015	9	6.31	2.2	6.12	+1.029	4 2	2.4	gG5	4
32923*	104 Tau	5 01.5 +18 30	+0.568	9	5.00	2.0	4.89	+0.543	3 2	2.2	G4 V	6
33111	β Eri	5 02.9 - 5 13	+0.074	2	2.81	0.5	2.79	+0.006	2	1.0	A3 III	2
33262	ζ Dor	5 03.8 -57 37	+0.425	6	4.83	2.7	4.74	+0.387	3	1.2	F8	1
241596	CC 318	5 06.9 +19 38	+1.405	9	10.32	1.5	10.06	+1.454	2	1.0	dK3	4
34411	λ Aur	5 12.1 +40 01	+0.533	8	4.79	1.3	4.68	+0.505	3 4	2.6	G0 V	2
34673	ADS 3900	5 14.1 - 3 11	+0.934	0	7.98	1.5	7.80	+0.941	2	1.0	dK5	4
35299*	HR 1781	5 18.6 - 0 15	-0.235	4	5.70	0.8	5.73	-0.331	2 2	2.0	B2 V	2
36003	CC 330	5 23.5 - 3 33	+0.990	6	7.83	1.0	7.64	+1.002	4	1.4	dK6	4
36389*	119 Tau*	5 26.3 +18 32	+1.815	1	4.57	1.0	4.23	+1.900	2	1.0	M2 Ib	2
36395	CC 334	5 26.3 - 3 41	+1.260	15	8.13	4.5	7.89	+1.296	4 2	2.4	dM3	4
36591	HR 1861	5 27.7 - 1 40	-0.232	5	5.35	2.5	5.38	-0.327	2	1.0	B1 V	2
36673	α Lep	5 28.3 -17 54	+0.165	17	2.60	0.5	2.56	+0.105	2	1.0	F0 Ib	2
37008	CC 338	5 30.4 +51 23	+0.746	6	7.86	0.5	7.72	+0.737	2	1.0	dK2	4
37065	CC 337	5 30.6 -23 31	+0.826	9	8.99	2.5	8.83	+0.824	2	1.0	K4	5
37124	CC 340	5 31.1 +20 40	+0.588	7	7.73	0.3	7.61	+0.565	3	1.2	G4	5
37394	HR 1925	5 33.2 +53 26	+0.760	6	6.36	3.5	6.21	+0.752	3 2	2.2	dK2	4
37501	HR 1936	5 33.9 -61 14	+0.745	5	6.50	4.0	6.36	+0.736	2	1.0	K0	1
37795	α Col	5 36.0 -34 08	-0.169	8	2.63	2.0	2.65	-0.259	2	1.0	B8 Ve	3
38393	γ Lep	5 40.3 -22 29	+0.404	3	3.67	4.0	3.59	+0.365	3 2	2.0	F6 V	3
39060	β Pic	5 44.9 -51 06	+0.135	1	3.89	4.0	3.86	+0.072	2	1.0	A5 III	3
39587	χ^1 Ori	5 48.5 +20 16	+0.513	9	4.49	0.9	4.39	+0.483	4 4	2.8	G0 V	6
39715	+2°1085	5 49.2 + 2 09	+0.924	2	8.99	1.0	8.81	+0.930	2	1.0	K4	5
39764	λ Col	5 49.5 -33 50	-0.161	10	4.82	1.5	4.84	-0.250	2	1.0	B5 V	3
39881*	HR 2067	5 50.3 +13 56	+0.595	5	6.73	1.7	6.61	+0.572	3	1.2	dG0	4
40312*	θ Aur	5 52.9 +37 12	-0.117	17	2.64	0.5	2.65	-0.202	2	1.0	A0p	1
40932*	μ Ori	5 56.9 + 9 39	+0.109	4	4.21	5.0	4.18	+0.044	2	1.0	Am	7
41700*	HR 2157	6 01.6 -45 02	+0.400	0	6.49	0.0	6.41	+0.360	2	1.0	F8	1
41742*	HR 2158	6 01.8 -45 05	+0.401	1	6.00	1.5	5.94	+0.361	2	1.0	F5	1
42807*	HR 2208	6 07.7 +10 40	+0.598	7	6.62	3.0	6.51	+0.576	2	1.0	dG4	7
43386	74 Ori	6 10.8 +12 18	+0.347	12	5.10	1.0	5.03	+0.302	2 3	2.2	F5 IV-V	6
43834	α Men	6 13.2 -74 43	+0.634	6	5.20	3.0	5.08	+0.615	4	1.4	G9	1
44743*	β Cma	6 18.3 -17 54	-0.284	4	1.89	1.0	1.93	-0.384	2	1.0	B1 II-III	2
46273*	HR 2384	6 27.3 -50 10	+0.302	7	5.34	3.0	5.28	+0.253	2	1.0	F2	1
48682	56 Aur	6 39.5 +43 41	+0.483	10	5.44	0.5	5.34	+0.450	2	1.0	G0 V	6
48737	ξ Gem	6 39.7 +13 00	+0.353	6	3.49	1.5	3.42	+0.309	2	1.0	F5 III	2
50241	α Pic	6 47.2 -61 50	+0.153	4	3.30	2.5	3.26	+0.092	2	1.0	A5 III	3
51219	CC 403	6 51.4 + 1 19	+0.616	4	7.48	1.7	7.36	+0.595	3	1.2	dG5	4
51825*	HR 2612	6 53.7 -35 23	+0.366	2	6.29	4.0	6.21	+0.323	2	1.0	F5	1
51866	CC 408	6 53.9 +48 33	+0.992	2	8.14	0.5	7.95	+1.004	2	1.0	dK5	4
52005	41 Gem	6 54.5 +16 13	+1.537	7	5.99	1.7	5.70	+1.597	2	1.0	cK4	4
52556	HR 2632	6 56.6 +15 28	+1.052	8	5.97	1.5	5.77	+1.069	2	1.0	gG9	4
52711	HR 2643	6 57.2 +29 31	+0.517	3	6.10	4.0	6.00	+0.487	2	1.0	dG2	4
54605	δ Cma	7 04.3 -26 14	+0.614	11	1.88	0.0	1.76	+0.593	2	1.0	F8 Ia	2
55130*	HR 2711	7 06.6 +27 26	+0.440	5	6.54	3.0	6.45	+0.404	3	1.2	dF6	4
56986	δ Gem	7 14.2 +22 10	+0.279	8	3.64	2.8	3.58	+0.229	4 2	2.4	dF8n	4
57061*	τ Cma	7 14.5 -24 47	-0.218	8	4.28	0.0	4.31	-0.312	3	1.2	O9 III	2
57150	HR 2787	7 14.8 -36 33	-0.174	11	4.68	0.5	4.70	-0.264	2	1.0	B3 Ve	3
57219	HR 2790	7 15.1 -36 34	-0.184	11	5.02	1.5	5.04	-0.275	2	1.0	B3 V	3
58350	η Cma	7 20.1 -29 06	-0.114	16	2.34	1.7	2.35	-0.199	2	1.0	B5 Ia	2
58715	β CMi	7 21.7 + 8 29	-0.138	4	2.91	---	2.92	-0.225	St	1.6	B8 V	2

TABLE IV—Continued

HD or BD	Name	α (1900) δ		C	AD	m	AD	V	P - V	No. in 89 S 23	Wt.	Sp	Ref
-----*	Cin 891	h	m										
58946*	ρ Gem	7 22.6	+32°12'	+0.832	3	7.75	0.5	7.59	+0.830	2	1.0	K0	7
61421	α CMi	7 22.7	+31 59	+0.259	16	4.27	0.5	4.21	+0.207	2	1.0	F0 V	2
62301	CC 435	7 34.1	+ 5 29	+0.365	10	0.46	1.7	0.40	+0.322	3	1.2	F5 IV-V	2
62509	β Gem	7 38.2	+39 50	+0.448	4	6.91	1.7	6.82	+0.413	3	1.2	dF4	4
		7 39.2	+28 16	+0.931	3	1.35	1.7	1.17	+0.938	3	1.2	K0 III	2
63077	HR 3018	7 41.9	-33 59	+0.465	4	5.42	2.0	5.33	+0.431	2	1.0	dG0	4
63578	HR 3037	7 44.5	-46 22	-0.186	6	5.18	1.0	5.20	-0.277	2	1.0	B2	1
63744	HR 3046	7 45.4	-46 50	+0.966	10	4.84	2.0	4.66	+0.976	2	1.0	K0	1
63949	HR 3058	7 46.3	-46 37	-0.172	6	5.80	2.5	5.82	-0.262	2	1.0	B2	1
66368*	+89°13	7 58.1	+88 56	+0.114	4	7.17	1.0	7.14	+0.049	3	1.2	A3	7
66811*	ζ Pup	8 00.1	-39 43	-0.272	7	2.12	1.5	2.16	-0.371	2	1.0	O5 f	7
67228	μ Cnc	8 01.9	+21 52	+0.565	2	5.38	2.0	5.27	+0.540	2	1.0	G2 IV	6
68017	CC 461	8 05.5	+32 47	+0.565	6	6.94	0.5	6.83	+0.540	2	1.0	dG4	4
68456	HR 3220	8 07.3	-60 59	+0.347	4	4.76	1.7	4.69	+0.302	3	1.2	F5	1
+31°1781	CC 468	8 12.0	+30 56	+1.022	2	9.02	0.5	8.83	+1.037	2	1.0	K4	5
69897	χ Cnc	8 14.0	+27 32	+0.389	3	5.18	2.3	5.10	+0.348	2	1.0	F6 V	6
72905	π UMa	8 30.3	+65 22	+0.514	15	5.70	3.0	5.60	+0.484	2	2.0	dG0	4
74280	η Hya	8 38.0	+ 3 46	-0.250	9	4.27	0.0	4.30	-0.347	2	1.0	B3 V	2
74377	CC 487	8 38.6	+42 04	+0.835	6	8.69	0.5	8.53	-0.833	2	1.0	dK5	4
74576	CC 488	8 39.6	-38 32	+0.808	3	6.66	0.3	6.50	+0.804	3	1.2	K2	5
74874*	ϵ Hya	8 41.5	+ 6 47	+0.602	7	3.53	2.2	3.41	+0.580	4	1.4	Comp.	7
74956	δ Vel	8 41.9	-54 21	-0.010	6	1.90	2.5	1.89	-0.086	2	1.0	A0 V	3
76294	ζ Hya	8 50.1	+ 6 20	+0.932	2	3.26	1.0	3.08	+0.939	2	1.0	K0 III	2
76644	ι UMa	8 52.4	+48 26	+0.140	5	3.14	0.3	3.10	+0.077	3	1.2	A7 V	2
76932*	HR 3578	8 54.1	-15 45	+0.433	10	5.82	2.0	5.73	+0.396	2	1.0	F6 V	7
76943*	10 UMa	8 54.2	+42 11	+0.351	7	4.08	3.0	4.01	+0.307	3	1.2	F5 V	2
77370	HR 3598	8 56.9	-58 42	+0.323	4	5.20	0.0	5.13	+0.277	2	1.0	F0	1
78154*	σ UMa	9 01.6	+67 32	+0.422	7	4.87	1.8	4.78	+0.384	2	2.0	F7 IV-V	2
78362/3*	τ UMa	9 02.7	+63 55	+0.291	8	4.75	0.8	4.69	+0.242	2	2.0	gF6	4
78647*	λ Vel	9 04.3	-43 02	+1.526	6	2.42	2.0	2.14	+1.585	2	1.0	K5 Ib-II	7
79210/1*	ADS 7251	9 07.7	+53 07	+1.246	13	7.22	1.5	6.99	+1.281	2	1.0	dM0, dM0	4
79969*	ADS 7284	9 12.0	+29 00	+0.893	9	7.38	1.0	7.21	+0.897	4	1.4	dK4	4
80007	β Car	9 12.1	-69 18	-0.026	14	1.62	2.5	1.61	-0.103	2	1.0	A0 III	3
80388/9*	+79°309	9 14.4	+78 51	+0.528	4	6.82	2.0	6.72	+0.500	3	1.2	G1 V	7
80404	ι Car	9 14.4	-58 51	+0.110	12	2.27	3.0	2.24	+0.045	2	1.0	F0 Ib	3
81188*	κ Vel	9 19.0	-54 35	-0.199	2	2.39	1.0	2.42	-0.292	2	1.0	B2 IV	3
81797	α Hya	9 22.7	- 8 14	+1.330	5	2.20	0.5	1.95	+1.372	3	2.4	K3 III	2
81997	γ Hya	9 24.1	- 2 19	+0.359	9	4.67	1.0	4.60	+0.316	2	1.0	F6 V	6
82328	θ UMa	9 26.2	+52 08	+0.404	14	3.28	2.8	3.20	+0.365	2	2.0	F6 IV	2
82434*	ψ Vel	9 26.8	-40 02	+0.278	6	3.60	3.5	3.54	+0.228	2	1.0	F2 III	3
82885	11 LMi	9 29.7	+36 16	+0.691	11	5.51	2.2	5.38	+0.677	2	2.0	G8 IV-V	2
83754	κ Hya	9 35.5	-13 53	-0.191	2	5.00	---	5.02	-0.283	St St	4.0	B5 V	2
85235*	φ UMa	9 45.4	+54 32	-0.020	5	4.60	2.5	4.59	-0.097	4	1.4	A3	4
+63°869	CC 553	9 48.8	+63 16	+1.239	8	9.27	1.0	9.04	+1.273	3	1.2	dM1	4
86728*	20 LMi	9 55.3	+32 26	+0.581	7	5.48	0.3	5.37	+0.557	3	1.2	G2 V	7
87884	Cin 1209	10 02.9	+12 29	+0.719	11	8.23	5.0	8.09	+0.707	2	1.0	dK1	4
88021/2*	ADS 7662	10 03.8	+20 49	+0.465	8	6.67	1.1	6.58	+0.431	4	1.4	gF5+A2	4
88230	CC 564	10 05.3	+49 58	+1.219	15	6.82	3.0	6.59	+1.251	2	2.4	dM0	2
89025	ζ Leo	10 11.1	+23 55	+0.275	8	3.51	0.0	3.45	+0.224	2	1.0	F0 III	2
+20°2465*	Cin 1244	10 14.2	+20 22	+1.297	6	9.58	0.0	9.34	+1.336	3	1.2	M4.5 V	2
89449	40 Leo	10 14.3	+19 59	+0.398	7	4.83	0.0	4.75	+0.358	2	1.0	F6 IV	2
89484/5*	γ Leo	10 14.5	+20 21	+1.038	9	2.15	0.1	1.95	+1.055	4	1.4	K0 IIIp	2
89758*	μ UMa	10 16.4	+42 00	+1.424	2	3.27	6.3	3.00	+1.474	3	1.2	M0 III	2
89862*	+57°1266	10 17.1	+57 02	+0.874	5	8.36	2.2	8.19	+0.876	3	2.2	K0 IV	2
90589*	HR 4102	10 22.4	-73 32	+0.296	6	4.02	1.0	3.96	+0.247	2	1.0	F5	1
+1°2447	CC 580	10 23.9	+ 1 21	+1.329	1	9.83	0.5	9.58	+1.372	2	1.0	dM2	4
+56°1458*		10 24.0	+56 15	+1.180	8	8.91	2.7	8.69	+1.209	4	2.4	K7 V	2
90839*	36 UMa	10 24.2	+56 30	+0.438	7	4.90	2.2	4.81	+0.402	2	2.0	F8 V	2
92787*	HR 4191	10 37.7	+46 44	+0.263	9	5.31	0.0	5.25	+0.211	4	1.4	dF0	4
92855*	+46°1658	10 38.2	+46 44	+0.443	5	7.39	0.7	7.30	+0.407	4	1.4	dG0	4
+29°2091	CC 589	10 42.0	+28 56	+0.422	8	10.35	2.0	10.26	+0.384	2	1.0	sdF5	4
93813	ν Hya	10 44.7	-15 40	+1.172	15	3.28	1.7	3.06	+1.200	3	1.2	K2 III	2
+42°2163	CC 599	10 51.4	+42 25	+0.760	4	9.86	2.0	9.71	+0.752	2	1.0	dK3	4
94978*	+67°676	10 52.8	+66 50	+0.322	10	8.93	4.5	8.86	+0.275	4	1.4	F0 IV	7
95001*	+55°1432	10 53.0	+55 33	+0.954	8	8.10	2.5	7.92	+0.963	3	1.2	G5	1

TABLE IV—*Continued*

HD or BD	Name	α (1900)	δ	C	AD	m	AD	V	P - V	No. in	Wt.	Sp	Ref	
95418	β UMa	10 55.8	+56°55'	-0.068	4	2.36	0.5	2.36	-0.149	89 S 23	2	1.0	A1 V	2
95689*	α UMa	10 57.6	+62 17	+0.970	8	2.00	1.5	1.82	+0.980	2 2	2.0	K0 III	2	
95735*	CC 604	10 57.9	+36 38	+1.321	13	7.73	2.4	7.48	+1.362	2 4	2.4	M2 V	2	
+44°2051	Cin 1349	11 00.5	+44 02	+1.360	5	9.00	3.5	8.75	+1.405	3 3	2.4	dM2	4	
96833	ψ UMa	11 04.0	+45 02	+1.059	4	3.16	0.5	2.96	+1.077	2	1.0	K1 III	2	
+36°2165*		11 07.3	+36 17	+0.328	6	9.92	2.5	9.85	+0.282	2	1.0	sdF3	7	
97603	ξ Leo	11 08.8	+21 04	+0.095	8	2.59	3.0	2.56	+0.028	3	1.2	A4 V	2	
97633	θ Leo	11 09.0	+15 59	-0.047	6	3.32	1.0	3.32	-0.126	3	1.0	A2 V	2	
100623	HR 4458	11 29.6	-32 18	+0.691	13	6.09	0.0	5.96	+0.677	3	1.2	dK2	4	
101501	61 UMa	11 35.7	+34 46	+0.640	8	5.43	1.6	5.30	+0.621	3 4	2.6	G8 V	2	
102070	ζ Crt	11 39.7	-17 48	+0.880	4	4.80	3.5	4.63	+0.882	2	1.0	G8 III	6	
102249	λ Mus	11 40.9	-66 10	+0.096	6	3.62	2.3	3.59	+0.029	3	1.2	A5 V	3	
102365	HR 4523	11 41.8	-39 57	+0.570	8	4.98	1.0	4.87	+0.545	2	1.0	dG4	4	
102647	β Leo	11 44.0	+15 08	+0.035	6	2.16	---	2.14	-0.037	StSt	4.0	A3 V	2	
102870	ρ Vir	11 45.5	+ 2 20	+0.473	7	3.70	1.9	3.60	+0.440	2 3 5	3.8	F8 V	2	
103095	HR 4550	11 47.2	+38 26	+0.642	6	6.57	1.2	6.44	+0.623	4	1.4	G8 Vp	2	
103287	γ UMa	11 48.6	+54 15	-0.045	7	2.45	0.7	2.45	-0.124	3	1.2	A0 V	2	
103932*	CC 673	11 53.0	-27 07	+1.028	2	7.42	1.5	7.23	+1.044	2	1.0	dK6	4	
104556	CC 678	11 57.4	+43 39	+0.775	7	6.76	0.0	6.61	+0.768	3	1.2	dG9	4	
105122*	ADS 8419	12 01.1	+69 15	+0.371	6	7.22	1.1	7.14	+0.329	5	1.6	dF5	4	
105382*	HR 4618	12 02.9	-50 06	-0.194	5	4.43	1.0	4.45	-0.286	2	1.0	B5 IV	3	
105383*	HR 4619	12 02.9	-50 12	-0.092	3	6.39	3.0	6.40	-0.175	2	1.0	B9	1	
105452	α Crv	12 03.3	-24 10	+0.245	2	4.04	0.5	3.99	+0.192	2	1.0	F2 IV	3	
105805*	HR 4633	12 05.7	+27 50	+0.072	2	6.03	1.0	6.01	+0.003	2	1.0	A2	1	
106116	CC 688	12 07.5	- 2 32	+0.624	6	7.52	0.0	7.40	+0.604	3	1.2	dG6	4	
106210	CC 690	12 08.1	+11 24	+0.608	7	7.62	2.0	7.50	+0.587	2	1.0	dG2	4	
106516*	HR 4657	12 10.0	- 9 43	+0.370	15	6.21	2.0	6.13	+0.328	3 2	2.2	F5 V	7	
106591	δ UMa	12 10.5	+57 35	+0.018	4	3.28	2.0	3.27	-0.055	3	1.2	A3 V	2	
106625	γ Crv	12 10.7	-16 59	-0.142	16	2.58	2.0	2.60	-0.229	3	1.2	B8 III	2	
107326	HR 4694	12 15.3	+26 34	+0.232	8	6.23	0.5	6.18	+0.177	4	1.4	dA8	4	
107596	Cin 1551	12 16.9	+42 42	+1.188	7	9.66	1.5	9.44	+1.218	4	1.4	dM0	4	
108076	Cin 1564	12 19.9	+38 53	+0.490	6	8.12	1.0	8.02	+0.458	3	1.2	dF6	4	
+36°2268*		12 20.4	+36 32	-0.283	5	10.43	2.0	10.47	-0.383	3	1.2	B5	7	
108722	18 Com	12 24.4	+24 39	+0.364	5	5.56	0.7	5.49	+0.321	3	1.2	F5 III	6	
108754	CC 712	12 24.6	- 2 46	+0.605	10	9.14	0.0	9.02	+0.583	2	1.0	dG6	4	
108767	δ Crv	12 24.7	-15 58	-0.090	0	2.92	1.0	2.93	-0.173	2	1.0	B9 V	2	
108903*	γ Cru	12 25.6	-56 33	+1.423	20	1.92	1.5	1.65	+1.473	2	1.0	M3 II	3	
+9°2636	CC 713	12 26.2	+ 9 23	+1.228	3	9.94	1.3	9.71	+1.261	3	1.2	dM1	4	
109011	+55°1536	12 26.5	+55 40	+0.835	2	8.30	1.7	8.14	+0.833	3	1.2	K2 V	2	
109345	HR 4784	12 28.9	+33 57	+0.951	9	6.40	1.8	6.22	+0.960	4	1.4	gG8	4	
109358	β CVn	12 29.0	+41 54	+0.513	8	4.35	1.3	4.25	+0.483	3 3	2.4	G0 V	2	
110304*	γ Cen	12 36.0	-48 25	-0.035	4	2.14	2.0	2.14	-0.113	2	1.0	A0 III	3	
110379/80*	γ Vir	12 36.6	- 0 54	+0.281	4	2.79	1.0	2.73	+0.231	5	1.6	F0 V	2	
110463	+56°1618	12 37.2	+56 17	+0.859	2	8.44	2.0	8.28	+0.860	4	1.4	K3 V	2	
110833	CC 735	12 39.8	+52 10	+0.845	10	7.17	0.0	7.01	+0.844	3	1.2	dK0	4	
110897	10 CVn	12 40.3	+39 50	+0.462	8	6.07	0.8	5.98	+0.427	3 2	2.2	dF9	4	
111028*	33 Vir	12 41.3	+10 06	+0.910	3	5.79	0.0	5.62	+0.915	3	1.2	K1 III-IV	7	
111456*	HR 4867	12 44.3	+60 52	+0.376	13	5.92	2.6	5.84	+0.334	4	1.4	F6 V	7	
111513	CC 739	12 44.7	+61 55	+0.531	6	7.50	2.0	7.39	+0.503	2	1.0	G5	1	
111515	CC 741	12 44.7	+ 1 46	+0.622	4	8.26	0.7	8.14	+0.602	2	1.0	dG6	4	
111631	Cin 1633	12 45.6	- 0 13	+1.260	3	8.64	0.7	8.40	+1.296	2	1.0	dM0	4	
+21°2462*	ADS 8680	12 45.8	+21 05	+0.906	4	9.41	1.5	9.24	+0.911	4	1.4	K5	7	
111980	CC 747	12 48.0	-17 57	+0.458	8	8.46	0.5	8.37	+0.423	2	1.0	dF6	4	
112097*	41 Vir	12 48.9	+12 58	+0.220	0	6.30	0.5	6.25	+0.164	2	1.0	dA8	4	
112185*	ϵ UMa	12 49.6	+56 30	-0.076	4	1.80	0.5	1.80	-0.158	2	1.0	A0p	2	
112412/3*	α CVn	12 51.4	+38 52	-0.106	6	2.83	0.3	2.84	-0.190	2	1.0	Ap, F0 V	2	
112758	CC 750	12 53.9	- 9 18	+0.717	6	7.68	2.0	7.54	+0.705	3	1.2	dK1	4	
+13°2618	CC 755	12 55.8	+12 55	+1.282	17	10.09	1.0	9.85	+1.320	4	1.4	dM2e	4	
113139*	78 UMa	12 56.5	+56 55	+0.285	6	5.01	3.0	4.95	+0.235	3	1.2	F2 V	2	
113226	ϵ Vir	12 57.2	+11 30	+0.843	5	2.81	---	2.65	+0.842	St	2.0	G9 III	2	
114174	CC 760	13 03.8	+ 5 46	+0.580	9	6.91	1.0	6.80	+0.556	5	1.6	dG6	4	
114378/9*	42 Com	13 05.1	+18 04	+0.376	9	4.38	2.6	4.30	+0.334	3 5	2.8	F5 V	6	
114494*	+2°3627	13 05.8	+ 2 16	+0.370	12	8.80	3.0	8.72	+0.328	6	1.7	F6 III	7	
114606	CC 763	13 06.5	+10 10	+0.511	13	8.83	3.0	8.73	+0.481	4 2	2.4	dF9	4	
114642	53 Vir	13 06.7	-15 39	+0.409	4	5.00	1.0	4.92	+0.370	2	1.0	F6 III-IV	6	

TABLE IV—Continued

ID or BD	Name	α (1900) h m	δ	C	AD	m	AD	V	P - V	No. in 89 S 23	Wt.	Sp	Ref
114703	CC 764	13 07.1	+68°02'	+0.806	7	9.10	0.7	8.94	+0.802	3	1.2	K3	5
114710	β Com	13 07.2	+28 23	+0.493	7	4.33	2.4	4.23	+0.462	2	4	G0 V	2
114762	CC 766	13 07.5	+18 02	+0.434	7	7.41	2.0	7.32	+0.397	4	1.4	dF7	4
115043	γ Cen	13 09.5	+57 14	+0.512	4	6.92	1.8	6.82	+0.482	4	1.4	G1 V	2
115383	59 Vir	13 11.8	+ 9 56	+0.498	6	5.28	1.3	5.18	+0.467	5	1.6	G0 V	6
115404*	ADS 8841	13 11.9	+17 34	+0.822	6	6.68	0.4	6.52	+0.819	4	1.4	dK3	4
115617	61 Vir	13 13.2	-17 45	+0.614	6	4.80	2.8	4.68	+0.593	2	3	G6 V	2
115659	γ Hya	13 13.5	-22 39	+0.815	18	3.12	0.5	2.96	+0.812	2	1.0	G5 III	3
+35°2436*	ADS 8861	13 14.9	+35 40	+1.317	16	9.66	1.5	9.41	+1.358	2	1.0	M0, M3	5
115892	ι Cen	13 15.0	-36 11	+0.011	7	2.71	1.0	2.70	-0.063	2	1.0	A2 V	3
116012	CC 773	13 15.8	+ 4 39	+0.842	6	8.78	3.0	8.62	+0.841	3	1.2	dK5	4
+35°2439*		13 16.3	+34 54	+1.196	10	10.94	2.0	10.71	+1.226	2	1.0	---	7
116495*	CC 777	13 18.9	+29 45	+1.188	8	9.15	0.7	8.93	+1.218	3	1.2	dM0	4
116656/7*	ζ UMa	13 19.9	+55 27	-0.019	3	2.06	1.0	2.05	-0.096	4	1.4	A2 V	2
116842	80 UMa	13 21.2	+55 30	+0.106	4	4.01	0.0	3.98	+0.040	2	1.0	A5 V	2
116875	-60°4687	13 21.4	-60 33	-0.008	10	7.35	3.0	7.34	-0.084	2	1.0	A0	1
116878	ADS 8901	13 21.5	+45 01	+0.636	5	8.43	1.7	8.31	+0.617	3	1.2	K0	1
117176	70 Vir	13 23.5	+14 19	+0.630	7	5.09	1.2	4.97	+0.610	4	3	G5 V	2
+11°2576	CC 782	13 24.9	+10 55	+1.279	9	9.33	1.0	9.09	+1.317	2	2	M1 V	2
117567	+24°2693	13 26.4	+24 42	+0.321	6	7.73	5.0	7.67	+0.274	2	1.0	F2	1
118022*	78 Vir	13 29.1	+ 4 10	-0.018	5	4.94	0.0	4.93	-0.095	3	1.2	A0p	1
118098	ζ Vir	13 29.6	- 0 05	+0.045	3	3.42	---	3.40	-0.026	St	2.0	A3 V	2
118261*	HR 5113	13 30.5	-61 11	+0.414	5	5.75	0.0	5.67	+0.376	2	1.0	F8	1
+42°2072	CC 790	13 31.2	+47 05	+0.910	13	11.05	1.7	10.88	+0.915	4	1.4	K4	5
+8°2735*	CC 792	13 32.0	+ 8 17	+0.920	3	10.20	0.0	10.02	+0.926	2	1.0	---	7
118889*	HR 5138	13 34.7	+11 15	+0.279	5	5.61	1.6	5.55	+0.229	3	3	A6n	4
119124*	ADS 8992	13 36.3	+51 02	+0.464	4	6.42	0.7	6.33	+0.430	4	1.4	dF9	4
119850	CC 803	13 40.6	+15 27	+1.242	10	8.73	1.0	8.50	+1.276	2	2	dM2	4
120066*	HR 5183	13 42.1	+ 6 51	+0.527	4	6.46	3.0	6.35	+0.498	2	3	dG2	4
120136	τ Boo	13 42.5	+17 57	+0.408	4	4.57	1.8	4.49	+0.369	2	4	F7 V	2
+7°2692*	CC 808	13 42.8	+ 6 47	+1.010	4	10.24	3.0	10.05	+1.024	4	1.4	K5	5
120315	η UMa	13 43.6	+49 49	-0.218	3	1.86	3.0	1.89	-0.312	2	1.0	B3 V	2
120323	2 Cen	13 43.6	-33 58	+1.341	7	4.45	3.0	4.20	+1.384	3	1.2	sgM6	4
120476*	ADS 9031	13 44.6	+27 29	+0.986	13	7.23	1.5	7.04	+0.998	6	1.7	dK6	4
+13°2721*	CC 821	13 48.6	+13 27	+1.200	8	10.04	1.8	9.81	+1.231	4	1.4	M0	7
121370*	η Boo	13 49.9	+18 54	+0.518	10	2.79	2.6	2.69	+0.489	2	3	G0 IV	2
+47°2112	CC 829	13 58.5	+46 49	+1.308	5	9.47	1.0	9.22	+1.348	4	1.2	M1, M1	5
122742	HR 5273	13 58.6	+11 16	+0.632	3	6.40	0.7	6.28	+0.612	3	1.2	dG6	4
122769*	ADS 9094	13 58.7	+ 8 58	+0.395	8	7.65	3.0	7.57	+0.355	3	1.2	F5	4
123123	π Hya	14 0.7	-26 12	+1.013	7	3.40	0.5	3.21	+1.027	2	1.0	gK3	4
123139	θ Cen	14 00.8	-35 53	+0.937	0	2.16	1.5	1.98	+0.944	2	1.0	K0 III-IV	3
123299*	α Dra	14 01.7	+64 51	-0.088	2	3.66	1.0	3.67	-0.170	2	1.0	A0 III	2
123657	HR 5299	14 03.9	+44 20	+1.452	6	5.40	1.0	5.13	+1.505	2	1.0	gM4	4
123782	HR 5300	14 04.6	+49 56	+1.524	5	5.54	1.5	5.25	+1.583	2	1.0	gM2	4
123977	HR 5302	14 05.7	+59 48	+0.949	7	6.64	0.5	6.46	+0.958	2	1.0	gG8	4
123999*	12 Boo	14 05.8	+25 34	+0.460	14	4.90	1.5	4.81	+0.425	2	1.0	F8 IV	6
124752	+68°771	14 10.3	+68 03	+0.740	8	8.68	2.0	8.54	+0.730	4	1.4	K0 V	2
124757*	ADS 9182	14 10.3	+ 3 35	+0.456	1	7.15	1.0	7.06	+0.421	2	1.0	F7, F8	4
124850	ι Vir	14 10.8	- 5 31	+0.424	5	4.20	2.0	4.11	+0.386	3	1.2	F6 III	6
124897	α Boo	14 11.1	+19 42	+1.134	3	0.14	2.0	-0.07	+1.159	2	1.0	K2 IIIp	2
125072*	CC 845	14 12.0	-58 53	+0.898	6	6.80	3.0	6.63	+0.902	3	1.2	K3	7
125162*	λ Boo	14 12.6	+46 33	+0.037	10	4.21	0.8	4.19	-0.035	4	1.4	A0p	7
125451	18 Boo	14 14.8	+13 28	+0.329	4	5.45	1.2	5.38	+0.283	4	1.4	F5 IV	6
+30°2512	CC 854	14 17.6	+30 06	+1.124	14	8.78	1.2	8.57	+1.148	4	1.4	dM0	4
126053	HR 5384	14 18.1	+ 1 43	+0.535	0	6.37	0.5	6.26	+0.507	2	1.0	dG3	4
126512	+21°2649	14 20.9	+21 04	+0.476	0	7.40	0.0	7.30	+0.443	2	1.0	dF8	4
+24°2733*	β CC 6869	14 21.1	+24 06	+1.277	5	9.38	3.0	9.14	+1.314	2	1.0	M0, M1	5
126660	θ Boo	14 21.8	+52 19	+0.422	9	4.12	2.5	4.03	+0.384	4	2	F7 V	2
-----	CC 863	14 24.8	+15 58	+1.257	10	10.93	2.3	10.72	+1.292	3	1.2	dM3	4
127506	CC 868	14 26.7	+35 53	+0.943	10	8.88	1.0	8.70	+0.951	3	1.0	dK5	4
127762	γ Boo	14 28.1	+38 45	+0.129	6	3.09	1.8	3.06	+0.065	4	1.4	A7 III	2
127871	CC 869	14 28.7	+ 9 48	+0.834	0	8.95	1.0	8.79	+0.832	2	1.0	dK6	4
128167	σ Boo	14 30.3	+30 11	+0.286	8	4.54	1.7	4.48	+0.236	3	3	F2 V	2
+34°2541	Cin 1920	14 30.8	+34 11	+1.126	5	9.82	1.0	9.61	+1.150	3	1.2	dM0	4
128429*	HR 5455	14 31.7	-11 53	+0.383	5	6.26	0.7	6.18	+0.342	3	1.2	F5 V	7

TABLE IV—Continued

HD or BD	Name	α (1900)	δ	C	AD	m	AD	V	P - V	No. in 89 S 23	Wt.	Sp	Ref
128898*	α Cir	14 34.4	-64°32'	+0.182	12	3.19	0.0	3.15	+0.123	2	1.0	F0 V (Sr)	3
129174/5*	τ Boo	14 36.0	+16 51	-0.055	1	4.51	1.0	4.51	-0.135	2	1.0	A0	1
129246/7*	ζ Boo	14 36.4	+14 09	-0.001	5	3.78	2.7	3.77	-0.076	2 4	2.4	A2n	4
+20°3009*		14 38.0	+19 55	+1.184	15	10.28	1.8	10.06	+1.213	5	1.6	M0	7
+20°3010*	ADS 9352	14 38.0	+19 55	+1.156	10	9.30	2.0	9.08	+1.183	6	1.7	M0	7
129988/9*	ϵ Boo	14 40.6	+27 30	+0.867	8	2.50	1.0	2.33	+0.868	4	1.4	gK0,A3	4
+17°2785	CC 884	14 41.7	+16 57	+1.108	2	9.50	3.0	9.29	+1.131	2	1.0	dK6	4
130188*	ADS 9378	14 41.7	+42 48	+0.388	2	7.38	1.5	7.30	+0.347	2	1.0	dF5	4
130669*	ADS 9397	14 44.4	+10 39	+0.784	5	8.55	2.0	8.40	+0.778	3	1.2	dG9	4
130819*	α^2 Lib	14 45.2	-15 35	+0.324	10	5.19	1.7	5.12	+0.278	4 2 2	3.4	F5 IV	6
130841*	α^2 Lib	14 45.3	-15 38	+0.091	4	2.79	3.0	2.76	+0.024	2 2	2.0	A3 V	2
130992	CC 889	14 46.0	-23 52	+0.901	9	8.04	1.5	7.87	+0.905	3	1.2	dK5	4
131156*	ξ Boo	14 46.8	+19 31	+0.669	6	4.66	2.5	4.53	+0.653	4	2.8	dG5,dK5	4
131511*	HR 5553	14 48.9	+19 34	+0.750	5	6.16	1.8	6.02	+0.741	4	1.4	dK1	4
131747	+15°2792	14 50.3	+15 23	+0.879	1	7.05	1.0	6.88	+0.881	3	1.2	K0	1
131873	β UMi	14 51.0	+74 34	+1.355	8	2.27	3.0	2.02	+1.399	4	3	K4 III	2
132142	Cin 1980	14 52.5	+54 04	+0.710	2	7.93	0.0	7.79	+0.697	2	1.0	dK0	4
132343	+14°2812	14 53.6	+14 26	+1.225	10	-6.94	2.0	6.71	+1.258	3	1.2	K2	1
132679	+15°2803	14 55.3	+15 14	+1.090	9	7.37	1.2	7.17	+1.111	4	1.4	K0	1
133110	+15°2808	14 57.6	+15 29	+0.265	4	8.22	1.5	8.16	+0.213	4	1.4	F0	1
133161	+16°2725	14 57.9	+16 26	+0.543	5	7.10	0.7	6.99	+0.516	3	1.2	G0	1
133190	+14°2824	14 58.1	+14 40	+0.457	8	9.42	1.1	9.33	+0.422	3	1.2	F8	1
133460*	+26°2646	14 59.5	+26 25	+0.455	12	7.34	2.8	7.25	+0.420	4	1.4	F7 V	7
133461	+15°2814	14 59.5	+15 09	+1.094	0	9.13	0.0	8.92	+1.115	2	1.0	K0	1
133487	+14°2828	14 59.6	+14 01	+1.102	6	8.16	0.7	7.95	+1.124	3	1.2	K0	1
+6°2986*		15 00.0	+ 6 02	+1.123	3	10.08	2.0	9.87	+1.147	2	1.0	K7	5
134083	45 Boo	15 02.9	+25 16	+0.357	3	5.01	0.3	4.94	+0.313	3	1.2	F5 V	2
+25°2874	Cin 2012	15 03.1	+25 18	+1.189	2	10.32	2.5	10.10	+1.219	2	1.0	dM0	4
+32°2547	CC 912	15 03.6	+32 46	+0.565	20	11.44	5.0	11.33	+0.540	4	1.4	dG0	4
134305	+13°2899	15 04.0	+12 52	+0.173	5	7.29	1.7	7.25	+0.113	3	1.2	A3	1
134319	Cin 2016	15 04.1	+64 26	+0.568	8	8.59	3.0	8.48	+0.543	2	1.0	dG5	4
+24°2824*		15 04.7	+24 24	+0.918	9	9.54	1.0	9.36	+0.924	3	1.2	---	7
134439*	CC 915	15 04.8	-15 53	+0.656	10	9.18	1.0	9.05	+0.639	5	2	sdG6	7
134440*	CC 914	15 04.8	-15 59	+0.750	14	9.55	1.3	9.41	+0.741	4	2	dK0	4
134468*	HR 5645	15 04.9	-61 22	+1.740	20	6.62	3.0	6.30	+1.818	2	1.0	K2	1
135101*	HR 5659	15 08.3	+19 40	+0.645	1	6.38	0.5	6.25	+0.627	2	1.0	dG5,dG6	4
135204*	ADS 9544	15 08.8	- 0 58	+0.674	4	6.73	3.0	6.60	+0.658	6 2 2	3.7	G8 V	7
135379	β Cir	15 09.6	-58 26	+0.061	8	4.10	3.3	4.08	-0.009	3	1.2	A3 V	3
135633*	Cin 2033	15 11.1	+22 55	+0.487	7	8.53	1.5	8.43	+0.455	5	1.6	G0 V	7
135722*	δ Boo	15 11.5	+33 41	+0.862	4	3.63	3.0	3.46	+0.863	2	2.0	G8 III	2
+33°2562*		15 11.5	+33 41	+0.516	4	7.95	2.0	7.85	+0.486	2	1.0	G0 V	2
135742	β Lib	15 11.6	- 9 01	-0.132	7	2.59	1.3	2.60	-0.218	3	1.2	B8 V	2
136064	HR 5691	15 13.5	+67 44	+0.454	4	5.24	2.0	5.15	+0.419	2	1.0	F8 V	6
136176*	ADS 9578	15 14.1	+27 12	+0.486	6	6.68	1.4	6.58	+0.454	6	1.7	dF8	4
136202	φ Ser	15 14.2	+ 2 09	+0.460	7	5.11	2.2	5.02	+0.425	2 4	2.4	F8 IV	6
136274*	CC 925	15 14.7	+26 04	+0.652	7	8.14	1.2	8.01	+0.634	4	1.4	dG4	4
136352	ν^2 Lup	15 15.1	-47 57	+0.571	4	5.74	0.5	5.63	+0.546	2	1.0	G0	1
136834	CC 929	15 17.7	+ 1 47	+0.905	5	8.44	1.5	8.27	+0.910	2	1.0	dK5	4
137052*	ϵ Lib	15 18.8	- 9 57	+0.381	7	4.98	1.0	4.90	+0.339	3	1.2	F5 V	6
137107/8*	η CrB	15 19.1	+30 39	+0.475	10	5.11	1.4	5.01	+0.442	5	1.6	G0 V	6
137391*	μ Boo	15 20.7	+37 44	+0.248	7	4.39	2.0	4.34	+0.195	3	3	dA7n	4
137392*	HR 5734	15 20.7	+37 41	+0.522	6	6.61	1.8	6.51	+0.493	3	2.4	dG0	4
137422*	γ UMi	15 20.9	+72 11	+0.008	8	3.06	2.8	3.05	-0.066	4	1.4	A3 II-III	2
137759	ι Dra	15 22.7	+59 19	+1.091	12	3.45	1.8	3.24	+1.112	4	1.4	K2 III	2
137909*	β CrB	15 23.7	+29 27	+0.240	5	3.70	1.1	3.65	+0.186	4	1.4	gA8	4
139006*	α CrB	15 30.5	+27 03	-0.052	4	2.22	1.0	2.22	-0.131	2	1.0	A0 V	2
139323*	ADS 9716C	15 32.4	+40 10	+0.860	3	7.79	2.2	7.63	+0.861	4	1.4	dK5	4
139341*	ADS 9716AB	15 32.5	+40 08	+0.816	8	6.94	2.0	6.78	+0.813	4	1.4	dK4	4
139664	HR 5825	15 34.3	-44 20	+0.353	8	4.72	2.0	4.66	+0.309	2	1.0	F5	1
140283*	CC 942	15 37.7	-10 36	+0.377	9	7.31	3.0	7.23	+0.335	3	1.2	sdA5p	4
140436*	γ CrB	15 38.5	+26 37	-0.039	6	3.81	1.7	3.81	-0.118	3	1.2	A0 III-IV	7
140573	α Ser	15 39.3	+ 6 44	+1.092	0	2.80	0.5	2.59	+1.113	2	1.0	K2 III	2
140665*	ADS 9766	15 39.8	+15 37	+0.580	7	8.18	1.0	8.07	+0.556	3	2	G0	1
140901	HR 5864	15 41.0	-37 36	+0.633	4	6.17	0.7	6.05	+0.614	2	1.0	dG6	4
141003*	β Ser	15 41.6	+15 44	+0.043	2	3.67	1.0	3.65	-0.028	2	1.0	A2 IV	2

TABLE IV—Continued

HD or BD	Name	α (1900)	δ	C	AD	m	AD	V	P - V	No. in	Wt.	Sp	Ref
		h m								89 S 23			
141004	λ Ser	15 41.6	+ 7°40'	+0.532	4	4.50	0.8	4.39	+0.504	2	3	G0 V	2
142267	39 Ser	15 48.5	+13 31	+0.513	1	6.18	1.0	6.08	+0.483	3	1.2	dG0	4
142373	γ Her	15 49.2	+42 44	+0.480	9	4.69	1.6	4.59	+0.447	2	6	F9 V	2
142860	γ Ser	15 51.8	+15 59	+0.409	11	3.90	1.8	3.82	+0.370	2	6	F6 V	2
143291	CC 956	15 54.5	+28 01	+0.676	6	8.19	2.7	8.06	+0.660	3	1.2	dG7	4
143474*	ι Nor.	15 55.4	-57 29	+0.200	7	4.68	2.5	4.63	+0.143	2	1.0	A2	1
143761	ρ CrB	15 57.2	+33 37	+0.532	8	5.51	3.0	5.40	+0.504	4	1.4	G2 V	6
144070*	ρ Sco	15 58.9	-11 06	+0.391	13	4.23	1.9	4.15	+0.350	3	4	F6 IV	6
144217*	θ Sco	15 59.6	-19 32	-0.140	2	2.48	1.5	2.50	-0.227	2	1.0	B0.5 V, B2V	2
144284*	θ Dra	16 00.0	+58 50	+0.461	6	4.10	2.0	4.01	+0.426	2	4	F8 IV-V	2
144287*	CC 963	16 00.0	+25 30	+0.661	9	7.28	1.0	7.15	+0.644	2	1.0	dG8	4
144294	θ Lup	16 00.0	-36 32	-0.218	18	4.12	0.7	4.15	-0.312	2	1.0	B3 V	3
144426*	HR 5992	16 00.8	+ 8 22	+0.057	13	6.32	2.0	6.30	-0.013	3	1.2	A2	1
144579	CC 965	16 01.5	+39 24	+0.649	6	6.80	1.0	6.67	+0.631	4	1.4	dG8	4
144872	CC 967	16 02.9	+38 56	+0.871	9	8.72	3.0	8.55	+0.873	4	4	dK5	4
+35°2774	CC 968	16 02.9	+34 55	+1.108	8	10.66	0.8	10.45	+1.131	4	1.4	dM0	4
144874	45 Ser	16 02.9	+10 10	+0.140	10	5.74	2.0	5.70	+0.077	2	1.0	A5	1
145000/1*	κ Her	16 03.6	+17 20	+0.899	9	4.90	3.0	4.73	+0.903	2	1.0	G8 III	6
145002	47 Ser	16 03.6	+ 8 48	+1.467	15	5.95	3.0	5.68	+1.521	2	1.0	gM3	4
145122	8 Her	16 04.2	+17 30	-0.038	13	6.17	2.0	6.17	-0.117	3	1.2	A0	1
145148*	HR 6014	16 04.3	+ 6 41	+0.902	8	6.10	2.0	5.93	+0.906	6	1.7	K1+ III-IV	7
145328*	τ CrB	16 05.3	+36 45	+0.936	10	4.92	1.5	4.74	+0.943	2	1.0	K0 III-IV	6
145389	ϕ Her	16 05.6	+45 12	-0.083	12	4.26	2.0	4.26	-0.165	2	1.0	A0p	7
145417	CC 971	16 05.7	-57 16	+0.698	11	7.69	2.3	7.55	+0.685	3	1.2	G5	1
145454	HR 6025	16 06.0	+68 04	-0.052	6	5.50	2.0	5.50	-0.131	2	1.0	A0	1
145647	HR 6035	16 07.0	+16 56	-0.026	0	6.15	3.0	6.14	-0.103	2	1.0	A0	1
145675	14 Her	16 07.1	+44 05	+0.808	2	6.75	0.0	6.59	+0.804	3	1.2	K1	4
145713*	10 Her	16 07.3	+23 45	+1.448	16	6.08	2.0	5.81	+1.501	2	1.0	gM4	4
145958*	49 Ser	16 08.6	+13 48	+0.647	6	6.82	2.5	6.69	+0.629	2	1.0	dK0, dK1	4
145976	HR 6052	16 08.7	+26 56	+0.313	4	6.56	1.0	6.49	+0.266	2	1.0	dF2	4
146051	δ Oph	16 09.1	- 3 26	+1.451	8	2.96	1.2	2.69	+1.504	4	1.4	M1 III	2
146738	ν CrB	16 12.7	+29 23	+0.019	6	5.86	2.0	5.85	-0.054	2	1.0	A3n	4
146791	ϵ Oph	16 13.0	- 4 27	+0.878	11	3.36	1.5	3.19	+0.880	4	1.4	G8 III	2
147379*	+67°935	16 16.6	+67 28	+1.239	10	8.81	3.0	8.58	+1.273	4	2	K7, M3	5
147547	γ Her	16 17.5	+19 23	+0.238	5	3.79	1.0	3.74	+0.184	2	1.0	A9 III	2
147584*	ζ TrA	16 17.6	-69 52	+0.487	10	4.95	1.0	4.85	+0.455	2	1.0	G0	1
148112*	ω Her	16 20.8	+14 16	-0.038	6	4.63	2.0	4.63	-0.117	2	1.0	A2p	7
148387	η Dra	16 22.6	+61 44	+0.837	9	2.87	2.4	2.71	+0.835	4	4	G8 III	2
148653*	ADS 10075	16 24.5	+18 38	+0.769	4	7.13	0.0	6.98	+0.762	3	1.2	dK2, dK2	4
148816*	CC 998	16 25.6	+ 4 27	+0.484	5	7.35	2.0	7.25	+0.452	5	1.6	F8 V+	7
148856*	β Her	16 25.9	+21 42	+0.846	1	2.92	0.5	2.76	+0.845	2	1.0	G8 III	2
149661*	12 Oph	16 31.1	- 2 06	+0.736	5	5.89	1.8	5.75	+0.726	4	1.4	dK0	4
149681	HR 6173	16 31.3	+79 11	+0.184	9	5.61	1.0	5.57	+0.125	3	1.2	A3	1
149757	ζ Oph	16 31.7	-10 22	-0.031	2	2.56	1.0	2.56	-0.109	2	1.0	O9.5 V	2
149957	Cin 2217	16 32.9	+31 18	+1.065	10	9.74	3.0	9.54	+1.084	5	1.6	dK6	4
150680*	ζ Her.	16 37.5	+31 47	+0.574	7	2.90	0.7	2.79	+0.550	3	1.2	G0 IV	2
150706	Cin 2228	16 37.7	+80 00	+0.523	3	7.11	3.0	7.01	+0.494	3	1.2	dG3	4
150997	η Her	16 39.5	+39 07	+0.831	7	3.61	1.3	3.45	+0.829	2	6	G8 III-IV	6
151188*	ADS 10188	16 40.8	+43 41	+0.931	13	8.56	2.0	8.38	+0.938	5	1.6	dK6	4
151288	Cin 2238	16 41.4	+33 40	+1.215	10	8.35	2.3	8.12	+1.247	3	4	K7 V	2
151680	ϵ Sco	16 43.7	-34 07	+1.072	11	2.44	1.5	2.24	+1.091	2	1.0	K2 III-IV	3
151769	20 Oph	16 44.3	-10 36	+0.406	9	4.68	2.8	4.60	+0.367	2	2	F6 III	6
151877	Cin 2245	16 45.1	+37 12	+0.737	7	8.56	3.0	8.42	+0.727	4	1.4	dK0	4
152107*	52 Her	16 46.3	+46 10	+0.040	2	4.79	0.0	4.77	-0.031	2	1.0	A4sp	4
152391	CC 1012	16 48.0	+ 0 12	+0.670	1	6.75	1.6	6.62	+0.654	2	2	dG9	4
152751*	CC 1013	16 50.1	- 8 09	+1.344	9	9.21	3.0	8.96	+1.387	6	1.7	dM3	4
153210	κ Oph	16 52.9	+ 9 32	+1.070	5	3.34	1.0	3.14	+1.089	3	1.2	K2 III	2
+25°3173	CC 1014	16 54.1	+25 55	+1.340	13	9.95	3.0	9.70	+1.383	3	1.2	dM2	4
153597*	19 Dra	16 55.4	+65 17	+0.417	17	4.94	0.5	4.85	+0.379	4	1.4	F6 V	6
154276	+17°3154	16 59.4	+17 21	+0.551	14	9.24	2.2	9.13	+0.524	5	1.6	sdG1	4
154345	CC 1015	16 59.8	+47 11	+0.642	7	6.90	2.0	6.77	+0.623	2	1.0	dK0	4
154363*	CC 1017	16 59.9	- 4 53	+1.022	10	7.96	1.5	7.77	+1.037	2	3	K5 V	2
-4°4226*	CC 1018	17 00.0	- 4 55	+1.180	10	10.32	3.0	10.10	+1.209	2	4	M3.5 V	2
154417	HR 6349	17 00.2	+ 0 51	+0.505	11	6.10	2.3	6.00	+0.474	8	2.0	dF8	4
154577	CC 1020	17 01.1	-60 37	+0.772	3	7.61	2.0	7.46	+0.765	3	1.2	G5	1

TABLE IV—Continued

HD or BD	Name	α (1900)	δ	C	AD	m	AD	V	P - V	No. in	Wt.	Sp	Ref
		h m								89 S 23			
154610	HR 6358	17 01.4	+ 9°53'	+1.374	11	6.54	0.5	6.28	+1.420	2	1.0	K5	1
154619	HR 6359	17 01.5	+10 35	+0.830	0	6.48	0.5	6.32	+0.828	2	1.0	K0	1
155103*	ϵ Her	17 04.5	+36 04	+0.225	6	5.49	2.0	6.44	+0.170	3	1.2	A5	4
155125*	η Oph	17 04.6	-15 36	+0.006	3	2.43	0.0	2.42	-0.069	2	1.0	A2 V	2
155203	η Sco	17 05.0	-43 06	+0.317	6	3.39	3.0	3.32	+0.270	2	1.0	F2 III	3
155456	Cin 2290	17 06.9	+24 38	+0.780	12	8.46	1.2	8.31	+0.774	5	1.6	dK0	4
155500	HR 6390	17 06.9	+ 8 01	+0.989	4	6.46	1.5	6.27	+1.001	2	1.0	K0	1
155644	37 Oph	17 07.8	+10 42	+1.486	4	5.56	0.5	5.28	+1.542	2	1.0	gM2	4
155646	HR 6394	17 07.8	+ 0 29	+0.446	9	6.70	1.5	6.61	+0.410	2	1.0	F5	1
155763	ζ Dra	17 08.5	+65 50	-0.152	8	3.19	1.8	3.21	-0.240	4	1.4	B8 IV	2
155876*	CC 1023	17 09.2	+45 52	+1.326	3	9.64	0.5	9.39	+1.368	2	1.0	dM4	4
155885/6*	36 Oph	17 09.2	-26 27	+0.763	10	4.43	3.0	4.28	+0.755	4 2	2.4	dK1,dK2	4
+42°2810	Cin 2297	17 09.9	+42 28	+1.078	4	10.46	1.5	10.26	+1.098	2	1.0	dM1	4
156014/5*	α Her	17 10.1	+14 30	+1.250	4	3.27	7.0	3.04	+1.285	2	1.0	M5 II	2
156026*	CC 1027	17 10.1	-26 23	+1.009	11	6.49	3.0	6.30	+1.023	5 2	2.6	dK5	4
156164	δ Her	17 10.9	+24 57	+0.046	8	3.15	0.0	3.13	-0.025	2	1.0	A3 IV	2
156208	HR 6412	17 11.2	+ 2 18	+0.180	3	6.21	1.0	6.17	+0.121	2	1.0	A0	1
156274*	HR 6416	17 11.5	-46 32	+0.733	2	5.62	3.0	5.48	+0.723	2	1.0	K0,M0	5
156283	π Her	17 11.6	+36 55	+1.328	5	3.32	1.5	3.07	+1.370	2	1.0	K3 II	2
156384*	HR 6426	17 12.1	-34 53	+0.927	6	6.10	0.5	5.92	+0.933	2	1.0	dK5	4
156697	HR 6434	17 14.0	+ 6 11	+0.330	2	6.56	0.5	6.49	+0.284	2	1.0	F0	1
157089*	Cin 2311	17 16.1	+ 1 32	+0.490	3	7.05	3.0	6.95	+0.458	6	1.7	F9 V	7
157214	72 Her	17 16.9	+32 36	+0.556	9	5.50	2.0	5.39	+0.530	6	1.7	G0 V	2
157617	HR 6476	17 19.2	+ 8 56	+1.183	5	5.86	0.5	5.64	+1.212	2	1.0	gK1	4
157881	CC 1036	17 20.8	+ 2 14	+1.194	4	7.82	2.0	7.60	+1.224	8 2	3.0	K7 V	2
157978/9*	HR 6497	17 21.5	+ 7 41	+0.514	3	6.12	0.5	6.02	+0.484	2	1.0	A0+G	1
157999	σ Oph	17 21.6	+ 4 14	+1.410	5	4.51	1.0	4.25	+1.459	2	1.0	K5 II	6
+31°3025*	Cin 2326	17 22.9	+31 09	+0.659	7	9.79	1.0	9.66	+0.642	3	1.2	dG7	4
158225	+31°3026	17 23.0	+31 21	+0.379	6	7.23	1.2	7.15	+0.337	4	1.4	dF4	4
158226*	CC 1039	17 23.0	+31 09	+0.522	0	8.59	0.3	8.49	+0.493	3	1.2	dG1	4
158352	HR 6507	17 23.7	+ 0 25	+0.198	5	5.45	1.0	5.40	+0.141	2	1.0	A5	1
158408*	ν Sco	17 24.0	-37 13	-0.274	10	2.62	1.0	2.66	-0.373	2	1.0	B2 IV	3
158614*	HR 6516	17 25.2	- 0 58	+0.634	7	5.39	3.0	5.27	+0.615	3 4	2.6	G8 IV-V	6
158633*	HR 6518	17 25.3	+67 24	+0.676	6	6.59	3.0	6.46	+0.660	2	1.0	dK1	4
158637*	HR 6524	17 26.4	+ 2 48	+0.789	7	5.68	0.5	5.53	+0.784	2	1.0	gG3	4
158926*	λ Sco	17 26.8	-37 02	-0.289	0	1.52	1.8	1.56	-0.390	4	1.4	B2 IV	6
159181	β Dra	17 28.2	+52 23	+0.862	10	2.92	1.2	2.75	+0.863	2 3	2.2	G2 II	2
159222	HR 6538	17 28.4	+34 21	+0.562	5	6.64	3.0	6.53	+0.536	3	1.0	G5	1
159532	θ Sco	17 30.1	-42 56	+0.330	4	1.91	1.5	1.84	+0.284	4	1.4	F0 I-II	3
159561*	α Oph	17 30.3	+12 38	+0.110	4	2.12	---	2.09	+0.045	St St	4.0	A5 III	2
160269*	26 Dra	17 33.9	+61 58	+0.523	4	5.34	2.5	5.24	+0.494	4	1.4	G1 V	2
160314	+2°3372	17 34.1	+ 2 07	+0.331	3	7.86	2.0	7.79	+0.285	3	1.2	F0	1
160315	HR 6575	17 34.1	+ 2 05	+0.937	7	6.41	2.6	6.23	+0.944	2 5	2.6	gG9	4
160346	Cin 2350	17 34.3	+ 3 37	+0.876	3	6.68	1.1	6.51	+0.878	4	1.4	dK3	4
160578	κ Sco	17 35.6	-38 59	-0.240	9	2.35	1.0	2.38	-0.336	3	1.2	B2 IV	3
160693	Cin 2353	17 36.3	+37 17	+0.490	3	8.50	1.7	8.40	+0.458	3	1.2	dF8	4
160781	HR 6590	17 36.7	+ 6 22	+1.206	7	6.10	0.0	5.87	+1.237	2	1.0	gG7	4
+68°946	CC 1053	17 37.0	+68 26	+1.324	15	9.40	2.5	9.15	+1.366	2 2	2.0	M3.5 V	2
161096	β Oph	17 38.5	+ 4 37	+1.087	4	2.93	---	2.72	+1.107	St St St	6.0	K2 III	2
161198	CC 1060	17 39.1	+21 41	+0.676	8	7.67	0.0	7.54	+0.660	2	1.0	dG8	4
+71°851	Cin 2361	17 40.1	+71 22	+0.968	6	9.37	3.0	9.19	+0.978	2	1.0	dM0	4
161471*	ι Sco	17 40.6	-40 05	+0.436	9	3.03	1.0	2.94	+0.399	3	1.2	F2 Ia	7
161797	μ Her	17 42.5	+27 47	+0.670	6	3.54	3.0	3.41	+0.654	3 4	2.6	G5 IV	2
161817*	+25°3344	17 42.6	+25 48	+0.089	11	7.04	2.0	7.01	+0.022	2	1.0	A2p	7
161848	Cin 2366	17 42.8	+ 4 59	+0.732	10	9.11	1.0	8.97	+0.721	2	1.0	dK3	4
161868	γ Oph	17 42.9	+ 2 45	+0.017	2	3.76	0.5	3.75	-0.057	2	1.0	A0 V	2
161941	HR 6633	17 43.3	+ 3 50	+0.110	4	6.26	0.5	6.23	+0.045	2	1.0	A0	1
162113	HR 6639	17 44.3	+ 2 00	+1.169	3	6.60	0.5	6.38	+1.197	2	1.0	K0	1
162262*	+2°3407	17 45.1	+ 2 16	+0.759	5	8.51	3.0	8.36	+0.751	5	1.6	F5 V	7
162774*	HR 6667	17 47.6	+ 1 20	+1.461	12	6.10	4.5	5.83	+1.514	2	1.0	K5	1
162917	HR 6670	17 48.4	+ 6 08	+0.377	8	5.83	0.0	5.75	+0.335	2	1.0	dF4	4
163472	HR 6684	17 51.2	+ 0 42	+0.030	7	5.84	0.5	5.82	-0.042	2	1.0	B3	1
163624*	HR 6689	17 52.0	+ 0 05	+0.085	3	5.97	0.0	5.94	+0.017	2	1.0	A2	1
163641	HR 6690	17 52.1	+ 6 31	-0.034	5	6.30	0.5	6.30	-0.112	2	1.0	A0	1
+4°3561*	CC 1069	17 52.9	+ 4 25	+1.538	18	9.80	3.3	9.51	+1.598	6 4	3.1	M5 V	2

TABLE IV—*Continued*

HD or BD	Name	α h m	(1900) δ	C	AD	m	AD	V	P - V	No. in 89 S 23	Wt.	Sp	Ref
163810*	CC 1070	17 53.0	-13°04'	+0.554	11	9.66	3.0	9.55	+0.528	4	1.4	G2	5
163917	γ Oph	17 53.5	- 9 46	+0.906	9	3.45	1.7	3.28	+0.911	3	1.2	K0 III	2
163989	35 Dra	17 53.9	+76 59	+0.424	3	5.10	0.0	5.01	+0.386	2	1.0	F6 IV	6
164058	γ Dra	17 54.3	+51 30	+1.400	12	2.43	2.0	2.17	+1.448	3	1.2	K5 III	2
+18°3516*		17 54.9	+18 53	+1.424	10	9.44	1.0	9.17	+1.474	3	1.2	-----	7
164258	HR 6709	17 55.2	+ 0 38	+0.112	8	6.38	1.7	6.35	+0.047	4	1.4	A2p	1
164259	ζ Ser	17 55.2	- 3 41	+0.293	7	4.68	1.5	4.62	+0.244	3	2.2	F3 V	2
164284	66 Oph	17 55.3	+ 4 23	-0.126	6	4.84	1.0	4.85	-0.212	2	1.0	B3	1
164353	67 Oph	17 55.6	+ 2 56	-0.035	8	4.00	0.5	4.00	-0.113	2	1.0	B5 Ib	2
164432	HR 6719	17 56.0	+ 6 16	-0.110	3	6.34	1.0	6.35	-0.195	2	1.0	B3	1
164577*	68 Oph	17 56.7	+ 1 11	+0.002	1	4.49	2.0	4.48	-0.073	2	1.0	A1 V	7
164922	CC 1072	17 58.4	+26 22	+0.717	1	7.16	2.0	7.02	+0.705	3	1.2	dK0	4
165174	HR 6747	17 59.6	+ 1 55	-0.073	4	6.10	0.5	6.10	-0.155	2	1.0	B3	1
165189/90*	HR 6749/50	17 59.6	-43 26	+0.165	5	4.93	2.3	4.89	+0.105	3	1.2	A3	1
165222	-3°4233	17 59.8	- 3 02	+1.330	13	9.62	2.3	9.37	+1.372	2	2.0	dM2	4
165341*	70 Oph	18 00.4	+ 2 31	+0.773	9	4.16	0.8	4.01	+0.766	3	2.2	K0 V	2
165401*	Cin 2392	18 00.7	+ 4 40	+0.506	15	6.89	2.8	6.79	+0.475	6	3.4	G0 V	7
165760	71 Oph	18 02.5	+ 8 43	+0.888	2	4.76	1.0	4.59	+0.891	2	1.0	G8 III-IV	6
165777	72 Oph	18 02.6	+ 9 33	+0.097	4	3.76	---	3.78	+0.030	St	St	A2s	4
-15°3364*	Cin 2387	18 02.8	+15 56	+0.580	5	8.77	1.3	8.66	+0.556	3	1.2	G0	7
165893*	-22°4584	18 03.2	-22 12	+0.911	4	9.03	0.0	8.86	+0.916	2	1.0	K2	1
165908*	99 Her	18 03.2	+30 33	+0.437	11	5.16	3.0	5.07	+0.400	5	3.2	F7 V	2
166067*	+46°2426	18 03.9	+46 16	+0.330	9	7.54	2.3	7.47	+0.284	6	1.7	F2	1
166233*	73 Oph	18 04.6	+ 3 58	+0.324	2	5.76	1.0	5.69	+0.278	2	1.0	dF0	4
166285	HR 6797	18 04.8	+ 3 06	+0.411	1	5.74	1.0	5.66	+0.372	2	1.0	dF4	4
166348	CC 1077	18 05.1	-43 28	+1.121	13	8.60	5.0	8.39	+1.145	2	1.0	K7	5
166460	HR 6800	18 05.6	+ 3 18	+1.136	2	5.64	0.0	5.43	+1.161	-2	1.0	gK2	4
166620	HR 6806	18 06.4	+38 28	+0.788	4	6.58	0.5	6.43	+0.783	2	1.0	K2 V	2
167516*	+1°3633	18 10.5	+ 1 20	+0.528	6	8.75	1.8	8.65	+0.500	4	1.4	F8 Ib:	7
167654	HR 6834	18 11.1	+ 2 22	+1.512	2	6.34	0.5	6.06	+1.570	2	1.0	gM4	4
167858	HR 6844	18 12.0	+ 0 58	+0.258	0	6.64	1.5	6.58	+0.206	2	1.0	F0	1
168245*	-4°4438	18 13.7	- 4 09	+0.970	5	7.73	2.7	7.55	+0.980	3	1.2	G7 II	7
168656	74 Oph	18 15.8	+ 3 20	+0.854	0	4.96	0.5	4.80	+0.854	2	1.0	G8 III	6
168723	η Ser	18 16.1	- 2 55	+0.845	6	3.37	2.4	3.21	+0.844	5	3	K0 III-IV	2
168797	HR 6873	18 16.5	+ 5 24	-0.062	5	6.14	0.5	6.14	-0.142	2	1.0	B5	1
169022	ϵ Sgr	18 17.5	-34 26	-0.069	2	1.76	1.0	1.76	-0.150	2	1.0	B9 IV	3
169578	HR 6900	18 20.2	+ 5 02	-0.016	5	6.74	1.0	6.73	-0.092	2	1.0	B9	1
169689/90*	HR 6902	18 20.8	+ 7 59	+0.832	2	6.78	0.5	6.62	+0.830	2	1.0	G0+A3	1
169822*	CC 1088	18 21.4	+ 8 44	+0.614	14	7.92	1.5	7.80	+0.593	3	2.2	dG2	4
169889*	CC 1089	18 21.7	+ 8 34	+0.691	16	8.42	2.8	8.29	+0.677	3	2.2	dG7	4
169916	λ Sgr	18 21.8	-25 29	+0.966	6	2.96	1.3	2.78	+0.976	3	1.2	K2 III	3
169985*	59 Ser	18 22.1	+ 0 08	+0.420	1	5.28	1.8	5.19	+0.382	4	1.4	A0+G	1
170137	HR 6925	18 22.8	+ 3 41	+1.529	1	6.28	1.0	5.99	+1.589	2	1.0	gK3	4
170153*	χ Dra	18 22.9	+72 41	+0.438	2	3.66	0.0	3.57	+0.402	2	1.0	F7 V	2
170200	HR 6928	18 23.1	+ 6 08	-0.054	8	5.70	0.5	5.70	-0.134	2	1.0	B8	1
170580	HR 6941	18 25.1	+ 4 00	+0.066	4	6.68	1.0	6.66	-0.003	2	1.0	B5	1
170973	HR 6958	18 27.1	+ 3 35	-0.057	1	6.43	1.0	6.43	-0.137	2	1.0	B9	1
171247	HR 6967	18 28.6	+ 8 12	-0.055	1	6.41	2.0	6.41	-0.135	2	1.0	B8	1
171314	Cin 2433	18 29.1	+22 15	+0.989	13	9.12	2.0	8.93	+1.001	2	1.0	dM1	4
171620*	Cin 2438	18 30.9	+34 20	+0.417	8	7.67	1.7	7.58	+0.379	3	1.2	dF7	4
171635*	45 Dra	18 30.9	+56 58	+0.544	0	4.89	0.0	4.78	+0.517	2	1.0	F7 Ib	7
171802	HR 6985	18 31.7	+ 9 03	+0.329	0	5.42	1.5	5.35	+0.283	2	1.0	dF2	4
171834*	HR 6987	18 31.8	+ 6 36	+0.320	0	5.48	1.5	5.41	+0.273	2	1.0	dF1	4
+45°2743	CC 1095	18 32.4	+45 39	+1.279	14	10.14	2.5	9.90	+1.317	4	1.4	dM2	4
172088*	HR 6999	18 33.1	- 3 17	+0.487	8	6.56	0.8	6.46	+0.455	3	1.4	dF8	4
172365*	HR 7008	18 34.7	+ 5 10	+0.707	6	6.48	1.5	6.34	+0.694	2	1.0	F8 Ib-II	7
172424	HR 7010	18 35.0	+ 7 16	+0.891	7	6.40	2.0	6.23	+0.894	2	1.0	K0	1
+31°3330*	Cin 2450	18 37.1	+31 28	+0.840	4	8.67	0.0	8.51	+0.839	2	1.0	K5,M0	5
173370	4 Aql	18 39.8	+ 1 57	-0.090	2	5.04	1.5	5.05	-0.173	2	1.0	B5	1
173495*	HR 7048	18 40.5	+ 5 23	+0.009	10	5.84	2.0	5.83	-0.065	2	1.0	A0	1
173667	110 Her	18 41.4	+20 27	+0.375	7	4.30	3.2	4.22	+0.333	7	2	F6 V	2
173739/90*	ADS 11632	18 41.8	+59 29	+1.413	2	8.75	1.3	8.49	+1.463	3	1.2	M4,M4	5
173954	HR 7076	18 43.1	+ 4 08	+1.386	6	6.42	1.5	6.16	+1.433	2	1.0	K5	1
174240	HR 7085	18 44.5	+ 0 44	+0.002	10	6.27	2.0	6.26	-0.073	2	1.0	A0	1
229590	Cin 2463	18 44.5	+17 20	+1.094	4	9.44	0.5	9.23	+1.115	2	1.0	dM1	4

TABLE IV—Continued

HD or BD	Name	α h m	(1900) δ	C	AD	m	AD	V	P - V	No. in 89 S 23	Wt.	Sp	Ref
175515	HR 7135	18 50.6	+ 6°30'	+0.975	4	5.68	2.0	5.49	+0.986	2	1.0	gG9	4
175541	Cin 2473	18 50.7	+ 4 08	+0.820	10	8.14	1.3	7.98	+0.817	3	1.2	dK0	4
175623	-15°5154	13 51.1	-15 00	+0.139	6	7.16	3.0	7.12	+0.076	3	1.2	B9	1
175679	HR 7144	18 51.4	+ 2 21	+0.888	6	6.28	0.5	6.11	+0.891	2	1.0	K0	1
175813*	ϵ CrA	18 52.0	-37 14	+0.322	5	4.94:	9.0	4.87:	+0.275	3	1.2	F5	1
175869	64 Ser	18 52.3	+ 2 26	-0.030	2	5.58	1.0	5.58	-0.108	2	1.0	B9n	4
176051*	HR 7162	18 53.3	+32 47	+0.524	7	5.31	1.8	5.21	+0.495	4	1.4	G0 V	6
176303	11 Aql	18 54.5	+13 30	+0.456	3	5.32	3.0	5.23	+0.421	3	1.2	F8 III-IV	6
176437	γ Lyr	18 55.2	+32 33	-0.086	10	3.25	1.0	3.26	-0.168	4	1.4	B9 III	2
176687*	ζ Sgr	18 56.3	-30 01	+0.035	0	2.59	0.0	2.57	-0.037	2	1.0	A2 IV	3
230409	CC 1122	18 56.4	+18 57	+0.659	11	10.21	1.7	10.08	+0.642	3	1.2	dG4	4
177166*	ADS 11987	18 58.4	-21 41	+0.468	3	7.16	1.5	7.07	+0.434	2	1.0	G0	1
177171*	ρ Tel	18 58.4	-52 29	+0.458	6	5.22	1.7	5.13	+0.423	3	1.2	G0	1
177474/5*	γ CrA	18 59.7	-37 12	+0.446	6	4.28	3.2	4.19	+0.410	5	1.6	F7,F7	4
177724	ζ Aql	19 00.8	+13 43	-0.032	6	2.98	1.0	2.98	-0.110	4	1.4	B9.5 V	2
177745	Cin 2491	19 00.9	+22 55	+0.740	3	8.65	2.0	8.51	+0.730	2	1.0	G9	5
177756	λ Aql	19 00.9	- 5 02	-0.102	12	3.41	2.3	3.42	-0.186	3	1.2	B8.5 V	3
178065	HR 7245	19 02.1	+ 0 30	0.000	20	6.56	0.5	6.55	-0.075	2	1.0	B9	1
178125	18 Aql	19 02.3	+10 55	-0.084	2	5.07	2.0	5.08	-0.166	2	1.0	B8	1
178126	CC 1128	19 02.3	+ 7 30	+0.957	0	9.42	0.5	9.24	+0.966	2	1.0	dK6	4
178428*	HR 7260	19 03.5	+16 43	+0.631	9	6.16	2.0	6.04	+0.611	5	1.6	dG4	4
178596	19 Aql	19 04.1	+ 5 55	+0.290	15	5.26	0.5	5.20	+0.241	2	1.0	dF2	4
178619*	HR 7267	19 04.2	+16 42	+0.407	3	6.74	0.5	6.66	+0.368	2	1.0	dF2	4
178882	-15°5259	19 05.2	-15 15	+1.484	9	7.80	0.7	7.52	+1.540	3	1.2	Mb	1
179130	-15°5317	19 06.2	-14 45	+1.326	8	7.23	0.7	6.98	+1.368	3	1.2	gK3	4
179518	-14°5333	19 07.8	-14 37	+0.390	9	7.72	0.3	7.64	+0.349	3	1.2	F5	1
179588*	HR 7285	19 08.1	+16 40	-0.046	0	6.74	0.5	6.74	-0.125	2	1.0	B9	1
179757*	ADS 12172	19 08.7	+18 58	+0.285	8	8.74	0.5	8.68	+0.235	2	1.0	F0	1
179957/8*	HR 7293/4	19 09.5	+49 39	+0.572	3	5.95	1.5	5.84	+0.547	4	1.4	dG3,dG5	4
180028*	+5°4087	19 09.8	+ 5 52	+0.830	4	7.08	0.5	6.92	+0.828	2	1.0	F6 Ib	7
180110	-15°5290	19 10.1	-15 01	-0.036	4	7.82	0.3	7.82	-0.114	3	1.2	B9	1
180262*	HR 7300	19 10.8	+14 54	+0.973	15	5.73	2.5	5.54	+0.984	3	2.4	G5p	7
180482*	22 Aql	19 11.6	+ 4 40	+0.031	6	5.58	0.5	5.56	-0.041	2	1.0	A2	1
180555*	HR 7307	19 11.9	+14 23	-0.044	2	5.66	2.0	5.66	-0.123	2	1.0	A0	1
180583*	HR 7308	19 12.0	+27 45	+0.535	8	6.22	1.8	6.11	+0.507	4	1.4	F6 II	7
180617	CC 1143	19 12.1	+ 5 03	+1.267	14	9.27	2.0	9.03	+1.304	10	2.0	M3.5 V	2
180809	θ Lyr	19 12.9	+37 57	+1.156	10	4.50	1.0	4.28	+1.183	2	1.0	K0 II	2
180868	ω Aql	19 13.1	+11 25	+0.140	0	5.33	2.0	5.29	+0.077	2	1.0	A5	1
181053	24 Aql	19 13.8	+ 0 10	+0.961	1	6.53	1.0	6.35	+0.970	2	1.0	gG9	4
181122	HR 7325	19 14.1	+ 9 26	+0.982	2	6.44	1.0	6.25	+0.993	2	1.0	K0	1
181166*	+15°3765	19 14.3	+16 05	+0.136	6	8.66	3.0	8.63	+0.073	2	1.0	A	1
181214*	+6°4090	19 14.5	+ 6 58	+0.438	11	7.83	2.0	7.74	+0.402	2	1.0	F8 III	7
181333	28 Aql	19 15.0	+12 12	+0.210	2	5.58	1.0	5.53	+0.153	2	1.0	gF4	4
181383	29 Aql	19 15.2	+11 21	+0.053	5	6.06	0.5	6.04	-0.017	2	1.0	A2	1
+41°3306	CC 1145	19 15.7	+41 28	+0.712	7	9.02	2.0	8.88	+0.699	2	1.0	dK1	4
181577	ρ Sgr	19 15.9	-18 02	+0.154	2	3.96	0.5	3.92	+0.093	2	1.0	dA7n	4
+33°3433	CC 1151	19 18.6	+33 40	+1.045	8	10.10	2.5	9.90	+1.062	2	1.0	dK6	4
182239	HR 7357	19 18.6	+14 44	+0.212	4	6.72	0.0	6.67	+0.155	2	1.0	A3	1
182488	HR 7368	19 19.8	+33 01	+0.735	5	6.50	2.0	6.36	+0.725	2	1.0	dK1	4
182490*	2 Sge	19 19.8	+16 45	+0.040	5	6.30	0.0	6.28	-0.031	2	1.0	A0	1
182572	31 Aql	19 20.2	+11 44	+0.681	1	5.25	2.0	5.12	+0.666	2	2.0	G8 IV	6
182640*	δ Aql	19 20.5	+ 2 55	+0.250	4	3.43	---	3.38	+0.197	St	4.0	F0 IV-V	2
182762	4 Vul	19 21.1	+19 37	+0.924	11	5.29	1.0	5.11	+0.930	2	1.0	K0 III	6
182807	HR 7386	19 21.3	+24 44	+0.457	4	6.27	1.8	6.18	+0.422	3	1.2	F6	4
182919*	5 Vul	19 21.9	+19 54	-0.043	4	5.60	1.5	5.60	-0.122	2	1.0	B9n	4
182955	HR 7391	19 22.1	+19 41	+1.414	10	6.06	1.0	5.80	+1.464	2	1.0	gM0	4
183030*	λ UMi	19 22.5	+88 59	+1.453	8	6.67	1.0	6.40	+1.506	2	2.0	M1 III	7
183255	CC 1153	19 23.6	+49 14	+0.832	10	8.21	1.7	8.05	+0.830	3	1.2	dK1	4
+35°3659f	CC 1156	19 27.6	+35 57	+0.407	10	10.27	2.0	10.19	+0.368	2	1.0	dF1	4
+35°3659p*		19 27.6	+35 57	+0.560	10	10.38	1.5	10.27	+0.534	2	1.0	---	7
184313*	+5°4190	19 28.8	+ 5 15	+1.424	8	6.58	3.7	6.31	+1.474	3	1.2	Mb	1
184467	CC 1157	19 29.5	+58 24	+0.782	8	6.74	0.0	6.59	+0.776	3	1.2	dK5	4
185395	θ Cyg	19 33.8	+49 59	+0.330	12	4.56	2.5	4.49	+0.284	2	2.2	F5 IV	6
186791	γ Aql	19 41.5	+10 22	+1.394	1	2.90	1.7	2.64	+1.442	3	1.2	K3 II	2
186858*	ADS 12889	19 41.8	+33 22	+0.903	7	7.76	1.3	7.59	+0.908	4	1.4	dK5	4

TABLE IV—Continued

HD or BD	Name	α (1900)	δ	C	AD	m	AD	V	P - V	No. in 89 S 23	Wt.	Sp	Ref
186882*	δ Cyg	19 41.9	+44°53'	-0.073	4	2.87	0.7	2.87	-0.155	2	1.0	B9.5 III	2
+31°3767*	CC 1165	19 42.5	+31 47	+1.312	5	10.05	2.0	9.80	+1.352	2	1.0	M1,M2	5
187013*	17 Cyg	19 42.6	+33 30	+0.384	8	5.08	1.8	5.00	+0.343	4	1.4	F5 V	2
187138*	+88°114	19 43.3	+88 41	+0.980	6	8.38	2.0	8.19	+0.991	2	4	G9 III	7
187642	α Aql	19 45.9	+ 8 36	+0.160	2	0.86	0.5	0.82	+0.099	2	1.0	A7 IV, V	2
188037*	+22°3840	19 48.1	+22 12	+0.680	7	8.04	3.0	7.90	+0.665	4	1.4	Comp.	7
188956*	20 Cyg	19 48.2	+52 45	+1.193	7	5.22	3.0	5.00	+1.223	10	2.0	K3 III	6
188512	β Aql	19 50.4	+ 6 09	+0.763	4	3.86	---	3.71	+0.755	St	2.0	G8 IV	2
189044*	ADS 13169	19 53.0	+ 4 40	+0.664	8	8.72	1.0	8.59	+0.648	2	1.0	G5	1
189276	HR 7633	19 54.1	+58 35	+1.439	8	5.21	2.8	4.94	+1.491	8	2.0	K5 II-III	6
190007	Cin 2615	19 57.8	+ 3 02	+1.004	5	7.64	1.5	7.45	+1.017	2	1.0	dK4	4
190067	CC 1183	19 58.1	+15 21	+0.668	0	7.27	2.0	7.14	+0.652	2	1.0	dG7	4
190248*	ζ Pav	19 58.9	-66 26	+0.672	8	3.71	4.6	3.58	+0.656	5	1.6	G5 IV	3
190360	HR 7670	19 59.5	+29 38	+0.672	12	5.87	3.0	5.74	+0.656	3	2	dG8	4
190404	CC 1186	19 59.7	+23 05	+0.752	7	7.42	2.3	7.27	+0.743	3	1.2	dK3	4
190406	15 Sge	19 59.7	+16 48	+0.550	3	5.87	1.7	5.76	+0.523	3	1.2	dG1	4
190446	+39°4020	19 59.9	+39 59	+0.502	2	8.32	3.0	8.22	+0.471	2	1.0	F2	4
190625*	+56°2344	20 00.8	+56 49	-0.014	13	7.80	4.0	7.79	-0.090	2	1.0	A0	1
191408*	HR 7703	20 04.6	-36 21	+0.764	4	5.48	3.0	5.33	+0.756	3	1.2	dK4	4
191785	CC 1195	20 06.6	+15 54	+0.756	2	7.44	1.5	7.29	+0.747	2	1.0	dK2	4
192310*	HR 7722	20 09.1	-27 20	+0.802	5	5.90	3.0	5.75	+0.797	2	1.0	dK5	4
192640*	29 Cyg	20 10.8	+36 30	+0.130	7	4.99	1.0	4.96	+0.066	2	1.0	A2p	7
193495/6*	β Cap	20 15.4	-15 06	+0.678	13	3.19	1.6	3.06	+0.663	3	2	G0+A0	1
193664	HR 7783	20 16.5	+66 32	+0.512	1	6.04	1.0	5.94	+0.482	2	1.0	dG1	4
193924*	α Pav	20 17.7	-57 03	-0.253	2	1.92	2.5	1.96	-0.350	2	1.0	B3 IV	3
194093	γ Cyg	20 18.6	+39 56	+0.590	10	2.33	2.2	2.21	+0.567	3	2	F8 Ib	2
194598	CC 1206	20 21.4	+ 9 09	+0.405	10	8.43	1.0	8.35	+0.366	2	1.0	dF5	4
194640	CC 1207	20 21.6	-31 11	+0.647	2	6.70	2.5	6.57	+0.629	2	1.0	dG6	4
195295	41 Cyg	20 25.3	+30 02	+0.340	4	4.11	2.5	4.04	+0.295	2	1.0	F5 II	2
196755*	κ Del	20 34.3	+ 9 44	+0.632	6	5.16	1.0	5.04	+0.612	3	1.2	G5 IV	6
196761	HR 7898	20 34.3	-24 09	+0.623	7	6.48	1.5	6.36	+0.603	2	1.0	dG7	4
196771*	+35°4197	20 34.4	+35 17	-0.025	2	8.48	1.7	8.47	-0.102	3	1.2	A2	1
196794*	Cin 2675	20 34.5	+ 9 43	+0.835	6	8.66	1.0	8.50	+0.833	3	1.2	dK1	4
+35°4198*		20 34.5	+35 35	+0.540	4	8.94	0.5	8.83	+0.513	2	1.0	---	7
197051	β Pav	20 36.0	-66 34	+0.100	3	3.46	1.7	3.43	+0.034	3	1.2	A5 III	3
197076	HR 7419	20 36.2	+19 33	+0.569	2	6.53	1.7	6.42	+0.544	3	1.2	dG2	4
197692	ψ Cap	20 40.2	-25 38	+0.368	4	4.20	2.0	4.12	+0.326	2	1.0	F5 V	3
197750	CC 1222	20 40.6	+75 32	+1.112	5	8.25	2.7	8.04	+1.135	3	1.2	K0	1
197989*	ϵ Cyg	20 42.2	+33 36	+0.940	11	2.66	3.7	2.48	+0.948	3	1.2	K0 III	2
198084	HR 7955	20 42.9	+57 13	+0.489	3	4.59	1.0	4.49	+0.457	3	1.2	F8 IV	6
198149	η Cep	20 43.3	+61 27	+0.828	17	3.56	1.8	3.40	+0.826	6	3	K0 IV	2
+12°4499	CC 1237	20 50.3	+12 47	+0.935	9	9.00	0.5	8.82	+0.942	2	1.0	dK5	4
+61°2061*		20 51.2	+61 48	+0.406	4	9.20	2.0	9.12	+0.367	3	1.2	F8	7
199305	Cin 2707	20 51.3	+61 49	+1.264	11	8.76	2.0	8.52	+1.300	4	1.4	dM2	4
199908*	+54°2452	20 55.0	+55 06	+0.266	9	7.31	1.7	7.25	+0.214	3	1.2	F0	1
+54°2461*		20 57.9	+54 55	+0.202	8	10.22	0.3	10.17	+0.144	3	1.2	A0	7
201601*	γ Equ	21 05.5	+ 9 44	+0.247	2	4.72	0.5	4.67	+0.194	2	1.0	F0p	1
201772*	HR 8104	21 06.6	-39 50	+0.361	3	5.30	0.5	5.23	+0.318	2	1.0	dF4	4
201891	CC 1266	21 07.4	+17 21	+0.429	2	7.44	0.5	7.35	+0.392	2	1.0	dF4	4
202275*	δ Equ	21 09.6	+ 9 36	+0.450	5	4.56	1.2	4.47	+0.415	3	2	F8 V	6
202444*	τ Cyg	21 10.8	+37 37	+0.398	6	3.83	1.8	3.75	+0.358	5	1.6	F0n	4
202447/8*	α Equ	21 10.8	+ 4 50	+0.484	4	4.00	1.5	3.90	+0.452	2	1.0	F8+A3	1
202560	CC 1273	21 11.5	-39 15	+1.240	5	6.99	1.0	6.76	+1.274	3	1.2	dM1	4
203133*	HR 8156	21 15.2	-70 10	+2.393	12	6.78	0.0	6.34	+2.529	2	1.0	Na	1
203280	α Cep	21 16.2	+62 10	+0.186	3	2.50	2.0	2.46	+0.127	2	1.0	A7 IV, V	2
203608	γ Pav	21 18.2	-65 49	+0.382	8	4.38	3.0	4.30	+0.340	2	1.0	F6 V	3
205478*	ν Oct	21 30.4	-77 50	+0.909	10	3.90	2.8	3.73	+0.914	4	1.4	K0	1
206774*	79 Cyg	21 39.3	+37 50	-0.029	5	5.72	0.0	5.72	-0.107	2	1.0	A0	1
206778	ϵ Peg	21 39.3	+ 9 25	+1.442	2	2.56	1.0	2.29	+1.494	3	1.2	K2 Ib	2
206792*	ADS 15267	21 39.4	+27 24	+0.370	8	7.50	0.5	7.42	+0.328	2	1.0	dF5	4
206804*	CC 1308	21 39.4	-58 08	+1.152	16	9.08	4.0	8.86	+1.178	4	1.4	Ma	1
206807*	+37°4410	21 39.5	+37 51	+0.064	1	7.03	0.0	7.01	-0.005	2	1.0	A0	1
206859	9 Peg	21 39.8	+16 54	+1.041	8	4.50	1.0	4.30	+1.058	4	1.4	G5 Ib	2
207652	13 Peg	21 45.4	+16 49	+0.306	8	5.40	1.7	5.33	+0.258	3	1.2	dA8n	4
209100	ϵ Ind	21 55.7	-57 12	+0.918	9	4.92	1.7	4.74	+0.924	4	1.4	K3 V	3

TABLE IV—Continued

HD or BD	Name	α (1900) δ h m	C	AD	m	AD	V	P - V	No. in 89 S 23	Wt.	Sp	Ref
209409	α Aqr	21 58.1 - 2°38'	-0.078	8	4.88	1.0	4.88	-0.160	2	1.0	B5 V	3
209747*	ν Peg	22 00.6 + 4 34	+1.351	11	5.06	1.5	4.81	+1.395	2	1.0	K4 III	6
209750	α Aqr	22 00.6 - 0 48	+0.857	4	3.11	0.0	2.95	+0.857	2	1.0	G2 Ib	2
209952	α Gru	22 01.9 -47 27	-0.189	8	1.67	2.0	1.69	-0.281	2	1.0	B5 V	3
210027*	ν Peg	22 02.4 +24 51	+0.365	12	3.86	2.0	3.78	+0.322	3 2	2.2	F5 V	2
210418	θ Peg	22 05.2 + 5 42	+0.052	2	3.55	1.0	3.53	-0.019	2	1.0	A2 IV	3
+22°4567*	CC 1342	22 05.9 +22 18	+0.855	10	9.37	1.0	9.21	+0.855	2	1.0	dK4	4
210745*	ξ Cep	22 07.4 +57 42	+1.431	10	3.58	1.0	3.31	+1.482	2	1.0	K1 Ib	2
211336	ϵ Cep	22 11.3 +56 33	+0.239	6	4.21	3.0	4.16	+0.185	3	1.2	F0 IV	2
211415	HR 8501	22 11.7 -54 07	+0.519	8	5.54	0.5	5.44	+0.490	2	1.0	G0	1
211476	CC 1351	22 12.2 +12 23	+0.524	0	7.12	1.0	7.02	+0.495	2	1.0	dG2	4
211998*	ν Ind	22 16.0 -72 44	+0.568	12	5.30	0.5	5.19	+0.543	2	1.0	G0	1
212044*	+51°3341	22 16.4 +51 21	-0.031	2	6.96	1.5	6.96	-0.109	2	1.0	B2p	1
212061*	γ Aqr	22 16.5 - 1 53	-0.086	4	3.86	1.5	3.87	-0.168	2	1.0	A0 V	3
212943	35 Peg	22 22.8 + 4 12	+0.976	6	4.95	1.0	4.76	+0.987	2	1.0	K0 III	6
213051/2*	ζ Aqr	22 23.7 - 0 32	+0.336	10	3.72	1.7	3.65	+0.290	2	1.0	F2 III	3
214846*	β Oct	22 35.8 -81 54	+0.154	3	4.17	2.0	4.13	+0.093	3	1.2	F0	1
215648	ξ Peg	22 41.6 +11 40	+0.440	1	4.29	0.0	4.20	+0.404	2	1.0	F7 V	2
216697	+14°4894	22 49.9 +14 49	+0.006	6	8.66	0.3	8.65	-0.069	3	1.3	A2	1
216735*	ρ Peg	22 50.2 + 8 17	-0.043	10	4.94	0.5	4.93	-0.122	2	1.0	A1 V	7
216803*	HR 8721	22 50.8 -32 06	+0.979	12	6.68	2.2	6.49	+0.990	5	1.6	dK4	4
216899*	CC 1392	22 51.8 +16 02	+1.318	4	8.93	0.0	8.68	+1.359	2	1.0	dM2	4
216956*	α PsA	22 52.1 -30 09	+0.051	11	1.15	0.0	1.13	-0.020	2	1.0	A3 V	2
216965	+14°4902	22 52.2 +14 53	+0.255	3	8.38	0.3	8.32	+0.203	3	1.2	F0	1
217014	51 Peg	22 52.5 +20 14	+0.595	6	5.58	1.2	5.46	+0.572	3	1.2	dG0	4
217357	CC 1396	22 55.0 -23 04	+1.177	3	8.18	0.5	7.96	+1.205	2	1.0	dM1	4
217479	+14°4912	22 55.9 +15 07	+1.153	7	8.25	1.0	8.03	+1.180	3 3 2	3.4	K2	1
217559	+14°4916	22 56.4 +14 20	+0.881	9	7.25	1.0	7.08	+0.883	4 3 2	3.6	K0	1
217602	+15°4748	22 56.8 +15 25	+0.263	10	8.30	1.3	8.24	+0.211	3 2	2.4	A0	1
217717	+15°4750	22 57.5 +15 18	+0.416	4	9.26	0.0	9.18	+0.378	2	1.0	F5	1
217732	+15°4751	22 57.6 +15 42	+1.125	4	6.72	---	6.51	+1.149	St St St	6.0	K0	1
217785	+15°4752	22 58.0 +15 55	+0.097	8	7.44	2.0	7.41	+0.030	4 3	2.6	A2	1
217819	+15°4753	22 58.3 +15 31	+1.200	7	8.73	0.5	8.50	+1.231	2 3	2.2	K2	1
217987	CC 1400	22 59.4 -36 26	+1.303	0	7.68	0.5	7.43	+1.343	2	1.0	dM2	4
218045	α Peg	22 59.8 +14 40	-0.059	3	2.50	---	2.50	-0.139	St St	4.0	B9 V	2
218060*	83 Aqr	22 59.9 - 8 14	+0.239	6	5.60	0.5	5.55	+0.185	2	1.0	dF0n	4
218155	+14°4929	23 00.6 +14 25	-0.022	5	6.79	---	6.78	-0.099	St St	4.0	A0	1
218329	55 Peg	23 02.0 + 8 52	+1.444	6	4.80	2.2	4.54	+1.496	4 2	2.4	M2 III	2
-0°4470*	CC 1404	23 04.4 + 0 12	+0.605	7	10.10	1.0	9.98	+0.583	2	1.0	sdG2	7
218658*	π Cep	23 04.7 +74 51	+0.718	9	4.51	2.0	4.37	+0.706	2	1.0	G2 III	7
219134	HR 8832	23 08.5 +56 37	+0.897	9	5.73	1.2	5.56	+0.901	4 2	2.4	K3 V	2
219459	+64°1779	23 10.8 +64 53	+0.351	0	7.32	1.5	7.25	+0.307	2	1.0	F2	1
219615	γ Psc	23 12.0 + 2 44	+0.804	5	3.86	---	3.71	+0.800	St	2.0	G8 III	2
219916*	θ Cep	23 14.5 +67 34	+0.737	5	4.85	2.0	4.71	+0.727	2	1.0	K0 III	2
220825*	κ Psc	23 21.8 + 0 42	-0.003	2	4.96	0.0	4.95	-0.078	2	1.0	A3s	4
220954	θ Psc	23 22.9 + 5 50	+0.994	4	4.42	0.5	4.23	+1.007	2	1.0	K1 III	6
221354	CC 1431	23 26.5 +58 37	+0.740	2	6.90	0.5	6.76	+0.730	2	1.0	dK2	4
222107*	λ And	23 32.7 +45 55	+0.930	5	4.06	2.0	3.88	+0.937	2	1.0	G8 III-IV	2
222237*	CC 1443	23 33.7 -73 15	+0.864	7	7.27	1.0	7.10	+0.865	4	1.4	K3	7
222368	ι Psc	23 34.8 + 5 05	+0.408	4	4.23	0.2	4.15	+0.369	3 2	2.2	F7 V	2
222404	γ Cep	23 35.2 +77 04	+0.924	9	3.37	2.0	3.19	+0.930	3	1.2	K1 IV	2
+1°4774	Cin 3124	23 44.0 + 1 52	+1.277	7	9.17	2.0	8.94	+1.314	2	1.0	dM2	4
223551*	-52°10521	23 45.3 -52 16	+0.668	4	7.73	3.0	7.60	+0.652	2	1.0	G5	1
223778*	HR 9038	23 47.5 +74 59	+0.854	2	6.49	2.0	6.33	+0.854	3	1.2	dK5	4
224151*	HR 9052	23 50.8 +56 51	+0.102	6	6.10	2.0	6.07	+0.036	2	1.0	B0	1
224617*	ω Psc	23 54.2 + 6 19	+0.342	4	4.12	1.5	4.05	+0.297	2	1.0	F4 III	6
224930*	85 Peg	23 56.8 +26 34	+0.580	16	5.87	1.3	5.76	+0.534	4 2	2.4	G2 V	2
225213	Cin 3161	23 59.4 -37 51	+1.288	13	8.83	3.0	8.59	+1.327	3	1.2	dM3	4

NOTES TO TABLE IV.		
HD No.		
886	A β CMa variable.	40312
1326	$\Delta m = 3.0$. The bright star is a Sp.B.	40932
2261	Sp.B., $P = 3849^d$.	
2880	$\Delta m = 0.0$.	
2884/5	β^1 and β^2 are separated by $27''$ and were observed as one star.	41700 }
3003	β^3 is a common proper motion companion, itself a visual binary with $\Delta m = 0.4$.	41742 }
3196	ADS 490, $\Delta m = 0.6$. The brighter star is a Sp.B., $P = 2^d 1$.	42807 }
3359 }	$330''$, common proper motion.	44743
3405 }	$\Delta m = 0.0$.	46273
3443	ADS 558, $\Delta m = 3.2$.	51825
3690	ADS 671AB, $\Delta m = 3.7$. The bright star is an unresolved astrometric binary.	55130
4614	Sp.B.	57061
5133	ADS 755, $\Delta m = 0.4$.	Cin 891 }
5286	Visual binary, $\Delta m = 0.0$.	58946 }
6595	$320''$, common proper motion. Both stars are visual binaries.	66368
7693 }	Spectral type by Roman (<i>Ap. J.</i> 110, 205, 1949).	66811
7788 }	Visual binary, $\Delta m = 0.2$.	74874
7804	Visual binary, $\Delta m = 0.0$.	
9770	Sp.B., $P = 2^d$.	76932
10360/1	Sp.B., $P = 107^d$.	76943
11443	$\Delta m = 0.0$. One of the stars is also a Sp.B.	78154
11636	Sp.B., 2 sp.	78362/3
11803	$\Delta m = 0.4$.	
13372	Sp.B., $P = 9^d 9$.	78647
13594	$\Delta m = 0.0$.	79210/11
13974	$14'$, common proper motion. The bright star is ADS 2080, $\Delta m = 2.5$, spectral type by Slettebak, (<i>Ap. J.</i> 119, 146, 1954).	79969
16619	The Mount Wilson classification of the spectrum is A4sp, "intermediate white dwarf."	80388/9
+2°418 }	Visual binary, $\Delta m = 3.0$. The companion is probably variable in light.	81188
16970 }	Visual binary, $\Delta m = 0.4$. The bright star is a Sp.B.	82434
19445		85235
20010		86728
20121		88021/2
20766 }	$310''$, common proper motion, parallax and radial velocity.	+20°2465
20807 }	$255''$, common proper motion.	89484/5
20781 }	NPS 10. Spectral type by Keenan (<i>Ap. J.</i> 91, 113, 1940).	
20782 }	Double-lined Sp.B.	89758
21070 }	Spectral type quoted by Hill and Schilt (<i>Contr. Rutherford Obs.</i> No. 32, 1952).	
21364	Sp.B. Light variable 0.02 mag. in spectroscopic period, Kron and Thompson, unpublished.	89862
+13°565 }	$24'.5$, common proper motion and parallax. The bright star is a Sp.B., $P = 1900^d$.	+56°1458 }
22124	$\Delta m = 2.8$. Kuiper classifies the companion as M4.	90839 }
23817 }	$\Delta m = 0.0$.	90589
24293 }	Spectral type G2 III by Roman (<i>Ap. J.</i> 110, 205, 1949), changed to G5 III in <i>Ap. J.</i> 116, 122, 1952.	92787 }
24916	ADS 3264, $\Delta m = 2.3$.	92855 }
26842	$\Delta m = 0.1$.	94978
27022	The spectral type is by Vyssotsky and Mateer (<i>Ap. J.</i> 116, 117, 1952).	95001
28485	Sp.B.	95689
30810	ADS 3701, $\Delta m = 0.0$.	95735
+49°1280 }	CE Tauri.	+36°2165
32147	ADS 4519, $\Delta m = 2.2$. An optical pair.	103932
32923		105122
36389		
39881		
	"Silicon" star. Deutsch (<i>Ap. J.</i> 105, 293, 1947).	
	ADS 4617, $\Delta m = 1.6$. The bright star is a Sp.B., $P = 4^d 4$. The system may vary in light. Slettebak (<i>Ap. J.</i> 119, 146, 1954) finds the bright star to be a metallic-line star.	
	$200''$, common proper motion. The faint star is a visual binary, $\Delta m = 3.0$.	
	Spectral type by Popper (<i>Ap. J.</i> 93, 210, 1943).	
	Sp.B. with two periods, $0^d 25$ and 42^d . The star may also be variable in light.	
	Visual binary, $\Delta m = 0.0$, also a Sp.B. A third star, 8.4 mag., also included in the observations.	
	Visual binary, $\Delta m = 0.2$.	
	ADS 5871, $\Delta m = 0.0$.	
	Sp.B., $P = 4^d 4$.	
	$12'.5$, common proper motion and parallax. The spectral type of the fainter star is by Vyssotsky.	
	NPS 6. Spectral type by Keenan (<i>Ap. J.</i> 91, 113, 1940).	
	Spectral type from the Yerkes Atlas.	
	ADS 6993, $\Delta m = 1.2$. The spectral type is given as Go III in the Yerkes Atlas. Bidelman (unpublished) says the spectrum is composite and the primary is near G5III.	
	Spectral type by Keenan and Keller, <i>Ap. J.</i> 117, 241, 1953.	
	Visual binary, $\Delta m = 1.7$.	
	ADS 7203, $\Delta m = 3.3$.	
	Metallic-line star. Herbig finds velocity variable in long period, unpublished.	
	Spectral type by Bidelman, unpublished.	
	$\Delta m = 0.0$.	
	$\Delta m = 0.0$.	
	Visual binary, $\Delta m = 2.0$. Spectral type by Moore and Paddock (<i>Ap. J.</i> 112, 48, 1950).	
	Sp. B., $P = 117^d$.	
	Visual binary, $\Delta m = 0.6$ to 1.2 . Companion variable in light.	
	ADS 7545, $\Delta m = 0.1$.	
	Spectral type by Bidelman (<i>Ap. J.</i> 113, 304, 1951).	
	$\Delta m = 0.0$.	
	AD Leonis, flare star. Unresolved astrometric binary, $P = 26.5$ years.	
	ADS 7724, $\Delta m = 1.2$. The spectral type refers to the bright star. Keenan and Keller classify the two components as KoIII- and G7III+, <i>Ap. J.</i> 117, 241, 1953.	
	Probably variable, $V = 3.21$, 3.28 and 3.33 mag. on May 1 and June 13, 1952, and January 29, 1953, respectively. Sp.B.	
	Common proper motion and radial velocity. The Yerkes classification of HD 89862 as KoIV makes a determination of the parallax of this star desirable.	
	Sp.B.	
	$288''$, common proper motion. The faint star is a Sp.B.	
	Spectral type by Moore and Paddock (<i>Ap. J.</i> 112, 48, 1950). Sp.B.	
	Reported as variable, with a range of 1.4 mag. by Schilt and Hill (<i>Contr. Rutherford Obs.</i> , No. 30, 1937).	
	ADS 8035, $\Delta m = 2.9$.	
	Lal 21185, unresolved astrometric binary.	
	The spectral type is by Popper (<i>Ap. J.</i> 95, 308, 1942). The velocity varies from -169 to -210 km/sec.	
	Sp.B.	
	$\Delta m = 0.0$.	

105382 }	368", common proper motion and velocity.	133460	Spectral type by Moore and Paddock (<i>Ap. J.</i> 112, 48, 1950). Sp.B.
105383 }	Galactic pole blue star. Spectral type by Humason and Zwicky (<i>Ap. J.</i> 105, 85, 1947).	+6°2986	Unresolved astrometric binary.
+36°2268	Sp.B.	+24°2824	Spectral type unknown.
105805	Spectral type by Keenan and Keller (<i>Ap. J.</i> 117, 241, 1953).	134439 }	301", common proper motion, parallax and velocity. $V_r = 300\text{km/sec}$. The spectral type of the bright star is by Popper [<i>Ap. J.</i> 95, 308, 1942).
106516	Visual binary, $\Delta m = 4.6$.	134440 }	Either this star is very highly reddened or the Harvard spectral type is in error.
108903	Visual binary, $\Delta m = 0.1$.	134468	ADS 9535, $\Delta m = 0.9$.
110304	ADS 8630, $\Delta m = 0.0$.	135101	$\Delta m = 0.0$. Spectral type by Keenan and Keller (<i>Ap. J.</i> 117, 245, 1953).
110379/80	Spectral type by Keenan and Keller (<i>Ap. J.</i> 117, 245, 1953).	135204	Spectral type by Moore and Paddock (<i>Ap. J.</i> 112, 48, 1950).
111028	Spectral type by Roman (<i>Ap. J.</i> 110, 205, 1949).	135633	105", common proper motion.
+21°2462	$\Delta m = 0.2$. Spectral type by Cannon and quoted in <i>Pub. Yale Obs.</i> 10, 1934.	135722 }	$\Delta m = 0.3$.
112097	Sp.B.	+33°2652 }	Sp.B.
112185	Sp.B., $P = 4.2$ years. Spectrum variable.	136176	Sp.B., $P = 227^d$.
112412/3	ADS 8706, $\Delta m = 2.7$. Bright star is a spectrum variable.	136274	ADS 9617, $\Delta m = 0.3$.
113139	ADS 8739, $\Delta m = 2.4$.	137052	108", common proper motion, parallax and velocity. ADS 9626A, BC. $\Delta m(\text{BC}) = 0.6$.
114378/9	ADS 8804, $\Delta m = 0.0$.	137107/8	Sp.B.
114494	Spectral type by Moore and Paddock (<i>Ap. J.</i> 112, 48, 1950). Sp.B.	137391 }	Sp.B., $P = 10$ years. Close visual binary, $\Delta m = 0.0$. Called a peculiar F-type star in the Yerkes Atlas.
115404	$\Delta m = 2.7$. Kuiper classifies the spectrum of the faint star as Mo.	137392 }	Sp.B. and eclipsing variable, $P = 17^d$. The magnitude and color is that of maximum light.
+35°2436	$\Delta m = 2.4$.	137422	122", common proper motion, parallax and velocity.
+35°2439	Spectral type unknown.	137909	The radial velocity of this subdwarf is -170 km/sec .
116495	ADS 8887, $\Delta m = 0.2$.	139006	ADS 9757, $\Delta m = 1.4$. The bright star is a Sp.B., 2 sp. The spectral type is by Slettebak (<i>Ap. J.</i> 119, 146, 1954).
116656/7	ADS 8891, $\Delta m = 1.6$. The bright star is a Sp.B., $P = 21^d$, two spectra. The spectral type refers to the bright star, the fainter component is a metallic-line star.	139323 }	27'4, common proper motion.
118022	Spectrum variable.	139341 }	Triple system, $\Delta m(\text{AB}) = 0.1$ and $\Delta m(\text{AB-C}) = 3.0$. All three stars were measured together.
118261	Visual binary, $\Delta m = 0.3$.	140283	ADS 9909, $\Delta m = 0.2$. A third star, 7.2 mag., was also included in the measures.
+8°2735	Spectral type unknown.	140436	ADS 9913AC, $\Delta m = 2.3$. The companion is a Sp.B., $P = 648$.
118889	ADS 8987, $\Delta m = 0.1$.	140665 }	Sp.B., $P = 3^d$.
119124	$\Delta m = 3.5$.	141003 }	Sp.B.
120066 }	485", common proper motion and parallax.	143474	Sp.B., $P = 9^d$.
+7°2692 }	$\Delta m = 0.5$.	144070	ADS 9933, $\Delta m = 1.2$. The spectral type refers to the bright star.
120476	Spectral type by Vyssotsky (<i>Ap. J.</i> 97, 381, 1943).	144217	Spectral type by Keenan and Keller (<i>Ap. J.</i> 117, 245, 1953).
+13°2721	Sp.B., $P = 495^d$.	144284	Sp.B.
121370	ADS 9090, $\Delta m = 0.0$.	144287	Sp.B., $P = 9^d$.
+47°2112	$\Delta m = 0.1$.	144426	ADS 9933, $\Delta m = 1.2$. The spectral type refers to the bright star.
122769	Sp.B., $P = 51^d$.	145000/1	Spectral type by Keenan and Keller (<i>Ap. J.</i> 117, 245, 1953).
123299	Sp.B.	145148	Sp.B.
123999	$\Delta m = 0.1$.	145328	"Peculiar A star of the manganese type." (Slettebak, <i>Ap. J.</i> 119, 146, 1954).
124757	Spectral type by Sahade (<i>Ap. J.</i> 117, 234, 1953).	145389	LQ Her. Observed on June 28 and 29, 1953.
125072	Weak line star. Spectral type from the Yerkes Atlas.	145713	ADS 9969, $\Delta m = 0.1$.
125162	Visual binary, $\Delta m = 0.3$.	145958	Visual binary, $\Delta m = 2.1$. The bright star is classified MoV on the MK system.
+24°2733	Spectral type by Keenan and Keller (<i>Ap. J.</i> 117, 245, 1953).	147379	Sp.B., $P = 13^d$.
128429	A "strontium" star.	147584	"Peculiar A star; chromium is very strong." (Slettebak, <i>Ap. J.</i> 119, 146, 1954.)
128898	ADS 9338, $\Delta m = 1.0$. The bright star is a spectrum variable, the fainter is a metallic-line star.	148112	$\Delta m = 0.0$.
129174/5	ADS 9343, $\Delta m = 0.0$.	148653	Spectral type by Keenan and Keller (<i>Ap. J.</i> 117, 245, 1953).
129246/7	135", common proper motion. The bright star is ADS 9352, $\Delta m = 0.3$. The spectral types are by Vyssotsky (<i>Ap. J.</i> 104, 234, 1946).	148816	Sp.B., $P = 411^d$.
+20°3009 }	ADS 9372, $\Delta m = 2.4$. The fainter component is a Sp.B., 2 sp.	148856	This star is both BD $-2^\circ 42'11''$ and $-1^\circ 32'20''$.
+20°3010 }	$\Delta m = 0.5$.	149661	ADS 10157, $\Delta m = 2.6$.
129988/9	$\Delta m = 0.0$.	150680	$\Delta m = 0.0$.
130188	231", common proper motion, parallax and velocity.	151188	"Peculiar A star: strontium and chromium are abnormally strong." (Slettebak, <i>Ap. J.</i> 119, 146, 1954.)
130669	ADS 9413, $\Delta m = 2.0$. The bright star is classified G8V on the MK-system.	152107	Visual binary, $\Delta m = 0.0$.
130819 }	Sp.B.	152751	
130841 }			
131156			
131511			

153597	Sp.B., $P = 52^d$.		
154363 } -4°42'26" }	187", common proper motion, parallax and velocity.	166233	June 30, July 5, and July 7, 1953, respectively.
155103	ADS 10360, $\Delta m = 0.0$.	167516	ADS 11111, $\Delta m = 1.0$.
155125	ADS 10374, $\Delta m = 0.5$.		Spectral type by Morgan (<i>Ap. J.</i> 115, 476, 1952) from objective prism plates taken with the Warner and Swasey Schmidt. Bidelman (unpublished) classifies the spectrum as "composite, G5III +A."
155876	Visual binary, $\Delta m = 0.3$.		Spectral type by Moore and Paddock (<i>Ap. J.</i> 112, 48, 1950). Sp.B.
155885/6 } 156026 }	700", common proper motion, parallax and velocity. The bright pair is ADS 10417, $\Delta m = 0.0$.	168245	600", common proper motion and velocity.
156014/5	ADS 10418. The bright star is an irregular variable, 3.0-4.0 mag. The faint star, 5.4 mag. is a Sp.B., $P = 52^d$. The magnitude results are $V = 3.33$, 3.21, and 3.12 mag., on August 27 and September 3, 1952, and June 4, 1953, respectively.	169689/0 } 169822 } 169889 } 169985 }	A triple spectroscopic system, $P(ab-c) = 386^d$ and $P(bc) = 2^d$. Sp.B., $P = 281^d$.
156274	Visual binary, $\Delta m = 3.1$.	170153	Bidelman (<i>Ap. J.</i> 113, 304, 1951) classifies the spectrum as F6p and states, "The lines, especially hydrogen, are weak, as in the subdwarfs."
156384	Visual triple, $\Delta m(AB) = 1.5$ and $\Delta m(AB-C) = 3.8$.	171620	Sp.B., $P = 14^d$. Spectral type by Morgan and Roman (<i>Ap. J.</i> 112, 363, 1950).
157089	The radial velocity is -160 km/sec. Spectral type by Keenan and Keller (<i>Ap. J.</i> 117, 245, 1953).	171635	Sp.B.
157978/9 } +31°30'25" }	The spectrum is composite. Sp.B.	171834	ADS 11520, $\Delta m = 0.1$.
158226 } 158408 }	70", common proper motion and velocity.	172088	Spectral type by Bidelman (<i>Ap. J.</i> 113, 304, 1951).
158614	Sp.B.	172365	ADS 11576, $\Delta m = 2.7$.
158633	ADS 10598, $\Delta m = 0.1$.	+31°33'30"	ADS 11640, $\Delta m = 0.4$.
158837	Sp.B.	173495	$\Delta m = 0.8$.
158926	ADS 10607, $\Delta m = 0.0$. Sp.B.	173739/0	Eclipsing variable discovered at the Cape Observatory, $P = 0^d$.
159561	Sp.B., $P = 5^d$.	175813	ADS 11871, $\Delta m = 1.8$.
160269	An unresolved astrometric binary.		ADS 11950, $\Delta m = 0.2$.
161471	ADS 10660, $\Delta m = 2.6$.	176051	$\Delta m = 0.1$.
161817	Spectral type by Morgan and Roman (<i>Ap. J.</i> 112, 362, 1950). Sp.B.	176687	Sp.B., 2 sp.
	Albitzky (<i>Pulkovo Obs. Circ.</i> , No. 7, 1933) and Merrill (<i>Pub. A.S.P.</i> , 59, 256, 1947) have found the velocity to be -360 km/sec. Slettebak (<i>Ap. J.</i> 115, 576, 1952) finds the spectrum to be peculiar and that the star is probably intermediate between the dwarfs and subdwarfs near spectral type A2.	177166	Visual binary, $\Delta m = 0.1$.
162262	Spectral type by Moore and Paddock (<i>Ap. J.</i> 112, 48, 1950). Sp.B.	177171	Sp.B., $P = 22^d$.
162774	The magnitude may be variable.	177474/5	Sp.B., $P = 5^d$.
163624	ADS 10912, $\Delta m = 0.2$.	178428	ADS 12160, $\Delta m = 1.3$.
+4°35'51"	Barnard's proper motion star. Joy (<i>Ap. J.</i> 105, 414, 1947) classifies this star as a subdwarf M4.5.	178619	$\Delta m = 1.4$. Sp.B.
163810	ADS 10938, $\Delta m = 1.2$. Munch (<i>Ap. J.</i> 99, 272, 1944) classifies this star as a subdwarf G5. The velocity is +200 km/sec.	179588	ADS 12169, $\Delta m = 0.2$.
+18°35'16"	Hoffmeister (<i>A. N.</i> 401, 1935) suspected the magnitude of this star to vary 1.3 mag. in a short period. The present observations are $V = 9.18$, 9.17, and 9.15 mag. on June 29, July 1, and August 26, 1952, respectively. The spectral type is unknown.	179757	The spectral type is by Bidelman (<i>Ap. J.</i> 113, 304, 1951).
164577	Spectral type is Slettebak (<i>Ap. J.</i> 119, 146, 1954). Sp.B.	179957/8	Spectral type by Bidelman. "In general, the spectrum is similar to G5II, but the hydrogen lines are definitely weaker than the normal for this type."
165189/0	Visual binary, $\Delta m = 0.0$.	180028	Sp.B.
165341	ADS 11046, $\Delta m = 1.7$. The bright star is a Sp.B., $P = 18^d$. The spectral type refers to the bright star.	180262	ADS 12248, $\Delta m = 2.9$.
165401	Spectral type by Keenan and Keller (<i>Ap. J.</i> 117, 245, 1953).	180482	The spectral type is by Bidelman (<i>Ap. J.</i> 113, 304, 1951).
+15°33'64"	Spectral type by Vyssotsky as quoted in the <i>General Catalogue of Trigonometric Stellar Parallaxes</i> , Louise Jenkins.	180555	Hoffmeister (<i>A. N.</i> 255, 401, 1935) suspected this star to be an eclipsing variable with a range of 0.6 mag.
165893	Visual binary, $\Delta m = 0.0$.	180583	The spectral type is by Bidelman, unpublished.
165908	ADS 11077, $\Delta m = 3.4$.	181166	Sp.B.
166067	Buser (<i>A. N.</i> 258, 131, 1936) suspected the visual magnitude to vary from 7.1 to 7.8 mag. The present observations give $V = 7.49$, 7.44, 7.46, 7.44, 7.51, and 7.46 mag. on June 3, June 29 and July 1, 1952 and	181214	Unresolved astrometric binary, $P = 1250^d$.
		182490	Sp.B.
		182640	Sp.B.
		182919	Sp.B.
		183030	NPS2r. Spectral type by Keenan (<i>Ap. J.</i> 91, 113, 1940).
		+35°36'59p	Spectral type unknown.
		184313	McCuskey (<i>Ap. J.</i> 109, 426, 1949) gives the spectral type as M8V. Slit spectra show the star to be a giant (Herbig, unpublished).
		186858 }	Common proper motion. The bright star is ADS 12913, $\Delta m = 3.6$. The faint pair is ADS 12889, $\Delta m = 0.2$.
		187013 }	ADS 12880, $\Delta m = 3.5$.
		186882	Visual binary, $\Delta m = 1.0$.
		+31°37'67"	NPS4r. Spectral type by Keenan (<i>Ap. J.</i> 91, 1940).
		187138	

188037	ADS 13055, $\Delta m = 0.1$. Espin (<i>A. N.</i> 118, 257, 1888) suspected the magnitude to vary with a range of 0.5 mag. The present results give $V = 7.93, 7.85, 7.93$, and 7.91 mag. on July 1 and August 27, 1952, and July 15 and August 6, 1953, respectively. The spectrum is composite, A1 and M5 $\pm$ (Herbig, unpublished).
188056	Danjon discovered this star to be an eclipsing variable, $P = 1^d 08$, with a range of 0.1 mag. The periodicity is not confirmed by the present observations.
189044	$\Delta m = 0.0$.
190248	Probably variable. Individual results are $V = 3.52, 3.64, 3.62, 3.65, 3.52$, and 3.57 on July 24, 25, 28, August 27, September 7 and 8, 1951, respectively.
190625	Schilt and Hill (<i>Rutherford Obs. Contr.</i> , No. 30, 1937) found the magnitude to vary with a range of 0.7 mag.
191408	The radial velocity is -130 km/sec.
192310	Sp.B.
192640	Spectral type by Slettebak (<i>Ap. J.</i> 115, 575, 1952). "Its (29 Cygni) spectral peculiarities are not so striking as those of a true subdwarf, but they tend in that direction."
193495/6	Sp.B., $P = 1374^d$. The spectrum is composite.
193924	Sp.B., $P = 11^d 8$.
196755 }	Common proper motion and velocity.
196794 }	
196771 }	
196771 }	
+35°4198	Liau (<i>Lyon Pub.</i> 1, No. 13, 1935) found the magnitude to be variable with a range of 0.3 mag. in a short period.
197989	Spectral type unknown.
+61°2067	Sp.B.
199908	Spectral type by Vyssotsky as quoted by Jenkins in the <i>General Catalogue of Trigonometric Stellar Parallaxes</i> , 1952.
+54°2461	Short period variable with a range of 0.06 mag., DQ Cephei.
201601	Intermediate white dwarf.
201772	"Strontium-Europium" star. Deutsch (<i>Ap. J.</i> 105, 283, 1946).
202275	Sp.B., 2 sp.
202444	ADS 14773, $\Delta m = 0.0$.
202447/8	ADS 14787, $\Delta m = 2.5$. The bright star is a Sp.B., $P = 0^d 14$.
203133	Sp.B., $P = 105^d$.
205478	Y Pavonis, a semi-regular variable with $P = 233^d$. The photographic magnitude range is about 2 mag. The present observations were made on September 7 and 8, 1951.
206774 }	Sp.B., $P = 1037^d$.
206807 }	
206792 }	
206804 }	
209747	153", common proper motion and velocity.
210027	$\Delta m = 0.0$.
210745	Visual binary, $\Delta m = 0.2$.
+22°4567	Sp.B.
21198	Sp.B., $P = 10^d$.
212044	Sp.B.
212061	Visual binary, $\Delta m = 0.1$.
213051/2	Kron (<i>Pub. A. S. P.</i> 50, 175, 1938) found the magnitude to vary irregularly with a range of 0.2 mag.
214846	Sp.B.
216735	ADS 15971, $\Delta m = 0.2$.
216803 }	Spectral type by Slettebak (<i>Ap. J.</i> 119, 146, 1954).
216956 }	
216899 }	
216899 }	Common proper motion, velocity and parallax.
216899 }	Sp.B.

218060	ADS 16497, $\Delta m = 0.0$. Sp.B.
-0°4470	Spectral type by Joy (<i>Ap. J.</i> 105, 96, 1947).
218658	ADS 16538, $\Delta m = 3.5$. The bright star is a Sp.B., $P = 556^d$. Spectral type from Yerkes Atlas.
219916	ADS 16666, $\Delta m = 2.5$.
220825	"Peculiar A star: Chromium is abnormally strong." (Slettebak, <i>Ap. J.</i> 119, 146, 1954.)
222107	Sp.B., $P = 20^d$.
222237	Spectral type by Sahade (<i>Ap. J.</i> 117, 234, 1953).
223551	Visual binary, $\Delta m = 0.2$.
223778	Sp.B., $P = 8^d$.
224151	Stebbins (<i>Pub. Washburn Obs.</i> 15, 99, 1928) suspected the magnitude to vary. Sp.B., 2 sp., $P = 13^d 4$.
224617	Sp.B.
224930	ADS 17175, $\Delta m = 3.0$.

Cincinnati Publications Vol. 20 (CC) or Vol. 18 (Cin) is used when available. Stars in Aitken's *Catalogue of Double Stars* are indicated by the abbreviation ADS followed by the number in that catalogue.

Third and fourth columns: The position for 1900 taken, when available, from the Henry Draper Catalogue.

Fifth, to eighth columns: The colors, C , and magnitudes, m , on the system defined by the photometer used in season "23." Equations (1) and (2) were used to reduce the observations of seasons "89" and "S" to this system. The average deviations, AD , are given in units of 0.001 mag. for C and 0.01 mag. for m .

Ninth and tenth columns: The visual magnitude, V , and the color index, $P-V$, on the $(P, V)_E$ -system. These values were computed from m and C with equations (3) and (4). The last place in the values of $(P-V)$ is carried only as a guard figure and the colors when used should be rounded off to the nearest 0.005 mag., as in Tables V, VI and VII.

Eleventh column: The total number of observations in the seasons in which the star was observed.

Twelfth column: The weight of V and of $P-V$ for each season was taken as

$$\text{weight per season} = \sqrt{n/2}, n = 1, 2, \dots, 8. \quad (5)$$

In the few cases where n , the number of observations in one season, exceeds 8, $n = 8$ was used in equation (5). The total weight was then obtained by summing the weights for each season observed. The weights range from 1.0 to 6.0.

The reference numbers in the last column refer to the following:

1. Henry Draper Catalogue.
2. The MK type defined by Johnson and Morgan in *Ap. J.* 117, 313, 1953. A few of

- the types are taken from chapter I of *Astrophysics* (Hynek, 1951) and, for 19 stars between $\alpha = 3^{\text{h}}11^{\text{m}}$ and $3^{\text{h}}31^{\text{m}}$, $\delta = +47^\circ$ to $+50^\circ$, from *Ap. J.* **111**, 426, 1950.
3. Unpublished types on the system of the Yerkes *Atlas of Stellar Spectra* determined by Miss E. Woods from objective-prism plates taken by W. B. Rimmer with the 9-inch Oddie refractor.
  4. Mount Wilson classifications, mostly by A. H. Joy, listed in the *General Catalogue of Stellar Radial Velocities* by R. E. Wilson.
  5. Spectral types by Kuiper and quoted by Louise Jenkins in the *General Catalogue of Trigonometric Stellar Parallaxes*. These types were corrected to the MK system with the reduction tables given by Johnson and Morgan in *Ap. J.* **117**, 313, 1953.
  6. The spectral types given by Miss N. G. Roman in *Ap. J.* **116**, 122, 1952, and *Ap. J.* **112**, 554, 1950.
  7. Other sources for these types are given in the Notes to the Catalogue.

Comparison with other systems. Johnson and Morgan (1953) recently published magnitudes and colors of 283 stars on their (B, V) system. The zero-point and scale of the V magnitudes are fixed by the nine polar stars in Table III, but the $(B-V)$ colors define an entirely new color system.

The comparison of $(B-V)$ with $(P-V)_E$ for 121 stars is shown in Figure 2C and Table V. For values of $(B-V) > +0.9$ mag. the giant and dwarf stars are distinguished by filled and open circles, respectively. The linear transformation, indicated by the full line, is:

$$(P-V)_E - 0.435 = 1.0376[(B-V) - 0.540], \quad (6)$$

or

$$(P-V)_{E,J} = -0.125 + 1.0376(B-V), \\ \pm 0.001 \pm 0.0012 (\text{p.e.}),$$

where $(P-V)_{E,J}$ indicates values of $(B-V)$ transformed to the $(P, V)_E$ -system. The dwarfs, with $(B-V)$ between $+1.0$ and $+1.5$ are represented by the dashed line computed from the equation:

$$(P-V)_{E,J} = +0.08 + 0.84(B-V) \\ \pm 0.01 \pm 0.01 (\text{p.e.}). \quad (7)$$

This luminosity effect in the red stars does not appear in the intercomparison of the colors obtained in seasons "89," "S," and "23." Its presence may result from the fact that the yellow cutoff of both blue filters used in the present work, Corning Nos. 5330 and 5562, is near

$\lambda 5400$, whereas the yellow cutoff of the blue filter used by Johnson and Morgan is nearer $\lambda 5600$. The difference in cutoff is small, but in this part of the spectrum the radiation from the reddest stars is relatively low and, percentage-wise, may vary rapidly with temperature.

The colors of the two late-type subdwarfs, $-4^\circ 4226$ and $+4^\circ 3561$, the latter Barnard's proper motion star, are not adequately represented by either (6) or (7), and are given in Table V in parentheses.

The two sets of magnitudes, V_E and V_J , are compared directly and the differences $V_E - V_J$ are plotted against $(P-V)_E$ in Figure 2C. The systematic difference is -0.0015 mag. and the probable error of one difference is ± 0.024 mag. The $(B-V)$ colors were converted to $(P-V)_{E,J}$ by (6) or (7) and then compared with $(P-V)_E$. The probable error of one difference is ± 0.011 mag. If the two series are of equal accuracy and we ignore any errors introduced by (6) and (7), the probable errors are:

$$\text{p.e. } V_J = \text{p.e. } V_E \\ = \pm 0.024/\sqrt{2} = \pm 0.017 \text{ mag};$$

$$\text{p.e. } (P-V)_{E,J} = \text{p.e. } (P-V)_E \\ = \pm 0.011/\sqrt{2} = \pm 0.008 \text{ mag}.$$

From the internal consistency of their observations, Johnson and Morgan found the average probable errors of V_J and $(B-V)$ to be ± 0.017 mag. and ± 0.009 mag., respectively.

Cape Mimeogram No. 1 (Cape 1953) contains the magnitudes and colors of 880 bright southern stars. The magnitudes were determined photographically with a Fabry photometer and the colors were measured photoelectrically with a 931 A multiplier. One hundred and thirty-five of these southern stars are also included in the present catalogue. Table VI contains the Cape photographic magnitude minus the Cape color indices, $Pg-CI$, for these stars. The magnitude of a few stars noted by the Cape observers as variable are marked with a colon in the table. The relationship between $Pg-CI$ and V is given by:

$$V_E = (Pg-CI) - 0.03 - 0.33(P-V)_E \quad (9) \\ \pm 0.01 \pm 0.01 (\text{p.e.}).$$

The values of $Pg-CI$ converted to the V_E -system are given in the table as V_C . The probable error of one difference, $V_E - V_C$, is ± 0.026 . If the values of V_C and V_E are, in the mean, equally accurate, then the average probable error is ± 0.018 for both series. The differences between the two magnitudes are plotted against $(P-V)_E$ in the

TABLE V. COMPARISON OF THE MAGNITUDES AND COLORS OF 121 STARS DETERMINED
BY JOHNSON AND MORGAN WITH THE VALUES FROM TABLE IV

HD or BD	V_E	V_J	$E-J$	$B-V$	$(P-V)_E$	$(P-V)_{E,J}$	$E-J$	HD or BD	V_E	V_J	$E-J$	$B-V$	$(P-V)_E$	$(P-V)_{E,J}$	$E-J$
432	2.27	2.25	+0.02	+0.35	+0.215	+0.24	-0.02 ₅	124897	-0.07	-0.06	-0.01	+1.23	+1.16	+1.15	+0.01
3651	5.86	5.84	+0.02	+0.86	+0.78	+0.765	+0.01 ₅	126660	4.03	4.06	-0.03	+0.50	+0.385	+0.395	-0.01 ₀
4614	3.44	3.45	-0.01	+0.58	+0.46	+0.475	-0.01 ₅	127762	3.06	3.03	+0.03	+0.19	+0.065	+0.07	-0.00 ₅
6582	5.15	5.12	+0.03	+0.69	+0.59	+0.59	0.00	135722	3.46	3.50	-0.04	+0.95	+0.865	+0.86	+0.00 ₅
9270	3.59	3.61	-0.02	+0.98	+0.91	+0.89	+0.02	+33°2562	7.85	7.84	+0.01	+0.59	+0.485	+0.485	0.00 ₀
10476	5.23	5.20	+0.03	+0.84	+0.755	+0.745	+0.01 ₀	135742	2.60	2.62	-0.02	-0.11	-0.22	-0.24	+0.02
10700	3.51	3.49	+0.02	+0.72	+0.62	+0.62	0.00	136202	5.02	5.06	-0.04	+0.54	+0.425	+0.435	-0.01 ₀
10780	5.60	5.63	-0.03	+0.81	+0.685	+0.715	-0.03 ₀	137391	4.34	4.30	+0.04	+0.30	+0.195	+0.185	+0.01 ₀
11636	2.70	2.62	+0.08	+0.14	+0.02	+0.02	0.00	137392	6.51	6.50	+0.01	+0.59	+0.495	+0.485	+0.01 ₀
12929	2.00	1.99	+0.01	+1.155	+1.075	+1.075	0.00 ₀	137759	3.24	3.26	-0.02	+1.17	+1.11	+1.09	+0.02
13974	4.88	4.87	+0.01	+0.61	+0.49	+0.51	-0.02	139006	2.22	2.23	-0.01	-0.02	-0.13	-0.145	+0.01 ₅
15318	4.28	4.27	+0.01	-0.04	-0.165	-0.165	0.00 ₀	140573	2.59	2.66	-0.07	+1.165	+1.115	+1.085	+0.03 ₀
16160	5.82	5.82	0.00	+0.99	+0.875	+0.90	-0.02 ₅	141003	3.65	3.67	-0.02	+0.07	-0.03	-0.05	+0.02
16895	4.12	4.12	0.00	+0.48	+0.375	+0.375	0.00 ₀	141004	4.39	4.43	-0.04	+0.60	+0.505	+0.50	+0.00 ₅
17094	4.25	4.25	0.00	+0.31	+0.205	+0.195	+0.01 ₀	142373	4.59	4.60	-0.01	+0.56	+0.445	+0.455	-0.01 ₀
19373	4.06	4.04	+0.02	+0.60	+0.485	+0.500	-0.01 ₅	142860	3.82	3.85	-0.03	+0.48	+0.37	+0.375	-0.00 ₅
20630	4.81	4.82	-0.01	+0.68	+0.575	+0.58	-0.00 ₅	144284	4.01	4.01	0.00	+0.53	+0.425	+0.425	0.00 ₀
20902	1.82	1.80	+0.02	+0.48	+0.36	+0.375	-0.01 ₅	147547	3.74	3.74	0.00	+0.26	+0.185	+0.145	+0.04 ₀
29139	0.77	0.78	-0.01	+1.51	+1.455	+1.44	+0.01 ₅	150680	2.79	2.82	-0.03	+0.64	+0.55	+0.54	+0.01
30652	3.16	3.16	0.00	+0.46	+0.335	+0.35	-0.01 ₅	151288	8.12	8.11	+0.01	+1.37	+1.245	+1.23+	+0.01 ₅
30836	3.70	3.69	+0.01	-0.17	-0.33	-0.30	-0.03	154363	7.77	7.74	+0.03	+1.16	+1.035	+1.05+	-0.01 ₅
33111	2.79	2.77	+0.02	+0.12	+0.005	0.00	+0.00 ₅	+4°4226	10.10	10.07	+0.03	+1.44	+1.21	(-1.29)	(-0.08)
34411	4.68	4.71	(-0.03)*	+0.67	+0.505	+0.57	(-0.06 ₅)*	156164	3.13	3.14	-0.01	+0.08	-0.025	-0.04	+0.01 ₅
35299	5.73	5.71	+0.02	-0.21	-0.33	-0.35	+0.02	157214	5.39	5.39	0.00	+0.62	+0.53	+0.52	+0.01
36395	7.89	7.96	(-0.07)*	+1.48	+1.295	+1.32	(-0.025)*	157881	7.60	7.54	+0.06	+1.36	+1.225	+1.22+	+0.00 ₅
36591	5.38	5.36	+0.02	-0.20	-0.325	-0.335	+0.01 ₀	160269	5.24	5.23	+0.01	+0.61	+0.49	+0.51	-0.02
36673	2.56	2.56	0.00	+0.21	+0.105	+0.095	+0.01 ₀	+68°946	9.15	9.15	+0.00	+1.50	+1.365	+1.34+	+0.02 ₅
58946	4.22	4.16	+0.06	+0.31	+0.205	+0.195	+0.01 ₀	161096	2.72	2.78	-0.06	+1.16	+1.105	+1.08	+0.02 ₅
61421	0.40	0.34	+0.06	+0.40	+0.32	+0.29	+0.03	161797	3.41	3.42	-0.01	+0.75	+0.655	+0.655	0.00 ₀
62509	1.17	1.15	+0.02	+1.00	+0.94	+0.915	+0.02 ₅	161868	3.75	3.72	+0.03	+0.04	-0.055	-0.085	+0.03 ₀
74280	4.30	4.31	-0.01	-0.195	-0.345	-0.325	-0.02 ₀	+4°3561	9.51	9.53	-0.02	+1.74	+1.60	(+1.54)	(+0.06)
76644	3.10	3.12	-0.02	+0.18	+0.075	+0.06	+0.01 ₅	164058	2.17	2.22	-0.05	+1.52	+1.45	+1.45	0.00
76943	4.01	3.95	+0.06	+0.43	+0.305	+0.32	-0.01 ₅	164259	4.62	4.62	0.00	+0.38	+0.245	+0.27	-0.02 ₅
78154	4.78	4.78	0.00	+0.48	+0.385	+0.375	+0.01 ₀	165908	5.07	5.04	+0.03	+0.52	+0.40	+0.415	-0.01 ₅
82885	5.38	5.47	-0.09	+0.75	+0.675	+0.655	+0.02 ₀	166620	6.43	6.40	+0.03	+0.87	+0.785	+0.78	+0.00 ₅
88230	6.59	6.59	0.00	+1.38	+1.25	+1.24†	+0.01	168723	3.21	3.26	-0.05	+0.94	+0.845	+0.85	-0.00 ₅
89449	4.75	4.83	-0.08	+0.44	+0.36	+0.33	+0.03	170153	3.57	3.58	-0.01	+0.50	+0.40	+0.395	+0.00 ₅
98662	8.19	8.22	-0.03	+0.92	+0.875	+0.83	+0.04 ₅	173667	4.22	4.20	+0.02	+0.46	+0.335	+0.35	-0.01 ₅
+56°1458	8.69	8.69	0.00	+1.36	+1.21	+1.22†	-0.01	176437	3.26	3.23	+0.03	-0.05	-0.17	-0.175	+0.00 ₅
90639	4.81	4.82	-0.01	+0.51	+0.40	+0.405	-0.00 ₅	180617	9.03	9.12	-0.09	+1.50	+1.30	+1.34	-0.04
95689	1.82	1.79	+0.03	+1.06	+0.98	+0.975	+0.00 ₅	187013	5.00	4.99	+0.01	+0.46	+0.345	+0.35	-0.00 ₅
95735	7.48	7.47	+0.01	+1.51	+1.36	+1.35†	+0.01	187642	0.82	0.75	+0.07	+0.23	+0.10	+0.115	-0.01 ₅
96833	2.96	3.01	-0.05	+1.13	+1.075	+1.045	+0.03 ₀	188512	3.71	3.70	+0.01	+0.86	+0.755	+0.765	-0.01 ₀
101501	5.30	5.33	-0.03	+0.69	+0.62	+0.59	+0.03	197989	2.48	2.45	+0.03	+1.03	+0.95	+0.945	+0.00 ₅
102647	2.14	2.12	+0.02	+0.09	-0.035	-0.030	-0.00 ₅	198149	3.40	3.43	-0.03	+0.92	+0.825	+0.83	-0.00 ₅
102870	3.60	3.63	-0.03	+0.54	+0.44	+0.435	+0.00 ₅	199305	8.52	8.50	(+0.02)	+1.49	+1.30	+1.33+	(-0.03)*
103095	6.45	6.49	-0.04	+0.75	+0.625	+0.655	-0.03 ₀	203280	2.46	2.41	+0.05	+0.23	+0.125	+0.115	+0.01 ₀
103287	2.45	2.43	+0.02	0.00	-0.125	-0.125	0.00 ₀	210027	3.78	3.76	+0.02	+0.44	+0.32	+0.33	-0.01
106591	3.27	3.27	0.00	+0.08	-0.055	-0.04	-0.01 ₅	211336	4.16	4.19	-0.03	+0.28	+0.185	+0.165	+0.02 ₀
109358	4.25	4.29	-0.04	+0.59	+0.485	+0.485	0.00 ₀	215648	4.20	4.19	+0.01	+0.50	+0.405	+0.395	+0.01 ₀
111631	8.40	8.49	-0.09	+1.41	+1.295	+1.265†	+0.03 ₀	216735	4.93	4.89	+0.04	+0.01	-0.12	-0.115	-0.00 ₅
113139	4.95	4.93	+0.02	+0.37	+0.235	+0.26	-0.02 ₅	216899	8.68	8.66	+0.02	+1.51	+1.36	(+1.35)	+0.01
114710	4.23	4.30	-0.07	+0.56	+0.46	+0.455	+0.00 ₅	217014	5.46	5.53	-0.07	+0.68	+0.57	+0.58	-0.01
115617	4.68	4.74	-0.06	+0.70	+0.595	+0.60	-0.00 ₅	218329	4.54	4.50	+0.04	+1.56	+1.495	+1.495	0.00 ₀
116842	3.99	4.01	-0.02	+0.16	+0.04	+0.04	0.00 ₀	219134	5.56	5.56	0.00	+1.015	+0.90	+0.935†	-0.03 ₅
117176	4.97	4.98	-0.01	+0.71	+0.61	+0.61	0.00 ₀	222107	3.88	3.88	0.00	+1.02	+0.935	+0.935	0.00 ₀
+11°2576	9.09	9.04	+0.05	+1.51	+1.315	+1.35†	-0.03 ₅	222368	4.15	4.13	+0.02	+0.51	+0.37	+0.405	-0.03 ₅
120136	4.49	4.51	-0.02	+0.48	+0.37	+0.375	-0.00 ₅	222404	3.19	3.22	-0.03	+1.03	+0.93	+0.945	-0.01 ₅
120315	1.89	1.86	+0.03	-0.20	-0.31	-0.335	+0.02 ₅	+1°4774	8.94	8.98	-0.04	+1.32	+1.32	+1.33	-0.01
121370	2.69	2.70	-0.01	+0.59	+0.49	+0.485	+0.00 ₅	224930	5.76	5.75	+0.01	+0.66	+0.535	+0.56	-0.02 ₅
123299	3.67	3.64	+0.03	-0.05	-0.17	-0.18	+0.01								

* Observed on only one night by Johnson and Morgan, and indicated by a cross in Figure 2 C.

† $(P-V)_{E,J}$ computed from $(B-V)$ with (7).

TABLE VI. COMPARISON OF THE MAGNITUDES AND COLORS OF 135 STARS
OBTAINED AT THE CAPE WITH THE VALUES FROM TABLE IV

HR	$P_g - CI$	V_E	$V_{E,C}$	E-C	CI	$(P-V)_E$	$(P-V)_{E,C}$	E-C	HR	$P_g - CI$	V_E	$V_{E,C}$	E-C	CI	$(P-V)_E$	$(P-V)_{E,C}$	E-C
25	4.17	3.89	3.83	+0.06	+0.81	+0.95	+0.95	0.00	5107	3.40	3.36	3.38	-0.02	-0.08	-0.025	0.00	-0.025
77	4.36	4.23	4.17	+0.06	+0.35	+0.475	+0.46	+0.015	5192*	4.58:	4.20	4.09	(+0.11)	+1.25:	+1.385	+1.42	(-0.035)
98	2.95	2.75	2.75	0.00	+0.41	+0.51	+0.525	(-0.015)	5287	3.58	3.21	3.22	-0.01	+0.92:	+1.015	+1.07	(-0.055)
99	2.72	2.33	2.36	-0.03	+0.87	+1.00	+1.015	-0.015	5288	2.40	1.98	2.06	-0.08	+0.77:	+0.945	+0.91	(+0.035)
188	2.33	2.00	1.98	+0.02	+0.81	+0.965	+0.95	+0.015	5338	4.15	4.11	3.99	+0.12	+0.31	+0.385	+0.415	-0.03
322	3.56	3.26	3.27	-0.01	+0.66	+0.80	+0.79	+0.010	5463	3.24	3.15	3.17	-0.02	+0.06:	+0.125	+0.15	(-0.025)
377	4.98	4.87	4.84	+0.03	+0.25	+0.34	+0.355	-0.015	5531	2.79	2.76	2.75	+0.01	-0.04	+0.025	+0.045	-0.020
509	3.67	3.51	3.44	+0.07	+0.52	+0.62	+0.64	(-0.02)	5670	4.09	4.08	4.06	+0.02	-0.11:	-0.01	-0.03	(+0.02)
566	3.92	3.61	3.64	-0.03	+0.64	+0.76	+0.77	-0.01	5685	2.58	2.60	2.62	-0.02	-0.30	-0.22	-0.235	+0.015
591	2.93	2.80	2.85	-0.05	+0.10	+0.14	+0.195	-0.055	5825	4.74	4.65	4.61	+0.04	+0.17:	+0.31	+0.265	(+0.045)
721	4.18	4.29	4.23	+0.06	-0.32	-0.245	-0.255	+0.010	5961	4.69	4.63	4.61	+0.02	+0.03:	+0.145	+0.12	(+0.025)
749	4.86	4.92	4.88	+0.04	-0.23	-0.16	-0.16	0.00	5977/8	4.26	4.15	4.11	+0.04	+0.24	+0.35	+0.34	+0.01
779	3.96	4.06	4.04	+0.02	-0.39	-0.345	-0.33	-0.015	5984/5	2.45	2.50	2.49	+0.01	-0.29	-0.225	-0.225	0.000
804	3.50	3.46	3.47	-0.01	-0.09	0.00	0.01	+0.01	5987	4.15	4.15	4.22	-0.07	-0.39	-0.31	-0.33	+0.02
911	3.06	2.49	2.51	-0.02	+1.39	+1.58	+1.57	+0.01	6056	3.21	2.69	2.68	+0.01	+1.38:	+1.505	+1.56	(-0.055)
963	3.96	3.86	3.79	+0.07	+0.31	+0.42	+0.415	+0.005	6075	3.50	3.19	3.18	+0.01	+0.76	+0.88	+0.895	-0.015
1008	4.41	4.23	4.18	+0.05	+0.50	+0.615	+0.62	-0.005	6098	5.04	4.85	4.86	-0.01	+0.32	+0.455	+0.425	+0.030
1084	3.96	3.70	3.66	+0.04	+0.67	+0.805	+0.80	+0.005	6175	2.54	2.55	2.55	0.00	-0.23	-0.11	-0.16	+0.05
1101	4.41	4.27	4.23	+0.04	+0.36	+0.45	+0.47	-0.02	6241	2.63	2.24	2.24	0.00	+0.94	+1.09	+1.09	0.00
1136	3.76	3.50	3.45	+0.05	+0.71	+0.86	+0.845	+0.015	6243	4.75	4.60	4.60	0.00	+0.25:	+0.365	+0.355	(+0.010)
1175	4.14	3.80	3.76	+0.04	+0.94	+1.05	+1.09	-0.04	6378	2.47	2.42	2.46	-0.04	-0.14	-0.07	-0.065	-0.005
1208	3.77	3.26	3.24	+0.02	+1.38	+1.515	+1.56	-0.045	6380	3.43	3.32	3.31	+0.01	+0.18	+0.27	+0.28	-0.01
1325	4.62	4.41	4.35	+0.06	+0.60	+0.73	+0.725	+0.005	6401/2	4.59	4.28	4.31	-0.03	+0.63	+0.755	+0.76	-0.005
1338*	4.30	4.27	4.19	(-0.08)	+0.11	+0.255	+0.205	(+0.05)	6498	4.78	4.25	4.27	-0.02	+1.27:	+1.46	+1.44	(+0.02)
1502	4.50	4.48	4.40	+0.08	+0.14	+0.20	+0.235	-0.035	6508	2.61	2.66	2.70	-0.04	-0.41	-0.375	-0.35	-0.025
1666	2.81	2.79	2.78	+0.01	-0.06	-0.005	+0.02	-0.015	6527	1.53	1.56	1.63	-0.07	-0.42	-0.39	-0.36	-0.03
1674	4.79	4.74	4.63	+0.11	+0.31	+0.39	+0.415	-0.025	6553	1.97	1.84	1.85	-0.01	+0.19	+0.285	+0.29	-0.005
1865	2.63	2.56	2.57	-0.01	+0.03	+0.105	+0.12	-0.015	6580	2.30	2.38	2.38	0.00	-0.41	-0.335	-0.35	+0.015
1956	2.56	2.65	2.62	+0.03	-0.29	-0.26	-0.225	-0.035	6603	3.15	2.72	2.75	-0.03	+0.92:	+1.105	+1.07	(+0.035)
1983	3.66	3.59	3.51	+0.09	+0.30	+0.365	+0.405	-0.04	6615	3.14	2.94	2.98	-0.04	+0.28	+0.40	+0.385	+0.015
2020	3.89	3.86	3.84	+0.02	-0.02	+0.07	+0.065	+0.005	6629	3.77	3.75	3.76	-0.01	-0.16	-0.055	-0.085	+0.030
2056	4.80	4.84	4.85	-0.01	-0.33	-0.25	-0.265	+0.015	6698	3.63	3.28	3.30	-0.02	+0.78:	+0.91	+0.92	(-0.01)
2294	1.86	1.93	1.96	-0.03	-0.42	-0.385	-0.36	-0.025	6710	4.70	4.62*	4.59	+0.03	+0.16	+0.245	+0.255	-0.010
2550	3.30	3.26	3.24	+0.02	+0.02	+0.09	+0.105	-0.015	6712*	4.72:	4.64	4.76	(-0.12)	-0.30	-0.21	-0.235	+0.025
2693	2.05	1.76	1.82	-0.06	+0.43	+0.595	+0.545	(+0.050)	6714	3.96	4.00	3.97	+0.03	-0.22:	-0.115	-0.15	(+0.035)
2782*	4.30	4.31	4.37	(-0.06)	-0.37	-0.31	-0.31	(0.00)	6714	3.96	4.00	3.97	+0.03	-0.22:	-0.115	-0.15	(+0.035)
2787	4.71	4.70	4.77	-0.07	-0.35	-0.265	-0.285	+0.02	6723	4.44	4.48	4.43	+0.05	-0.17	-0.075	-0.095	-0.02
2790	5.01	5.04	5.07	-0.03	-0.34	-0.275	-0.275	0.00	6752	4.25	4.01	3.97	+0.04	+0.64	+0.765	+0.77	(-0.005)
2827	2.39	2.35	2.43	-0.08	-0.27	-0.20	-0.20	0.00	6866	5.10	4.80	4.79	+0.01	+0.69	+0.855	+0.82	+0.035
2943	0.46	0.40	0.33	+0.08	+0.20	+0.32	+0.30	+0.02	6869	3.49	3.21	3.18	+0.03	+0.72	+0.845	+0.855	-0.010
3046	5.00	4.66	4.65	+0.01	+0.84:	+0.975	+0.98	(-0.005)	6879	1.79	1.76	1.81	-0.05	-0.21:	-0.15	-0.14	(-0.01)
3165	2.13	2.16	2.22	-0.06	-0.45	-0.37	-0.395	+0.025	6913	3.11	2.78	2.76	+0.02	+0.84	+0.975	+0.98	-0.005
3220	4.83	4.69	4.70	-0.01	+0.22	+0.30	+0.32	-0.02	7194	2.62	2.57	2.60	-0.03	-0.11	-0.035	-0.03	-0.005
3454	4.21	4.30	4.29	+0.01	-0.38	-0.345	-0.32	-0.025	7226/7	4.33	4.19	4.16	+0.03	+0.29	+0.41	+0.395	+0.015
3485	1.95	1.89	1.95	-0.06	-0.14	-0.085	-0.065	-0.020	7236	3.39	3.42	3.42	0.00	-0.27:	-0.185	-0.20	(+0.015)
3634	2.76	2.14	2.21	-0.07	+1.41:	+1.58	+1.59	(-0.01)	7340	3.98	3.92	3.92	0.00	+0.02:	+0.095	+0.105	(-0.01)
3685	1.67	1.61	1.67	-0.06	-0.19	-0.105	-0.115	+0.010	7665*	3.75	3.58	3.50	(+0.08)	+0.53	+0.655	+0.65	+0.005
3699	2.28	2.24	2.24	0.00	-0.02	+0.045	+0.065	-0.020	7776	3.27	3.06	3.02	+0.04	+0.56	+0.66	+0.685	-0.025
3734	2.38	2.42	2.45	-0.03	-0.34:	-0.29	-0.275	(-0.015)	7790	1.86	1.96	1.95	+0.01	-0.38	-0.35	-0.32	-0.03
3748*	2.54	1.95	2.06	(-0.11)	+1.13	+1.37	+1.29	(+0.08)	7913	3.49	3.43	3.45	-0.02	-0.03	+0.035	+0.055	-0.020
3759	4.65	4.60	4.52	+0.08	+0.28	+0.315:	+0.385	(-0.07)	7936	4.24	4.12	4.10	+0.02	+0.20	+0.325	+0.30	+0.025
3786	3.64	3.54	3.53	+0.01	+0.18:	+0.23	+0.255	(-0.025)	8131	4.08	3.90	3.90	0.00	+0.30	+0.45	+0.405	+0.045
3849	5.01	5.02	5.07	-0.05	-0.34	-0.285	-0.275	-0.010	8181	4.36	4.30	4.22	+0.08	+0.25	+0.34	+0.355	-0.015
4102	4.06	3.96	3.95	+0.01	+0.15	+0.245	+0.245	0.000	8254	4.05	3.73	3.72	+0.01	+0.77	+0.915	+0.91	+0.005
4232	3.48	3.06	3.05	+0.01	+1.03	+1.20	+1.185	+0.015	8387	5.02	4.74	4.68	+0.06	+0.83	+0.925	+0.97	-0.045
4514	4.96	4.63	4.64	-0.01	+0.78	+0.88	+0.92	-0.04	8402	4.85:	4.88	4.87	(+0.01)	-0.24	-0.16	-0.17	+0.01
4520	3.66	3.59	3.62	-0.03	-0.03	+0.03	+0.055	-0.025	8413	5.27	4.81	4.78	+0.03	+1.23:	+1.395	+1.40	(-0.005)
4540	3.75	3.60	3.57	+0.03	+0.32:	+0.44	+0.425	(+0.015)	8414	3.23	2.95	2.92	+0.03	+0.75:	+0.855	+0.885	(-0.03)
4618	4.42	4.45	4.48	-0.03	-0.36:	-0.285	-0.30	(+0.015)	8425	1.71	1.69	1.77	-0.08	-0.32	-0.28	-0.255	-0.025
4623	4.08	3.99	3.99	0.00	+0.13	+0.19	+0.225	-0.035	8450	3.55	3.53	3.53	0.00	-0.11	-0.02	-0.03	+0.01
4662	2.52	2.60	2.57	+0.03	-0.28	-0.23	-0.215	-0.015	8518	3.86	3.87	3.89	-0.02	-0.26:	-0.17	-0.19	(+0.02)
4757	2.93	2.93	2.96	-0.03	-0.22	-0.175	-0.15	-0.025	8551	5.09	4.76	4.73	+0.03	+0.83	+0.985	+0.97	+0.015
4819	2.14	2.14	2.15	-0.01	-0.20	-0.115	-0.125	+0.010	8558/9	3.74	3.65	3.61	+0.04	+0.18	+0.29	+0.28	+0.01
4825/6	2.83	2.73	2.72	+0.01	+0.14	+0.23	+0.235	-0.005	8630	4.19:	4.13	4.13	0.00	+0.01:	+0.09	+0.095	(-0.005)
5019	4.89	4.68	4.66	+0.02	+0.51:	+0.595	+0.63	(-0.035)	8728	1.21	1.13	1.14	+0.07	-0.09	-0.02	-0.01	-0.01
5020	3.23	2.96	2.93	+0.03	+0.71	+0.81	+0.845	-0.035	8852	3.97	3.71	3.68	+0.03	+0.69:	+0.80	+0.82	(-0.02)
5028	2.77	2.70	2.76	-0.06	-0.15	-0.065	-0.075	+0.010	8911	4.93	4.95	4.93	+0.02	-0.13	-0.08	-0.055	-0.025
5105	4.93	4.93	4.93	0.00	-0.15	-0.095	-0.075	-0.020	8916	4.56	4.23	4.20	+0.03	+0.87	+1.005	+1.015	-0.010
									8969	4.27	4.15	4.12	+0.03	+0.28	+0.37	+0.385	-0.015

* These stars may be variable.

lower portion of Figure 2D with those for known variable stars omitted. The amount of ultraviolet radiation included in the Cape magnitudes is unknown but it is stated that "... the bandwidth to which these magnitudes refer is slightly narrower than the international photographic magnitudes and the equivalent wave length slightly shorter." The run of the differences in Figure 2D bottom would seem to indicate that the effect of the ultraviolet on the magnitudes is small.

The color indices determined at the Cape, CI , are compared with the values of $(P-V)_E$ in the upper portion of Figure 2D. The linear transformation is given by:

$$(P-V)_E - 0.239 = 1.067(CI - 0.196), \quad (10)$$

or

$$(P-V)_{E,C} = 1.067CI + 0.086, \\ \pm 0.002 \quad \pm 0.003(\text{p.e.}),$$

where $(P-V)_{E,C}$ indicate values of CI converted to the $(P-V)_E$ system. The stars marked with a

cross in Figure 2D and a colon in Table VI are noted by the Cape observers as having relatively larger dispersions in their measured colors than do the remaining stars. Omission of the 23 values so marked gives the probable error of one difference, $(P-V)_{E,C} - (P-V)_E$, as ± 0.015 mag. Inclusion of the 23 stars of lower accuracy only changes this probable error to ± 0.016 mag. If the two series are of equal accuracy, the average probable error of each is then ± 0.010 mag. The Cape observers do not give the band width of their blue filter, but Figure 2D top indicates little departure from a linear relationship between the two systems.

Colors of 2031 stars south of -15° declination have been determined by Schilt and Jackson (1952). Since the magnitudes of the stars were not determined, the observations will not be discussed here.

Summary of probable errors. The available external and internal average probable errors for the three sets of colors and magnitudes discussed here are as follows:

$$\begin{aligned} \text{Probable error of } V_E &= \pm 0.018 \text{ Internal} \\ &\pm 0.017 \text{ External, comparison with } V_J \\ &\pm 0.018 \text{ External, comparison with } V_C \\ \hline &\pm 0.018 \text{ Mean} \end{aligned}$$

$$\begin{aligned} \text{Probable error of } (P-V)_E &= \pm 0.006 \text{ Internal} \\ &\pm 0.008 \text{ External, comparison with } (P-V)_J \\ &\pm 0.010 \text{ External, comparison with } (P-V)_C \\ \hline &\pm 0.008 \text{ Mean} \end{aligned}$$

$$\begin{aligned} \text{Probable error of } V_J &= \pm 0.017 \text{ Internal} \\ &\pm 0.017 \text{ External, comparison with } V_E \\ \hline &\pm 0.017 \text{ Mean} \end{aligned}$$

$$\begin{aligned} \text{Probable error of } (P-V)_{E,J} &= \pm 0.009 \text{ Internal} \\ &\pm 0.008 \text{ External, comparison with } (P-V)_E \\ \hline &\pm 0.0085 \text{ Mean} \end{aligned}$$

$$\text{Probable error of } V_C = \pm 0.018 \text{ External, comparison with } V_E$$

$$\text{Probable error of } (P-V)_{E,C} = \pm 0.010 \text{ External, comparison with } (P-V)_E$$

The three series are apparently of nearly equal accuracy. The small range, ± 0.006 to ± 0.010 mag., in the average probable errors of the colors as determined from the internal and external evidence, probably results from the fact that the relationships between the three color systems are not strictly linear. This departure from lin-

earity, however, is apparently extremely small and may safely be ignored.

Earlier observations on the C_p system. Preliminary values for the colors on the C_p -system of some 80 stars in Table IV, with $(P-V)_E > +0.2$, which were published in 1950 (Eggen, 1950a) from observations made in season "89," are now

TABLE VII. MEAN VALUES OF $(P-V)$ AND V FOR 232 BRIGHT STARS

HR	V_E	V_J	V_C	$\bar{V}$	$(P-V)_E$	$(P-V)_J$	$(P-V)_C$	$(P-V)$	S_p
21	2.27	2.25		2.26	+0.215	+0.24		+0.23	F2 IV
25	3.89		3.83	3.86	+0.95		+0.95	+0.95	K0 III
77	4.23		4.17	4.20	+0.475		+0.46	+0.47	G0 V
99	2.75		2.75	2.75	+0.51		+0.525	+0.52	G1 IV
99	2.33		2.36	2.34	+1.00		+1.015	+1.01	K0 III
166	5.86	5.84		5.85	+0.78	+0.765		+0.77	K0 V
188	2.00		1.98	1.99	+0.965		+0.95	+0.96	K0 III
219	3.44	3.45		3.44	+0.46	+0.475		+0.47	G0 V
321	5.15	5.12		5.14	+0.59		+0.59	+0.59	G5 Vp
322	3.26		3.27	3.26	+0.80		+0.79	+0.795	G8 III
377	4.87		4.83	4.85	+0.34		+0.355	+0.35	F6 V
437	3.59	3.61		3.60	+0.91	+0.89		+0.90	G8 III
493	5.23	5.20		5.22	+0.755	+0.745		+0.75	K1 V
509	3.51	3.49	3.43	3.48	+0.62	+0.62	+0.64	+0.625	G8 Vp
511	5.60	5.63		5.62	+0.685	+0.715		+0.70	dK0
553	2.70	2.62		2.66	+0.02	+0.02		+0.02	A5 V
566	3.61		3.64	3.62	+0.76		+0.77	+0.765	G5 IV
591	2.80		2.84	2.82	+0.14		+0.195	+0.17	F0 V
617	2.00	1.99		2.00	+1.075	+1.07		+1.07	K2 III
660	4.88	4.87		4.88	+0.49	+0.51		+0.50	G0 V
718	4.28	4.27		4.28	-0.165	-0.165		-0.165	B9 III
721	4.29		4.23	4.26	-0.245		-0.255	-0.25	B8 III
749	4.92		4.88	4.90	-0.16		-0.16	-0.16	B9
779	4.06		4.04	4.05	-0.345		-0.33	-0.34	B2 IV
799	4.12	4.12		4.12	+0.375	+0.375		+0.375	F7 V
804	3.46		3.47	3.46	0.00		-0.01	-0.005	A2 V
813	4.25	4.25		4.25	+0.205	+0.195		+0.20	F0 IV
911	2.49		2.51	2.50	+1.58		+1.57	+1.575	M2 III
937	4.06	4.04		4.05	+0.485	+0.495		+0.49	G0 V
963	3.86		3.79	3.82	+0.42		+0.415	+0.42	F6 V
996	4.81	4.82		4.82	+0.575	+0.58		+0.58	G5 V
1008	4.23		4.18	4.20	+0.615		+0.62	+0.62	G5 V
1017	1.82	1.80		1.81	+0.36	+0.375		+0.37	F5 Ib
1084	3.70		3.67	3.68	+0.805		+0.80	+0.80	K2 V
1101	4.27		4.23	4.25	+0.45		+0.47	+0.46	F8 V
1136	3.50		3.45	3.48	+0.86		+0.845	+0.85	K0 IV
1175	3.80		3.76	3.78	+1.05		+1.09	+1.07	K0
1208	3.26		3.22	3.24	+1.515		+1.56	+1.54	M2 II-III
1325	4.41		4.35	4.38	+0.73		+0.725	+0.73	dK0
1338*	4.27		4.19: (4.23)	4.23	+0.255		+0.205	(+0.23)	F5
1457	0.77	0.78		0.78	+1.455	+1.44		+1.45	K5 III
1502	4.48		4.40	4.44	+0.20		+0.235	+0.22	F2
1543	3.16	3.16		3.16	+0.335	+0.35		+0.34	F6 V
1666	2.79	2.77	2.78	2.78	+0.005	0.00	+0.02	+0.01	A3 III
1674	4.74		4.63	4.68	+0.39		+0.415	+0.40	F8
1713		0.08	0.18	0.13		-0.155	-0.170	-0.16	B8 Ia
1781	5.73	5.71		5.72	-0.33	-0.345		-0.34	B2 V
1855		4.59	4.59	4.59		-0.405	-0.395	-0.40	B0 V
1861	5.38	5.36		5.37	-0.325	-0.335		-0.33	B1 V
1865	2.56	2.56	2.57	2.56	+0.105	+0.095	+0.12	+0.105	F0 Ib
1899		2.74	2.72	2.73		-0.385	-0.36	-0.37	O9 III
1903		1.71	1.70	1.70		-0.335	-0.32	-0.33	B0 Ia
1956	2.65		2.61	2.63	-0.26		-0.225	-0.24	B8 Ve
1983	3.59		3.50	3.54	+0.365		+0.405	+0.385	F6 V
2004		2.04	2.04	2.04		-0.31	-0.30	-0.305	B0.5 Ia
2020	3.86		3.84	3.85	+0.07		+0.065	+0.07	A5 III
2056	4.84		4.86	4.85	-0.25		-0.265	-0.26	B5 V
2294	1.93		1.95	1.94	-0.385		-0.36	-0.37	B1 II-III
2491		-1.47	-1.40	-1.44		-0.115	-0.115	-0.115	A1 V
2550	3.26		3.24	3.25	+0.09		+0.105	+0.10	A5 III
2596		4.36	4.39	4.38		-0.20	-0.215	-0.21	B3 II
2782*	4.31	4.39	4.37: (4.36)		-0.31	-0.27	-0.31	(-0.30)	O9 III
2787	4.70		4.77	4.74	-0.265		-0.285	-0.275	B3 Ve
2790	5.04		5.07	5.06	-0.275		-0.275	-0.275	B3 V
2827	2.35		2.43	2.39	-0.20		-0.20	-0.20	B5 Ia
2852	4.22	4.16		4.19	+0.205	+0.195		+0.20	F0 V
2943	0.40	0.34	0.33	0.36	+0.32	+0.29	+0.30	+0.305	F5 IV-V
2990	1.17	1.15		1.16	+0.94	+0.915		+0.93	K0 III
3046	4.66		4.65	4.66	+0.975		+0.98	+0.98	K0
3165	2.16		2.23	2.20	-0.37		-0.395	-0.38	O5f
3220	4.69		4.70	4.70	+0.30		+0.32	+0.31	F5
3314		3.89	3.90	3.90		-0.135	-0.115	-0.125	A0 V
3454	4.30	4.31	4.29	4.30	-0.345	-0.325	-0.32	-0.33	B3 V
3485	1.89		1.94	1.92	-0.085		-0.065	-0.075	A0 V
3569	3.10	3.12		3.11	+0.075	+0.06		+0.07	A7 V
3579	4.01	3.95		3.98	+0.305	+0.32		+0.31	F5 V
3616	4.78	4.78		4.78	+0.385	+0.375		+0.38	F7 IV-V
3634	2.14		2.21	2.18	+1.58		+1.59	+1.585	K5 Ib-II
3685	1.61		1.68	1.64	-0.105		-0.115	-0.11	A0 III
3699	2.24		2.23	2.24	+0.045		+0.065	+0.055	F0 Ib
3734	2.42		2.44	2.43	-0.29		-0.275	-0.28	B2 IV
3748*	1.95		2.06	(2.02)	+1.37		+1.29	(+1.33)	K3 III
3786	3.54		3.53	3.54	+0.23		+0.255	+0.24	F2 III
3815	5.38	5.47		5.42	+0.675	+0.655		+0.665	G8 IV-V
3849	5.02		5.07	5.04	-0.285		-0.275	-0.28	B5 V
4054	4.75	4.83		4.79	+0.36	+0.33		+0.345	F6 IV
4102	3.96		3.95	3.96	+0.245		+0.245	+0.245	F5
4112	4.81	4.82		4.82	+0.40	+0.405		+0.40	F8 V
4232	3.06		3.06	3.06	+1.20		+1.185	+1.19	K2 III
4301	1.82	1.79		1.80	+0.98	+0.975		+0.98	K0 III
4335	2.96	3.01		2.98	+1.075	+1.045		+1.06	K1 III
4496	5.30	5.33		5.32	+0.62	+0.59		+0.605	G8 V
4514	4.63		4.63	4.63	+0.88		+0.92	+0.90	G8 III
4520	3.59		3.62	3.60	+0.03		+0.055	+0.04	A5 V
4534	2.14	2.12		2.13	-0.035	-0.03		-0.03	A3 V
4540	3.60	3.63	3.58	3.60	+0.44	+0.435	+0.425	+0.435	F8 V
4550	6.45	6.49		6.47	+0.625	+0.655		+0.64	G8 Vp
4554	2.45	2.43		2.44	-0.125	-0.125		-0.125	A0 V
4618	4.45		4.49	4.47	-0.285		-0.30	-0.29	B5 IV
4623	3.99		3.98	3.98	+0.19		+0.225	+0.21	F2 IV
4660	3.27	3.27		3.27	-0.055	-0.040		-0.05	A3 V
4662	2.60		2.56	2.58	-0.23		-0.215	-0.22	B8 III
4757	2.93		2.95	2.94	-0.175		-0.15	-0.16	B9 V
4785	4.25	4.29		4.27	+0.485	+0.485		+0.485	G0 V
4819	2.14		2.15	2.14	-0.115		-0.125	-0.12	A0 III
4825/6	2.73		2.72	2.72	+0.23		+0.235	+0.23	F0 V
4931	4.95	4.93		4.94	+0.235	+0.26		+0.25	F2 V
4983	4.23	4.30		4.26	+0.46	+0.455		+0.46	G0 V
5019	4.68	4.74	4.66	4.69	+0.595	+0.60	+0.63	+0.61	G6 V
5020	2.96		2.93	2.94	+0.81		+0.845	+0.83	G5 III
5028	2.70		2.76	2.73	-0.065		-0.075	-0.07	A2 V
5056		0.98	1.00	0.99		-0.395	-0.385	-0.39	B1 V
5062	3.99	4.01		4.00	+0.04	+0.04		+0.04	A5 V
5072	4.97	4.98		4.98	+0.61	+0.61		+0.61	G5 V
5105	4.93		4.93	4.93	-0.095		-0.075	-0.085	A0 p
5107	3.36		3.37	3.37	-0.025		0.00	-0.01	A3 V
5185	4.49	4.51		4.50	+0.37	+0.375		+0.37	F7 V
5191	1.89	1.86		1.88	-0.31	-0.335		-0.32	B3 V
5192*	4.20		4.09: (4.14)		+1.385		+1.42	(+1.40)	M6
5235	2.69	2.70		2.70	+0.49	+0.485		+0.49	G0 IV

TABLE VII—Continued

HR	V_E	V_I	V_C	$\overline{V}$	$(P-V)_E$	$(P-V)_{E,I}$	$(P-V)_{E,C}$	$\overline{(P-V)}$	S_p	HR	V_E	V_I	V_C	$\overline{V}$	$(P-V)_E$	$(P-V)_{E,I}$	$(P-V)_{E,C}$	$\overline{(P-V)}$	S_p
5264	4.26	4.25	4.26		-0.02		-0.01	-0.015	A3 V	6714	4.00	3.97	3.98	-0.115		-0.15	-0.13	B5 Ib	
5287	3.21		3.21	3.21	+1.015		+1.07	+1.04:	gK3	6723	4.48	4.44	4.46	-0.075		-0.095	-0.085	A1 V	
5288	1.98		2.06	2.02	+0.945		+0.91	+0.93	K0 III-IV	6752	4.01	3.97	3.99	+0.765		+0.77	+0.77	K0 V	
5291	3.67	3.64		3.66	-0.17	-0.18		-0.175	A0 III	6775	5.07	5.04		5.06	+0.40	+0.415		+0.41	F7 V
5338*	4.11		3.99	(4.05)	+0.385		+0.415	+0.40	F6 III	6806	6.43	6.40		6.42	+0.785	+0.78		+0.78	K2 V
5340	-0.07	-0.06		-0.06	+1.16	+1.15		+1.155	K2 IIIp	6866	4.80		4.79	4.80	+0.855		+0.82	+0.84	G8 III
5404	4.03	4.06		4.04	+0.385	+0.395		+0.39	F7 V	6869	3.21	3.26	3.18	3.22	+0.845	+0.85	+0.855	+0.85	K0 III-IV
5435	3.06	3.03		3.04	+0.065	+0.07		+0.07	A7 III	6879	1.76		1.81	1.78	-0.15		-0.14	-0.145	B9 IV
5463	3.15		3.16	3.16	+0.125		+0.150	+0.14	F0 V	6913	2.78		2.76	2.77	+0.975		+0.98	+0.98	K2 III
5511		3.75	3.72	3.74		-0.135	-0.115	-0.125	A0 V	6927	3.57	3.58		3.58	+0.40	+0.395		+0.40	F7 V
5531	2.76		2.75	2.76	+0.025		+0.045	+0.035	A3 V	7061	4.22	4.20		4.21	+0.335	+0.35		+0.34	F6 V
5670	4.08		4.07	4.07	-0.01		-0.03	-0.02	A3 V	7178	3.26	3.23		3.24	-0.17	-0.175		-0.17	B9 III
5681	3.46	3.50		3.48	+0.865	+0.86		+0.86	G8 III	7194	2.57		2.60	2.58	-0.035		-0.03	-0.03	A2 IV
5685	2.60	2.62	2.62	2.62	-0.22	-0.24	-0.235	-0.23	B8 V	7226/7	4.19		4.17	4.18	+0.41		+0.395	+0.40	F7
5694	5.02	5.06		5.04	+0.425	+0.435		+0.43	F8 IV	7236	3.42		3.42	3.42	-0.185		-0.20	-0.19	B8.5 V
5733	4.34	4.30		4.32	+0.195	+0.185		+0.19	A7	7340	3.92		3.92	3.92	+0.095		+0.105	+0.10	A7
5744	3.24	3.26		3.25	+1.11	+1.09		+1.10	K2 III	7534	5.00	4.99		5.00	+0.345	+0.35		+0.35	F5 V
5793	2.22	2.23		2.22	-0.13	-0.145		-0.14	A0 V	7557	0.82	0.75		0.78	+0.10	+0.115		+0.11	A7 IV,V
5825	4.65		4.62	4.64	+0.31		+0.265	+0.29	F5	7602	3.71	3.70		3.70	+0.755	+0.765		+0.76	G8 IV
5854	2.59	2.66		2.62	+1.115	+1.085		+1.10	K2 III	7665*	3.58		3.51	(3.54)	+0.655		+0.655	(+0.655)	G5 IV
5867	3.65	3.67		3.66	-0.03	-0.05		-0.04	A2 IV	7776	3.06		3.02	3.04	+0.66		+0.685	+0.67	Comp.
5868	4.39	4.43		4.41	+0.505	+0.50		+0.50	G0 V	7790	1.96		1.94	1.95	-0.35		-0.32	-0.335	B3 IV
5914	4.59	4.60		4.60	+0.445	+0.455		+0.45	F9 V	7913	3.43		3.45	3.44	+0.035		+0.055	+0.045	A5 III
5933	3.82	3.85		3.84	+0.37	+0.375		+0.37	F6 V	7936	4.12		4.11	4.12	+0.325		+0.30	+0.31	F5 V
5961	4.63		4.62	4.62	+0.145		+0.12	+0.13	A2	7949	2.48	2.45		2.46	+0.95	+0.945		+0.95	K0 III
5977/8	4.15		4.12	4.14	+0.35		+0.34	+0.345	F6 IV	7950		3.77	3.79	3.78		-0.105	-0.115	-0.11	A1 V
5984/5	2.50		2.49	2.50	-0.225		-0.225	-0.225	B0.5 V	7957	3.40	3.43		3.42	+0.825	+0.83		+0.83	K0 IV
5986	4.01	4.01		4.01	+0.425	+0.425		+0.425	F8 IV-V	8131	3.90		3.91	3.90	+0.45		+0.405	+0.43	Comp.
5987	4.15		4.23	4.19	-0.31		-0.33	-0.32	B3 V	8162	2.46	2.41		2.44	+0.125	+0.115		+0.12	A7 IV,V
6056	2.69		2.68	2.68	+1.505		+1.56	+1.53:	M1 III	8181	4.30		4.21	4.26	+0.34		+0.355	+0.35	F6 V
6075	3.19		3.18	3.18	+0.88		+0.895	+0.89	G8 III	8254	3.73		3.72	3.72	+0.915		+0.91	+0.91	K0
6095	3.74	3.74		3.74	+0.185	+0.145		+0.165	A9 III	8387	4.74		4.68	4.71	+0.925		+0.97	+0.95	K3 V
6098	4.85		4.86	4.86	+0.455		+0.425	+0.44	G0	8402*	4.88		4.87:(4.88)	-0.16		-0.17	-0.165	B5 V	
6134*	0.92		0.93	(0.92)		+1.785	+1.73	(+1.76)	M1 Ib	8413	4.81		4.78	4.80	+1.395		+1.40	+1.40	K4 III
6175	2.55		2.55	2.55	-0.11		-0.16	-0.135	O9.5 V	8414	2.95		2.91	2.93	+0.855		+0.855	+0.87	G2 Ib
6212	2.79	2.82		2.80	+0.55	+0.54		+0.545	G0 IV	8425	1.69		1.77	1.73	-0.28		-0.255	-0.27	B5 V
6241	2.24		2.24	2.24	+1.09		+1.09	+1.09	K2 III-IV	8430	3.78	3.76		3.77	+0.32	+0.33		+0.325	F5 V
6243	4.60		4.60	4.60	+0.365		+0.355	+0.36	F6 III	8450	3.53		3.53	3.53	-0.02		-0.03	-0.025	A2 IV
6378	2.42		2.46	2.44	-0.07		-0.065	-0.07	A2 V	8494	4.16	4.19		4.18	+0.185	+0.165		+0.175	F0 IV
6380	3.32		3.31	3.32	+0.27		+0.28	+0.275	F2 III	8518	3.87		3.89	3.88	-0.17		-0.19	-0.18	A0 V
6401/2	4.28		4.31	4.30	+0.755		+0.76	+0.76	dK1	8551	4.76		4.74	4.75	+0.985		+0.97	+0.98	K0 III
6410	3.13	3.14		3.14	-0.025	-0.04		-0.03	A3 IV	8558/9	3.65		3.61	3.62	+0.29		+0.29	+0.29	F2 III
6458	5.39	5.39		5.39	+0.53	+0.52		+0.525	G0 V	8630	4.13		4.13	4.13	+0.09		+0.095	+0.09	F0
6498	4.25		4.27	4.26	+1.46		+1.44	+1.45	K5 II	8665	4.20	4.19		4.20	+0.405	+0.395		+0.40	F7 V
6508	2.66		2.70	2.68	-0.375		-0.35	-0.36	B2 IV	8717	4.93	4.89		4.91	-0.12	-0.115		-0.12	A1 V
6527	1.56		1.62	1.59	-0.39		-0.36	-0.375	B2 IV	8728	1.13		1.18	1.16	-0.02		-0.01	-0.015	A3 V
6553	1.84		1.84	1.84	+0.285		+0.29	+0.29	F0 I-II	8729	5.46	5.53		5.50	+0.57	+0.58		+0.575	G0
6573	5.24	5.23		5.24	+0.49	+0.51		+0.50	G1 V	8795	4.54	4.50		4.52	+1.495	+1.495		+1.495	M2 III
6580	2.38		2.38	2.38	-0.335		-0.35	-0.34	B2 IV	8832	5.56	5.56		5.56	+0.90	+0.93		+0.915	K3 V
6603	2.72	2.78	2.76	2.75	+1.105	+1.08	+1.07	+1.085	K2 III	8852	3.71		3.67	3.69	+0.80		+0.82	+0.81	G8 III
6615	2.94		2.98	2.96	+0.40		+0.385	+0.39	F2 Ia	8911	4.95		4.92	4.94	-0.08		-0.055	-0.07	A3
6623	3.41	3.42		3.42	+0.655	+0.655		+0.655	G5 IV	8916	4.23		4.20	4.22	+1.005		+1.015	+1.01	K1 III
6629	3.75	3.72	3.76	3.74	-0.055	-0.085	-0.085	-0.075	A0 V	8961	3.88	3.88		3.88	+0.935	+0.935		+0.935	G8 III-IV
6698	3.28		3.30	3.29	+0.91		+0.92	+0.915	K0 III	8969	4.15	4.13	4.11	4.13	+0.37	+0.405	+0.385	+0.385	F7 V
6705	2.17	2.22		2.20	+1.45	+1.45		+1.45	K5 III	8974	3.19	3.22		3.20	+0.93	+0.945		+0.94	K1 IV
6710	4.62	4.62	4.59	4.61	+0.245	+0.27	+0.255	+0.255	F3 V	9088	5.76	5.75		5.76	+0.535	+0.56		+0.55	G2 V
6712*	4.64		4.76:(4.70)	-0.21		-0.235	(-0.22)	B3											

* These stars were suspected of variability by the Cape observers.

Figure 3. Relationship between C_p and $(P-V)_E$ for stars with $(P-V)_E > 0.2$ mag.

superseded by the values in Table IV. A few errors have since been detected in Table I of that publication and they are noted as follows:

No.	Star	Column	For	Read
15	θ Per	4	$2^h 32^m 4$	$2^h 37^m 4$
16	HR 857	The one observation refers to another star		
18	κ Cet	3	χ	κ
19	ϵ Eri	6	+4.87	+4.47
21	π^3 Ori	6	+4.02	+3.49
41	HR 4550	5	+35 $^{\circ}$ 26'	+38 $^{\circ}$ 26'
45	61 Vir	9	0.116 $\pm$ 6	0.129 $\pm$ 7

Figure 3 shows the relationship between $(P-V)_E$ and C_p , which is linearly represented by:

$$(P-V)_E = -0.040 + 1.065C_p. \quad (II)$$

The probable error of one difference, $(P-V)_E - C_p$, is ± 0.011 mag.

Bright stars. Two hundred and thirty-two stars of the *Yale Catalogue of Bright Stars* are included either in two or in all three of the series discussed here. The magnitudes and colors of these stars are given in Table VII. The distribution in declination is as follows:

-90 $^{\circ}$ to -45 $^{\circ}$	37 stars
-45 $^{\circ}$ to -10 $^{\circ}$	62
-10 $^{\circ}$ to +10 $^{\circ}$	61
+10 $^{\circ}$ to +45 $^{\circ}$	43
+45 $^{\circ}$ to +90 $^{\circ}$	29
	232 stars

Because of the accuracy of the final magnitudes and colors, and because of their distribution in the sky, these stars should be useful as secondary standards on the nine-star system of the North Polar Sequence.

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