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Measures of Double Stars in 1898.

By *R. G. Aitken.*

The following measures of double stars were made with the 36 inch and 12 inch telescopes of the Lick Observatory in the year 1898, the same methods of observing and arrangement of results having been followed as in previous years.

Owing to the length of the list, I have omitted nearly all notes relating to the relative motion of the stars. Such notes are the less necessary as the majority of the pairs are β stars of which Professor Burnham, at whose request most of them were measured, is now printing a General Catalogue which will include all the measures and as complete a discussion as possible of the motion of each pair. The miscellaneous stars include a few measured at the request of Professor Barnard, a number of known stars show-

ing orbital or proper motion, and one or two new pairs accidentally discovered.

In lieu of observing notes, which, for the most part, have also been omitted, it will be sufficient to say that no measures were made unless the seeing was good enough to promise trustworthy results and that the more difficult pairs were only attempted on very good nights. In general, the 36 inch telescope was reserved for stars out of reach of the 12 inch, and, in some cases, stars were observed with the latter that ought, perhaps, to have been left for the larger instrument.

The magnitudes given are my own estimates, and the star places are for the epoch 1900.0.

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
β 1155.					
RA. = $0^h 1^m 28^s$ Decl. = $+3^\circ 37'$.					
1898.638	89°3	0".41	8.5 , 9.0	2	36
.648	93.0	0.43	9.0 , 9.0	2	»
1898.64	91.2	0.42	8.7 , 9.0		

β 395.					
RA. = $0^h 32^m 10^s$ Decl. = $-25^\circ 19'$.					
1898.542	280°3	0".37	6.2 , 6.5	3	36
.577	280.5	0.41	6.0 , 6.0	2	»
.648	280.4	0.36	6.5 , 6.5	2	»
1898.59	280.4	0.38	6.2 , 6.3		

Σ 60. η Cassiopeiae.					
RA. = $0^h 43^m 3^s$ Decl. = $+57^\circ 17'$.					
1898.725	213°2	5".05	4 , 7	3	12
.878	212.8	5.02	— , —	3+	»
.925	214.6	4.96	— , —	4	»
.939	214.5	4.98	— , —	3	»
1898.87	213.8	5.00	4 , 7		

β 1228.					
RA. = $1^h 0^m 33^s$ Decl. = $+12^\circ 47'$.					
1898.942	268°5	0".80	8.5 , 9.5	2	36

β 1164. 95 Piscium.					
RA. = $1^h 22^m 28^s$ Decl. = $+4^\circ 50'$.					
1898.942	160°2	0".40	7.0 , 7.5	3	36

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
β 512.					
RA. = $1^h 48^m 18^s$ Decl. = $+18^\circ 49'$.					
1898.878	18°3	1".97	8.0 , 12.5	3	12

β 513. 48 Cassiopeiae.					
RA. = $1^h 53^m 44^s$ Decl. = $+70^\circ 25'$.					
1898.870	5°9	0".36	5.0 , 7.0	3	36
.925	7.7	0.36	5.0 , 7.0	4	»
.963	4.1	0.35	5.5 , 7.5	3	»
1898.92	5.9	0.36	5.2 , 7.2		

The angle is increasing, distance probably still diminishing. At discovery in 1878.7 β and De. found $264^\circ 7$, $1^\circ 04$.

Σ 208.					
RA. = $1^h 58^m 8^s$ Decl. = $+25^\circ 27'$.					
1898.878	58°4	0".73	6.0 , 8.0	3	12
.884	62.7	0.79	— , —	3	»
1898.88	60.6	0.76	6.0 , 8.0		

Angle increasing, distance diminishing.

β 517.					
RA. = $2^h 19^m 55^s$ Decl. = $-4^\circ 21'$.					
AB.					
1898.709	248°2	11".40	7.0 , 12.0	3	12
.805	249.5	11.26	— , 12.0	4	»
.859	248.8	11.04	— , 12.0	2	»
1898.79	248.8	11.23	7.0 , 12.0		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
AC.					
1898.709	289°4	56".10	—, 12.5	3	12
.805	288.7	56.48	—, 12.0	4	»
.859	289.1	55.98	—, 12.0	2	»
1898.79	289.1	56.19	—, 12.2		

 β 519.RA. = $2^h 24^m 39^s$ Decl. = $-2^\circ 43'$.

1898.703	58°5	0".93	8.0, 9.0	3	12
.805	58.4	0.82	8.0, 9.0	4	»
.859	60.6	0.84	8.5, 9.5	3	»
1898.79	59.2	0.86	8.2, 9.2		

 β 520.RA. = $2^h 31^m 49^s$ Decl. = $-4^\circ 0'$.

1898.709	196°8	0".90	8.5, 10.5	3	12
.805	204.5	0.83	8.0, 10.0	4	»
.859	204.8	0.93	8.5, 10.5	3	»
.868	200.6	1.01	8.5, 10.0	2	36
1898.81	201.7	0.92	8.4, 10.2		

 β 83.RA. = $2^h 41^m 0^s$ Decl. = $-5^\circ 23'$.

1898.709	105°5	0".97	7.5, 9.5	3	12
.805	104.1	1.00	7.0, 9.0	4	»
.859	103.2	1.04	7.5, 9.0	3	»
1898.79	104.3	1.00	7.3, 9.2		

h 3555. α Fornacis.RA. = $3^h 7^m 51^s$ Decl. = $-29^\circ 23'$.

1898.878	328°9	1".39	4, 8	3	12
99.015	329.1	1.36	4, 8	3	»
1898.95	329.0	1.38	4, 8		

 β 1039.RA. = $3^h 12^m 4^s$ Decl. = $+7^\circ 17'$.

1898.920	208°2	2".43	7.0, 13.0	2	36
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A. C. 2. 95 Ceti.

RA. = $3^h 13^m 15^s$ Decl. = $-1^\circ 18'$.

1898.126	132°5	0".65	6, 10.0	3	12
.175	140.9	0.37	6, 9.5	3	36

The discordance in these measures is evidence of the difficulty experienced in measuring this pair. The second measure is probably the more accurate.

 λ_1 23.RA. = $3^h 13^m 57^s$ Decl. = $-22^\circ 53'$.

1897.912	287°8	0".41	5, 7	2	36
98.060	282.5	0.30	—, —	2	»
.079	281.7	0.27	—, —	2	»
1898.02	284.0	0.33	5, 7		

Seeing poor on all three nights and measures difficult.

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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 β 879.RA. = $3^h 23^m 8^s$ Decl. = $+11^\circ 3'$.

1898.725	72°1	24".74	6.5, 12.2	3	12
.805	71.4	24.67	—, 12.0	4	»
.859	71.6	24.45	—, 12.5	3	»
1898.80	71.7	24.62	6.5, 12.2		

Innes 58. χ^3 Fornacis.RA. = $3^h 24^m 20^s$ Decl. = $-36^\circ 12'$.

1898.071	248°3	5".50	6.0, 10.5	3	12
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 Σ 400RA. = $3^h 26^m 51^s$ Decl. = $+59^\circ 42'$.

1898.082	320°5	0".58	7, 8	4	12
.093	324.5	0.58	—, —	3	»
.120	324.0	0.52	—, —	3	»
1898.10	323.0	0.56	7, 8		

Angle increasing, distance diminishing.

 β 1231.RA. = $3^h 34^m 33^s$ Decl. = $+65^\circ 40'$.

AB.

1898.890	13°1	2".61	8.0, 13.0	3	36
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AC.

1898.890	252°6	84".06	8.0, 8.0	3	36
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 β 1041.RA. = $3^h 38^m 32^s$ Decl. = $+27^\circ 35'$.

BC.

1898.725	339°7	9".71	8.0, 12.2	3	12
.805	341.0	9.98	7.0, 12.5	4	»
.859	340.2	10.16	7.0, 12.5	3	»
1898.80	340.3	9.95	7.3, 12.4		

AB.

1898.725	41°0	124".5	7.5, 8.0	3	12
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f Eridani.

RA. = $3^h 44^m 54^s$ Decl. = $-37^\circ 56'$.

1898.071	205°0	7".14	5.0, 5.5	2	12
.074	204.7	7.04	5.0, 5.5	2	»
1898.07	204.8	7.09	5.0, 5.5		

This star was measured because Flammarion in his »Etoiles doubles« has the note »Mouvement rectiligne. La distance diminue«. Doberck, in 1895.87 found $205^\circ 4' 7".36$. There are few micrometer measures. Meridian observations at Cordoba and the Cape of Good Hope, in excellent agreement, give the distance $9".3$ for 1877+.

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

β 263.

RA. = $3^h 50^m 5^s$ Decl. = $+32^\circ 54'$.

1898.725	75°9	0".84	8.0 , 8.5	3	12
.805	74.7	0.90	— , —	4	»
.859	72.7	0.90	— , —	3	»
1898.80	74.4	0.88	8.0 , 8.5		

β 1042.

RA. = $3^h 53^m 37^s$ Decl. = $-2^\circ 56'$.

BC.

1898.805	35°3	0".97	9.5 , 10.5	4	12
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AB.

1898.805	94°1	55".88	7.0 , 9.0	4	12
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β 1004.

RA. = $3^h 58^m 12^s$ Decl. = $-34^\circ 46'$.

AB.

1898.805	143°0	1".93	7.0 , 7.5	4	12
.878	143.8	2.01	7.0 , 8.0	3	»
1898.84	143.4	1.97	7.0 , 7.7		

AC.

1898.805	134°5	59".93	— , 12.0	4	12
.878	134.7	60.14	— , 11.5	3	»
1898.84	134.6	60.04	— , 11.7		

Σ 536.

RA. = $4^h 17^m 13^s$ Decl. = $-4^\circ 55'$.

1898.074	165°4	1".43	8 , 9	2	12
.082	160.9	2.00	— , —	4	»
.093	163.0	1.80	— , —	3	»
1898.08	163.1	1.74	8 , 9		

Slow increase of angle.

β 744. AB.

RA. = $4^h 17^m 22^s$ Decl. = $-25^\circ 58'$.

1898.878	314°0	0".81	7.0 , 7.5	4	12
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Σ 535.

RA. = $4^h 17^m 45^s$ Decl. = $+11^\circ 9'$.

1898.022	327°9	1".53	7.0 , 9.0	2	36
.074	332.0	—	7.0 , 10.0	2	12
.093	329.0	—	6.5 , 9.0	3	»
.126	328.4	1.63	7.0 , 9.0	4	»
1898.08	329.3	1.58	6.9 , 9.2		

β 1186. Tauri 248.

RA. = $4^h 21^m 57^s$ Decl. = $+10^\circ 59'$.

1897.882	173°7	0".74	6.5 , 10.0	3	12
98.093	172.7	0.77	6.0 , 9.5	4	»
.126	176.8	0.73	6.0 , 10.5	4	»
1898.03	174.4	0.75	6.2 , 10.0		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

β 881. 46 Eridani.

RA. = $4^h 29^m 2^s$ Decl. = $-6^\circ 57'$.

1898.120	47°0	1".80	6.5 , 11.5	4	12
.126	50.9	1.81	6.0 , 11.5	3	»
1898.12	49.0	1.80	6.2 , 11.5		

β 1031. Aldebaran.

RA. = $4^h 30^m 11^s$ Decl. = $+16^\circ 19'$.

AB = β 550.

1898.079	110°5	31".32	— , 14.0	3	36
.098	110.2	31.47	— , —	2	»
.137	108.5	31.12	— , —	3	»
1898.10	109.7	31.30	— , 14.0		

CD.

1898.079	276°2	1".49	9.0 , 12.5	3	36
.137	274.2	1.74	9.5 , 13.0	3	»
1898.11	275.2	1.62	9.2 , 12.7		

AC = Σ 2 (App. II).

1898.082	34°1	118".01	— , 10.0	4	12
.093	34.4	118.00	— , —	4	»
.112	34.4	117.81	— , —	4	»
.120	34.4	117.76	— , —	4	»
1898.10	34.3	117.90	— , 10.0		

C and D have no connection with the stars A and B but may possibly form another physical system. The faint star B shows the proper motion of A.

β 1044.

RA. = $4^h 34^m 8^s$ Decl. = $+16^\circ 19'$.

1898.079	219°3	0".95	9.0 , 11.0	3	36
.137	221.0	0.91	9.0 , 11.0	3	»
1898.11	220.2	0.93	9.0 , 11.0		

Σ 577.

RA. = $4^h 35^m 30^s$ Decl. = $+37^\circ 19'$.

1898.082	70°3	1".53	8 , 8	4	12
.093	68.8	1.67	— , —	3	»
1898.09	69.6	1.60	8 , 8		

Σ 596.

RA. = $4^h 41^m 11^s$ Decl. = $-12^\circ 8'$.

1898.074	286°2	10".19	8 , 10	2	12
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β 883.

RA. = $4^h 45^m 40^s$ Decl. = $+10^\circ 54'$.

AB.

1898.022	38°2	0".30	— , —	2	36
.041	39.0	0.24	— , —	3	»
.079	37.8	0.27	— , —	3	»
.082	39.3	0.27	— , —	3	»
.137	35.7	0.25	— , —	3	»
.175	36.2	0.24	— , —	3	»
1898.09	37.7	0.26	— , —		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
1898.577	[33°9]	0"30	— , —	2	36
.638	43.0	0.28	— , —	2	»
.673	43.8	0.28	6.5 , 6.5	3	»
.761	44.2	0.26	— , —	3	»
.794	44.7	0.27	— , —	3	»
.947	48.7	0.25	— , —	3	»
.963	45.2	0.25	— , —	3	»
1898.76	44.9	0.27	6.5 , 6.5		

AC.

1898.175	154°5	17"55	— , —	3	36
.947	155.2	17.96	— , 13.0	2	»
1898.56	154.8	17.75	— , 13.0		

 β 552.RA. = $4^h 46^m 11^s$ Decl. = $+13^\circ 29'$.

1898.041	196°5	0"39	7.0 , 10.0	3	36
.137	195.9	0.41	6.5 , 10.5	2	»
.175	199.3	0.48	6.5 , 10.0	2	»
.673	200.4	0.45	7.0 , 10.0	4	»
.761	199.4	0.47	7.0 , 10.0	3	»
.794	197.6	0.43	7.0 , 10.0	3	»
1898.43	198.2	0.44	6.8 , 10.1		

 β 1237.RA. = $4^h 47^m 41^s$ Decl. = $+23^\circ 23'$.

1898.093	56°9	4"46	8.0 , 11.0	3	12
.126	59.0	4.58	8.0 , 11.5	3	»
1898.11	58.0	4.52	8.0 , 11.2		

 $O\Sigma$ 89.RA. = $4^h 52^m 1^s$ Decl. = $+73^\circ 55'$.

1898.963. Examined with care with powers to 1900. No measurable elongation. Star east of and close to meridian. Seeing good. Similar results were obtained on several other nights in this, and the preceding year.

 Σ 655. ι Leporis.RA. = $5^h 7^m 38^s$ Decl. = $-11^\circ 59'$.

1898.074	335°4	11"82	4.5 , 11.5	2	12
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 β 555. β Orionis.RA. = $5^h 9^m 44^s$ Decl. = $-8^\circ 19'$.

BC.

1898.794	175°3	0"18	9.5 , 9.5	4	36
.878	181.0	0.13	— , —	3	»
.947	177.6	0.17	— , —	3	»
1898.87	178.0	0.16	9.5 , 9.5		

A and BC = Σ 668.

1898.843	201°8	9"51	— , —	2	36
.942	201.7	9.73	— , —	2	»
1898.87	201.8	9.62	— , —		

As early as 1871 Burnham suspected an elongation in the Σ companion to β Orionis, and in 1878 he succeeded

in measuring the pair with the 18 $\frac{1}{2}$ inch refractor of the Dearborn Observatory. While the elongation was suspected, independently, by Mr. Herbert Sadler, no other double star observer was able to verify Burnham's measure or even the suspected elongation and the discoverer himself was unable to secure additional measures either with the 18 $\frac{1}{2}$ inch in 1880–82, or with the 36 inch in 1889–91*). The present certain elongation taken in connection with these failures invite the hypothesis of very rapid motion. The quadrant is indeterminate.

 β 318.RA. = $5^h 11^m 15^s$ Decl. = $-3^\circ 36'$.

1898.761	232°6	0"67	8.0 , 8.0	3	36
.788	235.0	0.64	— , —	1	»
.794	235.0	0.60	8.0 , 8.0	4	»
1898.78	234.2	0.64	8.0 , 8.0		

 β 190.RA. = $5^h 15^m 35^s$ Decl. = $-8^\circ 8'$.

AB.

1898.843	356°1	0"53	8.0 , 8.5	2	36
.878	356.7	0.74	8.0 , 8.5	4	12
1898.86	356.4	0.63	8.0 , 8.5		

AB and C.

1898.843	3°8	34"81	— , —	2	36
.878	3.7	35.16	8.0 , 8.0	4	12
1898.86	3.7	34.98	8.0 , 8.0		

Da. 5. η Orionis.RA. = $5^h 19^m 27^s$ Decl. = $-2^\circ 29'$.

1898.082	78°1	1"46	3.5 , 5.5	4	12
.093	79.9	1.15	3.5 , 6.0	4	»
.120	78.8	1.14	3.5 , 5.5	4	»
1898.10	78.9	1.25	3.5 , 5.7		

 β 320. β Leporis.RA. = $5^h 23^m 58^s$ Decl. = $-20^\circ 50'$.

1898.120	296°3	2"60	3.0 , 10.5	4	12
.123	296.4	2.78	3.0 , 11.0	3	»
.126	294.3	2.78	3.0 , 10.0	3	»
1898.123	295.7	2.72	3.0 , 10.5		

 Σ 728. 32 Orionis.RA. = $5^h 25^m 26^s$ Decl. = $+5^\circ 52'$.

1897.989	164°4	0"22	5.5 , 7.0	3	36
98.011	157.5	0.30	5.0 , 7.0	2	»
.041	161.7	0.24	5.0 , 7.0	3	»
1898.01	161.2	0.25	5.2 , 7.0		

 β 1048.RA. = $5^h 27^m 38^s$ Decl. = $-1^\circ 40'$.

1898.126	356°2	2"22	6.0 , 11.0	3	12
.227	353.9	2.22	5.5 , 10.5	3	»
.260	353.7	2.22	6.5 , 11.0	3	»
1898.20	354.6	2.22	6.0 , 10.8		

*) Vgl. die Notiz von Brenner in Nr. 3559. Kr.

Date | θ_o | ρ_o | Mag. | Wt. | Tel.

β 1049.

RA. = $5^h 28^m 4^s$ Decl. = $-1^\circ 47'$.

AB = Σ 734.

1898.126	350°2	1"88	7.0 , 8.5	3	12
.227	353.5	2.13	6.5 , 8.5	3	»
.260	352.8	1.74	7.5 , 8.5	4	»
1898.20	352.2	1.92	7.0 , 8.5		

CD.

1898.260	297°2	0"77	9.0 , 9.5	4	12
.794	294.2	0.70	9.0 , 10.0	2	36
.890	291.4	0.52	9.0 , 10.0	3	»
.983	295.9	0.62	9.5 , 10.5	3	»
1898.73	294.7	0.65	9.1 , 10.0		

AC = H_1 V. 119.

1898.260	243°6	29"96	— , —	4	12
.794	243.1	29.72	— , —	2	36
1898.53	243.4	29.84	— , —		

β 89.

RA. = $5^h 32^m 31^s$ Decl. = $-1^\circ 29'$.

1898.794	354°2	0"77	8.0 , 9.0	3	36
.848	359.6	0.73	8.0 , 9.0	2	»
.890	358.2	0.64	8.0 , 9.0	3	»
.983	357.0	0.86	8.5 , 9.5	3	»
1898.88	357.2	0.75	8.1 , 9.1		

β 1032. σ Orionis.

RA. = $5^h 33^m 43^s$ Decl. = $-2^\circ 39'$.

1898.794	332°7	0"24	4.0 , 4.5	3	36
.848	334.1	0.25	— , —	2	»
.890	334.9	0.31	— , —	3	»
.963	330.0	[0.20]*	— , —	3	»
1898.77	332.9	0.27	4.0 , 4.5		

* Estimated.

Clouds interrupted measure on the last night.

The angle has diminished 24° since 1888.81 without appreciable change in the distance.

β 1052.

RA. = $5^h 36^m 39^s$ Decl. = $-2^\circ 57'$.

1898.126	190°5	0"67	7.0 , 8.0	3	12
.260	186.8	0.73	7.5 , 9.0	4	»
1898.19	188.6	0.70	7.2 , 8.5		

β 1188.

RA. = $5^h 45^m 34^s$ Decl. = $-1^\circ 27'$.

AB.

1898.878	103°1	1"43	8.0 , 10.0	3	12
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AC = Σ 809.

1898.878	98°2	25"00	8.0 , 9.0	3	12
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Date | θ_o | ρ_o | Mag. | Wt. | Tel.

S. 503.

RA. = $5^h 50^m 20^s$ Decl. = $+13^\circ 56'$.

AB.

1898.082	335°7	8"46	7.0 , 8.0	4	12
.093	335.6	8.58	7.0 , 8.0	3	»
1898.09	335.6	8.52	7.0 , 8.0		

AC.

1898.093	173°4	15"92	— , 11.5	3	12
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Perrine. Harvard AG. 2368.

RA. = $5^h 51^m 21^s$ Decl. = $+52^\circ 41'$.

1898.848	304°5	1"67	8.0 , 8.5	3	36
.99.015	306.9	2.02	9.0 , 10.0	3	12
1898.93	305.7	1.84	8.5 , 9.2		

β 1190.

RA. = $5^h 52^m 4^s$ Decl. = $+0^\circ 1'$.

AB.

1898.848	339°4	1"47	7.5 , 10.5	2	36
.878	336.0	1.73	7.5 , 10.0	3	12
1898.86	337.7	1.60	7.5 , 10.2		

AC.

1898.848	95°4	6"51	— , 12.5	2	36
.878	96.3	5.90	— , 12.5	3	12
1898.86	95.8	6.20	— , 12.5		

β 1056. μ Orionis.

RA. = $5^h 56^m 53^s$ Decl. = $+9^\circ 39'$.

1898.079	273°8	17"25	4.0 , 14.0	2	36
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β 17. 4 Monocerotis.

RA. = $6^h 3^m 44^s$ Decl. = $-11^\circ 8'$.

AB.

1898.123	181°5	3"14	6.0 , 10.5	3	12
.227	181.2	2.88	— , 10.0	3	»
1898.18	181.4	3.01	6.0 , 10.2		

AC.

1898.123	248°5	9"32	— , 11.5	3	12
.227	249.7	9.32	— , 11.5	3	»
1898.18	249.1	9.32	— , 11.5		

β 1020.

RA. = $6^h 17^m 2^s$ Decl. = $+28^\circ 48'$.

1898.123	163°8	1"24	8.0 , 11.0	3	12
.126	155.2	1.32	8.0 , 10.5	3	»
1898.12	159.5	1.28	8.0 , 10.7		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 $O\Sigma$ 149.RA. = $6^h 30^m 11^s$ Decl. = $+27^\circ 22'$.

1898.082	275.3	0.81	6.5 , 9.0	4	12
.093	281.2	0.96	6.5 , 9.0	3	»
.123	276.7	0.87	6.0 , 9.0	4	»
1898.10	277.7	0.88	6.3 , 9.0		

Sirius.

RA. = $6^h 40^m 44^s$ Decl. = $-16^\circ 35'$.

1898.137	171.0	4.24	— , —	4+	36
.175	170.5	4.20	— , —	3	»
1898.16	170.8	4.22	— , —		
1898.673	163.3	—	— , —	3	36
.714	161.8	—	— , —	3	»
.794	160.5	4.22	— , —	4	»
1898.73	161.9	4.22	— , —		

 β 1023.RA. = $7^h 8^m 59^s$ Decl. = $+26^\circ 3'$.

1898.271	294.6	0.38	8.3 , 8.6	3	36
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 β 1268.RA. = $7^h 10^m 12^s$ Decl. = $+0^\circ 1'$.

1898.942	310.3	3.89	6.0 , 13.0	2	36
.947	311.0	3.90	6.0 , 13.0	2	»
1898.94	310.6	3.90	6.0 , 13.0		

The bright star is the suspected close double $O\Sigma$ 169. It appeared perfectly round on both nights.

 β 198.RA. = $7^h 21^m 8^s$ Decl. = $-20^\circ 46'$.

1898.246	214.5	5.68	8.0 , 11.0	3	12
.260	212.8	5.84	8.0 , 11.0	4	»
.268	213.5	5.57	8.0 , 10.5	4	»
1898.26	213.6	5.70	8.0 , 10.8		

 β 21. η Canis minoris.RA. = $7^h 22^m 40^s$ Decl. = $+7^\circ 9'$.

1898.123	24.8	4.30	6.0 , 11.0	3	12
.126	23.8	4.36	6.0 , 11.0	3	»
1898.12	24.3	4.33	6.0 , 11.0		

 β 578.RA. = $7^h 22^m 41^s$ Decl. = $-17^\circ 40'$.

1898.246	44.6	2.37	6.5 , 11.0	3	12
.260	48.6	2.26	6.0 , 10.8	4	»
.268	45.9	2.14	6.5 , 11.0	4	»
1898.26	46.4	2.26	6.3 , 10.9		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 β 1194. 65 Geminorum.RA. = $7^h 23^m 36^s$ Decl. = $+28^\circ 7'$.

1898.876	286.2	13.35	5.0 , 14.0	2	36
.890	288.3	13.36	5.0 , 14.5	3	»
.922	290.2	13.28	5.0 , 14.0	3	»
1898.90	288.2	13.33	5.0 , 14.2		

Anon. (New).

RA. = $7^h 24^m 5^s$ Decl. = $+28^\circ 6'$.

1898.890	254.6	2.07	8.5 , 12.5	3	36
.922	255.9	2.21	9.0 , 13.0	3	»
1898.91	255.2	2.14	8.8 , 12.8		

The star is AG. Cambr. 3993. It is in the finder field with 65 Geminorum.

Procyon.

RA. = $7^h 34^m 7^s$ Decl. = $+5^\circ 29'$.

1898.137	324.6	[4.75±]*	— , —	3	36
.175	325.3	4.68	— , —	3	»
.315	326.1	4.95	— , —	4	»
1898.209	325.3	4.82	— , —		

* Estimated.

1898.714	331.1	5.19	— , 13.3	4	36
.761	331.8	4.93	— , 13.5	3	»
.794	329.9	4.78	— , 13.5	4	»
1898.756	330.9	4.97	— , 13.4		

Since Professor Schaeberle's discovery in November 1896, the companion has moved through an angle of 12° .

 β 1061. α Argus.RA. = $7^h 34^m 44^s$ Decl. = $-26^\circ 34'$.

BC.

1898.271	227.7	7.30	4.0 , 14.5	3	36
.276	228.3	6.44	4.0 , 14.5	2	»
1898.27	228.0	6.87	4.0 , 14.5		

AB = H₁ III.27.

1898.271	318.1	9.86	4 , 4	3	36
.276	318.1	9.58	— , —	2	»
1898.27	318.1	9.72	4 , 4		

 β 580. β Geminorum.RA. = $7^h 39^m 12^s$ Decl. = $+28^\circ 16'$.

AB.

1898.876	280.6	30.60	— , 15.0	2	36
.890	279.5	29.84	— , 15.0	3	»
1898.88	280.0	30.22	— , 15.0		

CD.

1898.890	131.2	1.27	10.0 , 13.0	3	36
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AC.

1898.876	71.8	187.72	— , 10.0	2	36
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Date	θ_o	ρ_o	Mag.	Wt.	Tel.
AE.					
1898.876	90°0	219".10	—, 10.0	2	36
AF.					
1898.876	75°8	242".57	—, 10.0	2	36
β 1063. ξ Argus.					
RA. = 7 ^h 45 ^m 5 ^s Decl. = -24° 37'.					
1898.271	189°2	4".86	4.0, 14.0	3	36
.276	190.5	4.98	4.5, 14.0	2	»
1898.27	189.8	4.92	4.2, 14.0		
β 1195.					
RA. = 7 ^h 46 ^m 33 ^s Decl. = -9° 9'.					
1898.041	81°3	0".49	8.0, 8.0	3	36
.079	81.8	0.42	7.5, 7.5	2	»
1898.06	81.6	0.46	7.7, 7.7		
β 101. 9 Argus.					
RA. = 7 ^h 47 ^m 9 ^s Decl. = -13° 38'.					
1898.271	288°1	0".63	6.5, 6.5	3	36
.276	289.7	0.57	6.5, 6.5	2	»
.309	290.4	0.64	6.5, 6.5	3	»
1898.29	289.4	0.61	6.5, 6.5		
β 23.					
RA. = 7 ^h 57 ^m 17 ^s Decl. = +3° 21'.					
1898.123	180°0	2".50	8.0, 11.5	3	12
.126	175.9	2.46	8.0, 11.5	3	»
1898.12	178.0	2.48	8.0, 11.5		
Σ 1196. ζ Cancri.					
RA. = 8 ^h 6 ^m 29 ^s Decl. = +17° 58'.					
AB.					
1898.309	9°1	1".12	—, —	3	36
.312	8.9	1.29	—, —	3	12
.315	9.1	1.10	—, —	3	36
1898.31	9.0	1.17	—, —		
AC.					
1898.309	115°6	5".26	—, —	3	36
.312	117.2	5.26	—, —	3	12
.315	116.2	5.21	—, —	3	36
1898.31	116.3	5.24	—, —		
BC.					
1898.309	129°1	5".75	—, —	3	36
.312	128.1	5.84	—, —	3	12
.315	128.2	5.86	—, —	3	36
1898.31	128.5	5.82	—, —		

The difference of declination between C and the 6 magnitude star 2^m following was observed on three nights with the 36 inch, to carry on the series of measures made with the same instrument by Burnham and Barnard. The results, corrected for refraction, are as follows:

Date	θ_o	ρ_o	Mag.	Wt.	Tel.
1898.304	$\Delta\delta = 104".33$		5 comparisons		
.306	104.35		5	»	
.309	104.25		5	»	
1898.306	104.31				
β 1065.					
RA. = 8 ^h 11 ^m 6 ^s Decl. = +9° 30'.					
1898.238	293°5	29".44	3.5, 14.0	2	36
.309	293.6	29.32	3.5, 13.5	2	»
1898.27	293.6	29.38	3.5, 13.8		
β 905.					
RA. = 8 ^h 11 ^m 54 ^s Decl. = -16° 1'.					
1898.257	111°3	3".94	8.0, 10.5	2	12
.260	112.4	3.87	8.0, 10.5	4	»
.268	112.9	3.94	8.0, 10.5	4	»
1898.26	112.2	3.92	8.0, 10.5		
β 906.					
RA. = 8 ^h 12 ^m 18 ^s Decl. = -15° 56'.					
1898.246	186°9	3".53	8.0, 11.0	3	12
.260	187.1	3.23	8.5, 11.5	4	»
.268	188.2	3.49	8.5, 11.0	4	»
1898.26	187.4	3.42	8.3, 11.2		
Σ 1216.					
RA. = 8 ^h 16 ^m 16 ^s Decl. = -1° 17'.					
1898.082	191°5	0".69	7.5, 8.0	4	12
.093	191.0	0.66	7.5, 8.0	3	»
.123	191.2	0.56	7.5, 7.5	4	»
1898.10	191.2	0.64	7.5, 7.8		
β 205.					
RA. = 8 ^h 28 ^m 46 ^s Decl. = -24° 16'.					
1898.246	237°5	0".79	7.7, 7.8	3	12
.257	234.2	0.72	8.0, 8.0	2	»
.260	237.8	0.73	7.5, 7.5	3	»
1898.25	236.5	0.75	7.7, 7.8		
β 208.					
RA. = 8 ^h 34 ^m 46 ^s Decl. = -22° 19'.					
1898.271	75°3	0".51	6.5, 8.5	2	36
.309	77.0	0.39	6.5, 8.0	2	»
1898.29	76.2	0.45	6.5, 8.2		
ϵ Hydrae. AB.					
RA. = 8 ^h 41 ^m 29 ^s Decl. = +6° 47'.					
1898.137	250°7	0".18	—, —	3	36
99.024	259.9	0.25	4.0, 6.0	3	»

Discovered by Schiaparelli in 1888.28 at which time the position angle was 142°0 and the distance 0".21. The object-glass fogged over during the 1898 measure, making the result somewhat uncertain.

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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 β 105. α Leonis.RA. = $9^h 18^m 50^s$ Decl. = $+26^\circ 37'$.

1898.238	205.6	2.88	4.0, 11.5	2	36
.271	205.8	3.06	—, 11.5	2	»
.315	204.4	2.93	—, 11.0	3	»
1898.27	205.3	2.96	4.0, 11.3		

 β 1070.RA. = $9^h 19^m 17^s$ Decl. = $+26^\circ 41'$.

1898.430	74.6	0.34	10.0, 10.0	3	36
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This measure is not very certain. The pair was examined on many other nights, but without success.

 Σ 1356. ω Leonis.RA. = $9^h 23^m 6^s$ Decl. = $+9^\circ 30'$.

1898.848	112.2	0.76	—, —	3	12
.870	111.3	0.76	—, —	4	»
99.024	111.7	0.81	6.5, 7.2	4	36
1898.91	111.7	0.78	6.5, 7.2		

 β 1071. θ Ursae majoris.RA. = $9^h 26^m 13^s$ Decl. = $+52^\circ 8'$.

1898.482	79.2	5.06	3.0, 14.0	3	36
.501	77.6	—	—, —	2	»
1898.49	78.4	5.06	3.0, 14.0		

 β 214.RA. = $9^h 36^m 50^s$ Decl. = $-18^\circ 2'$.

1898.246	256.0	3.23	7.5, 11.0	3	12
.257	254.6	3.26	7.8, 11.0	2	»
.260	258.8	3.14	7.5, 11.0	4	»
1898.25	256.5	3.21	7.6, 11.0		

A. C. 5. 8 Sextantis.

RA. = $9^h 47^m 34^s$ Decl. = $-7^\circ 38'$.

1898.848	90.9	0.45	5.5, 6.0	3	12
.870	93.3	0.55	5.5, 5.5	4	»
99.024	92.4	0.44	5.0, 5.2	4	36
1898.91	92.2	0.48	5.3, 5.6		

 β 215.RA. = $9^h 49^m 35^s$ Decl. = $-27^\circ 32'$.

1898.246	339.2	1.90	7.5, 11.0	4	12
.257	339.0	2.04	7.5, 11.0	2	»
.260	340.8	1.96	7.5, 11.0	4	»
1898.25	339.7	1.97	7.5, 11.0		

 β 911.RA. = $10^h 3^m 38^s$ Decl. = $-19^\circ 15'$.

AB.

1898.246	311.0	4.74	7.5, 12.0	3	12
.257	308.6	4.91	7.5, 12.0	2	»
.260	310.4	4.86	8.0, 12.0	4	»
1898.25	310.0	4.84	7.7, 12.0		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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AC.

1898.246	77.3	50.98	7.5, 9.5	3	12
.257	77.5	51.68	7.5, 10.0	2	»
.260	77.4	51.22	8.0, 9.5	4	»
1898.25	77.4	51.29	7.7, 9.7		

 $O\Sigma$ 215.RA. = $10^h 10^m 49^s$ Decl. = $+18^\circ 14'$.

1898.123	207.1	0.89	7.5, 7.5	3	12
.126	209.5	0.97	7.5, 7.5	3	»
.424	208.8	0.75	7.2, 7.5	3	»
1898.22	208.5	0.87	7.4, 7.5		

Holden 101.

RA. = $10^h 12^m 1^s$ Decl. = $-20^\circ 10'$.

1898.123	117.6	1.39	6.0, 10.5	3	12
.126	116.2	1.15	6.0, 10.0	3	»
1898.12	116.9	1.27	6.0, 10.2		

Probably unchanged.

 β 912.RA. = $10^h 17^m 25^s$ Decl. = $-13^\circ 10'$.

1898.246	107.8	1.33	8.0, 10.5	3	12
.260	101.0	1.17	8.5, 10.5	3	»
.306	101.8	1.15	8.0, 11.0	3	»
.397	106.9	0.89	8.0, 10.5	3	»
1898.30	104.4	1.14	8.1, 10.6		

 β 1073. 101 Sextantis.RA. = $10^h 27^m 27^s$ Decl. = $-5^\circ 34'$.

1898.022	47.5	3.42	7.0, 12.0	3	36
.238	46.1	3.43	7.0, 11.5	2	»
1898.13	46.8	3.42	7.0, 11.8		

 β 913. 40 Leonis minoris.RA. = $10^h 37^m 33^s$ Decl. = $+26^\circ 51'$.

1898.271	119.6	12.71	6.0, 13.0	2	36
.315	119.5	12.98	6.0, 13.0	3	»
.430	118.8	12.87	6.0, 13.0	3	»
1898.34	119.3	12.85	6.0, 13.0		

The 36 inch shows another faint companion which was measured on one night, as follows:

1898.315	77.3	39.71	—, 14.0	3	36
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 β 595.RA. = $10^h 42^m 47^s$ Decl. = $-14^\circ 35'$.

1898.257	13.7	2.19	9.0, 10.5	2	12
.260	12.4	2.28	9.0, 10.5	3	»
.268	11.2	2.25	9.0, 10.5	3	»
1896.26	12.4	2.24	9.0, 10.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
β 111.					
RA. = $10^h 46^m 10^s$ Decl. = $-8^\circ 34'$.					
1898.246	3 $^{\circ}7$	3 $^{\circ}60$	9.0 , 9.0	3	12
.257	5.6	3.39	9.0 , 9.0	2	»
.260	4.5	3.57	9.0 , 9.0	3	»
1898.26	4.6	3.52	9.0 , 9.0		

β 1076. 55 Leonis.					
RA. = $10^h 50^m 34^s$ Decl. = $+1^\circ 16'$.					
1898.022	36 $^{\circ}6$	0 $^{\circ}87$	6.0 , 10.0	3	36
.312	35.4	0.88	6.0 , 11.0	3	»
.315	33.0	0.90	6.0 , 11.0	2	»
1898.22	35.0	0.88	6.0 , 10.7		

β 598. 59 Leonis.					
RA. = $10^h 55^m 34^s$ Decl. = $+6^\circ 38'$.					
1898.254	221 $^{\circ}2$	46 $^{\circ}25$	5.5 , 14.0	2	36
.271	221.4	46.54	5.5 , 14.0	3	»
1898.26	221.3	46.40	5.5 , 14.0		

β 916.					
RA. = $11^h 9^m 4^s$ Decl. = $-14^\circ 53'$.					
1898.246	357 $^{\circ}7$	0 $^{\circ}70$	7.5 , 7.5	3	12
.260	363.0	0.67	7.5 , 7.5	3	»
.268	361.7	0.65	7.5 , 8.0	3	»
.306	360.1	0.60	7.0 , 7.5	3	»
1898.27	360.6	0.65	7.4 , 7.6		

β 600.					
RA. = $11^h 11^m 54^s$ Decl. = $-6^\circ 35'$.					
AB.					
1898.246	244 $^{\circ}1$	1 $^{\circ}00$	6.0 , 12.0	3	12
.268	239.2	1.07	6.0 , 12.0	4	»
.306	238.4	0.87	6.0 , 12.0	4	»
1898.27	240.6	0.98	6.0 , 12.0		

AB and C.					
1898.246	97 $^{\circ}5$	60 $^{\circ}83$	6 , 8.0	3	12
.268	97.6	60.56	6 , 8.5	4	»
.306	97.9	60.39	— , 9.0	4	»
1898.27	97.7	60.59	6.0 , 8.5		

β 791.					
RA. = $11^h 14^m 29^s$ Decl. = $+7^\circ 25'$.					
1898.246	195 $^{\circ}0$	2 $^{\circ}21$	9.0 , 11.0	4	12
.268	199.3	2.02	8.5 , 11.0	3	»
.306	197.6	2.21	8.5 , 10.5	3	»
1898.27	197.3	2.15	8.7 , 10.8		

β 601.					
RA. = $11^h 24^m 15^s$ Decl. = $-16^\circ 46'$.					
BC.					
1898.246	220 $^{\circ}0$	0 $^{\circ}97$	9.0 , 10.0	4	12
.260	220.4	1.14	8.5 , 9.0	3	»
.268	219.5	0.93	8.0 , 8.8	4	»
1898.26	220.0	1.01	8.5 , 9.3		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
A and BC.					
1898.246	330 $^{\circ}2$	28 $^{\circ}19$	8.0 , 9.0	4	12
.260	330.4	28.34	7.5 , 8.5	3	»
.268	330.5	28.40	7.0 , 8.0	4	»
1898.26	330.4	28.31	7.5 , 8.5		

$O\Sigma$ 234.					
RA. = $11^h 25^m 25^s$ Decl. = $+41^\circ 50'$.					
1898.848	138 $^{\circ}3$	0 $^{\circ}48$	7.0 , 7.0	3	12
.870	138.9	0.53	7.5 , 7.5	4	»
99.024	133.2*	0.33*	7.2 , 7.5	4	36
1898.94	135.9	0.42	7.2 , 7.4		

* Weight 2.

$O\Sigma$ 235.					
RA. = $11^h 26^m 41^s$ Decl. = $+61^\circ 38'$.					
1898.093	100 $^{\circ}2$	0 $^{\circ}81$	— , —	3	12
.123	96.5	0.72	— , —	3	»
.126	98.6	0.66	— , —	4	»
1898.11	98.4	0.73	— , —		
1898.848	112 $^{\circ}7$	0 $^{\circ}60$	6.0 , 7.5	3	12
.870	107.8	0.71	— , —	4	»
99.024	108.4	0.74	6.0 , 7.5	3	36
1898.91	109.6	0.68	6.0 , 7.5		

β 456.					
RA. = $11^h 31^m 46^s$ Decl. = $-11^\circ 48'$.					
1898.022	290 $^{\circ}6$	0 $^{\circ}40$	8.5 , 9.0	3	36
.309	288.9	0.42	8.5 , 9.0	2	»
.312	293.0	0.42	8.5 , 9.0	3	»
1898.21	290.8	0.41	8.5 , 9.0		

β 1078.					
RA. = $11^h 34^m 48^s$ Decl. = $-13^\circ 55'$.					
1898.238	51 $^{\circ}7$	8 $^{\circ}03$	6.0 , 11.5	2	36
.254	52.6	8.23	6.0 , 13.0	2	»
.276	51.0	8.08	6.0 , 13.0	2	»
1898.26	51.8	8.11	6.0 , 12.5		

β 792.					
RA. = $11^h 36^m 33^s$ Decl. = $+3^\circ 26'$.					
1898.246	203 $^{\circ}2$	2 $^{\circ}08$	9.0 , 11.0	3	12
.268	203.0	2.35	8.5 , 11.0	3	»
.306	201.9	2.15	8.0 , 11.0	3	»
1898.27	202.7	2.19	8.5 , 11.0		

β 917.					
RA. = $11^h 38^m 26^s$ Decl. = $+11^\circ 15'$.					
1898.268	176 $^{\circ}5$	3 $^{\circ}61$	7.5 , 10.5	2	12
.306	175.8	3.80	8.0 , 11.5	3	»
.397	176.5	3.47	8.0 , 10.5	3	»
1898.32	176.3	3.63	7.8 , 10.8		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
β 793.					
RA. = $11^h 38^m 30^s$ Decl. = $+7^\circ 5'$.					
1898.315	$109^\circ 8'$	$1''.66$	9.5, 10.5	3	36
.430	111.1	1.62	9.5, 10.0	3	»
.462	112.6	1.46	9.5, 10.5	3	»
1898.40	111.2	1.58	9.5, 10.3		

β 602.					
RA. = $11^h 41^m 41^s$ Decl. = $+15^\circ 33'$.					
1898.430	78.2	$0''.43$	8.0, 12.5	3	36
.462	75.6	—	—, —	3	»
1898.45	76.9	0.43	8.0, 12.5		

Exceedingly difficult.

β 604. β Leonis.					
RA. = $11^h 43^m 58^s$ Decl. = $+15^\circ 8'$.					
AC.					
1898.315	351.8	$79''.22$	—, 14.5	3	36
.430	350.9	78.87	—, 14.0	3	»
.462	351.4	78.58	—, 14.5	4	»
1898.40	351.4	78.89	—, 14.3		

AB (new).					
1898.315	344.6	$39''.83$	—, 15.5	3	36
.430	346.9	39.92	—, 15.5	3	»
.462	347.0	39.46	—, 15.5	4	»
1898.40	346.2	39.74	—, 15.5		

β 794.					
RA. = $11^h 48^m 19^s$ Decl. = $+74^\circ 19'$.					
AB.					
1898.482	163.0	$0''.44$	6.0, 7.0	3	36
.597	161.7	0.36	7.0, 8.0	2	»
.608	163.0	0.40	6.0, 7.0	2	»
1898.56	162.6	0.40	6.3, 7.3		
AC.					
1898.482	71.2	$5''.56$	—, 14.0	3	36
.597	73.0	5.23	—, 14.5	2	»
.608	72.2	5.28	—, 14.5	2	»
1898.56	72.1	5.36	—, 14.3		
AD.					
1898.482	77.6	$27''.04$	—, 14.5	3	36
.597	80.1	27.29	—, 14.0	2	»
.608	77.4	27.03	—, 14.0	2	»
1898.56	78.4	27.12	—, 14.2		

β 457.					
RA. = $11^h 56^m 17^s$ Decl. = $-20^\circ 58'$.					
1898.246	79.6	$1''.21$	8.0, 10.0	4	12
.260	78.9	1.21	8.5, 10.5	4	»
.268	81.7	1.12	8.0, 9.5	4	»
1898.26	80.1	1.18	8.2, 10.0		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
β 458.					
RA. = $11^h 59^m 9^s$ Decl. = $-20^\circ 29'$.					
1898.246	232.9	$30''.52$	8.0, 9.5	4	12
.260	233.1	30.69	7.5, 9.5	4	»
.268	233.0	30.44	7.5, 9.5	4	»
1898.26	233.0	30.55	7.7, 9.5		

Σ 3123.					
RA. = $12^h 1^m 0^s$ Decl. = $+69^\circ 15'$.					
AB.					
1898.482	181.7	$0''.35$	7.3, 7.5	4	36
.501	182.1	0.40	—, —	2	»
.597	180.1	0.35	—, —	2	»
1898.53	181.3	0.37	7.3, 7.5		
AB and C = Barnard.					
1898.482	309.9	$3''.00$	—, 15.5	4	36

β 920.					
RA. = $12^h 10^m 36^s$ Decl. = $-22^\circ 48'$.					
1898.246	251.0	$1''.05$	6.5, 7.0	4	12
.260	256.3	1.04	6.5, 7.5	3	»
.268	247.7	1.04	6.5, 7.5	4	»
1898.26	251.7	1.04	6.5, 7.3		

β 796.					
RA. = $12^h 12^m 20^s$ Decl. = $+7^\circ 9'$.					
1898.268	272.7	$0''.67$	8.0, 8.0	4	12
.452	270.8	—	8.0, 8.0	2	»
.462	274.3^*	0.45^*	8.0, 8.2	3	36
1898.41	273.0	0.52	8.0, 8.1		
* Weight 2.					

β 27.					
RA. = $12^h 15^m 1^s$ Decl. = $+14^\circ 25'$.					
1898.268	103.6	$3''.36$	7.0, 11.0	4	12
.304	104.5	3.42	7.0, 11.5	3	»
.397	106.8	3.46	7.5, 12.0	3	»
1898.32	105.0	3.41	7.2, 11.5		

Σ 1639.					
RA. = $12^h 19^m 26^s$ Decl. = $+26^\circ 8'$.					
1898.309	186.1	$0''.38$	6.5, 7.0	3	36
.312	185.5	0.28	6.5, 7.5	3	»
.315	182.5	0.33	6.5, 7.0	3	»
1898.31	184.7	0.33	6.5, 7.2		

β 923.					
RA. = $12^h 23^m 13^s$ Decl. = $+4^\circ 57'$.					
1898.476	58.8	$2''.87$	—, —	2	12
.492	58.1	2.38	7.0, 12.0	3	»
.528	60.3	2.70	7.0, 12.5	3	»
1898.50	59.1	2.65	7.0, 12.2		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

β 1080. 17 Comae.

RA. = $12^h 23^m 55^s$ Decl. = $+26^\circ 28'$.

1898.482	156.0	1.83	—, 14.0	3	36
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β 28.

RA. = $12^h 24^m 56^s$ Decl. = $-12^\circ 50'$.

1898.246	7.2	2.01	6.0, 12.0	4	12
.257	5.2	2.14	—, 11.0	2	»
.260	8.2	1.96	—, 11.0	4	»
1898.25	6.9	2.04	6.0, 11.3		

β 459.

RA. = $12^h 42^m 59^s$ Decl. = $+4^\circ 0'$.

1898.260	293.3	3.67	8.0, 12.0	3	12
.268	292.9	3.64	8.0, 11.0	4	»
.304	292.4	3.96	8.0, 12.0	3	»
1898.28	292.9	3.76	8.0, 11.7		

$O\Sigma$ 256.

RA. = $12^h 51^m 19^s$ Decl. = $-0^\circ 25'$.

1898.175	254.0	0.77	7.5, 7.5	3	36
.424	251.3	0.72	6.5, 7.0	3	12
.452	250.9	0.87	7.5, 7.5	3	»
1898.35	252.1	0.79	7.2, 7.3		

β 1081. 37 Comae.

RA. = $12^h 55^m 29^s$ Decl. = $+31^\circ 29'$.

1898.482	349.4	5.20	5.0, 14.0	3	36
.558	348.0	5.29	—, 14.0	2	»
1898.52	348.7	5.24	5.0, 14.0		

β 112.

RA. = $12^h 55^m 45^s$ Decl. = $+18^\circ 55'$.

BC.

1898.260	294.0	2.14	9.0, 9.0	3	12
.268	294.2	2.01	9.0, 9.0	4	»
.304	290.6	2.21	8.5, 9.0	3	»
1898.28	292.9	2.12	8.8, 9.0		

A and BC.

1898.260	348.6	151.12	6.0, 9.0	3	12
.268	349.0	151.12	7.0, 9.0	4	»
.304	349.1	150.92	6.0, 8.5	3	»
1898.28	348.9	151.05	6.3, 8.8		

β 1082.

RA. = $12^h 56^m 26^s$ Decl. = $+56^\circ 54'$.

1898.479	85.0	1.48	6.0, 10.0	3	12
.517	86.0	1.34	6.0, 9.0	3	»
.528	88.5	1.45	6.0, 9.5	4	»
1898.51	86.5	1.42	6.0, 9.5		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

β 341.

RA. = $12^h 58^m 24^s$ Decl. = $-20^\circ 3'$.

1898.246	313.6	0.69	6.5, 6.5	4	12
.260	316.2	0.66	6.5, 6.5	4	»
.268	316.6	0.62	6.5, 6.5	4	»
1898.26	315.5	0.66	6.5, 6.5		

β 1083.

RA. = $13^h 1^m 24^s$ Decl. = $+29^\circ 34'$.

BC.

1898.482	235.9	0.49	12.5, 12.5	3	36
.558	240.5	0.45	12.5, 12.5	2	»
1898.52	238.2	0.47	12.5, 12.5		

A and BC.

1898.482	218.2	6.46	—, 12.0	3	36
.558	220.0	6.35	—, 12.0	2	»
1898.52	219.1	6.40	—, 12.0		

AD.

1898.482	9.0	39.52	—, 12.5	3	36
.558	8.6	39.15	—, —	2	»
1898.52	8.8	39.33	—, 12.5		

Σ 1728. 42 Comae.

RA. = $13^h 5^m 8^s$ Decl. = $+18^\circ 3'$.

1898.309	3.0	0.22	6.5, 6.5	2	36
.312	13.0	0.17	6.5, 6.5	3	»
.315	10.1	0.18	6.0, 6.0	3	»
1898.31	8.7	0.19	6.3, 6.3		

β 931.

RA. = $13^h 5^m 50^s$ Decl. = $+13^\circ 50'$.

1898.268	202.3	4.95	7.0, 11.0	4	12
.304	203.3	5.15	7.0, 12.0	3	»
.397	202.2	4.95	7.0, 11.5	3	»
1898.32	202.6	5.02	7.0, 11.5		

β 800.

RA. = $13^h 11^m 51^s$ Decl. = $+17^\circ 33'$.

1898.268	112.5	2.47	6.5, 10.5	4	12
.304	111.0	2.64	7.0, 10.0	4	»
.397	112.2	2.59	7.0, 10.5	3	»
1898.32	111.9	2.57	6.8, 10.3		

β 342.

RA. = $13^h 9^m 53^s$ Decl. = $-18^\circ 23'$.

1898.306	34.8	3.95	8.0, 8.3	3	12
.397	35.1	3.99	8.0, 9.0	4	»
.421	34.6	3.92	—, —	2	»
1898.37	34.8	3.95	8.0, 8.6		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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H. 529.

RA. = $13^h 14^m 54^s$ Decl. = $+35^\circ 40'$.

1898.848	120°3	17"57	9.0 , 10.0	3	12
.870	121.7	17.56	9.0 , 10.0	4	»
1898.86	121.0	17.56	9.0 , 10.0		

The larger star has a proper motion of $0''.900$ in 154^6 (Porter) and in this the smaller star shares as is shown by comparison of the above result with my measures in 1896.51, 120°4 17'30 3n. I know of no other measures.

 β 1084.RA. = $13^h 17^m 1^s$ Decl. = $-4^\circ 8'$.

1898.175	89°0	2"75	7.5 , 13.5	2	36
.306	88.1	2.77	7.0 , 13.0	2	»
.312	89.1	2.83	7.0 , 14.0	3	»
1898.26	88.7	2.78	7.2 , 13.5		

 β 113.RA. = $13^h 24^m 8^s$ Decl. = $+12^\circ 0'$.

1898.268	204°9	1"41	8.0 , 11.5	4	12
.304	203.0	1.52	8.0 , 11.5	4	»
.397	204.8	1.24	8.5 , 11.0	3	»
1898.32	204.2	1.39	8.2 , 11.3		

 $O\Sigma$ 269.RA. = $13^h 28^m 20^s$ Decl. = $+35^\circ 25'$.

1898.175	225°9	0"30	6.5 , 6.5	2	36
.309	220.6	0.30	7.5 , 7.5	3	»
.315	222.7	0.33	7.0 , 7.5	3	»
1898.27	223.1	0.31	7.0 , 7.2		

 β 932.RA. = $13^h 29^m 21^s$ Decl. = $-12^\circ 42'$.

AB.

1898.260	84°5	0"49	6.0 , 6.0	3	12
.309	83.7	0.41	6.5 , 6.5	2	36
.312	85.9	0.42	6.5 , 6.5	3	»
.397	83.2	0.46	6.5 , 6.5	3	12
1898.32	84.3	0.44	6.4 , 6.4		

AB and C.

1898.260	152°5	24"60	6 , 12.5	3	12
.306	153.4	25.22	— , 12.0	3	»
.309	153.5	25.40	— , 12.5	2	36
.312	153.8	25.35	— , 13.0	3	»
.397	154.2	25.19	— , 12.0	3	12
1898.32	153.5	25.15	6 , 12.4		

 β 933.RA. = $13^h 30^m 2^s$ Decl. = $+33^\circ 39'$.

AB.

1898.304	29°1	2"46	8.0 , 8.5	4	12
.397	29.6	2.19	8.5 , 9.0	4	»
.399	29.7	2.30	8.5 , 9.0	3	»
1898.37	29.5	2.32	8.3 , 8.8		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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AC.

1898.304	17°3	34"68	— , 12.5	4	12
.397	16.3	34.56	— , 12.5	4	»
.399	16.0	34.89	— , 12.5	3	»
1898.37	16.5	34.71	— , 12.5		

 β 611.RA. = $13^h 32^m 20^s$ Decl. = $-14^\circ 13'$.

1898.421	257°2	4"70	9.0 , 12.2	2	12
.424	261.1	4.91	9.0 , 12.5	3	»
.473	258.1	4.98	8.5 , 12.0	3	»
1898.44	258.8	4.86	8.8 , 12.2		

 Σ 1768. 25 Canum venaticorum.RA. = $13^h 33^m 1^s$ Decl. = $+36^\circ 48'$.

1898.123	135°7	1"12	6.0 , 9.0	3	12
.126	134.1	1.18	5.0 , 8.5	4	»
.137	136.2	1.19	5.0 , 8.5	4	»
1898.13	135.3	1.16	5.3 , 8.7		

 β 612.RA. = $13^h 34^m 39^s$ Decl. = $+11^\circ 15'$.

1898.577	230°6	0"32	6.0 , 6.0	2	36
.608	230.5	0.25	— , —	2	»
.648	233.4	0.27	6.5 , 6.5	2	»
1898.61	231.5	0.28	6.2 , 6.2		

 β 343.RA. = $13^h 46^m 17^s$ Decl. = $-31^\circ 7'$.

1898.260	120°2	1"28	6.5 , 7.5	4	12
.306	118.4	1.34	6.5 , 7.5	3	»
.397	117.4	1.21	6.5 , 7.2	4	»
1898.32	118.7	1.28	6.5 , 7.4		

 β 936.RA. = $13^h 51^m 56^s$ Decl. = $+35^\circ 7'$.

1898.479	96°0	4"64	9.0 , 12.0	3	12
.517	95.3	4.61	8.5 , 12.0	3	»
.528	96.4	4.72	8.5 , 12.0	4	»
1898.51	95.9	4.66	8.7 , 12.0		

 $O\Sigma$ 278.RA. = $14^h 8^m 18^s$ Decl. = $+44^\circ 39'$.

1898.126	98°0	0"34	7.5 , 7.5	4	12
.137	104.2	0.32	8.0 , 8.0	4	»
.591	102.8	0.42	7.5 , 7.5	4	»
1898.28	101.7	0.36	7.7 , 7.7		

 β 224.RA. = $14^h 8^m 36^s$ Decl. = $+13^\circ 3'$.

1898.268	67°3	0"70	8.0 , 8.3	4	12
.304	64.5	0.63	8.5 , 8.5	4	»
.397	65.1	0.73	8.5 , 8.6	4	»
1898.32	65.6	0.69	8.3 , 8.5		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

β 1246.

RA. = $14^h 13^m 21^s$ Decl. = $-25^\circ 22'$.

AB.

1898.506	190.3	3".49	5.5, 13.5	2	36
.544	188.0	3.10	—, 14.0	2	»
1898.52	189.2	3.30	5.5, 13.7		

AC.

1898.506	93.2	39".81	—, 13.5	2	36
.544	92.8	38.30	—, 13.5	2	»
1898.52	93.0	39.06	—, 13.5		

Image of A very large on second night.

β 1110.

RA. = $14^h 13^m 41^s$ Decl. = $-36^\circ 24'$.

1898.492	131.2	4".08	7.0, 11.5	3	12
.528	131.5	3.66	7.0, 12.0	4	»
.536	131.0	3.61	7.5, 11.5	3	»
1898.52	131.2	3.78	7.2, 11.7		

β 1111.

RA. = $14^h 18^m 28^s$ Decl. = $+8^\circ 54'$.

BC.

1898.506	16.7	0".30	8.0, 8.0	3	36
.577	19.8	0.29	8.0, 8.0	2	»
.597	17.4	0.24	—, —	2	»
.608	22.1	0.28	8.5, 8.5	2	»
1898.57	19.0	0.28	8.2, 8.2		

A and BC.

1898.506	189.7	6".53	5.5, 7.0	3	36
.577	190.5	6.39	5.0, 7.0	2	»
.608	189.5	6.45	5.0, 7.0	2	»
1898.56	189.9	6.46	5.2, 7.0		

The close pair is in rapid motion. The angle has increased 64° since discovery in 1889.4.

β 225. BC.

RA. = $14^h 19^m 53^s$ Decl. = $-19^\circ 31'$.

1898.260	100.1	1".31	7.0, 8.0	4	12
.306	95.2	1.52	—, 8.5	4	»
.397	95.4	1.18	—, 8.2	3	»
.399	95.2	1.48	—, 8.0	3	»
1898.34	96.5	1.37	7.0, 8.2		

Σ 1879.

RA. = $14^h 41^m 23^s$ Decl. = $+10^\circ 5'$.

1898.126	145.7	0".73	7.5, 8.5	4	12
.137	146.7	0.66	7.5, 8.0	4	»
.246	145.1	0.69	7.7, 8.5	4	»
1898.17	145.8	0.69	7.6, 8.3		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

β 1113.

RA. = $14^h 42^m 22^s$ Decl. = $+2^\circ 27'$.

1898.137	140.0	—	6.0, 11.5	4	12
.479	135.0	4".25	—, 12.5	3	»
.492	135.9	4.04	—, 12.0	3	»
.517	134.9	—	—, 12.0	3	»
1898.41	136.4	4.15	6.0, 12.0		

β 617.

RA. = $14^h 43^m 32^s$ Decl. = $-23^\circ 50'$.

BC.

1898.306	333.6	2".59	8.5, 11.0	4	12
.399	335.4	2.43	8.5, 11.0	3	»
.476	334.4	2.53	8.0, 11.5	3	»
1898.39	334.5	2.52	8.3, 11.2		

AB = S. 663.

1898.306	219.8	60".68	6, —	4	12
.399	220.0	60.41	6.5, —	3	»
.476	219.6	60.24	6.0, —	3	»
1898.39	219.8	60.44	6.2, —		

β 106. μ Librae.

RA. = $14^h 43^m 50^s$ Decl. = $-13^\circ 44'$.

AB.

1898.542	338.8	—	—, —	2	36
.553	339.6	1".56	5.5, 6.0	3	12
.572	340.4	1.62	5.5, 6.0	4	»
1898.56	339.6	1.59	5.5, 6.0		

AC.

1898.506	281.9	17".98	—, 15.0	3	36
.542	281.2	—	—, 15.0	2	»
1898.52	281.6	17.98	—, 15.0		

AD.

1898.506	184.7	26".35	—, 14.0	3	36
.542	185.0	26.05	—, —	2	»
1898.52	184.8	26.20	—, 14.0		

AE.

1898.501	232.6	27".25	—, —	2	36
.506	233.1	27.75	—, 13.5	3	»
.542	232.7	27.37	—, —	2	»
1898.52	232.8	27.46	—, 13.5		

Σ 1888. ξ Bootis.

RA. = $14^h 46^m 46^s$ Decl. = $+19^\circ 37'$.

1897.997	214.0	3".01	4.5, 6.5	4	12
98.123	210.1	2.91	—, —	3	»
.126	212.7	2.66	—, —	4	»
1898.08	212.3	2.86	4.5, 6.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
β 239.					
RA. = $14^h 52^m 44^s$ Decl. = $-27^\circ 15'$.					
1898.260	317.3	1.01	5.5 , 6.0	4	12
.268	316.8	0.97	5.5 , 6.0	4	»
.306	315.3	0.98	5.5 , 6.0	4	»
1898.28	316.5	0.99	5.5 , 6.0		

β 1085.					
RA. = $14^h 53^m 41^s$ Decl. = $-4^\circ 35'$.					
1898.079	21.3	9.67	6.0 , 14.0	2	36
.544	20.7	9.21	— , 13.0	3	»
1898.31	21.0	9.44	6.0 , 13.5		

Σ 1932. 1 Coronae.					
RA. = $15^h 14^m 4^s$ Decl. = $+27^\circ 12'$.					
1898.126	325.7	0.89	6.5 , 7.0	4	12
.137	325.8	0.98	— , —	3	»
.246	323.2	0.87	6.5 , 7.0	4	»
1898.17	324.9	0.91	6.5 , 7.0		

β 33.					
RA. = $15^h 25^m 49^s$ Decl. = $-12^\circ 39'$.					
1898.399	41.2	2.88	8.0 , 10.0	3	12
.452	42.5	2.97	— , —	3	»
.476	41.8	3.01	— , —	3	»
1898.44	41.8	2.95	8.0 , 10.0		

β 33 and β 34.					
1898.452	138.7	246.5	8.0 , 11.0	3	12

β 34.					
1898.399	56.0	6.65	10.5 , 10.5	3	12
.452	56.5	6.64	11.0 , 11.0	3	»
.476	56.2	6.44	11.0 , 11.0	3	»
1898.44	56.2	6.58	10.8 , 10.8		

The measure connecting the two pairs relates to the preceding star in each pair. A 12th magnitude star is situated $30'' \pm$ from A of β 33 in 310° (1898.399).

β 945.					
RA. = $15^h 26^m 35^s$ Decl. = $+57^\circ 47'$.					
1898.528	35.2	16.25	6.0 , 12.0	4	12
.591	33.9	15.93	— , 12.0	4	»
.594	33.8	16.08	— , 12.0	4	»
1898.57	34.3	16.09	6.0 , 12.0		

Σ 1967. γ Cor. Bor.					
RA. = $15^h 38^m 33^s$ Decl. = $+26^\circ 37'$.					
1898.123	115.1	0.59	4 , 7	3	12
.126	119.2	0.62	— , —	5	»
.137	120.2	0.63	— , —	4	»
1898.13	118.2	0.61	4.0 , 7.0		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
β 621.					
RA. = $15^h 46^m 25^s$ Decl. = $+44^\circ 54'$.					
1898.528	53.7	0.59	7.5 , 8.5	4	12
.591	59.2	0.72	7.5 , 8.5	4	»
.594	58.2	0.58	7.5 , 8.5	4	»
1898.57	57.0	0.63	7.5 , 8.5		

β 810.					
RA. = $15^h 47^m 36^s$ Decl. = $+42^\circ 46'$.					
1898.591	90.6	1.08	8.5 , 11.5	3	12
.594	87.6	0.99	8.5 , 11.5	4	»
.643	90.1	0.91	8.7 , 12.0	3	»
1898.61	89.4	0.99	8.6 , 11.7		

Σ 1998. ξ Scorpii.					
RA. = $15^h 58^m 52^s$ Decl. = $-10^\circ 6'$.					
1898.126	222.5	0.80	5 , 5	4+	12
.137	221.9	0.89	— , —	4	»
.246	223.3	0.84	— , —	4	»
1898.17	222.6	0.84	5.0 , 5.0		

β 949.					
RA. = $16^h 2^m 59^s$ Decl. = $-9^\circ 50'$.					
1898.479	208.3	0.52	7.0 , 7.0	3	12
.492	210.0	—	— , —	3	»
.542	209.6	0.31	— , —	2	36
.572	206.7	0.41	8.0 , 8.0	4	12
1898.52	208.6	0.41	7.5 , 7.5		

Very difficult with the 12 inch.

β 1087. τ Coronae.					
RA. = $16^h 5^m 19^s$ Decl. = $+36^\circ 45'$.					
1898.608	168.1	3.33	5.0 , 14.5	2	36
.648	169.9	3.26	5.5 , 14.5	3	»
.673	171.8	3.21	5.5 , 14.0	2	»
1898.64	169.9	3.27	5.3 , 14.3		

β 1198. τ Herculis.					
RA. = $16^h 16^m 44^s$ Decl. = $+46^\circ 33'$.					
1898.608	148.1	7.11	4.5 , 14.0	2	36
.648	148.2	7.19	— , 14.0	3	»
.673	152.0	7.01	— , 14.5	2	»
1898.64	149.4	7.10	4.5 , 14.2		

β 41.					
RA. = $16^h 17^m 42^s$ Decl. = $+61^\circ 41'$.					
1898.591	62.3	2.43	9.0 , 11.0	4	12
.643	59.2	2.50	9.0 , 11.0	3	»
.646	63.2	2.15	9.0 , 11.0	2	»
1898.63	61.6	2.36	9.0 , 11.0		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 Σ 2045.

RA. = $16^h 18^m 56^s$ Decl. = $+61^\circ 44'$.

1898.594	183.5	2.22	8.0, 10.0	4	12
.643	182.1	2.36	8.0, 10.0	3	»
.646	180.1	2.30	8.0, 10.0	2	»
1898.63	181.9	2.29	8.0, 10.0		

Anon. AG. Berlin B. 5594.

RA. = $16^h 19^m 36^s$ Decl. = $+20^\circ 38'$.

1898.126	110.5	5.09	7.0, 11.5	4	12
.137	111.7	5.45	7.0, 10.5	3	»
1898.13	111.1	5.27	7.0, 11.0		

Discovered with the 12 inch in 1896.

 β 625. ω Herculis.

RA. = $16^h 20^m 48^s$ Decl. = $+14^\circ 16'$.

AB.

1898.479	183.0	1.91	5.5, 11.5	3	12
.492	187.4	1.96	5.5, 11.0	3	»
.528	182.5	1.70	5.0, 12.0	4	»
1898.50	184.3	1.86	5.3, 11.5		

AC.

1898.479	102.3	33.07	—, 11.5	3	12
.492	103.2	32.81	—, 12.5	3	»
.528	102.7	33.00	—, 12.5	4	»
1898.50	102.7	32.96	—, 12.2		

 β 814.

RA. = $16^h 23^m 50^s$ Decl. = $+40^\circ 7'$.

1898.648	323.8	0.38	8.5, 8.5	2	36
.673	328.2	0.32	8.5, 8.5	2	»
.698	327.1	0.36	8.5, 8.5	4	»
1898.67	326.4	0.35	8.5, 8.5		

 β 815.

RA. = $16^h 23^m 54^s$ Decl. = $+43^\circ 8'$.

1898.591	340.4	9.03	8.5, 10.5	4	12
.594	341.1	8.70	8.5, 10.5	4	»
.643	340.4	8.94	8.5, 10.5	3	»
1898.61	340.6	8.89	8.5, 10.5		

 β 626. ϕ Ophiuchi.

RA. = $16^h 25^m 25^s$ Decl. = $-16^\circ 24'$.

1898.399	37.0	34.01	—, 12.5	3	12
.410	36.5	33.30	—, 12.5	1	»
.427	36.7	32.84	—, 12.5	3	»
1898.41	36.7	33.38	—, 12.5		

 Σ 2061.

RA. = $16^h 29^m 19^s$ Decl. = $+31^\circ 7'$.

1898.462	23.2	2.38	7.0, 11.0	3	36
.673	22.1	2.61	7.0, 10.0	3	»
1898.57	22.6	2.50	7.0, 10.5		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 β 818. 32 Herculis.

RA. = $16^h 29^m 35^s$ Decl. = $+30^\circ 43'$.

1898.608	32.8	4.06	6.5, 14.0	2	36
.648	34.7	3.73	6.0, 14.0	3	»
.673	33.8	4.08	6.5, 13.5	3	»
1898.64	33.8	3.96	6.3, 13.8		

 β 952.

RA. = $16^h 31^m 51^s$ Decl. = $+37^\circ 7'$.

AB.

1898.648	145.4	3.72	8.0, 9.0	3	36
.698	144.3	3.84	8.0, 9.0	4	»
1898.67	144.8	3.78	8.0, 9.0		

BC.

1898.648	233.6	2.62	9.0, 14.0	3	36
.698	233.4	2.55	9.0, 14.0	4	»
1898.67	233.5	2.58	9.0, 14.0		

 Σ 2084. ζ Herculis.

RA. = $16^h 37^m 32^s$ Decl. = $+31^\circ 47'$.

1898.268	310.9	0.63	3.5, 6.5	4+	12
.397	317.5	0.63	3.0, 6.0	4	»
1898.33	314.2	0.63	3.2, 6.2		
1898.698	294.0	0.45	—, —	4	36
.794	285.1	(0.50 $\pm$)*	—, —	2+	»
1898.75	289.6	0.45	—, —		

* Estimated.

The 12 inch measures were secured in the morning twilight under excellent conditions. The pair is exceedingly difficult, however, with so small a telescope. The first measure with the 36 inch telescope was also made under excellent conditions. None of the published elements of this pair represent the observed motion satisfactorily.

 β 953.

RA. = $16^h 37^m 14^s$ Decl. = $+69^\circ 59'$.

1898.597. Star examined with powers to 1500. Seeing fair. No measurable elongation. 36 inch.

1898.698. Excellent conditions. Star examined with powers to 1900. No elongation detected.

 β 627. 52 Hydrae.

RA. = $16^h 46^m 18^s$ Decl. = $+46^\circ 9'$.

1898.591	315.2	1.98	5.0, 9.0	4	12
.594	312.1	1.84	—, 9.5	3	»
.643	316.2	1.88	—, 9.5	3	»
1898.61	314.5	1.90	5.0, 9.3		

 β 955.

RA. = $16^h 53^m 57^s$ Decl. = $+82^\circ 1'$.

1898.597	351.1	0.77	8.2, 9.5	2	36
.608	352.0	0.74	8.5, 9.5	2	»
.698	350.0	—	8.0, 9.5	4	»
1898.63	351.0	0.76	8.2, 9.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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 β 1088. μ Draconis.RA. = $17^h 3^m 16^s$ Decl. = $+54^\circ 36'$.

BC.

1898.597	191.0	11.92	5.0 , 13.5	2	36
.608	189.5	12.47	5.0 , 13.0	2	»
.648	191.3	12.61	5.0 , 14.0	3	»
1898.62	190.6	12.33	5.0 , 13.5		

 β 1118. η Ophiuchi.RA. = $17^h 4^m 38^s$ Decl. = $-15^\circ 36'$.

1898.246	253.5	0.49	3.5 , 4.0	4	12
.268	253.6	0.63	3.5 , 4.0	4	»
.304	255.6	0.49	— , —	3	»
.309	251.2	—	3.5 , 4.0	2	36
1898.28	253.5	0.54	3.5 , 4.0		

 Σ 2140. α Herculis.RA. = $17^h 10^m 5^s$ Decl. = $+14^\circ 30'$.

1898.492	114.2	4.84	4.0 , 6.0	3	12
.536	112.8	4.44	3.5 , 6.0	3	»
.539	114.8	4.75	4.0 , 6.0	2	»
1898.52	113.9	4.68	3.8 , 6.0		

 β 958.RA. = $17^h 10^m 35^s$ Decl. = $-19^\circ 14'$.

1898.397	214.0	1.72	8.5 , 8.7	4	12
.452	212.2	1.53	8.5 , 8.8	3	»
.479	214.7	1.72	9.0 , 9.5	3	»
1898.44	213.6	1.66	8.7 , 9.0		

 β 416.RA. = $17^h 12^m 6^s$ Decl. = $-34^\circ 53'$.

AB.

1898.268	305.4	2.07	6.5 , 7.0	4	12
.304	304.1	2.05	— , —	3	»
.397	304.2	1.95	6.5 , 8.5	3	»
.427	301.5	1.89	— , —	2	36
1898.35	303.8	1.99	6.5 , 7.8		

AC.

1898.397	130.4	29.83	— , 10.5	4	12
.427	130.4	30.60	— , 12.0	2	36
1898.41	130.4	30.22	— , 11.2		

There is also an 11th magnitude star 57" from A in 88°.

 β 127.RA. = $17^h 14^m 40^s$ Decl. = $-27^\circ 15'$.

1898.452	91.7	5.09	8.0 , 10.0	3	12
.479	93.4	4.98	8.0 , 10.0	3	»
.492	93.9	5.06	8.5 , 9.5	3	»
1898.47	93.0	5.04	8.2 , 9.8		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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 Σ 2173.RA. = $17^h 25^m 15^s$ Decl. = $-0^\circ 59'$.

1897.797	332.7	1.42	6.0 , 6.0	4	12
98.246	330.6	1.31	6.5 , 6.5	4	»
.260	331.6	1.36	6.5 , 6.5	4	»
.268	331.5	1.52	6.5 , 6.5	4	»
1898.14	331.6	1.40	6.4 , 6.4		

 β 1201.RA. = $17^h 26^m 34^s$ Decl. = $+67^\circ 51'$.

1898.597	338.3	0.42	7.7 , 7.9	2	36
.608	343.2	0.48	8.0 , 8.0	2	»
.648	339.7	0.38	8.0 , 8.0	2	»
1898.62	340.4	0.43	7.9 , 8.0		

 β 960.RA. = $17^h 33^m 5^s$ Decl. = $-1^\circ 5'$.

1898.492	297.2	3.54	7.5 , 12.0	3	12
.536	300.1	3.28	8.5 , 11.8	3	»
.539	295.7	3.51	8.0 , 11.5	3	»
1898.52	297.7	3.44	8.0 , 11.8		

 β 1123.RA. = $17^h 46^m 40^s$ Decl. = $-34^\circ 42'$.

1898.397	211.8*	0.58*	7.0 , 7.0	3	12
.506	207.9	[0.30 $\pm$] $\dagger$	— , —	2	36
.577	205.2	0.39	7.5 , 7.5	2	»
1898.51	207.6	0.45	7.2 , 7.2		

* Weight $\frac{1}{2}$. $\dagger$ Estimated.

Difficult and uncertain because of low altitude of star.

 β 1125.RA. = $17^h 56^m 41^s$ Decl. = $+1^\circ 18'$.

1898.492	17.4	1.10	5.0 , 10.0	3	12
.536	17.8	0.96	5.0 , 10.0	3	»
.553	14.5	0.99	5.5 , 10.0	3	»
1898.53	16.6	1.02	5.2 , 10.0		

 β 635.RA. = $17^h 57^m 42^s$ Decl. = $+1^\circ 37'$.

AB.

1898.479	117.2	1.62	9.5 , 11.5	3	12
.492	119.2	1.45	9.0 , 10.0	3	»
.536	116.6	1.60	9.0 , 10.0	2	»
1898.50	117.7	1.56	9.2 , 10.5		

AC.

1898.479	122.0	69.45	— , 9.5	3	12
.492	122.4	69.23	— , 10.5	3	»
.536	122.2	69.54	— , 9.5	2	»
1898.50	122.2	69.41	— , 9.8		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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 Σ 2272. 70 Ophiuchi.RA. = $18^h 0^m 24^s$ Decl. = $+2^\circ 31'$.

1898.246	275.2	2.02	4 , 6	4	12
.260	274.6	2.09	— , —	3	»
.268	274.2	1.94	— , —	3	»
.591	271.6	1.72	— , —	4	»
.627	271.8	1.69	— , —	3	»
.629	271.9	1.90	— , —	3	»
1898.44	273.2	1.89	4 , 6		

 β 1091.RA. = $18^h 9^m 16^s$ Decl. = $+38^\circ 34'$.

1898.572	25.7	0.41	8.0 , 8.0	4	12
.591	30.4	0.53	8.5 , 8.5	4	»
.594	33.4	0.58	8.0 , 8.0	3	»
.597	27.9	0.40	8.5 , 8.5	2	36
.673	31.7	0.31	9.0 , 9.0	3	»
1898.61	29.8	0.45	8.4 , 8.4		

 β 1274.RA. = $18^h 12^m 56^s$ Decl. = $+56^\circ 33'$.

BC.

1898.597	143.8	0.98	10.0 , 11.0	2	36
.608	147.6	1.17	10.5 , 11.5	2	»
.648	151.1	1.32	10.5 , 11.5	2	»
.673	142.5	1.18	12.0 , 12.5	3	»
1898.63	146.2	1.16	10.7 , 11.6		

BD.

1898.597	9.6	4.76	— , 10.0	2	36
.668	7.7	4.95	— , 10.5	2	»
.648	6.4	5.12	— , 11.0	2	»
.673	8.9	5.22	— , 11.5	3	»
1898.63	8.2	5.01	— , 10.8		

AB.

1898.597	239.5	96.29	6 , —	2	36
.608	239.1	96.00	— , —	2	»
.648	239.6	96.00	— , —	2	»
1898.62	239.4	96.10	6 , —		

 β 49.RA. = $18^h 18^m 14^s$ Decl. = $-19^\circ 38'$.

1898.397	46.0	8.07	8.0 , 11.0	3	12
.492	47.0	8.12	8.0 , 11.0	3	»
.528	46.4	8.11	8.0 , 11.0	4	»
1898.47	46.5	8.10	8.0 , 11.0		

There are also two fainter companions, a 12th magnitude one 24".2 from A in 148°3; and a 12.5 magnitude one 21".7 in 301°3.

 β 965.RA. = $18^h 21^m 7^s$ Decl. = $-17^\circ 15'$.

1898.492	—	1.63	8.0 , 12.5	3	12
.553	107.1	1.39	8.0 , 12.5	3	»
.681	105.3	1.78	8.5 , 12.5	3	»
.687	103.6	1.60	8.0 , 12.5	4	»
1898.60	105.3	1.60	8.1 , 12.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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Barnard.

RA. = $18^h 21^m 30^s$ Decl. = $-26^\circ 42'$.

1898.430	120.4	0.34	9.0 , 9.5	3	36
.482	125.3	0.34	8.5 , 9.5	3	»
.506	124.9	0.27	8.5 , 9.5	3	»
1898.47	123.5	0.32	8.7 , 9.5		

 β 966.RA. = $18^h 26^m 36^s$ Decl. = $-19^\circ 3'$.

BC.

1898.684	120.6	0.70	8.0 , 9.5	2	36
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A and BC.

1898.684	252.9	66.82	6.5 , —	2	36
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 β 1253.RA. = $18^h 29^m 1^s$ Decl. = $+30^\circ 29'$.

1898.673	157.9	7.43	6.0 , 13.5	3	36
.698	156.7	7.23	— , 13.0	4	»
.870	156.7	7.26	— , 13.0	3	»
1898.75	157.1	7.31	6.0 , 13.2		

 β 643.RA. = $18^h 30^m 41^s$ Decl. = $+4^\circ 51'$.

AB.

1898.492	334.9	9.88	6.5 , 12.5	3	12
.553	336.2	9.56	6 , 12.5	3	»
.556	336.2	9.33	6 , 12.5	2	»
1898.53	335.8	9.59	6.2 , 12.5		

AC = Σ 2342.

1898.492	7.0	29.43	— , 8.5	3	12
.553	7.2	29.27	— , 8.0	3	»
.556	6.7	29.14	— , 8.0	2	»
1898.53	7.0	29.28	— , 8.2		

 Σ 2375.RA. = $18^h 40^m 34^s$ Decl. = $+5^\circ 24'$.

1898.761	114.9	2.14	6.3 , 6.8	3	12
.764	115.4	2.16	— , —	3	»
.766	115.5	2.19	— , —	3	»
1898.76	115.3	2.16	6.3 , 6.8		

 β 968. ζ Lyrae.RA. = $18^h 41^m 20^s$ Decl. = $+37^\circ 30'$.

AB.

1898.597	51.0	27.15	— , 14.5	2	36
.638	51.6	26.69	— , 15.0	3	»
.648	49.6	27.28	— , 14.5	2	»
1898.63	50.7	27.04	— , 14.7		

AD.

1898.597	273.1	45.37	— , 14.0	2	36
.638	273.6	46.39	— , 14.0	3	»
.648	272.5	44.89	— , 14.0	2	»
1898.63	273.1	45.55	— , 14.0		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
AE.					
1898.597	302°6	61"82	— , 13.0	2	36
.638	303.3	61.90	— , 13.5	3	»
.648	302.4	61.65	— , 12.5	2	»
1898.63	302.8	61.79	— , 13.0		

 β 293. β Lyrae.RA. = $18^h 46^m 23^s$ Decl. = $+33^\circ 15'$.

AC.					
1898.638	247°5	46"88	— , 13.5	3	36
.648	247.5	47.59	— , 13.0	2	»
.673	247.7	46.91	— , 13.0	3	»
1898.65	247.6	47.13	— , 13.2		

AD (new).

1898.638	68°8	63"51	— , 14.5	3	36
.648	68.1	64.64	— , 14.0	2	»
.673	68.0	64.63	— , 14.5	3	»
1898.65	68.3	64.26	— , 14.3		

AE.

1898.638	317°9	67"15	— , 10.0	3	36
.648	317.9	67.26	— , 9.5	2	»
.673	317.5	67.24	— , 9.5	3	»
1898.65	317.8	67.22	— , 9.7		

AF.

1898.648	18°9	85"90	— , 9.0	2	36
.673	19.0	86.65	— , 9.0	3	»
1898.66	19.0	86.28	— , 9.0		

 Σ 2409.RA. = $18^h 47^m 8^s$ Decl. = $+13^\circ 24'$.

1898.575	29°2	0"82	8.5 , 10.0	3	12
.591	29.6	1.15	8.7 , 10.0	4	»
1898.58	29.4	0.98	8.6 , 10.0		

 β 1033. ν^1 Sagittarii.RA. = $18^h 48^m 8^s$ Decl. = $-22^\circ 52'$.

1898.410	92°2	2"43	— , 11.0	2	12
.479	98.3	2.67	— , 11.0	3	»
.492	97.9	2.57	— , 10.5	3	»
.553	95.6	2.47	5.0 , 11.0	3	»
1898.48	96.0	2.54	5.0 , 10.9		

 β 647.RA. = $18^h 51^m 24^s$ Decl. = $+13^\circ 28'$.

AB.

1898.553	11°3	1"18	9.0 , 9.5	3	12
.572	9.6	1.20	9.2 , 9.7	4	»
.575	11.5	0.98	9.0 , 9.5	3	»
.591	8.9	1.26	9.0 , 9.5	3	»
1898.57	10.3	1.16	9.0 , 9.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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AC.

1898.553	218°0	19"15	— , 9.0	3	12
.572	217.8	19.05	— , —	4	»
.575	217.4	19.06	— , —	3	»
1898.57	217.7	19.09	— , 9.0		

 β 1255.RA. = $18^h 52^m 9^s$ Decl. = $+48^\circ 44'$.

1898.608	90°1	1"81	6 , 12.5	3	36
.648	86.8	1.92	— , 12.5	3	»
.673	91.1	1.60	— , 12.5	3	»
1898.64	89.3	1.78	6 , 12.5		

 $O\Sigma$ 365.RA. = $18^h 52^m 56^s$ Decl. = $+44^\circ 6'$.

1897.838. Examined the star with the 36 inch telescope, powers to 1500, under good conditions. No certain elongation. The star was examined on several nights in 1898, also with negative results.

 β 648.RA. = $18^h 53^m 16^s$ Decl. = $+32^\circ 46'$.

1898.268	227°7	1"34	6.5 , 9.5	4	12
.397	228.9	1.35	6.0 , 9.0	4	»
.536	226.4	1.29	6.0 , 9.0	3	»
1898.40	227.7	1.33	6.2 , 9.2		

 ζ Sagittarii (Winlock).RA. = $18^h 56^m 15^s$ Decl. = $-30^\circ 1'$.

1898.482	92°2	0"28	— , —	2	36
.506	94.0	0.40	— , —	3	»
1898.49	93.1	0.34	— , —		

The accuracy of the position angle measure was checked by allowing the stars to trail along the wires set for parallel. The following star was just enough south of the other to make the difference appreciable.

H. N. 126.

RA. = $18^h 58^m 21^s$ Decl. = $-21^\circ 41'$.

1898.397	314°5	0"62	7.5 , 8.0	4	12
.410	313.0	0.41	7.0 , 7.5	2	36
.577	310.8	0.50	7.5 , 8.5	2	»
1898.46	312.8	0.51	7.3 , 8.0		

 H_2 5084. γ Coronae Australis.RA. = $18^h 59^m 39^s$ Decl. = $-37^\circ 12'$.

1898.397	149°2	1"64	5.5 , 5.5	4	12
.479	148.9	1.81	— , —	3	»
.492	147.3	1.60	— , —	4	»
1898.46	148.5	1.68	5.5 , 5.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tei.
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 β 1204.RA. = $19^h 7^m 2^s$ Decl. = $+2^\circ 27'$.

AB.

1898.684	9 ⁰ .1	0 ⁰ .40	7.5 , 8.0	2	36
.794	8.0	0.37	7.5 , 8.0	3	»
1898.74	8.6	0.38	7.5 , 8.0		

AB and C.

1898.684	196 ⁰ .9	13 ⁰ .22	— , 14.5	2	36
.794	197.2	12.80	— , 14.0	3	»
.813	197.1	13.08	— , 14.0	2	»
1898.76	197.1	13.03	— , 14.2		

AB and D.

1898.684	161 ⁰ .6	21 ⁰ .33	— , 15.0	2	36
.794	160.6	21.15	— , 14.5	3	»
.813	159.5	—	— , 15.0	2	»
1898.76	160.6	21.24	— , 14.8		

AB and E.

1898.684	315 ⁰ .6	26 ⁰ .55	— , 14.5	2	36
.794	315.1	26.75	— , 14.5	3	»
.813	316.0	—	— , 14.5	2	»
1898.76	315.6	26.65	— , 14.5		

AB and F.

1898.684	291 ⁰ .1	27 ⁰ .57	— , 14.0	2	36
.794	290.9	28.06	— , 14.0	3	»
.813	291.2	—	— , 14.0	2	»
1898.76	291.1	27.82	— , 14.0		

AB and G = Σ 2476.

1898.684	214 ⁰ .3	31 ⁰ .64	— , 10.5	2	36
.794	214.0	31.47	— , 10.0	3	»
.813	213.8	31.45	— , 10.0	2	»
1898.76	214.0	31.52	— , 10.2		

 β 138.RA. = $19^h 7^m 45^s$ Decl. = $-14^\circ 37'$.

1898.553	292 ⁰ .1	1 ⁰ .28	7.5 , 10.5	3	12
.572	284.9	1.28	7.0 , 10.0	3	»
.575	288.7	1.24	7.0 , 10.0	3	»
1898.57	288.6	1.27	7.2 , 10.2		

 Σ 2481.RA. = $19^h 7^m 45^s$ Decl. = $+38^\circ 37'$.

BC = Secchi.

1897.838	238 ⁰ .0	(0 ⁰ .10 $\pm$) [*]	— , —	3+	36
.854	248.6	0.17	— , —	3	»
1897.85	243.3	0.17	— , —		

* Estimated.

1898.506	217 ⁰ .5	0.15	8.0 , 8.5	2+	36
.698	204.7	0.18	— , —	3	»
1898.60	211.1	0.17	8.0 , 8.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tei.
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This is the north star of the Σ pair, found to be double by Secchi in 1856. The measures, as will be seen, are discordant, but there is no doubt of a real elongation in the direction given.

 β 139.RA. = $19^h 8^m 5^s$ Decl. = $+16^\circ 41'$.

AB.

1898.553	145 ⁰ .4	0 ⁰ .87	7.0 , 7.8	4	12
.572	142.6	0.77	7.2 , 8.0	4	»
.575	136.9	0.80	7.0 , 8.0	3	»
.591	138.7	0.90	7.5 , 8.5	4	»
1898.57	140.9	0.84	7.2 , 8.1		

AC.

1898.553	286 ⁰ .6	116 ⁰ .82	— , 7.0	4	12
.572	286.4	116.27	— , —	4	»
1898.56	286.5	116.54	— , 7.0		

An 11.5 magnitude star is situated $27''$ from A in 103° . 1898.553: Several other faint stars are nearer to A than the star called C is.

 β 1256.RA. = $19^h 13^m 35^s$ Decl. = $+6^\circ 9'$.

1898.575	39 ⁰ .2	0 ⁰ .65	8.2 , 8.8	3	12
.591	35.2	0.82	8.8 , 9.2	4	»
.594	36.0	0.65	8.2 , 8.8	4	»
1898.59	36.8	0.71	8.4 , 8.9		

 β 141.RA. = $19^h 17^m 42^s$ Decl. = $+22^\circ 19'$.

AB.

1898.556	85 ⁰ .2	0 ⁰ .80	7.0 , 8.5	2	12
.572	76.7	0.90	7.5 , 8.5	3	»
.638	78.0	0.88	7.0 , 8.5	3	36
1898.59	80.0	0.86	7.2 , 8.5		

CD.

1898.556	179 ⁰ .2	4 ⁰ .91	11.5 , 12.5	2	12
.572	174.7	4.63	12.0 , 12.5	3	»
.638	177.7	5.16	12.5 , 13.0	3	36
1898.59	177.2	4.90	12.0 , 12.7		

AC.

1898.556	334 ⁰ .8	28 ⁰ .86	— , —	2	12
.638	332.8	28.63	— , —	3	36
1898.60	333.8	28.75	— , —		

AE.

1898.556	90 ⁰ .7	50 ⁰ .32	— , 10.0	2	12
.572	90.3	50.12	— , 10.0	3	»
.638	90.6	50.41	— , 9.0	3	36
1898.59	90.5	50.28	— , 9.7		

AF.

1898.638	214 ⁰ .4	50 ⁰ .22	— , 12.5	3	36
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Several other faint stars near.

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 β 1129.RA. = $19^h 19^m 11^s$ Decl. = $+52^\circ 11'$.

1898.597	341.6	0.43	6.5 , 6.5	3	36
.608	340.6	0.46	— , —	3	»
.648	337.9	0.44	— , —	2	»
1898.62	340.0	0.44	6.5 , 6.5		

 β 653. μ Aquilae.RA. = $19^h 29^m 12^s$ Decl. = $+7^\circ 10'$.

BC.

1898.556	195.5	5.20	11.0 , 11.5	3	12
.572	196.7	5.19	11.0 , 11.5	3	»
.577	196.9	5.27	12.0 , 12.5	3	36
1898.57	196.4	5.22	11.3 , 11.8		

AC.

1898.556	278.5	27.06	5 , —	3	12
.572	277.8	27.64	— , —	3	»
.577	278.6	27.17	— , —	3	36
1898.57	278.3	27.29	5 , —		

AB.

1898.556	288.1	26.85	— , —	3	12
.572	289.0	27.66	— , —	3	»
.577	289.6	26.89	— , —	3	36
1898.57	288.9	27.13	— , —		

 β 1130. η Vulpeculae.RA. = $19^h 30^m 11^s$ Decl. = $+19^\circ 33'$.

1898.638	32.8	9.24	5 , 14.0	3	36
.794	32.6	9.34	— , 14.5	3	»
.865	33.6	9.33	— , 14.0	2	»
1898.77	33.0	9.30	5 , 14.2		

 β 1257.RA. = $19^h 31^m 25^s$ Decl. = $+10^\circ 56'$.

1898.684	178.4	4.41	7.0 , 13.5	2	36
.794	178.7	3.76	7.0 , 13.0	3	»
1898.74	178.6	4.08	7.0 , 13.2		

 β 1131. θ Cygni.RA. = $19^h 33^m 46^s$ Decl. = $+49^\circ 59'$.

1898.597	46.2	3.65	5 , 14.5	3	36
.608	49.2	3.62	— , 14.0	2	»
.673	45.2	3.86	— , 15.0	2	»
1898.63	46.9	3.71	5 , 14.5		

 β 1132.RA. = $19^h 39^m 11^s$ Decl. = $+26^\circ 41'$.

1898.698	224.6	0.53	8.2 , 9.0	4	36
.947	225.7	0.31	8.5 , 9.0	2	»
1898.82	225.2	0.42	8.3 , 9.0		

Star four hours west of meridian on second night.
Distance measure very difficult.

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 β 657.RA. = $19^h 39^m 32^s$ Decl. = $+22^\circ 24'$.

1898.632	147.3	0.86	9.0 , 10.0	3	12
.646	148.4	0.86	9.0 , 10.0	3	»
.665	147.3	0.80	9.0 , 10.0	2	»
1898.65	147.7	0.84	9.0 , 10.0		

 β 829.RA. = $19^h 44^m 11^s$ Decl. = $+5^\circ 30'$.

1898.632	308.6	0.89	8.2 , 8.7	3	12
.640	309.3	0.80	8.3 , 8.5	3	»
.646	308.8	0.79	— , —	3	»
1898.64	308.9	0.83	8.2 , 8.6		

 β 978.RA. = $19^h 47^m 13^s$ Decl. = $+23^\circ 16'$.

1898.632	233.9	0.92	8.5 , 8.5	3	12
.638	235.0	1.14	8.5 , 8.5	3	»
.646	232.4	1.10	8.5 , 8.5	3	»
1898.64	233.8	1.05	8.5 , 8.5		

 β 980. η Cygni.RA. = $19^h 52^m 33^s$ Decl. = $+34^\circ 49'$.

1898.876	208.9	7.71	4 , 14.5	2	36
.947	209.0	7.70	— , 14.0	2	»
1898.91	209.0	7.70	4 , 14.2		

 β 149.RA. = $19^h 53^m 41^s$ Decl. = $+16^\circ 13'$.

BC.

1898.632	200.4	8.44	8.5 , 11.5	3	12
.640	199.9	8.87	8.5 , 12.0	3	»
.646	198.2	7.83	— , 11.0	3	»
1898.64	199.5	8.38	8.5 , 11.5		

AB.

1898.632	278.6	127.74	7 , —	3	12
.640	278.6	128.03	— , —	3	»
.646	278.5	127.47	— , —	3	»
1898.64	278.6	127.75	7 , —		

 β 833.RA. = $20^h 6^m 16^s$ Decl. = $-6^\circ 27'$.

BC.

1898.553	59.7	2.35	8.0 , 11.0	3	12
.632	56.6	2.40	8.3 , 12.2	3	»
.665	56.8	2.47	8.5 , 11.7	2	»
1898.62	57.7	2.41	8.3 , 11.6		

AB.

1898.553	63.0	119.68	8.0 , —	3	12
.629	63.2	119.47	— , —	2	»
.632	63.2	120.06	8.0 , —	3	»
1898.60	63.1	119.74	8.0 , —		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 $O\Sigma$ 400.

RA. = $20^h 6^m 55^s$ Decl. = $+43^\circ 39'$.

1898.462	45 ²⁶	0 ¹⁸	7.5 , 7.5	3	36
.597	47.1	0.23	7.5 , 8.0	2	»
.673	43.4	0.20	7.5 , 7.5	3	»
.698	41.3	0.21	7.5 , 7.5	4	»
1898.61	44.4	0.20	7.5 , 7.6		

 β 660.

RA. = $20^h 10^m 21^s$ Decl. = $+43^\circ 5'$.

1898.501	320 ⁰⁰	9 ⁴²	— , —	2	36
.597	320.1	9.63	6.5 , 13.0	2	»
.608	320.4	9.75	— , 13.0	2	»
1898.57	320.2	9.60	6.5 , 13.0		

 β 294.

RA. = $20^h 10^m 51^s$ Decl. = $-12^\circ 38'$.

BC.

1898.542	180 ⁰⁹	7 ³⁶	13.5 , 14.5	2	36
.577	180.0	7.62	13.5 , 14.5	2	»
1898.56	180.4	7.49	13.5 , 14.5		

AB.

1898.542	35 ²⁶	26 ⁶⁵	6.5 , —	2	36
.577	36.4	26.44	— , —	2	»
1898.56	36.0	26.54	6.5 , —		

 β 985.

RA. = $20^h 14^m 3^s$ Decl. = $+25^\circ 20'$.

AB.

1898.794	146 ⁰⁷	4 ⁹⁴	7.0 , 13.0	3	36
.876	146.9	4.51	6.7 , 14.0	2	»
1898.83	146.8	4.72	6.8 , 13.5		

CD.

1898.794	63 ⁰⁸	9 ⁷⁷	10.0 , 13.0	3	36
.876	63.6	9.89	10.0 , 13.0	2	»
1898.83	63.7	9.83	10.0 , 13.0		

AC.

1898.794	355 ⁰⁸	21 ⁶²	— , —	3	36
.876	355.8	21.62	— , —	2	»
1898.83	355.8	21.62	— , —		

Several other faint stars in the field.

Barnard.

RA. = $20^h 14^m 5^s$ Decl. = $+32^\circ 53'$.

AB.

1898.315	196 ⁰⁹	0 ³⁴	7.7 , 8.0	4	36
.430	199.9	0.28	8.0 , 8.2	3	»
.462	198.4	0.32	8.5 , 9.0	3	»
1898.40	198.4	0.31	8.1 , 8.4		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

AB and C.

1898.315	258 ⁰⁴	2 ⁸²	— , 11.0	4	36
.430	257.3	2.85	— , —	3	»
.462	259.5	2.98	— , —	3	»
1898.40	258.4	2.88	— , 11.0		

A beautiful triple star. Discovered with the 40 inch equatorial, Sept., 1897. (See A. J. 447).

 β 431.

RA. = $20^h 16^m 11^s$ Decl. = $+35^\circ 57'$.

1898.591	40 ⁰²	0 ⁸⁴	8.5 , 8.5	4	12
.594	40.5	0.65	8.5 , 8.5	4	»
.629	33.3	0.81	8.0 , 8.5	2	»
.632	38.0	0.70	8.5 , 8.5	3	»
1898.61	38.0	0.75	8.4 , 8.5		

 β 763. α^2 Sagittarii.

RA. = $20^h 17^m 6^s$ Decl. = $-42^\circ 45'$.

1898.492	210 ⁰⁴	0 ⁹⁶	6.0 , 9.0	3	12
.553	214.2	0.99	— , —	3	»
.687	214.1	1.05	6.0 , 8.5	3	»
1898.58	212.9	1.00	6.0 , 8.8		

 β 1207.

RA. = $20^h 17^m 6^s$ Decl. = $+43^\circ 32'$.

1898.608	214 ⁰⁵	5 ⁵⁵	7.0 , 13.5	2	36
.673	216.9	6.18	7.5 , 13.5	3	»
.698	215.6	5.75	7.5 , 13.5	4	»
1898.66	215.7	5.83	7.3 , 13.5		

 β 1259.

RA. = $20^h 17^m 16^s$ Decl. = $+30^\circ 17'$.

1898.591	167 ⁰¹	0 ⁶⁴	8.5 , 8.5	4	12
.594	169.2	0.63	8.3 , 8.7	4	»
.629	166.3	0.63	9.0 , 9.0	2	»
1898.60	167.5	0.63	8.6 , 8.7		

 β 663.

RA. = $20^h 17^m 51^s$ Decl. = $+53^\circ 17'$.

AB.

1898.673	311 ⁰⁴	7 ⁸⁰	6.0 , 15.5	3	36
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AC.

1898.673	76 ⁰⁷	7 ⁶⁰	— , 13.0	3	36
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 β 665. γ Cygni.

RA. = $20^h 18^m 38^s$ Decl. = $+39^\circ 56'$.

BC.

1898.501	303 ⁰⁷	1 ⁷⁶	10.0 , 10.0	2	36
.575	298.1	1.80	— , —	3	12
.591	298.8	2.19*	10.0 , 10.0	3	»
1898.56	300.2	1.86	10.0 , 10.0		

* Weight $\frac{1}{2}$.

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

A and BC.

1898.501	196°0	—	— , —	2	36
.575	196.3	141.32	— , —	3	12
1898.54	196.2	141.32	— , —		

Distance measure poor on third night because of unsteadiness of driving clock.

Anon. (W_2 20^h630).

RA. = 20^h18^m44^s Decl. = +43°27'.

1898.591	269°1	1780	9.0 , 11.0	4	12
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 β 664.

RA. = 20^h19^m36^s Decl. = +5°11'.

1898.627	285°1	8"55	7.0 , 12.0	2	12
.690	290.0	9.02	— , 12.5	3	»
.722	289.5	9.14	— , 12.0	3	»
1898.68	288.2	8.90	7.0 , 12.2		

 β 432.

RA. = 20^h20^m59^s Decl. = +35°26'.

1898.591	196°6	1750	8.2 , 9.5	4	12
.594	197.9	1.49	8.5 , 9.5	3	»
.629	193.8	1.41	8.5 , 9.5	2	»
.632	196.2	1.36	8.5 , 9.5	3	»
1898.61	196.1	1.44	8.4 , 9.5		

 β 60. π Capricorni.

RA. = 20^h21^m36^s Decl. = -18°32'.

AB.

1898.542	144°1	3"33	5 , 9.0	3	36
.577	144.4	3.46	— , 9.5	2	»
1898.56	144.2	3.40	5.0 , 9.3		

AC.

1898.542	43°5	38"04	— , 14.0	3	36
.577	43.5	38.21	— , 14.0	2	»
1898.56	43.5	38.12	— , 14.0		

 β 63. γ Delphini.

RA. = 20^h25^m31^s Decl. = +10°34'.

AB.

1898.629	343°1	1718	6.0 , 9.0	2	12
.640	341.9	1.07	— , 8.7	3	»
.684	346.8	1.11	— , 9.0	2	36
.865	344.4	1.19	— , 9.0	2	»
1898.70	344.0	1.14	6.0 , 8.9		

AC.

1898.684	346°8	17"07	— , 13.5	2	36
.813	346.1	17.88	— , 13.5	1	»
.865	346.9	18.37	— , 13.5	2	»
1898.79	346.6	17.77	— , 13.5		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 β 668.

RA. = 20^h26^m55^s Decl. = -10°12'.

1898.542	25°7	4"80	7.0 , 12.5	3	36
.553	26.2	4.93	7.0 , 12.0	3	12
.632	24.8	5.15	6.7 , 12.0	3	»
1898.58	25.6	4.96	6.9 , 12.2		

 β 670.

RA. = 20^h28^m12^s Decl. = +13°38'.

1898.690	44°5	0"63	8.5 , 9.0	4	12
.766	45.9	0.55	9.2 , 9.7	3	»
.785	51.0	0.53	8.5 , 9.0	3	»
1898.75	47.1	0.57	8.7 , 9.2		

 β 151. β Delphini.

RA. = 20^h32^m52^s Decl. = +14°15'.

1898.482	361°4	0"55	— , —	3	36
.492	359.5	0.77	— , —	3	12
.542	362.0	0.59	— , —	3	36
1898.50	1.0	0.64	— , —		

 β 675. 57 Cygni.

RA. = 20^h39^m8^s Decl. = +49°59'.

AB.

1898.597	99°5	3"10	— , 13.5	2	36
.608	103.5	3.40	6.0 , 13.0	2	»
.673	103.8	2.99	6.0 , 13.0	3	»
1898.63	102.3	3.16	6.0 , 13.2		

AC.

1898.591	181°6	25"88	— , 12.5	4	12
.597	182.6	25.93	— , 12.5	2	36
.608	183.4	26.01	— , 12.5	2	»
1898.60	182.5	25.94	— , 12.5		

AD.

1898.591	329°3	33"81	— , 12.0	4	12
.597	328.9	33.25	— , 12.0	2	36
.608	328.4	33.23	— , 12.0	2	»
1898.60	328.9	33.43	— , 12.0		

 β 152.

RA. = 20^h39^m48^s Decl. = +57°2'.

1898.646	104°2	0"69	7.5 , 9.0	3	12
.681	106.4	0.70	7.5 , 9.0	4	»
.725	100.3	0.61	7.5 , 9.0	3	»
1898.68	103.6	0.67	7.5 , 9.0		

 β 64.

RA. = 20^h40^m15^s Decl. = +12°22'.

AB.

1898.665	185°7	0"62	7.5 , 7.5	3	12
.690	182.1	0.67	— , —	4	»
.783	184.3	0.54	— , —	2	36
1898.71	184.0	0.61	7.5 , 7.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
AB and C = O Σ App. 209.					
1898.665	157°8	96"68	— , 7.0	3	12
.690	157.9	96.53	— , 8.0	4	»
1898.68	157.8	96.60	— , 7.5		
β 676. ε Cygni.					
RA. = 20 ^h 42 ^m 9 ^s Decl. = +33°36'.					
1898.501	305°0	39"18	— , —	2	36
.629	304.9	39.51	— , 12.0	2	12
.646	305.6	38.72	— , 12.0	3	»
1898.59	305.2	39.14	— , 12.0		
Σ 2729. 4 Aquarii.					
RA. = 20 ^h 46 ^m 7 ^s Decl. = -6°0'.					
1898.479	207°7	0"21	6.5 , 7.0	2	36
.506	207.1	0.25	6.5 , 7.5	3	»
.783	206.6	0.24	6.0 , 7.0	2	»
1898.59	207.1	0.23	6.3 , 7.2		
β 1137.					
RA. = 20 ^h 53 ^m 15 ^s Decl. = +50°21'.					
1898.673	343°6	7"28	6 , 14.5	3	36
.698	344.4	7.08	— , 14.0	4	»
.794	343.8	7.24	— , 14.5	3	»
1898.72	343.9	7.20	6 , 14.3		
β 765.					
RA. = 20 ^h 54 ^m 25 ^s Decl. = -35°41'.					
1898.594	129°9	1"88	7 , 11.5	3	12
.665	128.8	—	— , 10.5	2	»
.687	133.8	1.93	— , 10.0	3	»
.764	128.7	1.77	— , 11.0	3	»
1898.68	130.3	1.86	7 , 10.8		
β 678.					
RA. = 20 ^h 55 ^m 25 ^s Decl. = -8°44'.					
1898.818	200°2	2"49	8.0 , 11.0	3	12
.824	199.9	2.61	8.0 , 11.0	3	»
1898.82	200.0	2.55	8.0 , 11.0		
β 1210.					
RA. = 20 ^h 56 ^m 47 ^s Decl. = +48°17'.					
AB.					
1898.597	121°8	2"48	7.0 , 12.0	3	36
.608	118.5	2.59	— , 12.5	2	»
1898.60	120.2	2.54	7.0 , 12.2		
AC = O Σ 425.					
1898.597	28°0	13"95	— , 11.0	3	36
.608	27.9	14.02	— , —	2	»
1898.60	28.0	13.98	— , 11.0		
CD = O Σ 425.					
1898.597	133°3	4"36	— , 11.5	3	36
.608	133.5	4.28	— , 11.5	2	»
1898.60	133.4	4.32	— , 11.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
Σ 2742. 2 Equulei.					
RA. = 20 ^h 57 ^m 17 ^s Decl. = +6°47'.					
1898.761	219°7	2"60	7.0 , 7.0	3	12
.764	219.9	2.67	8.0 , 8.0	3	»
.824	220.5	2.64	7.0 , 7.0	3	»
1898.78	220.0	2.64	7.3 , 7.3		
β 1139.					
RA. = 20 ^h 59 ^m 12 ^s Decl. = +56°41'.					
1898.698	143°1	1"94	6.0 , 13.5	4	36
.794	141.9	1.92	— , 13.5	3	»
.870	137.4	2.29	— , 12.5	3	»
1898.79	140.8	2.05	6.0 , 13.2		
β 1138.					
RA. = 20 ^h 59 ^m 17 ^s Decl. = +45°27'.					
1898.673	189°2	0"32	7.2 , 8.0	3	36
.698	182.7	0.32	7.0 , 8.0	4	»
.794	185.2	0.33	7.0 , 8.0	3	»
1898.72	185.7	0.32	7.1 , 8.0		
Σ 2751.					
RA. = 20 ^h 59 ^m 24 ^s Decl. = +56°16'.					
1898.646	349°6	1"80	6.0 , 7.0	3	12
.681	349.6	1.84	6.0 , 6.5	3	»
1898.66	349.6	1.82	6.0 , 6.7		
β 368.					
RA. = 21 ^h 2 ^m 5 ^s Decl. = -8°38'.					
AB.					
1898.577	89°0	0"61	7.2 , 8.0	3	36
CD.					
1898.577	316°1	5"14	14.0 , 14.5	3	36
AC.					
1898.577	30°9	12"20	— , —	3	36
β 836.					
RA. = 21 ^h 3 ^m 8 ^s Decl. = +47°59'.					
AB.					
1898.591	179°8	0"81	8.5 , 9.0	4	12
.594	189.5	0.81	8.2 , 8.7	4	»
.709	3.8	0.63	9.0 , 8.5	3	»
.870	0.7	0.80	8.5 , 8.4	2	36
1898.69	3.4	0.78	8.5 , 8.6		
CD.					
1898.591	68°1	1"35	11.0 , 11.5	4	12
.594	67.6	1.24	11.0 , 11.5	4	»
.870	65.2	1.38	10.5 , 11.5	2	36
1898.69	67.0	1.32	10.8 , 11.5		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
AC.					
1898.591	217°9	27"37	— , —	4	12
.594	219.6	27.75	— , —	4	»
.709	219.7	27.36	— , —	3	»
1898.63	219.1	27.49	— , —		

The quadrant of AB is uncertain. With the 36 inch the south star seems slightly brighter. Magnitude estimates for so close and nearly equal a pair are very difficult with the 12 inch. Other faint stars near.

β 270.

RA. = $21^h 8^m 31^s$ Decl. = $+6^\circ 48'$.

AB.					
1898.665	348°1	0"61	7.0 , 9.0	3	12
.690	342.4	0.72	7.5 , 8.5	4	»
.783	344.3	0.49	7.0 , 8.0	2	36
1898.71	344.9	0.61	7.2 , 8.5		

AC.					
1898.665	31°4	—	— , 12.5	3	12
.690	32.5	32"60	— , 13.0	4	»
.783	32.4	32.99	— , 13.0	2	36
1898.71	32.1	32.80	— , 12.8		

AD = S. 781.

1898.665	172°3	184"40	7 , 7.0	3	12
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$O\Sigma$ 535. δ Equulei.

RA. = $21^h 9^m 37^s$ Decl. = $+9^\circ 37'$.

1898.479	206°4	0"25	— , —	2	36
.482	204.0	0.32	5.0 , 5.5	3	»
.501	205.2	0.28	— , —	2	»
.506	203.4	0.34	— , —	3	»
1898.49	204.8	0.30	5.0 , 5.5		

Special attention was given on the best two nights to the distance measures of this pair.

A. G. C. 13. τ Cygni.

RA. = $21^h 10^m 48^s$ Decl. = $+37^\circ 37'$.

1898.462	315°8	0"76	4 , 9.0	3	36
.482	319.4	0.75	— , —	3	»
.501	316.6	—	— , —	2	»
.506	314.6	0.79	— , —	3	»
1898.49	316.6	0.77	4 , 9.0		

β 163.

RA. = $21^h 13^m 45^s$ Decl. = $+11^\circ 9'$.

1898.690	[242°7]	0"63	6.8 , 10.0	4	12
.709	253.0	(0.6 $\pm$)*	7.0 , 10.0	3	»
.766	255.1	0.67	7.0 , 9.5	3	»
.805	251.4	0.58	7.0 , 9.0	4	»
1898.74	253.2	0.63	7.0 , 9.6		

* Estimated.

The first angle is probably 10° in error.

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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β 289.

RA. = $21^h 14^m 11^s$ Decl. = $+34^\circ 31'$.

AB.

1898.687	138°2	0"98	8.0 , 10.0	4	12
.818	136.7	1.11	8.0 , 10.5	3	»
.947	142.8	0.92	— , 10.0	2	36
1898.82	139.2	1.00	8.0 , 10.2		

AC.

1898.687	260°0	6"44	— , 12.5	4	12
.947	256.7	6.66	— , 13.5	2	36
1898.82	258.4	6.55	— , 13.0		

β 766. θ^2 Microscopii.

RA. = $21^h 18^m 3^s$ Decl. = $-41^\circ 26'$.

1898.594	294°5	1"10	5 , 7	3	12
.764	291.1	—	— , —	3	»
.785	294.7	1.05	— , —	3	»
1898.71	293.4	1.08	5 , 7		

β 1035.

RA. = $21^h 18^m 26^s$ Decl. = $-23^\circ 11'$.

1898.665	204°8	1"15	8.0 , 10.0	2	12
.766	207.5	1.03	8.0 , 10.0	3	»
.785	208.8	—	8.0 , 11.0	3	»
1898.74	207.0	1.09	8.0 , 10.3		

β 447.

RA. = $21^h 19^m 40^s$ Decl. = $+24^\circ 53'$.

1898.687	328°3	8"90	6.2 , 12.5	3	12
.709	328.0	8.80	6.0 , 12.5	4	»
.805	328.6	9.02	6.5 , 12.0	4	»
1898.73	328.3	8.91	6.2 , 12.3		

β 164.

RA. = $21^h 20^m 10^s$ Decl. = $+8^\circ 57'$.

BC.

1898.665	236°9	0"74	7.5 , 7.5	3	12
.687	239.0	0.67	— , —	3	»
.690	238.0	0.70	— , —	4	»
1898.68	238.0	0.70	7.5 , 7.5		

AB = Σ 2793.

1898.665	241°4	26"65	— , 8.5	3	12
.687	241.9	26.67	— , —	3	»
.690	242.1	26.74	— , —	4	»
1898.68	241.8	26.69	— , 8.5		

β 767.

RA. = $21^h 20^m 37^s$ Decl. = $-42^\circ 59'$.

1898.594	145°5	3"16	6.0 , 10.0	3	12
.687	142.6	3.15	— , 10.0	3	»
.709	144.2	3.22	— , 10.0	3	»
1898.66	144.1	3.18	6.0 , 10.0		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 β 683.

RA. = $21^h 21^m 51^s$ Decl. = $-20^\circ 39'$.

1898.665	194 ⁰ .7	3".04	8.0 , 10.5	2	12
.687	193.4	3.25	— , 10.5	3	»
.766	197.3	2.75	— , 11.5	3	»
1898.71	195.1	3.01	8.0 , 10.8		

 β 1141.

RA. = $21^h 22^m 41^s$ Decl. = $+57^\circ 48'$.

1898.673	169 ⁰ .6	3".10	7.5 , 14.5	3	36
.684	174.1	3.05	— , 13.5	2	»
.698	172.1	3.25	— , 13.5	4	»
1898.68	171.9	3.13	7.5 , 13.8		

 β 1142.

RA. = $21^h 25^m 42^s$ Decl. = $+56^\circ 44'$.

1898.684	358 ⁰ .3	0".43	9.5 , 9.5	2	36
.698	358.8	0.42	9.5 , 9.5	4	»
.870	352.8	0.46	9.0 , 9.0	3	»
.947	356.2	—	— , —	2	»
1898.80	356.6	0.44	9.3 , 9.3		

 β 1212. 24 Aquarii.

RA. = $21^h 34^m 22^s$ Decl. = $-0^\circ 30'$.

1898.684	270 ⁰ .1	0".53	6.5 , 6.5	3	36
.690	269.3	0.48	6.5 , 6.7	4	12
.980	267.5	0.47	6.5 , 6.5	3	36
1898.78	269.0	0.49	6.5 , 6.6		

 β 687.

RA. = $21^h 35^m 32^s$ Decl. = $+55^\circ 20'$.

1898.594	3 ⁰ .2	0".84	7.5 , 8.8	4	12
.643	2.7	0.79	8.0 , 9.5	2	»
.681	2.5	0.93	8.0 , 9.5	3	»
.684	1.8	0.77	7.5 , 9.0	2	36
1898.65	2.5	0.83	7.7 , 9.3		

The quadrant is certain.

 β 1143.

RA. = $21^h 36^m 51^s$ Decl. = $+57^\circ 2'$.

AB.

1898.673	324 ⁰ .4	—	6.0 , 14.0	3	36
.698	322.2	1".87	6.0 , 14.0	4	»
.870	328.4	1.59	7.0 , 14.0	3	»
1898.75	325.0	1.73	6.3 , 14.0		

AC = Σ 2816.

1898.870	120 ⁰ .7	11".60	— , —	3	36
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AD = Σ 2816.

1898.870	339 ⁰ .4	20".15	— , —	3	36
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The close pair is very difficult even under the best conditions.

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 β 688.

RA. = $21^h 38^m 32^s$ Decl. = $+40^\circ 35'$.

1898.709	200 ⁰ .0	0".55	7.5 , 7.5	4	12
.725	202.0	0.53	7.5 , 7.5	4	»
.794	200.5	0.47	8.0 , 8.0	4	36
1898.74	200.8	0.52	7.7 , 7.7		

 β 989. α Pegasi.

RA. = $21^h 40^m 7^s$ Decl. = $+25^\circ 11'$.

1898.430	288 ⁰ .2	0".13	— , —	3	36
.462	292.7	0.17	— , —	3	»
.482	292.4	0.17	— , —	3	»
.501	297.0	0.18	5.0 , 5.0	2	»
.638	302.2	0.16	— , —	3	»
1898.50	294.5	0.16	5.0 , 5.0		

AB and C = Σ 2824.

1898.430	299 ⁰ .6	12".43	— , 9.5	3	36
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 β 1214.

RA. = $21^h 52^m 15^s$ Decl. = $+33^\circ 51'$.

AB.

1898.709	203 ⁰ .4	1".78	9.0 , 10.0	4	12
.722	199.7	1.52	9.5 , 11.0	3	»
.725	200.3	—	— , —	3	»
1898.72	201.1	1.65	9.2 , 10.5		

CD.

1898.709	243 ⁰ .2	4".92	10.0 , 11.0	4	12
.722	243.2	4.84	10.0 , 10.5	3	»
.725	243.3	—	10.0 , 11.0	3	»
1898.72	243.2	4.88	10.0 , 10.8		

AC.

1898.709	18 ⁰ .9	112".47	— , —	4	12
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Fog prevented distance measures on the third night.

 β 275.

RA. = $21^h 54^m 15^s$ Decl. = $+60^\circ 49'$.

1898.643	358 ⁰ .4	0".56	7.5 , 7.5	2	12
.681	363.4	0.53	7.5 , 7.5	3	»
.698	184.3	0.48	7.5 , 7.7	4	36
1898.67	182.0	0.52	7.5 , 7.6		

The quadrant was carefully considered on the last night and the north star noted as certainly the brighter.

 β 695.

RA. = $21^h 59^m 10^s$ Decl. = $+60^\circ 37'$.

1898.594	145 ⁰ .2	3".06	7.8 , 11.0	4	12
.681	147.5	2.95	8.0 , 11.5	3	»
.818	148.0	3.32	8.0 , 10.5	4	»
1898.70	146.9	3.11	7.9 , 11.0		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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 β 769.RA. = $22^h 5^m 47^s$ Decl. = $-34^\circ 57'$.

1898.687	360.2	0.67	7.5 , 8.0	4	12
.766	358.9	0.67	6.5 , 7.5	3	»
.785	356.2	0.66	7.0 , 8.0	3	»
.805	354.4	0.65	7.0 , 8.0	4	»
1898.76	357.4	0.66	7.0 , 7.9		

 β 290. 34 Pegasi.RA. = $22^h 21^m 32^s$ Decl. = $+3^\circ 53'$.

1898.687	216.6	3.13	6 , 12.5	3	12
.783	220.2	3.03	— , 13.0	2	36
1898.73	218.4	3.08	6 , 12.8		

 β 291.RA. = $22^h 22^m 40^s$ Decl. = $+4^\circ 1'$.

AB.

1898.690	174.3	0.55	8.5 , 8.5	3	12
.783	172.3	0.50	7.5 , 7.5	2	36
.785	173.8	0.51	8.0 , 8.0	3	12
1898.75	173.5	0.52	8.0 , 8.0		

AB and C.

1898.783	125.0	31.06	— , 13.5	2	36
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 β 478.RA. = $22^h 24^m 11^s$ Decl. = $-7^\circ 51'$.

AB.

1898.709	33.8	1.22	9.0 , 10.0	3	12
.764	30.0	1.20	9.5 , 11.0	3	»
.766	33.5	1.27	9.0 , 10.0	4	»
1898.75	32.4	1.23	9.2 , 10.3		

AC.

1898.709	239.2	28.89	— , 9.0	3	12
.764	239.1	29.27	— , —	3	»
1898.74	239.2	29.08	— , 9.0		

 β 1264.RA. = $22^h 25^m 3^s$ Decl. = $-0^\circ 22'$.

1898.684	19.1	4.39	8.0 , 13.0	2	36
.868	18.6	4.10	7.8 , 13.5	3	»
.942	21.8	4.02	7.8 , 13.5	2	»
1898.83	19.8	4.17	7.9 , 13.3		

Another 13th magnitude in the field south of A. β 710.RA. = $22^h 37^m 53^s$ Decl. = $+29^\circ 12'$.

1898.608	243.3	0.32	8.5 , 8.5	2	36
.638	235.7	0.31	9.0 , 9.0	3	»
.673	239.0	0.34	9.0 , 9.0	3	»
1898.64	239.3	0.32	8.8 , 8.8		

Date	θ_0	ρ_0	Mag.	Wt.	Tel.
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 β 1144. η Pegasi.RA. = $22^h 38^m 19^s$ Decl. = $+29^\circ 42'$.

BC.

1898.597	84.1	0.32	10.0 , 10.0	2	36
.608	77.4	0.33	9.0 , 9.0	2	»
.638	84.0	0.23	9.5 , 9.5	3	»
.673	80.9	0.25	8.7 , 8.7	3	»
1898.63	81.6	0.28	9.3 , 9.3		

A and BC.

1898.597	338.8	90.95	3 , —	2	36
.608	338.4	91.14	— , —	2	»
1898.60	338.6	91.04	3 , —		

 β 711.RA. = $22^h 40^m 29^s$ Decl. = $+10^\circ 40'$.

1898.690	47.4	1.21	9.0 , 10.0	3	12
.764	49.4	0.84	8.5 , 10.0	3	»
.766	46.1	0.91	9.0 , 10.0	3	»
1898.74	47.6	0.99	8.8 , 10.0		

 β 1145.RA. = $22^h 43^m 32^s$ Decl. = $+58^\circ 1'$.

AB.

1898.818	155.3	1.14	8 , 11.5	3	12
.947	157.3	0.99	— , 11.0	2	36
1898.88	156.3	1.06	8 , 11.2		

AC.

1898.681	179.7	22.34	— , 10.0	3	12
.818	179.5	22.32	— , —	3	»
.947	179.8	22.16	— , —	2	36
1898.81	179.7	22.27	— , 10.0		

 β 1011.RA. = $22^h 57^m 1^s$ Decl. = $-36^\circ 57'$.

1898.640	302.0	2.09	7.0 , 10.0	3	12
.766	300.8	2.35	7.0 , 10.0	3	»
.805	299.9	2.39	7.0 , 10.0	4	»
1898.74	300.9	2.28	7.0 , 10.0		

 β 1147. 2 Andromedae.RA. = $22^h 58^m 0^s$ Decl. = $+42^\circ 13'$.

1898.698	325.4	0.36	5 , 9.0	4	36
.980	333.9	0.35	5 , 8.0	3	»
1898.84	329.6	0.36	5.0 , 8.5		

 $O\Sigma$ 487.RA. = $22^h 59^m 32^s$ Decl. = $+80^\circ 15'$.

1897.854	213.8	0.33	7.0 , 8.5	3	36
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Professor Hussey in his review of the $O\Sigma$ stars obtained:

1898.60 212.2 0.29 3 nights 36 inch

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 β 852.

RA. = $23^h 5^m 50^s$ Decl. = $+25^\circ 59'$.

BC.

1898.802	9°8	1°5 $\pm$)*	— , —	3	12
.824	7.8	1.42	10.5 , 11.5	3	»
.859	359.7	1.57	11.0 , 12.0	3	»
.876	4.0	1.47	11.0 , 11.7	2	36
1898.84	5.3	1.49	10.8 , 11.7		

* Estimated.

A and BC.

1898.802	282°6	59°12	7.0 , —	3	12
.824	282.9	58.34	— , —	3	»
.859	283.3	58.78	— , —	3	»
1898.83	282.9	58.75	7.0 , —		

BD.

1898.876	207°8	18°00	11.0 , 14.0	2	36
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 β 714.

RA. = $23^h 8^m 58^s$ Decl. = $-3^\circ 11'$.

1898.805	138°9	0°55	7.0 , 9.5	4	12
.868	140.1	0.63	7.0 , 10.0	3	36
1898.84	139.5	0.59	7.0 , 9.7		

 β 1220. ψ Aquarii.

RA. = $23^h 10^m 36^s$ Decl. = $-9^\circ 37'$.

BC.

1898.577	99°8	0°39	9.0 , 9.3	3	36
.868	94.7	0.44	9.5 , 9.5	3	»
.920	90.2	0.34	9.0 , 9.0	2	»
.980	94.4	0.38	9.5 , 9.5	2	»
1898.84	94.8	0.39	9.2 , 9.3		

BC and E.

1898.980	9°2	18°26	— , 13.5	2	36
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In 1891.89 β found for BC and E $16^\circ 7' 19'' 25$. The change both in angle and distance corresponds so closely to the known proper motion of the bright star, A, that it is evident that A and BC form one physical system to which E does not belong.

 β 80.

RA. = $23^h 13^m 46^s$ Decl. = $+4^\circ 52'$.

1898.690	342°0	0°67	8.0 , 9.0	4	12
.764	340.9	0.65	8.0 , 9.0	3	»
.805	346.6	0.58	8.0 , 9.0	4	»
.868	343.0	0.57	8.5 , 9.0	2	36
1898.78	343.1	0.62	8.1 , 9.0		

 β 774.

RA. = $23^h 26^m 13^s$ Decl. = $+63^\circ 46'$.

1898.643	360°7	0°60	8.5 , 8.5	2	12
.681	357.6	0.67	8.0 , 9.0	3	»
.703	359.0	0.72	8.0 , 9.0	4	»
1898.68	359.1	0.66	8.2 , 8.8		

Date | θ_0 | ρ_0 | Mag. | Wt. | Tel.

 β 720. 72 Pegasi.

RA. = $23^h 28^m 59^s$ Decl. = $+30^\circ 46'$.

1898.643	162°8	0°48	6.5 , 6.5	2	12
.673	161.3	0.49	— , —	3	36
.681	159.4	0.53	— , —	3	12
1898.67	161.2	0.50	6.5 , 6.5		

 β 1012.

RA. = $23^h 31^m 48^s$ Decl. = $-32^\circ 25'$.

1898.640	250°8	5°15	7.0 , 10.0	3	12
.766	250.9	5.37	— , —	4	»
.805	250.0	5.31	— , —	4	»
1898.74	250.6	5.28	7.0 , 10.0		

 β 724.

RA. = $23^h 35^m 47^s$ Decl. = $+7^\circ 26'$.

1898.805	89°5	0°63	9.0 , 10.0	4	12
.868	87.8	0.62	9.0 , 9.5	2	36
.878	88.9	0.55	8.5 , 9.5	3	12
1898.85	88.7	0.60	8.8 , 9.5		

 β 726.

RA. = $23^h 41^m 25^s$ Decl. = $-13^\circ 18'$.

1898.805	321°8	0°73	8.0 , 10.0	4	12
.920	318.6	0.61	— , —	2	36
1898.86	320.2	0.67	8.0 , 10.0		

 β 995.

RA. = $23^h 42^m 35^s$ Decl. = $+46^\circ 17'$.

1898.591	241°9	0°79	6.0 , 8.5	4	12
.643	239.3	0.72	6.5 , 8.0	2	»
.681	234.9	0.83	6.0 , 8.5	3	»
.703	234.0	0.91	6.5 , 8.5	4	»
1898.65	237.5	0.81	6.2 , 8.4		

 β 1152.

RA. = $23^h 43^m 15^s$ Decl. = $+63^\circ 16'$.

BC.

1898.681	104°4	(0°81)	— , —	3	12
.703	102.2	0.66	9.0 , 9.0	4	»
.963	101.9	0.53	9.0 , 9.2	4	36
1898.78	102.8	0.60	9.0 , 9.1		

A and BC.

1898.643	136°0	74°39	— , —	2	12
.681	136.3	74.62	7.0 , —	3	»
.703	136.1	74.26	— , —	4	»
1898.68	136.1	74.42	7.0 , —		

 Σ 3050.

RA. = $23^h 54^m 24^s$ Decl. = $+33^\circ 10'$.

1898.802	212°7	2°53	6.0 , 6.5	3	12
99.015	212.1	2.57	6.0 , 6.5	3	»
1898.91	212.4	2.55	6.0 , 6.5		

Date | θ_o | ρ_o | Mag. | Wt. | Tel.

 β 731.

RA. = $23^h 54^m 28^s$ Decl. = $-8^\circ 22'$.

1898.690	266.0	1.56	8.5 , 9.5	3	12
.703	263.1	1.69	9.0 , 10.0	3	»
.709	264.8	1.52	9.0 , 9.5	3	»
1898.70	264.6	1.59	8.8 , 9.7		

 W_2 $23^h 10^m 71^s$.

RA. = $23^h 54^m 43^s$ Decl. = $+1^\circ 19'$.

1898.703	88.5	1.94	8.5 , 9.5	3	12
.709	88.2	2.00	9.0 , 10.0	4	»
.878	88.1	1.88	8.5 , 9.0	3	»
1898.76	88.3	1.94	8.7 , 9.5		

Marked »duplex« in W_2 . The only previous measure was made at Cincinnati in 1879.74. No change.

 β 733. 85 Pegasi.

RA. = $23^h 56^m 55^s$ Decl. = $+26^\circ 34'$.

AB.

1898.011	214.1	—	— , —	2	36
.479	216.0	0.75	— , —	3	»
.482	218.3	0.83	6 , 11.5	3	»
.805	221.6	0.80	— , —	4	12
1898.44	217.5	0.79	6 , 11.5		

AC.

1898.673	344.6	32.92	— , —	3	36
.698	344.3	32.89	6 , 9.0	3	»
1898.69	344.5	32.90	6 , 9.0		

Date | θ_o | ρ_o | Mag. | Wt. | Tel.

AD.

1898.673	288.5	83.84	— , 13.0	3	36
.698	288.5	83.88	— , 13.0	3	»
1898.69	288.5	83.86	— , 13.0		

 β 281.

RA. = $23^h 57^m 39^s$ Decl. = $+1^\circ 35'$.

AB.

1898.690	200.4	1.56	7.5 , 10.0	3	12
.709	207.3	1.59	— , 10.0	3	»
.764	202.4	—	— , 10.0	3	»
.766	202.7	1.46	7.0 , 10.0	3	»
1898.73	203.2	1.54	7.2 , 10.0		

AC.

1898.690	334.3	32.12	— , 12.0	3	12
.709	334.5	32.36	— , 12.0	3	»
1898.70	334.4	32.24	— , 12.0		

Object-glass fogged on third night.

 β 863.

RA. = $0^h 0^m 43^s$ Decl. = $+73^\circ 2'$.

1898.643	121.8	1.76	9.0 , 10.0	2	12
.681	118.2	2.24	9.0 , 10.0	3	»
.703	117.8	2.08	9.0 , 10.0	4	»
1898.68	119.3	2.03	9.0 , 10.0		

Comparison with Ephemerides.

I have compared my observations of 26 of the well-known binaries given in the above list with one or more of the recent orbits and give the results in the following table. As recent observations were used in computing these orbits, it was to be expected that, in general, the residuals

would be small enough to be considered as accidental errors of observation. Actual comparison, however, shows many residuals too large to be accounted for in this way and indicates, considerable uncertainty in several of the orbits.

Star	Date	θ_o	θ_c	ρ_o	ρ_c	$\theta_o - \theta_c$	$\rho_o - \rho_c$	Orbit by
η Cassiopeiae Σ 60	1898.87	213.8	215.0	5.00	4.59	— 1.2	+0.41	See
β 883	1898.09	37.7	44.2	0.26	0.32	— 6.5	—0.06	See
			42.5		0.35	— 4.8	—0.09	Glazenapp
β 883	1898.76	44.9	67.9	0.27	0.18	— 23.0	+0.09	See
			48.8		0.35	— 3.9	—0.08	Glazenapp
Sirius	1898.16	170.8	168.3	4.22	4.45	+ 2.5	—0.23	Zwiers
			169.5		4.71	+ 1.3	—0.49	See
			173.0		4.4	— 2.2	—0.2	Burnham
Sirius	1898.73	161.9	161.5	4.22*	4.62	+ 0.4	—0.40	Zwiers
			163.5		5.12	— 1.6	—0.90	See
			166.1		4.5	— 4.2	—0.3	Burnham
γ Argus β 101	1898.29	289.4	289.3	0.61	0.58	+ 0.1	+0.03	Glazenapp
			291.9		0.59	— 2.5	+0.02	See
ζ Cancri AB Σ 1196	1898.31	9.0	11.4	1.17	1.13	— 2.4	—0.03	See
ω Leonis Σ 1356	1898.91	111.7	112.0	0.78	0.89	— 0.3	—0.11	See

* Distance measured on one night only.

Star	Date	θ_o	θ_c	ϱ_o	ϱ_c	$\theta_o - \theta_c$	$\varrho_o - \varrho_c$	Orbit by
<i>O</i> Σ 234	1898.94	135°9	135°1	0".42	0".35	+ 0".8	+0".07	See
<i>O</i> Σ 235	1898.11	98.4	100.9	0.73	0.74	— 2.5	—0.01	See
	1898.91	109.6	103.3	0.68	0.71	+ 6.3	—0.03	»
42 Com. Ber. Σ 1728	1898.31	188.7	191.9	0.19	0.15	— 3.2	+0.04	See
<i>O</i> Σ 269	1898.27	223.1	225.3	0.31	0.40	— 2.2	—0.09	See
25 Can. ven. Σ 1768	1898.13	135.3	132.7	1.16	1.14	+ 2.6	+0.02	See
ξ Bootis Σ 1888	1898.08	212.3	212.5	2.86	2.46	— 0.2	+0.40	See
γ Cor. Bor. Σ 1967	1898.13	118.2	115.6	0.61	0.70	+ 2.6	—0.09	See
ξ Scorpii AB Σ 1998	1898.17	222.6	221.4	0.84	0.81	+ 1.2	+0.03	See
ζ Herculis Σ 2084	1898.33	314.2	359 $\pm$	0.63	0.58	—45 $\pm$	+0.05	See
			298.5		0.54	+15.7	+0.09	Doberck
ζ Herculis Σ 2084	1898.75	289.6	337 $\pm$	0.45	0.52	—47 $\pm$	—0.07	See
			280.5		0.59	+ 9.1	—0.14	Doberck
β 416	1898.35	303.8	293.5	1.99	1.61	+10.3	+0.38	See
Σ 2173	1898.14	331.6	334.8	1.40	1.30	— 3.2	+0.10	See
70 Ophiuchi Σ 2272	1898.44	273.2	280.2	1.89	1.99	— 7.0	—0.10	Schur
			277.7		1.88	— 4.5	+0.01	See
ζ Sagittarii	1898.49	93.1	63.5	0.34	0.46	+29.6	—0.12	See
γ Cor. Austr. H_2 5084	1898.46	148.5	150.7	1.68	1.80	— 2.2	—0.12	See
<i>O</i> Σ 400	1898.61	44.4	37.1	0.20	0.22	+ 7.3	—0.02	Burnham
			33.8		0.18	+10.6	+0.02	Doberck
β Delphini β 151	1898.50	1.0	1.7	0.64	0.72	— 0.7	—0.08	See
4 Aquarii Σ 2729	1898.59	207.1	205.8	0.23	0.20	+ 1.3	+0.03	See
δ Equulei AB <i>O</i> Σ 535	1898.49	204.8	202.3	0.30	0.51	+ 2.5	—0.21	See
α Pegasi β 989	1898.50	294.5	288.7	0.16	0.27	+ 5.8	—0.11	See
85 Pegasi β 733	1898.44	217.5	231.4	0.79	0.70	—13.9	+0.09	See

Lick Observatory, University of California, February 12, 1899.

R. G. Aitken.

Observations on southern variable stars.

By *W. Doberck.*

The following observations were made by aid of a binocular or, in case of very bright stars, with the naked eye. The magnitudes are referred to the scale of the Uranometria Argentina, and the positions to 1875.0.

T Ceti. 97 XII 26: 6.4, 27: 6.3, 98 I 1: 5.7, 8: 6.0, 9: 5.6, 12: 5.5, 20: 5.7, 21: 6.0, 22: 5.5, 24: 5.5, 25: 5.6, 26: 5.6, 98 II 10: 6.0, 12: 6.0, 13: 5.8, 98 VII 18: 5.9.

R Sculptoris. 97 XII 26: 6.4, 27: 6.5, 98 I 12: 6.7, 98 II 12: 7.9, 13: 6.8.

Lacaille 480 and Ll. 9706 were below the 7th mag. at the beginning of 1898, ν Fornacis = 5.0, ε Leporis = 3.4, Lac. 1890 = 6.0.

R Leporis. 97 XII 27: 7.3, 98 I 12—21: 7.6, 22: 7.7, 24: 7.9, 25: 7.8, 26: 7.1, 27: 7.8, 98 II 11: 8.4, 12: 7.7, 13: 8.1. On the 25th it was invisible.

R Columbae. 97 XII 26: 7.9, 27: 7.9, 98 I 12: 8.0, 21: 7.7, 24: 7.8, 98 II 10: 7.9, 11: 7.6, 12: 7.5 (maximum), 14: 7.7, 25: 7.9, 98 III 14: 7.9, 16: 8.0.

S Leporis = 7.1 from end of December 1897 till April 1898.

L¹ Puppis = 5.0 in December 1897, = 5.1 in January and February 1898, = 5.2 in March and April 1898. One observation only was made in May = 5.4. Of course the twilight might influence my estimates.

L² Puppis. 97 XII 26 and 27: 4.6, 98 I 12: 4.6, 20: 4.5, 21 and 24: 4.7, 98 II 11 and 12: 4.8, 25: 4.9, 98 III 14: (5.2), 16 and 24: 4.1, 98 IV 17: 4.0, 18: 3.9, 19: 4.2, 98 IV 10: 5.0. — The minimum appears to lie in the middle of February, and the maximum about the 10th of April.

R Canis majoris. Minima (Hongkong Mean Time): Nr. 3483, 1898 I 24^d 11^h 12^m, Nr. 3484, 1898 I 25^d 14^h 14^m, Nr. 3497, 1898 II 9^d 8^h 26^m, Nr. 3526, 1898 III 14^d 7^h 20^m, Nr. 3527, 1898 III 15^d 10^h 45^m. The following table shows in column 2 the magnitudes of R at a certain number of minutes in column 1 before (—) or after (+) the minimum based on the number of observations in column 3.