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Micrometrical Measures of Double and Multiple Stars in the Southern Hemisphere

made with the 61 cm Refractor of the Lowell Observatory.

By *T. F. F. See.*

In the course of a survey of the southern heavens for the discovery and measurement of new double stars and nebulae entered upon at Flagstaff 1896 August 1, I have swept over the greater part of the zone between -20° and -45° , besides the region included between -45° and -65° , and the hours of right ascension 4 and 16, studied at Mexico. It is estimated that in this work we have examined carefully not less than 100000 stars brighter than 10th magnitude. On reducing our results it is found that we have measured 1000+ double and multiple stars; of which 500 are new, while the remaining 500+ stars have been noticed by previous observers. The systems discovered by former observers have sometimes been measured by them; but in the state of neglect until recently characteristic of southern stellar astronomy, it was often thought sufficient to note the duplicity of stars without even estimating the coordinates or the magnitudes of the components. In some cases considerable lists of stars have been published as double without any data which could be made the basis of future investigation. It is needless to point out that the observers who have pursued this unfortunate method of merely noting the duplicity of stars without measuring them have missed a rare opportunity of contributing something of real value to the literature of double star astronomy. In view of the fact that accurate measurement is the sole aim of double star observation, it seems clear that measurement is the only contribution which should be recognized in adjudging the right of discovery to observers. Yet as the stellar astronomy of the southern hemisphere has hitherto rested in a state of great confusion, and some observers have been unable to measure the systems they have discovered, I have thought it proper in every case to credit the stars seen by previous observers to those by whom duplicity was first noticed, even though the first measurer had made the only contribution to our knowledge of any real value. Accordingly in our survey all those stars noticed as double by previous observers have been classed as 'known double stars'. The following catalogue contains the measures of these systems made at the Lowell Observatory during the past year and four months. In many instances our measures are the first that have ever been made, and on that account a great part of the accompanying results possess a degree of interest equal to that of the first measures of new double stars.

Our discoveries at Flagstaff and at Mexico have been embodied in a catalogue communicated to the Astronomical

Journal, which contains a description of the instruments of the Observatory (the only account of the kind yet published); the reader of this catalogue is referred to that source for information relative to the equipment and method of observation.

In the accompanying catalogue the places of the stars are referred to 1900.0.

The following abbreviations are used:

Cord. GC.	= Argentine General Catalogue	} Gould
Cord. ZC.	= Argentine Zone Catalogue	
Cord. DM.	= Cordoba Durchmusterung, Thome	
AOe ₂	= Argelander-Oeltzen	
SD.	= Southern Durchmusterung, Schönfeld.	

On Double star observers:

R	= Rümker	
J	= Dunlop	
h	= Sir John Herschel	
Hh	= Sir William Herschel's work, as edited by Sir John	
Jacob	= Capt. W. S. Jacob	
Syd ₁	= First Sydney Catalogue	} Russell
Syd ₂	= Second Sydney Catalogue	
Sellors	= R. P. Sellors	
Innes	= R. T. A. Innes	
Ho	= Hough	
Harvard	= Harvard observers, etc.	

Measures which have been made by my assistants, Messrs. *W. A. Cogshall* and *S. L. Boothroyd*, are indicated by the names; in case more than one observer has taken part in the work all the names are written to prevent confusion. In addition to the acknowledgement of their services made elsewhere I must here bear witness to their patience, zeal and interest in perfecting the work embodied in this catalogue. To those who are familiar with double star work with a great telescope, we need not point out the energy and the skill required in the measurement, identification and reduction of a catalogue of this extent; accordingly, in the achievement of the results now presented to the public, it will be understood that they have borne a great and indeed a distinguished part, which I acknowledge with lasting gratitude.

Micrometrical Measures of Double and Multiple Stars in the Southern Hemisphere.

 β 391 = α^1 Sculptoris.

Cord. GC. 56.

 $\alpha = 0^h 4^m 15^s.0$, $\delta = -28^\circ 32' 37''.8$

6.4, yellow; 6.4, yellow.

1896.758	271.5	1.35
.758	273.2	1.20
.829	275.2	1.28

1896.782	273.3	1.28
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1897.657	92.8	1.20
.657	93.2	1.15

1897.657	93.0	1.17
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No appreciable motion, unless increase of distance.

 β 393 = G. 31 Ceti.

Cord. GC. 205.

 $\alpha = 0^h 13^m 13^s.0$, $\delta = -21^\circ 41' 39''.0$

7.5, yellow; 8, yellow.

1897.711 $18^\circ \pm$ $0''.3 \pm$

Excellent estimates, not separated.

Perhaps a very slow direct motion, with diminution of distance.

1877.87 $6''.2$ $0''.6 \pm$ in Howe

h 1957. Cord. GC. 269.

 $\alpha = 0^h 16^m 48^s.8$, $\delta = -23^\circ 33' 32''.8$

7, yellow; 9.8, purple.

1897.627	22.4	6.37
.627	22.8	6.11

1897.627	22.6	6.24
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Fixed.

Cord. dpl. I. Cord. ZC. $0^h 48^m 9^s$. $\alpha = 0^h 19^m 41^s.8$, $\delta = -33^\circ 53' 28''.7$

8.7, yellow; 9.4, bluish.

1896.755	123.6	2.02
.788	115.9	2.64
.788	117.1	2.92

1896.777	118.9	2.53
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A nice system; no other measures.

h 1964 = G. 39 Ceti.

Cord. GC. 352.

 $\alpha = 0^h 21^m 18^s.9$, $\delta = -19^\circ 14' 49''.2$

7.8, yellow; 11.2, purple.

1897.711	113.6	7.39
.711	114.6	7.23

1897.711	114.1	7.31
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Probably fixed.

h 3367. Cord. ZC. $0^h 57^m 0^s$. $\alpha = 0^h 22^m 38^s.9$, $\delta = -32^\circ 30' 38''.7$

8.9, bl. white; 9.2, bl. white.

1896.755	176.0	5.03
.775	177.0	5.48
.775	177.7	5.81

1896.769	176.9	5.44
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No other measures since Herschel; motion uncertain.

h 3377. Cord. GC. $47^\circ 3'$. $\alpha = 0^h 28^m 38^s.1$, $\delta = -26^\circ 38' 35''.8$

5.9, orange; 10.5, purple.

1897.736	55.5	19.00
.736	57.4	19.21

1897.736	56.4	19.10
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h 3375 = G. 78 Sculptoris.

Cord. GC. 478.

 $\alpha = 0^h 28^m 50^s.0$, $\delta = -35^\circ 32' 8''.7$

7.3, yellow; 9.1, bl. purple.

1896.733	166.5	6.05
.788	165.1	6.01
.788	164.6	6.03

1896.770	165.4	6.03
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No change.

h 3379. Cord. GC. 535.

 $\alpha = 0^h 31^m 46^s.1$, $\delta = -27^\circ 58' 12''.6$

7, yellow; 11.2, bluish.

1897.747	231.0	14.61
.747	231.4	14.22

1897.747	231.2	14.41
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 β 395 = G. 59 Ceti.

Cord. GC. 544.

 $\alpha = 0^h 32^m 9^s.9$, $\delta = -25^\circ 19' 2''.3$

6.9, yellow; 7, yellow.

1897.627	278.0	0.22
.627	279.3	0.22
.671	277.3	0.24
.671	278.1	0.20

1897.649	278.2	0.22
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1897.671	269.7	0.26	Cogshall
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.671	275.9	0.25	"
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1897.671	272.8	0.25	Cogshall
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A remarkable binary revolving in 16.3 years. See A. N. 3455.

O. Stone. Cord. GC. $784^\circ 3'$. $\alpha = 0^h 47^m 17^s.5$, $\delta = -23^\circ 9' 15''.5$

AB.

7.4, yellow; 8, yellow.

1897.736	267.5	2.31
.736	267.7	2.19

1897.736	267.6	2.25
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AC; C 11, bluish.

1897.736 197.4 35.76

Unchanged.

 β 734 = G. 88 Ceti.

Cord. GC. 791.

 $\alpha = 0^h 47^m 46^s.0$, $\delta = -24^\circ 33' 2''.5$

6, or. yellow; 10, purple.

1897.627	345.6	11.25
.627	345.8	11.24

1897.627	345.7	11.24
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No change.

 β 233. AO ϵ_2 505. $\alpha = 0^h 50^m 8^s.3$, $\delta = -17^\circ 59' 7''.8$

7.5, yellow; 8.8, bl. yellow.

1897.753	89.8	1.52
.753	90.1	1.40

1897.753	90.0	1.46
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Nice close system, unchanged.

h 2004 = G. 97 Ceti.

Cord. GC. 881-0.

 $\alpha = 0^h 52^m 41^s.4$, $\delta = -19^\circ 32' 22''.3$

6.5, yellow; 9.7, purple.

1897.799	239.7	3.99
.799	238.8	3.77

1897.799	239.2	3.88
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Very slight retrograde motion.

O. Stone = β 735 = G. 98 Sculptoris.

Cord. GC. 987.

 $\alpha = 0^h 59^m 49^s.7$, $\delta = -34^\circ 4' 6''.4$

6.5, yellow; 12.5, bl. purple.

1896.703	219.8	8.04
.788	219.1	8.52

.788	219.2	8.54
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1896.760	219.4	8.37
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No change.

β 1229. Cord. GC. 1244. $\alpha = 1^h 14^m 41^s.6$, $\delta = -35^\circ 1' 3''.8$

8.3, yellow; 8.6, yellow.

1896.793	285.8	0.789
.843	295.0	1.02
.843	293.0	0.98
1896.825	291.3	0.96

1896.843 291.6 1.12 Cogshall

Unchanged since 1891.

h 2043 = G. 133 Ceti.

Cord. GC. 1299-1300.

 $\alpha = 1^h 17^m 39^s.6$, $\delta = -19^\circ 36' 8''.5$

6.8, yellow; 8.8, purple.

1897.799	74.3	5.88
.799	75.5	5.30
1897.799	74.9	5.59

Fixed.

h 3432. Cord. ZC. 1^h439. $\alpha = 1^h 18^m 7^s.4$, $\delta = -31^\circ 8' 59''.6$

7.9, yellow; 10.8, bluish.

1896.753	218.4	8.37
.788	217.1	7.91
.788	217.6	7.84
1896.777	217.7	8.04

No change.

Secchi = G. 134 Ceti.

Cord. GC. 1320-21.

 $\alpha = 1^h 18^m 49^s.0$, $\delta = -24^\circ 52' 31''.2$

6.7, yellow; 9.1, purple.

1897.671	80.3	2.93
.671	80.6	3.04
.736	84.2	2.67
.736	84.8	2.71
1897.703	82.5	2.84

Fixed.

h 3436 = G. 112 Sculptoris.

Cord. GC. 1379.

 $\alpha = 1^h 22^m 26^s.2$, $\delta = -30^\circ 45' 14''.1$

7.7, yellow; 9.7, bl. purple.

1896.753	125.8	9.77
.788	125.7	9.21
.788	125.0	9.76
1896.777	125.5	9.58

Unchanged.

h 3447 = τ Sculptoris.

Cord. GC. 1547.

 $\alpha = 1^h 31^m 31^s.2$, $\delta = -30^\circ 25' 9''.9$

6.3, yellow; 8.7, bl. purple.

1896.785	92.2	2.18
.843	91.6	1.97
.844	94.0	1.88
1896.817	92.6	2.01

Slow direct motion of 18° since 1835.h 3456. Cord. DM. $-22^\circ 57.8$. $\alpha = 1^h 39^m 22^s.7$, $\delta = -21^\circ 55' 54''.5$

7.5, yellow; 10.2, purple.

1897.753	348.2	15.14
.753	347.4	14.76
1897.753	347.8	14.95

No change.

h 3461 = ϵ Sculptoris.

Cord. GC. 1713.

 $\alpha = 1^h 40^m 57^s.5$, $\delta = -25^\circ 33' 5''.4$

5.5, yellow; 8.3, purple.

1897.627	51.8	4.98
.627	51.5	4.85
1897.627	51.6	4.91

Retrograde motion of 21° since 1835.

Jacob 21. Cord. GC. 2226-23.

 $\alpha = 2^h 7^m 39^s.7$, $\delta = -32^\circ 45' 27''.4$

6.7, yellow; 10.8, bl. yellow.

1897.731	278.0	7.14
.731	278.6	7.17
1897.731	278.3	7.15

Discovered by Jacob, 1847 June 15.
No change.h 3491. AO ϵ_2 1439. $\alpha = 2^h 11^m 29^s.9$, $\delta = -21^\circ 28' 14''.6$

8.5, yellow; 8.5, yellow.

1897.753	285.7	6.77
.753	286.1	6.97
1897.753	285.9	6.87

No change in 60 years.

Cord. dpl. Cord. GC. 2329.

 $\alpha = 2^h 12^m 37^s.7$, $\delta = -33^\circ 27' 31''.9$

8.1, yellow; 8.2, yellow.

1897.731	270.7	2.18
.731	269.5	2.31
1897.731	270.1	2.25

No other measures.

h 3506 = ω Fornacis.

Cord. GC. 2693-2.

 $\alpha = 2^h 29^m 27^s.9$, $\delta = -28^\circ 40' 17''.4$

5.2, yellow; 8.1, bl. yellow.

1897.731	243.4	11.13
.731	243.1	11.09
1897.731	243.2	11.11

No change in 60 years.

h 3524. SD. $-20^\circ 50.6$. $\alpha = 2^h 38^m 21^s.8$, $\delta = -20^\circ 43' 47''.0$

6.9, yellow; 9.5, purplish.

1897.753	144.3	20.30
.753	144.8	20.56
1897.753	144.5	20.43

No other measures since 1836.

1836.09 133.1 21.2 4n Herschel

h 3536 = η^2 Fornacis.

Cord. GC. 3030.

 $\alpha = 2^h 46^m 12^s.2$, $\delta = -36^\circ 15' 26''.8$

6, orange; 10.8, purple.

1897.720	12.6	4.87
.720	12.6	4.86
1897.720	12.6	4.86

Direct motion of 10° since 1835. $\Delta 9 = \theta$ Eridani. Cord. GC. 3223. $\alpha = 2^h 54^m 28^s.0$, $\delta = -40^\circ 42' 19''.7$

2.7, yellow; 4.3, yellow.

1897.046	87.6	8.30	bad seeing
.077	81.5	8.49	blurred
.077	84.6	8.74	
1897.067	84.5	8.51	

No appreciable change in 60 years.

h 3555 = α Fornacis.

Cord. GC. 3462.

 $\alpha = 3^h 7^m 48^s.8$, $\delta = -29^\circ 23' 7''.0$

4, yellow; 8, purple.

1897.720	329.7	1.59
.720	330.8	1.58
1897.720	330.2	1.58

In the time of Herschel the angle was about 306° , and the distance $4''.5 \pm$.

Fine system in slow direct orbital motion; now difficult, and moving rapidly. It deserves attention annually.

h 3556 = G. 71 Eridani.

Cord. GC. 3487.

 $\alpha = 3^h 8^m 54^s.8$, $\delta = -44^\circ 47' 40''.7$
7, yellow; 10.3, purple.

1897.041	213.6	2.32
.077	221.3	2.58
.077	226.0	2.50
1897.065	220.3	2.46

Probably a slow retrograde motion with increase of distance.

Jacob = τ^4 Eridani.

Cord. GC. 3607.

 $\alpha = 3^h 15^m 3^s.9$, $\delta = -22^\circ 7' 47''.6$

AB = Jacob.

2.8, orange; 11.8, purple.

1897.731	287.3	6.05
.731	288.2	6.13
1897.731	287.8	6.09

No change since 1857.

There is a third component C, 10 mag., which Burnham has measured:

1877.810 99.3 39.97 1 n

 $\Delta 15 = G. 118$ Eridani.

Cord. GC. 4055.

 $\alpha = 3^h 36^m 10^s.9$, $\delta = -40^\circ 40' 34''.0$
7.1, yellow; 8.2, yellow.

1897.036	328.0	7.72
.077	326.7	7.78
.077	326.6	7.98
1897.064	327.1	7.83

No change in 60 years.

h 3589 = G. 126 Eridani.

Cord. GC. 4148.

 $\alpha = 3^h 40^m 34^s.1$, $\delta = -40^\circ 58' 20''.5$
7.1, yellow; 10.5, purple.

1897.041	348.3	5.00
.088	348.1	5.17
.088	347.9	5.37
1897.073	348.1	5.18

Unchanged.

h 3592 = G. 13 Reticuli.

Cord. GC. 4185.

 $\alpha = 3^h 42^m 0^s.9$, $\delta = -54^\circ 35' 21''.0$
6.3, yellow; 10.2, purple.

1897.011	11.0	5.00
.022	12.8	5.96
.030	13.2	5.74
1897.021	12.3	5.56

Motion very doubtful; colors extremely remarkable.

 $\Delta 16 = f$ Eridani.

Cord. GC. 4242.

 $\alpha = 3^h 44^m 54^s.3$, $\delta = -37^\circ 55' 31''.6$
4.3, yellow; 4.4, yellow.

1897.722	206.6	7.90
.722	206.8	7.71
1897.722	206.7	7.81

Very slight direct motion.

Harvard = G. 1 Doradus.

Cord. GC. 4395.

 $\alpha = 3^h 51^m 56^s.4$, $\delta = -52^\circ 58' 54''.2$
6, yellow; 12.5, bluish.

1897.022	268.3	23.01
.096	267.0	22.57
1897.059	267.6	22.79

No other measures.

h 3611. Cord. GC. 4409.

 $\alpha = 3^h 53^m 5^s.8$, $\delta = -40^\circ 12' 17''.1$

7.7, yellow; 8.2, bl. yellow.

1897.041	143.7	3.48
.096	142.7	4.15
.096	143.7	4.22
1897.078	143.4	3.95

Unchanged.

Cord. dpl. = β 1004 = G. 165 Erid.

Cord. GC. 4501.

 $\alpha = 3^h 58^m 12^s.1$, $\delta = -34^\circ 45' 36''.4$

7.2, or. yellow; 8.3, or. yellow.

1897.722	144.6	1.87
.722	143.9	1.68
1897.722	144.2	1.77

 Duplicity first noted at Cordoba (in U. A.); first measured by Burnham
1881 Nov. 2:
1881.85 154.1 1.79 2.3 n β

Slow retrograde motion.

Cord. dpl. Cord. GC. 4511.

 $\alpha = 3^h 58^m 26^s.4$, $\delta = -54^\circ 36' 11''.7$

8, yellow; 8.2, yellow.

1897.019	13.6	5.51
.096	11.9	5.36
.096	11.2	5.13
1897.070	12.3	5.33

1878.01 13.1 6.85 4 n Cordoba

No change.

Innes. Cord. GC. 4627.

 $\alpha = 4^h 4^m 26^s.0$, $\delta = -33^\circ 7' 20''.7$

8, yellow; 8.1, yellow.

1897.731	337.4	0.65
.731	337.4	0.58
1897.731	337.4	0.62

No other measures.

h 3641 = G. 26 Reticuli.

Cord. GC. 4820.

 $\alpha = 4^h 13^m 29^s.3$, $\delta = -62^\circ 26' 36''.1$

6.2, yellow; 12.3, bl. purple.

1897.022	264.8	7.24
.022	269.6	8.14
1897.022	267.2	7.69

Slow retrograde motion; probably orbital.

h 3642 = G. 207 Eridani.

Cord. GC. 4841-2.

 $\alpha = 4^h 15^m 16^s.8$, $\delta = -34^\circ 8' 46''.0$

7.1, yellow; 9.1, purple.

1897.758	142.8	6.30
.758	142.9	6.11
.788	144.0	6.25
.788	143.2	6.62
1897.773	143.2	6.32

Former observers make the angle about 160° ; can find no error in my work.

R 3 = G. 29 Reticuli.

Cord. GC. 4880.

 $\alpha = 4^h 16^m 33^s.1$, $\delta = -63^\circ 29' 54''.7$

7.6, yellow; 10.3, purple.

1897.025	3.3	4.41 bad seeing
.118	4.7	5.48
.118	4.1	5.68
1897.087	4.0	5.19

No change.

 β 744 = G. 214 Eridani.

Cord. GC. 4883.

 $\alpha = 4^h 17^m 22^s.1$, $\delta = -25^\circ 57' 47''.7$

6.3, yellow; 7.2, yellow.

1897.731	311.4	0.51
.731	312.9	0.54
1897.731	312.1	0.52

No material change.

Innes = G. 220 Eridani.

Cord. GC. 4957.

$$\alpha = 4^h 21^m 14.3, \delta = -34^\circ 58' 57.0$$

AB.

6, yellow; 9.2, bl. yellow.

$$1897.722 \quad 197.6 \quad 42.63$$

C, 10.2, bl. yellow.

BC.

$$1897.722 \quad 280.3 \quad 3.75$$

$$.722 \quad 280.8 \quad 3.59$$

$$1897.722 \quad 280.6 \quad 3.67$$

No other measures.

R 4 = G. 6 Doradus.

Cord. GC. 4985.

$$\alpha = 4^h 22^m 15.6, \delta = -57^\circ 17' 49.1$$

6.7, or. yellow; 7.1, or. yellow.

$$1897.022 \quad 235.5 \quad 5.87$$

$$.036 \quad 236.5 \quad 4.99$$

$$1897.029 \quad 236.0 \quad 5.43$$

Slow direct motion.

 β 311 = G. 222 Eridani.

Cord. GC. 4982.

$$\alpha = 4^h 22^m 44.6, \delta = -24^\circ 18' 20.6$$

6, yellow; 6.6, yellow.

$$1897.671 \quad 333.2 \quad 0.71$$

$$.671 \quad 333.2 \quad 0.69$$

$$1897.671 \quad 333.2 \quad 0.70$$

No material change.

h 3650 = G. 2 Caeli.

Cord. GC. 4997.

$$\alpha = 4^h 23^m 15.5, \delta = -40^\circ 45' 14.7$$

6.6, yellow; 9.5, bl. yellow.

$$1897.041 \quad 181.7 \quad 3.34$$

$$.096 \quad 180.9 \quad 3.53$$

$$.096 \quad 181.4 \quad 3.49$$

$$1897.078 \quad 181.3 \quad 3.45$$

Fixed.

 β 184 = G. 225 Eridani.

Cord. GC. 5004.

$$\alpha = 4^h 23^m 36.6, \delta = -21^\circ 42' 29.9$$

7.4, yellow; 7.6, yellow.

$$1897.760 \quad 241.1 \quad 1.26$$

$$.760 \quad 239.7 \quad 1.34$$

$$1897.760 \quad 240.4 \quad 1.30$$

Retrograde motion of 30° since 1874.

h 3683 = G. 11 Doradus.

Cord. GC. 5325.

$$\alpha = 4^h 38^m 39.0, \delta = -59^\circ 8' 29.9$$

7.8, yellow; 8, yellow.

$$1897.036 \quad 265.1 \quad 0.87 \text{ est. } 0.9$$

$$.068 \quad 267.0 \quad 0.85$$

$$.071 \quad 263.1 \quad 1.03$$

$$1897.058 \quad 265.1 \quad 0.92$$

$$1897.068 \quad 257.7 \quad - \quad \text{Cogshall}$$

$$.071 \quad 261.3 \quad 1.00 \quad \text{>}$$

$$1897.069 \quad 259.5 \quad 1.00 \quad \text{Cogshall}$$

Remarkable system revolving in about 44 years. See Monthly Notices, March 1897.

Cord. dpl. Cord. GC. 5330.

$$\alpha = 4^h 39^m 4.1, \delta = -48^\circ 0' 50.1$$

7.8, yellow; 11.3, bl. purple.

$$1897.044 \quad [250 \pm] \quad [3.3 \pm] \text{ micr. wires}$$

$$.096 \quad 225.8 \quad 3.86 \quad \text{[broken]}$$

$$.096 \quad 226.8 \quad 3.88$$

$$1897.079 \quad 226.3 \quad 3.86$$

Physical system.

Cord. dpl. Cord. ZC. $4^h 14.13$.

$$\alpha = 4^h 42^m 17.3, \delta = -51^\circ 40' 5.0$$

7.9, yellow; 9.3, purplish.

$$1897.030 \quad 198.1 \quad 11.07 \quad \text{Cogshall}$$

$$.099 \quad 198.1 \quad 11.52 \quad \text{See}$$

$$.099 \quad 195.0 \quad 10.94 \quad \text{>}$$

$$1897.076 \quad 197.1 \quad 11.18 \quad \text{C 1; S 2}$$

No other measures.

h 3697. Cord. GC. 5510.

$$\alpha = 4^h 47^m 1.2, \delta = -41^\circ 29' 38.2$$

7.3, yellow; 11.5, bl. purple.

$$1897.046 \quad 280.5 \quad 15.27$$

$$.120 \quad 281.5 \quad 14.04$$

$$.140 \quad 280.6 \quad 15.50 \text{ hazy}$$

$$1897.102 \quad 280.9 \quad 14.94$$

Unchanged.

h 3715. Cord. GC. 5743.

$$\alpha = 4^h 56^m 53.2, \delta = -49^\circ 36' 24.2$$

7.2, yellow; 9.8, bl. yellow.

$$1897.011 \quad 113.4 \quad 9.12$$

$$.019 \quad - \quad 9.77$$

$$.046 \quad 114.4 \quad 9.95$$

$$1897.025 \quad 113.9 \quad 9.61$$

Unchanged.

Jacob 47 = Syd₁ 56 = β 750= γ Caeli. Cord. GC. 5807.

$$\alpha = 5^h 0^m 48.3, \delta = -35^\circ 37' 11.2$$

5.7, yellow; 10.5, bl. purple.

$$1897.036 \quad 315.5 \quad 3.04$$

$$.123 \quad 311.5 \quad 3.20$$

$$.123 \quad 313.3 \quad 3.28$$

$$1897.094 \quad 313.4 \quad 3.17$$

Discovered by Jacob, 1847 Febr. 18.
No change in 50 years.

h 3728 = G. 2 Columbae.

Cord. GC. 5922.

$$\alpha = 5^h 5^m 17.7, \delta = -41^\circ 21' 4.9$$

7.3, yellow; 10, bl. purple.

$$1897.036 \quad 260.9 \quad 10.16$$

$$.046 \quad 261.9 \quad 9.90$$

$$.141 \quad 261.6 \quad 9.94$$

$$.159 \quad 260.0 \quad 10.41$$

$$1897.095 \quad 261.1 \quad 10.10$$

Fixed since 1836.

h 3752 = G. 41 Lupi.

Cord. GC. 6177-78.

$$\alpha = 5^h 17^m 40.0, \delta = -24^\circ 52' 12.4$$

5.7, yellow; 8, purple.

$$1897.799 \quad 101.9 \quad 3.37$$

$$.799 \quad 102.3 \quad 3.25$$

$$1897.799 \quad 102.1 \quad 3.31$$

No change in 60 years.

 β 320 = β Leporis.

Cord. GC. 6344.

$$\alpha = 5^h 23^m 57.6, \delta = -20^\circ 50' 20.4$$

2.9, yellow; 10.4, purple.

$$1897.758 \quad 280.1 \quad 3.33$$

$$.758 \quad 279.3 \quad 3.41$$

$$.799 \quad 297.4 \quad 2.73$$

$$.799 \quad 297.3 \quad 2.73$$

$$1897.778 \quad 288.5 \quad 3.05$$

No change.

 Δ 22 = G. 23 Columbae.

Cord. GC. 6438.

$$\alpha = 5^h 28^m 3.7, \delta = -42^\circ 22' 29.5$$

7.4, yellow; 8.1, yellow.

$$1897.036 \quad 169.7 \quad [8.77] \text{ bad seeing}$$

$$.071 \quad 168.6 \quad 7.35$$

$$.148 \quad 169.0 \quad 7.67$$

$$.159 \quad 169.7 \quad 7.39$$

$$1897.101 \quad 169.2 \quad 7.47$$

No change.

h 3778.

$\alpha = 5^h 31^m 40^s \pm$, $\delta = -54^\circ 57' 21'' \pm$
9.9, bl. yellow; 12, bl. yellow.

1897.014	103.4	11.39
.036	103.6	[9.29]
.096	103.2	11.47
.097	103.4	11.57
1897.061	103.4	11.48

Unchanged.

Lal. dpl. = Harvard 78.

AO₂ 4145.

$\alpha = 5^h 33^m 58^s.6$, $\delta = -20^\circ 40' 50''.9$

AB.

6, yellow; 7.8, bl. yellow.

1897.799	123.4	11.07
.799	123.3	11.26
1897.799	123.3	11.17

C 11.5, bl. yellow.

AC (Winlock).

1897.799 82.2 32.36

Duplicity noticed by Lalande. No change.

Ho. 336. AO₂ 4269.

$\alpha = 5^h 40^m 36^s.1$, $\delta = -21^\circ 42' 2''.8$
6, yellow; 11.2, purple.

1897.804	237.5	19.76
.804	237.4	19.74
1897.804	237.4	19.75

Cape dpl. Cord. GC. 7068.

$\alpha = 5^h 53^m 58^s.7$, $\delta = -41^\circ 46' 2''.0$
8.4, yellow; 8.8, yellow.

1897.148	210.5	1.81
.148	210.0	1.74
.159	207.6	1.90
1897.152	209.4	1.82

h 3834 = G. 2 Puppis.

Cord. GC. 7279.

$\alpha = 6^h 1^m 47^s.8$, $\delta = -45^\circ 4' 47''.7$
6.2, yellow; 10.2, purple.

1897.008	222.8	[2.34]
.074	224.9	3.45
.082	223.5	3.95
.123	225.8	4.02
.142	225.2	3.80
.192	226.3	3.64
1897.103	224.7	3.75

Slow retrograde motion of 20° in 60 years.

 Δ 23 = G. 3 Puppis.

Cord. GC. 7297.

$\alpha = 6^h 2^m 11^s.7$, $\delta = -48^\circ 26' 56''.5$
7.1, yellow; 9, bl. yellow.

1897.170	31.9	1.82
.170	31.9	1.80
1897.170	31.9	1.81

Direct motion of $61''$ since 1826.

Cord. dpl. Cord. GC. 7459.

$\alpha = 6^h 8^m 24^s.0$, $\delta = -40^\circ 23' 23''.6$
7.8, yellow; 8.5, purplish.

1897.008	[44.8]	4.02
.074	41.0	5.38
.074	40.8	5.04
.096	40.4	4.81
1897.063	40.7	4.81

h 3857 = G. 93 Columbae.

Cord. GC. 7801.

$\alpha = 6^h 20^m 32^s.9$, $\delta = -36^\circ 39' 19''.9$
5.8, yellow; 11.7, bl. purple.

1896.843	256.6	12.04
1897.145	254.4	13.26
.145	255.0	13.13
1897.045	255.3	12.81

h 3858. Cord. GC. 7842.

$\alpha = 6^h 22^m 3^s.7$, $\delta = -34^\circ 58' 51''.7$
7.4, yellow; 7.8, bl. yellow.

1897.046	317.5	3.88
.074	316.4	3.95
.074	315.3	3.75
1897.065	316.4	3.86

h 3860. Cord. GC. 7855.

$\alpha = 6^h 22^m 34^s.5$, $\delta = -40^\circ 54' 58''.8$
8.3, yellow; 9.6, bl. yellow.

1897.164	224.3	8.66
.164	224.4	8.70
1897.164	224.4	8.68

Harvard = G. 36 Canis Majoris.

Cord. GC. 7914.

$\alpha = 6^h 24^m 56^s.2$, $\delta = -32^\circ 18' 23''.2$
7.1, yellow; 10.7, bl. purple.

1897.082	45.2	0.96
.082	44.5	0.96
.134	46.5	0.87
1897.100	45.4	0.93

1894.364 48.0 1.4 2 n Bailly.

 Δ 30 = Syd₁ 65 = G. 16 Puppis.

Cord. GC. 7991.

$\alpha = 6^h 27^m 21^s.8$, $\delta = -50^\circ 10' 5''.5$
AB = Syd₁ 65.

7.4, yellow; 7.4, yellow.

1897.019	80.±	0.56
.074	100.3	0.84
.096	89.0	0.66
1897.063	89.8	0.69

C 9.2, bl. purple. $\frac{1}{2}$ AB, C = Δ 30.

1897.019	315.8	13.08
.074	315.5	13.61
.096	315.5	13.02

1897.063	315.6	13.24
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Very little motion in either pair.

Innes 4 = G. 100 Columbae.

Cord. GC. 7987.

$\alpha = 6^h 27^m 26^s.4$, $\delta = -40^\circ 22' 39''.7$
7.5, yellow; 8.4, yellow.

1897.164 303.1 0.85 See

1897.164	302.3	0.69	Cogshall
.165	301.0	0.82	'
1897.164	301.7	0.76	Cogshall

h 3869 = G. 47 Canis Majoris.

$\alpha = 6^h 28^m 54^s.5$, $\delta = -31^\circ 57' 21''.8$
5.4, yellow; 9.5, purple.

1897.772	241.4	25.04
.772	241.6	25.54
.788	241.1	25.20
.788	241.3	25.24

1897.780	241.4	25.25
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No other measures since Herschel.

 β 754 = G. 107 Columbae.

Cord. GC. 8077.

$\alpha = 6^h 31^m 5^s.3$, $\delta = -33^\circ 55' 52''.0$
6.2, yellow; 7.5, yellow.

1897.772	16.5	0.88
.772	16.0	0.96
1897.772	16.2	0.92

 β 725 = G. 108 Columbae.

Cord. GC. 8093.

$\alpha = 6^h 31^m 55^s.7$, $\delta = -36^\circ 41' 57''.3$
AB.

6.2, yellow; 9.8, bl. yellow.

1897.167	260.2	1.13
.167	261.0	1.06
1897.167	260.6	1.00

C 12.9, bluish.

 $\frac{1}{2}$ AB, C.

1897.167	302.2	22.06
.167	301.4	21.60

1897.167	301.8	21.83
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Change doubtful.

Sydney. Cord. GC. 8096.

$\alpha = 6^h 32^m 0^s.9$, $\delta = -38^\circ 43' 39''.1$
8.4, yellow; 8.5, yellow.

1897.145	243.3	0.84
.145	243.0	0.83
.159	238.5	1.48

1897.150	241.6	1.05
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Unchanged.

Hh 240 = G. 55 Canis Majoris.

Cord. GC. 8109-7.

$\alpha = 6^h 32^m 28^s.8$, $\delta = -22^\circ 31' 51''.8$
6, yellow; 9.8, purple.

1897.804	336.7	9.61
.804	336.4	9.37

1897.804	336.5	9.49
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No change in 115 years.

h 5443 = G. 23 Puppis.

Cord. GC. 8282.

$\alpha = 6^h 37^m 58^s.8$, $\delta = -40^\circ 15' 16''.2$
6.9, yellow; 11.7, bl. yellow.

1897.184	108.2	14.80	Cogshall
.211	107.1	15.32	"

1897.197	107.6	15.06	Cogshall
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No other measures since Herschel's.

 Δ 32 = G. 26 Puppis.

Cord. GC. 8304.

$\alpha = 6^h 38^m 53^s.4$, $\delta = -38^\circ 18' 2''.6$
6.2, yellow; 8.8, bl. purple.

1896.843	277.5	7.68
1897.145	277.2	8.22

.146	277.0	8.04
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.170	275.4	7.75
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.170	275.9	7.91
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.181	277.1	8.20
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1897.109	277.0	7.97
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No change in 60 years.

Innes = G. 70 Canis Majoris.

Cord. GC. 8363.

$\alpha = 6^h 41^m 12^s.9$, $\delta = -30^\circ 28' 56''.2$
5.8, yellow; 10.7, bl. purple.

1897.772	204.2	5.30
.772	205.4	5.50

1897.772	204.8	5.40
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No other measures.

h = 3891 = G. 74 Canis Majoris.

Cord. GC. 8382-1.

$\alpha = 6^h 41^m 42^s.5$, $\delta = -30^\circ 50' 37''.2$
6, yellow; 9, purple.

1897.772	203.7	5.28
.772	203.7	5.70

1897.772	203.7	5.49
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The angles given by previous observers are about 220° ; can find no error.

 β 325. Cord. GC. 8567.

$\alpha = 6^h 47^m 47^s.3$, $\delta = -26^\circ 27' 41''.6$
7.5, yellow; 9.6, purple.

1897.843	36.9	1.80
.843	37.5	1.82

1897.843	37.2	1.81
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Slow direct motion.

h 3900. Cord. GC. 8648.

$\alpha = 6^h 50^m 36^s.0$, $\delta = -34^\circ 5' 48''.5$
7.8, yellow; 10, bl. yellow.

1897.145	281.5	2.39
.145	281.6	2.39
.159	283.8	2.59

1897.150	282.3	2.46
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Fixed.

Hh 254 = π Canis Majoris.

Cord. GC. 8658.

$\alpha = 6^h 51^m 17^s.2$, $\delta = -20^\circ 0' 32''.9$
4.8, yellow; 10, purple.

1897.788	1.2	11.82
.788	1.5	11.78

1897.788	1.3	11.80
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No change.

Freeman = ϵ Canis Majoris.

Cord. GC. 8752.

$\alpha = 6^h 54^m 41^s.7$, $\delta = -28^\circ 50' 8''.9$
2.5, yellow; 10.8 purple.

1896.843	160.8	7.58
1897.145	161.5	8.04

.145	160.5	7.94
1897.045	160.9	7.85

No change since 1850.

Harvard 94 = β 572

= G. 112 Canis Majoris.

Cord. GC. 8794.

$\alpha = 6^h 56^m 16^s.2$, $\delta = -20^\circ 29' 59''.5$
6, yellow; 10.7, purple.

1897.804	143.6	5.83
.804	143.5	6.02

1897.804	143.5	5.92
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Fixed.

Innes. Cord. ZC. 6^h2870.

$\alpha = 6^h 56^m 42^s.3$, $\delta = -25^\circ 30' 9''.6$
6.5, yellow; 9.8, purple.

1897.843	144.6	3.33
.843	144.3	3.34

1897.843	144.4	3.34
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No other measures.

h 3914. Cord. GC. 8846.

$\alpha = 6^h 57^m 57^s.4$, $\delta = -23^\circ 21' 14''.9$
7.5, yellow; 10.8, purple.

1897.760	296.4	11.31
.760	296.6	11.34

1897.760	296.5	11.33
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Retrograde motion; no other measures since Herschel's.

h 3928 = G. 62 Puppis.

Cord. GC. 8961.

$\alpha = 7^h 1^m 54^s.4$, $\delta = -34^\circ 37' 33''.8$
6.2, yellow; 8.8, bl. yellow.

1897.200	152.7	3.77
.200	154.5	— clouds

.211	156.3	4.43
.211	155.8	4.40

1897.205	154.8	4.20
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Fixed.

Cord. dpl. = β 757 = G. 69 Puppis.

Cord. GC. 9148.

$\alpha = 7^h 8^m 52^s.4$, $\delta = -36^\circ 22' 31''.0$
6.3, yellow; 11.8, bl. purple.

1897.195	73.0	2.79
.211	67.4	3.19

.211	67.1	3.20
1897.206	69.2	3.06

No change.

Innes. Cord. GC. 9329.

$\alpha = 7^h 14^m 37^s.7$, $\delta = -46^\circ 49' 5''.7$
7.4, yellow; 8.2, yellow.

1897.088	214.6	0.59
.131	213.2	0.72

.142	212.4	0.73
.159	210.9	0.72

.164	211.8	0.68
1897.137	212.6	0.69

Jacob 80. Cord. GC. 9337-6.

$\alpha = 7^h 14^m 59^s.3$, $\delta = -36^\circ 35' 7''.6$
8.5, yellow; 9, yellow.

1897.145	208.1	3.05	See
.145	207.5	3.13	"

1897.145	207.8	3.09	See
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1897.082	213°5	2°81	Cogshall
.134	207.0	2.70	
1897.108	210.2	2.75	Cogshall

R 6 = G. 38 Carinae.

Cord. GC. 9420.

$\alpha = 7^h 17^m 57^s.0$, $\delta = -52^\circ 7' 41''.7$
6, or. yellow; 7, or. yellow.

1897.019	19.6	9.10
.022	21.0	9.65

1897.020	20.3	9.37
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No change.

Gummere. AO ϵ_2 6772.

$\alpha = 7^h 20^m 42^s.9$, $\delta = -20^\circ 57' 45''.9$
8.1, yellow; 8.7, yellow.

1897.824	347.1	4.72
.824	346.5	4.76

1897.824	346.8	4.74
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h 3966 = G. 90 Puppis.

Cord. GC. 9523.

$\alpha = 7^h 21^m 15^s.1$, $\delta = -37^\circ 5' 42''.1$
7, yellow; 7, yellow.

1897.184	142.7	7.05
.211	140.9	6.86

1897.197	141.8	6.96
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Cord. dpl. Cord. GC. 9516-15.

$\alpha = 7^h 21^m 15^s.8$, $\delta = -27^\circ 59' 20''.1$
8.2, yellow; 8.6, yellow.

1897.829	290.6	0.66
.829	290.2	0.62

1897.829	290.4	0.64
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Nice system just well separated. In Cord. GC. the places of the components differ 0°54; 8°9. Unless there is some great error, which I cannot detect, this system is in rapid motion. It is now altogether beyond the reach of any small telescope.

Δ 51 = σ Puppis.

Cord. GC. 9652.

$\alpha = 7^h 26^m 3^s.6$, $\delta = -43^\circ 5' 59''.6$
3.6, or. red; 10.8, purplish.

1897.151	72.7	22.27
.151	73.2	22.35
.159	73.9	22.70

1897.154	73.2	22.44
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Relatively fixed.

h 3979. Cord. ZC. 7^h2062.

$\alpha = 7^h 30^m 3^s.0$, $\delta = -36^\circ 12' 52''.4$

9.1, yellow; 9.3, yellow.

1897.142	249°6	8°84
.142	249.7	8.80
.159	248.9	9.16

1897.148	249.4	8.93
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Unchanged.

Hh 269 = π Puppis.

Cord. GC. 9744-5.

$\alpha = 7^h 30^m 5^s.2$, $\delta = -23^\circ 15' 17''.6$

6.2, yellow; 6.3, yellow.

1897.824	108.5	9.39
.824	108.7	9.36

1897.824	108.6	9.37
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Very slight direct motion.

Harvard = G. 185 Puppis.

Cord. GC. 10188.

$\alpha = 7^h 43^m 52^s.8$, $\delta = -38^\circ 15' 49''.1$

5.9, yellow; 13.3, bluish.

1897.230	86.1	11.01
.230	85.9	10.98

1897.230	86.0	11.00
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No other measures. Also found by Mr. Innes.

Cord. dpl. Cord. GC. 10312.

$\alpha = 7^h 47^m 21^s.0$, $\delta = -54^\circ 49' 31''.1$

7.6, yellow; 9.8, purple.

1897.022	56.3	3.98
.088	54.5	3.93
.088	54.4	3.63

1897.066	55.1	3.85
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1876.18 51°9 4°85 3n Cordoba

From $\Delta\alpha$ and $\Delta\delta$.

Howe 8 = G. 212 Puppis.

Cord. GC. 10335.

$\alpha = 7^h 48^m 32^s.1$, $\delta = -34^\circ 27' 19''.3$

5.8, yellow; 10.8, purple.

1896.843	289.6	3.50
1897.134	289.4	2.64
.145	287.1	3.21

1897.041	288.7	3.12
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No material change.

Cord. dpl. Cord. GC. 10452.

$\alpha = 7^h 52^m 23^s.3$, $\delta = -43^\circ 30' 52''.5$

7.3, or. yellow; 12.3, bl. purple.

1897.134	147°6	5°46
.134	147.5	5.39
.162	143.9	5.34

1897.144	146.3	5.40
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No other measures.

Innes 26 = G. 229 Puppis.

Cord. GC. 10510.

$\alpha = 7^h 54^m 21^s.7$, $\delta = -47^\circ 37' 16''.0$

7.8, yellow; 8, yellow.

1897.164	26.3	0.61
.164	27.2	0.75

1897.164	26.8	0.68
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Arg. dpl. = β 333.

AO ϵ_2 7818-19.

$\alpha = 7^h 56^m 58^s.9$, $\delta = -22^\circ 3' 36''.8$

7, yellow; 8.8, purple.

1897.829	45.3	2.07
.829	46.4	1.98

1897.829	45.8	2.02
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Burnham misidentifies this as AO ϵ_2 7866; no change since 1877.

β 202. Cord. DM. $-26^\circ 53' 86''$.

$\alpha = 7^h 57^m 40^s.1$, $\delta = -26^\circ 54' 11''.3$

AB.

6, yellow; 11.5, purple.

1897.856	160.8	7.39
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C 13.6, bluish.

AC.

1897.856	77.1	19.37
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D 12, bluish.

AD.

1897.856	239.2	29.43
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The wider components have not been seen before.

h 4034.

$\alpha = 7^h 58^m 42^s \pm$, $\delta = -42^\circ 29' 34'' \pm$

7.5, yellow; 8, yellow.

1897.162	296.3	6.39
.162	296.6	6.31
.211	296.2	6.53

1897.179	296.4	6.41
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No change.

Innes 8 = G. 245 Puppis.

Cord. GC. 10666.

$$\alpha = 7^h 59^m 13^s.6, \delta = -44^\circ 23' 13''.6$$

6.4, yellow; 11.8, bluish.

1897.197	312.9	2.08
.197	310.4	1.98
1897.197	311.6	2.03

Arg. dpl. = β 334.AO₂ 8050-51.

$$\alpha = 8^h 3^m 46^s.3, \delta = -21^\circ 46' 25''.2$$

7.1, yellow; 8.1, yellow.

1897.829	352.6	2.85
.829	352.4	2.94
1897.829	352.5	2.90

Unchanged.

 Δ 63 = G. 264 Puppis.

Cord. GC. 10859.

$$\alpha = 8^h 6^m 24^s.3, \delta = -42^\circ 20' 44''.1$$

6.7, yellow; 7.9, bl. yellow.

1897.145	84.3	5.45
.145	83.1	5.53
.162	80.5	5.84
.162	81.0	5.79

1897.154	82.2	5.65
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1897.137 81.2 5.50 Cogshall.

h 4073 = G. 288 Puppis.

Cord. GC. 11106.

$$\alpha = 8^h 14^m 29^s.6, \delta = -37^\circ 3' 45''.4$$

6.6, yellow; 7.6, yellow.

1897.230	179.8	2.42
.230	178.7	2.27
1897.230	179.2	2.34

Possibly an increase in angle and distance.

1835.977 170°± 1"± Herschel.

h 4079? Cord. GC. 11133.

$$\alpha = 8^h 15^m 19^s.4, \delta = -55^\circ 27' 49''.3$$

7.6, or. yellow; 12.7, purplish.

1897.022	187.7	6.42
.088	186.7	5.75
.088	187.0	5.85
1897.066	187.1	6.01

h 4080. Cord. ZC. 8^h1282.

$$\alpha = 8^h 16^m 12^s.8, \delta = -46^\circ 57' 24''.5$$

8.4, yellow; 9, yellow.

1897.167	217.4	5.93
.167	219.8	5.81
1897.167	218.6	5.87

Fixed.

h 4087. Cord. GC. 11225.

$$\alpha = 8^h 18^m 35^s.4, \delta = -40^\circ 40' 20''.6$$

AB.

7, yellow; 7.8, yellow.

1897.181	303.8	1.66
.181	303.7	1.59
1897.181	303.7	1.62

Retrograde motion of 25° since 1837.

 $\frac{1}{2}$ AB, C.

C 12.4, bl. purple.

1897.181	344.1	14.53
.181	343.9	14.61
1897.181	344.0	14.57

 Δ 70 = G. 34 Velorum.

Cord. GC. 11429.

$$\alpha = 8^h 26^m 5^s.6, \delta = -44^\circ 23' 25''.8$$

6.2, yellow; 8.5, purple.

1897.137	348.1	4.83
.162	350.0	4.72
1897.150	349.0	4.77

1897.137	347.0	4.82	Cogshall
.162	349.3	4.48	"
1897.150	348.2	4.65	Cogshall

Sellors 8 = G. 39 Velorum.

Cord. GC. 11522.

$$\alpha = 8^h 29^m 18^s.4, \delta = -52^\circ 52' 20''.8$$

7.6, or. yellow; 7.8, or. yellow.

1897.025	293.5	0.77
.088	298.4	0.47
.088	299.8	0.52
1897.067	297.2	0.59

 β 208 = G. 19 Pyxidis.

Cord. GC. 11669.

$$\alpha = 8^h 34^m 45^s.7, \delta = -22^\circ 19' 26''.9$$

6.2, or. yellow; 6.4, or. yellow.

1897.835	74.5	0.42
.835	75.0	0.36
1897.835	74.7	0.39

Direct motion of 45° since 1874.

1874.192 30.4 1.4± in β

The distance has much diminished, and the motion is now quite rapid. This important binary deserves annual attention.

Cord. dpl. = G. 50 Velorum.

Cord. GC. 11727.

$$\alpha = 8^h 36^m 39^s.2, \delta = -39^\circ 54' 31''.1$$

5.9, yellow; 10.2, purple.

1897.017	[60°±]	[5"±]
.074	58.7	4.23
.151	61.4	3.72
.162	61.6	3.96

1897.101	60.4	3.97
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1894.370 61.2 3.8 2n Baily.

Duplicity noted in U. A., afterwards found by Baily, and by Innes.

h 4126 = G. 54 Velorum.

Cord. GC. 11751.

$$\alpha = 8^h 37^m 6^s.7, \delta = -52^\circ 42' 1''.3$$

5.6, yellow; 11, bl. purple.

1897.011	30.4	[18.46] horrible
.088	31.2	16.67 [seeing]
.088	31.1	16.64

1897.062	30.9	16.66
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Companion apparently dpl. in 120°, 0.28.

h 4130 = G. 98 Carinae.

Cord. GC. 11785.

$$\alpha = 8^h 38^m 16^s.9, \delta = -57^\circ 11' 20''.0$$

7, yellow; 9.5, purple.

1897.025	231.7	3.49
.074	226.5	3.36
.074	223.3	3.59
1897.058	227.2	3.48

Fixed. This is also h 4142.

Innes = δ Velorum.

Cord. GC. 11887.

$$\alpha = 8^h 41^m 56^s.5, \delta = -54^\circ 20' 29''.4$$

2.8, yellow; 11, purplish.

1897.159 178.7 3.01 blurred

1894.367 177.4 2.15 2n Baily.

Probably no change; this object was independently discovered by the Harvard observers at Arequipa.

R 9 = G. 102 Carinae.

Cord. GC. 11911.

$$\alpha = 8^h 42^m 43^s.6, \delta = -58^\circ 21' 33''.1$$

7.6, or. yellow; 7.6, or. yellow.

1897.019	111.0	4.07
.028	108.4	3.86
.074	112.3	3.81

1897.040	110.6	3.91
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No change.

Jacob. Cord. GC. 11907.

 $\alpha = 8^h 42^m 57^s.8$, $\delta = -42^\circ 11' 58''.7$
7.2, yellow; 11.6, bl. yellow.

1897.074	315.9	1.20	
.181	311.2	2.13	
.181	308.9	1.93	
1897.145	312.0	1.75	
1897.041	311.4	2.04	Cogshall
.074	323.1	2.13	"
1897.058	317.2	2.08	Cogshall

No other measures.

Jacob 110. Cord. GC. 11934.

 $\alpha = 8^h 43^m 41^s.8$, $\delta = -42^\circ 14' 1''.0$
7.8, yellow; 7.8, yellow.

1897.074	85.3	4.84	See
1897.041	88.6	5.03	Cogshall
.074	87.7	5.28	"
1897.058	88.1	5.15	Cogshall

h 4144 = G. 37 Pyxidis.

Cord. GC. 12014.

 $\alpha = 8^h 46^m 27^s.5$, $\delta = -35^\circ 33' 25''.7$
8, yellow; 12, purple.

1897.200	319.3	1.99	
.200	313.9	2.17	
1897.200	316.6	2.08	

Fixed.

Harvard-Innes = f Velorum.

Cord. GC. 12035.

 $\alpha = 8^h 47^m 10^s.0$, $\delta = -46^\circ 9' 17''.4$
5.1, yellow; 11.8, purple.

1897.017	—	—	magnificent
.028	81.8	3.16	[system]
.096	82.7	3.09	
.096	84.1	3.19	
.151	83.1	3.23	
.167	86.1	2.85	
1897.103	83.6	3.10	

1894.373 81.2 3.7 2n Bailly

This object was found by Innes and the writer, before any announcement had been made of its discovery in 1894, at the Harvard station, Arequipa.

h 4148. Cord. GC. 12055.

 $\alpha = 8^h 47^m 55^s.6$, $\delta = -53^\circ 44' 17''.6$
8, yellow; 12, bl. purple.

1897.022	109.8	5.40	Cogshall
.088	110.7	5.39	"
1897.055	110.2	5.39	Cogshall
1897.088	111.0	5.72	See

No certain change.

Cord. dpl. = G. 83 Velorum.

Cord. GC. 12102.

 $\alpha = 8^h 49^m 39^s.0$, $\delta = -51^\circ 45' 3''.5$
7, yellow; 8.8, purple.

1897.022	83.0	2.94	Cogshall
1897.137	80.6	2.92	See
.137	81.1	2.92	"
1897.137	80.8	2.92	See

h 4156 = c Carinae.

Cord. GC. 12175.

 $\alpha = 8^h 52^m 46^s.9$, $\delta = -60^\circ 15' 46''.7$
5.7, or. yellow; 11.8, bluish.

1897.019	321.2	27.52	
.022	321.3	30.40	
1897.020	321.3	28.96	

Distances inconsistent; do not know the cause. No change in 60 years.

Syd₁ 87 = H Velorum.

Cord. GC. 12180.

 $\alpha = 8^h 53^m 18^s.2$, $\delta = -52^\circ 20' 21''.4$
4.9, yellow; 10.3, bl. purple.

1897.022	340.3	2.96	
.096	339.2	2.97	
.096	339.2	3.14	
1897.072	339.6	3.02	

Probably unchanged.

h 4165 = G. 94 Velorum.

Cord. GC. 12330.

 $\alpha = 8^h 58^m 38^s.4$, $\delta = -51^\circ 47' 42''.4$
7.1, yellow; 7.7, yellow.

1897.022	106.6	1.32	
.096	106.4	0.68	
.151	96.8	1.05	
.162	99.5	0.99	
1897.108	102.1	1.01	

1837.265 87.9 1.33 2n Herschel

Slow direct motion.

h 4169. Cord. GC. 12354.

 $\alpha = 8^h 59^m 49^s.2$, $\delta = -37^\circ 47' 19''.4$
8.5, yellow; 10, yellow.

1897.200 289.1 9.94 Cogshall

h 4177. Cord. GC. 12389.

 $\alpha = 9^h 1^m 43^s.0$, $\delta = -55^\circ 56' 31''.4$
AB.

6.9, yellow; 9, bl. yellow

1897.120	261.5	13.92	
.120	261.4	13.67	
.162	265.2	14.42	
1897.134	262.7	14.00	

AC.

C 9.5, purplish.

1897.162 295.6 36.40

1835.153 278.8 15" 1n Herschel

h 4188 = G. 106 Velorum.

Cord. GC. 12542.

 $\alpha = 9^h 8^m 48^s.3$, $\delta = -43^\circ 12' 7''.5$
6.4, yellow; 7.4, yellow.

1897.028	283.3	2.54	
.120	281.5	3.36	
.120	282.3	3.15	
1897.089	282.4	3.02	

1897.041 282.7 2.78 Cogshall

h 4191 = z Velorum.

Cord. GC. 12593.

 $\alpha = 9^h 10^m 40^s.7$, $\delta = -42^\circ 48' 47''.6$
6.2, yellow; 11.2, purple.

1897.025	13.0	5.58	
.164	14.6	5.57	
.192	11.2	5.58	
1897.127	12.9	5.58	

1897.041 9.4 5.67 Cogshall

No other measures since Herschel's.

Innes = G. 116 Velorum.

Cord. GC. 12618.

 $\alpha = 9^h 11^m 37^s.4$, $\delta = -45^\circ 8' 20''.0$
6.2, yellow; 7.6, yellow.

1897.142	274.0	0.88	
.142	275.2	0.78	
.184	265.5	0.59	
1897.156	271.6	0.75	

Jacob 220 = G. 66 Pyxidis.

Cord. GC. 12857.

 $\alpha = 9^h 22^m 23^s.4$, $\delta = -28^\circ 21' 14''.4$
7.9, yellow; 7.9, yellow.

1897.856	65.3	0.44	
.856	65.8	0.40	
1897.856	65.4	0.42	

No change since 1858.

h 4215. Cord. ZC. 9^h1930. $\alpha = 9^h 24^m 55^s.4$, $\delta = -49^\circ 3' 0''.6$

8, yellowish; 8.2, yellowish.

1897.120 257.9 10.13 See

1897.019	259.5	[8.18]	Cogshall
.120	258.4	10.88	»

1897.070	259.0	10.88	Cogshall
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No change.

Copeland 1 = ψ Velorum.

Cord. GC. 12989.

 $\alpha = 9^h 26^m 46^s.1$, $\delta = -40^\circ 1' 45''.4$

5, yellow; 5.1, yellow.

1897.082	260.±	0.60±
.085	258.2	0.51
.120	250.7	0.39
.159	254.8	0.47

1897.111	255.9	0.49
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1897.085	256.9	0.81	Cogshall
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Discovered by Copeland in 1883:

1883.271 45°± 0.8± in Copeland

No other measures. Probably in motion, but the components are so nearly equal that the angles may be reversed. This fine system deserves regular attention.

h 4220 = G. 145 Velorum.

Cord. GC. 13077.

 $\alpha = 9^h 30^m 9^s.5$, $\delta = -48^\circ 33' 36''.3$

6.3, yellow; 7, yellow.

1897.025	206.2	1.54
.082	205.0±	2.40±
.120	203.0	2.74
.120	201.7	2.98

1897.087	204.0	2.41
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Unchanged.

Cape dpl. = Syd₁ 123.

Cord. GC. 13082.

 $\alpha = 9^h 30^m 18^s.0$, $\delta = -57^\circ 31' 7''.4$

7.3, yellow; 7.4, yellow.

1897.019	24.7	1.70
.120	27.3	1.66
1897.070	26.0	1.68

Jacob 121 = Syd₁ 125.

Cord. GC. 13135.

 $\alpha = 9^h 32^m 47^s.8$, $\delta = -48^\circ 18' 7''.0$

6.5, yellow; 10.5, purple.

1897.120	165.0	3.55
.192	166.4	3.04
1897.156	165.7	3.29

1897.025	170.5	2.67	Cogshall
.120	165.7	3.24	»

1897.072	168.1	2.95	Cogshall
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1846.25 201.5 2.70 2n Jacob

Retrograde motion of 35° in 50 years.

h 4245 = 156 Velorum.

Cord. GC. 13323.

 $\alpha = 9^h 42^m 18^s.4$, $\delta = -45^\circ 27' 20''.9$

7, yellow; 11, bl. purple.

1897.142	214.9	9.49
.142	215.3	9.69
1897.142	215.1	9.59

No change.

 Δ 81 = G. 166 Velorum.

Cord. GC. 13518.

 $\alpha = 9^h 50^m 21^s.4$, $\delta = -44^\circ 48' 39''.8$

6.1, yellow; 9, purple.

1897.120	236.2	5.64
.128	242.2	5.51
.128	241.2	5.38

1897.126	239.8	5.51
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1897.041	238.7	5.64	Cogshall
.088	237.1	5.34	»
.120	236.8	5.75	»

1897.083	237.5	5.58	Cogshall
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h 4267.

 $\alpha = 9^h 52^m 30^s.±$, $\delta = -42^\circ 3' ±$

7.3, yellow; 12.1, bluish.

1897.230	153.0	9.93
.230	153.1	10.07
1897.230	153.1	10.00

No change.

h 4269 = G. 173 Velorum.

Cord. GC. 13607.

 $\alpha = 9^h 53^m 52^s.6$, $\delta = -47^\circ 56' 13''.7$

6, yellow; 12.3, bl. purple.

1897.181	321.0	14.51
.181	321.4	14.28
1897.181	321.2	14.39

Unchanged.

h 4284. Cord. GC. 13768.

 $\alpha = 10^h 1^m 5^s.1$, $\delta = -45^\circ 24' 33''.9$

8, yellow; 9.8, bl. purple.

1897.142	77.9	6.76
.142	78.2	7.11
1897.142	78.0	6.93

Fixed.

Syd₁ 140. Cord. GC. 14091. $\alpha = 10^h 15^m 20^s.9$, $\delta = -55^\circ 31' 10''.8$

7.5, yellow; 8.5, purplish.

1897.025	280.1	3.09
.028	280.6	3.51
.074	285.0	3.05
.074	285.0	3.12

1897.050	282.7	3.19
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Slow direct motion.

R 13 = J Velorum.

Cord. GC. 14145.

 $\alpha = 10^h 17^m 12^s.4$, $\delta = -55^\circ 32' 23''.4$

5.4, yellow; 9.8, purple.

1897.025	101.5	7.27
.074	107.8	6.84
.074	106.4	7.50
1897.058	105.2	7.20

No change in 60 years.

Innes. Cord. GC. 14320.

 $\alpha = 10^h 24^m 52^s.1$, $\delta = -48^\circ 28' 37''.5$

6.9, yellow; 12.3, bluish.

1897.175	218.2	5.19
.175	217.8	5.34
1897.175	218.0	5.27

No other measures.

Hh 352 = h 4321 = δ Antliae.

Cord. GC. 14319.

 $\alpha = 10^h 24^m 59^s.2$, $\delta = -30^\circ 5' 43''.3$

6, yellow; 11, purple.

1897.151	226.2	11.38
.151	225.7	11.77
.375	226.0	11.21
.375	226.7	10.94
1897.263	226.2	11.32

Absolutely fixed.

Cord. dpl. Cord. ZC. 10^h1879. $\alpha = 10^h 26^m 59^s.1$, $\delta = -45^\circ 38' 22''.9$

8.2, yellow; 8.2, yellow.

1897.028	146.6	6.79	Cogshall
.128	146.9	7.39	»
1897.078	146.7	7.09	Cogshall

1897.128 147.9 7.23 See

Δ 88 = s Velorum.

Cord. GC. 14373.

$$\alpha = 10^h 27^m 41^s.1, \delta = -44^\circ 33' 7''.3$$

6.7, yellow; 7.1, yellow.

1897.041	217.8	13.87
.128	218.2	13.51
.128	217.8	13.35
1897.099	217.9	13.58

No change.

Cape dpl. = Syd₁ 150.

Cord. GC. 14377.

$$\alpha = 10^h 27^m 50^s.1, \delta = -51^\circ 43' 2''.7$$

7, yellow; 11.2, bl. purple.

1897.175	342.2	2.00
.175	343.9	1.87
1897.175	343.0	1.93

Unchanged.

Δ 94 = t² Carinae.

Cord. GC. 14558.

$$\alpha = 10^h 34^m 56^s.8, \delta = -58^\circ 39' 45''.9$$

6, or. yellow; 9.8, bl. purple.

1897.041	19.9	15.30
.071	17.7	15.21
.071	19.6	15.18
1897.061	19.0	15.23

No motion since 1836.

Syd₁ 153 = G. 215 Carinae.

Cord. GC. 14566.

$$\alpha = 10^h 35^m 10^s.8, \delta = -58^\circ 17' 46''.9$$

6.7, or. yellow; 9.5, purplish.

1897.041	71.8	19.69
.071	71.0	20.41
.071	71.8	20.39
1897.061	71.5	20.16

Cord. dpl. Cord. GC. 14605.

$$\alpha = 10^h 36^m 45^s.6, \delta = -59^\circ 1' 16''.5$$

8.2, yellow; 11.6, bl. yellow.

1897.181	274.1	17.42
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In the cluster of η Carinae.

h 4347.

$$\alpha = 10^h 38^m 18^s.6, \delta = -59^\circ 22' 56''.6$$

10, yellow; 11.7, bl. purple.

1897.178	303.2	3.35
.178	304.6	3.54
.181	307.1	2.42
.184	—	3.25
1897.180	305.0	3.14

No other measures.

h 4354.

$$\alpha = 10^h 39^m 56^s.8, \delta = -59^\circ 34' 18''.6$$

10.6, yellow; 12.6, bluish.

1897.175	218.4	10.25
.175	216.9	10.42
.178	216.9	10.49
1897.176	217.4	10.39

Cord. dpl. G. 78 Cat. η Carinae cluster.

$$\alpha = 10^h 40^m 2^s.5, \delta = -59^\circ 1' 27''.2$$

8.5, yellow; 12.4, bl. yellow.

1897.181	236.7	7.27
.181	237.0	6.76
.184	240.7	7.85
.184	241.7	7.40
1897.183	239.0	7.32

h 4356. G. 80 Cat. η Carinae cluster.

$$\alpha = 10^h 40^m 5^s.4, \delta = -59^\circ 1' 21''.9$$

7.5, or. yellow; 11.9, bl. purple.

1897.175	151.6	2.75
.175	149.6	2.74
.178	147.4	3.07
.181	147.9	2.76
1897.177	149.1	2.83

h 4359. G. 82 Cat. η Carinae cluster.

$$\alpha = 10^h 40^m 6^s.9, \delta = -59^\circ 33' 58''.4$$

10.4, yellow; 12.6, bluish.

1897.175	234.6	6.74
.175	234.8	6.66
.178	232.8	6.52
1897.176	234.1	6.64

h 4358.

$$\alpha = 10^h 40^m 10^s.1, \delta = -59^\circ 34' 29''.2$$

10.4, yellow; 12.7, bluish.

1897.175	192.3	8.36
.175	192.7	7.95
.178	194.2	8.04
1897.176	193.1	8.12

h 4360. Cord. ZC. 10^h 2864.

$$\alpha = 10^h 40^m 14^s.4, \delta = -59^\circ 2' 59''.3$$

BC = h 4360.

9, yellow; 9.3, yellow.

1897.175	118.2	1.67
.175	120.8	1.84
.178	118.0	1.84
1897.176	119.0	1.78

$\frac{1}{2}$ BC, A = B 3190.

A, 8.3, yellow.

1897.175	108.6	14.27
.175	108.2	14.29
.178	108.3	13.91
1897.176	108.4	14.16

Duplicity noticed by Brisbane.

B 3194. G. 107 Cat. η Carinae cluster.

$$\alpha = 10^h 40^m 41^s.5, \delta = -59^\circ 12' 43''.0$$

9, yellow; 9.2, yellow.

1897.181	213.7	18.81
.181	214.0	18.64
1897.181	213.8	18.72

There is a small double in the same field, n. p.

$$1897.181 \quad 90^\circ \pm \quad 3''.8 \pm$$

12.5, yellow; 13, yellow.

h 4364. Cord. GC. 14715.

$$\alpha = 10^h 40^m 51^s.0, \delta = -58^\circ 50' 0''.6$$

AB.

8.9, yellow; 10.1, yellow.

1897.175	354.6	8.27
.178	355.5	7.92
1897.176	355.1	8.09

AC.

C 11.1, yellow.

1897.178	148.1	9.46
.181	146.8	9.47
1897.180	147.4	9.46

h 4366. n. f. η Carinae.

$$\alpha = 10^h 41^m 11^s.0, \delta = -59^\circ 9' 31''.3$$

11.4, bl. yellow; 12.8, bl. yellow.

1897.175	141.0	5.28
.176	141.2	5.40
.178	144.5	[4.47]
.181	143.9	5.19
.181	143.2	5.51
1897.178	142.8	5.35

A and η Carinae.

1897.175	37.7	13.82
.178	41.6	14.33
.181	38.9	14.30
1897.178	39.4	14.15

Magnitude of η Carinae 7.60.

Cord. dpl. Cord. ZC. 10^h2946. $\alpha = 10^h 41^m 19^s.7$, $\delta = -59^\circ 13' 25''.8$
9, yellow; 9.5, yellow.

1897.192	190.3	16.12
.192	190.9	15.75
1897.192	190.6	15.94

h 4369. Cord. GC. 14744.

 $\alpha = 10^h 41^m 56^s.8$, $\delta = -58^\circ 57' 42''.8$
7.3, reddish; 12.1, bl. purple.

1897.175	40.7	14.60
.178	41.4	14.96
.178	41.3	14.92
1897.177	41.1	14.83

No other measures.

Syd₁ 155 = μ Velorum.

Cord. GC. 14751.

 $\alpha = 10^h 42^m 28^s.0$, $\delta = -48^\circ 53' 29''.4$
2.6, yellow; 10.6, purple.

1897.025	65.8	2.59
.041	59.6	2.91
.085	62.6	2.18
.085	63.0	2.38
1897.059	62.7	2.52

1897.085 63^o 2' 24 Cogshall

No appreciable motion since 1880.

Cord. dpl. G. 166 Cat. η Carinae cluster. $\alpha = 10^h 43^m 22^s.8$, $\delta = -59^\circ 33' 59''.1$
8.5, yellow; 11.5, bluish.

1897.181 115.5 16.78

Faint system n. f. 25" $\pm$

10.5, yellow; 11.5, yellow.

1897.181 274.6 8.28

h 4374. G. 190 Cat. η Carinae cluster. $\alpha = 10^h 44^m 58^s.3$, $\delta = -58^\circ 55' 4''.1$
9.4, yellow; 12.8, bl. yellow.

1897.192	117.5	14.89
.192	117.3	14.52
1897.192	117.4	14.71

Syd₂ 53 = Cord. dpl.

Cord. GC. 14880.

 $\alpha = 10^h 48^m 21^s.2$, $\delta = -58^\circ 12' 54''.6$
9, yellow; 12.5, bluish.

1897.192	217.9	3.89
.192	218.3	3.29
1897.192	218.1	3.59

Howe 14. Cord. GC. 14988.

 $\alpha = 10^h 53^m 9^s.5$, $\delta = -35^\circ 6' 22''.5$
7.9, yellow; 12.7, purple.

1897.381	150.0	9.37
.381	150.2	9.24
1897.381	150.1	9.30

h 4409 = G. 4 Centauri.

Cord. GC. 15224.

 $\alpha = 11^h 2^m 39^s.5$, $\delta = -42^\circ 5' 57''.1$
6, yellow; 10.6, bl. purple.

1897.099	267.3	2.17
.120	271.2	2.20
.142	269.4	1.74
.151	273.2	1.82
.167	268.9	1.82
.173	269.7	1.86

1897.142 270.0 1.94

No motion in 60 years, which is remarkable in so close and unequal an object as this.

Syd₁ 165. Cord. GC. 15359. $\alpha = 11^h 8^m 27^s.4$, $\delta = -46^\circ 30' 42''.0$
7.9, yellow; 7.9, yellow.

1897.088	60.9	3.22
.088	62.0	3.37
.096	62.2	3.24
1897.091	61.7	3.28

No change.

Syd₁ 168. Cord. GC. 15562. $\alpha = 11^h 17^m 58^s.5$, $\delta = -42^\circ 23' 57''.9$
8, yellow; 8.5, yellow.

1897.173	307.4	2.48
.173	309.1	2.44
.227	311.0	2.89
.227	310.3	2.73
1897.200	309.4	2.63

Unchanged.

B 3594 = G. 34 Centauri.

Cord. GC. 15684.

 $\alpha = 11^h 23^m 46^s.4$, $\delta = -42^\circ 7' 25''.2$
5.7, yellow; 9, bl. yellow.

1897.134	167.1	13.51
.134	167.6	13.42
.164	168.4	13.57
.197	167.8	13.44
1897.157	167.7	13.48

Hh 376 = N Hydrae.

Cord. GC. 15759.

 $\alpha = 11^h 27^m 18^s.8$, $\delta = -28^\circ 42' 58''.0$
6, yellow; 6.5, yellow.

1897.041	210.2	8.84
.071	209.2	8.86
.071	210.1	8.95

1897.061 209.8 8.88

No change.

Harvard = G. 41 Centauri.

Cord. GC. 15795.

 $\alpha = 11^h 28^m 45^s.1$, $\delta = -40^\circ 2' 5''.9$
6.4, yellow; 6.4, yellow.

1897.197	273.2	1.12
.197	271.9	1.04
1897.197	272.6	1.08

This object was also discovered by Innes.

h 4455 = G. 291 Hydrae.

Cord. GC. 15854.

 $\alpha = 11^h 31^m 37^s.5$, $\delta = -33^\circ 0' 55''.0$
AB.

6, or. yellow; 9.2, purple.

1897.381	242.2	3.89
.400	242.8	3.85
.427	245.4	3.59
.430	244.5	3.88
1897.409	243.7	3.80

AC.

C 13.5, bluish.

1897.400 84.4 47.57

Cape dpl. = Cord. dpl.

Cord. GC. 15964.

 $\alpha = 11^h 35^m 54^s.1$, $\delta = -62^\circ 0' 6''.9$
7.1, yellow; 7.6, yellow.

1897.025	215.9	2.72
.120	213.8	3.18
.120	214.2	2.88
1897.089	214.6	2.93

h 4478 = β Hydrae.

Cord. GC. 16217.

 $\alpha = 11^h 47^m 51^s.4$, $\delta = -33^\circ 21' 6''.4$
4.2, yellow; 6.5, bl. yellow.

1897.383	351.2	1.90
.383	349.0	1.78
1897.383	350.1	1.84

Slow direct motion.

Howe 17 = G. 77 Centauri.

Cord. GC. 16247.

$$\alpha = 11^h 49^m 25^s.4, \delta = -37^\circ 11' 39''.7$$

6.9, yellow; 9.8, purple.

1897.433	279.2	1.55
.433	279.4	1.63
.447	275.7	1.80
.447	275.5	1.97
1897.440	277.5	1.74

Cord. dpl. = Cape dpl. = Washb. 114.

Cord. GC. 16261 = G. 78 Centauri.

$$\alpha = 11^h 49^m 57^s.4, \delta = -55^\circ 31' 57''.5$$

7.1, yellow; 7.3, yellow.

1897.041	200.4	1.87
.120	198.0	2.28
.120	197.0	2.27
1897.094	198.5	2.14

Retrograde motion of 30° since 1882.

h 4484. Cord. GC. 16345.

$$\alpha = 11^h 53^m 15^s.7, \delta = -40^\circ 23' 28''.0$$

7.4, or. yellow; 13.2, bl. purple.

1897.088	309.6	3.51
.088	309.6	3.53
1897.088	309.6	3.52

Direct motion of 10° since 1838.

h 4495 = G. 312 Hydrae.

Cord. GC. 16521.

$$\alpha = 12^h 0^m 57^s.5, \delta = -32^\circ 23' 50''.2$$

AB.

6.5, yellow; 9.5, purple.

1897.416	314.8	6.90
.416	314.8	6.95
1897.416	314.8	6.92

AC.

C 13.2, bluish.

1897.416	64.5	26.24
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Howe 19 = G. 317 Hydrae.

Cord. GC. 16690.

$$\alpha = 12^h 8^m 25^s.3, \delta = -33^\circ 14' 9''.7$$

7, yellow; 11, bl. purple.

1897.427	168.4	1.09
.427	165.7	1.08
1897.427	167.0	1.08

R 14 = D Centauri.

Cord. GC. 16700.

$$\alpha = 12^h 8^m 49^s.2, \delta = -45^\circ 10' 4''.1$$

6.2, or. yellow; 8, or. yellow.

1897.041	243.2	2.95
.071	237.6	3.22
.071	239.0	3.06
.134	244.7	3.21
.197	244.1	3.12
1897.103	241.7	3.11

Almost fixed.

Sellors 10. Cord. GC. 16725.

$$\alpha = 12^h 9^m 47^s.7, \delta = -35^\circ 39' 51''.7$$

7.2, yellow; 12, bl. purple.

1897.373	245.2	1.76
.373	244.6	1.64
.433	246.1	2.39
.433	246.7	2.18
1897.403	245.6	1.99

Syd₁ 193 = G. 106 Centauri.

Cord. GC. 16772.

$$\alpha = 12^h 12^m 34^s.1, \delta = -35^\circ 32' 16''.3$$

7.6, yellow; 8.5, yellow.

1897.427	167.9	1.05
.427	168.1	1.10
1897.427	168.0	1.07

Unchanged.

h 4518 = G. 116 Centauri.

Cord. GC. 16915.

$$\alpha = 12^h 19^m 26^s.0, \delta = -40^\circ 49' 39''.2$$

7, yellow; 10.7, bluish.

1897.041	208.6	10.03
.071	208.8	10.01
.071	208.8	9.65
1897.061	208.7	9.90

No change.

 Δ 123 = α Crucis.

Cord. GC. 16942.

$$\alpha = 12^h 21^m 2^s.1, \delta = -62^\circ 32' 40''.9$$

2.6, or. yellow; 2.6, or. yellow.

1897.128	115.9	4.91
.128	116.0	5.00
1897.128	115.9	4.96

No change in 70 years.

Cord. dpl. Cord. GC. 16964.

$$\alpha = 12^h 21^m 57^s.1, \delta = -33^\circ 34' 39''.0$$

8.1, yellow; 11.5, purple.

1897.381	19.6	3.65
.381	20.5	3.39
1897.381	20.1	3.52

h 4528 = G. 327 Hydrae.

Cord. GC. 17126.

$$\alpha = 12^h 28^m 53^s.9, \delta = -31^\circ 32' 29''.7$$

6.5, yellow; 12, bl. yellow.

1897.397	154.2	23.36
.397	154.2	23.88
1897.397	154.2	23.62

Syd₁ 203. Cord. ZC. 12^h1846.

$$\alpha = 12^h 31^m 53^s.8, \delta = -40^\circ 15' 40''.2$$

7.9, yellow; 11.5, bl. purple.

1897.088	176.0	8.11
.088	176.1	8.24
.131	177.0	8.50
1897.103	176.4	8.28

Washburn 116. Cord. GC. 17188.

$$\alpha = 12^h 32^m 30^s.5, \delta = -55^\circ 20' 49''.1$$

7.5, yellow; 12, purple.

1897.131 189.7 1.81 See

1897.085	190.±	2.0.±	Cogshall
.131	196.3	1.80	"
1897.108	193.1	1.90	Cogshall

h 4556. Cord. GC. 17550.

$$\alpha = 12^h 48^m 52^s.9, \delta = -27^\circ 24' 55''.4$$

6.2, yellow; 8.2, bl. yellow.

1897.414	80.9	6.63
.414	82.1	6.41
1897.414	81.5	6.52

No change.

Cord. dpl. Cord. ZC. 12^h2919.

$$\alpha = 12^h 50^m 40^s.1, \delta = -39^\circ 56' 37''.8$$

7.8, or. yellow; 12.8, bl. purple.

1897.383	162.9	23.11
.383	162.7	23.64
1897.383	162.8	23.52

No other measures.

Innes = G. 154 Centauri.

Cord. GC. 17595.

$$\alpha = 12^h 50^m 59^s.3, \delta = -47^\circ 8' 39''.5$$

7.7, yellow; 7.7, yellow.

1897.197	261.2	0.44 est. 0.4
.197	261.4	0.43
1897.197	261.3	0.44

No other measures.

Syd₁ 210 = G. 163 Centauri.

Cord. GC. 17708.

$$\alpha = 12^h 55^m 33^s.8, \delta = -33^\circ 5' 2''.4$$

6, or. yellow; 8, bl. purple.

1897.381	237.1	6.68
.381	235.8	6.84
.395	234.5	6.65
.395	235.5	6.73
1897.388	235.7	6.72

h 4571 = G. 184 Centauri.

Cord. GC. 17938.

$$\alpha = 13^h 5^m 55^s.9, \delta = -34^\circ 35' 52''.4$$

5.4, or. yellow; 9, purple.

1897.414	268.8	24.19
.414	268.2	23.95
.463	268.0	23.98
.463	268.0	23.79
1897.436	268.2	23.98

No change.

Howe 22. Cord. GC. 17968.

$$\alpha = 13^h 7^m 29^s.3, \delta = -28^\circ 34' 8''.0$$

AB.

7.6, yellow; 10, bl. yellow.

1897.460	289.0	2.90
.460	289.9	2.88
1897.460	289.4	2.89

AC.

C 13.5, bl. yellow.

1897.460	281.2	38.05
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Nova? Cord. GC. 17993.

$$\alpha = 13^h 8^m 14^s.0, \delta = -34^\circ 8' 34''.9$$

7.2, yellow; 8.8, purple.

1897.395	221.4	31.52
.395	222.1	31.61
1897.395	221.7	31.57

A wide object of no special interest.

h 4578. Cord. GC. 18081.

$$\alpha = 13^h 11^m 59^s.4, \delta = -36^\circ 29' 22''.9$$

7.2, yellow; 13.2, bl. purple.

1897.373	150.7	8.28
.373	151.9	8.03
.427	150.5	8.15
.427	151.4	8.37
1897.400	151.1	8.21

Slow retrograde motion.

h 4587. Cord. GC. 18270.

$$\alpha = 13^h 20^m 33^s.3, \delta = -42^\circ 31' 41''.8$$

8.6, yellow; 8.7, yellow.

1897.436	268.1	5.54
.436	267.0	5.39
1897.436	267.5	5.47

h 4595. Cord. ZC. 13^h1687.

$$\alpha = 13^h 29^m 31^s.8, \delta = -35^\circ 8' 9''.3$$

7.2, yellow; 7.6, yellow.

1897.367	99.2	9.10
.367	98.6	8.88
1897.367	98.9	8.99

No motion.

Hh 422 = f Hydrae.

Cord. GC. 18512.

$$\alpha = 13^h 31^m 16^s.7, \delta = -25^\circ 59' 5''.3$$

5.7, yellow; 8.8, yellow.

1897.463	191.9	10.13
.463	191.3	10.33
1897.463	191.6	10.23

A 141 = Q Centauri.

Cord. GC. 18587.

$$\alpha = 13^h 35^m 20^s.6, \delta = -54^\circ 3' 7''.6$$

6, or. yellow; 7.5, bl. yellow.

1897.134	162.3	5.10
.134	162.3	5.28
.140	162.4	5.00
.140	162.6	4.81
.197	164.9	5.16

1897.149	162.9	5.07
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No change.

h 4608. Cord. GC. 18615.

$$\alpha = 13^h 36^m 36^s.1, \delta = -33^\circ 28' 27''.1$$

7.4, yellow; 7.9, yellow.

1897.044	180.±	[5.5±]
.074	178.9	4.46
.383	358.0	4.52
.414	357.7	4.47
.422	180.5	4.50
1897.287	179.0	4.46

Howe 23 = G. 260 Centauri.

Cord. GC. 18647.

$$\alpha = 13^h 37^m 55^s.2, \delta = -39^\circ 40' 26''.6$$

7.5, yellow; 7.8, yellow.

1897.373	186.9	2.30
.373	188.7	1.87
1897.373	187.8	2.08

No change.

Sydney. Cord. ZC. 13^h2398.

$$\alpha = 13^h 40^m 56^s.1, \delta = -36^\circ 6' 15''.6$$

9.2, yellow; 10, yellow.

1897.447	83.0	5.94
.447	83.0	5.84
1897.447	83.0	5.89

h 4612 = z Centauri.

Cord. GC. 18718.

$$\alpha = 13^h 41^m 6^s.7, \delta = -35^\circ 45' 2''.7$$

5.6, yellow; 12.5, bluish.

1897.381	341.2	27.60
.381	341.2	27.53
1897.381	341.2	27.56

Howe 24 = G. 271 Centauri.

Cord. GC. 18761.

$$\alpha = 13^h 43^m 10^s.8, \delta = -35^\circ 11' 58''.2$$

6.4, or. yellow; 10.8, purple.

1897.419	352.8	11.47
.419	352.5	11.38
.422	353.7	11.55
.422	353.0	11.39
1897.421	353.0	11.45

Harvard = μ Centauri.

Cord. GC. 18773.

$$\alpha = 13^h 43^m 35^s.0, \delta = -41^\circ 58' 31''.2$$

3, yellow; 14.5, bluish.

1897.419	128.5	46.77
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No other measures.

h 4617. Cord. GC. 18801.

$$\alpha = 13^h 45^m 2^s.1, \delta = -29^\circ 22' 41''.6$$

7, or. yellow; 10.2, bl. purple.

1897.493	260.9	5.08
.493	259.7	5.12
1897.493	260.3	5.10

R 18 = N Centauri.

Cord. GC. 18817.

$\alpha = 13^h 45^m 38^s.4$, $\delta = -52^\circ 18' 55''.6$
5.9, yellow; 9.5, purplish.

1897.145	288.4	18.22
.145	288.3	18.35
.162	289.5	18.12
1897.151	288.7	18.23

No motion.

Hh 426 = Δ 148 = k Centauri.

Cord. GC. 18833.

$\alpha = 13^h 46^m 3^s.2$, $\delta = -32^\circ 29' 51''.7$
5.7, yellow; 6, yellow.

1897.071	108.8	7.99
.071	108.5	8.31
.381	109.7	7.85
.381	110.1	8.28
1897.226	109.3	8.11

No material change since the time
of Sir William Herschel.

 β 343 = G. 282 Centauri.

Cord. GC. 18839.

$\alpha = 13^h 46^m 16^s.7$, $\delta = -31^\circ 7' 21''.6$
6.4, yellow; 8, yellow.

1897.088	124.1	0.71
.131	125.1	1.17
.386	121.8	1.20
.386	121.1	1.15
1897.223	123.0	1.05

Hh 428 = B dpl. = h Centauri.

Cord. GC. 18855.

$\alpha = 13^h 47^m 27^s.1$, $\delta = -31^\circ 26' 2''.0$
5, yellow; 10.5, purple.

1897.383	185.4	15.21
.383	185.5	15.41
1897.383	185.4	15.31

No material change.

Harvard = γ Centauri.

Cord. GC. 18863.

$\alpha = 13^h 47^m 42^s.2$, $\delta = -35^\circ 10' 11''.8$

AB.

6.6, yellow; 6.7, yellow.

1897.367	89.8	0.57
.367	90.7	0.71
.403	90.7	0.89
.403	91.8	0.79
1897.385	90.8	0.74

AC.

C 14.4, bluish.

1897.367	166.9	27.43
.403	167.1	27.34
1897.385	167.0	27.38

A fine triple, first noticed at Are-
quipa.

There are no other measures.

h 4624 = G. 285 Centauri.

Cord. GC. 18859.

$\alpha = 13^h 47^m 43^s.9$, $\delta = -46^\circ 38' 5''.6$
6.8, yellow; 11.3, bl. yellow.

1897.071	351.5	28.15
.131	350.5	29.07
1897.101	351.0	28.61

Cord. dpl. Cord. GC. 18873.

$\alpha = 13^h 48^m 16^s.2$, $\delta = -50^\circ 11' 54''.3$
8.4, yellow; 8.5, yellow.

1897.148	77.0	17.60
.148	77.0	17.68
.162	76.5	17.92
1897.153	76.8	17.73

Howe 26. Cord. GC. 18902.

$\alpha = 13^h 49^m 30^s.0$, $\delta = -31^\circ 36' 27''.0$
7, yellow; 10.5, purple.

1897.383	117.8	6.02
.383	116.9	6.24
.414	114.9	6.26
.414	115.4	6.55
.427	117.6	6.45
.427	118.1	6.23
.471	115.1	6.14
.471	114.7	6.07
1897.424	116.3	6.24

Syd₁ 227 = G. 290 Centauri.

Cord. GC. 18904.

$\alpha = 13^h 49^m 46^s.4$, $\delta = -53^\circ 38' 28''.4$

AB.

7.2, yellow; 10.4, purplish.

1897.145	353.1	1.30
.145	353.1	1.42
.162	352.0	1.60
1897.150	352.7	1.44

 $\frac{1}{2}$ AB, C.

C 12.8, purplish.

1897.145	284.7	27.85
.145	285.3	27.77
.162	288.1	28.03
1897.150	286.0	27.88

The component C is new.

 β 1197 = G. 306 Centauri.

Cord. GC. 19054.

$\alpha = 13^h 57^m 13^s.1$, $\delta = -31^\circ 12' 17''.8$
6.9, yellow; 9.2, bl. yellow.

1897.422	185.7	1.24
.422	184.7	1.13
1897.422	185.2	1.18

Direct motion of 9° since 1891.

h 4643. Cord. GC. 19073.

$\alpha = 13^h 58^m 9^s.2$, $\delta = -36^\circ 46' 56''.8$
7.2, yellow; 12.2, purple.

1897.403	136.6	21.20	Cogshall
.403	136.4	[20.27] cl.	"
.447	135.7	21.62	"
.447	135.3	21.42	"

1897.425	136.0	21.41	Cogshall
1897.403	134.9	21.31	See
.447	134.5	21.58	"
1897.425	134.7	21.44	See

h 4655. Cord. ZC. 14^h166.

$\alpha = 14^h 4^m 3^s.4$, $\delta = -36^\circ 31' 9''.6$
7.3, yellow; 11.5, bl. purple.
1897.197 268.2 6.05

 β 1110. Cord. GC. 19369.

$\alpha = 14^h 13^m 41^s.2$, $\delta = -36^\circ 23' 47''.8$
6.9, orange; 14.2, dingy.

1897.373	133.1	3.24
.373	133.7	3.80
1897.373	133.4	3.52

h 4672 = G. 2 Lupi.

Cord. GC. 19371.

$\alpha = 14^h 13^m 52^s.9$, $\delta = -42^\circ 35' 56''.5$
6.1, yellow; 10.5, purple.

1897.167	303.9	4.03
.167	304.4	4.01
1897.167	304.2	4.02

O. Stone. Cord. GC. 19510.

$\alpha = 14^h 19^m 24^s.6$, $\delta = -27^\circ 40' 39''.0$
7, orange; 7.6, orange.

1897.473	286.3	0.32
.473	285.4	0.29
1897.473	285.8	0.31

β 940 = 1 Hydrae.

Cord. GC. 19577.

 $\alpha = 14^h 22^m 18^s.9$, $\delta = -29^\circ 2' 31''.8$

4, yellow; 13, purple.

1897.433	279.3	5.62
.433	279.6	5.95
.460	277.3	4.53
1897.442	278.7	5.37

No change.

Cord. dpl. Cord. GC. 19614.

 $\alpha = 14^h 24^m 4^s.9$, $\delta = -25^\circ 5' 45''.0$

7, or. yellow; 9.8, bl. purple.

1897.520	57.6	13.13
.520	58.3	12.89
1897.520	58.0	13.01

No other measures.

Cord. dpl. Cord. GC. 19678.

 $\alpha = 14^h 26^m 17^s.4$, $\delta = -27^\circ 35' 39''.4$

8, yellow; 10.9, bluish.

1897.463	181.2	14.88
.463	181.2	14.76
1897.463	181.2	14.82

No other measures.

 β 1112 = G. 352 Centauri.

Cord. GC. 19697.

 $\alpha = 14^h 27^m 14^s.0$, $\delta = -30^\circ 16' 19''.9$

5.8, or. yellow; 12.4 purple.

1897.395	8.8	2.65
.395	8.0	2.56
.419	6.7	2.84
.419	7.4	2.61
1897.407	7.7	2.66

h 4687. Cord. ZC. $14^h 17^m 93.$ $\alpha = 14^h 27^m 58^s.2$, $\delta = -36^\circ 0' 7''.9$

7.6, yellow; 8.4, yellow.

1897.383	92.4	1.77	
.383	93.1	1.78	
.386	92.6	1.57	
.386	91.4	1.50	
.447	92.8	1.71	
1897.397	92.5	1.71	
1897.447	91.2	1.46	Cogshall
.447	90.9	1.44	"
1897.447	91.1	1.45	Cogshall

Syd₁ 248. Cord. GC. 19736. $\alpha = 14^h 29^m 11^s.9$, $\delta = -46^\circ 14' 50''.5$

8.2, yellow; 10.8, bl. yellow.

1897.148	292.2	5.42
.148	291.6	5.36
.159	290.1	5.34
.162	289.8	5.61
1897.154	290.9	5.43

Fixed.

Howe 29. Cord. GC. 19783-2.

 $\alpha = 14^h 30^m 58^s.7$, $\delta = -37^\circ 5' 50''.0$

8.1, yellow; 8.4, yellow.

1897.151	214.4	4.29
.159	213.3	4.20
.159	214.1	4.17
.162	213.3	4.28
1897.158	213.8	4.24

Richaud 1 = α Centauri.

Cord. GC. 19825.

 $\alpha = 14^h 32^m 57^s.3$, $\delta = -60^\circ 25' 40''.4$

1, or. yellow; 2, or. yellow.

1897.025	209.4	21.37
.085	208.0	21.37 good meas.
.085	207.8	21.22 "
1897.065	208.4	21.32

1897.085 208.2 20.77 Cogshall

The altitude here was only 10° , but the images were very good. Δ 166 = α Circini.

Cord. GC. 19849.

 $\alpha = 14^h 34^m 26^s.1$, $\delta = -64^\circ 32' 16''.5$

4.6, yellow; 10.2, purple.

1897.159	249.9	17.84
.159	249.9	17.77
1897.159	249.9	17.81

Very little motion in 60 years.

 β 345. Cord. GC. 19892. $\alpha = 14^h 35^m 50^s.5$, $\delta = -29^\circ 16' 7''.3$

7.2, yellow; 8.1, yellow.

1897.460	303.4	0.74
.460	303.3	0.71
.540	304.0	1.15
.540	304.0	1.09
1897.500	303.7	0.92

 β 414 = G. 369 Centauri.

Cord. GC. 19894.

 $\alpha = 14^h 35^m 53^s.9$, $\delta = -30^\circ 30' 14''.6$

6, yellow; 8.2, bl. yellow.

1897.395	341.9	0.86
.395	343.1	0.87
1897.395	342.5	0.86

Cord. dpl. Cord. GC. 19918.

 $\alpha = 14^h 37^m 3^s.3$, $\delta = -37^\circ 6' 49''.5$

8.2, yellow; 8.5, yellow.

1897.403 268.6 2.48 See

1897.403	271.4	2.31	Cogshall
.403	269.4	1.89	"
1897.403	270.4	2.10	Cogshall

No other measures.

h 4698 = b Lupi.

Cord. GC. 19985.

 $\alpha = 14^h 40^m 1^s.7$, $\delta = -51^\circ 57' 35''.9$

5.4, or. yellow; 13.2, bl. purple.

1897.137	260.7	9.12
.137	261.6	8.88 Resembles
.159	259.7	9.02 [η Cassiopeiae
.162	259.6	8.64
.230	259.7	9.08
.230	259.2	9.31

1897.176 259.9 9.01

Absolutely fixed for 60 years.

No other measures since Herschel's.

Hh 449 = m Hydrae.

Cord. GC. 19997.

 $\alpha = 14^h 40^m 13^s.0$, $\delta = -25^\circ 1' 4''.5$

5.9, yellow; 8.7, bl. yellow.

1897.473	128.2	9.05
.473	128.0	8.95
1897.473	128.1	9.00

No change since the time of W. Herschel.

h 4701. Cord. DM. $-36^\circ 9' 64.2$. $\alpha = 14^h 42^m 0^s.4$, $\delta = -36^\circ 21' 58''.2$

9, yellow; 10, yellow.

1897.447	81.1	9.68	Cogshall
.447	80.8	9.88	"
1897.447	81.0	9.78	Cogshall

1897.447 83.7 9.83 See

h 4702. Cord. GC. 20051.

 $\alpha = 14^h 42^m 21^s.8$, $\delta = -35^\circ 25' 23''.4$
 6.2, or. yellow; 11.2, bl. purple.

1897.383	214.3	9.62
.383	214.8	9.90
.386	215.7	9.66
.386	214.4	9.69
.411	215.1	9.34
1897.390	214.9	9.64

1897.411	215.7	8.98 *	Cogshall
.411	215.8	8.80 *	"
1897.411	215.8	8.89	Cogshall

No other measures since Herschel's.

*) bad seeing.

 β 617. Cord. GC. 20078.
 $\alpha = 14^h 43^m 29^s.3$, $\delta = -23^\circ 50' 52''.4$
 8, or. yellow; 11.2, purple.

1897.504	335.4	2.65
.504	335.2	2.49
1897.504	335.3	2.57

Unchanged.

h 4706. Cord. GC. 20097.

 $\alpha = 14^h 44^m 33^s.2$, $\delta = -46^\circ 59' 29''.0$
 8.2, yellow; 10.6, bl. yellow.

1897.148	218.6	6.66
.148	219.3	6.55
.159	218.9	6.91
.162	218.8	6.47
1897.154	218.9	6.65

Fixed.

h 4716. Cord. GC. 20178.

 $\alpha = 14^h 48^m 17^s.1$, $\delta = -24^\circ 14' 42''.9$
 8.5, yellow; 9.5, yellow.

1897.504	357.4	3.13
.504	358.2	2.93
1897.504	357.8	3.03

No change.

Innes. Cord. GC. 20187.

 $\alpha = 14^h 48^m 40^s.6$, $\delta = -36^\circ 1' 19''.2$
 6.7, yellow; 13.8, bl. purple.

1897.381	253.3	5.07
.381	257.9	4.72
1897.381	255.6	4.90

No other measures.

Ho. 390 = G. 381 Centauri.

Cord. GC. 20203.

 $\alpha = 14^h 49^m 36^s.3$, $\delta = -33^\circ 26' 59''.5$
 5.7, yellow; 12.7, bl. yellow.

1897.518	168.6	24.95
.518	168.6	24.64
1897.518	168.6	24.79

h 4715 = G. 37 Lupi.

Cord. GC. 20202.

 $\alpha = 14^h 49^m 44^s.5$, $\delta = -47^\circ 28' 23''.2$
 6.4, yellow; 7.4, bl. yellow.

1897.128	277.5	2.81
.128	277.4	2.77
.148	277.9	2.65
.148	278.0	2.61
1897.138	277.7	2.71

No motion.

h 4718. Cord. GC. 20248.

 $\alpha = 14^h 51^m 21^s.0$, $\delta = -34^\circ 58' 48''.8$
 7.1, or. yellow; 10.2, purple.

1897.383	62.9	2.34
.383	61.7	2.18
1897.383	62.3	2.26

No material change in 60 years.

 β 239 = G. 392 Hydrae.

Cord. GC. 20295.

 $\alpha = 14^h 52^m 44^s.1$, $\delta = -27^\circ 15' 20''.8$
 6.8, yellow; 7.9, yellow.

1897.485	319.0	0.96
.485	318.4	0.97
1897.485	318.7	0.96

1897.542	312.8	0.88
.542	312.9	0.89
1897.542	312.9	0.89

Very slight direct motion.

Howe 30 = G. 387 Centauri.

Cord. GC. 20313.

 $\alpha = 14^h 53^m 27^s.3$, $\delta = -30^\circ 18' 37''.1$

AB.

7, yellow; 10.2, purple.

1897.460	338.7	8.82
.460	339.3	8.53
.463	338.8	8.29
.487	338.5	8.68
1897.468	338.8	8.58

1897.487	338.3	8.84	Cogshall
.487	338.5	8.74	"
1897.487	338.4	8.79	Cogshall

AC.

C 13, bluish.

1897.463	294.2	32.14	See
.463	295.1	32.38	"
1897.463	294.7	32.26	See

AD.

D 13.9, bluish.

1897.487 226.2 39.16

h 4723. Cord. GC. 20338.

 $\alpha = 14^h 54^m 51^s.3$, $\delta = -51^\circ 31' 15''.6$
 8, orange; 10.5, bl. purple.

1897.170	167.0	5.27
.170	167.6	5.41
1897.170	167.3	5.34

No great change.

h 4727. Cord. GC. 20417.

 $\alpha = 14^h 57^m 37^s.1$, $\delta = -27^\circ 26' 43''.1$
 7, yellow; 7, yellow.

1897.542	37.1	7.45	Cogshall
.542	36.8	7.62	"
1897.542	36.9	7.53	Cogshall

h 4728 = π Lupi.

Cord. GC. 20428.

 $\alpha = 14^h 58^m 18^s.7$, $\delta = -46^\circ 39' 34''.2$
 6.4, yellow; 6.4, yellow.

1897.071	91.8	1.30
.128	86.3	1.37
.128	84.9	1.22
1897.109	87.7	1.30

Slow retrograde orbital motion, with increase of distance.

1835.367 112.2 0.80 5.3 n Herschel

h 4743. Cord. GC. 20495.

 $\alpha = 15^h 1^m 4^s.7$, $\delta = -32^\circ 31' 24''.7$
 7.2, yellow; 7.3, yellow.

1897.430	197.4	10.98
.430	197.2	11.17
1897.430	197.3	11.07

Cord. dpl. Cord. GC. 20550.

$$\alpha = 15^h 3^m 46^s.6, \delta = -40^\circ 37' 32''.8$$

8, yellow; 8.8, yellow.

1897.556	75.1	5.22 hazy.
.556	76.4	5.22

1897.556	75.7	5.22
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No other measures.

h 4734 = G. 59 Lupi.

Cord. GC. 20543.

$$\alpha = 15^h 3^m 48^s.7, \delta = -54^\circ 57' 54''.5$$

5.9, or. yellow; 14.5, bl. purple.

1897.230	246.3	11.20
.230	246.3	11.58

1897.230	246.3	11.39
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Resembles b Lupi, and like it shows no motion.

Howe 31. Cord. ZC. 15^h344.

$$\alpha = 15^h 6^m 39^s.2, \delta = -36^\circ 52' 14''.3$$

7.3, yellow; 7.4, yellow.

1897.367	47.5	6.68
.367	47.9	6.66

.386	47.5	6.50
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.386	47.5	6.79
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1897.377	47.6	6.66
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No change.

Cord. dpl. Cord. GC. 20596.

$$\alpha = 15^h 6^m 44^s.3, \delta = -59^\circ 26' 41''.7$$

7.9, yellow; 9.8, bl. purple.

1897.170	216.2	2.19
.170	215.4	2.14

1897.170	215.8	2.16
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1878.50 287.5 12.63 3n Cordoba

This shows rapid motion, probably orbital; no other measures.

h 4750 = G. 70 Lupi.

Cord. GC. 20655.

$$\alpha = 15^h 8^m 56^s.3, \delta = -47^\circ 42' 4''.5$$

6.6, yellow; 13, bl. yellow.

1897.192	21.3	13.43
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No change.

Cord. dpl. Cord. GC. 20674.

$$\alpha = 15^h 9^m 26^s.9, \delta = -36^\circ 46' 34''.9$$

7.5, yellow; 7.9, yellow.

1897.383	197.1	22.16
.383	196.9	21.60

1897.383	197.0	21.88
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 β 350 = G. 62 Librae.

Cord. GC. 20685.

$$\alpha = 15^h 9^m 40^s.7, \delta = -27^\circ 13' 31''.9$$

7.1, yellow; 8.5, bl. yellow.

1897.485	153.8	0.97
.485	154.5	0.94

1897.485	154.1	0.95
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Slow retrograde motion.

h 4753 = μ Lupi.

Cord. GC. 20713.

$$\alpha = 15^h 11^m 34^s.4, \delta = -47^\circ 30' 23''.7$$

AB = h 4753.

5.9, yellow; 6.2, yellow.

1897.128	335.6	1.69
.128	335.5	1.80

1897.128	335.5	1.74
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 $\angle$ 180 = $\frac{1}{2}$ AB, C.

C 8.3, bl. yellow.

1897.128	130.3	23.23
.128	130.1	23.66

1897.128	130.2	23.44
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Very slow retrograde motion in AB; the angle here given differs 180°, from those heretofore recorded.

h 4755. Cord. ZC. 15^h790.

$$\alpha = 15^h 13^m 8^s.8, \delta = -36^\circ 19' 55''.4$$

8, yellow; 9.3, purple.

1897.381	202.3	4.32
.381	202.3	4.13

1897.381	202.3	4.22
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Cord. dpl. Cord. GC. 20767.

$$\alpha = 15^h 14^m 39^s.8, \delta = -58^\circ 48' 14''.7$$

8.4, yellow; 11.2, purple.

1897.137	100.9	5.49
.159	96.1	6.64

.159	96.1	6.36
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1897.151	97.7	6.16
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1881.02 103.5 6.41 4n Cordoba

No other measures.

Howe 32 = G. 87 Lupi.

Cord. GC. 20787.

$$\alpha = 15^h 15^m 3^s.3, \delta = -37^\circ 51' 34''.4$$

6, yellow; 9, purple.

1897.373	122.5	6.06
.373	123.0	6.09

1897.373	122.7	6.07
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h 4757 = γ Circini.

Cord. GC. 20785.

$$\alpha = 15^h 15^m 23^s.7, \delta = -58^\circ 57' 37''.3$$

5.3, or. yellow; 5.3, or. yellow.

1897.137	268.6	1.28
.159	263.1	1.38

.159	264.0	1.26
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1897.151	265.2	1.31
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1897.137 263.9 0.88 Cogshall

Slow retrograde motion.

Sellors 20. Cord. GC. 20796.

$$\alpha = 15^h 15^m 41^s.3, \delta = -47^\circ 33' 9''.6$$

8.4, yellow; 8.7, yellow.

1897.151	217.9	1.34
.162	212.6	1.50

.162	213.1	1.46
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1897.158	214.5	1.43
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Copeland 2 = ϵ Lupi.

Cord. GC. 20806.

$$\alpha = 15^h 15^m 53^s.4, \delta = -44^\circ 19' 46''.0$$

AB = Copeland 2.

4.7, yellow; 6.0, bl. yellow.

1897.120	281.6	0.4 $\pm$
.123	279.7	0.93

.123	280.3	0.98
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1897.122	280.5	0.77
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1883.271 285.0 $\pm$ 0.8 $\pm$ 1n Copel. $\angle$ 182 = $\frac{1}{2}$ AB, C.

C 8.8, bluish.

1897.123	171.9	26.93
.123	172.2	26.58

1897.123	172.0	26.75
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No certain evidence of motion.

Howe 33. Cord. GC. 20815.

$$\alpha = 15^h 16^m 12^s.4, \delta = -33^\circ 48' 20''.8$$

6.7, yellow; 10.5, purplish.

1897.548	249.6	8.32	Cogshall
.548	249.1	8.32	"

1897.548	249.3	8.32	Cogshall
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 β 1114 = G. 79 Librae.

Cord. GC. 20964.

$$\alpha = 15^h 22^m 54^s.3, \delta = -28^\circ 31' 6''.3$$

AB = β 1114.

6.9, yellow; 8, yellow.

1897.485	319.3	0.61
.485	319.1	0.58

1897.485	319.2	0.60
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$\frac{1}{2}$ AB, C = h 4774.

C 10.5, purplish.

1897.485	4.0	9.27
.485	4.3	9.23
1897.485	4.2	9.25

h 4786 = γ Lupi.

Cord. GC. 21084.

$\alpha = 15^h 28^m 28.4$, $\delta = -40^\circ 49' 49.9$
2.9, yellow; 3.1, yellow.

1897.047	92.0	0.30
.085	92.5	0.35
.085	92.7	0.34
1897.072	92.4	0.33

1897.086 90.4 0.47 Cogshall

A remarkable binary with the plane of its orbit in the line of vision like 42 Comae Berenices. See Monthly Notices, Nov. 1897.

h 4788 = d Lupi.

Cord. GC. 21095.

$\alpha = 15^h 29^m 0.2$, $\delta = -44^\circ 37' 23.2$
5.4, yellow; 8.3, purple.

1897.131	9.2	2.44
.131	9.1	2.36
1897.131	9.1	2.40

Direct orbital motion of 21° since 1835.

Harvard = ω Lupi.

Cord. GC. 21153.

$\alpha = 15^h 31^m 19.4$, $\delta = -42^\circ 14' 22.2$
4.6, orange; 11.7, purple.

1897.131	27.0	11.85
.131	27.0	11.66
1897.131	27.0	11.75

Duplicity noticed by the Harvard observers at Arequipa. No other measures.

Innes = G. 2 Normae.

Cord. GC. 21150.

$\alpha = 15^h 31^m 23.7$, $\delta = -52^\circ 2' 32.7$
BC.

11, bluish; 12, bluish.

1897.170 341.0 2.10

$\frac{1}{2}$ AB, C.

A, 5.9, yellow.

1897.170 280.5 53.76

No other measures.

Innes = G. 123 Lupi.

Cord. GC. 21232.

$\alpha = 15^h 34^m 28.9$, $\delta = -39^\circ 39' 25.8$
7.3, yellow; 8.2, yellow.

1897.151	157.5	0.81
.164	152.0	0.93
.164	152.7	0.94
1897.160	154.1	0.89

No other measures.

Cord. dpl. = Syd₂ 121 = G. 126 Lupi.

Cord. GC. 21309.

$\alpha = 15^h 37^m 38.0$, $\delta = -41^\circ 30' 3.0$
6, yellow; 8.9, purple.

1897.131	348.3	3.86
.131	348.5	4.02
.559	348.5	3.79
.559	348.2	3.99
1897.345	348.4	3.92

Cord. dpl. = Washburn 124

= G. 7 Normae.

Cord. GC. 21306.

$\alpha = 15^h 37^m 39.1$, $\delta = -50^\circ 28' 4.1$
7.4, yellow; 8.7, purple.

1897.131	207.2	2.56
.131	207.4	2.54
.164	203.4	2.46
1897.142	206.0	2.52

Probably in slow retrograde motion.

Cord. dpl. Cord. ZC. $15^h 27^m 6.5$.

$\alpha = 15^h 40^m 58.3$, $\delta = -32^\circ 18' 8.9$
7.2, yellow; 9.8, purplish.

1897.425	56.4	11.09
.425	55.9	11.16
1897.425	56.1	11.12

h 4807. BD. $-21^\circ 41' 19.7$.

$\alpha = 15^h 44^m 4.5$, $\delta = -21^\circ 11' 10.0$
7.5, yellow; 12, bl. yellow.

1897.534	2.6	10.19
.534	2.9	10.28
1897.534	2.7	10.23

h 4810. Cord. ZC. $15^h 29^m 7.4$.

$\alpha = 15^h 44^m 6.6$, $\delta = -46^\circ 10' 23.1$
7, yellow; 10.5, yellow.

1897.227 64.1 17.47 See

1897.178 65.7 16.61 Cogshall

Sellors 11 = Innes

= G. 18 Triang. Australe.

Cord. GC. 21487.

$\alpha = 15^h 46^m 25.2$, $\delta = -60^\circ 26' 44.6$
6.8, yellow; 9.7, purple.

1897.142	95.1	1.28
.142	95.4	1.10
.164	90.5	1.0 difficult.
1897.150	93.5	1.16

Cord. dpl. = G. 18 Normae.

Cord. GC. 21499.

$\alpha = 15^h 47^m 9.6$, $\delta = -59^\circ 52' 43.6$
6.5, yellow; 10, purple.

1897.142	97.5	3.68
.142	97.8	3.55
.164	101.7	3.72
1897.149	98.9	3.65

This object may be h 4813, but if so, Herschel's Right Ascension is 4^m too small.

β 36 = A Scorpii.

Cord. GC. 21521.

$\alpha = 15^h 47^m 36.4$, $\delta = -25^\circ 1' 42.9$
5.9, yellow; 9, bl. yellow.

1897.473	274.3	2.99
.473	274.6	2.87
1897.473	274.4	2.93

No motion since 1871.

Δ 196 = ξ Lupi.

Cord. GC. 21586.

$\alpha = 15^h 50^m 29.7$, $\delta = -33^\circ 40' 24.2$
6, yellow; 6.6, yellow.

1897.140	48.5	10.77
.140	48.4	10.62
.151	48.6	10.53
.151	48.2	10.68
1897.146	48.4	10.65

Absolutely fixed.

R 21 = η Lupi.

Cord. GC. 21653.

$\alpha = 15^h 53^m 29.6$, $\delta = -38^\circ 6' 38.7$
3.5, yellow; 10.3, purple.

1897.131	20.9	14.74
.131	20.9	14.82
.167	20.6	14.98
.373	21.2	14.37
1897.201	20.9	14.73

No change in 60 years.

Cord. dpl. = G. 149 Lupi.

Cord. GC. 21676.

 $\alpha = 15^h 54^m 8^s.8$, $\delta = -40^\circ 9' 11''.2$

6.5, yellow; 12.4, bl. purple.

1897.151	158.2	7.84
.164	158.0	7.96
.164	158.0	7.92
1897.160	158.1	7.91

Howe 40. Cord. DM. $-35^\circ 10' 65''$. $\alpha = 15^h 54^m 14^s.0$, $\delta = -35^\circ 48' 24''.8$

8, yellow; 9.5, yellow.

1897.386	101.9	6.81
.386	101.7	6.59
1897.386	101.8	6.70

Howe 41. Cord. GC. 21751.

 $\alpha = 15^h 57^m 26^s.9$, $\delta = -32^\circ 47' 31''.2$

7.9, yellow; 8.1, yellow.

1897.427	345.6	2.96
.427	345.2	3.04
1897.427	345.4	3.00

B dpl. = G. 28 Scorpii.

Cord. GC. 21875.

 $\alpha = 16^h 3^m 9^s.5$, $\delta = -32^\circ 22' 56''.4$

6.7, or. yellow; 7.8, or. yellow.

1897.427	85.7	7.83
.427	84.8	7.87
1897.427	85.2	7.85

Harvard = ϵ Normae.

Cord. GC. 21921.

 $\alpha = 16^h 5^m 35^s.3$, $\delta = -54^\circ 22' 16''.5$

5.8, or. yellow; 13.9, purplish.

1897.142	213.0	16.90
.164	207.6	18.1
.227	209.4	17.65
.227	209.1	17.41
1897.190	209.8	17.49

No other measures.

h 4839 = ϵ^1 Scorpii.

Cord. GC. 21948.

 $\alpha = 16^h 6^m 5^s.3$, $\delta = -28^\circ 9' 25''.8$

6, yellow; 8.7, purple.

1897.485	77.3	4.13
.485	77.7	4.14
1897.485	77.5	4.14

h 4840. Cord. GC. 22050.

 $\alpha = 16^h 10^m 56^s.4$, $\delta = -34^\circ 34' 26''.7$

7.7, yellow; 8.3, purplish.

1897.430	296.9	5.05
.430	297.3	4.99
1897.430	297.1	5.02

B dpl. = G. 55 Scorpii.

Cord. GC. 22108.

 $\alpha = 16^h 13^m 13^s.0$, $\delta = -30^\circ 39' 51''.8$

6, yellow; 7, bl. yellow.

1897.647	319.5	23.40
.647	319.2	23.23
1897.647	319.4	23.32

Harvard = G. 56 Scorpii.

Cord. GC. 22124.

 $\alpha = 16^h 13^m 46^s.9$, $\delta = -39^\circ 11' 13''.3$

5.8, yellow; 13.5, purple.

1896.627	295.1	10.68
.648	297.2	10.1
1896.637	296.2	10.34
1897.425	295.5	10.87
.425	294.9	11.03
1897.425	295.2	10.95

No other measures.

h 4843. Cord. GC. 22153.

 $\alpha = 16^h 15^m 59^s.9$, $\delta = -33^\circ 3' 39''.8$

8, yellow; 12.5, purple.

1897.479	267.7	11.98
.479	266.8	12.48
1897.479	267.2	12.23

h 4850 = G. 67 Scorpii.

Cord. GC. 22222.

 $\alpha = 16^h 18^m 22^s.7$, $\delta = -29^\circ 28' 12''.0$

5.8, yellow; 7.2, yellow.

1897.468	349.4	6.54
.468	349.8	6.66
1897.468	349.6	6.60

 β 1115. Cord. GC. 22239. $\alpha = 16^h 19^m 24^s.5$, $\delta = -23^\circ 13' 46''.7$

8, yellow; 10.5, bl. yellow.

1897.649	27.1	1.00
.649	26.2	0.95
1897.649	26.7	0.97

Innes. Cord. GC. 22233.

 $\alpha = 16^h 19^m 27^s.5$, $\delta = -47^\circ 48' 56''.4$

6.9, yellow; 12.1, purplish.

1897.167	284.0	1.12
.167	284.1	1.14
1897.167	284.1	1.13

Howe 42. Cord. GC. 22243.

 $\alpha = 16^h 19^m 31^s.8$, $\delta = -34^\circ 45' 3''.4$

7.8, yellow; 7.9, yellow.

1897.383	106.5	1.80	See
.383	106.6	1.78	'
.548	106.9	1.83	Cogshall
.548	106.8	2.01	'
1897.465	106.7	1.85	

Hh 512 = ρ Ophiuchi.

Cord. GC. 22250.

 $\alpha = 16^h 19^m 35^s.3$, $\delta = -23^\circ 13' 1''.6$

5.5, yellow; 6, yellow.

1897.649 357.0 3.43

Both single under high powers. Very little motion during the past 115 years; the angle has diminished about 10° .h 4853 = ϵ Normae.

Cord. GC. 22246.

 $\alpha = 16^h 19^m 50^s.9$, $\delta = -47^\circ 19' 34''.5$

5.6, yellow; 10.3, bluish.

1897.148	335.5	22.61
.164	335.6	22.99
.164	334.9	22.91
1897.159	335.3	22.84

O. Stone. Cord. GC. 22272.

 $\alpha = 16^h 21^m 2^s.9$, $\delta = -26^\circ 57' 45''.3$

7.9, yellow; 12.5, purplish.

1897.485	342.3	9.36
.485	342.4	9.46
1897.485	342.4	9.41

Mitchel = Antares.

Cord. GC. 22314.

 $\alpha = 16^h 23^m 16^s.5$, $\delta = -26^\circ 12' 35''.7$

2, red; 6.8, greenish.

1896.600	271.4	3.21
.602	272.4	3.11
.605	273.2	3.21
1896.602	272.3	3.18

1897.20 Both stars absolutely round, a dozen diffraction rings perfectly steady; no trace of elongation or of a third body.

No motion since Mitchel's discovery in 1846.

Innes. Cord. GC. 22380.

 $\alpha = 16^h 26^m 31^s.4$, $\delta = -33^\circ 19' 49''$
7, yellow; 11.5, purple.

1897.479	357.6	1.55
.479	357.9	1.82
.556	358.9	1.58
.556	359.5	1.45
.657	358.8	1.46
.657	361.6	1.60
1897.561	359.0	1.58

No other measures.

h 4867 = G. 62 Normae.

Cord. GC. 22476.

 $\alpha = 16^h 31^m 21^s.9$, $\delta = -43^\circ 11' 43''.8$
6.3, yellow; 10.5, purple.

1897.148	294.3	16.45
.164	294.5	16.51
.164	294.8	16.47
.170	294.5	16.28
.625	294.1	16.77
1897.254	294.4	16.50

Distance increasing.

h 4876 = G. 4 Arae.

Cord. GC. 22534.

 $\alpha = 16^h 33^m 51^s.0$, $\delta = -48^\circ 34' 0''.5$
AB = Harvard.

6.5, yellow; 12, deep bl. purple.

1897.145	10.8	1.31
.167	11.9	1.76
.167	11.4	1.79
1897.160	11.4	1.62

1897.178 12.0 1.74 Cogshall

AC.

C 7.2, purple.

1897.145	265.1	9.43
.167	265.2	9.65
.167	265.3	9.65
1897.160	265.2	9.58

1897.178 267.9 9.43 Cogshall

Syd, 283 = G. 80 Scorpii.

Cord. GC. 22583.

 $\alpha = 16^h 35^m 47^s.7$, $\delta = -36^\circ 53' 1''.4$
7.2, or. yellow; 9.8, bl. yellow.

1897.518	87.3	1.26
.518	88.5	1.18
1897.518	87.9	1.22

Fixed since 1881.

 β 1116 = G. 89 Scorpii.

Cord. GC. 22624.

 $\alpha = 16^h 38^m 52^s.2$, $\delta = -27^\circ 16' 6''.6$

AB.

6.5, yellow; 11.2, purple.

1897.485	356.9	2.24
.485	356.6	2.18
1897.485	356.7	2.21

AC.

C 14.2, bluish.

1897.485 197.0 25.42

This component has not been seen before.

h 4885. Cord. GC. 22657.

 $\alpha = 16^h 40^m 7^s.0$, $\delta = -48^\circ 9' 55''.6$
8.1, yellow; 9.8, bl. purple.

1897.148	243.0	4.21
.149	243.1	4.23
.164	241.9	4.29
1897.154	242.7	4.24

h 4889 = G. 96 Scorpii.

Cord. GC. 22744.

 $\alpha = 16^h 44^m 15^s.6$, $\delta = -37^\circ 20' 20''.8$
6.6, yellow; 9.5, purple.

1897.419	5.4	6.86
.419	5.7	7.00
.518	7.2	6.93
.518	6.0	6.74
1897.468	6.1	6.88

No motion.

h 4896. Cord. ZC. 16^h3337.
 $\alpha = 16^h 48^m 51^s.2$, $\delta = -46^\circ 41' 12''.8$
7.5, yellow; 10, bl. yellow.

1897.192 23.0 4.01

Unchanged.

Cord. dpl. Cord. GC. 22914.

 $\alpha = 16^h 49^m 58^s.2$, $\delta = -40^\circ 21' 9''.7$

AB.

6.8, yellow; 10.2, bl. purple.

1897.373	253.0	7.76
.373	253.0	7.69
1897.373	253.0	7.73

AC.

C 10.2, bl. purple.

1897.373	237.6	14.90
.373	239.5	15.30
1897.373	238.5	15.10

Remarkable triple; C has not been seen before. No other measures.

h 4899. Cord. ZC. 16^h3469.
 $\alpha = 16^h 50^m 36^s.3$, $\delta = -45^\circ 46' 45''.7$
8, yellow; 8.7, yellow.

1897.227	276.1	1.94
.227	276.9	1.92
1897.227	276.5	1.93

1897.186 275.2 3.02 Cogshall

h 4908.

 $\alpha = 16^h 54^m 57^s.5$, $\delta = -39^\circ 32' 27''.0$
9.3, yellow; 11.2, yellow.

1896.605	[175±]	[4±]
.636	177.7	5.39
.638	176.7	5.00
.649	177.2	4.89
1896.641	177.2	5.09

Harvard = G. 117 Scorpii.

Cord. GC. 23035.

 $\alpha = 16^h 55^m 24^s.7$, $\delta = -31^\circ 59' 39''.2$

AB.

5.4, yellow; 14, bluish.

1897.419	161.5	26.93
.419	161.9	27.24
.430	160.9	27.31
.430	161.0	27.09
1897.424	161.3	27.14

AC.

C 14.2, bluish.

1897.419	108.7	42.78
.430	108.6	43.32
1897.425	108.6	43.05

AD.

D 14.4, bluish.

1897.430 41.2 48.21

No other measures.

Cord. dpl. Cord. ZC. 16^h3841.
 $\alpha = 16^h 55^m 33^s.2$, $\delta = -46^\circ 36' 16''.9$
8, yellow; 9, yellow.

1897.186 41.0 3.17 Cogshall

No other measures.

Cord. dpl. Cord. GC. 23036.

 $\alpha = 16^h 55^m 38^s.0$, $\delta = -46^\circ 2' 29''.8$
9, yellow; 11, yellow.

1897.186 226.6 1.71 Cogshall

No other measures.

Harvard = G. 122 Scorpii.

Cord. GC. 23126.

$\alpha = 16^h 59^m 34^s.7$, $\delta = -37^\circ 5' 22''.1$
6, yellow; 13.7, purple.

1897.419	84.6	7.27
.419	85.1	7.00
1897.419	84.8	7.13

There are no other measures of this interesting and difficult system.

Cord. dpl. = Innes.

Cord. GC. 23138.

$\alpha = 17^h 0^m 7^s.2$, $\delta = -44^\circ 18' 24''.9$
7.2, yellow; 10.2, purple.

1897.625	139.6	5.10
.625	139.2	5.04
1897.625	139.4	5.07

Howe 45. Cord. ZC. 16^h4176.

$\alpha = 17^h 0^m 7^s.3$, $\delta = -35^\circ 45' 5''.8$
8, yellow; 8.5, yellow.

1897.386	24.6	5.02
.386	23.1	5.18
1897.386	23.8	5.10

 Δ 213 = G. 37 Arae.

Cord. GC. 23197.

$\alpha = 17^h 2^m 54^s.7$, $\delta = -46^\circ 36' 34''.0$
6.5, yellow; 9.5, bl. yellow.

1897.192 166.8 7.97

Unchanged.

 β 1118 = η Ophiuchi.

Cord. GC. 23251.

$\alpha = 17^h 4^m 38^s.4$, $\delta = -15^\circ 36' 5''.1$
3.8, yellow; 3.8, yellow.

1897.485	80.5	0.56
.485	81.0	0.51
1897.485	80.7	0.53

Slow retrograde motion.

 β 956. Cord. GC. 23263.

$\alpha = 17^h 5^m 24^s.0$, $\delta = -26^\circ 34' 39''.1$
7.5, yellow; 8.5, yellow.

1897.655	163.1	0.61
.655	163.5	0.54
1897.655	163.3	0.58

Unchanged since 1880.

 β 125 = G. 93 Ophiuchi.

Cord. GC. 23272.

$\alpha = 17^h 5^m 57^s.7$, $\delta = -26^\circ 54' 59''.4$
6.6, or. yellow; 10.2, purple.

1897.649	70.0	1.71
.649	69.2	1.82
.660	64.7	1.49
.660	64.7	1.58
1897.655	67.1	1.65

Unchanged.

Howe 46 = G. 132 Scorpii.

Cord. GC. 23296.

$\alpha = 17^h 7^m 3^s.4$, $\delta = -38^\circ 10' 30''.0$
7, or. yellow; 9.2, purple.

1896.663	143.2	2.40
.663	143.2	2.59
1897.427	144.3	3.02
.427	144.8	3.23
.627	144.7	3.02
.627	143.8	2.93
1897.236	144.0	2.86

No change.

Sh 243 = A Ophiuchi.

Cord. GC. 23354.

$\alpha = 17^h 9^m 12^s.6$, $\delta = -26^\circ 26' 55''.9$
6, or. yellow; 6.5, or. yellow.

1897.655	12.5	4.20
.655	12.5	4.23
1897.655	12.5	4.21

Slow retrograde motion

 β 958. AO_{e2} 16543.

$\alpha = 17^h 10^m 35^s.5$, $\delta = -19^\circ 12' 29''.1$
8.5, yellow; 9.1, yellow.

1897.657	212.5	1.64
.657	212.7	1.58
1897.657	212.6	1.61

Retrograde motion.

 β 1119. Cord. GC. 23390.

$\alpha = 17^h 10^m 57^s.4$, $\delta = -30^\circ 3' 12''.8$
7.5, or. yellow; 8.2, or. yellow.

1897.660	353.8	0.55
.660	353.7	0.57
1897.660	353.7	0.56

Unchanged.

Syd₁ 297 = G. 41 Arae.

Cord. GC. 23397.

$\alpha = 17^h 11^m 26^s.1$, $\delta = -46^\circ 31' 58''.7$
6, or. yellow; 11, purple.

1897.192	44.2	3.06
.211	48.5	2.77
1897.201	46.3	2.91

Hh 533. Cord. GC. 23408.

$\alpha = 17^h 11^m 26^s.6$, $\delta = -26^\circ 31' 7''.4$
7.2, or. yellow; 10, purple.

1897.655	333.2	5.92
.655	332.5	5.84
.706	334.2	5.99
.706	333.5	5.93
1897.681	333.4	5.92

No change.

 β 416 = G. 142 Scorpii.

Cord. GC. 23422.

$\alpha = 17^h 12^m 3^s.7$, $\delta = -34^\circ 7' 34''.5$
AB.

7.1, or. yellow; 8.2, or. yellow.

1897.386	306.9	1.80
.386	307.2	1.58
1897.386	307.0	1.69

AC = h 4935.

C 12.8, bl. yellow.

1897.386 129.3 29.98

AD.

D 13.2, bl. yellow.

1897.386 86.1 55.42

AB is a rapid binary, period 33 years.

 β 127. Cord. ZC. 17^h897.

$\alpha = 17^h 14^m 39^s.6$, $\delta = -27^\circ 14' 28''.2$
7.8, yellow; 8.7, yellow.

1897.493	93.2	4.96
.493	93.2	4.89
1897.493	93.2	4.92

No change.

h 4942 = γ Arae.

Cord. GC. 23515.

$\alpha = 17^h 16^m 58^s.6$, $\delta = -56^\circ 16' 59''.0$
2.9, yellow; 11.5, purple.

1897.145 328.6 18.58

Harvard 146 = β 128.

Cord. GC. 23620.

 $\alpha = 17^h 20^m 38^s.2$, $\delta = -26^\circ 14' 38''.3$
7.2, or. yellow; 10.2, purple.

1897.660	323.1	4.04
.660	323.6	3.97
.706	322.0	3.83
.706	322.5	4.05
1897.683	322.8	3.97

 β 1120. Cord. GC. 23659. $\alpha = 17^h 22^m 28^s.4$, $\delta = -25^\circ 25' 34''.3$
8, yellow; 8.4, yellow.

1897.655	107.2	1.01
.655	105.7	1.04
1897.655	106.4	1.02

Howe 47 = G. 151 Scorpil.

Cord. GC. 23685.

 $\alpha = 17^h 23^m 30^s.1$, $\delta = -33^\circ 38' 8''.3$
AB.

7, yellow; 13.5, purple.

1897.386	319.2	4.45
.386	319.3	4.39
1897.386	319.2	4.42

AC = Hough.

C 13.8, bl. purple.

1897.386	312.8	15.38
.386	312.8	15.39
1897.386	312.8	15.39

No change.

Howe 48. Cord. GC. 23712.

 $\alpha = 17^h 24^m 25^s.1$, $\delta = -38^\circ 56' 26''.3$
7.4, yellow; 9.5, bl. purple.

1896.668	229.1	2.85
.668	227.1	3.14
.671	233.0	2.80
1896.669	229.7	2.93

1897.518	232.7	3.27
.518	232.9	3.49

1897.518	232.8	3.38
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Unchanged.

Washburn 29. Cord. ZC. $17^h 15^m 56^s$. $\alpha = 17^h 24^m 44^s.2$, $\delta = -30^\circ 14' 38''.0$
8, yellow; 9, yellow.

1897.502 230.9 1.50

Fixed.

h 4957. Cord. ZC. $17^h 15^m 56^s$. $\alpha = 17^h 24^m 55^s.6$, $\delta = -46^\circ 33' 10''.0$
8.3, yellow; 8.6, yellow.

1897.211	266.9	3.21
.211	266.9	2.85

1897.211	266.9	3.03
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1897.170 266.4 2.70 Cogshall

No change in 60 years.

h 4962 = G. 157 Scorpil.

Cord. GC. 23811.

 $\alpha = 17^h 28^m 10^s.6$, $\delta = -32^\circ 30' 44''.6$
6, yellow; 10.8, bl. purple.

1897.649	101.8	6.09
.649	101.5	6.07

1897.649	101.7	6.08
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Fixed.

h 4963. Cord. ZC. $17^h 18^m 54^s$. $\alpha = 17^h 29^m 24^s.5$, $\delta = -41^\circ 51' 44''.5$
7.6, yellow; 11.8, purple.

1897.701	316.0	6.80
.701	315.5	6.67

1897.701	315.8	6.73
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h 4970. Cord. GC. 23939.

 $\alpha = 17^h 34^m 36^s.0$, $\delta = -48^\circ 35' 24''.0$
6.9, yellow; 8.7, bl. yellow.

1897.227	68.8	7.88
.227	69.1	8.02

1897.227	69.0	7.95
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h 4986. Cord. GC. 24209.

 $\alpha = 17^h 44^m 4^s.6$, $\delta = -26^\circ 17' 43''.8$
7.5, yellow; 10.8, purple.

1897.706	225.7	10.97
.706	226.1	10.63

1897.706	225.9	10.80
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 β 1123. Cord. GC. 24262. $\alpha = 17^h 46^m 39^s.6$, $\delta = -34^\circ 42' 22''.4$
6.9, yellow; 7.2, yellow.

1897.627	226.8	0.32
.627	226.8	0.33

.655	213.3	0.20
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.655	214.0	0.24
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1897.641	220.4	0.27
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Decrease of distance. In a great cluster.

h 5000. Cord. GC. 24396.

 $\alpha = 17^h 52^m 25^s.4$, $\delta = -36^\circ 55' 42''.8$
7, yellow; 8.6, purple.

1896.649	103.5	7.69
.663	107.9	7.78

.666	104.4	7.34
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.668	107.4	7.26
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1896.661	105.8	7.52
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Cord. dpl. = G. 14 Sagittarii.

Cord. GC. 24407.

 $\alpha = 17^h 52^m 39^s.9$, $\delta = -30^\circ 14' 33''.5$
AB.

5.4, orange; 7.3, purple.

1897.775	88.8	5.58
.775	90.1	6.04

1897.775	89.4	5.81
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1897.775 88.0 6.09 Boothroyd

AC.

C 13, purplish.

1897.775 222.4 27.03 See

This object may be h 5003, which is preceding about $1^m 5$; but if so, there is some error in the angle which I cannot explain.O. Stone. Cord. ZC. $17^h 36^m 1^s$. $\alpha = 17^h 55^m 46^s.0$, $\delta = -27^\circ 30' 42''.9$
7.6, yellow; 9, yellow.

1897.706	162.4	3.40
.706	163.4	3.32

.720	164.0	3.38
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.720	162.0	3.43
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1897.714	162.9	3.38
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Hh 552. Cord. GC. 24509.

 $\alpha = 17^h 56^m 19^s.5$, $\delta = -23^\circ 1' 46''.8$
AB.

7, yellow; 11.8, bluish.

1897.625	19.5	6.27
.625	20.2	5.93

.747	20.5	6.37
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.747	20.7	6.17
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1897.686	20.2	6.18
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CD = Harvard.

8, yellow; 11, bl. yellow.

1897.625	281.1	2.47
.625	280.0	2.36

.747	281.9	2.60
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.747	281.6	2.64
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1897.686	281.1	2.52
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AC.

1897.625	211.2	10.77
.747	212.1	10.86
1897.686	211.7	10.81

Remarkable quadruple in the Trifid nebula. No material change.

O. Stone. Cord. DM. — 24° 13' 84.5.

$\alpha = 17^h 58^m 34^s.6$, $\delta = -24^\circ 21' 28''.9$

9.2, yellow; 10, yellow.

1897.671	349.9	3.70
.671	350.0	3.60
1897.671	349.9	3.65

Howe 50. Cord. GC. 24582.

$\alpha = 17^h 58^m 58^s.0$, $\delta = -36^\circ 35' 3''.9$

7.3, yellow; 8.4, purple.

1896.605	5.3	3.35
.649	1.6	3.42
.663	2.5	3.19
.666	4.5	3.06

1896.646	3.5	3.20
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1896.647 2.9 2.94 A. G. Clark

h 5014 = G. 1 Coronae Australis.

Cord. GC. 24598.

$\alpha = 17^h 59^m 35^s.9$, $\delta = -43^\circ 25' 44''.6$

5.4, yellow; 5.6, yellow.

1897.170	247.9	1.84	Cogshall
.186	242.8	1.51	"

1897.178	245.3	1.67	Cogshall
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1897.753	60.1	1.80	See
.753	59.0	1.82	"

1897.753	59.6	1.81	See
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1836.523 68.9 0.89 3n Herschel

Distance has increased and angle diminished, but the motion is slow.

h 5015 = G. 85 Arae.

Cord. GC. 24630.

$\alpha = 18^h 1^m 5^s.7$, $\delta = -45^\circ 46' 40''.7$

6.2, yellow; 12.8, bl. purple.

1897.167	256.2	4.09
.167	255.5	4.04
.230	257.3	4.09

1897.188	256.3	4.07
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Unchanged.

β 243. Cord. DM. — 22° 12' 59.3.

$\alpha = 18^h 2^m 7^s.5$, $\delta = -22^\circ 17' 38''.9$

7.9, yellow; 8.3, yellow.

1897.655	124.0	0.55
.655	124.1	0.49

1897.655	124.1	0.52
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No change.

β 244. Cord. GC. 24667.

$\alpha = 18^h 2^m 16^s.7$, $\delta = -27^\circ 52' 36''.7$

7, or. yellow; 9, purple.

1897.493	257.5	2.24
.493	257.6	2.34
.703	258.7	2.41
.703	258.8	2.30
.706	257.3	2.42
.706	256.0	2.60

1897.634	257.6	2.38
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Unchanged.

Harvard 149 = β 245.

Cord. GC. 24708.

$\alpha = 18^h 3^m 36^s.9$, $\delta = -30^\circ 44' 42''.0$

6.1, or. yellow; 9.5, purplish.

1897.502	353.5	4.74
.502	353.7	4.59

1897.502	353.6	4.67
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Harvard = ϵ Telescopii.

Cord. GC. 24703.

$\alpha = 18^h 3^m 48^s.4$, $\delta = -45^\circ 58' 16''.5$

4.9, or. yellow; 14, bluish.

1897.227	228.5	21.35
.227	227.6	21.04

1897.227	228.1	21.20
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No other measures.

β 759. Cord. GC. 24744.

$\alpha = 18^h 5^m 32^s.4$, $\delta = -39^\circ 21' 48''.7$

AB.

8.3, yellow; 9.2, yellow.

1896.613	120.0	1.88
.666	119.2	1.63
.671	120.1	1.77

1896.650	119.7	1.76
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No change.

AC = h 5028.

C 9.5, yellow.

1896.671	149.7	15.43
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h 5035 = μ Sagittarii.

Cord. GC. 24812.

$\alpha = 18^h 7^m 47^s.0$, $\delta = -21^\circ 5' 6''.1$

AB.

6, or. yellow; 12.5, purple.

1897.649	258.9	17.18
.711	257.6	17.20
.711	258.5	16.69
.736	257.4	17.70
.736	257.9	17.41

1897.709	258.1	17.24
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AC.

C 14, bluish.

1897.736 120.7 25.98

No material change.

h 5034. Cord. GC. 24825.

$\alpha = 18^h 8^m 45^s.5$, $\delta = -46^\circ 3' 19''.2$

6.5, yellow; 9, purple.

1897.186 93.6 2.56 Cogshall

1897.227	95.6	2.55	See
.227	95.1	2.59	"

1897.227	95.3	2.57	See
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Distance slowly increasing.

β 286 = G. 44 Sagittarii.

Cord. GC. 24854.

$\alpha = 18^h 9^m 15^s.9$, $\delta = -20^\circ 25' 3''.0$

6, yellow; 14.9, purple.

1897.736	216.9	6.22
.736	217.6	6.22

1897.736	217.2	6.22
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Unchanged.

β 285. Cord. GC. 24886-890.

$\alpha = 18^h 10^m 40^s.4$, $\delta = -25^\circ 2' 21''.3$

AB.

8.2, yellow; 10, purple.

1897.671	321.8	1.46
.671	321.1	1.52

1897.671	321.4	1.49
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CD = Cord. GC. 24890.

9, yellow; 12, bluish.

1897.671	21.1	1.32
.671	22.4	1.31

1897.671	21.7	1.31
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Unchanged. Remarkable quadruple.

β 760 = η Sagittarii.

Cord. GC. 24888.

 $\alpha = 18^h 10^m 52^s.1$, $\delta = -36^\circ 47' 25''.3$
3.5, or. yellow; 10, purple.

1896.647	102.1	3.90
1897.742	107.1	3.91
.742	106.6	3.80
1897.377	105.3	3.87

No change since 1879.

Arg. dpl. AO ϵ_2 18039-40. $\alpha = 18^h 13^m 38^s.9$, $\delta = -19^\circ 46' 16''.0$
7, yellow; 7.3, yellow.

1897.720	226.2	1.04
.720	226.6	0.92
1897.720	226.4	0.98

No other measures.

Hough. Cord. GC. 25059.

 $\alpha = 18^h 17^m 20^s.3$, $\delta = -26^\circ 13' 12''.7$
7.5, yellow; 8.1, yellow.

1897.627	141.2	0.54
.627	139.8	0.49
1897.627	140.5	0.51

h 5041 = G. 10 Telescopii.

Cord. GC. 25055.

 $\alpha = 18^h 17^m 40^s.9$, $\delta = -53^\circ 41' 42''.8$
7, yellow; 11, purple.

1897.192 258.9 2.83

No change in 60 years.

 β 49. AO ϵ_3 18155. $\alpha = 18^h 18^m 14^s.5$, $\delta = -19^\circ 36' 40''.2$
7.5, yellow; 11.8, bluish.

1897.655	44.9	8.18
.655	44.9	8.14
.747	46.2	8.51
.747	45.6	8.42
1897.701	45.5	8.31

No change.

Cord. dpl. Cord. ZC. 18^h1122. $\alpha = 18^h 19^m 21^s.0$, $\delta = -27^\circ 27' 42''.7$
8, yellow; 8.1, yellow.

1897.673	359.3	5.71
.673	360.0	5.64
1897.673	359.6	5.67

No other measures.

Jacob 201 = G. 65 Sagittarii.

Cord. GC. 25108.

 $\alpha = 18^h 19^m 23^s.6$, $\delta = -20^\circ 35' 41''.6$
5, orange; 9.5, purple.

1897.720	287.6	1.77
.720	289.1	1.88
1897.720	288.3	1.82

Very slow retrograde motion.

1846.14 298.1 1.8 $\pm$ 3 n Jacob

This star is also A. C. 10.

Arg. dpl. = Washburn 144.

AO ϵ_2 18212-3. $\alpha = 18^h 20^m 37^s.1$, $\delta = -20^\circ 54' 39''.4$
8, yellow; 8.1, yellow.

1897.750	40.1	3.13
.750	39.2	3.15
1897.750	39.6	3.14

 β 133 = G. 68 Sagittarii.

Cord. GC. 25160.

 $\alpha = 18^h 21^m 29^s.7$, $\delta = -26^\circ 41' 36''.9$
7.5, yellow; 8, yellow.

1897.627	258.5	1.80
.627	258.8	1.70
.731	259.0	1.72
.731	258.6	1.76
1897.679	258.7	1.74

Slow retrograde motion.

Hh 567. Cord. GC. 25201.

 $\alpha = 18^h 22^m 46^s.8$, $\delta = -25^\circ 6' 18''.3$
8, yellow; 8.3, yellow.

1897.660	102.1	3.11
.660	101.3	3.17
.750	102.2	3.26
.750	101.8	3.01
1897.705	101.8	3.14

1889.746 99.0 1.81 1 n Hough

h 5045. Cord. GC. 25209.

 $\alpha = 18^h 23^m 21^s.9$, $\delta = -48^\circ 4' 46''.8$
6, yellow; 10.5, purple.

1897.227	24.5	8.02
.227	25.7	7.96
1897.227	25.1	7.99

No change in 60 years.

O. Stone. Cord. GC. 25338.

 $\alpha = 18^h 27^m 47^s.5$, $\delta = -34^\circ 53' 29''.5$
7.9, yellow; 8.1, yellow

1896.649	135.9	1.49
.663	137.2	2.00
.663	137.5	1.70

1896.659 136.9 1.73

No change since 1876.

O. Stone. SD. $-20^\circ 52' 44''$. $\alpha = 18^h 37^m 59^s.9$, $\delta = -19^\circ 59' 12''.3$
8, yellow; 8.2, yellow.

1897.720	285.5	1.91
.720	285.5	1.95
1897.720	285.5	1.93

Unchanged.

h 5066 = G. 27 Coronae Australis.
Cord. GC. 25732. $\alpha = 18^h 43^m 57^s.1$, $\delta = -41^\circ 10' 37''.1$
7, yellow; 9, purple.

1896.605	84.0	10.29
.671	83.7	10.16
.671	83.8	9.89
1896.649	83.8	10.11

Very little change.

 β 1033 = ν^1 Sagittarii.

Cord. GC. 25853.

 $\alpha = 18^h 48^m 7^s.9$, $\delta = -22^\circ 52' 3''.8$
AB = β 1033.

5, or. yellow; 13.9, purple.

1897.597	99.1	2.29
.597	100.3	2.22
.655	94.4	2.42
.655	94.3	2.50
1897.626	97.0	2.36

AC = h 5073.

C 12.8, purple.

1897.655 59.2 28.22

Burnham has misidentified this star
as ν^2 Sagittarii; and his place is wrong
accordingly.

Ho. 271. Cord. GC. 25943.

 $\alpha = 18^h 52^m 14^s.8$, $\delta = -20^\circ 33' 24''.8$
6.2, yellow; 13, bl. purple.

1897.720	329.6	17.14
.720	329.6	17.36
.747	329.6	16.91
.747	329.7	17.11
.750	329.8	16.99
.750	330.4	17.16
1897.739	329.8	17.11

Nova? Cord. GC. 25987.

 $\alpha = 18^h 54^m 27.3, \delta = -33^\circ 22' 14.4$
6.5, yellow; 6.7, yellow.

1896.668	282.1	12.91
.736	281.3	13.48
.736	281.7	13.31
1896.714	281.7	13.23

A wide easy object which can hardly be new, though I have not run across it in any Catalogue.

Washburn. 33. Cord. GC. 26040.

 $\alpha = 18^h 56^m 14.0, \delta = -28^\circ 47' 2.3$
7.6, yellow; 8.4, yellow.

1897.627	57.8	2.74
.627	58.0	2.75
1897.627	57.9	2.74

No change.

Harvard 150 = ζ Sagittarii.

Cord. GC. 26041.

 $\alpha = 18^h 56^m 15.1, \delta = -30^\circ 1' 22.8$
4, yellow; 4, yellow.

1896.692	179.8	0.25
1897.668	118.2	0.31
.668	117.9	0.35
.706	117.2	0.25
.706	118.5	0.25
.760	109.9	0.25
.760	112.2	0.24
1897.711	115.8	0.27

1897.760 93.6 0.22 Cogshall

1897.760 98.7 0.18 Boothroyd

This object in 1896 was excessively close, and the distance could hardly have exceeded 0".18; it is now very much easier, and barely separates under good seeing. The motion since 1896 seems to be nearly a quadrant; but this is not remarkable as the body has just past periastron, and the eccentricity may be larger than that given by my orbit. The period is only 18 years.

h 5082 = G. 132 Sagittarii.

Cord. GC. 26063.

 $\alpha = 18^h 57^m 11.1, \delta = -19^\circ 23' 23.2$

AB.

6, orange, 9.8, purple.

1897.733	89.2	7.43
.733	89.3	7.27
1897.733	89.2	7.35

AC.

C 12, purple.

1897.733	112.2	20.69
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Harvard 151 = G. 135 Sagittarii.

Cord. GC. 26094.

 $\alpha = 18^h 58^m 12.3, \delta = -23^\circ 2' 36.8$
7, yellow; 9.9, purplish.

1897.655	307.3	8.43
.655	306.6	8.44
.660	307.2	8.45
.660	307.6	8.41
1897.657	307.2	8.44

No motion.

Hh 595. Cord. GC. 26096.

 $\alpha = 18^h 58^m 21.3, \delta = -21^\circ 40' 38.9$
8, yellow; 8.1, yellow.

1897.747	311.1	0.57
.747	310.2	0.55
1897.747	310.7	0.56

Rapid binary deserving annual attention. The following are all the measures.

1801.673	I cl.	Hersch.
1873.0	40° ± 1"00	1 n Burnham
1879.528	21.7 0.97	2 n Stone
1890.48	352.2 0.58	3 n Burnham
1891.51	359.3 0.48	3 n Burnham
1896.73	317.5 0.44	2 n Aitken
1897.747	310.7 0.56	1 n See

The period is likely to be short, but it can not yet be ascertained.

h 5084 = γ Coronae Australis.

Cord. GC. 26123.

 $\alpha = 18^h 59^m 39.4, \delta = -37^\circ 12' 17.8$
4, yellow; 4, yellow.

1896.668	157.0	2.04
.717	154.9	1.63
.731	160.3	1.62
1896.705	157.4	1.76
1897.766	141.2	2.06
.766	140.1	2.02
1897.766	140.7	2.04

Cord. dpl. Cord. GC. 26129.

 $\alpha = 18^h 59^m 43.0, \delta = -38^\circ 16' 39.0$
7.8, orange; 9.5, purple.

1896.649	196.4	5.07
.663	196.0	5.44
.666	199.7	4.75
1896.659	197.4	5.09

1880.66 185.4 5.01 2 n Cordoba

No other measures.

h 5091. Cord. ZC. 19^h23. $\alpha = 19^h 2^m 6.8, \delta = -31^\circ 7' 38.1$
8.1, yellow; 10, purple.

1896.753	207.3	8.89
.788	206.6	8.54
.789	206.1	8.80
1896.777	206.7	8.74

Harvard 152. Cord. GC. 26333.

 $\alpha = 19^h 8^m 6.9, \delta = -29^\circ 26' 38.7$
8, yellow; 8.6, yellow.

1896.753	268.3	0.84
.788	262.4	0.49
.788	263.7	0.43
1896.777	264.8	0.59

1867.625 263.1 1" 1 n Searle

No other measures; probably fixed.

Cord. dpl. Cord. GC. 26344-43.

 $\alpha = 19^h 8^m 26.3, \delta = -27^\circ 29' 30.3$
7.6, yellow; 8.4, bl. yellow.

1897.711	328.6	1.96
.711	328.1	2.02
1897.711	328.3	1.99

No other measures.

h 5107. Cord. GC. 26464.

 $\alpha = 19^h 14^m 23.8, \delta = -33^\circ 14' 0.0$
7.9, yellow; 10.2, bl. yellow.

1896.755	126.5	13.37
.802	127.0	13.64
.802	126.8	13.77
1896.787	126.8	13.59

 $\Delta 226 = \beta^1$ Sagittarii.

Cord. GC. 26485.

 $\alpha = 19^h 15^m 27.0, \delta = -44^\circ 38' 47.4$
4, yellow; 7.8, purplish.

1897.753	76.7	28.48
.753	76.9	28.56
1897.753	76.8	28.52

No appreciable motion.

Cord. dpl. Cord. ZC. 19^h668. $\alpha = 19^h 16^m 56.1, \delta = -34^\circ 42' 56.8$
8.5, yellow; 8.9, bl. yellow.

1896.758	185.2	3.62
.802	184.2	3.95
.802	184.9	4.01
1896.788	184.8	3.86

No other measures.

h 5115. Cord. GC. 26567.

 $\alpha = 19^h 18^m 17^s.1$, $\delta = -40^\circ 2' 45''.9$
9, yellow; 9, yellow.

1896.608	66.4	10.28
.698	65.5	11.07

1896.653	66.0	10.67
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Unchanged.

h 5113 = G. 180 Sagittarii.
Cord. GC. 26582. $\alpha = 19^h 18^m 46^s.3$, $\delta = -29^\circ 30' 7''.4$
7, or. yellow; 10, purple.

1896.753	168.8	15.39
.772	168.6	15.56
.772	169.1	15.67

1896.766	168.8	15.54
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1897.706	168.7	15.76
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.706	168.7	16.14
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1897.706	168.7	15.95
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Some motion, but the character of
it is uncertain. β 423. Cord. GC. 26635. $\alpha = 19^h 21^m 33^s.3$, $\delta = -29^\circ 41' 57''.4$
7.1, yellow; 8.6, yellow.

1897.706	124.5	1.32
.706	125.3	1.29

1897.706	124.9	1.31
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Unchanged.

h 5120. Cord. GC. 26669.

 $\alpha = 19^h 23^m 5^s.5$, $\delta = -29^\circ 54' 43''.4$
7.5, yellow; 9.5, bl. purple.

1897.706	169.4	4.56
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.706	168.8	4.29
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1897.706	169.1	4.42
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h 2875.

 $\alpha = 19^h 25^m 28^s \pm$, $\delta = -21^\circ 12' 18'' \pm$
8, yellow; 8.4, yellow.

1897.720	332.0	10.90
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.720	331.6	10.93
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1897.720	331.8	10.91
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 β 654 = h² Sagittarii.

Cord. GC. 26843.

 $\alpha = 19^h 30^m 37^s.2$, $\delta = -25^\circ 6' 15''.8$
4.8, yellow; 11.8, purple.

1897.627	162.1	3.15
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.627	161.6	3.14
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.711	167.9	2.55
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.711	166.6	2.70
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.736	163.4	2.88
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.736	164.2	2.91
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1897.691	164.3	2.89
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No motion since 1878.

 β 761 = G. 215 Sagittarii.

Cord. GC. 26890.

 $\alpha = 19^h 33^m 6^s.8$, $\delta = -39^\circ 39' 31''.9$
6.8, orange; 9.3, purple.

1896.602	194.8	2.63
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.636	197.8	1.77
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.663	195.4	2.59
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1896.634	196.0	2.33
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Fixed.

h 5144. Cord. ZC. 19^h1629. $\alpha = 19^h 40^m 7^s.2$, $\delta = -25^\circ 54' 2''.1$
8.1, yellow; 9.1, yellow.

1897.671	10.0	9.79
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.671	10.7	9.73
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1897.671	10.3	9.76
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 β 467. AOe₂ 19936. $\alpha = 19^h 40^m 35^s.0$, $\delta = -21^\circ 45' 57''.2$
7.5, yellow; 10.8, bluish.

1897.747	136.8	3.17
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.747	136.6	3.36
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1897.747	136.7	3.27
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Distance increasing.

O. Stone. Cord. DM. -22^h14231. $\alpha = 19^h 41^m 33^s.7$, $\delta = -22^\circ 4' 8''.3$
7.3, yellow; 8.3, purplish.

1897.747	5.7	2.04
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.747	6.3	2.12
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.775	0 $\pm$	1.78
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.775	0 $\pm$	1.54
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1897.761	3.0	1.62
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Cord. dpl. Cord. ZC. 19^h1758. $\alpha = 19^h 43^m 17^s.1$, $\delta = -34^\circ 30' 23''.4$
8.8, yellow; 10.3, bl. purple.

1896.755	172.0	5.28
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.788	171.8	5.50
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.788	171.9	5.55
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1896.777	171.8	5.44
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No other measures.

Harvard = G. 260 Sagittarii.

Cord. GC. 27354.

 $\alpha = 19^h 53^m 37^s.8$, $\delta = -37^\circ 58' 24''.1$
7.5, orange; 10.5, blue.

1896.668	209.0	22.80
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.695	207.6	20.57
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.695	207.1	20.92
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1896.686	207.9	21.43
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No other measures.

h 5170. Cord. ZC. 20^h44. $\alpha = 20^h 2^m 57^s.6$, $\delta = -35^\circ 27' 29''.2$
7.9, yellow; 10.3, bluish.

1896.758	317.2	12.34
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.799	315.4	12.80
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.799	316.4	13.22
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1896.785	316.3	12.79
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h 5173 = G. 279 Sagittarii.

Cord. GC. 27600.

 $\alpha = 20^h 4^m 36^s.9$, $\delta = -36^\circ 20' 29''.0$
7.1, orange; 10.5, bl. purple.

1896.668	119.7	9.18
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.668	119.3	9.50
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.695	120.2	9.23
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.695	117.7	8.89
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1896.681	119.2	9.20
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No other measures since Herschel's.

 β 762. Cord. GC. 27755. $\alpha = 20^h 10^m 35^s.4$, $\delta = -32^\circ 55' 5''.5$
7.8, yellow; 8.2, yellow.

1896.638	298.9	2.26
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.663	299.1	2.40
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.663	302.5	2.58
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.703	302.8	2.35
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.709	305.3	2.02
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.788	301.4	2.39
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1896.694	301.7	2.33
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No motion.

 Δ 230. Cord. GC. 27768. $\alpha = 20^h 11^m 7^s.5$, $\delta = -40^\circ 29' 35''.9$
7.4, or. yellow; 7.4, or. yellow.

1897.793	99.3	9.67
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.793	99.2	9.81
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1897.793	99.2	9.74
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The other measures indicate that
the circle has been read 10° to small.

h 5188 = G. 289 Sagittarii.

Cord. GC. 27847.

 $\alpha = 20^h 14^m 18^s.4$, $\delta = -29^\circ 30' 43''.0$
7.7, yellow; 12, red. purple.

1896.838	56.9	4.16
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.843	60.1	3.86
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.843	59.5	4.31
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1896.841	58.8	4.11
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Slow retrograde motion.

Howe 103. Cord. ZC. 20^h419. $\alpha = 20^h 14^m 24.2^s$, $\delta = -29^\circ 29' 6''.4$
9.2, yellow; 10, yellow.

1896.838	188.1	4.58
.843	185.3	4.11
.843	184.6	3.41
1896.841	186.0	4.03

No motion.

h 5189. Cord. GC. 27871.

 $\alpha = 20^h 15^m 17.3^s$, $\delta = -37^\circ 13' 3''.2$
8, yellow; 9, yellow.

1896.600	292.8	7.95
.605	296.2	7.54
1896.602	294.5	7.74

No change in 60 years.

 β 763 = π^2 Sagittarii.

Cord. GC. 27909.

 $\alpha = 20^h 17^m 5.4^s$, $\delta = -42^\circ 44' 38''.0$ AB = β 763.

7, yellow; 8.9, yellow.

1897.777	195.2	1.34
.777	195.1	1.46
1897.777	195.1	1.40

 $\frac{1}{2}$ AB, C.

C 14, bluish.

1897.777 209.3 29.31

This component has not been seen before.

AB is in slow retrograde motion, 14° being described in 8 years; interesting triple.

Ho. 456. Cord. GC. 27925.

 $\alpha = 20^h 17^m 30.7^s$, $\delta = -27^\circ 3' 18''.0$
7.8, yellow; 12, bluish.

1896.829	212.7	14.29
.838	211.8	13.85
.838	212.5	14.54
1896.835	212.3	14.23
1897.717	212.0	14.88
.717	212.1	14.74
1897.717	212.1	14.81

Arg. dpl. AO ϵ_2 20449-50. $\alpha = 20^h 18^m 24.0^s$, $\delta = -18^\circ 39' 38''.2$
8, yellow; 8.6, yellow.

1897.747	107.7	2.53
.747	108.8	2.17
.753	109.1	2.48
.753	109.6	2.54
1897.750	108.8	2.43

No other measures.

Syd₁ 321. Cord. GC. 28001. $\alpha = 20^h 20^m 24.9^s$, $\delta = -37^\circ 43' 32''.2$
7.2, reddish; 8.2, reddish.

1896.636	97.5	0.55
.671	103.0	0.87
.698	98.7	0.91
1896.668	99.7	0.78

No material change.

Howe. Cord. GC. 28007.

 $\alpha = 20^h 20^m 28.6^s$, $\delta = -26^\circ 57' 6''.6$
8.5, yellow; 9.6, yellow.

1896.829	56.1	2.94
.838	51.5	2.79
.838	51.6	2.51
1896.835	53.1	2.75
1897.791	50.4	3.23
.791	49.6	3.01
1897.791	50.0	3.12

Mitchel 135 = β 60 = π Capricorni.

Cord. GC. 28036.

 $\alpha = 20^h 21^m 35.8^s$, $\delta = -18^\circ 32' 22''.0$
4.9, yellow; 7.8, bl. yellow.

1897.731	148.3	3.15
.731	146.1	3.20
.753	146.2	3.77
.753	145.3	3.69
1897.742	146.5	3.45

Discovered by Mitchel in 1846;
no certain change in 50 years.

Wilson. Cord. GC. 28086-7.

 $\alpha = 20^h 23^m 35.7^s$, $\delta = -27^\circ 38' 42''.7$
7.6, yellow; 11.2, bluish.

1897.717	22.4	7.37
.717	21.3	7.41
1897.717	21.8	7.39

Gilliss 259. Cord. GC. 28114.

 $\alpha = 20^h 25^m 11.3^s$, $\delta = -41^\circ 13' 58''.1$
7.5, yellow; 7.5, yellow.

1896.602	154.3	3.17
.641	151.6	3.21
.666	151.3	2.77
1896.636	152.4	2.85

h 5206. Cord. GC. 28136.

 $\alpha = 20^h 26^m 30.3^s$, $\delta = -31^\circ 43' 13''.1$
7.8, or. yellow; 9.9, purple.

1896.753	191.6	16.57
.799	192.4	16.27
.799	192.5	15.90
1896.784	192.2	16.25

Very little change in 60 years.

Lal. dpl. = Arg. dpl.

Cord. GC. 28145.

 $\alpha = 20^h 26^m 51.7^s$, $\delta = -16^\circ 56' 52''.5$
7.9, yellow; 7.9, yellow.

1897.747	300.9	0.41 [est. 0.24]
.747	298.7	0.35
1897.747	299.8	0.38

The duplicity of this remarkable object was noticed by Lalande, and afterwards by Argelander. I do not find it in the Catalogues of double stars. The Catalogue places give:

Lal.: $\Delta\alpha = -0.03$; $\Delta\delta = +1.2$;
 $\theta = 19.7$; $\rho = 1.27$.Arg.: $\Delta\alpha = +0.21$; $\Delta\delta = +7.6$;
 $\theta = 338.4$; $\rho = 8.17$.

As the magnitudes are equal, two interpretations of the angles are possible; these results are moreover very rough, and not to be trusted too implicitly. The system is now exceedingly difficult in the great telescope, and looks like a binary; it needs very careful attention for the next few years. If the above Catalogue places are approximately correct, there is retrograde orbital motion of great interest.

Jacob 217. Cord. GC. 28147-6.

 $\alpha = 20^h 27^m 8.4^s$, $\delta = -40^\circ 53' 47''.2$
8, yellow; 9, bl. purple.

1896.760	222.0	4.29
.766	222.6	4.08
.799	222.1	4.58
1896.775	222.2	4.32

h 2975. Cord. GC. 28157.

 $\alpha = 20^h 27^m 40.7^s$, $\delta = -22^\circ 34' 13''.4$
7, yellow; 11.8, bl. purple.

1897.589	20.9	9.35	Cogshall
.589	20.7	9.45	»
.655	21.7	9.40	See
.655	21.6	9.56	»
1897.622	21.2	9.44	

h 5207. Cord. GC. 28175.

 $\alpha = 20^h 28^m 28.1^s$, $\delta = -34^\circ 15' 51''.7$
7.8, yellow; 9.9, bluish.

1896.755	256.6	9.82
.802	257.3	10.19
.802	257.6	10.33
1896.786	257.2	10.11

No other measures since Herschel's.

Washburn 40. AO_{e2} 20773.

$$\alpha = 20^{\text{h}} 37^{\text{m}} 43^{\text{s}}.1, \delta = -19^{\circ} 50' 21''.0$$

AB.

8.5, yellow; 12.6, bluish.

1896.832	188.1	3.782
.838	187.2	4.52
.838	185.5	4.51

1896.836	186.9	4.28
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No change.

CD.

8.5, yellow; 10.5, yellow.

1896.832	355.0	5.12
.838	354.4	4.22
.838	353.5	4.53

1896.836	354.3	4.62
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No motion.

AC.

1896.836 247.8 144.85

A remarkable quadruple, much like ϵ Lyrae.h 2991. Cord. DM. $-24^{\circ} 16' 23.8$.

$$\alpha = 20^{\text{h}} 38^{\text{m}} 30^{\text{s}}.2, \delta = -24^{\circ} 0' 28''.2$$

8.3, yellow; 13, bluish.

1896.826	89.2	6.56
.838	87.7	7.48
.838	86.8	7.49

1896.834	87.9	7.18
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 β 674. SD. $-21^{\circ} 58' 14$.

$$\alpha = 20^{\text{h}} 39^{\text{m}} 10^{\text{s}}.7, \delta = -21^{\circ} 15' 3''.0$$

7, yellow; 9.8, purple.

1897.791	[87.5]	1.64
.791	[87.8]	1.62
.804	102.4	1.74
.804	103.9	1.76

1897.797	103.1	1.69
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h 5220 = G. 49 Capricorni.

Cord. GC. 28466.

$$\alpha = 20^{\text{h}} 40^{\text{m}} 28^{\text{s}}.4, \delta = -27^{\circ} 13' 56''.2$$

6.4, yellow; 9.6, bl. yellow.

1897.660	355.0	18.30
.660	354.9	17.78
.736	354.7	18.00
.736	354.8	17.89

1897.698	354.8	17.99
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 β 153. Cord. GC. 28489.

$$\alpha = 20^{\text{h}} 41^{\text{m}} 22^{\text{s}}.1, \delta = -26^{\circ} 46' 51''.6$$

6.5, yellow; 11, purple.

1896.815	278.3	1.39
.816	279.1	1.56
.845	281.4	1.42
.845	281.3	1.58

1896.831	280.0	1.49
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1897.742	274.3	1.64
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.742	274.3	1.68
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1897.742	274.3	1.66
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No material change.

h 2998. AO_{e2} 20874-5.

$$\alpha = 20^{\text{h}} 43^{\text{m}} 27^{\text{s}}.3, \delta = -20^{\circ} 59' 25''.6$$

8.1, yellow; 8.5, yellow.

1897.753	140.7	6.35
.753	140.6	5.97

1897.753	140.7	6.16
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No other measures since Herschel's.

h 5224 = α Microscopii.

Cord. GC. 28544.

$$\alpha = 20^{\text{h}} 43^{\text{m}} 43^{\text{s}}.4, \delta = -34^{\circ} 8' 58''.7$$

4.8, yellow; 9.5, blue.

1896.711	167.1	20.25
.731	166.3	20.05
.731	166.5	20.06

1896.724	166.6	20.12
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Unchanged.

h 5226. Cord. GC. 28557.

$$\alpha = 20^{\text{h}} 44^{\text{m}} 5^{\text{s}}.6, \delta = -27^{\circ} 44' 15''.2$$

7.8, yellow; 9.7, bl. yellow.

1896.835	67.5	18.34
.845	66.3	19.22
.845	66.5	18.86

1896.842	66.8	18.81
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1897.660	68.1	19.05
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.660	68.0	18.91
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1897.660	68.0	18.98
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h 3003 = G. 58 Capricorni.

Cord. GC. 28629.

$$\alpha = 20^{\text{h}} 47^{\text{m}} 9^{\text{s}}.2, \delta = -24^{\circ} 9' 26''.7$$

7, yellow; 11, purplish.

1896.818	212.1	2.4
.845	219.9	2.41
.845	217.0	2.30

1896.836	216.3	2.37
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1897.655	216.0	2.45
.655	216.0	2.14
.736	218.4	2.49
.736	218.7	2.50

1897.696	217.3	2.39
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Fixed for 70 years.

 β 1211. Cord. GC. 28866.

$$\alpha = 20^{\text{h}} 58^{\text{m}} 23^{\text{s}}.0, \delta = -18^{\circ} 30' 24''.2$$

7.8, yellow; 9, bl. yellow.

1897.753	348.1	0.52
.753	349.9	0.52

1897.753	349.0	0.52
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No change.

 β 251. Cord. GC. 29058.

$$\alpha = 21^{\text{h}} 6^{\text{m}} 5^{\text{s}}.9, \delta = -30^{\circ} 59' 50''.0$$

7.8, yellow; 9.6, bl. purple.

1896.736	231.8	3.02
.737	228.6	3.18
.753	233.6	3.03

1896.742	231.3	3.08
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Unchanged.

h 3014. Cord. GC. 29131.

$$\alpha = 21^{\text{h}} 8^{\text{m}} 54^{\text{s}}.0, \delta = -26^{\circ} 19' 29''.0$$

8.2, yellow; 8.7, yellowish.

1896.835	296.3	2.01
.851	301.4	1.94
1897.657	295.2	1.92
1897.114	297.6	1.96

O. Stone 106. Cord. GC. 29203.

$$\alpha = 21^{\text{h}} 11^{\text{m}} 53^{\text{s}}.0, \delta = -27^{\circ} 38' 44''.2$$

8, yellow; 9.8, bl. yellow.

1896.829	238.4	6.72
.851	237.8	7.39
.852	237.5	7.40

1896.844	238.0	7.17
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 β 271 = G. 85 Capricorni.

Cord. GC. 29240.

$$\alpha = 21^{\text{h}} 14^{\text{m}} 0^{\text{s}}.0, \delta = -26^{\circ} 45' 43''.4$$

7.7, yellow; 10.7, purple.

1896.829	242.5	2.95
.835	242.2	3.39
.851	242.1	2.85

1896.838	242.3	3.06
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1897.627	240.3	3.57
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.627	240.4	3.53
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.657	241.8	3.12
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.657	239.8	3.07
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1897.642	240.6	3.32
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No material change.

β 252. Cord. GC. 29244. $\alpha = 21^h 14^m 9^s.0$, $\delta = -27^\circ 43' 32''.6$

8.5, yellow; 8.5, yellow.

1896.815	277.1	2.36
.843	276.9	2.74
.843	276.8	2.68

1896.894	276.9	2.59
----------	-------	------

Unchanged.

 β 766 = θ^2 Microscopii.

Cord. GC. 29314.

 $\alpha = 21^h 18^m 2^s.5$, $\delta = -41^\circ 26' 6''.2$

7, yellow; 8, yellow.

1896.799	279.7	0.96
.799	276.1	0.96
.810	283.9	1.11
.813	284.1	0.79
.813	284.6	0.88

1896.807	281.7	0.94
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1896.813	286.1	0.86	Cogshall
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1897.791	273.4	1.01	See
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.791	272.1	0.96	"
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1897.791	272.7	0.98	See
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Binary in retrograde motion.

h 5269. Cord. GC. 29330.

 $\alpha = 21^h 18^m 38^s.2$, $\delta = -23^\circ 43' 10''.6$

8.3, yellow; 9.5, yellow.

1897.826	338.8	8.80
.826	339.1	9.04

1897.826	339.0	8.92
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h 5266. Cord. ZC. $21^h 537$. $\alpha = 21^h 18^m 44^s.5$, $\delta = -31^\circ 31' 54''.5$

8.1, yellow; 10.1, bluish.

1896.753	272.0	13.36
.766	272.8	13.74
.785	272.8	13.30

1896.768	272.5	13.46
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No other measures since Herschel's.

Howe. Cord. ZC. $21^h 615$. $\alpha = 21^h 21^m 17^s.2$, $\delta = -32^\circ 48' 13''.8$

8, yellow; 8.3, yellow.

1896.703	293.1	1.61
.703	290.6	1.77
.722	292.2	1.93

1896.710	292.0	1.77
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Unchanged; possibly the distance is diminishing.

Cord. dpl. Cord. GC. 29658-9.

 $\alpha = 21^h 34^m 37^s.2$, $\delta = -18^\circ 53' 1''.2$

8, yellow; 8.5, yellow.

1897.753	63.0	5.01
.753	62.9	4.80

1897.753	62.9	4.91
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No other measures.

h 5288. Cord. GC. 29685.

 $\alpha = 21^h 36^m 21^s.1$, $\delta = -38^\circ 23' 17''.0$

7.8, yellow; 9.6, bl. yellow.

1896.758	49.3	18.67
.785	50.4	19.50
.785	51.5	19.83

1896.776	50.4	19.33
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Nova? SD. $-21^\circ 60' 76$. $\alpha = 21^h 37^m 38^s.8$, $\delta = -20^\circ 52' 12''.4$

7.1, yellow; 10.7, bl. purple.

1897.804	57.8	3.71
.804	56.9	3.69

1897.804	57.3	3.70
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Howe 108. Cord. GC. 29725.

 $\alpha = 21^h 38^m 13^s.8$, $\delta = -26^\circ 58' 29''.0$

8.4, yellow; 9.8, bl. yellow.

1896.815	299.8	1.55
.838	300.1	1.22
.838	299.7	1.41

1896.831	299.9	1.39
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1897.627	299.5	1.66
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.627	298.0	1.71
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.657	298.5	1.79
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.657	298.0	1.76
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1897.642	298.5	1.73
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Unchanged.

O. Stone 110. Cord. DM. $-27^\circ 156' 15$. $\alpha = 21^h 41^m 3^s.6$, $\delta = -27^\circ 33' 20''.9$

8, white; 9.2, white.

1897.627	174.8	3.78
.627	174.4	3.98

1897.627	174.6	3.88
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Fixed.

Cord. dpl. Cord. ZC. $21^h 1337$. $\alpha = 21^h 44^m 2^s.2$, $\delta = -26^\circ 6' 28''.3$

8.8, yellow; 9.8, yellow.

1896.802	305.0	2.43
.810	306.7	2.42
.810	307.8	2.18

.835	307.4	2.16
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.843	307.8	2.44
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1896.820	306.9	2.33
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1897.747	303.8	2.87
.747	302.8	2.94

1897.747	303.3	2.91
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No other measures.

O. Stone 111. Cord. GC. 30076.

 $\alpha = 21^h 53^m 50^s.9$, $\delta = -28^\circ 6' 30''.5$

7.7, yellow; 11.5, bl. yellow.

1896.829	35.7	11.79
.843	37.0	12.57
.843	37.4	12.12

1896.839	36.7	12.16
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No motion.

 β 276 = η Piscis Austrini.

Cord. GC. 30101.

 $\alpha = 21^h 55^m 5^s.7$, $\delta = -28^\circ 55' 59''.8$

6.5, yellow; 7, yellow.

1896.714	117.5	1.87
.722	116.9	1.63
.722	116.4	1.57

1896.719	116.9	1.69
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1897.627	118.1	1.96
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.627	117.7	2.13
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1897.627	117.9	2.04
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No change.

Ho. 468. AO ϵ_2 21810. $\alpha = 21^h 55^m 49^s.5$, $\delta = -17^\circ 59' 43''.9$

7.5, or. yellow; 10.8, purple.

1897.829	345.8	3.92
.829	344.2	4.02

1897.829	345.0	3.97
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South 802. Cord. GC. 30146-7.

 $\alpha = 21^h 56^m 57^s.0$, $\delta = -17^\circ 26' 48''.0$

6.9, or. yellow; 6.9, orange.

1897.736	63.5	4.40
.736	62.2	4.09

1897.736	62.8	4.24
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No change in 70 years.

Howe 113. Cord. GC. 30233.

 $\alpha = 22^h 1^m 27^s.2$, $\delta = -28^\circ 32' 5''.6$

7.8, yellow; 9.8, purple.

1896.799	151.1	2.47
.810	149.7	3.01
.810	150.2	2.40

1896.803	150.3	2.63
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Unchanged.

Arg. dpl. = β 170.AOe₂ 21923-4.

$$\alpha = 22^h 3^m 37^s.0, \delta = -18^\circ 58' 22''.6$$

8.2, yellow; 8.4, yellow.

1897.736	57.9	1.66
.736	57.8	1.72
.753	58.7	2.02
.753	58.3	1.82
.856	60.4	1.60
.856	58.5	1.63
1897.782	58.6	1.74

No material change.

 β 769 = G. 32 Piscis Austrini.

Cord. GC. 30325.

$$\alpha = 22^h 5^m 47^s.4, \delta = -34^\circ 57' 24''.2$$

6.1, yellow; 8.1, bl. yellow.

1897.791	342.5	0.46
.791	342.3	0.47
1897.791	342.4	0.46

Not much change, distance probably diminishing.

h 5319. Cord. GC. 30333.

$$\alpha = 22^h 6^m 5^s.3, \delta = -38^\circ 47' 47''.1$$

7.8, yellow; 7.8, yellow.

1896.613	118.3	1.71
.638	119.7	2.45
.666	121.5	2.08
.666	121.3	2.02
1896.646	120.2	2.06

Slow direct motion.

Hh 753 = G. 123 Aquarii.

Cord. GC. 30385-6.

$$\alpha = 22^h 8^m 46^s.6, \delta = -21^\circ 34' 18''.9$$

5.9, or. yellow; 8, bl. purple.

1897.736	117.7	5.02
.736	117.4	5.18
1897.736	117.5	5.10

No change in 70 years.

South 808 = G. 143 Aquarii.

Cord. GC. 30602.

$$\alpha = 22^h 20^m 20^s.2, \delta = -20^\circ 44' 39''.5$$

5.7, yellow; 7.2, bl. yellow.

1897.627	151.7	6.93
.627	150.2	6.88
.753	151.4	6.75
.753	151.8	6.96
1897.690	151.3	6.88

No change in 70 years.

h 5344. Cord. GC. 30791.

$$\alpha = 22^h 29^m 47^s.4, \delta = -39^\circ 14' 31''.7$$

8.2, or. yellow; 10.2, purple.

1896.613	169.2	4.18
.649	170.8	4.79
.666	169.4	4.93
.695	169.5	4.54
.725	167.7	4.82
1896.669	169.3	4.65

Very little change since 1836.

 β 771 = G. 51 Gruis.

Cord. GC. 30814.

$$\alpha = 22^h 31^m 8^s.9, \delta = -41^\circ 6' 24''.0$$

7, or. yellow; 12.5, purple.

1896.758	269.0	2.06
.799	266.2	2.09
.799	263.5	1.91
1897.796	261.7	3.45
1897.037	265.1	2.38

No change.

Innes = G. 52 Gruis.

Cord. GC. 30830.

$$\alpha = 22^h 31^m 59^s.8, \delta = -40^\circ 22' 33''.3$$

7.4, orange; 14, purplish.

1896.758	278.6	3.51
.799	279.3	3.48
.799	280.3	3.33
1896.786	279.4	3.44

No other measures.

Hh 770 = h 5356.

Cord. GC. 30873.

$$\alpha = 22^h 34^m 12^s.2, \delta = -28^\circ 52' 3''.5$$

7.7, yellow; 8.8, purplish.

1896.717	58.8	2.85
.785	60.4	3.33
.785	59.7	3.31
.838	61.8	3.61
1896.781	60.1	3.25

1896.813 61.0 2.85 Cogshall

1897.660	60.9	3.40	See
.736	61.7	3.28	"
.736	61.8	3.28	"
.804	62.4	3.59	"
.804	62.4	3.41	"
1897.748	61.8	3.37	See

No change.

h 5362 = G. 56 Gruis.

Cord. GC. 30909.

$$\alpha = 22^h 36^m 39^s.5, \delta = -47^\circ 43' 21''.2$$

5.9, yellow; 12.1, purple.

1897.711	137.0	7.90
.711	136.9	7.97
.799	132.9	7.72
.799	133.9	7.94
1897.755	135.2	7.88

Slow retrograde motion, and decrease of distance.

O. Stone. Cord. ZC. 22^h1093.

$$\alpha = 22^h 37^m 16^s.8, \delta = -32^\circ 9' 12''.3$$

8, yellow; 9, bl. yellow.

1896.636	28.8	2.22
.649	31.9	3.23
.666	34.8	2.90
.706	35.0	3.09
.788	32.6	2.74
.788	33.0	3.00
1896.705	32.7	2.86

Cord. dpl. = G. 66 Gruis.

Cord. GC. 30999-1000.

$$\alpha = 22^h 40^m 48^s.6, \delta = -47^\circ 27' 58''.5$$

6, orange; 10.2, purple.

1897.799	138.3	10.40
.799	139.1	10.13
1897.799	138.7	10.26

No other measures.

Innes. AOe₂ 22432.

$$\alpha = 22^h 43^m 50^s.6, \delta = -20^\circ 47' 19''.6$$

8.1, yellow; 9.8, purple.

1897.856	319.7	2.70
.856	319.5	2.70
1897.856	319.6	2.70

No other measures.

h 5365 = G. 61 Piscis Austrini.

Cord. GC. 31110.

$$\alpha = 22^h 46^m 8^s.2, \delta = -36^\circ 25' 8''.5$$

7.7, or. yellow; 11.2, purple.

1896.668	282.5	4.99
.731	276.1	4.92
.731	276.1	4.59
1896.710	278.2	4.83

h 5367 = γ Piscis Austrini.

Cord. GC. 31123.

 $\alpha = 22^h 46^m 58^s.3$, $\delta = -33^\circ 24' 20''.1$

4.5, yellow; 9, purple.

1896.714 267.5 4.46

Slight retrograde motion.

Howe 117 = β 772 = δ Piscis Austrini.

Cord. GC. 31184.

 $\alpha = 22^h 50^m 24^s.6$, $\delta = -33^\circ 4' 26''.2$

4.2, orange; 10, purple.

1896.703 234.6 4.98

.714 236.7 5.31

1896.709 235.6 5.14

Discovered by Howe in 1877. No material change.

h 5371. Cord. GC. 31221-20.

 $\alpha = 22^h 52^m 20^s.8$, $\delta = -26^\circ 38' 0''.3$

7.7, yellow; 9.7, purplish.

1896.829 342.8 8.53

.838 343.9 8.87

.838 343.9 9.06

1896.835 343.5 8.82

1897.627 344.4 8.90

.657 343.4 8.93

1897.642 343.9 8.91

Practically fixed.

 β 179. Cord. GC. 31282. $\alpha = 22^h 55^m 30^s.5$, $\delta = -22^\circ 47' 48''.4$

7.9, yellow; 9.3, bl. yellow.

1896.835 116.5 13.55

.838 114.1 13.65

.838 115.4 13.76

1896.837 115.3 13.65

Unchanged.

 β 1011 = G. 79 Gruis.

Cord. GC. 31304.

 $\alpha = 22^h 57^m 0^s.5$, $\delta = -36^\circ 57' 26''.5$

6.3, yellow; 8.2, yellow.

1896.602 294.1 1.96

.728 285.5 1.30

.728 285.1 1.30

.755 299.2 1.79

.772 293.7 1.72

1896.717 291.5 1.61

Slow retrograde motion.

 β 384 = G. 203 Aquarii.

Cord. GC. 31311.

 $\alpha = 22^h 57^m 18^s.2$, $\delta = -19^\circ 4' 44''.5$

6, yellow; 9.2, purple.

1897.660 69.4 1.46

.660 68.9 1.28

1897.660 69.1 1.37

Very slow retrograde motion.

Cord. dpl. Cord. GC. 31333-4.

 $\alpha = 22^h 58^m 15^s.6$, $\delta = -46^\circ 42' 23''.3$

7.5, yellow; 9.4, purple.

1897.796 105.4 3.43

.796 105.6 3.67

1897.796 105.5 3.55

Jacob 238 = θ Gruis.

Cord. GC. 31380.

 $\alpha = 23^h 1^m 14^s.9$, $\delta = -44^\circ 3' 36''.7$

3.6, yellow; 7, purple.

1897.657 24.3 2.99

.657 23.5 2.89

1897.657 23.9 2.94

Fine binary in slow direct motion.

Discovered by Jacob in 1845:

1845.88 12.1 2.5 in Jacob

Howe 119. Cord. GC. 31492.

 $\alpha = 23^h 7^m 32^s.6$, $\delta = -32^\circ 51' 33''.4$

7.2, yellow; 9.5, bl. purple.

1896.703 265.2 7.02

.728 267.0 7.33

.728 267.1 7.11

1896.720 266.4 7.23

No change.

h 5387. Cord. GC. 31506.

 $\alpha = 23^h 7^m 59^s.3$, $\delta = -41^\circ 28' 46''.1$

7.9, yellow; 9.3, bl. yellow.

1896.695 [270 $\pm$] [5 $\pm$]

.758 278.2 8.18

.775 279.2 7.69

1896.766 278.7 7.93

No motion in 60 years.

Cord. dpl. Cord. ZC. 23^h349. $\alpha = 23^h 14^m 11^s.2$, $\delta = -37^\circ 13' 0''.3$

8.3, yellow; 9.8, bluish.

1896.678 56.1 2.24

.731 57.7 1.28

.731 58.6 1.82

1896.714 57.5 1.71

Elegant system. No other measures.

Howe. Cord. GC. 31712.

 $\alpha = 23^h 19^m 23^s.8$, $\delta = -27^\circ 54' 0''.4$

7.5, yellow; 11, purple.

1896.799 268.2 6.53

.838 267.0 6.54

1896.819 267.6 6.53

1896.829 [273.2] 5.68 Cogshall

1897.627 266.9 7.12 ,

1897.228 266.9 6.40 Cogshall

1897.753 265.7 6.85 See

.753 265.6 7.01 ,

1897.753 265.6 6.93 See

Harvard 176.

 $\alpha = 23^h 20^m 53^s.8$, $\delta = -21^\circ 54' 44''.5$

9, yellow; 9.2, yellow.

1896.815 56.2 4.05

.843 50.1 4.67

.843 50.8 5.02

1896.834 52.4 4.61

O. Stone. Cord. ZC. 23^h573. $\alpha = 23^h 22^m 27^s.1$, $\delta = -27^\circ 13' 44''.3$

8, yellow; 8.9, bl. yellow.

1897.627 219.3 1.70

.627 217.1 1.83

1897.627 218.2 1.76

No motion.

Howe 122 = G. 21 Sculptoris.

Cord. GC. 31944.

 $\alpha = 23^h 31^m 48^s.4$, $\delta = -32^\circ 25' 27''.8$

7.7, orange; 11, blue.

1896.753 252.3 5.76

.755 251.1 5.26

.755 250.5 5.11

1896.755 251.3 5.38

Unchanged.

h 5417 = G. 26 Sculptoris.

Cord. GC. 32078.

 $\alpha = 23^h 39^m 16^s.9$, $\delta = -26^\circ 48' 3''.9$

6, or. yellow; 10.2, purple.

1896.813 320.0 9.02

.851 319.9 8.77

.851 320.6 8.79

1896.835 320.2 8.86

1897.627 318.6 9.06

Very little change.

Cord. dpl. Cord. ZC. $23^h 10^m 41^s$.
 $\alpha = 23^h 39^m 29^s.0$, $\delta = -45^\circ 48' 4''.6$
 AB.

7.2, yellow; 8.3, yellow.

1897.799	305.2	4.35
.799	307.0	4.30
1897.799	306.1	4.32

AC.

C 12, bl. yellow.

1897.799	8.4	24.49
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Hh 807 = i^2 Aquarii.

Cord. GC. 32105-7.

$\alpha = 23^h 40^m 49^s.1$, $\delta = -19^\circ 14' 2''.9$

6.5, yellow; 7.3, yellow.

1897.753	137.7	6.06
.753	136.8	6.28
1897.753	137.2	6.17

No change in 70 years.

h 5423 = G. 29 Sculptoris.

Cord. GC. 32180.

$\alpha = 23^h 44^m 38^s.9$, $\delta = -25^\circ 53' 11''.9$

6, yellow; 12.4, bl. purple.

1897.627	306.5	13.55
.627	306.6	13.74
.711	304.2	13.65
.736	305.4	13.79
.747	304.9	13.18
1897.689	305.5	13.58

Unchanged.

Miscellaneous Stars north of -15° .

The following objects, north of -15° , and thus outside of the region to which our work is usually confined, have been measured for some special reason. It seems desirable to subjoin these few miscellaneous results to the foregoing Catalogue.

A.C. 2 = G. 318 Ceti. Cord. GC. 3573.

$\alpha = 3^h 13^m 14^s.9$, $\delta = -1^\circ 17' 38''.3$

5.3, yellow; 10, purplish.

1897.671	No certain trace of the companion		
.832	151.0	0.37	See, est. 0.73
.832	146.3	0.39	"
.832	147.7	0.50	"
1897.832	148.3	0.42	See
1897.832	147.5	0.51	Boothroyd

Distinctly divided with 1500, excellent and careful measures. This object has not been seen since 1888, when Burnham measured it with the Lick telescope; and prior to that date there is only one measure, by Dawes in 1854, when the distance was $0.7 \pm$. It is recognized as one of the most difficult of known double stars, but I make it a shade easier than G. 79 Eridani, which is one of our new stars very similar in character. The measures are:

1854.800	71.9	$0.73 \pm$	3 n	Dawes
1888.769	112.8	0.45	2 n	Burnham
1897.832	148.3	0.42	1 n	See
1897.832	147.5	0.51	1 n	Boothroyd

Burnham searched for this object many times at the Lick, after his measures in 1888, and as the great telescope failed to show the companion, he suspected it to be variable. It is now closer than when the searches were made at Mt. Hamilton, and its further investigation will require exceptionally steady atmosphere. It is now clear that the system is a binary in moderately rapid direct motion.

β 883. Lal. 9091.

$\alpha = 4^h 45^m 38^s.7$, $\delta = +10^\circ 53' 52''.1$

7.8, yellow; 7.8, yellow.

1897.622	38.6	0.25, est. 0.28^*
.832	36.1	0.36, est. 0.3
.832	37.5	0.34
.832	39.4	0.30
1897.779	37.9	0.31

1897.622	37.9	0.28	Cogshall
1897.832	39.8	0.35	Boothroyd

The motion since the observations made at Mexico, and communicated to the Royal Astronomical Society at the May Meeting (1897), has been very slight, which indicates that the companion is now near its maximum distance and hence slackening its motion according to the law of areas. It may be another year before the motion again becomes rapid. It is now always easy, with a black line between the components.

*) Certainly closer than when last seen at Mexico.

Bessel-Schaeberle. α Canis Minoris.

$\alpha = 7^h 34^m 6^s.5$, $\delta = +5^\circ 28' 44''.4$

1, yellow; 14, purplish.

1897.829	327.4	4.80	See
1897.829	328.6	4.82	Boothroyd

About as difficult as the companion of Sirius in its present position, but a little wider. This system, like that of η Centauri, requires a very steady atmosphere. The measures indicate orbital motion since Schaeberle's discovery in 1896.

γ Virginis. Cord. GC. 17291.

$\alpha = 12^h 36^m 36^s.5$, $\delta = -0^\circ 54' 0''.1$

1897.460	331.2	5.84	See
.460	331.7	5.82	"
1897.460	331.4	5.83	See
1897.460	331.0	5.66	Cogshall

α^2 Capricorni. Cord. GC. 27800.

$\alpha = 20^h 12^m 30^s.2$, $\delta = -12^\circ 51' 17''.7$

AB = h 608.

3, orange; 11, purplish.

1896.636	152.6	7.41
.663	152.4	7.56
.666	153.3	7.33
1896.655	152.8	7.44

BC = A. G. Clark.

11, purplish; 11, purplish.

1896.663	57.3	1.15
.666	61.0	1.17
1896.664	59.1	1.16

Very little motion.

β 151 = β Delphini.

$\alpha = 20^h 32^m 51.5$, $\delta = +14^\circ 14' 49.5$

1896.728	356.8	0.56
.760	359.2	0.73
.791	355.0	0.72
1896.760	357.0	0.67
1897.760	353.3	0.62
.760	354.7	0.69
1897.760	354.0	0.65

While pointing the great telescope for Mr. Alvan G. Clark, on Sept. 23, 1896, I noticed a very faint third component to this system. Mr. Clark recognized the object, and set the micrometer to the angle $108^\circ 7$, and estimated

Lowell Observatory, Mars' Hill, Flagstaff, Arizona, 1898 Jan. 12.

the distance at $6''$. It is extremely difficult, and requires a very steady atmosphere. I have not tried to measure it since 1896, when we got the following rather discordant results.

1896.728	106.4	7.88, est. 7"
.732	113.6	4.86
.736	115.0	5.40
.760	111.3	4.77
.791	110.0	5.38
1896.749	111.2	5.66

G. 12 Aquarii. Cord. GC. 28612.

$\alpha = 20^h 46^m 7.5$, $\delta = -6^\circ 0' 0.4$

6, yellow; 7, yellow.

1897.760	185.4	0.28
.760	185.1	0.23
1897.760	185.3	0.25

Exceedingly close, but nicely separated. This well known binary (F. 4 Aquarii) is following the orbit I have assigned with great accuracy.

T. F. F. See.

Beobachtungen auf der Privatsternwarte Jena II.

$\varphi = +50^\circ 56' 15.7$, $\lambda = 46^m 22.02$ östl. Gr., Höhe 174 Meter.

1. Sternbedeckungen.

1897	Stern	Phase	M. Z. Jena	hieraus abgeleitet
Febr. 13	37 Geminorum	E. d.	$8^h 41^m 3.4$	$0 = + 8.7 + 0.1995612 \Delta(a-a) - 9.9108652 \Delta(\delta-d)$
18	BAC. 3873	A. d.	$7 26 53.0$	$0 = + 4.5 + 0.2284167 \Delta(a-a) - 9.5639198 \Delta(\delta-d)$
April 6	BD. — 13°3692	E. d.	$10 59 29.2$	$0 = -12.5 + 9.8245899 \Delta(a-a) + 0.3076788 \Delta(\delta-d)$
Juni 14	χ^1 Sagittarii	E. h.	$12 17 32.4$ *)	$0 = -11.2 + 0.1580799 \Delta(a-a) - 9.2775005 \Delta(\delta-d)$
Juli 12	BAC. 6194	E. d.	$8 56 52.3$	$0 = -11.9 + 0.1039976 \Delta(a-a) + 0.3867245 \Delta(\delta-d)$
13	χ^1 Sagittarii	E. d.	$10 21 36.2$	$0 = -2.6 + 9.5574907 \Delta(a-a) + 0.2785179 \Delta(\delta-d)$
13	χ^1 Sagittarii	A. h.	$11 25 49.5$ †)	$0 = + 2.9 - 0.2166026 \Delta(a-a) + 9.6413980 \Delta(\delta-d)$
Oct. 12	μ Arietis	A. d.	$7 3 15.4$	$0 = -4.8 + 0.2111132 \Delta(a-a) - 0.0677514 \Delta(\delta-d)$

*) Unruhige Luft. †) Stern schon vom Mondrande getrennt.

Sämtliche Beobachtungen am 6 zöll. Refractor mit 154 f. Vergrößerung. Die Zeitbestimmungen geschahen im unmittelbaren Anschluss an die Beobachtungen. Nur am 12. October ist der Uhrstand interpolirt, Zeitbestimmung am 14. October angestellt. Die Coefficienten sind Logarithmen, Oerter der Sterne und des Mondes nach dem Naut. Almanac; $k = 0.272518$, $\log r = 9.991389$.

2. Erscheinungen der Jupitersmonde.

Sämtliche Beobachtungen der Jupitersmonde am 6 zöll. Refractor mit Vergr. 154, nur am 7. März mit Vergr. 196.

Verfinsterungen.

1897	Phase	M. Z. Jena	B — R	
			Berl. Jahrb.	N. A.
Febr. 20	II Ec. D.	$12^h 9^m 30.1$	$-1^m 9.3$	$-1^m 16.9$
April 10	III Ec. D.	$7 48 32.5$	$+3 30.3$	$+3 14.4$
10	III Ec. R.	$11 7 8.8$	$+0 30.4$	$+0 23.8$

Es sind die Zeiten des ersten resp. letzten Lichtschimmers notirt.

Bedeckungen und Vorübergänge.

1897	Phase	M. Z. Jena	B — R
			N. A.
Febr. 20	I Oc. R.	$9^h 2^m 50.0$	$+0^m 5$
März 7	I Tr. I.	$7 31 14.5$	$+1.9$
17	II Oc. D.	$8 11 14.0$	-1.1

Die Zeiten sind im Mittel aus 1. und 2. Contact angegeben.