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Variables to be observed

Name Star.	Place.	Estimated Interval	Eye + Ear Trans.	Selection Comp. Stars
1 T Cassiop. III	0h 15m +55.0			
2 R Andromed.	0 16 +37.8		108. 131.	
3 S Ceti.	0 17 −10.1	108. 96. c	108. 97. c	✓
4 B Cassiop.	0 17 +63.3			
5 T Piscium.	0 24 +13.8	108. 85. c	108. 85. c	✓
7 S Cassiop.	1 9 +71.8			
8 S Piscium.	1 10 +8.2			
9 R Piscium. HP	1 23 +2.1			
10 S Arietis.	1 57 +11.8	?	108. 133. c	
11 R Arietis.	2 8 +24.4	108. 104 c	108. 104 c	✓
12 o Ceti. III	2 12 −3.6	———	108. 188	
13 S Persei.	2 12 +57.9			
14 R Ceti. III	2 19 −0.8	~~~~	108. 66. c	c ✓
15 T Arietis.	2 40 +16.9	———	108. 189. c	✓
16 R Persei.	3 21 +35.2	108. 104 c	108. 103 c	✓
20 T Tauri. III?	4 14 +19.2	108. 68	108. 68.	
21 R Tauri. III	4 20 +9.8		108. 149. c	
22 S Tauri.	4 21 +9.6			
23 V Tauri.	4 44 +17.3			
24 R Orionis.	4 51 +7.9			
26 R Leporis. IV	4 53 −15.0			
27 R Aurigae.	5 6 +53.4			
27a S Aurigae.	5 18 +34.0			
28 S Orionis.	5 22 −4.8	109. 7. c	109. 5. c	✓
28a T (?) Orionis.	5 29 −5.			
33 R Monoc.	6 31 +8.9	108. 77. c	108. 76. c	✓
35 R Lyncis.	6 49 +55.5			
37 R Gem. bolides	6 59 +22.9			
38 R Cam. Mm. III?	7 1 +10.2			

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Variables to be observed

Name Star.	Place.	Ext. Intervals.	Eye & Ear Transits	Selections.
38a U Gem.	7 15 +13.4			
39 S Cam. Mmi. III!	7 25 +4.6			
40 T Cam. Mmi.	7 26 +12.0			
40a W Cam. Mmi.	7 33 +8.7			
41 S Gem.	7 34 +23.8	108.99.	108.99.	
42 T Gem.	7 41 +24.1			
43 U Gem.	7 46 +22.4			✓
43a W Puppis. l	7 54 −12.4	108.55. c	108.55. c	
44 R Cancri III	8 9 +12.2			
45 V Cancri	8 13 +17.7			
46 U Cancri.	8 27 +19.4			
47 S Cancri.	8 36 +19.6			
48 S Hydrae. IV?	8 46 +3.6			
49 T Cancri.	8 48 +20.4			
50 T Hydrae.	8 49 −8.6			
51 R Leo. Mmi. III	9 37 +35.2			
52 R Leonis. III?	9 40 +12.1			
52a V Leonis.	9 52 +22			
52b W Leonis.	10 16 +14.7			
53 R Urs. Maj. III!	10 34 +69.5			
55 R Crateris. ?	10 53 −17.5			
56 S Leonis.	11 3 +6.2			
57 T Leonis.	11 31 +4.2			
58 X Virginis.	11 54 +9.9			
59 R Com. Ber.	11 57 +19.6			
60 T Virg.	12 7 −5.2			
61 R Corvi.	12 12 −18.4			
61a Y(2) Virg.	12 26 −3.6			
62 T Urs. Maj. III	12 30 +60.3			

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Variables to be observed

Name Star.	Place.	Est. Intervals.	Eye & Ear Transits	Selection.
63 R Virg. III	12 31 +7.8			
64 S Urs. Maj.	12 38 +61.9			
65 W Virg.	12 44 +6.3			
66 Z Virg.	13 19 −2.6			
67 V Virg.	13 20 −2.4			
68 R Hydræ. III!	13 22 −22.5			
69 S Virg.	13 25 −6.4			
69a Z Virg.	14 21 −12.6			
70 T Bootis.	14 7 +19.7			
71 S Bootis.	14 18 +54.5			
72 R Camel.	14 29 +84.5			
73 R Bootis. III	14 31 +27.4			
73a U Bootis.	14 48 +18.3			
74a T Libræ.	15 2 −19.5			
76 S Libræ.	15 13 −19.9			
77 S Serpentis. IV	15 15 +14.8			
78 S Coronæ.	15 15 +31.9			
79 R Coronæ.	15 43 +28.6			
80 R Serpentis III	15 44 +N.6			
80a V Cor. Bor.	15 44 +40.0			
81 R Libræ.	15 45 −15.8			
82 T Coronæ.	15 53 +26.3			
83 R Herculis. II?	16 0 +18.8			
83a V Scorpii.	16 3 −19.8			
84 T Scorpii.	16 8 −22.6			
85 R Scorpii.	16 9 −22.6			
86 S Scorpii.	16 9 −22.5			
86a V Ophi.	16 14 −7.4			
87 U Scorpii.	16 14 −17.5			

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Variables to be observed

Name Star.	Place.	Est. Intervals.	Eye + Ear Transits	Selection.
87a W Oph.	16 19 −12.1			
88 U Herculis. III!	16 19 +19.2			
90 T Oph.	16 25 −15.8			
91 S Oph.	16 26 −16.9			
91a R Cor. Bor.	16 32 +72.6			
91b R Draco.	16 32 +67.1			
91c W Herculis.	16 30 +37.6			
92 S Herculis. III!	16 45 +15.2			
93 − Oph.	16 51 −12.7			
93a V Herculis.	16 53 +35.3			
94 R Oph.	16 59 −15.9			
97 − Serpen.	17 22 −21.4			
100 T Herculis.	18 4 +31.0			
101 T Serpentis.	18 22 +6.2			
102 V Sagittarii.	18 23 −14.4			
103 U "	18 23 −19.2			
104 T Aquilæ.	18 39 +8.6			
105 R Scuti.	18 40 −5.9			
106 S Cor. Austr.	18 51 −37.1			
109 R " "	18 52 −37.1			
110 R Aquilæ III	18 59 +8.0			
111 T Sagitt.	19 8 −17.2			
112 R Sagitt. III	19 8 −19.6			
113 W Sagitt.	19 11 −19.3			
114 R Cygni.	19 33 +49.9			
115 U Vulpec.	19 42 +27.6			
116 S Vulpec.	19 42 +26.9			
117 X Cygni. III	19 45 +32.6			
119 S Cygni.	20 2 +57.6			

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Variables to be observed.

Name Star.	Place.	Est. Intervals.	Eye & Ear Transits.	Selections.
120 R Capric.	20h 3m −14.7°			
121 S Aquilæ.	20 5 +15.2			
122 R Sagittæ.	20 7 +16.3			
123 R Delphini.	20 8 +8.7			
124 P Cygni.	20 12 +37.6			
125 U Cygni. IV	20 15 +47.4			
126 R Cephei.	20 35 +88.7			
127 S Delphini. III	20 36 +16.6			
127a V Cygni. IV	20 36 +47.6			
128 T Delphini.	20 39 +15.9			
129 U Capric.	20 40 −15.3			
131 T Aquarii.	20 42 −5.7			
132 R Vulpec. III	20 58 +23.2	10h 8. 49.	10h 8. 49.	
132a T Cephei.	21 8 +67.9			
133 T Capric.	21 14 −15.8			
Nova Cygni. (1876)	21 36 +43.7			
134 S Cephei. IV	21 37 +74.0			
136 T Pegasi.	22 2 +11.8	10h. 45.	10h. 46.	
137a R Lacertæ.	22 37 +41.6			
138 S Aquarii.	22 49 −21.1	10h. 88	10h. 88	
140 R Pegasi.	22 59 +9.8			
141 S Pegasi.	23 13 +8.1			
142 R Aquarii. III	23 36 −16.1	10h. 92	10h. 92	
143 R Cassiop.	23 51 +50.6			

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Objects to be examined with Equatorial.

Dm. +0° 588 3ʰ 53ᵐ.8 +0° 58′ 9.1 mt. Lun Lewis 234, 372.
Dm. +54° 48′ 0 15.4 +55° 00′ 8.5 – Dm. 8.6 & M. 11.1 10.7 = E.S. 2 M.

See p. 10 v.

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Variables to be observed.

Name Star.	Place.	Date.	Obs.	Nom. mag.	Date.	Obs.	Nom. mag.	Date.	Obs.	Nom. mag.
14 R Ceti.	2h 19m −0.8	Nov. 28	S. H.	13						
43 U Gem.	7 46 +22.4									
20 T Tauri.	4 14 +19.2	Nov. 28.	S.	—						
24 R Orionis.	4 51 +7.9									
33 R Monoc.	6 31 +8.9	Nov. 30.	P. V.	13						
18 R Persei.	3 21 +35.2	Dec. 3.	S.		Dec. 4.	S.	13.			
3 S Ceti.	0 17 −10.1	Dec. 3.	S.	12						
28 S Orion (Colors)	5 22 −4.8									
132 R Vulpeculae.	20 48 +23.2	Nov. 27.	S. H.	13.						
136 T Pegasi.	22 2 +11.8	Nov. 27.	S.	12.						
91c W. Herculis.	16 30 +37.6	Nov. 25.	C.	12.						
18 R Persei.	3 21 +35.2	Nov. 20.	C.		Dec. 6.	S. P. H.	12.5			
132 R Vulpeculae	20 48 +23.2	Nov. 14.	H.	Wrong star.						
35 R Lyncis.	6 49 +55.5	Nov. 14.	H.							
91c H. Herculis.	16 30 +37.6	Nov. 8.	H.	—						
43 U Gem.	7 46 +22.4	Nov. 11.	S.	14.						
46 U Cancri	8 27 +19.4									
40 T Can. Min.	7 26 +12.0									
526 U Leonis.	10 16 +14.7									
41 S. Gem.	7 34 +23.8	Dec. 3.	P. S.	14						
5 T Piscium.	0 24 +13.8	Dec. 2.	S.	10.3						
37 R Gem.	6 59 +22.9									
138 S Aquarii.	22 49 −21.1	Dec. 3.	P.	11.6						
142 R Aquarii.	23 36 −16.1	Dec. 3.	H.	8.7						
11 R Arietis.	2 8 +24.4	Dec. 6.	H.	12						
10 S Arietis.	1 57 +11.8	Dec. 11	H.	14.2						
42 T Geminorum.	7 41 +24.1									
57 T Leonis.	11 31 +4.2									
131 T Aquarii.	20 42 −5.7									
140 R Pegasi.	22 59 +9.6									
27a S Aurigae.	5 10 +34.0									
12 T Arietis.	2 40 +16.3	Dec. 3.	P.	8.5						

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Variable Stars to be observed.

Name Star.	Place.			Date.	Obs.	Norm. Mag.	Date.	Obs.	Norm. Mag.	Date. For March.	Obs.	Norm. Mag.
43 U Gem.	7h	46m	+22.4	Feb. 15	W.	13.9						
"												
124 T Delphin.	20	39	+15.9									
~~134 L Aquarii.~~	~~22~~	~~49~~	~~-24.1~~									
~~140 R Pegasi.~~	~~22~~	~~59~~	~~+9.5~~									
~~1 X Cass.~~	0	15	+55.0									
3 S Ceti.	0	17	-10.1				+					
10 S Arietis.	1	57	+11.6				+					
14 R Persei.	3	21	+35.2	Jan. 16.	W.	13.4						
20 T Tauri.	4	14	+19.2	" 21.	W.	—	Feb. 20.	S.	—	+		
22 S Tauri.	4	21	+9.6	Jan. 16.	W.	13.2	~~+~~ Feb. 20.	W. S.	—			
23 V "	4	44	+17.3	" 16.	W. S.	13.0	~~+~~ Feb. 20.	W.	14.4			
24 R Orionis.	4	51	+7.9	" 21.	W.	12.6						
27a S Aurigae.							++			+		
24 S Orionis.	5	22	-4.4	Jan. 21.	S. R.	13.4						
33 R Monoc.	6	31	+4.9									
37 R Gem.	6	59	+22.9				Feb. 15.	S.	14.5			
40 T Can. Min.	7	26	+12.0				+					
41 S Gem.	7	34	+23.4	Jan. 26.	S.	14.5	+					
42 T "	7	41	+24.1	Jan. 26.	S.	—	+					
43a U Puppis.				~~Feb. 15.~~	~~W. S.~~	~~14.~~	Feb. 15.	W. S.	14.	+		
46 U Canis.	7	27	+19.4	Jan. 26.	S.	—						
52a V Leonis.							+					
52b U "							+					
56 S "	11	3	+6.2									
57 T "	11	31	+4.2				+			+		
R Tauri.				Jan. 16.	W.	12.6						
59 R Com. Ber.							+					
60 T Virg.							+					

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2 γ a Aurigæ.				
20 I Tauri.				
43 a W Puppis.				
57 I Leonis.				
91 a R Ursæ Min.				Obs. comp. stars for color & spec.

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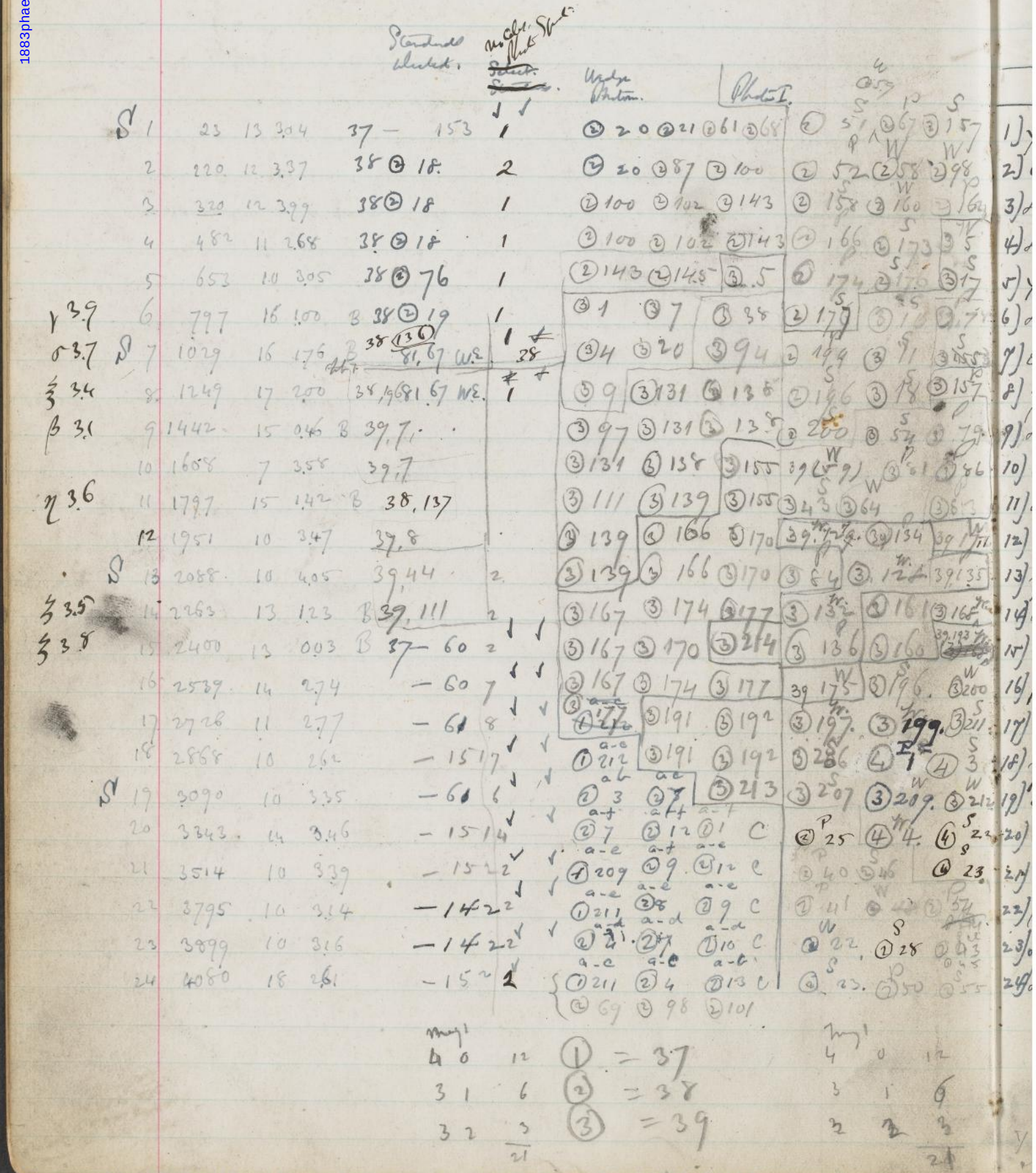
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Standard Stars.

Star.	Place. R.A.	Dec.	Estimated Intervals	Eye & Ear Transits.	Chronograph Transits.
1) γ Pegasi.	0h 7m	+14.5	108.93. c	108.95 c	H. R. c
2) θ Ceti.	1 18	−8.8	108.182 c	108.139. 161. c	H. R.
3) ε Piscium.	1 55	+2.1		108.140 c	
4) ε Ceti.	2 56	+3.6	108.53. Repeat.	108.52. c	
5) γ Eridani.	3 53	−13.8	108.168 c	108.167 c	H. R.
6) ε Tauri.	4 29	+16.3	109.48. Repeat c	108.171. 109.49 c	H. R.
7) ε Orionis.	5 30	−1.3	108.169. c	108.169. c S	H. R.
8) γ Geminorum.	6 31	+16.5	109.55. c	109.54. c S	H. R.
9) ε Can. Min.	7 33	+5.5	109.80.	109.79 S	H. R.
10) ε Hydrae.	8 41	+6.8	109.99./109.116	109.84./109.115.	H. R.
11) ε Leonis.	10 2	+12.5	109.102./109.117	109.101.	H. R.
12) θ Leonis.	11 8	+16.2	109.104	109.104 S.	H. R.
13) η Virginis.	12 14	−0.0	109.106/~~109.117~~	109.105-109.117	H. R.
14) ε Virginis.	13 19	−10.6	109.175.	109.176.	H. R.
15) ε Bootis.	14 10	+19.8	109,107	109,107	H. R. Comp. with Holden
16) β Librae.	15 11	−9.0	106.207-9 c	106.207-9 c	106.207-9 H. R. c
17) δ Ophiuchi.	16 8	−3.4	106.204-6 c	106.204-6 c	106.204-6 H. R. c
18) η Ophiuchi.	17 4	−15.6	106.210-12 c	106.210-12 c	106.210-12 H. R c
19) η Serpentis.	18 15	−2.9	——— C	110,209 C	——— H. R C
20) δ Aquilae.	19 20	+2.9	107.197.	107.162.	107.162. H.
21) θ Aquilae.	20 5	−1.2	107.202. c	108.14./108.101. c	108.32. H. R. c
22) β Aquarii.	21 25	−6.1	107.175-7 c	107.175-7 108.15. c	— H. R. c
23) ε Aquarii.	22 0	−0.9	107.154/108.43. c	108.16./107.184./108.42. c	107.186. H. R. c
24) ε Pegasi.	22 59	+14.6	108.83. Repeat. c	108.82. c	H. R.

"H" = Sent to Holden.

"R" = Copy with suggestions, if any, returned by Holden.

γ Gem. corrected as much as possible by Prof. H's reading but needs re-observation.

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Charts of Standard Stars recd from Prof. Young and corrections incorporated on our charts.

γ Pegasi.
ζ Cetí.
ε Pegasi.
ε Orionis.
ζ Aquarii.
β "
η Serpentis
θ' Cetí.
ζ Piscium.

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Charts returned by Young.

Star.	Examined.
γ Pegasi.	Y.
θ' Ceti.	Y.
α Piscium.	Y.
α Ceti.	Y.
γ Eridani.	
α Tauri.	
ε Orionis.	Y.
γ Geminorum.	
α Canis min.	Y.
ε Hydrae.	
α Leonis.	Y.
θ Leonis.	Y.
γ Virginis.	Y.
α Virginis.	Y.
α Bootis.	Y.
β Librae.	Y.
δ Ophiuchi.	Y.
γ "	Y.
γ Serpentis.	Y.
δ Aquilae.	Y.
θ "	Y.
β Aquarii.	Y.
α "	Y.
α Pegasi.	Y.

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Eclipses of Jupiter's Satellites.

Dec. 1843.

Dec. 6.	9h	50m	Dis.	I.	S. obs. W. rec.
" 8.	9	8	"	II.	Cloudy.
" 11.	10	39	"	IV.	"
" 11.	14	43	Re.	IV.	"
" 11.	17	15	Dis.	I.	
" 13.	11	43	"	I.	Cloudy.
" 15.	11	44	"	II.	P. obs. W. rec.
" 20.	13	37	"	I.	Cloudy.
" 22.	8	5	"	I.	S. obs. W. rec.
" "	14	21	"	II.	Cloudy.
" 27.	15	30	"	I.	P. obs. W. rec.
" 28.	8	49	Re.	IV.	S. obs. W. rec.
" "	11	32	Dis.	III.	P. obs. W. rec. S. read circ.
" 29.	9	59	"	I.	S. obs. P. rec.
" "	16	57	"	II.	S. obs. W. & C. recs.

Jan. 1844.

Jan. 2.	6h	15m	Dis.	II.	Cloudy.
" 3	17	24	Dis.	I.	"
" 4	15	30	"	III.	P. obs. S. rec.
" 5	11	52	"	I.	S. obs. P. rec.
" 7	6	21	"	I.	P. obs. S. rec.
" 9	8	51	"	II.	Cloudy.
" 12	13	46	"	I.	S. obs. W. rec.
" 14	8	14	"	I.	P. obs. W. rec. S. read circ.
" 16	11	27	"	II.	S. obs. W. rec.
" 21	12	24	Re.	I.	P. obs. W. rec.
" 23	6	53	"	I.	
" "	16	52	"	II.	
" 26	6	52	"	III.	

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Eclipses Jupiter's Satellites.

Jan. 27	6h	10m	Re. II.	
" 28.	14	18	" I.	
" 30.	8	47	" I.	

Feb. 1884.

Feb. 2.	10	52	Re. III.	S. obs. P. rec.
" 3.	8	46	" II.	P. " S. "
" 4.	16	13	" I.	Cloudy.
" 6.	10	42	" I.	"
" 8.	5	10	" I.	"
" 9.	14	52	" III.	
" 10.	11	22	" II.	Ralfin cloudy - see book.
" 13.	12	37	" I.	Cloudy.
" 15.	7	5	" I.	P. obs. H. rec.
" 16.	10	45	Dis. IV.	S. obs. P. & H. recs.
" "	15	8	Re. IV.	Cloudy.
" 17.	13	58	" II.	"
" 20.	14	31	" I.	S. obs. H. rec.
" 22.	9	0	" I.	
" 28.	5	51	" II.	
" 29.	10	55	" I.	

March 1884.

Mar. 2.	5	24	Re. I.	
" 4.	9	15	" IV.	
" 6.	8	27	" II.	
" 7.	12	50	" I.	
" 9.	6	51	" III.	
" 9.	7	19	" I.	
" 13.	11	3	" II.	
" 14.	14	46	" I.	
" 16	7	24	Dis. III.	

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Mar.	16.	9h	1Km	Re. I.
"	"	10	52	" III.
"	20.	13	38	" II.
"	23.	11	10	" I.
"	"	11	24	Dis. III.
"	30	13	5	Re. I.

April 1884.

Apr.	1.	7h	34m	Re. I.
"	7.	8	6	" II.
"	8.	9	29	" I.
"	14.	10	41	" II.
"	15.	11	25	" I.
"	21.	6	53	" III.
"	23.	10	58	Dis. IV.
"	24.	7	49	Re. I.
"	28.	7	23	Dis. III.
"	28.	10	53	Re. III.

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Eclipses Jupiter's Sats.

1884.

Sept.

Eastern Time.

Sept.	17.	16h	33m	Dis.	II.
"	18.	15	7	"	III.
"	21.	16	11	"	I.

Oct. 1884.

Oct.	7.	14	27	Dis.	I.
"	12.	13	35	"	II.
"	14.	16	20	"	I.
"	19.	16	11	"	II.
"	24.	14	31	Re.	III.
"	"	17	14	Dis.	IV.
"	30.	14	35	"	I.
"	31.	14	55	"	III.

Nov. 1884.

Nov.	6.	16	24	Dis.	I.
"	10.	15	57	Re.	IV.
"	13.	13	15	Dis.	II.
"	"	14	21	"	I.
"	15.	12	49	"	I.
"	20.	15	51	"	II.
"	22.	14	42	"	I.
"	27.	14	26	"	II.
"	29.	16	35	"	I.

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Eclipses of Jupiter's Sat.
Dec. 1884.

Dec.	1.	11h	4m	Dis. I.	
"	6.	10	43	" III.	J. Lew.
"	"	14	16	Re. III.	
"	"	14	24	Dis. I.	
"	8.	10	19	" II.	J. Lew.
"	"	12	56	" I.	
"	13.	14	41	" III.	
"	"	14	13	Re. III.	
"	15	12	55	Dis. II.	D.
"	"	14	49	" I.	S
"	20	14	38	" III.	
"	22	15	31	" II.	
"	"	16	42	" I.	
"	24	11	11	" I.	
"	29	14	7	" II.	
"	29	16	35	" I	
"	30	17	4	" IV.	
"	31	13	6	" I.	

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Planetary Nebulae.

Cur. No.	Position	Discovery.	material for Charts.	
1	1ʰ 2ᵐ 10ˢ −25° 13′	1880. July 18. R92. 43		
2	1 4 19 −24 12	" " 14 R92. 45		
3	1 14 23 −26 3	" Sept. 3. R92. 139		
4	20 6 27 +37 3	1881. Nov. 25. R99. 195		
5	17 54 6 −19 51	1882 July 15. R102. 45.		
6	19 16 50 +1 17	" " 16. R102. 49		
7	1 7 44 −20 19	" Aug. 18. R102. 115		
8	17 41 22 −16 26	" " " R102. 116.		
9	1 5 13 −19 7	" " " R102. 116		
10	1 56 27 −0 37	" " 19. R102. 121		
11	19 24 40 +5 26	" Sept. 4. R103. 17.		
~~13~~ 13	21 1 42 +41 45			
~~14~~ 14	21 2 12 +47 22			
~~15~~ 15	20 4 54 +16 33		R. 108. 178.	R. 108. 180.
12	19 25 36 +9 49	" Sept 17		
16	19 6 32 +46 42	1883 May 8		
17	19 46 21 +48 39.5	" "		

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Stars of type III. $-2°$ to $+20°$

0—

2 ?
3 ?
4 ?
8 h?
11 ?
13 !
18 !
20
21
25 ! $0^h\ 14.^m0$ $+2°\ 22'$ var.
34
41 ?
49 !!! Hl
50
84 !!! Hl
92
111
112 ?
121
1h 125 !
138 ?
139 ?
152 ?
156 ?
160 ?
164 ?
179 !! vam
184 !
191
211 ?

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222

234 !!

235 ?

242

244 !

2h

245 ?

248 !

250

256 ! HH

261 ?

262 ?

271 ?

275 !! HH

R Ceti 0h 19m9 +0° 57' var.

302

308

310

311 ?

317

325 ?

332

333

334 !!!

340

342 !!!

344 ?

347

348

352 !!! HH

354 ?

357 !!

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1883phae.proj..460S

358 ?
361
364 !
368 !!! 46
375 ! 2h
378 ?
379
385
390
420
429
433 ?
440 ?
441
455 ?
458 ?
462 ?
468 ?
470 ?
481
485
487 ?
490
502 ? 4h
514
529 ?
531 !
534 ?
559 ?
569 ?

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1883phae.proj..460S

574 ?
582 ?
585 ?
588 ?
594
595 ?
597 !
600 !!
610
612
618 !
634
687 ?
690 !!! H
691 4h 55m +6° 28' 92
737 B !!! H
5h
740
752 ?
753 ?
755 ?
761 !!
820
828
832 !! H
844 ?
853
857
867 ?
875
894

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1883phae.proj..460S

901 ? HB
916 ?
919 ?
923 !!! HB
931
952 ! 6h
978
986 ?
989 ?
1009 ! HB
1010 ?
1011 ?
1030 B !!!
1032 ?
1043 ?
1058
1078
1110
1115 ! 6h 38m +3° 27' 9.3
1145 ?
1151 ?
1169
1172 ?
1177 !!!
1179 !!
1192 ? 7h
1202 !
1204
1214 !!! HB
1219 !!

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1883phae.proj..460S

1227
1255 ? 7h 26m +8° 3' var.
1272 ?
1283 !
1287 !
1289 !! HP
1291 ?
1294
1298
1311 ?
1313 !!
1326 ? d L
1356
1361 ?
1365
1376 D!
1380
1383 ?
1389
1394
1397
1398
1407 !! HP
1417
1421 ?
1464
1466
1467 ?
1484 D?
1485 D !!!

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1883phae.proj..460S

1494 ?

9h 1499

1513 !

1521 ?

1543 !!

1549 !

1553 ?

1556 ?

1577

1594 HP

1597

1599

1600 ?

1604 !! HP

1613

1628 !! HP 110,38, III 3 PS = HP 1782

10h 1642 ?

1649

1655 HP

1670 HP

1674 ?

1676 ?

1689 !

1693 ?

1698 ?

1712

1725 !!!

1733 ! HP

11h 1752 110,38 Peculum 4.S.!

1763 ! HP 110,42 III! P = HP. 1958

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1883phae.proj..460S

1785 ? 110.42 Bas? 0.
1797 ? 110.42 " 0.
1808 ?
1811 !!! HP 110.42 III 6 0S.
1820 ! HP 110.43 III 4 S0
1821 110.43 ? S0
1827 ?
1838 ?
1840 110.44 III ?2 0
12 L
1860 ?
1883 b !!! 110.44 IV 4 0S
1894 !! 110.44 III 4S0 real end/6
12h 24m +5° 8'.5
1907 ?
1910 ?
1915 !! HP. 110.76
1916 b ?
1918 b
1925 ?
1930 ! 110.76
1937 !! 1
1948 !!! HP 110.77
13 L 1950 ! HP 110.77.
1969 !! 110.78
1975 ! 110.78.
1980 ! 110.78.
1989 !! HP 110.79
1991 ?
2022 ! 110.79
2035 ?
2038 HP 110.79

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1883phae.proj..460S

2060 ?
2080 !
2096 !
2103 !
2132 ?
2160
2162 ?
2170 !!! Hl
2180 ?
2187
2193 ?
2200 ?
2201
2213 ?
2221
2227 !! Hl.
2245 ?
2249 b ?
2254 ?
2287 !!! Hl
2291 ?
2304 ?
2306 ?
2328
2330
2331 !! Hl
2336 v.b. ?
2341 ?
2375 !! Hl
2376 !!

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1883phae.proj..460S

2380 ?
2393
2405 ?
2417 ?
2419 ?
2420 ? 16h 20m +19° 10' var.
2427 !
2429
2443
2475 !
2492 !
2511 ?
2538 ! H
17h
2564 !
2569 !!! H
2586 !!
2588 ?
2591 !
2596 ?
2600 ?
2614 ?
2619 !!
2621 !!
2635 ?
2638 ?
2643 !!
2651 ?
2705 ?
2714
2732

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1883phae..proj...460S

2739 ?
2742 ?!
2753 !
2757 !
2764 !
2767 !
18h
2773 !!
2776 ?
2786
2804 !!
2816 ?
2856
2865
2871 ?
2875
2886 ?
2888 ?
2897 ?
2923 ?
2929 ?
2935 !
18h 52m +14° 12' 9.0
2995 L!
19h 3009 ?
3040 ?
3044 !
3049
3094
3103
3133 L!
3177

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1883phae.proj..460S

3189 ?
3209 ?
3236
3240
3241
3242
3249 !! H.B.
3262 ?
3281 ?
3297 ! H.B.
3331 ?
20 G
3335 ?
3342 !
3349
3351
3355 ?
3356 !
3363 !
3367
3377
3384 ?
3397
3408 ?
3413 ?
3427 !!!
3435
3436
3443
3445 !
3457 ?

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1883phae.proj..460S

3463 ?
3465 !!!
3485
3489 !
3498 !!
3513 !!
3525 ?
3526 ?
3527
3551 !!
3565 !! HP
3572
3573 !
3574 ?
3576 ? HP
21 2
3587 !
3591
3598 ?
3606 ?
3610
3617 ?
3631 ?
3638 !
3647 ?
3662
3666 ?
3676 2?b
3678 ?
3702 !! HP
3716

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1883phae.proj..460S

3731
3733
3741
3758
3764
3768 !
22h
3778
3786
3789
3798 ?
22h 11m +40° 33' 7.8
3814 ?
3818 2?Z
3826 HB
3828 ?
3832
3838
3840
3853 !
3854
3867
3872
3878 ?
3889 !
3891 ?
3892
3895 !
3908
23h 3912 ?
3920 ?
3923 ! HB

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1883phae.proj..460S

3930 !! Hb

3934 !!

3942 ?

3948

3952

3956 ?

3967

3979

3995 ! Hb

4001 b !!! Hb

4004 ?

4009 !

4012 Hb

4013 ?

4014 !!!

4020 !!! Hb.

4021

4025

4032 !

4034

4035 ?

4036 ?

4039 ?

4041 ?

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1883phae.proj..460S

Stars banded light-red III,

110,2. Lal 20556 IV,7. PW.
16 Oltm 68°617 IV,6. WP
20 Lal 12561 IV 5 P
38 HP 1752 SP Peculiar ✓
44 Rtb 1883 IV pmb. P
33 Rtb. 1485 IV 6 P nebulous
35 α Hydra ? W
36 HP 1889 WS
14 HP 2636 W.P. II!

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Stars brighter than 4.25 in H. P.

Photographic

More highly than 3.25 marked B in the Durchmusterung

H.P. No.	Mag.	Class.	δ^h					
5	2.1	C.	+28	.879	B	38,182 P	—	.879
9 + 2.4		B.	+58	.523	B	38,183 P		.523
23	3.0	B.	+44	.968	B (2)	116 P	38,182 P —	.968
27	3.6	B.	-9t	.986			—	.986
71 + 4.2		A.	+62	.465				.465
82 + 3.7		B.	+53	.599				.599
92	3.4	B.	+30t	.864		38,209 S	—	.864
103	2.1	D.	-18t	.947	B	38,118 S	—	.947
120 + 3.6		B.	+57					.542
142 + 2.3		B.	+62t		B	38,167 S		.499
148 + 3.9		B.	+37					.790
154	4.1	D.	-32					.866
183.	3.6	D.	-10t				—	.982
185 + 2.2		B.	+34t		B	38,182 P		.819
213. + 2.2		A.	+88		B	too far north.		.023
219. + 2.4		B.	+59		B	38,186 S		.506
220.	3.6	D.	-8			38,107 W 38,118 S	—	.988
239.	3.7	C.	+14				—	.967
248 + 4.2		B.	+40					.757
251. + 3.7		B.	+48					.669
269. + 4.2		B.	+50					.642
271.	3.6	D.	-16				—	.958
286.	3.4	D.	-10				—	.982
287 + 3.6		A.	+63					.453
289	3.6	C.	+29				—	.875
295	2.4	C.	+20		B	(2) 114 P	—	.938
306 + 4.1		A.	+71					.312
320-1	4.4 v.v.	C.						
315	3.4	D.	-21t					
324 + 2.2	v.v.	B.	+41h		B	(2) 116 P	—	.929
333	2.0	C.	+22t		B	(2) 115 P	—	.996
								.746
								.921
336 + 3.1		B.	+34		B	(2) 115 P		.825
361 + 4.2		B.	+33			7		.836
418	4.1	D.	-0				—	1.000
429 + 4.2		B.	+48					.660

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433	3.6	C	+2		—	.999
443	+ 3.9	B	+55t			.568
447	3.4	C.	+26		—	.893
457	+ 4.0	B.	+52			.612
464	4.0	D.	-9		—	.987
482	4.7	C.	+3 t	B	38, 127S — 38, 184	.998
483	+ 3.1	B.	+53	B	38, 184 38, 127S. 38, 116	.601
487	4.1	D.	-24		—	.913
489			— 3	Ob.	38 121 S	
496	+ 4.1	B.	+49			.654
496				B	38 120 S	
497	+ 4.0	B.	+44			.714
512	3.4	D.	-29		—	.871
533	3.8	D.	-22		—	.926
541	+ 4.9	B.	+49	B	38, 119 S	.650
550	3.8	C.	+8 t		—	.989
557	+ 4.2	B.	+59			.507
564	3.6	C.	+9		—	.987
576	3.7	D.	-9		—	.985
582	+ 4.2	B.	+47			.672
599	4.2	D.	-22		—	.927
591	+ 3.2	B.	+47	B	38, 119 S	.677
600	+ 4.0	B.	+31			.849
602	+ 4.0	B.	+42			.741
604	3.7	D.	-10 t		—	.984
604	3.8	C.	+23		—	.915
613	4.0	C.	+24		—	.914
615	4.2	C.	+23		—	.917
614	3.0	C.	+23	B	⊙ ∠ 5 —	.915
625	3.4	C.	+23		—	.916
638	+ 3.1	B.	+31	B	38, 120 S	.852
649	+ 3.9	B.	+39	B	38, 188 S	.770
652	+ 4.1	B.	+35			.815

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695	3.0	D.	-13t	B	38, 129 S	38, 210 S	–	.971
697	3.6	C.	+12				–	.978
665	4.0	C.	+5				–	.995
701	4.1	D.	-7				–	.992
702	+4.2	B.	+48					.668
707	3.9	C.	+15				–	.964
750	4.0	C.	+17				–	.955
763	4.2	C.	+17				–	.953
773	3.7	C.	+18				–	.946
775	3.9	C.	+15				–	.963
776	3.6	C.	+15				–	.963
797	1.0	C.	+16t	B	38, 121, S	38 179 S	–	.960
799	4.1	D.	-3				–	.998
812	3.9	D.	-14				–	.968
840	3.3	C.	+6				–	.993
845	4.0	C.	+5				–	.996
857	3.9	C.	+2				–	.999
862	+2.7	B.	+32	B	86			.839
876	+4.2	B.	+60					.496
877	+3.2	B.	+43	B	38, 108 W			.724
879	+4.0	B.	+40t					.756
896	+3.3	B.	+41					.754
901	3.3	D.	-22t				–	.924
910	2.9	D.	-5	B	38, 180 S		–	.996
929	3.3	D.	-16t				–	.960
932	+0.2	B.	+45	B	38, 107 W			.696
936	0.3	D.	-8	B	38, 129 S		–	.989
944	0.6	D.	-6				–	.993
975	3.5	D.	-2				–	.999
978	1.9	C.	+28	B	38 109 W		–	.879

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979	1.9	C	+6	B	38,189 S	—	γ Ori	.994
994	3.0	D	-20	B	38179S	—	β Leporis	.935
1005	2.4			B	38,129 S			
1014	2.8	D	-17	B	38180 S	—	α Leporis	.952
1019-20	3.7 v.b	C	+9			—		.985
1032	3.0	C	+21	B	38,190S	—	ζ Tauri	.933
1027	3.0	D	-5	B	38,191 S	—	ε Orionis	.994
1029	1.8	D	S -1	B	38, 181S. 38 185 S	—		1000
1039	3.7	D	-2 t			—		.999
1046.6	2.8 4.2	D	-2	B	38 ~~139~~ 130 S incomplete	—	ζ Aurae 38,189S	.999
1057	3.8	D	-22			—		.924
1065	3.7	D	-14 t			—		.966
1068	2.2	D	-9	B	38,192 S	—		.986
1078 + 4.2		B	+39 t					.776
1086	4.0	D	-20		38, 190 S	—		.934
1091		&						
1093 + 3.8		B	+54 t					.584
1100 + 2.1		B	+44	B	38 109 W			.708
1101	3.7	D	-44			—	———————	.970
1104 + 2.7		B	+37 6	& B	39,98 W			.796
1143	4.2	C	+14			—		.969
1160	3.5	C	+22 t		38,110 W	—		.924
1170	4.0	D	-6 t			—		.994
1194	3.2	C	+22 t	B	38 110 W	—		.923
1195	3.0	D	-30	B	38 211 S	—		.866
1201	2.0	D	-17	B	38 213 S	—		.952
1216	4.0	C	+20		38 112 W	—		.938
~~1220-1~~	~~4.7 v.2~~	D						
1235	4.2	D	-23			—		.918
1249	2.0	C	S +16	B	38,112 W	39,98 W.		.959
1263	3.2	C	+25 t	B	38 191 S	—		.904
1272	3.5	C	+13			—		.974
1275	-1.5	D	-16	B	38 212 S	—		.958
1296 + 3.7		B	+34					.825
1309	4.2	D	-11 t			—		.978

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~~1304 +37 39 98 W~~ ✓

~~1329 S +16 39 98 W~~ ✓

Rudolph. 39.47 S

1312	4.0	R	-24 t			–	.913	1608
1325	1.5	R	-28	B	39, 46 S	–	.876	1629
1333	3.5	R	-27 t			–	.885	1636
1337	3.0	R	-23	B	39, 47 S	–	.916	1641
1340	4.1	R	-15 t			–	.964	1645
1350	1.8	R	-26	B	39, 48 S	–	.897	1676
1359	4.0	R	-0			–	1.000	1681
1370	3.7	R	-26			–	.894	1685
1373	3.6	C	+16			–	.958	1698
1377	3.6	C	+22			–	.926	1701
1394	4.0	C	+28			–	.883	1709
1399	2.4	R	-29 t	B	38, 21 1 S	–	.874	1734
1403	3.1	C	+8	B	38, 19 2 S	–	.989	1746
1407+	4.2	B	+32				.848	1747
1423-4+	2.0 2.5	B	+32	B	39, 99 W	✓	.847	
1430	4.2	C	+27 t			–	.890	1752
1442	0.4	C	+5	B	38, 19 3 S 38, 21 3 S	–	.995	1760
~~1445-6~~	~~4.6 4.6~~	~~R~~						
1452	4.2	R	-9 t			–	.987	1779
1453	4.1	C	+29 t			–	.873	1795
1457	3.6	C	+24			–	.909	1809
1459	1.1	C	+28 t	B	39, 99 W	✓	.880	1810
1462	4.2	R	-28 t			–	.877	1811-1823 1827
1474	3.4	R	-24 t			–	.909	1833
1515	2.9	R	-23	B	38 49 S	–	.914	1845
1518	4.2	R	-18			–	.946	1869
1533	3.8	C	+9 +18			–	.986	1901
1554	3.9	R	-3			–	.998	1913
1558+	3.4	A	+61				.483	1922 1927
1588	4.1	C	+6			–	.994	1944
1599	4.2	C	+3			–	.998	1947
1605	4.2	C	+29			–	.873	1951

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1608	3.6	C	S+6	ε Hydrae 50	39 ~~49~~ S	39, 144 ~~E~~ W	.993
1629	3.3	C	+6		39 49 S	–	.994
1636+3.2		B	+48	B	39, 100 W	≠	.662
1641+4.2		B	+42			⊃	.740
1645+3.7		B	+47				.674
1676	3.9	C	+20			–	.999
1681+3.8		B	+37				.795
1685+3.4		B	+36 t				.820
1698	2.0	D	-8 t	B	39, 50 S	–	.990
1701+3.7		A	+63				.445
1709+3.2		B	+52	B δ	39, 145. W	✓	.613
1734	4.2	D	-0 t			–	1.000
1740	3.8	C	+10			–	.983
1747	3.1	C	+24	B	✓ 39, 88, P	–	.911
1753+4.0		B	+59				.506
1760	4.1	C	+26 t		✓	–	.894
			10				
1793	3.6	C	+17 t			–	.954
1797	1.4	C	S+12	B	39, 51, S	39, 88 P – 39, 100 W	.976
1800	3.9	D	-11 t			–	.979
1810+3.6		B	+43				.725
1811-2	3.8 5.5	C	+24 t	B	✓	–	.913
1823-4	2.5 3.7	C	+20 t	B	39, 89, P	–	.957
1827+3.1		B	+42 t	B μ	39, 145, W.	– ✓	.742
1837	4.1	D	-16 t			–	.960
1859	4.0	C	+9			–	.985
1893	3.3	D	-15 t			–	.963
1902+3.9		B	+34				.820
1918	4.1	D	-17 t			–	.953
1923+2.6		B	+57	B β	39, 146, W	✓	.544
1926+2.0		A	+62	C t B α	89, 146, W	✓	.463
1941+3.1		B	+45 t	B ψ	39, 147, W	✓	.705
1949	2.8	C	+21	B	39, 51 S	–	.932
1951	3.5	C	S+16	δ Leonis	39, 89, P	✓ 39, 147, W	.961

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~~2259-60 4.3 4.5 B.~~

1961 + 3.8 B. +33 t .831

1965 4.1 C. +6 — .993

1963 3.9 D. -14 — .970

1969 4.0 C. +11 110. 113. H. S. — .981

1973 4.2 D. -17 — .956

1988 + 4.1 A. +70 t .342

2018 + 3.9 B. +48 t 110. 114. .663

2019 4.2 C. +7 t — .992

2025 2.2 C. +15 t B 39, 52 — .965

2028 3.7 C. +2 — .999

2036 + 2.6 B. +54 12h 110. 115. H. S. .583

2063 3.1 D. -21 t 110, 65 PS. — .928

2077 + 3.4 B. +57 .534

2078 2.8 D. -16 110, 67 SP — .957

2088 4.0 C +0 1 110. 111. H. S. ✓ — 1.000

2120 3.1 D. -15 t 110 68 PS. — .962

2138 2.8 D. -22 t 110, 69 SP — .922

2135 + 3.8 A. +70 .335

2155-6 3.5 3.5 D. -0 110. 112. 8. H. — 1.000

2191 + 1.8 B. +56 110. 116. .550

2193 3.7 C. +4 t 110. 95. H. — .998

2195-6 + 3.1 3.7 B. +38 .778

2208 3.0 C. +11 13h 110. 97. H. — .980

2249 3.4 D. -22 t 110, 70 PS. — .924

2263 1.2 D. -10 8 110. 72. PS ✓ — .983

2264-5 + 2.6 4.2 B. +55 110. 117 H. .566

2267 + 4.2 B. +55 110. 118 H. .565

2294 3.5 C. +0 110. 98. H. — 1.000

2338 + 2.0 B. +49 110. 118. H. .644

2343 4.1 C. +16 t 110. 100. H. — .959

2360 3.9 C. +19 110. 101 H. — .946

2378 3.5 D. -26 t 14h 110. 71. SP — .898

2381 + 3.6 A. +64 110. 119. H. .423

2398 4.2 D. -5 110. 102 H. — .996

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2600	0.0	C	+49 t	110,168 W.S.	—	.941
2633+	3.6	C.	+30 t	110.160. W.	—	.858
2636+	3.1	B.	+38	110.159 W.		.779
~~2652-3~~	~~4.4~~	~~4.8~~	~~C.~~			
2657	3.9	D.	-5	110, 169. W.	—	.996
2667	2.6	C.	+27 t	110.160. W. S.	—	.886
2668	3.7	C.	+2	110, 110. W.	—	.999
2670	3.0	D.	-15	110.161. S. W.	—	.963
2700+	2.1	A.	+74 t	110.156. W. ~~+10.178. W.S.~~ ② 62 P		.265
2714	3.2	D.	-24 t	110.163. W. S.	—	.908
2715+	3.6	B.	+40	110.170 S. W.		.756
			1/2			
2739	2.7	D.	-8	110. 117. W.S. 110.164 S. W. 110.178 W.S. 110.182. W.	—	.988
2741+	3.5	B.	+33	110.171. W. N.		.831
2766+	3.2	A.	+72 B	② 62 P		.305
2769+	3.4	B.	+59 t	~~+10.179. S. W.~~		.509
2772	3.6	C.	+29	110.172 S. P.	—	.870
2789	4.0	D.	-14 t	110. 179 S. W.	—	.969
~~2790-1~~	~~4.4~~	~~4.3~~	~~C.~~			
2794	2.3	C.	+27 t	110, 174, P.S.	—	.890
2797	3.9	D.	-27 t	— 18 W	—	.885
2796	4.2	B.	+18	110.182. W.	—	.951
2801	3.9	D.	-29	— 17 W.	—	.871
2825	4.2	C.	+26	110.175 S.P.	—	.894
2827	2.7	C.	+6 t	110.176, P.S.	—	.993
2832	3.8	C.	+15	110.182. W.	—	.962
2838	3.5	D.	-3	— 18 W	—	.999
2845	3.7	C.	+4	110. 214 S.W.	—	.996
2862	4.0	D.	-28	~~10.214. S. W.~~ — 121. W.	—	.876
2866	4.0	C.	+16	110.216 W.S.	—	.961
2871	3.1	D.	-25	— 25 S P	—	.901
2893	4.1	C.	+27 t	110. 217. S. W.	—	.889
2917	2.5	D.	-22	— 26 P.S	—	.925

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2290-1	3.0	V.2	C	-19			—	.943
2698	4.1	D	-20	= 27 28 S P S			—	.938
			-16 L					
2713 +	4.2	B.	+46					.704
2714	4.2	D.	-19	— 29 S P			—	.945
2726	2.8	D.	-3 t	110, 177, SP.; 110, 183, W; 110. 218. W.S. — 19. W — 30 P.S.				.998
2736	3.4	D.	-4 t	— 20 W			—	.997
2738	3.0	D.	-25 t	— 33 R			—	.904
2746 +	3.9	B.	+46					.687
2747	3.8	C.	+19	— 122. Yr.			—	.943
2764	1.1	D.	-26 t	— 32 P			—	.898
2766 +	2.8	A.	+61	B (2) 63				.473
2773	4.0	C.	+2	— 20. W.			—	.999
2774	2.8	C.	+21 t	— 123. Yr.			—	.929
2783	2.9	D.	-27	— 34 P			—	.883
2788	2.8	D.	-10	— 34 P.			—	.984
2807 +	3.1	B.	+31	B (2) 73 P				.850
2810 +	3.7	B.	+39					.776
2838	3.4	C	+9 t	— 21 W			—	.986
2844 +	4.0	B.	+31					.856
			-17 L					
2868	2.6	D	-15	110, 186, W; — 24 PS — 32 P — 85 PS — 121. Yr.			—	.963
2880	3.3	C	+24 +24 t				—	.906
2885 +	3.4	B.	+36 t					.799
2899	3.4	D	-24	— 35, P.			—	.907
2928 +	3.3	A	+65					.409
2879	3.2	C	+14 III	22. Yr.			—	.968
2937 +	3.0	B.	+52 t	B (2) 69				.610
2944	2.2	C.	+12	— 21. W.			—	.976
2947	3.7	D.	-15	— 35, P.			—	.964
2959 +	3.9	B.	+46					.694
2962	2.9	C.	+4 t	— 123 Yr.			—	.997
2976	3.5	C.	+27				—	.885
2979	3.8	C.	+2	— 124. Yr.			—	.999

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3003 + 3.9	B. +66 t				.546
3004 + 4.0	B. +37				.796
3005 3.5	D. -9	-86 SP		—	.986
3007 3.9	C. +29			—	.872
3009 + 2.4	B. +51 t	B (2) 64			.623
3017 4.0	C. +2			—	.999
3037 4.1	C. +2 18 L	— 124. 4t.		—	.999
3045 3.8	C +9			—	.986
3048 4.0	C +28			—	.877
3062 4.1	D -21 t	-87 PS		—	.933
3084 2.8	D -29 t	-89 SP		—	.867
3090 3.4	D S -2	-36 S. -94 PS -96 DS: -125 W.		—	.999
3107 3.9	C +21 t			—	.929
3147 + 0.2	B +38	B 2 Lyrae			.781
3111 3.1	D -26 t	-90 PS		—	.903
3120 + 4.2	A +71				.321
3122 + 3.7	A +72				.298
3134 4.0	D -8 t	-91 SP		—	.989
3157 3.3	D -27	-95 SP		—	.890
3199 2.3	D -26	-97 SP		—	.895
3218 2.5	D -21 t	-98 PS		—	.932
3231 4.1	C +14			—	.966
3232 + 3.3	B. +32				.843
3240 4.0	D. -5 t	-92 PS		—	.995
3252 3.9	D. -21 t	-99. SP		—	.928
3258 3.5	D. -27 t	-100 PS		—	.884
3259 3.1	C +13	B (2) 73 P		—	.972
3260 3.6	D -5 19 L	-93 DS		—	.996
3270 3.1	D -21	-101 SP		—	.932
3307 + 3.2	A +67 t				.383

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3316 + 3.9	B.	+53				.600	38
3319 3.9	D.	-18	— 102 PS		—	.951	38
3343 3.5	C.	+2	110. 213. H. S. — 103 SP		—	.999	38
3362-3 3.1 v	C.	+27 t	— 195		—	.887	38
3367 + 3.9	B.	+51				.623	38
3418 2.8	C.	+10 t	B ② 74P		—	.984	38
3419 + 3.0	B.	+44	B ② 71N			.709	38
3421 3.7	C.	+18 t			—	.950	39
3429 1.0	C.	+8	B ② 74P		—	.989	39
3447 + 3.9	A.	+69				.343	39
3450 4.0	C.	+6			—	.994	39
3460 + 4.0	B.	+34				.821	39
3466 3.6	C.	+19 t L			—	.945	39
		20					
3514 3.4	D.	-1 t S	① 65 ② 75P		—	1.000	39
3522 + 3.5	B.	+46				.690	
3552-3 - 3.4	D.	-13			—	.974 -.965	
3564 + 2.3	B	+39	B ② 70 W			.768	39
3583 4.1	C.	+29			—	.866	40
3592 4.1	C.	+10			—	.982	40
3605 3.7	C.	+14			—	.970	40
3624 4.0	C.	+15			—	.964	40
3631 + 1.5	B.	+44	B ② 71 W			.709	40
3647 3.8	D.	-9			—	.985	40
3654 + 2.7	B.	+33 t	B ② 70 W			.834	40
3676 + 3.6	A.	+61				.479	40
3687 + 4.1	B.	+40 L				.758	40
		21					
3732 3.5	C.	+29			—	.868	40
3739 4.1	C.	+4			—	.997	40
3741 + 3.9	B.	+37				.793	4
3757 + 2.6	A.	+62	B ② 72 W			.468	4
3779 3.8	D.	-22			—	.921	4
3790 3.1	D.	-6 S t B	② 66	③ +0	—	.994	4
3798 + 3.4	A	+70				.341	4

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3807	+4.2	B.	+45			.706
3814	3.8	D.	-17	④ δ 2,	—	.955
3836	2.4	C.	+9t	B ② δ 3.	—	.987
3843	4.2	C.	+25		—	.906
3848	3.0	D.	-16	B ④ δ 2	—	.958
3899	3.2	D.	-0t / 22	LB ②6?W ⑤75P	—	1.000
3907	4.0	C.	+24		—	.908
3913	3.8	C.	+5		—	.995
3928	+3.5	B.	+57t			.536
3942	+4.2	B.	+56			.553
3944	+4.1	B.	+37t			.797
3950	4.0	D.	-1		—	.999
3957	+3.9	B.	+49			.647
3994	4.2	D.	-0		—	1000
4007	4.1	D.	-27		—	.886
4013	3.6	C.	+10		—	.984
4020	3.1	C.	+29	B ② δ 4	—	.869
4024	4.2	C.	+11		—	.980
4026	4.2	C.	+22		—	.921
4031	4.1	D.	-14t		—	.969
4034	3.7	C.	+23		—	.914
4037	+3.6	A.	+65t			.414
4040	3.8	D	-8t		—	.990
4047	3.4	D	-16		—	.959
4073	+3.8	B.	+41			.747
4080	2.6	C.	+14 / 23	LB ②72W ⑤114P	—	.968
4093	3.6	D	-21		—	.928
4106	4.2	D	-6t		—	.993
4114	3.8	C	+2		—	999
4139	4.1	D	-20		—	.935

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~~174 + 4.0 B +45~~ .697

4182 + 3.4 A. +76 .226

4238 4.2 C. +6 — .994

Stars stable in the Arcturus Dec. 4.1884.

Feb 1, 1885

H.P.	Mags	Dec.	R.C.				
23	3.0	+14°	a^h S	38 117,	P	~~4078 β Pegasi~~ 370 o Ceti	~~4078~~
5	2.1	+28	B			653 γ Erid. S	38,128 S 3845
9	2.4	+58	B			1104	3981
142	2.3	+6.0	S			~~653 γ Erid~~	~~653~~
185	2.2	+34	1^h B			~~1104~~	653
~~213~~	~~2.2~~	~~+88~~				4078 β Pegasi	880
249	2.8	+5.9	S			1205 T Monoc	
482	2.7	+ 3°	2^h S	B		1256 S Monoc	
— Stars lost.						ε Pers. 1334 ζ Gemin.	
649	3.0	+39	3^h S			1417 U Monoc	
653	3.0	-13	S			1506 δ Leonis	
797	1.0	+16	4^h S	38,1215	48,179 S	2972 X Sagitt	
910	2.9	-5	5^h	38,1805		3035 W Sagitt	
~~936~~	~~0.3~~	~~-8~~		~~38,129~~		3176 R Scuti	
						3436 η Aquilae	
4078	β Pegasi					3845 μ Cephei	
3845	μ Cephei					3981 δ Cephei	
3981	δ Cephei					1608 ε Hydrae. S.	
653	γ Erid					1709 θ Ursae Maj	
1104							
370	o Ceti						

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Stars marked with a "t" in H. P.

Spectroscope

H.P. No.	Mag.		
6		-18°	III?
18		-28	
21		-18	
29		-8	III
30		-19	III
45	3.6	-9	
51	var.	+55	III
54	var.	+37	
60		+17	III P49 (IIIa!!!)
92	3.4	+30	h
93		+20	?
94	2.2	+55	
103	2.1	-18	
115		-23	
116		+14	III P84 (IIIa!!!)
123		+4	P90 (I?)
125		+6	III/o P92 (IIIa)
138		-1	P101 (IIIa!!)
142	2.3	+60	h Lins
143		+58	
147		-11	
150		+22	h?
155		+85	
175		+54	
183	3.6	-10	
185	2.2	+34	
225		-15	
265		+4	P200 (IIIa!)
291		+18	P218 (Ia!; Ia)
292		+18	

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H. P. No.	mag.	°	
313		-21	III
315	3.8	-21	III
316		-9 2 L	III
333	2.0	+22	P256(IIIa!)
341		+18	III
349		+43	
357		+25	
370	var.	-3	III
372	cum.	+56	∴ P275(IIIa!!)
375		-0	III
381		+49	
403		+34	III
438		-19	III
439		+7	III K
443	3.9	+55	III K P352(IIIa!!!)
458		+17	III P368(IIIa!!!)
482	2.7	+3	III
486		-8	
489	3.7	+38 3 L	III
496	2.3	+40	
503		+39	
536		-24	III
550	3.8	+8	
560		+47	
561		-11	
583		+62	III
604	3.7	-10	III?
612		+65	III
619		-12	III
630		-30	
641		+60	

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H. P. No.	mag.		
653	3.0	-13	III?
661		+9	P498(Iz!)
696		-7	
698		-9	
712		+8	P530(Ia!)
713		+9	P535(Ia)
744		-6	III?
759		-25	
766	4.0	-34	
787		-0	P625(IIa)
793		+41	
794		-8	III
795		-9	
797	1.0	+16	P638(IIa!!!)
821		-19	III
824		-8	
831		+63	III
839		+3	P671(IIa?)
846		-16	P690(IIIa!!!)
850		+14	III P694(IIa!)
855		+2	III P706(IIa)
860		+7	III
866		-16	
867		-16	
875		+1	P720(IIa).
879	4.0	+40	III+
880	var	-14	IV
884		-7	
889		+0	P727(IIa)
892		-26	

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H. P. No.	mag.		
899		+15	P737(IIIb!!!) IV
901	3.3	-22	
919		-0	P751(IIa)
925		-12	III
927		-12	
928		+2	P756(IIa)
929	3.3	-16	P760(IIa)
935		+5	
941		+42	III
947		+40	
955		-18	
973		-7	
974		-1	P797(Ib)
995		-3	P822(IIa)
997		-1	P832(IIIa!!) III?
1003		+18	III
1030		+9	P852(IIa(Ib))
1039		-2	
1047		-1	P863(Ia?Ib)
1050		+1	P871(IIa(Ia))
1065	3.7	-14	
1072		+37	III R110,19, III 3, P
1073	4.2	+39	
1076		+4	P901(IIa(IIIa))
1085		+1	P913(II)
1091	0.9	+7	P923(IIIa!!!) III
1093	3.8	+54	
1102		+45	III R110,19. III 7, P
1114		-3	
1125		-26	

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H.P.No.	mag.	δ	h
1140		-19	III?
1148		-22	h?
1156		-27	
1159		+61	III R110,20, III 3,8
1160	3.5	+22	III
1170	4.0	-6	
1183		-16	
1185		+14	P1009(III 2!)
1189		-2	
1194	3.2	+22	III
1197		+58	
1204		-11	
1226		-12	
1227		+4	P1077(II 2)
1229		-8	
1253		-18	
1254		-14	
1262		-9	
1263	3.2	+25	
1278		-14	
1280		+8	P1136(II a)
1283		-14	
1292		+87	III
1309	4.2	-11	
1311		-23	pec.
1312	4.0	-24	
1316		-13	
1319		+70	
1330		-5	III
1333	3.5	-27	

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N.P.No.	mag.		
1352		+51	III R 110, 20, III, 3.8
1353		-16	
1360		+82	
1361		+16	P 1214 (III z !!!) III
1374		-23	
1375		-27	b
1383		-26	
1398		-15	
1399	2.4	-24	III
1420		-30	
1429		-14	III
1430	4.2	+27	
1444		+23	
1447		-14	
1451		+14	P 1289 (III z !!) III
1452	4.2	-9	
1453	4.1	+29	
1458		-26	
1459	1.1	+28	
1461		-28	
1462	4.2	-28	
1473		-16	
1474	3.4	-24	
1477		+79	110. 150. W. S.
1492		-22	
1503		-1	P 1344 (II z)
1506		+22	III
1510		+58	110. 151 S. W.
1541		-22	
1556		-23	

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H.P.No.	mag.		
		P1407 (III 2 !!)	
1577		+13 III	
1578		-24	
1582		+7 P1433 (I a)	
1597		-29	
1618		-29 IV	
1630		+12 P1487 (II 2)	
1638		+68 III	R 110, 21, III 6, PS.
1651		+67	
1654		+5 P1512 (II 2)	
1663		-25 Bad?	
1664		+31 III	R 109, 195 III 4 P R 110, 13, III 8 PW
		P1528 (III 2)	
1677		+15 (II a)	II
1683		+57 III	R 110, 22 III 7 PS.
1685	3.4	+34 III	R 110, 12 III 3 PW
1690		-25	
1698	2.0	-8 III?	
1710		+23 P1575 (III 2)	
1712		+10 (II a Ia P)	
1729		-24	
		P1588 (III 2 !!)	
1734	4.2	-0 (II a !!)	
		P1594 (III 2)	
1744		+14 III	
		P1604 (III a !!)	
1752	var.	+11 III	
1760	4.1	+26 III?	R 110, 14, III 4, WP.
1769		-18	
		P1628 (III 2 !!)	110, 38 III 3 PS
1782		+8 (III a !!)	R 109, 26, III 6 PW
		10 P1640 (I a)	
1793	3.6	+17 ?	R 109, 26. H.
1794		-16	
1795		+10 P1643 (II 2 !!)	
1800	3.9	-11	
1801		-7 Double ?	

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H.P.No.	mag.			
			P1655 IIIa	
1814		+14	III	R 110,1, IIIa 6, P.W.
1823	2.5	+20		
1824	3.7	+20		
1827	3.1	+42	IIIa P1670(IIIa)	R 110,15 III 3, P.W.
1835		+9	IIIa	R 110,1, III W
1836		-7		
1837	4.1	-16		
1842		-30		
1848		-29		
1869		-12	IIIa IV	B
1870		-26	~~IIIa~~	
1880	var.	+69	III	
1893	3.3	-15		
1917		-15	III/IV	B
1918	4.1	-17	P1733(IIIa!)	
1924		-1	IIIa	R. 110,4, III 4,3, W.P.
1925		+20		R 110,75 I B
1926	2.0	+62		
1928		-10		
			110	
1940		+36	III	R 110,16 III 3, P.W.
1941	3.1	+45		R 110 76 ns P
1952		+20	IIIa P1763(IIIa!)	R 110,17 III 4, W.P.
1958		+2	III	R 110,4 IIIa P R 110,4. III 2,2 P.W.
1961	3.8	+33	P1786(Ia;Ia)	110. 150. S. Yr.
1976		+3	P1787(IIa)	
1987		-2		101.128. Yr.
1988	4.1	+79		
1992		-26	broad	
1993		-30	"	
1998		+17	P1800(Ia)	110. 129. Yr. S.

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H.P. No.	mag.			
2003		-0	P1806(IIa)	110. 130 S. H.
2008		+8	III P1811(IIIa!!!)β	110,42 III 6 PS
2014		-31		
2018	3.9	+48		110, 146, ns β
2019	4.2	+7	III P1820(IIIa!)	110,43 III 4 SP
2027	2.2	+15	1816 (Ia !!!)	110. 130. H. S.
2033		-30		12 L
2063	3.1	-21		✓ 110,80 ns P.
2067		+82	III/t.	110,152 SP
2087		+49	III	110 146 ns β
2110		+28		110. 131. S. H.
2114		+56	III	110, 146, III 2 β
2120	3.1	-15		brem. 110,80 I? β
2124		+69	III	110,146 III 4 β
2134	2.8	-22	P1915(IIIa!!)	110,80. ns β
2146		+2	III	110,76 β
2147	var.	+7	III/t	110. 131. H.(nat vis.)
2161		-27		110,80, ns β
2164		+46	IV	110,147, IV 7 β
2182		+17	P1941(IIa)	110. 132. S. P.
2183		+17	P1942 (Ia(IIa))	110. 132. S. P.
2186		-8	III	110,80 III β
2187		-11	III	110,81 I 4 β
2193	3.7	+4	P1948(IIIa!!) III P1950(IIIa!)	(110,7) β
2201		+18	III	110,77 β
2206		+67		110,147. ns β
2216		+23	III P1959(IIIa!!)	13 L 110,133 PS
2246		+6	III	110,79 β
2249	3.4	-22		110.81. ns β
2258		-17		110,81 ns β

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H.P. No.	mag.			
2262		+37	III	110, 147 III 3 P
2268		-12	IV, III	110. 149. Nr. S.
2275	var.	-22	III	—
2279		+60	III	110, 147. 2s P I?
2280		-5		110 82. ns P.
2283		-5	III	110, 81. III 5, P.
2289	var.	-6		—
2302		+25	III	110, 134 S.P.
2312		-8	III	110, 82. III 3P.
2314		+55	III P2058 (IIIa)	110, 148, III 4 P
2343	4.1	+16	Rec.	110, 79 P
2346		+65	III	110, 148 III 5 P
2378	3.5	-26		110, 82. 2s P.
2380		-8		110, 82, 2s P
2382		+44	III	110. 93. Nr. W.
2383		+50	III	110. 94. SW. nebIII
2384		-15	III	110, 82, III 3 P
2390		-9		110 83. Ns P
2396		+78		110, 152 2s PS.
2399		+70	III	
2400	0.0	+19	P2100 (IIIa!!)	110. 134. P. S.
2429		-6		110, 83. ns P.
2433	3.6	+30	Nr.	
2436		+39	III H	
2439		+76		
2445	var.	+27	III	
2449		+27	III	
2463		-24		110, 82, I? P.
2467	2.6	+27	P2170 (IIIa!!!)	
2470		+15	III	110, 92, 93 P W
2473		-23		110, 82, 2s P

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H.P.No.	Mag.			
2477		−27		110,83 ns P.
2500	2.1	+74		
2510		+66		
2514	3.2	−24	L. banded.	110,83 III 7 P
		−15		
2522		−15	P2227 (III 2 !!)	110,83 ns P
2532		+19	III	110.91. W.P. S. 11.
2540		−29		110,83 ns P
2544		+ 2	P2244 (I 2)	110,135 SP
2548		+ 1	P2248 (II 2).	110 135 PS
2553	var.	+31	III	—
2557		+72	P2259 (III 2 !)	
2563		+15	III	
2569	3.4	+59		
2582		− 0	P2273 (II 2).	110 84 ns P
2583		+41	III	− 161 PW
2587		−27		110,83, ns P.
2589	4.0	−14	P2279 (I !)	110,84, ns P
2590		+10	III	110,135, SP
2594	2.4	+27		
2597	3.9	−27	P2287 (III 2 !!!)	110,84, ns P
2599		+15	III	110,139 III 6 P PW
2607		−34		110,84, ns P
2610		−23		110,84, ns P
2614		+37		
2617		+37		— 162 W. P.
2616		+77		
2618		−19		110,84, III 2 P.
2627	2.9	+ 6	P2309 (III 2 !!!) III	110,136 PS
2636	4.2	+18	P2331 (III 2 !!) III	110,140 W. P.
2639	var.	+28		—

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N.P.No.	mag.		
2641		+ 2 P_{2334}(IIa(Ia))	110, 137 SP
2643		+26	
2647	var.	+18 P_{2336}(IIIa(IIIb)) III, IV.	
2649		+21	
2655		−16	110, 84, ms. P.
2665		+43 III	
2673		+27 III	
		76	
2700		−20	110, 84, ms P
2701		−26 III?	110, 85, ms. P.
2704		+22 P_{2375}(IIIa!!)	alg. on tg° 3153
2705		+ 8 III	110, 141. P.W.
2709		−29	110. 151. W. S.
2712		−28 ~~110, 152.~~ 110 152 PS	
2721		−11	110, 85 2s P
2726	2.8	− 3 III	110, 85 III 6, P
2736	3.4	− 4	110 86 2s P
2737		−23	
2738	3.0	−25	
2741		+60 III	
2751		+34 III	
2752		+33 III	
2761		− 7 III	110, 86, III 3 P
2764	1.1	−26 III	110, 85, III. 8, P
2772		+42 III	
2774	2.8	+21	
2800		−19	
2802		+49 III	
2813		+64	
2814		+ 8 P_{2477}(IIa!!)	110 142 III 2P
2818	2.2	−34	

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H.P. No.	mag.		
2828	var.	+15	P2497(Iz!) III
2838	3.4	+9	P2516(IIz!!!) 110,143 no P.
2842		−4	110,86. III 1, P
2849		+14	P2538(IIIz!) III 110,143 III 4P
2877		−26	P2569(IIIz!!!)
2879	3.2	+14	III 110,86 III 10,P
2880	3.3	+24	110,143 I sP
2884		−24	
2887	3.4	+36	−16 z P. Hr.
2890		+33	
2903		−28	
2906		+46	III
2909		−24	
2933		+26	110,143. no P
2937	3.0	+52	
2957		+31	
2962	2.9	+4	P2672(IIz!!!) ~~III~~ 110,143 II 5P.
2990		+1	P2716(IIz) 110,144 no P
3003	3.9	+56	
3009	2.4	+51	
3039		−28	
3042		+22	III 110 144, III 4P
3046		−30	~~+43 no P~~ low
3058		−23	− 147. Hr.
3062	4.1	−21	− 147. Hr.
3063		−21	− 148. N.
3065		+31	III 110,144 III 2P
3069		−20	− 140 N.
3074	3.0	−36	III low.
3076		−27	− 193 P no

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N.P.No.	mag.		
3083		−15°	−140, W.
3084	7.8	−29	−143 P nr.
3086		−24	br −140, W.
3105		−20	−141, W.
3106		+49	III
3107	3.9	+21	
3111	3.1	−25	−141, W.
3123		−2	−148, P
3128		−14	II–III −148, P
3129		−24	−141, W.
3130		−14	−148, P
3134	4.0	−8	−148, P.
3137		+23	−202 Hr.
3159		−22	−141, W.
3176		−5	−148, P
3198	3.6	+33	Hr.
3196		−22	
3200		−22	
3208		+6	P 2972 (II a)
3210		+36	III
3214	3.5	−21	
3219		−6	−148, P.
3220		+17	P 2986 (II a) −202 Hr.
3224		+43	III
3238		−25	
3240	4.0	−5	−149, P.
3241		+31	III?
3252		−21	
3256		−4	−149, P.
3258		−27	br

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H.P.No.	mag.	19h	
3276		-12	- 149, P.
3296		-19	- 149, P.
3307	3.2	+67	
3325		- 0 P 3130 (III 2)	- 149, P.
3339		-22	- 149, P.
3348		+24	- 203, W. S.
3357		+24 III	- 203, W. S.
3360		- 3 II-III	- 149, P.
3362	3.1	+27	- 204 S. W.
3363		+27 P 3193 (III 2)	- 205 W. S.
3368		+ 7 III	
3376		-18	- 149, P.
3379		+49 III	
3380		- 7 III P 3207 (I 2)	- 149, P.
3381		- 1 III ?	- 149, P.
3393		+49	
3395	var.	+49	
3396		-16	
3414		- 20 P 3246 (II a!!)	
3418		+10 P 3249 (III a!!)	
3421		+18 III	- 205 S. W.
3422		-11	- 163 nS W P
3425		+47	
3426		+88 III/II ?	
3430		- 2	- 164, P. W.
3434	var.	+32 III	
3435		+38 III	
3447		+70. III H	
3451		-27 P 3294 (II 2!)	
3466		+19 III/I	- 206 W. S.
3473		- 23 P 3297 (III 2!)	
3474		+17 III	
3475		+ 8 P 3299 (II 2)	

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H.P.No.	Mag.	
3476		−13°
3477		−28 III
3484		−32
3489		+ 6 P3319(II 2)
		— 20
3498		+64
3519		+26
3521		− 1 P3362(II 2) — 164, WP
3522		−27
3528	3.8	+46
3534		+27
3537		−12
3538	3.8	−12
3541	4.1	+47
3543		−19
3544		+39
3548		− 1 P3380(II 2)
3567		+40
3569		+31
3572		+68
3579		+48
3588		+ 1 P3440(II 2)
3597		+48
3599		+34
3602		− 2 — 164. P. Nr.
3618		−18
3620		+ 9 P3469(II 2)
3644		+56
3648	2.7	+33
3649		− 5 + 165, WP III 5
3652		−26

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H.P.No.	Mag.	
3661		-27
3674		+32
3700		+18 P3565 (IIIa!!)
3706		-20
3709		+5 P3576 (IIa?IIIa)
		21 12
3715		-25
3716	3.7	+43
3737		-21
3738		-15
3756		-17
3767		-21
3790		+21
3792		+23
3796	3.1	-6
3823		+42
3824		-19
3826		+5 P3702 (IIIa!!)
3836	2.4	+9 P3707 (IIa!!!)
3846	3.9	+58
3879		+63
3883		+65
3885		+7 P3753 (IIa)
3899	3.2	-0 P3767 (IIa)
		22
3904		+62
3906		+62
3923	3.5	+57
3924		-25
3934		+62
3935		+39
3944	4.1	+37
3949		-22

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H.P.No.	mag.	
3959		+51°
3963		-17
3965		+4 P3822(II 2)
3970		-0 P3825(I2?II2)
3971		-0
3973		+8 P3826(III 2)
3980		+47
3981		+57
3997		+39
4004		+56
4011		+43
4028		-14
4031	4.1	-14
4037	3.6	+65
4040	3.8	-8
4042		+42
4052		-33
4055		+40
4064		-25
4069		-29
4070	2.6	+27 2 3 4
4084		+8 P3923(III 2!)
4095		+8 P3930(III 2!!)°
4106	4.2	-6
4109		-9
4113		-8
4119		-9
4120		+48
4125		-14
4144		+61

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H.P.No.	mag.	
4145		−21
4158		+21
4174	4.0	+45
4186		−18
4192		+9 P3995(III 2!)
4193	var.	−15
4194		+28
4198		+2 P4001(III 3!!!)
4215		+2 P4012(III 2)
4224		+56
4225		−0 P4020(III 2!!!)
4229		+21
4233		+24
4234	var.	+50
4247		−6
4259		−6

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Stars north of +20° to be examined with Spectroscope.

Rect.	Dec.	H.L.Sts.
0h 13.6m	+4°.0'	
0 16.8	+55 1	51.
0 21.2	+34 55	
0 32.9	+30 12	92
0 49.5	+60 4	143
0 50.8	+22 46	150
1 9.5	+25 8	
1 51.2	+30 33	
1 51.6	+54 14	
2 28.5	+34 10	403
2 36.8	+31 52	
2 41.3	+56 29	
2 56.0	+3 37	482
2 57.5	+38 22	489
3 2.2	+57 29	
3 22.4	+35 15	
3 31.5	+62 15	
3 31.7	+62 50	583
3 38.	+22.7	
3 38.5	+6.5 9	612
3 41	+23.7	618
4 37.5	+32 42	
4 38.8	+67 57	~~831~~
4 40.8	+63 18	831
4 44.0	+28 19	
4 54.1	+40 54	
5 7.6	+53 25	
5 9.7	+42 40	941
5 11.8	+39 13	
5 19.2	+34 4	

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Northern Stars.

	R.A.	Dec.	H.P.N.
5h	37.9	+24° 22′	
5	38.5	+20 38	
5	42.9	+37 16	1072.
5	51.0	+45 46	1102.
6	3.4	+26 2	
6	6.0	+27 12	
6	6.8	+61 33	1159.
6	7.6	+22 32	1160.
6	12.1	+23 19	
6	15.7	+22 34	1194.
6	23	+43	
6	28.3	+38 32	
6	43.8	+87 14	1292.
7	0.1	+22 53	
7	4.0	+51 37	1352.
7	5.8	+82 38	
7	29	+45	
7	59.2	+22 59	1508.
8	51.7	+68 6	1638.
8	56.1	+39 13	
9	3.4	+31 27	1664.
9	12.9	+57 12	1683.
9	13.8	+34 54	1685.
9	38.4	+35 4	
9	46.0	+26 39	1760.
10	15.2	+42 6	1827.
10	36.1	+69 24	1869.
10	36.7	+68 2	1880.
11	2.7	+36 58	1940.
11	8.8	+23 45	1952.

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Northern Stars.

R.A.	Dec.	H.P. No.
11h 24.3	+70° 0′	1988.
11 49.0	+37 26	
11 54.0	+20 5	
11 54.0	+81 31	
12 5.6	+82 23	2067
12 13.9	+49 39	2087
12 21.9	+56 28	2114
12 23.2	+28 58	
12 24.8	+69 52	
12 30.9	+60 9	
12 39.5	+46 6	2164.
12 51.7	+66 39	
13 0.5	+23 16	2216.
13 18.0	+47 38	
13 18.4	+37 40	2262
13 24.1	+60 34	2279
13 31.3	+25 13	2302.
13 36.2	+55 17	2315.
13 47.9	+65 19	2356.
13 48.1	+46 56	
13 56.1	+38 27	
14 3.1	+44 26	2382.
14 3.8	+50 2	2383.
14 9.8	+70 0	2399.
14 18.8	+26 15	
14 26.7	+30 54	2433.
14 26.7	+84 22	
14 29.7	+37 9	
14 31.9	+27 16	2445.
14 38.2	+27 2	2459.

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Northern Stars.

	R. A.	Dec.	N. P. No.
1	14h 55.7	+66° 24′	2510.
2	15 16.5	+31 55	2553.
3	15 26.7	+51 15	2583.
4	15 45.2	+39 56	
5	15 50.6	+43 29	2665.
6	15 52.6	+27 14	2678.
7	15 59.1	+47 34	
8	16 1.0	+59 55	
9	16 15.2	+60 4	2741.
10	16 17.8	+34 6	2751.
11	16 18.0	+33 59	2752
12	16 24.7	+42 9	2772.
13	16 32.0	+72 36	
14	16 32.4	+67 0	
15	16 35.8	+49 6	
16	16 35.5	+49 10	2802.
17	16 38.8	+36 54	
18	16 43.5	+42 27	
19	16 59.2	+35 35	
20	17 17.0	+46 22	2906.
21	17 25.2	+71 55	
22	17 35.4	+31 16	2957.
23	18 1.0	+22 12	3042.
24	18 3.2	+43 26	
25	18 4.6	+31 0	
26	18 7.4	+31 23	3065.
27	18 16.6	+25 0	
28	18 18.5	+49 4	3106.
29	18 28.2	+36 54	
30	18 34.2	+39 34	

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Northern Stars.

R. A.	Dec.	H. P. No.
18h 38m.7	+36° 51′	
18 45.6	+33 14	3193.
18 50.3	+36 47	3210.
18 51.7	+43 48	3224.
18 54.0	+86 33	
18 54.9	+22 39	
18 55.5	+31 59	3241.
18 59.3	+68 48	
19 0.8	+30 33	
19 3.6	+23 59	
19 14.4	+22 21	
19 23.7	+24 26	3357.
19 14.4	+27 2	
19 25.8	+76 20	
19 30.4	+49 0	3379.
19 30.6	+47 48	
19 33.6	+49 56	3395.
19 36.4	+32 20	
19 39.4	+55 11	
19 43.5	+27 0	
19 44.0	+47 38	3425.
19 44.2	+88 57	3426.
19 46.0	+32 37	3434.
19 46.3	+38 25	3435.
19 46.5	+37 31	
19 48.0	+62 54	
19 53.3	+43 56	
20 0.2	+64 29	3498.
20 3.1	+36 15	
20 3.7	+36 21	

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Northern Stars.

R. A.	Dec.	N. P. No.
20h 4.3m	+35° 50'	
20 4.5	+35 25	
20 5.8	+35 49	
20 5.9	+35 33	
20 5.8	+47 30	
20 6.4	+37 3	
20 6.6	+35 54	
20 7.4	+35 51	
20 9.0	+36 22	
20 10.0	+36 14	
20 11.8	+47 21	35541.
20 12.5	+37 3	
20 12.5	+37 8	
20 15.9	+47 31	
20 19.6	+68 30	35772.
20 23.4	+48 59	35779.
20 24.0	+37 24	
20 27.6	+48 49	35795.
20 36.6	+47 38	
20 37.4	+47 43	
20 41.3	+56 3	36044.
20 43.5	+22 33	
20 47.8	+49 41	
20 59.0	+23 21	
21 0.6	+43 27	37016.
21 6.3	+47 10	
21 17.5	+41 53	
21 23.5	+21 39	37190.
21 24.5	+23 7	37192.
21 26.4	+51 3	

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Northern Stars.

	R.A.	Dec.	H.P.No.	
	21h 31m	+44° 50'		
	21 35.4	+42 44	3823	100
	21 36.7	+78 5		
	21 37.0	+34 58		
	21 38.3	+37 28		917
	21 39.4	+37 19		
200	21 39.8	+58 14	3845	841
300	21 50.7	+49 56		
	21 51.8	+60 58		
400	21 53.3	+63 3	3879	705
	21 54.2	+65 35		
	21 56.2	+79 44		600
500	21 54.4	+65 34	3883	
	22 0.4	+62 31	3904	500
600	22 33.9	+56 10	4004	
	22 44.4	+65 34	4037	
	22 51	+43.0		
	22 54	+51.0		
700	22 58.0	+27 26	4078	400
	22 59	+42.0		
800	23 8.9	+57 18		300
	23 12.2	+48 22	4120	
	23 14.4	+56 35		
900	23 19.5	+61 38	4144	200
	23 26.5	+23 11		
1000	23 27.5	+21 52	4158	100
	23 46.5	+74 52		
	23 53.0	+62 13		
1105	23 55.2	+59 41		

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Objects to be examined with Equatorial.

Cur. No.

R. 41. p. 46

Dm. +0° 6[illegible] 3[h] 53[m] +0° 5[illegible] 9.1 not seen Lewis 234. 37[s]

2 (Cass) m +5[illegible] 0 15.4 +55° 0' 6.5 in Dm. 46 – in Wash. P. 11.1 in 6. Eq. 10.7 Yr. obs. —

3 Dm. +0° 2344 0[h] 39[m].1 +0° 52'.6 9.0 —

4 ~~Place wrong.~~ ~~Dm. +69° 169 7 49.0 +69° 53.7 8.0 Very ft. in Wash. P.~~

Dm. +24° 2360 mag. 8.5 has companion by Lewis. Phot. at 250° dist 0.5 = about same ΔR. and 1' south, mag 8.7 – not in Dm.

6 Dm. +69° 59[illegible] mag. 9.2 seemed to be out of place by a small amount when seen in the Wash. Phot. – to be looked up with larger telescope. R.A. 10[h] 53[m].2 Dec. +69° 57'.[illegible]

7 Dm. +9° 47[illegible]0 seems to be missing or faint. while 4777, 4774, 47[illegible]1 and 47[illegible]2 seem to be in place. (Place correct. 9 mag. by Heisse)

S V. 53. (R 41. p. 47) This is Dm. −0° 61[illegible] mag. 8.[illegible]. Has not been seen in Wash. Phot. goes but was seen and identified in Lowe 573 as 9.5 (very ft.)

IV 23. R.A. 6[h] 23[m] +[illegible]3°. Place wanted more accurately for obs. with Wash. Phot. (See R 41. p. 50.)

III R.A. 7[h] 29[m] Dec. +45° Place wanted more accurately for obs. with Wash. Phot. (See R 41 p. 52.)

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List of variable stars the comparison stars for which should be observed the first season.

12 o Ceti
44 R Cancri
52 R Leonis
63 R Virginis
68 R Hydrae
77 S Serpentis
79 R Coronae
80 R Serpentis
117 χ Cygni

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Hagen's list.

71	S Bootis	40,65 S	40,85 S
75	U Coronae	(all M)	No wedge ds. wanted.
77	S Serpentis	40,64 S	40,80 S
78 S	Coronae	40,86 S	
82	Coronae	40,79 W	
83	R Herculis	40,61 S	
91a	W Herculis	40,81 W	
92	S Herculis	40,62 S	
100	T Herculis	40,124 S	40,126 S
114	R Cygni	40,125 S	40,128 S
116	S Vulpeculae	40,127 S	40,129 S
122	R Sagittae	40,10 W	40.11 W.
123	R Delphini	[40,143 S]	

Eadie's supposed variable star near T Piscium.

42; 190, 195, 198, 200,

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Comparison Stars for Variables.

No.	
0a	Mim. 7.0
1	42,115 S. 42,125 W, 50.54 Fr. 50.62 Fr.
2	42,130 W 42,133 W. 0.98 Fr. 0.107. Fr.
3	[42,157 W] 42,163 W 42,169 W, [42,216 S] [45,42 S.] 45,69 S. 45,81 S.
4	B Cass.
5	[40,164 S.] 40,180 S. 42,117 S. 42,209 S. 43,11 S.
6a	Northum (Herschel)
7	(Northum) 42,143 W 42 145 W
8	42,164 S. 42,170 S.
8a	No Est and chart

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1883phae.proj..460S

No. Comps. Stars for Var.

8.b Nov. 7.8

9 42,173 S ~~42~~ [42,179 S] 49.172. Yr. 50.59 Yr.

10 40,158 S [40.172 Yr.] 42,137 Yr. 50.90. Yr. 50. 20. Yr.

11 42,138 S. [42 150 S] 42,176 S. 50. 92. Yr.

12 o Ceti

13 42,171 S. 42,174 S.

14 42.172 Yr. 42.175. Yr. [43,1 S] [43,29 S] 50. 64. Yr. 50. 77. Yr.

15 42,144 S. 42,151 S. 43,26 S.

16 Nov. 4.2

18 [42,146 S] 42,178 S. 42,182 S. 33,143, P S W.

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1883phae.proj..460S

No.	Comps. Stars for Var.		
20	[41.64 W.]	42,181 S	42,188 S ∨0.110. W. ∨0.103. W.
21	[42,186 S]	42,201 S.	42,204 S
22	[42,186 S]	42,201 S.	42,204 S.
23	42,187 S	[42,196 S]	42,200 S.
24	41.125 W.	[41.128 W.]	42,208 S.
26	41.62 W.	41.66 W.	43,31 S. ∨0.112. W. ∨0.113. W. 50.42. W.
27	[42.183 W.] 42,184 W.		42,189 S.
27a	41,120 S.	[42.191 S.]	42,207 S. [43.27 W.
28	41,119 S.		42,197 S.
29	Nöw. 2.7		

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Comp. Stars for Var.

No.	
29a	No list or chart
31	Mem. 4.2
31a	~~No list or chart~~ Has chart.
32	Mem. 7.6
33	41,116 W. 41. 157. Yr.
34	Mem. 5.4
35	42,190 W. 42,210 W. ~~43.16 W~~ 43. 14. Yr.
37	[41,126 S.] 41,129 S. 42, 211 S.
38	41,117 S. [41. 132 Yr.] 41,143 W.
38b	41,146 S: [43,9 S] [43,15 S.]

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1883phae.proj..460S

No. Comps. Stars for Var.

3 & c Min. 7.2

39 41, 118 S. [41. 134 W.] 41, 157 S. 43, 186 W.

40 [41, 162 163 S.] [42, 214 S.] 43, 72 S. 49. 174. W. [43, 102 S.]

40 a 43, 10 S. 43, 30 S. 50. 71 W. 43, 190 W [43, 193 W]

41 [41, 168 S.] [43, 40 S.] 43, 45 S. 43, 103 S.

42 [43, 35 S.] 43, 39 S. [43, 46 S.] 43, 58 S.

43 [[41, 159 S.]] Note 41, 168, 175. [41, 178 S.] 43, 107 S. 43, 111 S. [43, 114 S.] 43, 119 S.

43 a 43, 34 S. 43, 61 S.

44 43, 74 S. 43, 136 S. 43. 177 W.

45 41. 154 W. 41. 167 W. 43. 73 W. 43, 163 W

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No. Comps. Stars for Var.

46 [43,134 W.] 43,137 S. 43,149 S. 43.196 N.

47 [43,66 W.] 43,134 S. 43,139 W. 49.141 N.

48 43,138 S. 43,145 S.

49 [41.174 N.] [41,177 W.] 43,135 S. 43,210 S.

v0 43,144 W. 43,146 W.

v1 43,15[illegible] W. [43.213. S.] 43.216. S.

v2 43,164 S. 43,165 W. [43,168 W.] 44,1 W.

v26 43.217 S. 44,5 S. 44.9 W

v2e [no plate obs. ~~44,159 S.~~] [43,212 W.] 43,214 W [not wanted. 44,18 ≡] 44,28 S.

v2f Min. 6

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No.	Comps. Stars for Var.			
3	[42.217 Tr.]	[43. 2. Tr.]	[43.8 Tr.]	43.14 Tr. 43.12. Tr.
5	43,156 S.	43,158 S.	44,14 W.	
6	43,148 S.	43,178 S.	[~~44~~ 19. Tr.]	[44,20 W]
7	43,154 S.	43,179 S.		
8	[41,176 S.]	43,158 S.	43,171 S.	
9	42.23 Tr.	43,180 S.		
60	43,154 S.	43,181 S.		
61	[41,166 S.]	[41,169 S.]	41 193 S.	43,167 S.
61a	~~No chart~~	[~~44,5 S.~~ no obs.]	44,28 S.	[47.167 Tr. Tar
62	[43,166, S.]	44. 169 Tr.	[42. 74. Tr.]	[4-7 ~~X~~

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No.	Comp. Stars for Var.
63	42,1 S. 43,132 S. 43,157 W.
64	43,167 S. 43,169 S. [48. 41. H.] 48,122, W.
65	43,172 S. 43,191 S. 43.204 H.
66	43,192 S. 43,194 S
67	43,192 S. 43,194 S
68	43,209 S. 43,210 S.
69	42,31 S 43,197 S.
69a	42,30 S. 43,198 S.
70	Temporary (Has chart) (Abs.)
71	40,65 S. 40,85 S [40,82 S.]

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No.	Comp. Stars for Var.	
72	44,171 S.	44,174 S.
73	40,67 S	42,77 S
73a	~~42.49 N.~~ ~~42 53 W~~	Min. 6.1
73b	42. 49 N.	42. 53 N.
74a	42,29 S	43,195 S.
75	Minimum 8.8	
76	42. 33 S.	43,203 S.
77	{40,64 S (without Hagen's f,g} ~~(40,80 S)~~ 40,80 S f,g identical with fgh.	
78	40,86 S. 42. 50 S.	
78a	[44,35 S.] [44,107 S]	47. 147. N. 47. 147. N.

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Comp. Stars for Var.

No.		
79	42,52 S.	42,86 S.
80	40,60 S.	42,85 S.
80a	42,74 S. [42,87 S.]	44. 166. Yr.
81	44,100 S. (new wedge) [44,105 S.]	[47. 145. Yr.] 47. 152 Yr.
82	40,79 W.	42,61 W
83	40,61 S. (without Halgen's aye)	42. 87 Yr.
83a	47,112 S.	47. 119. Yr. 47. 177. Yr.
84	47. 116 Yr.	47. 126 Yr. 47. 133. Yr.
85	47. 116. Yr.	47. 126. Yr. 47. 133 Yr.
86	47. 116 Yr.	47. 126 Yr. 47. 133 Yr.

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Comp. Stars for Var.

No.		
46a	42,55 S.	42,63 S.
47	[47.19 Yr. H.]	47.200. Yr.
47a	40,48 S	42,64 S
48	40,62 S	42,54 W.
49	Minimum 6.2	
90	(42,56 S)	42,58 S. 42,83 S
91	42,56 S	(42,58 S) 42,83 S
91a	40,81 W	42,90 S.
91b	44,20 S.	44,24 S.
91c	[45,1 S.]	[45,4 S.] 45,6 S. 45,14 S.

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No.	Comps. Stars for Var.
92	40,62 S. (arithmet. Haguenin's d.) 42,89 S. [42,90 S.]
93	(No chart but a dot.)
93a	42,76 S. 42,91 S. 4h. 196 M.
94	40,66 S.; 42,59 S.
95	Minimum 3.9
95a	Minimum 6.8
96	Minimum 5.4
97	Temporary
98	Minimum 6
99	Minimum 6.5

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No.	Comp. Stars for Var.	
100	40,124 S.	40,126 S.
101	42,67 S.	42,81 S
102	42,62 S	42,75 S
103	42,62 S	42,75 S.
104	40. K. M.	42,69 S
105	40. KK. S.	
105a	Minimum 5.5	
107	Minimum 4.6	
108	42,60 S.	42,79 S.
109	42,60 S.	42,79 S.
110	42,69 S.	42,82 S.

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No.	Comps. Adopted for Var.
111	42,79 S. 42,84 S.
112	42,65 S. 42,80 S.
113	42,65 S. 42,80 S.
114	40,125 S. 40,128 S.
115	Temporary (11 Vulp.)
116	40.,127 S. 40,129 S.
117	[40,141 S.] 40,159 S. 40.162 S!
~~116~~ 119	[40,142 S.] 40,160 S. [42,155 S] 42,158 S
120	42,99 S. 42,102 S.
121	40.13.Yr. 40,165 S. 49. 1. Yr.

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No. Comps. Stars for Var.

122 40.10.*. 40,145 W.. 40,118 W. 49. 11. Yr.

123 [40,143 S] 42,92 S 42,124 S. 48,124 S

124 (Plygni)

125 [40,144 S] 42,152 S

126 [44,130 S (new wedge)] [44,179 S (Lords exist.)] 44,183 S. 44,191 S. 44,197 S. 44,204 S.

126a 40,158 S 40.163.*. 48.113.*.

127 [40,146.S.] [40.148*] 42,123 W. 42,135 S 48.136.*.

128 40,149 S. 42,101 W. [48.144*], 48.150.*.

129 42,104 S. 42,120 S. 48.193 *.

130 ~~42,105 *~~. Min. 6

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No. Comps. Stars for Var.

131 42,71 S 42,163 W

132 40,150 S. 42,154 S.

132a No list or chart

132b 42,113 W. 42,114 W.

133 42,105 S 42,121 S

134 [44,131 S (new wedge)] 44.151. W. 44.159. W.

134a Temporary

135 Nov. 5

136 [40,147 S] 40.152 W. 40.157 W. 40.168 W.

137a 42.107 W. [42,109 W.] 49.162. W.

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No.	Comps. Stars for Var.	
139	42, 131 S.	42, 134 S.
140	40, 153 S [40, 166 S]	42, 110 S.
141	40, 154 S [40, 167 S]	42, 116 S.
142	42, 111 S.	42, 132 S.
143	45, 87 S. [46. 72 Fr.] [46. 44. Fr.]	46. 117. Fr.

Nova Orionis.

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Comp. Stars for Var.

New list for observation, taking place of old.

	Star.	
~~20 a~~	~~2 ℓ S. Orionis Obs. ones.~~	49. 20$\frac{4}{7}$ Yr.
~~122 R~~	3 ~~ℓ~~ b V Gem. " "	49. 207. Yr.
~~2 ℓ~~	40 Y Cam Vuii.	49. 207. Yr.
~~102-3~~	40 a U " "	50. 41. Yr.
~~3 ℓ~~	44 R Canes.	50. 47. Yr. 50. 51 Yr.
~~126 a~~	61 a - Virginis.	
~~12 ℓ~~	62 T Urs. Maj.	
~~179 ℓ~~	64 S " "	
~~131 ℓ~~	65 U Virginis.	
	74 S Coronae.	
	80 a V Cor. ~~Boreae~~	
	83 R Herculis.	
	87 U Scorpii.	
	102-3 U. V. Sagittarii. ~~Obs. ones.~~	
	104 T Aquilae.	
	105 R Scuti.	
	122 R Sagittae.	
	125 U Cygni.	49. 211. Yr.
	126 a - Cygni ~~Obs. ones.~~	49. 201. Yr.
	127 T Delphini.	
	128 T Del. " "	
	129 U Cas. " "	
	131 T Aquarii. "	
	137 a R Lacertae.	50. 1. Yr.

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Eclipses of Jupiter's Satellites.

Date	Time	Sat.	Phe.	
1885	h m s			
Oct. 10	17 23 8	I	Dis.	S. obs. P. rec.
" 17	17 52 19	III	Dis.	Cloudy.
" 20	17 29 50	II	Dis.	Cloudy.
Nov 2	17 32 51	I	Dis.	Obs. Rec.
18	15 48 7	I	Dis.	Cloudy
21	17 2 22	II	Dis	P. Cloudy.
22	16 47 42	III	Re.	S. Cloudy.
25	17 41 26	I	Dis.	P. Cloudy.
29	17 40 24	III	Dis	P obs. S. rec.
30	17 36 55	IV	Dis	P. Cloudy.
Dec 4	14 3 3	I	Dis	P. "
11	15 56 12	I	Dis	S. obs. W. rec.
16	14 2 7	II	Dis	P. obs. W. rec.
17	14 22 57	III	Re.	S. Cloudy.
18	17 49 18	I	Dis.	P. "
23	16 36 41	II	Dis	S "
S 27	14 10 34	I	Dis	S obs. P. rec.
1886				
S Jan. 3	16 3 35	I	Dis	SP. Cloudy.
4	13 29 8]	III	Dis	"
4	16 28 14]	III	Re.	"
S 10	17 56 35	I	Dis	"
11	17 26 26	III	Dis	Not obs. on account of intense cold.
12	12 24 51	I	Dis	P. obs. W. rec.
S 17	13 39 19	II	Dis	P. obs. S. rec.
19	14 17 51	I	Dis	S. obs. W. rec.
S 24	16 14 39	II	Dis	S Cloudy.
26	16 10 52	I	Dis	P "
28	10 39 6	I	Dis	S "

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Eclipses of Jupiters Satellites

Date 1886	Time Eastern Time. h m s	Sat. Phe.		
Feb 2	18 3 55	I Dis		? Cloudy.
4	12 32 10	I Dis	P	"
5	17 38 34	III Dis	S	Omitted a number of obs. Mer $-5^{\circ}\pm$
9	12 11 8	III Re.	P	Attempted obs. but failed on ac. of fog.
11	10 43 13	II Dis.	P	Cloudy.
11	14 25 18	I Dis	S	"
16	13 15 12	III Dis.	P	P. obs.
16	16 8 23	III Re.	S	S. obs.
18	13 19 9	II Dis.	P	P. obs.
18	16 18 30	I Dis	S	S. obs.
~~20~~	10 46 50	I Dis	~~P~~S	P. "
22	11 40 44	III Dis	P	P. "
22	13 39 21	IV Re.	P	Cloudy.
23	17 12 57	III Dis	S	S. obs.
25	15 55 17	II Dis	S	Cloudy.
~~27~~	12 40 9	I Dis	P	Omitted. Dome cannot be moved.
Mar 6	14 33 34	I Dis	S	S. obs.
8	7 50 20	II Dis	P	Cloudy.
8	9 1 56	I Dis	S	"
13	16 27 5	I Dis	P	"
15	10 26 52	II Dis	S	Eye piece loose & fell out. Abandoned.
15	10 55 30	I Dis	S	S. obs.
22	15 0 15	I Re.	~~P~~S	Cloudy.
22	15 48 17	II Re.	~~P~~S	"
24	9 28 39	I Re	S	S. obs.
24	11 53 16	III Re	P	P. obs.
29	16 53 59	I Re	S	Cloudy.
31	11 22 25	I Re	P	"
31	15 50 46	III Re.	S	"

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Eclipses of Jupiter's Satellites.

Date	Time	Sat.	Phe.		
1886	h m s				
Apr. 2	7 42 38	III	Re.		S. obs.
7	13 16 19	I	Re.	P	Cloudy.
9	7 44 49	I	Re.	S	S. obs.
9	10 19 21	II	Re.	P	P. obs.
14	15 10 ~~22~~ 20.	I	Re.	S	S. obs.
16	9 38 52	I	Re.		Cloudy.
16	12 56 7	III	Re.	P	"
23	11 33 3	I	Re	P	P. obs. 9.7
29	7 41 22	III	Re.		S obs
30	12 22 29	IV	Dis	S	S. obs.
30	12 34 24	IV	Re	S	"
30	13 27 21	I	Re.	S	"
May 2	7 55 56	I	Re		P. obs.
" 4	7 20 26	II	Re		P. obs
✓ 6	8 57 44	III	Dis		S. obs. 8.9
6	11 39 11	III	Re		P. obs.
9	9 50 21	I	Re		S. obs.
11	10 5 27	II	Re		Cloudy.
13	12 57 22	III	Dis		"
16	11 44 52	I	Re		P. obs. S. rec.
18	12 42 10	II	Re		Cloudy.
✓ 25	8 8 10	I	Re		" 7.6
June 1	10 2 51	I	Re		S. obs. Tr. rec.
8	11 ~~35~~ 56 ~~57~~	I	Re		P. obs. Tr. rec.
12	9 49 43	II	Re		S. obs. P. rec.
17	8 21 50	I	Re		Cloudy.
"Descard" 18	8 53 55	III	Dis		S. obs. Tr. rec.
18	11 28 37	III	Re		Abandoned as too low.
24	10 15 52	I	Re.		Cloudy.
July 10	8 34 19	I	Re		S. obs. Tr. rec.
14	9 31 47	II	Re		Cloudy.

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Eclipses Jupiter's Sats.

Date	Time	Sat. Phe	
1866	h m s	Sat	
July 31	8 50 59	III Dis	Hazy. Jupiter & and more clouds
Aug 2	8 47 33	I Re	
Nov 21	18 39 36	I Dis	P. obs. S. rec. Rejected.
Nov 22	18 25 46	II Dis	Cloudy.

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Occultations.

Date.	East. Time.	Star.	Mag.	Phenom.	Ang. fr. N. p.	Ang. fr. Vertex.	Obs. Time.	Remarks.
1886.								
Feb. 10.	10^h 27.7	85 Ceti.		Im.	111°	62°		
" 12.	7 40.2	70 Tauri.		"	103	74.		
" "	8 54.1	"		Em.	239	197.		
" 12.	9 29.5	θ' Tauri		Im.	122	76.		
" "	10 26.5	"		Em.	277.	178½		
" "	9 48.1	θ² Tauri		Im.	153.	107		
" "	10 12.7	"		Em.	194.	146		
" "	9 42.6	75 Tauri		Im.	22.	335½		
" "	10 15.8	"		Em.	324.	276		
" "	10 24.3	B.A.C. 1391		Im.	74.	29.		
" "	11 32.7	"		Em.	273.	223.		
" 13	1 26.3	Aldebaran.		(near approach) —	352.	305.		
" "	7 55.8	111 Tauri		Im.	119.	106.		
" "	9 1.8	"		Em.	232.	197.		
" 15.	10 6.8	H. VII 685.		Im.	56.	39.		
" "	11 1.0	"		Em.	324.	249.		
" 19.	9 44.8	89 Leonis.		Im.	50.	92.		
" "	10 15.1	"		Em.	354.	34.		

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Stars brighter than 2.75 in H.P.

5	Androm.	α	2.1	C		
9	Cassiop.	β	2.4	B	28	
94	Cetus	α	2.2		23	
p 103.	Cetus	β	2.1	D		
142	Cassiop.	γ	2.3	B	24	27
185	Androm.	β	2.2	B		
213	Ursa Min.	α	2.2	A		
324	Androm.	γ	2.2	B		
333	Aries	α	2.0	C		
p 482	Cetus	α	2.7	C		
541	Perseus	α	1.9	B	25	
✓ 794	Taurus	α	1.0	C	15, 16R 18.	
862	Auriga	ι	2.7	B		
✓ 932	"	α	0.2	B	22	29
936	Orion	β	0.3	D	8R 9R 17R	
978	Taurus	β	1.9	C	26	
979	Orion	γ	1.9	C		
1005	"	δ	2.4			
✓ 1029	"	ε	1.8	D	20	
1045	"	ζ	2.0	D	19 R	
1068	"	χ	2.2	D		
✓ 1091	"	α	0.9		1R 4R, 10, 14R, 21	
1100	Auriga	β	2.1	B		
1104	"	θ	2.7	B		
1201	Canis Maj.	β	2.0	D		
1249	Gemini	γ	2.0	C		
✓ 1275	Canis Maj.	α	-1.4	D	11, 12R 13R	
1325	"	ε	1.5	D		
1350	"	δ	1.8	D		
1399	"	η	2.4	D		
1423	Gemini	α	2.0	B		

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1442	Canis Min.	α	0.4	C	2R 3R 5R 6R 30
1459	Gemini	β	1.1	C	
1698	Hydra	α	2.0	D	
1797	Leo	α	1.4	C	7R
1823	"	γ	2.5	C	
1923	Ursa Maj.	β	2.6	B	
1926	"	α	2.0	A	
2025	Leo.	β	2.2	C	
2036	Ursa Maj.	γ	2.6	B	
2191	"	ε	1.8	B	
2263	Virgo	α	1.2	D	
2264	Ursa Maj.	ζ	2.6	B	
2338	"	η	2.0	B	
2400	Bootes	α	0.0	C	
2467	"	ε	2.6	C	
2500	Ursa Maj.	β	2.1	A	
2539	Libra	β	2.7	D	
2594	Corona	α	2.3	C	
2627	Serpens	α	2.7	C	
2674	Scorpius	δ	2.5	D	
2764	"	α	1.1	D	
2868	Ophiuchus	η	2.6	D	
2944	"	α	2.2	C	
3009	Draco.	γ	2.4	B	
3147	Lyra	α	0.2	B	
3199	Sagittarius	σ	2.3	D	
3218	"	ξ	2.5	D	
3429	Aquila	α	1.0	C	
3564	Cygnus	γ	2.3	B	
3631	"	α	1.5	B	

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3648 Cygnus ε 2.7 B
3757 Cepheus α 2.6 A
3836 Pegasus ε 2.4 G
4080 " α 2.6 G

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Eclipses Jupiter's Sats.

Date.	A. M. T.			East. Time.			Sat.	Phe.		
1886.	h	m	s	h	m	s				
Nov. 21	18	31	22	18	39	34	I.	Dis.	Twilight.	P. obs. A few observations, rejected.
22	18	17	33	18	25	45	II	Dis	Clouds.	S. obs. No observations.
Dec. 7	16	47	11	16	55	23	I	Dis	P. obs. W. rec. ✓	Apparently clear
14	18	40	47	18	48	59	I	Dis	S	Cloudy.
17	15	13	29	15	21	41	II	Dis	☾	"
21	16	18	39	16	26	51	III	Dis	☾ ☾	P. obs. W. rec. ✓
21	18	22	58	18	31	10	III	Re	☾ ☾	Cloudy.
23	15	2	43	15	10	55	I	Dis	☾	"
24	17	46	39	17	54	51	II	Dis	☾	"
30	16	56	8	17	4	20	I	Dis	☾ ☾S	"
1887.										
Jan. 15	15	11	5	15	19	17	I	Dis	☾	Dome frozen.
18	14	43	27	14	51	39	II	Dis	S	" "
22	17	4	21	17	12	33	I	Dis	☾	Cloudy.
25	17	17	6	17	25	18	II	Dis	S	"
26	14	6	34	14	14	46	III	Re.	☾	P. obs. W. rec. ✓ seeing very bad
31	13	25	56	13	34	8	I	Dis	☾	Cloudy.
Feb. 2	16	5	50	16	14	2	III	Dis	S	"
2	18	3	30	18	11	42	III	Re	S	"
7	15	19	7	15	27	19	I	Dis	☾S	"
14	17	12	18	17	20	30	I	Dis	☾☾S	"
19	14	15	54	14	24	6	II	Dis	☾☾	P. obs. W. rec. ✓ Some clouds
23	13	33	46	13	41	58	I	Dis	☾	Cloudy.
26	16	50	19	16	58	31	II	Dis	S	"
Mar. 2	15	26	59	15	35	11	I	Dis	☾	S. obs. W. rec. ✗ many clouds
9	17	20	15	17	28	27	I	Dis	S	Cloudy.
10	11	54	27	12	2	39	III	Dis	☾	"
10	13	46	49	13	55	1	III	Re	☾	"

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1992phao.proj.:4606

Eclipses of Jupiter's Sats.

Date.	Ir. to. S.			Emb. Tim.			Sat.	Phe.		
1887.	h	m	s	h	m	s				
Mar. 11	11	48	35	11	56	47.	I	Dis	☌	Cloudy.
16	11	17	42	11	25	54	II	Dis	☌	"
17	15	52	26	16	0	38	III	Dis	S	"
18	13	41	55	13	50	7	I	Dis	☌	"
23	13	52	58	14	1	10	II	Dis	☌	P. obs. Ir. rec. ✓
25	15	35	20	15	43	32	I	Dis	S	N. obs. Ir. rec. ✓
27	10	3	40	10	11	52	I	Dis	S	Cloudy.
30	16	28	28	16	36	40	II	Dis	S	N. obs. Ir. rec. ✓
Apr. 3	11	57	10	12	5	22	I	Dis	☌	Cloudy.
"Descard" 10	8	21	45	8	29	57	II	Dis		P. obs. Ir. rec. hazy; planet low ×
10	13	50	45	13	58	57	I	Dis	☌	P. obs. Ir. imperfect det. of zero. ×
"Descard" 12	8	19	13	8	27	25	I	Dis		N. obs. Ir. Much cloudiness ×
17	10	57	51	11	6	3	II	Dis	☌	N. obs. Ir. " ✓
"Descard" 17	15	44	24	15	52	39	I	Dis	S	" " "seeing" very bad ×
19	10	12	56	10	21	8	I	Dis		P. obs. N. rec. ✓
22	13	29	15	13	37	27	III	Re	☌	P. obs. Ir. rec. ✓
24	16	5	18	16	13	30	II	Re	S	Cloudy.
26	14	14	16	14	22	28	I	Re	S	N. obs. Ir. rec. Much haze ×
28	8	42	43	8	50	55	I	Re		Cloudy.
May 5	8	0	29	8	8	41	II	Re		"
5	10	36	37	10	44	49	I	Re		"
12	10	37	12	10	45	24	II	Re		N. obs. Ir. rec. ✓
12	12	30	38	12	38	50	I	Re	☍	N. obs. Ir. rec. ✓
19	13	14	4	13	22	16	II	Re	☌	Cloudy.
19	14	24	45	14	32	57	I	Re	S	"
21	8	53	17	9	1	29	I	Re		N. obs. Ir. rec. ✓
28	9	18	34	9	26	46	III	Re		Cloudy.
28	10	47	31	10	55	43	I	Re		"

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Eclipses of Jupiter's Sats.

Date.	W.M.T. h	m	s	East. Time. h	m	s	Sat.	Phe.		
1887										
June 4.	11	35	29	11	43	41	III.	Dis.	f	Cloudy.
4	12	41	50	12	50	2	I	Re	f	"
4	13	16	36	13	24	48	III	Re	f	"
13	9	4	51	9	13	3	I	Re		S. obs. F. rec. (some clouds) ✓
13	10	23	27	10	31	39	II	Re		" " ✓
20	10	59	21	11	7	33	I	Re		Cloudy.
July 6	9	17	10	9	25	22	I	Re		"
10	9	9	6	9	17	18	III	Re		"
15	10	11	40	10	19	52	II	Re		"
29	9	29	56	9	38	8	I	Re		"
Aug. 14	7	48	3	7	56	15	I	Re		S. obs. G. rec. Many clouds X
22	7	27	33	7	35	45	III	Dis		Cloudy
Sept. 10	7	4	45	7	12	57	II	Re		P. obs. F. rec.
Dec. 26	17	53	21	18	1	33	I	Dis	s	Cloudy.
1888										
Jan. 11	16	9	18	16	17	30	I	Dis	f	P. obs. F. rec. i
12	16	28	0	16	36	12	III	Re	s	Cloudy.
18	18	2	56	18	11	8	I	Dis	f	P. obs. 2
19	16	11	55	16	20	7	II	Dis	s.	S. obs. 1
"Discard" Feb. 3	16	18	23	16	26	35	I	Dis	s	~~S. obs.~~ + Rej.
19	14	33	45	14	41	57	I	Dis	f	Cloudy.
20	15	40	6	15	48	18	II	Dis	s	"
24	14	43	9	14	51	21	III	Dis	f	Cloudy.
24	16	15	29	16	23	41	III	Re	f	"
26	16	27	11	16	35	23	I	Dis	~~f~~ s	S. obs. 3
Mar. 13	14	42	21	14	50	33	I	Dis	s	Cloudy.
16	12	36	15	12	44	27	II	Dis	f	P. obs. 3
20	16	35	48	16	44	0	I	Dis	s	Cloudy.

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Eclipses of Jupiter's Sats.

Date.	W.M.T.			East. Time.			Sat.	Ph.	
1888	h	m	s	h	m	s			
Mar. 23	15	9	45	15	17	57	II	Dis	S. obs. 4
29	12	57	41	13	5	53	I	Dis	P. obs. 4
31	12	4	52	12	13	4	III	Re	P. obs. 5
Apr. 5	14	51	12	14	59	24	I	Dis	Cloudy.
7	14	27	18	14	35	30	III	Dis	S. obs. 5
7	16	3	3	16	11	15	III	Re	S. obs. 6
12	16	44	45	16	52	57	I	Dis	P. obs. 6
14	11	13	6	11	21	18	I	Dis	Cloudy.
17	12	8	28	12	16	40	II	Dis	S. obs. 7
21	13	6	44	13	14	56	I	Dis	S. obs. 8
24	14	42	55	14	51	7	II	Dis	S. obs. 9
28	15	0	26	15	8	38	I	Dis	Missed.
30	9	28	54	9	37	6	I	Dis	Cloudy.
May 7	11	22	42	11	30	54	I	Dis	P. obs. 7
12	9	10	28	9	18	40	II	Dis	Cloudy.
13	10	15	56	10	24	8	III	Dis	"
14	13	16	36	13	24	48	I	Dis	"
19	11	45	54	11	54	6	II	Dis	P. obs. 8
20	14	14	2	14	22	14	III	Dis	S. obs. 9
23	11	46	58	11	55	10	I	Re	P. obs. 1
30	13	41	5	13	49	17	I	Re	Cloudy.
June 1	8	9	40	8	17	52	I	Re	P. obs. 2
6	8	40	10	8	48	22	II	Re	Cloudy.
8	10	3	53	10	12	5	I	Re	S. obs. 1
13	11	16	37	11	24	49	II	Re	P. obs. 3
15	11	58	12	12	6	24	I	Re	Cloudy.
20	13	53	18	14	1	30	II	Re	"
22	13	52	36	14	0	48	I	Re	"

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Eclipses of Jupiter's Sat.

Date. 1888	W.M.T. h m s	East. T. h m s	Sat.	Phe.		
June 24	8 21 12	8 29 24	I	Re	S	Cloudy.
25	10 5 56	10 14 8	III	Dis	P	P. obs. 4
25	11 50 45	11 58 57	III	Re	P	" 5
July 1	10 15 42	10 23 54	I	Re	S	Cloudy.
8	8 26 29	8 34 41	II	Re	S	"
8	12 10 16	12 18 28	I	Re	P	"
15	11 3 53	11 12 5	II	Re	P S	S. obs. 2 P. rec.
17	8 33 33	8 41 45	I	Re	S	S. obs. 3
24	10 28 15	10 36 27	I	Re	P	P. obs. 6
31	7 49 48	7 58 0	III	Re	P	Cloudy
Aug. 7	9 58 48	10 7 0	III	Dis	P	Cloudy
9	8 15 9	8 23 21	II	Re	P	Cloudy
9	8 46 26	8 54 38	I	Re	P	Cloudy
Sept. 1	8 59 30	9 7 42	I	Re	S	Cloudy.
10	8 5 47	8 13 59	II	Re	S	"
12	7 49 41	7 57 53	III	Re	P	S. obs.
~~17~~ 1889	7 17 42	7 26 0	I	Re.	S	Cloudy.
Feb. 9	14 19 19	14 27 31	III	Dis	P	Cloudy.
20	14 17 4	14 25 16	II	Dis	S	S. obs. S. rec.
21	14 29 53	14 38 5	I	Dis	P	Cloudy.
Mar. 9	15 45 40	15 53 52	I	Dis	S	2 S. obs. S. rec.
17	15 35 35	15 43 47	III	Re	P	Cloudy.
24	16 46 19	16 54 31	II	Dis	P	"
24	17 5 32	17 13 44	III	Dis	P	"
Apr. 1	15 54 54	16 3 6	I	Dis	S	"
17	14 10 42	14 18 34	I	Dis	P	"
18	13 42 12	13 50 24	II	Dis	P	"
24	16 4 25	16 12 37	I	Dis	S	"

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Eclipses of Jupiter's Sats.

Date.	W.M.T.			East. T.			Sat.	Phe.		
1889	h	m	s	h	m	s				
Apr. 25	16	15	28	16	23	40	II	Dis	S	Cloudy.
29	12	54	31	13	2	43	III	Dis	D	"
29	15	29	50	15	38	2	III	Re	S 3	N. obs.
May 3	12	26	35	12	34	44	I	Dis	D	Cloudy.
10	14	20	24	14	28	36	I	Dis	S	"
19	10	42	49	10	51	1	I	Dis	D	Cloudy.
20	13	12	57	13	21	9	II	Dis	D	"
26	12	36	48	12	45	0	I	Dis	D	1 P. obs. H. rec.
							IV	Conjct		+ P. obs. H. rec.
27	15	46	57	15	55	9	II	Dis	S	Cloudy.
June 2	14	30	51	14	39	3	I	Dis	S	"
11	10	53	29	11	1	41	I	Dis	D	"
11	12	44	14	12	52	26	III	Dis		4 P. obs. H. rec.
12	9	55	16	10	3	28	IV	Dis		Cloudy.
12	10	27	41	10	35	53	IV	Re		"
14	10	12	51	10	21	3	II	Dis		5 P. obs. H. rec.
18	12	47	45	12	55	57	I	Dis	D	2 P. obs. H. rec.
21	12	47	40	12	55	52	II	Dis	D	Cloudy.
27	11	22	55	11	31	7	I	Re	D	"
July 4	13	17	26	13	25	38	I	Re	1 D	3 P. obs. H. rec.
9	9	51	1	9	59	13	II	Re	D	Cloudy.
13	9	40	40	9	48	52	I	Re	2	4 P. obs. H. rec.
16	12	27	13	12	35	25	II	Re	3 D	P. obs. H. rec.
17	11	27	38	11	35	50	III	Re	1 S	N. obs. H. rec.
20	11	35	23	11	43	35	I	Re	2 #S	N. obs. H. rec. with eclipse.
24	12	38	16	12	46	28	III	Dis	D	Occultation interfered
29	7	58	55	8	7	7	I	Re		Cloudy.
Aug. 5	9	53	48	10	2	0	I	Re	4	Obs. Time
10	9	35	38	9	43	50	II	Re	5	Obs. Time

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Eclipses of Jupiter's Sats.

Date.	W.M.T. h	m	s	East. T. h	m	s	Sat.	Phe.		
1889										
Aug. 12	11	48	43	11	56	55	I	Re	P.	Cloudy.
18	9	23	17	9	31	29	IV	Dis	S. 3	S obs. J rec.
18	11	29	3	11	37	15	IV	Re	4	S obs. J rec.
21	8	12	25	8	20	37	I	Re	5	S obs. J. rec.
22	7	30	3	7	38	15	III	Re	6	S obs. J. rec.
28	10	7	26	10	15	38	I	Re	6	P. obs. A. rec.
29	8	36	14	8	44	26	III	Dis	7	P. obs. A rec.
Sept. 11	9	25	18	9	33	30	II	Re		Cloudy.
13	8	26	17	8	34	29	I	Re	S	"
29	6	45	6	6	53	18	I	Re	P	Cloudy
Oct. 4	7	34	50	7	43	2	III	Re	S	Cloudy.
6	6	38	15	6	46	27	II	Re	P	"
6	8	40	7	8	48	19	I	Re	S	Cloudy
11	8	34	20	8	42	32	III	Dis.	P	Cloudy.
22	6	58	50	7	7	2	I	Re	S	S. obs. H. rec.
Nov. 7	6	30	57	6	39	3	II	Re	P	Cloudy.
10	6	27	46	6	35	58	IV	Re	S	"
30	5	30	16	5	38	28	I	Re	P	P. obs. A. rec.
1890										
Feb. 17.	12	42	6	18	50	18	I.	Dis.		Omit.
14.	19	23	15	19	31	27	IV.	Re.		"
21.	19	0	26	19	8	40	II.	Dis.		"
Mar. 3	16	22	6	16	30	18	III	Dis.	P	Invisible.
5	16	58	21	17	6	33	I	Dis.	S	Cloudy.
18	16	2	26	16	10	38	II	Dis.	P	Too low.
28	17	8	23	17	16	35	I	Dis.	S	Cloudy.
Apr. 8	15	39	0	15	47	12	III	Re.	P	"
13	15	24	24	15	32	36	I	Dis.	S	S. obs. D. rec.

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	Date	W. M. T.	East Time	Sat.	Phe.		
	1890						
	Apl. 15	16h 15 13	16h 23 25	III	Dis.	P	P. obs. Forec.
Su	" 20	17 18 13	17 26 25	I	Dis.	S	Not taken. Sunrise.
	" 26	15 39 33	15 47 45	IV	Dis.	P	Cloudy.
	May 6	15 34 23	15 42 35	I	Dis.	S	S. obs. F. rec.
	" 13	13 58 42	~~14~~ 6 * 54	IV	Re.	P	Cloudy.
	" 21	15 8 11	15 16 23	II	Dis.	S	S. obs. F. rec.
	" 21	15 36 54	15 45 6	III	Re.	S	S. obs. F. rec.
	" 22	13 50 36	13 58 48	I	Dis	P	P. obs. F. rec.
	" ~~28~~	~~16 9 41~~	~~16 17 53~~	~~III~~	~~Dis.~~	~~S~~	~~Daylight~~
	" ~~29~~	~~15 44 34~~	~~15 52 46~~	~~I~~	~~Dis.~~	~~P~~	
	June 7	12 7 11	12 15 23	I	Dis.	P	S. obs. F. rec.
Sat	" 14	14 1 19	14 9 31	I	Dis.	S	Cloudy.
	" 15	12 6 18	12 14 30	II	Dis.	P	S. obs. D. rec.
Su	" 22	14 40 15	14 48 27	II	Dis.	S	Cloudy.
	" 30	12 18 21	12 26 33	I	Dis.	P	P. obs. F. rec.
	July 3	12 7 35	12 15 47	III	Dis.	P	P. Cloudy.
	" 7	14 12 45	14 20 57	I	Dis.	P	Guide of dome broken.
M.	" 17	11 40 11	11 48 23	II	Dis.	S P	P. obs. F. rec.
Sat	" 19	9 58 28	10 6 40	IV	Dis.	P	P. obs. F. rec.
W.	" 23	12 30 36	12 38 48	I	Dis.	P	P. obs. F. rec.
Th	" 24	14 14 54	14 23 6	II	Dis.	S	Cloudy.
F	Aug 1	11 9 55	11 18 7	I	Re	P	P. obs. F. rec.
	4	8 55 50	9 4 2	II	Re	S	S obs. F rec.
	5	8 39 3	8 47 15	IV	Re	P	P obs Forec.
	8	11 38 44	11 46 56	III	Re	P	Cloudy.
F	8	13 4 46	13 12 58	I	Re	P	Cloudy.
Su	17	9 28 31	9 36 43	I	Re	S P	Cloudy.
Su	31	13 18 44	13 26 56	I	Re	P	Cloudy.

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Date.	W. M. T.			East. T.			Sat. Phe.		
Sept. 2	7	47	29	7	55	41	I Re	S	S. obs. W. rec.
5	8	37	59	8	46	11	II Re	P	Cloudy.
9	9	42	42	9	50	54	I Re	S	"
13	7	42	58	7	51	10	III Re	P	"
20	8	12	23	8	20	35	III Dis.	S	Obs. Wire
24	10	30	18	10	38	30	IV Dis	P	S. obs. W. rec.
25	8	2	12	8	10	24	I Re	S	P. obs. W. rec.
Oct. 7	8	24	41	8	32	53	II Re	P	Cloudy.
18	8	17	6	8	25	18	I Re	S	S. obs. W. rec.
26	7	50	50	7	59	2	III Re	P	Cloudy
Nov. 3	6	36	38	6	44	50	I Re	S	Cloudy.
26	6	51	10	6	59	22	I Re	P	Missed.
Dec. 3	5	29	16	5	37	28	II Re	S	Cloudy.
12	5	10	9	5	18	21	I Re	P	P. obs. W. rec.
17	5	25	17	5	33	29	IV Dis.	S	Cloudy.
									End of Third Cycle.
1891.									
Apr. 9	16	52	24	17	0	36	I Dis.		Daylight. Not obs.
13	15	12	11	15	20	23	II Dis.		Sup. not risen.
25	15	8	50	15	17	2	I Dis.		Abandoned. Too low.
30	16	7	9	16	15	21	III Re		" near sunrise.
May 11	13	25	17	13	33	29	I Dis		Cloudy.
15	14	52	32	15	0	44	II Dis		"
18	15	19	14	15	27	26	I Dis		W. obs. Power rec.
June 3	13	35	40	13	43	52	I Dis.		Cloudy.
10	15	29	41	15	37	53	I Dis		"
12	12	41	26	12	49	38	III Dis		W. obs. Power rec.
16	14	29	50	14	38	2	II Dis		Cloudy.
19	13	30	58	13	39	10	IV Dis		"
26	13	46	25	13	54	37	I Dis.		"
July 5	10	9	4	10	17	16	I Dis		Sup. not risen.

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Date	W. M. T.	East. T.	Sat.	Phr.	
1891					
July 6	11 56 10	12 4 22	IV	Re.	3 W. obs. Power rec.
11	11 30 51	11 39 3	II	Dis.	Cloudy.
12	12 3 20	12 11 32	I	Dis.	Practically cloudy.
18	12 6 12	12 14 24	III	Re	Cloudy.
18	14 5 22	14 13 34	II	Dis.	"
19	13 57 40	14 5 52	I	Dis.	1 P. obs. Power rec.
25	12 45 19	12 53 31	III	Dis.	4 W. obs. Power rec.
25	16 6 22	16 14 34	III	Re	Sunrise.
26	15 52 6	16 0 18	I	Dis.	Cloudy.
28	10 20 47	10 28 59	I	Dis.	"
Aug. 1	16 46 20	16 54 32	III	Dis.	Too near sunrise
4	12 15 20	12 23 32	I	Dis.	Cloudy
5	8 31 48	8 40 0	II	Dis.	Cloudy
11	14 9 59	14 18 11	I	Dis.	Cloudy
12	11 6 31	11 14 43	II	Dis	Cloudy.
13	8 38 37	8 46 49	I	Dis.	2 P. obs.
18	16 4 45	16 12 57	I	Dis.	3 P. obs.
19	13 41 21	13 49 33	II	Dis.	4 P. obs.
20	10 33 25	10 41 37	I	Dis.	5 P. obs.
25	14 25 54	14 34 6	IV	Dis.	Cloudy
26 W	16 16 19	16 24 31	II	Dis.	Cloudy
27 W	12 28 19	12 36 31	I	Dis.	Cloudy
30 S	8 50 57	8 59 9	III	Dis.	Cloudy
Sept. 3	14 23 21	14 31 33	I	Dis.	5 W. obs. W. rec.
6	10 55 14	11 3 26	II	Re.	Cloudy.
11	12 30 28	12 38 40	IV	Re.	6 W. "
12	13 1 43	13 9 55	I	Re.	W Cloudy
S 13	13 30 26	13 38 38	2	Re.	P Cloudy.

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Date.	W. M. T.	East. T.	Sat. Phe.			
1891.						
Sept. 14	7 30 26	7 38 38	I Re			Cloudy.
19	14 56 55	15 5 7	I Re	W		"
21	9 25 39	9 33 51	I Re	P		Cloudy.
28	6 40 36	6 48 48	IV Re	6	P	P. obs. Tr. rec.
28	11 20 58	11 29 10	I Re	7		Tr. obs. Powr rec.
Oct. 1	7 59 21	8 7 33	II Re	8		Tr. obs. Moore rec.
5	8 13 10	8 21 22	III Re	7	P	P. obs. Tr. rec.
5	13 16 23	13 24 35	I Re	9	W	Tr. obs. Powr rec.
7	7 45 17	7 53 29	I Re		P	Cloudy
8	10 35 16	10 43 28	II Re	10	W	Tr. obs. Moore rec.
12	9 2 46	9 10 58	III Dis		P	Cloudy.
12	12 14 34	12 22 46	III Re		P	
14	9 40 46	9 48 58	I Re	8	P	P. obs. Tr. rec.
15	13 11 25	13 19 37	II Re		W	Cloudy. circles.
21	11 36 20	11 44 32	I Re	9		P. obs. Tr. rec. Mr. read ^
23	6 5 12	6 13 24	I Re	10		P. obs. Tr. rec. Pr. read circ.
28	13 31 56	13 40 8	I Re		W	Tr. obs. Powr rec.
30	8 0 49	8 9 1	I Re		W	Cloudy.
Nov. 2	7 42 48	7 51 0	II Re.	11	P	Tr. obs. Powr rec.
6	9 56 27	10 4 39	I Re	11	W	Tr. obs. Powr rec.
9	10 19 41	10 27 53	II Re		W	Cloudy.
13	11 52 7	12 0 19	I Re	12	W	Tr. obs. Powr rec.
15	6 21 5	6 29 17	I Re	12		P. obs. Tr. rec.
17	8 22 15	8 30 27	III Re			Cloudy.
17	9 56 48	10 5 0	IV Dis.			"
22	8 16 45	8 24 57	I Re			"
24	9 17 44	9 25 56	III Dis.	13	W	Tr. obs. Powr rec.
29	10 12 23	10 20 35	I Re			Omitted.
Dec. 4	7 23 37	7 31 49	IV Re			Cloudy.
4	7 30 1	7 38 13	II Re			"

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Date	W. M. T.	East. T.	Sat.	Obs
1891.				
Dec. 8	6 36 51	6 45 3	I	Re. 13 P. obs. Fr. rec.
11	10 7 38	10 15 50	II	Re 14 Fr. obs. Powe rec.
15	8 32 26	8 40 38	I	Re Cloudy.
22	10 27 56	10 36 8	I	Re "
30	5 31 24	5 39 36	III	Dis. 14 P. obs. Fr. rec.
30	8 31 38	8 39 50	III	Re 15 Fr. " Nowe "
31	6 52 16	7 0 28	I	Re 15 P. " Fr. rec. Powe read.

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(1884a) ~~(1884a)~~

Ephemeris of Comet (Swarthout) (from "Science Observer" Mar. 1. 1884.)

Date.	R. A.	Dec.	Light.
Feb. 29.	20h 12m 55s	−40° 56′	1.39
Mar. 4.	29 59	−34 44	.50
8.	47 26	−28 24	1.57
12.	20 59 24	−22 6	1.48
16	21 13 52	−15 52	1.52
20.	27 29	−9 56	1.40
24	40 56	−4 23	1.24
28.	21 54 14	+0 47	1.07
Apr. 1.	22 7 24	+5 28	0.90
5.	20 31	+9 43	0.75

Ephemeris of Comet c 1884 (Brooks.) Sci. Obs. Aug. 16.

Date. Gr. mid nt.	Appr. R. A.	Appr. Dec.	Light.
Aug 17.5	11h 25m 44s	+43° 57′	0.94
" 21.5	11 56 2	42 40	
" 25.5	12 25 50	40 52	
" 29.5	12 53 56	38 36	0.43

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Observations of Comet Sawerthal.

Date.	Book.	Page.	Red. Book.	Page.
Mar. 23	46	13f	~~4~~ 5	208
Apr. 6.	46	190	4 5	204
Apr. 16.	47	11	~~6~~ 5	~~46~~ 200
Apr. 28.	"	40	6	46
June 29.	"	203	6	64
July 5.	"	21f	6	66

The above obs. are all made on Comet Sawerthal, and have been sent to "Nachrichten". and "Astr. Journals".

Observations of Comet c 1886 (Brooks.)

(2 series)	Aug. 27.	46	2f	6	68 & 70
	Aug. 29.	46	2~~9~~ 7	6	74
	Sept. 5.	46	34	6	78
	" 6.	46.	37	6	82
	" 24.	46.	9~~7~~ 7	6	~~84~~ 76
	" 26.	46.	102	6	92
	Oct. 8.	46.	142	6	138
	" 10.	46.	146	6	144

The above obs. are all that were made on Comet c (Brooks), and have been sent to "Nachrichten" and "Astr. Journals."

Observations of Comet 1886 e (Barnard)

~~Sept. 26. 46. 109.~~ 88 (This was a nebula

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Obs. of Comets.

Name.	Date.	Book.	Page.	
Sawerthal.	Dec. 23.	R 46	136.	
"	Apr. 6.	"	190.	See previous page.
"	" 16.	R 47	11.	
"	" 24.	"	40.	
"	June 29.	"	203.	
"	July 5.	"	214.	

Comet Olbers.

Olbers.	1887. Sept. 16.	44	155.	Book. 6. p. 154.
"	" Oct. 19.	"	193.	" 3 " 170.
"	" " 21.	"	195.	" 3 " 174.
"	" " 30.	"	196.	" 3 " 174.
"	1888 Jan. 11.	45	189.	" 6 " 156.
"	" " 16.	"	199.	" 6 p. 160

The above sent to et. ct. and ct of. Oct. 14. 1889.

Comet e 1888 (Barnard.) (due, Sept. 2.)

Barnard.	1888. Oct. 29.	48	204.	Book 6. p. 164.
"	" " 30.	"	209.	" " " 172.
"	" " 31.	"	214.	" " " 176
"	" Nov. 1.	49	5.	" " " 180.
"	" " 3.	"	16.	" " " 188.
"	" " 7.	"	22.	" " " 192.
"	" " 12.	"	33.	" " " 198.
"	" " 14.	"	47.	" " " 202.
"	" " "	"	49.	" " " 206.
"	" " 21	"	73.	" " " 210.
"	" Dec. 6.	"	94.	" 7 " 2
"	" " 12.	"	103.	" " " 6.

(Can. ons. 157)

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Obs. of Comets.

Comet f 1884 (Barnard) (disc. Oct. 30.)

Barnard, 1884. Nov. 1. 49 8
" 1889. Jan. 25. 50. 6s
" " " 29. 50. 7s
" " " 30. 50. 8s
" " Feb. 1. 50. 9s

See next page.

Comet e 1884 (Barnard.) (Con. from prs. page.)

Barnard. 1884. ~~Dec.~~ Oct. 14. 49. 11s Book 7. p. 10.
" " " " " 120. " " " 12.
" " " 18 " 124. " " " 16.
" " " 19 " 131. " " " 20.
" " " 22 " 160. " " " 24.
~~" 1889 Jan. 1. " 49.~~
1889 Jan.
" " " 3. " 192. " " " 32
" " " 19. 50. 3k. " " " 34
" " " 21. 50. 39. " " " 42.

The above sent to A. N. and A. J. Oct. 14. 1889.

Comet e 1890 (Barnard Sept. 2.) continued.

Barnard, 1890, June 10. 55, 60, Book 10. p. 42.
(The above obs. was when the comet had a distance from the sun of 5.63 units, and from the earth, of 4.66 units, according to Berberich's ephemeris).

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Comet f. (1884 Barnard) (dec. Feb. 30) ~~6. 144.~~

Barnard	1884 Febr.	1.	49	6	Red.	6. 144.
"	1849 Jan.	25.	50	65		7. 44.
"	"	" 29.	50	75		7. 50.
"	"	" 30.	50	84		7. 54.
"	"	Feb. 1.	50	95		7. 52.
"	"	" 28.	50	159	Red.	7. 62.
"	"	Mar. 1.	50	164	Red.	7. 66.
"	"	" 7.	50	171	Red.	7. 70.
~~"~~	~~"~~	~~Apr. 24.~~	~~51~~	~~49~~	~~(Star oc. obs.)~~	

The above sent to A. Ct. and A. J. Oct. 14. 1849.

Comet b (1849 Barnard) dec Mar. 31.

Barnard	1849 Apr.	2,	50	214.	Red.	7. 174.
"	"	" 6.	51	4	Red.	7 " 74
"	"	" 19.	51	34.	Red.	7 " 42
"	"	" 23.	51	40.	Red.	7 " 46

The above obs. of Comet b 1849. sent both to the "Astronomische Nachrichten" and "Astronomical Journal" May 8. 1849.

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Comet d (1889 July 6. Brooks)

(July 6)

Brooks	1889	July	20.	52.	19	Red. B. 7.	110.	(1st series)
"	"	"	23.	52.	30	" "	7.	114.
"	"	"	24.	52.	36	" "	7.	118.
"	"	"	25.	52.	40	" "	7.	122.

These obs. sent both to A. N. and A. J.

Comet d 1889 Brooks (July 6. 1889) 2d series.

Brooks	1889	Oct.	2.	52,	114.	Red. B. 7.	146	
"	"	"	15.	"	148.	" "	"	154.
"	"	"	16.	"	155.	" "	"	162.
"	"	"	17.	"	162.	" "	"	166.
	and Comp. ≡ (3 obs.)							
"	"	"	18.	"	164.	" "	"	170
	and Comp. ≡							
"	"	"	23	"	178	" "	"	180
"	"	Nov.	5.	twice. "	186	" "	"	186-92
	and Comp. ≡							
"	"	"	14.	"	199	" "	"	202-6
	and Comp. ≡							
"	"	Nov.	15	"	207	" "	"	210-14
	and Comp. ≡							
"	"	Nov.	16	"	215	" "	9	2
"	"	Nov.	22	53	10	" "	9	10
"	"	Nov.	25	twice 53	19	" "	9	27
"	"	Nov.	26	twice 53	27	" "	9	34
"	"	Nov.	29	53	30	" "	9	42
"	"	Dec	7	53	56	" "	9	46
"	"	"	13	53	75	" "	9	54
"	"	"	16	53	81	" "	9	62
"	"	"	19	53	88	" "	9	66
"	"	"	21	53	97	" "	9	74
"	"	"	23	53	112	" "	9	86
"	"	"	26	53	114.	" "	9	94

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1883phae.proj..460S

Comet f 1889. (Swift Nov. 16.)

Swift.	1889	Nov.	18.	53	3	Red. 9 a
"	"	Nov.	22.	53	a	Red. 9 12
"	"	Nov.	23.	53	14	Red. 9 24
"	"	Nov.	26.	53	25	" 9 34
"	"	Dec.	13	53	7K	" 9 50
"	"	Dec.	21.	53	9S	" 9 7a
"	"	Dec.	23.	53	107	" 9 90

These obs. sent to both A. N. and A. J. Feb. 7. 1890.

Comet g 1889 (Borelly Dec. 12.)

Borelly	1889.	Dec.	16.	53	79	Red. 9. 52 Arr.
"	"	Dec.	21.	53	93	" 9 70
"	"	Dec.	23.	53	103	" 9. a2.

These obs. sent to both A. N. and A. J. Feb. 7. 1890

Comet a 1890 (Brooks Mar. 19.)

Brooks	1890	Mar.	21.	5K	a6	Red. 9.	196.
"	"	"	24.	5K	9S	" "	200.
"	"	"	30.	5K	106	" "	20a.
"	"	May	21.	55.	21	" 10	22.
"	"	"	23.	55.	31	" 10	26.
"	"	"	24.	55.	3K	" 10	32
"	"	June	9.	55.	54	" 10	36

See p. 161.

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Comet d 1889 (Brooks July 6.) con.

Brooks 1889, Dec. 27. 53. 120. Red. B. 9. p. 98.
" 1890. Jan. 14. 53. 141. " " 9. p. 102.
" 1890. Jan. 16. 53. 151. " " 9. p. 112.
" " " 17. 53. 159. " " 9. p. 122.
" " " 18. 53. 170. " " 9. p. 126.
" " " 20. 53. 176 " " 9. p. 130.
" " " 21. 53. 182 " " 9. p. 134
" " " 22. 53. 190 " " 9. p. 142
" " " 24. 53. 196 " " 9. p. 146.
" " Feb. 11. 54. 5. " " 9. p. 154.
" " Feb. 12. 54. 12. " " 9. p. 162.
" " " 15. 54. 20. " " 9. p. 170.
" " " 20. 54. 29. " " 9. p. 174.
" " " 21. 54. 37. " " 9. p. 182.
" " Mar. 17. 54. 71. " " 9. p. 188.
" " " 18. 54. 78. " " 9. p. 192.
~~" " Apr. 17. 54. 149. " " 9. p. 212.~~ not the same

Comet a 1890. (Brooks Mar. 19) Con. from p. 160.

Brooks 1890, June 25. B. 55. p. 93. Red. Book 10. p. 48.
" " " 30. B. 55. p. 110. " " " p. 52.
" " July 9. B. 55. p. 135. " " " p. 56.
" " " 11. B. 55. p. 141. " " " p. 60.

Denning's New Comet July 27. 55. p. 197.
Barnard's " " of Oct. 6. 1890 which is probably a return of d'Arrest's comet. B. 56. p. 121. Red. B. 10. p.

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Caggia's Comet (Disc. July 18. 1890 = 1890b)

Caggia. 1890. July 21. 55. p. 178 Red. 10. p. 74.
" " " 22. 55. p. 180. " " " 80.
" " " 23. 55. p. 186. " " " 86.
" " Aug. 1. " " 201.

All the Comet Obs. hitherto unpublished, sent to Astron. Nach. and Ast. Jour. Sept. 6. 1890.

Comet a 1890. Sept. 8. 56. p. 17 Red.
The above observation sent to A. N. and A. J. Nov. 18. 1891.

Comet Denning. Sept. 8. 56. p. 15. Red. 10. p. 102.

✓ Comet Zona (Nov. 15.) Nov. 19. 1890 56. 149. Red. 10. p. 124.
✓ " " (" ") Nov. 16. 1890. R. 56. p. 147 Red. 10. p. 118.
✓ " " (" ") " 20. 1890. R. 56. p. 196. " 10. p. 130.
✓ " " (" ") " 21. " R 56. p. 200. " 10. p. 134.
✓ " " (" ") " 22. " R 56. p. 205. " 10. p. 140.
(The above 5 observations of Comet Zona sent Nov. 26. 1890. to Astron. Nach. and Astron. Journal.)

✓ Comet Zona (Nov. 15.) Nov. 28. R. 56. p. 211. Red. 10. p. 146.
✓ " " " 15. Dec. 15. R. 57. p. 22. Red. 10. p. 152

~~The above sent to A. N. and A. J.~~

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✓ Comet Spitaler, (1890 f) Dec. 22. R. 57. p. 42. Red. 10. p. 156.
The two obs. of Zona's Comet of Nov. 28 and Dec. 14, and also the above obs. of Spitaler's Comet of Dec. 22, sent to ~~Astron. Nach. and~~ Astron. Journal. Dec. 25. 1890.
The above is not Spitaler's Comet. (See R. 57. p. 40.)

The two above mentioned obs. of Zona's Comet sent to Astron. Nach. Apr. 18. 1891.

All the comet obs. posted in this book are ~~not~~ now published or sent for publication. Apr. 19. 1891

For subsequent observations, see Book of Eph. No. 2. p. 3. ff.

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Obs. of Asteroids with Square Ber. Inst.

Name.	Date	Book.	Page.	
	Peters New Asteroid (247)			
(247)	1849 Oct 19.	52.	87	2 series.
"	" " 23.	52.	92	1 "
"	" " 24.	52.	96	2 "

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Observations of Asteroids with Hedge Photometer.

Name.	Date.	Book.	Page.	Obs.
Alcmene (42)	Nov. 12. 1887.	R. 45.	18.	S.
Juno (3)	Nov. 13. "	" "	20.	S.
" "	Nov. 16. "	" "	21.	S.
" "	Nov. 16. "	" "	22.	W.
" "	Nov. 17. "	" "	24.	S.
" "	Nov. 17 "	" "	25	W.
Alcmene (82)	Nov. 17 "	" "	25	S.
" "	Nov. 18 "	" "	28	S.
Juno (3)	Nov. 18 "	" "	29	W.
Alcmene (82)	Nov 21 "	" "	33	S.
Juno (3)	Dec 1 "	" "	55	S.
Juno "	Dec 1 "	" "	56	W.
" "	Dec 5 "	" "	60	W.
Alcmene (82)	Dec. 5 "	" "	62	S.
Juno (3)	Dec 6 "	" "	63	S.
Alcmene (82)	Dec 6 "	" "	64	S.
" "	Dec 6 "	" "	65	W.
Juno (3)	Dec. 12 "	" "	68	W.
Alcmene (82)	Dec. 13 "	" "	73	S.
" "	Dec. 13 "	" "	74	W.
Juno (3)	Dec. 13 "	" "	75	W.
Alcmene (82)	Dec. 14 "	" "	78	S.
" "	Dec. 14 "	" "	79	W.
Juno (3)	Dec. 16 "	" "	83	S.
Alcmene (82)	Dec. 19 "	" "	84	S.
Juno (3)	Dec 19 "	" "	85	W.
" "	Dec. 21 "	" "	88	W.
" "	Jan. 16, 1888 "	" "	197	S.

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1883phae.proj..460S

Observations of Asteroids with Wedge Photometer.

Name	Date	Book	Page	Obs
Juno (3)	Jan. 19, 1888	R. 45	206	W.
Alcmene (82)	Jan. 20 "	" "	213	S.
Juno (3)	Jan. 20 "	" "	214	W.
" "	Jan. 21 "	R. 46	2	W.
Alcmene (82)	Jan 21 "	" "	3	S.
Juno (3)	Jan 22 "	" "	5	S.
" "	Jan. 27 "	" "	17	S.
Alcmene (82)	Feb 1 "	" "	37	S.
Juno (3)	Feb 2 "	" "	39	W.
Alcmene (82)	Feb 2 "	" "	40	S.
Juno (3)	Feb 3 "	" "	41	S.
" (3)	Feb 3 "	" "	42	W.
Alcmene (82)	Feb. 3 "	" "	43	S.
Juno (3)	Feb. 6 "	" "	45	W.
Alcmene (82)	Feb 6 "	" "	46	S.
Juno (3)	Feb. 9 "	" "	50	S.
" "	Feb. 9 "	" "	51	W.
Alcmene (82)	Feb. 9 "	" "	52	S.
Juno (3)	Feb. 13 "	" "	55	S.
" "	Feb. 13 "	" "	56	W.
Alcmene (82)	Feb. 13 "	" "	58	S.
Juno (3)	Feb. 15 "	" "	60	W.
" "	~~Feb 17~~ "	" "	~~64~~	
" "	Feb 18 "	" "	66	W.
" "	Feb. 22 "	" "	68	S.
" "	Feb. 22 "	" "	69	W.
" "	Feb. 28 "	" "	78	S. W.
" "	Feb. 29 "	" "	80	S.

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1883phae.proj..460S

Observations of Asteroids with Wedge Photometer

Name	Date	Book	Page	obs
Juno (3)	Feb. 29, 1888.	R. 46	81	W.
" "	Mar. 3, "	" "	88	W.
" "	Mar. 6 "	" "	94	S.
" "	Mar 6 "	" "	95	W.
" "	Mar. 7 "	" "	98	W.
Flora (8)	Mar. 7 "	" "	102	S.
Parthenope (11)	Mar. 9 "	" "	104	S.
Flora (8)	Mar. 9 "	" "	104	S.
Juno (3)	Mar. 10 "	" "	107	W.
Flora (8)	Mar. 10 "	" "	109	S.
Parthenope (11)	Mar 10 "	" "	109	S.
Juno (3)	Mar. 17 "	" "	117	W.
Flora (8)	Mar. 17 "	" "	119	W.
Flora (8)	Mar. 18 "	" "	121	S.
Parthenope (11)	Mar. 18 "	" "	121	S.
Flora (8)	Apr. 2 "	" "	176	W.
Parthenope (11)	Apr. 2 "	" "	176	W.
Juno (3)	Apr. 3 "	" "	178	W.
Flora (8)	Apr. 3 "	" "	182	W.
Juno (3)	Apr. 4 "	" "	183	W.
Flora (8)	Apr. 4 "	" "	185	W.
Juno (3)	Apr. 6 "	" "	189	W.
Juno (3)	Apr. 7 "	" "	195	W.
" "	Apr. 9 "	" "	208	W.
Flora (8)	Apr. 9 "	" "	210	W.
" "	Apr. 13 "	R. 47	6	W.
~~Vesta~~	~~Apr 26~~ "	"	~~48~~ 105	

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1883phae.proj..460S

Observations of Asteroids with Wedge Photometer

Name	Date	Book	Page	Remarks
~~Iris~~	~~Sept 26 1888~~	~~R48~~	~~107~~	
~~Vesta~~	~~" 27 "~~	~~"~~	~~111~~	
~~Iris~~	~~" 27 "~~	~~"~~	~~115~~	
~~Vesta~~	~~" 28 "~~	~~"~~	~~119~~	
~~Iris~~	~~" 28 "~~	~~"~~	~~120~~	
Sappho	Apr. 16, 1888	R47	8	
"	" 17, "	"	14	
"	" 18, "	"	22	2nd series
"	" 21 "	"	27	"
"	" 23 "	"	34	"
"	" 26 "	"	45	
"	May 3 "	"	57	Repeated
"	" 7 "	"	60	2nd series
Vesta.	Sept 26 "	R48	105	W.
Iris.	" 26 "	"	107	W.
Vesta.	" 27 "	"	111	"
Iris.	" 27 "	"	115	"
Vesta	" 28 "	"	119	"
Iris	" 28 "	"	120	"
Vesta	Oct. 2. "	"	133.	"
Vesta	" 3 "	"	138	"
Iris	" 3 "	"	139	"
Vesta	" 10 "	"	152	"
Iris	" 10 "	"	153.	"
Vesta	" 11. "	"	154.	"
Iris.	" 11. "	"	159.	"
Iris.	" 17. "	"	173.	"

Positions Obs.

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Observations of asteroids with Wedge Photometer.

Name.	Date.	Book.	Page. obs	Remarks.
Vesta.	Oct. 14. 16ff.	Ff.	124	W.
Vesta.	" 25. "	Ff.	194	"
Iris.	" " "	Ff.	199.	"
Iris.	" 29 "	Ff.	201.	"
Vesta.	" " "	Ff.	202.	"
Iris.	" 30 "	Ff.	207.	"
Vesta.	Nov. 1. "	49.	3.	"
Iris.	" " "	"	4.	"
"	" 3 "	"	14.	"
Vesta	" " "	"	15.	"
Iris.	" 7 "	"	20.	"
Vesta	" 13 "	"	45.	"
Iris	" 17 "	"	57.	"
Vesta	" 17 "	"	58	"
Iris.	" 20 "	"	64.	"
Vesta	" " "	"	65.	"
Iris	" 21. "	"	72.	"
"	" 22. "	"	80.	"
Vesta	" "	"	81.	"
Iris.	Dec. 6. "	"	91.	"
Vesta	" " "	"	93.	"
Iris.	" 12 "	"	101.	"
Vesta.	" " "	"	102.	"
Iris.	" 16 "	"	123.	"
Vesta.	" " "	"	125.	"
Vesta.	" 21 "	"	142	"
Iris.	" 22 "	"	154	"

Work all brought up to Dec 18

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1883phae.proj..460S

Observations of Asteroids with Hodges Photometer.

Name.	Date.	Book.	Page.	Obs.	Remarks.
Iris.	Dec. 26. 1854.	49.	171	H.	
"	" 28. "	"	124	H.	
Vesta	Jan. 1. 1859.	"	147	H.	
"	" 3. "	"	191	H.	
" Iris.	" 3 "	"	194	H.	Ref. Dem. on O. J.
~~Iris.~~	~~" 12. " 50.~~		~~27~~	~~H.~~	
Vesta.	" 14. " 50.		29.	H.	
Iris.	" " " "		31.	H.	
Ceres	" " " "		32.	H.	
Iris.	" 19. " "		35.	H.	
Ceres.	" " " "		37.	H.	
Iris	" 21. " "		47.	H.	
" "	" 23. " "		57.	H.	
Ceres	Feb. 7. " "		106.	H.	
" Iris.	" 13. " "		114.	H.	
" Ceres.	" 19 " "		120.	H.	
	" 19. " "		146	W.	
Iris	Mar. 7 " "		142.	H.	
Ceres	" 7 " "		174	W	
~~Vesta~~	~~" 11 " "~~		176	W	
			~~182~~	~~W.~~	Ref. Comp. x not obs.
Ceres	" 21 " "		189	W.	
Iris	" 22 " "		193	W.	

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New Wedge Photometer was first used July 12. 1887. (See R. 44. p. 100.) It was used in all the Zones below. as well as in Zones 1. 2. and 3.

Observations of Zones with Wedge Photometer.

	Dec'n.	Date.	Book.	Page.
	+19° Series 4	Nov 7, 1887.	R. 45	8
	+9° " 5	" 9, "	"	12
	+9° " 6	" 12, "	"	17
	+29° " 7	" 21, "	"	34
	+19° " 8	" 21, "	"	36
	+19° " 9	" 22 "	"	43
	+19° " 10	" 22 "	"	46
	+9° " 11	" 30 "	"	32
	+59° " 1	" 1 "	R. 44	206
	+9° " 2	" 2 "	"	209
	+9° " 3	" 3 "	"	211
	+29° " 12	Jan. 19, 1888	R 45	207
	+19° " 13	" 20, "	"	216
	+29° " 14	" 22, "	R 46	6
	+9° " 15	" 24 "	"	10
	+9° " 16	" 24 "	"	13
	+9° " 17	Feb. 29 "	"	83
	+9° " 18	Mar. 4 "	"	91
	+9° " 19	" 7 "	"	99
	+19° " 20	Oct. 18, "	R. 48	175
	+19° " 21	Nov. 12 "	R 49	25
	+19° " 22	Nov. 13, "	"	36
	+19° " 23	Nov. 14. "	"	51
	+19° " 24	" 17. "	"	60
	+19° " 25	" 20. "	"	616
	+9° " 26	" 21. "	"	76
	+9° " 27	" 22. "	"	82

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Obs. of Zones with Wedge Photometer.

Decl.	Date.	Book.	Page.
+29°	Nov. 26.	Dec. Nr.	49	104.
+9°	" 29.	" 13	"	110.
+19°	" 30.	" 14	"	126.
+19°	" 31.	" 19	"	135.
+19°	" 32.	" 20	"	140.
+9°	" 33	" 22	"	155.
+29°	" 34	Jan. 3. 89.	"	195.
+29°	" 35	" 14. " 50		9.
+29°	" 36	" 14. " "		17.
+19°	" 37	Feb. 14. " "		122.
+9°	" 38	" 15. " "		129.
+19°	" 39	" 19. " "		140.
+19°	" 40	Apr. 13. " 51.		21.
+29°	" 41.	" 14. " 51.		30.
+19°	" 42.	May 8. " 51.		73.
+19°	" 43.	" 11. " 51.		85.
+9°	" 44.	" 15. " 51.		95.
+9°	" 45	July 6. " 51.		186.
+9°	" 46	" 16. " 51.		207.
+19°	" 47.	Oct. 4. " 52.		114.
+9°	" 48.	" 7. " 52.		126.
+9°	" 49.	" 8. " 52.		135.
+19°	" 50.	" 10. " 52.		141.
+19°	" 51	Dec. 7 " 53		57
+19°	" 52	" 9 " 53		66
+19°	" 53	Jan. 28 1890. " 53		212
+9°	" 54	Mar. 3. " 54		44
+9°	" 55	" 4. " 54		52.
+49°	" 56	" 7 " 54		60

Continued on p. 184.

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Observations of doubtful cases (with Meridian Circle) made with East Equatorial and Square Bar micrometer.

Red. v. page.	Decl.	Date.	Book.	Page.
~~Dec. +51° 54, 55. 60.~~		~~Jan 29. 1847.~~	~~A 46.~~	~~26.~~
	Dec. +50° 150. 153. 155. 145.	Dec. 21. 1847.	A. 45.	91.
1 124 ~~126~~	" +50° 155. 160, 154, 159	" " "	" "	89.
	" +54° 35. 36. 37.	" 22 "	" "	93
	" +51° 25° 30°	" " "	" "	95
1. 2.	" +53° 53 59.	" " "	" "	96
	" +51° 126 129. 130	" " "	" "	97
	" +50° 144 147	" " "	" "	99
	" +53° 169 179 180	" " "	" "	100
	" +52° 3056 3059	" 23 "	" "	102
	" +52° 3059, 3063.	" 23 "	" "	103
1 22	" +53° 2547 2548 2549.	" 24 "	" "	105
	" +52° 3181, 3182	" " "	" "	107
	" +49° 1103 1106 1108	" 27 "	" "	111
	" +51° 983, 987.	" " "	" "	113
	" +52° 1082 1077	" " "	" "	115
	" +54° 195, 203, 204	" 27 "	" "	116
	" +52° 234. 240, 241	" " "	" "	118
	" +54° 223, 225	" " "	" "	119
	" +54° 223, 225	" 28 "	" "	122
1 72	" +55° 701 704 706.	" 29 "	" "	124
1 74	" +52° 639 642 643.	" 29 "	" "	125
	" +51° 3213, 3208, 3222, 3211	" 29 "	" "	127
	" +51° 3259, 3273, 3277	" " "	" "	129
	" +53° 241, 245. 246	" " "	" "	131

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Same as on previous page. con.

Red. v. + page.	Desig.	Date.	Book.	Page
	Dm +52°, 277, 276	Dec. 29, 1887	R. 45	133
	" +54° 2607, 2611, 2612	" 30 "	"	135
1 28	" +50° 3502 3503 3506,	" 30 "	"	136
	" +51° 3321, 3324, 3329	" " "	"	138
	" +52° 3229, 3236	" " "	"	140
1 56	" +54° 295, 297,	" " "	"	141
1 92	" +53° 345, 351, 355,	" " "	"	142
1 58	" +55° 375, +54° 344,	" " "	"	143
	" +54° 392, 397, 398	" " "	"	144
	" +53° 437, a	Jan. 2 1888	"	147
	" +52° 492, a	" " "	"	148
	" +54° 444, 448	" " "	"	149
1 60&62	" +52° 541, 542, 546, 548,	" " "	"	150
	" +53° 2734, 2736	" 3 "	"	152
1 26	" +54° 2818, 2822, 2825,	" 3 "	"	153
	" +54° 2883 2886	" 3 "	"	155
	" +53° 3033, 3032	" 3 "	"	156
1 64	" +49°, 620, 625, 629,	" 3 "	"	157
1 66	" +52°, 564, 569, +53°505,	" 3 "	"	158
1 30	" +50°, 3572, 3575, 3576,	" 3 "	"	160
	" +52° 3400 3410, 3417	" 5 "	"	162
	" +51° 3547, 3550, 3553	" 5 "	"	163
1 68	" +51° 574, 580,	" 5 "	"	165
1 70	" +50° 553, 556,	" 5 "	"	166
	" +50 553, a	" 5 "	"	167
	" +54 563, 565	" 5 "	"	167
	" +54, 592, 594, a	" 5 "	"	168

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Same as on previous page. cont.

Vol. & page.	Desig.	Date	Book	Page.	Rem.
	Dm +52° 611, 612, 617	Jan. 8, 1888	R. 45	170	
	" +51° 617, 618, 621	" "	"	171	
	" +53° 594, 595, 598	" "	"	172	
	" +50° 723, 725, 729	" "	"	173	
	" +50° 3171, 3174, 3176	" 10 "	"	174	
	" +52° 3229, 3236	" 10 "	"	175	
	" +~~52~~ 50° 3788, 3789, +51° 3444	" "	"	176	
1 ~~128~~ 126	" +50° 154, 155, 159, 160	" "	"	178	
1 128	" +53° 345, 351, 355	" "	"	179	
1 130	" +52° 542, 546, 548	" "	"	180	
1 18	" +50° 3171, 3174, 3176,	" 11 "	"	181	
	" +53° 2932, 2933, 2934	" "	"	182	
	" +53° 3176, 3180,	" "	"	183	
1 32	" +49° 4141, 4145,	" "	"	184	
1 132	" +52° 564, 562, 53° 505	" "	"	185	
	" +50° 557	" "	"	186	
	" +51° 1112, a)	" 12 "	"	193	
	" +51° 1439, 1442, 1443	" 12 "	"	193	
	" +51° 54, 58, 62	" 29 "	R. 46	26	
	" +54° 69, 71, 82, 87	" "	"	27	
	" +51° 109, 110, 113	" 30 "	"	29	
	" +51° 173, 177, 178	" 30 "	"	30	
	" +~~54~~ 52° 201, 202	" "	"	31	
	" +52° 201, 202	" 31 "	"	33	
	" +54° 183, 184, 191	" 31 "	"	34	
	" +51° 750, 744	Mar. 23 "	"	125	
	" +52° 750, 752, 758	" "	"	126	
	" +54° 809, 819	" 23 "	"	129	
	" +50° 1074, 1076	" 28 "	"	130	

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Red. b. + page.	Design.	Date	Book.	Page.
1 38	DM +53° 895, 896, 899,	Mar. 23, 1888	R. 46	131
	" +53° 845, 848, 849	" 24 "	"	141
	" +51 1110, 1111, 1114	" "	"	143
	" +52° 943, 942	" "	"	144
	" +52° 1020 1019	" "	"	146
~~+ 40~~	" +53° 929, 942	" 29 "	"	149
1 76	" +51° 993, 999,	" "	"	151
1 46	" +50° 1564, 1571,	" "	"	153
	" +53° 1698, 1699, 1694	" 31 "	"	159
	" +50° 2420, 2425, 2429	" "	"	162
	" +50° 2410, 2411, 2415	" "	"	165
1 36	" +51° 1063, 1065, +50° 1165,	Apr. 27 "	R. 47	48
1 34	" +52° 946, 955, +51° 1060,	" "	"	50
1 40	" +51° 1110°, 1111,	" "	"	52
	" +51° 993° 999	" 28 "	"	54
	" +54° 1092, 1097	" "	"	55
1 ~~50~~ 49 1/4	" +50° 1763, 1765,	May 16 "	"	71
1 50	" +50° 1826, +49° 2056,	" "	"	72
1 48	" +55° 1344, 1345,	" 17 "	"	74
	" +50° 1564 1566	" "	"	75
1 42	" +49° 1695, 1693,	" 21 "	"	84
1 44	" +54° 1237 1238,	" "	"	86
1 52	" +54° 1513, 1514,	" "	"	88
	" +55° 1277 +54° 1222	" 22 "	"	90
	" +55° 1317, 1320	" "	"	91
	" +51° 1536, +52° 1416	" "	"	93
	" +50° 1710, 1721, 1725	" "	"	94
1 90 ~~+ 84~~	" +54° 1831, 1832	" 25 "	"	100

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Vol. & page.	Desig.	Date	Book	Page.
1. 6.	Dm +50° 2420, 2425, 2426,	June 4, 1878	R. 47	114
1. 8.	" +53° 2041. 2043.	" 5. "	"	121.
1. 10.	" +53° 2089, +54 [illegible]	" 5 "	"	124
	" +53 2042. 2043	" 5 "	"	122
1. 12	" +55° 2081, 2083, +54° 1998,	" 8 "	"	130
1. 14	" +53° 2219, 2220, 2224,	" 9 "	"	141
1 16	" +54° 2198 2202, 2205,	" 9 "	"	144
1 20	" +53° 2481, +54° 2405, 2406,	" 12 "	"	150
1 24	" +52° 3060, +53° 2730, 2737,	" 13 "	"	158
1. 4.	" +50° 2411, 2415.	" 16 "	"	165
1 54.	" +51° 1770, 1774,	" 21 "	"	172
1 78	" +54° 1550. 1551.	" 25. "	"	17[illegible]
1 80	" +50° 1962, 1967, 1968,	" 27 "	"	193
1 82	" +53° 1657, 1662,	" 29 "	"	199
1 84	" +53 1698, 1699	July 2 "	"	206
1 85	" +53 1698, 1699,	" 3 "	"	211
1 88	" +53 1698 1699	" 5 "	"	213
1 94	" +50° 2358, 2359	Sept 6 "	48	42
1 96	" +51° 2171, 2172	" 6 "	"	48
1 98	" +53° 1697, 1698, 1699	" 7 "	"	46
1 100	" +54° 1831, 1832, 1834	" 7 "	"	48
1 102	" +50° 2858, 2859	" 10 "	"	52
1 104	" +51° 2171, 2172	" 10 "	"	54
1 106	" +50° 2410, 2411, 2415	" 10 "	"	56
1 108	" +51° 649, 657, 658	" 12 "	"	65
1 110	" +51° 750, 751	" 12 "	"	68
1 112	" +51° 817, 818	" 12 "	"	70
1 114	" +55° 701 704	" 15 "	"	87
1 116	" +52° 753, 757	" 15 "	"	89
1 118	" +52° 750 752 758	" 15 "	"	91

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Rd. h.	Page	Desig	Date	Book	Page
1	120	DM +54° 809, 818, 812	Sept 15, 1888	R. 48	98
1	122	" +50° 1074, 1076	" 15 "	"	98
1	134	" +53° 443. 442. 849. 850.	Oct. 2 "	"	130.
1	~~142~~	" +49° 1303, 1298, 1306	" 11, "	"	~~142~~
1	1446	" +53° 929. 934.	" 15. "	"	160
1	1482	" +54° 942. 943.	" 15. "	"	164.
1	150.	" +55° 1017. 1022.	" " "	"	166.
1	152.	" +53° 952. 961.	" 17 "	"	168.
1	154.	" +52° 1020. 1023. 1024.	" " "	"	169.
1	156.	" +55° 1044. 1045. 1049.	" " "	"	171.
1	158	" +51° 1313, 1311.	Jan. 9. 1890	R 53	131.
1	160	" +52° 1231. 1229.	" 9. "	"	132.
1	162	" +52° 1367, 1365.	" 9. "	"	134.
1	164	" +53° 1321. 1322.	" 9. "	"	135.
1	166	" +55° 1344. 1345.	" 9. "	"	136.
1	168	" +49° 2056, +50° 1826	" 9. "	"	138.
1	170	" +54° 215, +55° 236.	" 9. "	"	139.
9	106	" +53° 344. 339.	" 14. "	"	143.
9	108	" +51° 804. 798.	" 14. "	"	144.
9	110	" +51° 604. 599.	" 14. "	"	146.
9	112	" +52° 746. 745.	" 14. "	"	147.
9	114	" +49° 1106. 1108.	" 14. "	"	148.
9	116	" +52° 832. 830.	" 14. "	"	149
1	142	" +55° 1045. 1049.	" 17. "	"	162
1	174	" +50° 1076. 1075.	" 17. "	"	164
1	176	" +53° 848. 850.	" 17. "	"	165
1	178	" +51° 1110. 1111.	" 18. "	"	168
1	180	" +50° 873. 874.	" 24. "	"	203
1	182	" +51° 1636. 1634.	" 27. "	Con. on next page.	205

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Asteroids.

Ceres.

Date.	Book.	Pg.
Mar. 7. 1889.	50. 176	
" 21 "	50, 189	
" 30. "	50. 212.	
Apr. 6. "	51. 6.	
" 19. "	51. 36.	
" 23. "	51. 42.	
May 6. "	51. 66.	
" 15. "	51. 94.	
" 24 "	51. 113.	
" 26. "	51. 126.	
June 20. "	51. 154.	

Juno.

Date.	Book.	Pg.
Mar. 7. 1889.	50. 174.	
" 22. "	50. 198	
May. 11. "	51. 84.	

Vesta.

Mer. Circle Stars.

Com. from previous page.

Red. B. + Pgs.	Desig.	Date.	Book.	Page.
1 184	Dm. +51° 831, 829.	Jan. 27. 1890.	R 53	207
1 186	" +49° 1106, 1103	" 28. "	"	209
1 190	" +50° 1911. 1913	Apr. 1. "	R 54	108
1 196	" +51° 1772. 1774.	" 1. "	"	109
1 198	" +53° 1618. 1622.	" 1. "	"	111
1 200	" +54° 1615. 1616	" 1. "	"	112
1 202	" +54° 1755. 1757	" 1. "	"	113
1 204	" +51° 2010. 2009.	" 2 "	"	115
1 206	" +50° 2303. 2302.	" 2 "	"	118
1 208	" +51° 2172. 2171.	" 2 "	"	119
+ ~~210~~	" +50° 2333.	" 2 "	"	119
1 212	" +50° 2340, 2342	" 2 "	"	121
2 2	" +51 2222	" 5 "	"	123
1 212	" +51° 2273, 2281	" 5 "	"	123
2 2	" +51° 2275	" 5 "	"	125

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~~Ar~~ ~~Asteroids~~

Name	Date	Book	Pg.	~~Asteroids~~ Name	Date	Book	Pg.
Ceres	Mar. 7. 1889	No. 176	4.	Ceres	Mar. 7. 1889	No. 176	4.

Rect. B & page		Desig	Date.	Bk & Pg.	
2	4	Dm. +50° 2534 & 2533	Apr 5, 1890	R 54	125
2	3	" +50° 2483	" 5 "	"	125
2	6	" +53° 2042 & 2043	" 5, "	"	127
2	8	" +54° 2205 & 2202	" 5, "	"	128
2	10	" +54° 2202 & other star	" 5, "	"	130
2	12	" +54° 2207 & 2202	" 30. "	"	201
2	14	" +50° 3047 & 3043	May 2. "	"	211
2	16	" +52° 2709 & 2711	" 2. "	"	213
2	18	" +52° 2710 &	" 2. "	"	211
2	20	" +52° 7548 and 7542.	" 3 "	55	1
2	22	" +53° 4448 and 4449	" 3. "	55	3
2	24	" +50° 3176 and 3171	" 21 "	55	18
2	26	" +52° 2778	" " "	"	20
2	28	" +54° 2806 and 2807	" 31 "	"	36
2	30	" +54° 3377 and 3379 June 9.	"	"	49.
2	32	" +52° 3086 and 3089	" 16. "	"	67.
2	34	" +50° 3506	" 3502	" 18. "	" 74.
2	36	" +53° 2870	" 2868	" 18. "	" 79.
2	38	" +53° 2876	" 2874	" 19 "	" 81.
2	40	" +50° 3770	" 3748 & 49	" 20 "	" 83
2	42	" +52° 3263	" 3257	" 20 "	" 87
2	44	" +52° 3340	" 3331	" 25 "	" 89
2	46	" +54° 2972	" 2969	" 27 "	" 96
2	48	" +49° 4126	" 4123	" " "	" 98
2	50	" +54° 2945	" 2979	" 26 "	" 99
2	52	" +51° 3639	" 3640	" 30 "	" 105.

Con. on next page.

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Ephemeris. Iris.

Date.	R.A.	Dec.
1889. Apr. 11.	5h 14m	+21° 1'
May 1	6 2.4	21 6
" 21	6 46.2	20 23
June 10	7 29.1	18 59
" 30	8 10.5	16 57
July 20	8 50.1	14 22
Aug. 9	9 27.9	11 22
" 29	10 3.8	8 04
Sept. 18	10 37.7	4 36
Oct. 8	11 9.7	1 02
" 28	11 39.7	2 27
Nov. 17	12 7.3	5 46
Dec. 7	12 31.8	8 50
" 27	12 52.1	11 31

Ephemeris. Ceres.

Date.	R.A.	Dec.
Apr. 11	8h 3.5	+ 30 57
May 1	8 25.8	29 15
" 21	8 58.2	27 06
June 10	9 23.8	24 31
" 30	9 56.0	21 33
July 20	10 29.1	18 16
Aug. 9	11 2.4	14 42
" 29	11 35.7	11 0
Sept. 18	12 9.0	7 15
Oct. 8	12 42.2	3 33
" 28	13 15.1	+ 0 2
Nov. 17	13 47.6	− 3 13
Dec. 7	14 19.4	6 05
" 27	14 49.8	− 8 28

Inter. Circle Stars (Con. from pre. page)

Red. B.	Page.	Desig.	Date.	Obs. B.	Page.
2	54	+49° 4144 and 4141.	July 1. 1890.	B VV	114.
2	V6	+52° 3440 and 3442	" " "	" "	115.
2	58	+50° 4091 " 4089	" " "	" "	117.
2	60	+50° 4074 " 4048	" V. "	" "	120
2	62	+54° 3042 " 3027 and 3041.	July 8. 1890.	" "	125
2	64	+50° 4090 a, and 4094	July 9. 1890.	" "	129
2	66	+50° 4215, 4208, +49° 4303,	" "	" "	140
2	68	+54° 137, 145 and 148.	" "	" "	166
2	70	+50° 381 and 388.	" "	" "	189
2	72	+50° 500 " 499.	" "	" "	190

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Extra Miscellaneous Obs. with Equatorial.

Dm. +30° 3609. Star with bright lines.	R. 55. p. 90.
Nova Delphini June 9. 1890.	R 55. p. 52.
Examination of Nova.	R 55. p. 147.
Star with bright lines	R. 56. p. 1.
Var. Dm. +62° 596 and Comp. Stars.	R. 56. p. 143.
New. Var. desc. by Photography. (See R 56. p. 153) (at 1ʰ 54ᵐ +56° 0′)	See this book p. 203.
Examined +36° 3960 and 4024 for bright lines.	R. 56. p. 182.

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Photometric Hedge Lines.

Con. from p. 173.

Desig.	Date.	Book.	Page.
+9° Sr. 57.	Mar. 27. 90.	54.	98.
+9° " 58.	Apr. 28. 90.	54.	182
+9° " 59.	" 29. "	54.	193
+9° " 60.	" 30. "	54.	203
+9° " 61.	May 2. "	54.	214
+9° " 62.	Sept. 22. "	56.	49
+9° " 63.	" 23 "	56	58
+9° " 64.	" 23 "	56	62
+9° " 65.	" 24 "	56	70
+9° " 66.	" 24 "	56	74
+9° " 67.	" 29 "	56	89
+9° " 68.	" 29 "	56	92
+9° " 69.	" 30 "	56	99
+9° " 70.	" 30 "	56	101
+9° " 71.	Oct. 1. "	56	111
+9° " 72	" 1. "	56	116
+59° " 73.	Dec. 19. "	57	31

For continuation of above ledger see 2d book of Ephemerides, p. 50.

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Chronometer Comparisons.

Date.	Chron.	Comp. with.	Time by Chr.	Time by Clock.	Error Chr.
1882. Oct. 29.	3451.	Bal. 103.	13h 20m 57.2 =	22h 30m 0.0	2m 1.8s slow.
" " 30.	"	"	2 7 1.7 =	11 14 0.0	2 2.5 "
" Nov. 1.	"	"	15 13 1.9 =	0 14 0.0	2 7.0 "
" " 1.	236.	"	15 25 39.2 =	0 29 0.0	4m 31.7 "
" " 2.	3451.	"	12 34 24.0 =	22 24 0.0	2 10.6 "
" " 4.	"	"	1 20 17.4 =	22 6 0.0	2m 16.1 "
" " 4.	236	"	13 38 54.3 =	22 27 0.0	4m 42.7 "
" " 7.	3451.	"	2 35 13.2 =	11 11 0.0	2m 22.8s "
~~" " 12.~~	~~"~~	~~"~~	~~1 39 33.2 =~~	~~22 1 0.0~~	~~6m 31.5s "~~
~~" " "~~	~~236~~	~~"~~	~~14 3 16.4 =~~	~~22 00 0.0~~	~~4m 41.5 "~~
~~" " 12~~	~~3451~~	~~"~~	2 52 41.7 =	11h 9 0.0	~~6m 33.6 "~~
~~" " 13~~	~~"~~	~~"~~	~~2 26 34.0 =~~	~~22 41 0.0~~	~~6m 40.0s "~~

There must have been some error in the above comparisons (crossed out) except, possibly that of 236. and also that of 3451. transferred below.

1882. Nov. 12.	3451	103.	2 52 41.7 =	11 9 0.0	2 36.4 slow.
" " 15.	"	"	14 38 16.3 =	22 41 0.0	2m 45.4s "
" " 18.	"	"	15 9 0.8 =	23 0 0.0	2m 53.7 "
" " 18.	236	"	15 17 45.3 =	23 7 0.0	1m 10.6 "
" " 21	3451	"	3 19 45.5 =	11 1 0.0	3m 0.6s "
" " 28	3451	"	6 42 34.1 =	1h 58m 0.0	3m 18.6 "
" Dec. 6	3451	"	4 26 17.2 =	11h 9m 0.0s	3m 38.4s "
" " 9	3451	"	3 0 39.8 =	21h 30m 0.0s	3m 47.5s "
" " 12	3451	"	4 45 40.7 =	11h 5m 0.0s	3m 53.6 "
" " 14	3451	"	2 14 2.5 =	8 26 0.0	3m 58.8 "
" " 18	3451	"	10 3 55.3 =	4 1 0.0	4m 8.6s "
" " 18	3451	"	5 2 3.5 =	10 58 0.0	4m 8.9s "
" " 19	3451	"	3 39 43.9 =	9 32 0.0	4m 11.7 "

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Chronometer Comparisons. cm.

Date	Chron.	Comp. with	Time by chron.	Time by clock	Corr. of chron
1888, Dec. 19	3451	Bal. 103	3h 39m 43.2s	9h 32m 0.0s	4m 11.7s slow
" " 22	"	"	5h 31m 40.0	11h 12m 0.0s	4m 20.9 "
" " 23	"	"	5h 53m 33.5	23h 28 0.0	4m 24.9s "
1889 J					
" Jan. 21	"	"	7h 17 39.5	11 1 0.0	5m 36.2s "
" Jan. 22	"	"	8h 9 37.5	23 47 0.0	5m 40.5s "
" " 25	"	"	7h 57 17.4	11 25 0.0	5m 48.4 "
" " 29	"	"	8h 2 49.9	11 15 0.0	6m 04s "
" " 30	"	"	8 0 43.0	11 9 0.0	6m 2.9 "
" Mar. 18	B&C 1182	"	12 13 1.6	0 12 0.0	1m 1.6s fast
" " 18	B. 236	"	0 7 30.4	0 16 0.0	* 9m 54.7 slow
" " 18	Fr. 3451	"	12 20 37.8	0 20 0.0	0m 50.4 "
" " 18	B 236	"	0 47 34.9	0 45 0.0	* 1m 2.3 fast
" Mar. 24	B. & C 1182	"	10 15 26.4	22 16 0.0	0m 33.6s slow
" " 24	B 236	"	21 54 58.7	21 26 0.0	0m 33.0 fast
" " 24	Fr. 3451	"	10 34 35.3	22 7 0.0	0m 56.8 slow
" " 31	B&C 1182	"	10 46 1.7	22 49 0.0	2m 58.3 slow
" " 31	B 236	"	23 48 7.4	22 52 0.0	0m 8.2 "
" " 31	Fr. 3451	"	11 53 2.4	22 58 0.0	1m 14.0 "
" Apr. 2	" "	"	12 6 54.5	11 6 0.0	1m 18.0s "
" Apr. 6	" "	"	12 28 33.2	11 12 0.0	1m 26.5 "
" Apr. 7	B 236	"	23 19 56.0	21 57 0.0	0m 46.2s "
" " 7	Fr. 3451	"	11 26 11.3	22 4 0.0	1m 31.9 "
" " 7	B&C. 1182	"	10 52 3.9	22 57 0.0	4m 56.1 "
" " 9	"	"	11 42 23.7	23 41 0.0	+ 1m 23.7 fast
" " 14	B. 236	"	0 9 54.7	22 20 0.0	1m 27.1 slow

* Mar. 18; B 236 altered to correspond to correct time + 1m + altered

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Chronometer Comparisons

	Chron.	Comp. with	Time by chron.	Time by clock	Error
1889, Apr. 14[a]	Fr. 3451	B. 103	12 15 36.8	22 26 0.0	1m 45.9s slow
" " 14[a]	B. & C. 1182	"	11 10 40.9	23 9 0.0	1m 40.9 fast
" " 19	Fr. 3451	"	13 20 20.5	11 13 0.0	1m 54.4 slow
" " 22	B. & C. 1182	"	11h 26 40.6	28 27 0.0	0m 19.4 "
" " 22	B 236	"	1 50 55.9	23 30 0.0	2m 9.7[a] "
" " 22	Fr. 3451	"	1 58 3.3	23 37 0.0	2m 3.4 "
" " 23[a]	"	"	13 28 55.6	11 6 0.0	2m 4.4 "
" " 25[a]	"	"	3 13 3.0	0 44 0.0	2m 7.9[a] "
" " 28[a]	B. & C. 1182	"	10 25 55.0	22 29 0.0	3m 5.0 "
" " 28[a]	B. 326	"	1 16 56.8	22 33 0.0	2m 38.7 "
" " 28[a]	Fr. 3451	"	1 50 24.6	23 6 0.0	2m 16.4 "
" " 29.[a]	B. & C. 1182	"	16 12 30.1	16 22 0.0	3 29.9 "
		(There was an error of some 2 secs. in Bal. 103 to day.)			
" May 3	Fr. 3451	"	12 30 44.0	21 27 0.0	2 23.4 "
" " 3	B. & C. 1182	"	12 2 22.5	12 7 0.0	4m 37.5 "
" " 3[a]	B 236	"	0 55 49.8	21 45 0.0	3m 13.5 "
" " 3[a]	Fr. 3451	"	1 23 35.8	22 12 0.0	2 32.1 "
" " 12[a]	B & C 1182	"	10 14 54.8	22 23 0.0	8m 5.2[a] "
" " 12[a]	B 236	"	2 4 3.7	22 26 0.0	3m 42.2[a] "
" " 12[a]	Fr. 3451	"	2 7 59.0	22 29 0.0	2m 47.6 "
" " 21[c] *	B. & C. 1182	"	11 14 0.5	23 10 0.0	4m 0.5 fast
" " 21[c]	Fr. 3451	"	3 27 13.8	23 13 0.0	3m 8.9[a] slow
" " 27[c]	B & C 1182	"	2 6 16.8	2 3 0.0	3 16.8 fast
" " 27[c]	Fr. 3451	"	6 26 9.4	1 52 0.0	3 22.2 "
" " 27[c]	B. 236	"	7 19 4.3	2 46 0.0	4m 36.0 "
" June 2	Fr. 3451	"	3 22 52.0	22 22 0.0	3 40.9 slow
" " 2	B. 236	"	3 24 31.3	22 25 0.0	5 1.9 "
" " 2	B. & C. 1182	"	10 29 13.6	10 28 0.0	1 13.6 fast
"					

* This chronometer altered since last comparison

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	Chron.	Comp. with	Time by chron.	Time clock	Error
	Previously, by mistake, the dates have in a few cases been put in civil time. Hereafter all dates will be put in astronomical time				
1889					
June 9	B.236	B.103	4h 44 17.8	23 12 0.0	*0m 0.1s f.
" 9	Fk.3451	"	4 45 17.5	23 17 0.0	4 0.3 a
" 9	B.&C.1182	"	11 18 21.2	23 19 0.0	0 38.8 a
" 17	B 236	"	4 36 12.2	22 33 0.0	0 31.5 a
" 17	Fk.3451	"	4 5 20.2	22 6 0.0	4m 18.4s a
" 17	B&C.1182	"	10 33 22.3	22 36 0.0	2 37.7 a
" 23	B 236	"	5 12 30.8	22 46 0.0	0 54.2 a
" 23	Fk.3451	"	5 0 48.0	22 38 0.0	4 35.1 a
" 23	B.&C.1182	"	10 37 32.2	22 41 0.0	3 27.8 a
July 6	Fk.3451	"	22 0 19.4	14 48 0.0	5m 1.6s a
" 7	" "	"	6 43 37.8	23 26 0.0	5 4.9 a
" 7	B.236	"	6 58 57.3	23 36 0.0	0 12.1 f.
" 7	B.&C.1182	"	11 38 29.2	23 41 0.0	2 30.8 a
" 22	Fk.3451	"	7 38 8.6	23 22 0.0	5 41.8 a
" 22	B.236	"	7 38 2.6	23 17 0.0	0 47.8 a
" 23	Fk.3451	"	21 29 23.3	13 11 0.0	5 43.3 a
" 24	"	"	21 14 14.9	12 52 0.0	5 45.1 a
" 25	"	"	21 31 11.9	13 5 0.0	5 46.8 a
" 28	B 236	"	7 33 16.0	22 49 0.0	1 9.0 a
" 28	Fk.3451	"	7 33 30.4	22 54 0.0	5 54.6 a
" 28	B.&C.1182	"	11 2 38.3	23 2 0.0	†0 38.3 f
" 29	"	"	10 6 10.6	22 5 0.0	††1 10.6 f
Aug 4	B.236	"	7 22 16.5	22 11 0.0	1 38.1 a

* B.236 altered previous to this comp.

† B&C.1182 has been repaired since last comp.

†† " " " " altered " " "

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Chronometer Comparisons

1889	Chron.	Comp. With.	Time by Chron.	Time by clock.	Error Chron.
Aug. 4	Fr. 3451	B. 103	7 21 47.0	22 15 0.0	6m 7.5s a
" 4	B. & C. 1182	"	10 23 32.0	22 22 ao	1 32.0 f
" 26	" "	"	0 58 21.8	0 58 0.0	21.8 f
" 27	" "	"	1 4 14.4	1 4 0.0	14.4 f
" 28	" "	"	1 2 18.4	1 2 00	18.4 f
" 29	" "	"	1 12 16.2	1 12 00	16.2 f
" 30	" "	"	1 3 21.4	1 3 00	21.4 f
" 31	" "	"	1 1 25.4	1 1 00	25.4 f
Sept 3	" "	"	0 49 27.8	0 49 00	27.8 f
" 4	" "	"	1 4 34.3	1 4 00	34.3 f
" 5	" "	"	1 5 38.8	1 5 00	38.8 f
" 6	" "	"	1 5 45.7	1 5 00	45.7 f 30.7 f
" 6	B. 236	B. 1327	9 37 33.8	9 38 00	21.7 a 12.8
" "	Fr. 3451	"	9 35 17.2	9 35 00	21.8 f
" 8	B & C 1182	B. 103	22 10 23.3	22 10 00	23.3 f
" "	B. 236	B. 1327	9 51 28.3	9 52 0.1	0 27.3 a
" "	Fr. 3451	"	10 00 13.3	10 00 0.1	0 17.7 f
" 17	B. 236	B 394	11 40 22.8	23 35 0.0	1m 14.0 a
" 17	Fr. 3451	"	11 46 22.7	23 40 0.0	0 15.1 a
" 17	B. & C. 1182	"	11 45 0.0	26 46 4.0	1 4.0 f
" 23	Fr. 3451	"	12 45 57.5	0 20 0.0	0 29.6 a
" 23	B. 236	"	12 38 55.2	0 14 0.0	1 30.7 a
" 23	B. & C. 1182	"	12 24 10.8	0 23 0.0	1 19.8 f.
" 29	Fr. 3451	"	10 21 43.0	21 29 0.0	0 51.8 a
" 29	B 236	"	10 18 36.8	21 25 0.0	0 2.5 f
Oct 29	B & C. 1182	"	1 36 24.7	1 36 0.0	0 24.7 f
Oct. 7	Fr. 3451	"	2 52 35.5	1 32 0.0	1 15.0 a
" 7	B. 236	"	14 49 27.7	1 28 0.0	0 23.3
" 14	Fr. 3451	"	2 53 45.0	1 6 0.0	37.1 a

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Chronometer Comps.

1889	Chron.	Comp. with.	Time by chron.	Time by clock	Corr. Chron.
Oct. 14	D.236	394	2 58 30.5	1 10 0.0	0 52.4 L
" 14	D.&C.1182	"	1 12 58.5	1 13 0.0	0 1.5 L
" 15	Fr. 3451	"	12 7 3.7	22 12 0.0	1 42.9 L
" 16	"	"	1 4 9.0	11 7 0.0	1 44.9 L
" 17	"	"	22 33 37.1	8 33 0.0	1 48.1 L
" 18	"	"	1 25 57.7	11 21 0.0	1 51.6 L
" 20	"	"	13 37 42.3	23 23 0.0	1 58.7 L
" 20	D.236	"	13 34 14.7	23 19 0.0	1 25.7 L
" 20	D&C.1182	"	11 28 36.3	23 29 0.0	0 23.7 L
" 24	Fr. 3451	"	14 47 31.1	0 21 0.0	2 9.1 L
Nov. 4	"	"	3 51 22.3	0 42 0.0	2 43.3 L
" 4	D.236	"	15 46 47.7	0 37 0.0	2 17.2 L
" 4	D.&C.1182	"	12 43 7.0	0 45 0.0	1 53.0 L
" 10	D.236	"	15 18 46.9	23 45 0.0	5 44.7 L
" 10	Fr. 3451	"	3 0 23.4	23 24 0.0	3 5.2 L
" 10	D&C.1182	"	23 45 0.0	15 18 46.9	3 34.9 L
" 14	Fr. 3451	"	2 58 58.2	11 9 0.0	3 15.9 L
" 15	"	"	2 55 50.0	11 2 0.0	3 19.5 L
" 16	"	"	3 6 44.0	11 9 0.0	3m 23.1 L
" 18	D.236	"	16 15 1.3	0 14 0.0	6m 10.6 L
" 18	Fr. 3451	"	4 26 44.8	0 23 0.0	3m 29.0 L
" 18	D.&C.1182	"	12 15 12.6	12 19 0.0	3 47.4 L
" 23	Fr. 3451	"	3 43 57.5	11 19 0.0	3 47.1 L
" 22	"	"	3 9 59.3	10 49 0.0	3 43.1 L
" 24	"	"	3 56 48.4	23 26 0.0	3 52.4 L
" 24	D.236	"	15 59 7.1	23 31 0.0	6 34 L
" 24	D&C.1182	"	11 30 15.2	23 35 0.0	4 44.8 L
" 29	Fr. 3451	"	3 49 13.5	11 1 0.0	4m 7.5 L
Dec. 1	"	"	3 37 53.1	22 40 0.0	4 15.8 L
" 1	D.236	"	15 31 7.5	22 36 0.0	7 0.3 L

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Circumpolar Observations of Var. Stars in 1889.

Desig.	1889.	Est. mag.	Est. mag.	Est.			
T Cassiop.	Feb. 28.	Mar. 21.		After 10. 8.9			May 24. 10.2
T Persei.	Feb. 25 N.S.	Feb. 28 N.S.	Mar. 21 N.S.	" " 8.5	After. 30.	12.5	May 18. 12.5
"	" 28	Mar. 22	Mar. 25. 9.4	" " 9.0	" "	8.8	" " 8.2
			" " 9.3	" " 8.8	" "	8.8	" " 8.7
R Arietis	Feb. 25	Feb. 28	Mar. 22	" " 8.3	After. 23.	8.0	" " 7.8
R Lyncis.	Feb. 28	Mar. 22		After. 9. 8.5	" "	8.1	" " 8.3
R Ursæ maj.	Mar. 1		~~After. 6. 12.1~~	After. 6. 12.1	" "	12.5	May 29. 11.5 May 17. 12.4
T " "	" 1	Mar. 23.	Mar. 30	After. 6. 10.2	" "	12.5	" 12.7
S " "	" 1	Mar. 23.	After. 2. 9.8	" " 9.7	" "	11.2	" 12.5
S Boötis.	" 1 Est. lost	" "		" 9. 8.4	" 24.	8.2	May 16. 8.5
R Canes Ven.	" 11	" "		" 9. 12.3	" "	12.3	" " 10.0
R Ursæ min.	" 11	" "		" 9. 9.5	" "	9.3	" " 9.5
R Draconis	" 11	" "		" " 10.2	" "	9.5	" " 8.3
T Cygni	" 11	" "		" " N.S.	May 6. 11.3 After. 30. 12.5 May 2. 11.0		" " 9.2 May 17. 9.5
T Cephei.	" 11	Mar. 25. 8.0		" " 7.5	Apr. 30	7.6	May 16. 6.3 " 24. 10.3
S "	" 11	" " 11.3		" 10 9.2	Apr. 30	9.9	" 18. 9.6
R Cassiop.	" 21	Mar. 23.	Mar. 25. 12.2	" 13. 11.5 (m)	" "	12.7	" " 12.3

Var. in G.C. 3636 (52. 125) (52. 134) (52. 140) (52. 154)

Peters' Norr. Var. at. Oct. 7. 10.2 Oct. 8. 10.3 Oct. 10. 9.2 Oct. 16. 9.5

Norr Var. at −38° Feb. 21.

" " " +48° = 2m. +48° 2942. (Pos. mean. No est.)

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Circumpolar Observations of Var. Nova in 1883.

June 20. 8.6
" " 9.7
" " 8.5
" " 8.8
" 23 8.4
June 20 8.9
June 14. 11.0
June 31. 11.4
June 14. 13.1
" " 11.3
" " 10.2
" 20 9.4
" 18. 9.5
" " 8.9
" 23 10.4
" 23 7.2
" 14 6.8
" 23 10.2
" " 10.3
" 20 10.9

July 1. 8.5
" " 9.8
" 12 8.8
" 12 8.7
" 12. 9.0
" 15. 9.5
June 29. 10.5
July 1. 10.2
July 13. 12.5
July 1. 10.2
" 6. 11.4
" 5. 8.6
" 5. 9.2
" 5. 10.1
July 13. 9.4
" 5. 7.3
" 15. 10.3
" 5. 10.9
" 6 10.0

July 14. 8.6
" " 11.0
" " 9.2
" " 9.2
July 20. 9.8
July 17. 9.7
" " 8.4
" " 12.9
" " 8.4
" " 12.7
" " 8.2
" " 9.7
" " 10.5
July 20. 11.3
July 17. 7.2
July 23. 10.4
July 20. 10.5
July 24 10.7
" " 9.5

Aug 6 8.6
" " 10.7
" " 8.8
" " 9.4
" 6. 9.9
" " 11.0
Aug 6 6.5
Aug 2 12.3
Aug. 2 8.5
Aug 2 12.9
" " 8.1
" 6 9.4
" " 11.3
" " 12.6
Aug 2 7.4
Aug 2 11.2
" 6 9.2

Sept. 24. 9.1
" " 9.6
" " 9.1
" " 9.4
" " 12.3
" 27. 12.0
" 27. 7.6
Sept. 23. 8.1
Sept. 23. 7.3
Sept. 23. 13.5
Sept. 23. 9.8
" " 9.2
" " 12.2
Oct. 2. 14.0
Sept. 24. 9.3
Sept. 23. 12.1
" 24. 7.4

Oct. 14. 10.2
Oct. 16. 8.5
" " 9.1
" " 9.1
" 18 12.9
" 16 12.5
Oct. 2 12.7
" 16 13.5
" " 8.5
" " 8.1
" " 8.4
Oct. 15. 12.3
" 15. 10.7
" 15. 9.4
" 15. 12.0
Oct. 23. 13.5
" 15. N.S. 13.5
" 15. 9.2
" 15. 12.6
" 14. 8.4

(8.2. 177)
Oct. 23. 9.4

July 12.

July 20.

Aug. 5.

Aug. 24.

Sept. 27.
Sept. 19. Sept. 23.

Con. on p. 19

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1889.

Decij.

ζ Cassiop.	Nov. 12. 9.8	Nov. 30. 10.7 Nov. 25. 10.8	Dec. 6. 10.9	Dec. 16. 11.0	Dec. 27. 11.4
κ Cassiop.	Nov. 6. 8.0	Nov. 25. 8.6	Dec. 6. 8.4	Dec. 16. 8.7	Dec. 27. 8.6
ζ Persei.	" " 8.9	Nov. 25. 8.7	Dec. 6. 9.0	Dec. 19. 9.3	Jan. 2. 9.4
ζ "	" " 8.6	Nov. 25. 8.0	Dec. 6. 7.7	Dec. 19. 8.5	Jan. 2. 7.6
R Aurigae	" 14 17.9 " 16 13.0	Nov. 26. 13.0	Dec. 6. <12.7	Dec. 23. <12.8	Jan. 2. <13.0
R Lyncis.	" " 13.2	Nov. 29. 13.8	Dec. 6. <13	Dec. 21. 12.7	Dec. 26. 13.4
R Ursæ Maj.	" " 9.3	Nov. 26. 10.1	Dec. 6. 10.5	Dec. 23. 10.8 Dec. 21. 11.0	Jan. 2. 11.4
ζ " "	" " 8.8	Nov. 26. 9.5	Dec. 6. 9.6	Dec. 21. 10.7	Dec. 26. 11.4
κ " "	" " 9.4	Nov. 26. 10.5	Dec. 6. 10.6	Dec. 21. 11.4	Dec. 26. 11.8
κ Boötis.	" 14 10.6	Dec. 3 9.7	Dec. 6. 9.6 Dec. 13. 10.1	Dec. 21. 8.8	Jan. 2. 8.4
R Camelop.	Nov. 15. 17.5 Nov. 16. 12.0	Nov. 29. 13.5	Dec. 4 13.3	Dec. 21. 13.9	Jan. 2. 13.2
R Ursæ Min.	" " 9.8	Nov. 18. 9.3	" " 9.6	Dec. 23. 9.7	Jan. 2. 9.9
R Draconis.	" " 11.0	" " 10.6	" " 8.9	Dec. 23. 7.7	Jan. 2. 7.7 Jan. 7. <12.5
κ Cygni.	" " <13.0	Nov. 29. <13.0	" " < 13.0	Dec. 16. <13.7	Jan. 2. <12.5
ζ Cephei.	Nov. 15. 9.7 " 16. 9.8	Nov. 23. 9.8	" " 9.6	Dec. 19. 10.4	Dec. 27. 10.1
ζ "	" " 12.8	Dec. 3 12.5 Nov. 23. 12.8	" " 12.5	Dec. 16. 12.6	Jan. 2. 12.2
R Cassiop.	" " 6.4	Nov. 30. 6.6 Nov. 29. 6.5	" " 6.5	Dec. 16. 7.0	Dec. 27. 7.4

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1890.

1890						
Jan. 16. 12.1	Feb. 11. 11.9	Mar. 17 11.0	Apr. 7. 10.4	Apr. 21. 10.2	May 21. 9.1
Jan. 22. 9.1	Feb. 20. 9.7				
Jan. 16. 9.4	Feb. 15. 9.7	Mar. 17 10.5	Apr. 7. 10.6	Apr. 21. 10.9	May 19. 12.0
Jan. 16. 9.5	Feb. 12. 8.9	Mar. 17 8.8	Apr. 7. 8.8	Apr. 21. 9.3	May 21. 8.6
Jan. 16. 8.3	Feb. 12. 8.5	Mar. 17 8.6	Apr. 7. 8.9	Apr. 21. 9.3	May 21. 9.7
			Apr. 12. 10.5		
Jan. 21. 12.8	Feb. 12. 11.9	Mar. 17 10.8	Apr. 7. 10.2	Apr. 21. 9.9	May 12. 10.0
Jan. 21. 11.7	Feb. 15. 10.8	Mar 18 9.2	Apr. 7. 8.0	Apr. 21. 7.7	May 12. 7.9
Jan. 20. 11.9		[Mar. 21. 12.7]			
Jan. 16. 12.0	Feb. 12. 12.4	Mar. 24. 12.6	Apr. 7. 12.2	Apr. 21. 11.8	May 12. 11.1
	Feb. 21. 12.5				
Jan. 20. 12.4	Feb. 12. 12.5	Mar. 18 11.7	Apr. 7. 9.8	Apr. 21. 9.2	May 12. 7.8
Jan. 20. 11.4	Feb. 12. 9.1	Mar. 18 8.7	Apr. 7. 8.5	Apr. 21. 8.2	May 12. 8.3
Jan. 20. 8.6			Apr. 16. 12.6		
Jan. 16. 8.6	Feb. 15. 9.2	Mar. 18 10.9	Apr. 11. 12.3	Apr. 22. 12.8	May 12. 13.3
Jan. 21. 12.4	Feb. 15. 10.0	Mar. 24. 8.9	Apr. 11. 8.6	Apr. 22. 8.8	May 12. 8.1
		[Mar. 21. 10.2]	Apr. 16. 9.1		
Jan. 21. 9.8	Feb. 15. 9.3	Mar. 24. 9.6	Apr. 11. 9.5	Apr. 22. 9.1	May 12. 9.3
			Apr. 15 10.4	Apr. 25. 11.7	
Jan. 21. 7.8	Feb. 15. 8.2	Mar. 24. 10.4	Apr. 11. 11.4	Apr. 22. 11.9	May 12. 12.3
Jan. 22. 14.3				Apr. 29. 11.7	
Jan. 21. 24. 13.2 (?)	Feb. 15. 11.5	Mar. 17 12.7	Apr. 11. 11.4	Apr. 22. 10.8	May 19. 10.6
Jan. 16. 9.4	Feb. 11. 8.6	Mar. 24. 8.2	Apr. 11. 7.5	Apr. 25. 7.3	May 19. 6.3
Jan. 16. 12.7	Feb. 11. 12.4	Mar. 18 12.0	Apr. 11. 11.1	Apr. 25. 10.8	May 19. 12.1
Jan. 16. 7.5	Feb. 11. 8.6	Mar. 18 9.3	Apr. 11. 9.3	Apr. 21. 9.5	May 21. 10.1

Con. on p. 199.

Estimates of seeing began May 21. 1890.

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Relative Estimates between Comp. Stars for Var.

Desig.	Book	Page.	Night.	
R Urs. Maj.	51	130.	Rather poor.	
" " "	51	132.		
S Cephei	51	160.	Rather poor.	
T "	51	161.		
R Urs. Maj.	51	164.	Rather poor.	
S Cephei	51	205.	Good.	
"	52	24.	Fair. (Last obs. aff. by clouds)	
R Lyncis.	52	107.	Pretty good (A little cloudy at times)	
"	52	116.	Troubled somewhat by clouds at intervals.	
R Aurigae	52	170.		
T Cephei	52	212.		
R Camelop	52	217.		
T Cephei	52	218.		
R Aurigae	52	219.		
R Cassiop.	53	40.	Good	
T Cassiop.	53	42.	"	
S Cephei	53	44.	"	
R Camelop	53	77	Fair.	
R Lyncis	53	116	Pretty good.	
S Cassiop.	53	194	Good.	
" "	53	202	Pretty good.	
" "	54	33	" "	
T Cassiop.	54	41	" Fair.	
R Urs. Min.	54	104	Good.	
R Aurigae	54	143	Rather poor.	(Hedge mesh. also)
R Draconis	54	151	Good.	
S Bootis.	54	156	"	
R Urs. Min.	54	157	"	(Hedge mesh. also.)

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Desig.	Book.	Page.	Sight.
S Böötis	54	161	Rather good.
R Urs. Min.	54	162	" " Wedge meets alas.
S Cephei.	54	176	(Some light var. cloud) Wedge meets only.
R Draconis.	54	179	" " " " No wedge meets.
S Persei.	54	181	Ref. Est. on a part of comp. stars (See book)
R Draconis.	54	191	Ref. Est. on all but "q". Obs. pretty fair.

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Relative Estimates between Comp. Stars for Var.

	Rel. Est.	Hedges means.
T. Cassiop.	√a. 4√. √a. 62. 53. 42, √6. [13√] 5a. 36, 5a. 40. √a. 64. √a 69.	
S "	53. 194, 202, 54, 33. 5a 4√.	56, 42.
T Persei		
S "	√a. 2a, 5a. 32. 54. [181.] 56, 20, 33, 5a, 23. √a. 29. √a, 32. 5a. 37. 5a. 40.	56. 20. 42 57. 131.
R Aurigae	52. 190. 219. 54. 143. 57. 204.	54. 143, 56. 45. 57. 189. 204.
R Lyncis	5a, 2√, √a, 30, √a, 34. 52. 107, 116, 53. 116. 57. 192.	57. 192.
R Urs. Maj.	√a. √7. 5a. 62. 51. 130. 132, 168, 5a. 43. 5a 47. √a √0, √a √2. √a 54. √a. 56. √a 60	55, 56.
T " "	54. 41. 55. 176. [182] √a 4a. √a. √2. √a, √6. √a, 60, √a, 63.	
N " "	55. 132, 140, 168. √a 4a. √a. √8 5a, 3√. 5a. 37. √a. √7. √a. 60. √a. 63.	
S Böötis.	54. 156, 161, √√. 184. √a. 30. √	57. 98. 103. 112.
R Camelop.	√a. 83. √a, 86. √a. 90 52. 217. 53. 77. √√. 164.	
R Urs. Min.	5a. 3a. 54. 104, 187, 162, √a, 2a, √a, 38, 5a. 41. 5a 46. √a, √a, √a. 61.	54. 158, 162.
R Draconis.	54, 151. 179. 191. 5a, 3√, 5a. 3a. 5a, 3√. 5a, 3a. 5a. 42.	
S Cygni.	55, 4√. 92. 122. 54, 2√, √ √a. 46. √a √4. √a, √a.	
T Cephei.	51. 161, 52, 212, 218, 5a, 41. √a. 26. 5a. 31. 5a. 34.	55. 160.
S "	51. 160, 205, 52. 24, 53. 44, √9. 74	√4. 176.
R Cassiop.	53. 40, 55. [86] √a. 4a, √9. 64	
+62° √96		√6. 143.

Posting in red, as above, indicates that the 3d" notation and final list of Comp. Stars were used.

Posting in blue, as above, indicates ~~that 2d" notation and was used but~~ partial series of rel. estimates on Comp. Stars, to finish.

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Obs. of Var. Stars con. from p. 19v.

1890.

T Cassiop.	June 2. 8v	June 18. 8.7	June 30. 8.6	July 17. 8.8		Sept. 4. 7.5v
S Cassiop.	June 9. 13.0	June 18. 13.3	July 5. 13.5v	July 17. 13.6		Sept. 4. 13.5v
T Persei.	June 9. 8.8	June 18. 8.9	June 30. 8.9	July 17. 8.9	Sept. 2v. 8.9	Sept. 4. 8.8
S "	June 9. 9.9	June 18. 10.1	June 30. 9.7	July 17. 10.1	Sept. 2v. 10.6	Sept. 4. 10.8
R Aurigae	May 31. 10.3	June 16. 9.4	June 30. 9.3	July 17. 8.0		Sept. 4. 10.9 Sept. 8. 8.2 " 20. 8.2
R Lyncis	May 31. 8v	June 16. 8.9	June 28. 8.9	July 14. 9.5		Sept. 4. 12.1
R Ursæ maj.	June 10. 7.0 May 31. 7.8	June 16. 7.4	June 28. 7.3	July 14. 7.3		Sept. 2. 8v
T " "	May 31. 7.3	June 16. 7.5v	June 28. 7.9	July 9. 10.8 July 11. 8.5v " 22. 8.5v	Aug. 1. 9.0	Sept. 2. 10.6
S " "	May 31. 8.8	June 16. 9.4*	June 28. 10.3	July 14. 10.8 July 14. 12.1	" 1. 11.7	Sept. 2. 11.3
S Bootis.	May 31. 13.8	June 16. 13.5v	June 28. 12.8	July 11. 12.7 July 18. 10.7	" 1. 10.5v	Sept. 2. 9.7
R Camelop.	May 31. 8.4	June 16. 9.4	June 28. 9.8	July 14. 10.6 July 14. 9.4		Sept. 2. 13.5v
R Ursæ min.	May 31. 9.2	June 16. 9.3	June 28. 9.3	July 11. 9.4	Aug. 1. 9.4	Sept. 2. 8v
R Draconis.	June 2. 12.5v	June 16. 13.1	June 28. 13.0	July 11. 12.4	" 1. 10.2	Sept. 2. 8.3
S Cygni.	June 2. 11.7	June 20. 13.0 2v. " 18. 12.3 3v.	July 5. 13.8 June 28. 13.3	July 14. 14.4 July 18. 7.0		Sept. 2. 413.5
T Cephei.	June 2. 6.9	June 18. 6.6	June 30. 6.5v	July 16. 7.2		Sept. 2. 8.0
S "	June 2. 10.9	June 18. 11.4 June 20. 10.9	June 30. 10.7	July 16. 10.5v		Sept. 4. 10.4
R Cassiop.	June 2. 10.2	June 18. 10.8	June 30. 11.6	July 17. 11.7		Sept. 4. 10.8

Star with brt. lines ——— Sept. 2.

Con. on p. 203.

* See Record Book for additional comp. star.

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Chronometer Comparisons.

Date	Chron.	Comp. with	Time by chron.	Time by clock	Error
1889 Dec 8	Fr. 3451	B 394	3 50 2.1	22 25 0.0	4 40.2 R.
"	B 236	"	15 51 1.5	22 29 0.0	7 40.9 R
"	B&C. 1182	"	10 ~~22~~ 31 8.3	22 33 0.0	1 51.7 R
Dec 16	Fr. 3451	"	0 15 7.7	0 17 0.0	
" "	B 236	"	0 17 33.6	0 21 0.0	
" "	B&C. 1182	"	12 24 17.5	0 23 0.0	
Dec. 23	Fr. 3451	"	8 9 35.1	1 44 0.0	0 7.6 f
" "	B&C. 1182	"	1 49 25.2	1 49 0.0	0 25.2 f

Chronometers ran down. Wound and set, but 3451 set about 1m wrong. Altered same on Dec. 27, so as to be about right.

1890 Jan. 6	Fr. 3451	"	8 13 24.1	0 54 0.0	1m 6.9 R	
" "	B&C. 1182	"	12 58 24.3	12 58 0.0	0 24.3 f	
Jan. 12	Fr. 3451	"	7 26 23.6	23 40 0.0	1 31.0 R	
" "	B&C. 1182	"	11 44 0.2	23 44 0.0	0 0.2 f	
Jan. 14	Fr. 3451	"	6 58 9.2	11 6 0.0	1 34.6 R	
Jan. 16	"	"	7 5 55.2	11 6 0.0	1 41.7 R	
Jan. 17	"	"	7 15 49.0	11 12 0.0	1 45.5 R	
Jan. 18	"	"	7 14 40.7	11 7 0.0	1 49.5 R	
Jan. 20	"	"	7 24 27.5	11 9 0.0	1 56.2 R	
Jan. 21	"	"	7 24 19.7	11 5 0.0	1 59.7 R	
Jan. 22	"	"	7 47 15.7	11 24 0.0	2 3.5 R	
Jan. 24	"	"	7 42 58.5	11 12 0.0	2 11.8 R	
Jan. 26	"	"	7 6 34.2	22 26 0.0	2 20.0 R	
" 26	B&C 1182	"	10 27 27.2	22 28 0.0	0 32.8 R.	
Feb 2	Fr. 3451	"	6 45 40.2	21 38 0.0	2 41.9 R	
Feb. 3	B&C 1182	"	1 7 7.9	1 8 0.0	0 52.1 R	
Feb. 10	B 236	"	21 48 25.3	0 11 0.0	0 58.0 R	
"	B&C 1182	"	12 16 41.7	0 18 0.0	1 18.3 R	
"	Fr. 3451	"	9 51 17.5	0 16 0.0	3 6.3 R	

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Date	Chron.	Comp. with	Time by chron.	Time clock.	Error
Feb. 16	Fr. 3451	B 394	9 44 23.2	23 42 0.0	3 30.8 R
" 16	D & C. 1182	"	11 39 39.2	23 41 0.0	1 20.8 R
" 16	B 236	"	21 56 36.0	23 53 0.0	2 16.8 R
" 25	Fr. 3451	"	11 23 40.2	0 50 0.0	3 57.4 R
" 25	B & C 1182	"	12 49 36.6	0 51 0.0	1 23.4 R
Mar. 4	Fr. 3451	"	8 33 11.8	21 29 0.0	4 25.1 R
" 4	B 236	"	20 40 33.0	21 32 0.0	0 51 R
" 4	B & C 1182	"	9 32 26.3	21 34 0.0	1 33.7 R
Mar. 9	Fr. 3451	"	9 25 41.2	22 2 0.0	4 43.9 R
" 9	B 236	"	21 39 50.7	22 12 0.0	0 36.7 R
" 9	B & C. 1182	"	10 5 17.0	22 7 0.0	1 43.0 R
" 16	"	"	11 57 41.1	0 0 0.0	2 18.9 R
" 16	B 236	"	23 55 31.5	23 59 0.0	4 6.5 f
" 16	Fr. 3451	"	11 44 12.7	23 53 0.0	4 6.4 R
" 18	"	"	11 3 55.0	11 7 0.0	5 11.4 R
" 23	"	"	11 23 19.2	23 5 0.0	5 27.8 R
" 23	B 236	"	23 31 35.2	23 8 0.0	0 13.2 R
" 23	B & C. 1182	"	11 6 27.0	23 9 0.0	2 33.0 R
" 30	Fr. 3451	"	17 8 26.7	16 24 0.0	5 50.3 R
" 31	"	"	1 20 46.5	0 35 0.0	5 51.1 R
" 31	B 236	"	1 29 17.0	0 38 0.0	0 22.0 R
" 31	B & C. 1182	"	12 35 48.0	0 39 0.0	3 12.0 R
Apr. 7	Fr. 3451	"	1 26 58.5	0 14 0.0	6 11.5 R
" 7	B 236	"	1 36 26.3	0 18 0.0	0 45.2 R
" 7	B & C. 1182	"	12 18 0.3	0 19 0.0	0 57.7 R
" 14	Fr. 3451	"	1 49 10.2	0 9 0.0	6 34.8 R
" 14	B 236	"	1 56 38.3	0 11 0.0	1 7.9 R
" 14	B & C. 1182	"	0 13 51.2	0 13 0.0	0 51 f
" 28	Fr. 3451	"	4 27 59.2	1 53 0.0	7 14.5 R
" 28	B 236	"	4 35 21.4	1 55 0.0	1 53.3 R

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Orbits of Comets.

Comet 2 1849. Davidson. A.N. 792 v.

" d 1849 (Brooks July 6) A.J. No. 202. p. 80.

" e 1848

" b 1849. A.J. 201. p. 69.

" c " " 192. p. 46.

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1890.

ϒ Cassiop.	Sept. 19. 7.5	Oct. 13. 7.6	Nov. 13. 9.1 Nov. 4. 8.1		Dec. 13. 10.0
		Oct. 14. 15.1		Nov. 21. 14.4(3)	Dec. 12. 14.2
S Cassiop.	Sept. 19. 15.0	Oct. 13. 15.1	Nov. 4. 15.1	Dec. 9. 15.0 Nov. 19. 14.9	Dec. 15. 14.2 Dec. 12. 14.9
		~~Oct. 31. 9.3~~	Nov. 4. 9.1		Dec. 20. 14.9
ϒ Persei.	Sept. 19. 9.1	Oct. 13. 9.1	Oct. 31. 9.3		Dec. 13. 9.5
	~~Sept. 20. 10.5~~	~~Oct. 31. 10.6~~	Nov. 4. 10.8		
S Persei.	Sept. 19. 10.8	Oct. 13. 10.8	Oct. 31. 10.6		Dec. 13. 10.4
	Sept. 20. 8.2		Nov. 14. 10.0		
R Aurigæ.	Sept. 19. 8.2	Oct. 11. 8.8	Nov. 4. 9.4	Nov. 26. 9.6	Dec. 12. 11.7
			Nov. 14. 14.4		Dec. 20. 14.5
R Lyncis.	Sept. 19. 12.6	Oct. 13. 13.8	Nov. 4. 14.7	Nov. 19. 14.4	Dec. 12. 14.8
		Oct. 21. 11.5		Nov. 20. 11.9	
R Ursæ Majoris.	Sept. 18. 10.5	Oct. 15. 11.7	Nov. 4. 12.1	Nov. 19. 11.6	Dec. 12. 12.8
					Dec. 15. 11.8
T " "	Sept. 18. 11.4	Oct. 15. 12.6	Nov. 5. <14.2	Nov. 19. 12.5	Dec. 12. 12.1
			Nov. 4. 8.0	Nov. 21. 7.9	Dec. 15. 8.3
S " "	Sept. 18. 10.2	Oct. 13. 8.5	Oct. 22. 8.2	Nov. 19. 7.9	Dec. 12. 8.6
		Oct. 15. 8.5			
S Boötis.	Sept. 18. 8.9	Oct. 1. 8.5	Nov. 5. 8.6		Dec. 13. 11.5
		Oct. 18. 13.3			
R Camelop.	Sept. 18. 14.1	[Oct. 15. 13.5	Nov. 5. 12.4		Dec. 12. 10.1
		Oct. 16. 9.9			
R Ursæ Min.	Sept. 18. 9.5	Oct. 1. 9.6	Nov. 5. 10.3		Dec. 13. 10.3
		Oct. 18. 8.6	Nov. 10. 10.1		
R Draconis.	Sept. 18. 8.1	Oct. 1. 8.6	Nov. 5. 9.4		Dec. 13. 11.5
		Oct. 18. <15.1	Nov. 5. <14.6	Nov. 21. <14.3]	Dec. 19. 13.7
ϒ Cygni.	Sept. 18. <14.4	Oct. 11. <14.2	Nov. 13. <14.5 Oct. 22. <14.9	Dec. 2. <14.5 Nov. 19. <14.4	Dec. 15. 13.7 Dec. 12. 13.8
			Oct. 31. 9.3		Dec. 20. 13.5
ϒ Cephei.	Sept. 18. 8.0	Oct. 13. 8.7	Nov. 5. 9.4 Oct. 22. 8.6	Dec. 2. 10.2	Dec. 12. 10.2
		Oct. 18. 16.2	Nov. 10. 18.0		
S "	Sept. 18. 10.1	Oct. 13. 10.5	Oct. 31. 10.4 Nov. 5. 18.3 Oct. 22. 18.2		Dec. 12. 11.6
			Nov. 10. 10.9		
R Cassiop.	Sept. 19. 10.5	Oct. 15. 10.0	Nov. 13. 9.2 Nov. 5. 9.2	Dec. 2. 7.3	Dec. 12. 6.1
			Oct. 31. 13.6		
			Nov. 5. 13.5		
New Var. at 1h 5m +56° 0'			Oct. 30. 13.5	Nov. 21. 13.5	—
+62° 5796			Oct. 21. 8.6	Nov. 26. 8.5	

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Chronometer Comparisons

Date 1890	Chron.	Comp. with	Time by chron.	Time by cl.	Error.
Apr. 28	B&C 1182	394	1 56 37.0	1 56 0.0	0 37.0 f.
May 6	"	"	1 12 32.2	1 12 0.0	0 32.2 f.
" 6	Fr. 3451	"	4 11 58.0	1 6 0.0	7 40.4 R
" 6	B 236	"	4 22 22.8	1 11 0.0	2 17.3 R
" 11	Fr. 3451	"	1 7 46.1	21 39 0.0	7 56.7 R
" 11	B 236	"	1 15 12.3	21 41 0.0	2 32.6 R
" 11	B&C. 1182	"	9 43 26.5	21 43 0.0	0 26.5 f.
" 19	"	"	1 45 24.7	1 45 0.0	0 24.7 f.
" 19	Fr. 3451	"	5 36 40.1	1 40 0.0	8 19.0 R
" 19	B 236	"	5 46 9.0	1 44 0.0	2 31.6 R
" 25	Fr. 3451	"	3 34 30.2	23 11 0.0	8 40.3 R
" 25	B 236	"	3 43 3.7	23 14 0.0	3 8.2 R
" 25	B&C 1182	"	11 16 20.0	11 16 0.0	0 20.0 f.
June 9	Fr. 3451	"	5 8 55.8	23 36 0.0	1 31.2 f.
" 9	B 236	"	5 7 36.4	23 40 0.0	3 47.9 R.
" 9	B&C 1182	"	23 39 45.8	23 41 0.0	0 14.2 R
" 15	Fr. 3451	"	5 20 14.0	23 25 0.0	0 12.1 f.
" 15	B 236	"	5 12 59.4	23 22 0.0	4 1.3 R
" 15	B&C 1182	"	11 21 41.2	23 23 0.0	1 18.8 R.
" 30	Fr. 3451	"	5 5 27.3	22 12 0.0	0 30.8 R
" 30	B 236	"	5 7 25.2	22 14 0.0	0 33.2 R
" 30	B&C 1182	"	10 13 35.0	22 15 0.0	1 m 25.0 s R
July 7	B&C 1182	"	10 17 36.0	22 19 0.0	1 24.0 R
" 7.6	Fr. 3451	"	5 31 50.4	22 15 0.0	~~4 53.3 R~~
" 7.6	B 236	"	5 34 54.2	22 18 0.0	~~4 50.4 R~~ 4 44.3 R
" 14	Fr. 3451	"	6 0 58.7	22 13 0.0	1 11.3 R
" 14	B 236	"	6 5 8.5	22 17 0.0	1 2.2 R.
" 14	B&C. 1182	"	10 16 33.8	22 18 0.0	1 16.2 R
" 21	Fr. 3451	"	9 17 48.7	1 6 0.0	1 29.0 R
" 21	B 236	"	9 21 0.3	1 9 0.0	1 16.9 R.

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Date.	Chron.	Comp. with	Time by Chron.	Time by ch.	Error.
July 21	B+C 1182	B 394	1 8 14.3	1 10 0.0	1 45.7 s.
" 27	Fr. 3451	"	7 11 39.4	22 33 0.0	1 49.1 R
" 28	B+C 1182	~~alt~~ altered	to about true time		
Oct. 13.	B.+C. 1182	B 394	1 3 8 19.0 =	1 3 8 0.0	0 19.0 f.
" 14.	B. 236	B 394	14 5 3.5	0 21 0.0	4 13.6 s.
" 24.	B. 236	B 394	12 22 32.1 =	21 56 0.0	4 43.1 s.
" "	B+C. 1182.	B. 394.	21 51 40.0 =	21 51 0.0	0 40.0 f.
" 26	B. 236.	B. 394.	12 31 21.3 =	21 57 0.0	4 57.2 s.
" "	B.+C. 1182	B. 394.	21 54 8.6 =	21 54 0.0	0 8.6 f.
Nov. 3.	~~B.+C.~~ B. 236. a	B. 394.	12 49 36.~~0~~ =	21 44 0.0	5 2.4 s.
" "	B.+C. 1182.	B. 394.	21 41 17.6 =	21 41 0.0	0 17.6 f.
" 6	B.+C. 1182.	B. 394.	21 38 20.2 =	21 39 0.0	0 31.8 s.
" "	B. 236.	B. 394.	12 ~~56~~ 56 42 =	21 36 0.0	1 33.3 s.
" 9	B. 236	B. 394.	15 8 56.4 =	23 36 0.0	1 40.6 s.
" 9	B.+C. 1182	B. 394.	23 31 39.3 =	23 33 0.0	1 20.7 s.
" 17	B.+C. 1182	B. 394	0 11 32.9 =	0 12 0.0	0 27.1 s.
" "	B. 236.	B. 394.	16 15 25.0 =	0 15 0.0	1 54.3 s.
" 18	B. 236	B. 394.	1 49 52.2 =	9 44 0.0	1 57.1 R.
" 19	B. 236	B. 394	0 45 35.5 =	8 36 0.0	1 59.2 R.
" ~~24~~ 24	B+C. 1182.	B. 394.	22 39 15.6 =	22 40 0.0	0 44.4 s.
" "	B. 236.	B. 394.	15 14 22.8 =	22 43 0.0	2 13.2 s.
" ~~22~~ 21.	B. 236.				2 4.7 s.
" 22.	" "				2 7.2 s.
" ~~24~~ 24	" "	B. 394.	1 27 40.5 =	8 43 0.0	2 24.2 s.
~~Dec~~ Nov 30 Det. T. 1	" "	B. 394.	15 24 43.4 =	22 30 0.0	2 30.4 s.
" "	B+C 1182	B. 394	22 33 32.1 =	22 34 0.0	0 27.9 R
Dec. ~~8~~ 7 Det. Time	B 236	B. 394	15 42 58.1 =	22 21 0.0	2 m 30 R
" "	B+C 1182	B 394	22 26 10.1 =	22 27 0.0	0 49.9 R
Dec. ~~15~~ 14 Det. Time	B 236	B 394	2 31 48.5 =	8 41 0.0	3 m 16.3 R.
Dec. 16 16 Det. Time	B+C 1182	B 394	22 59 54.1 =	23 1 0.0	1 m 5.9 R

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107 I Cassiop.



F14 S and 793 I Persei.



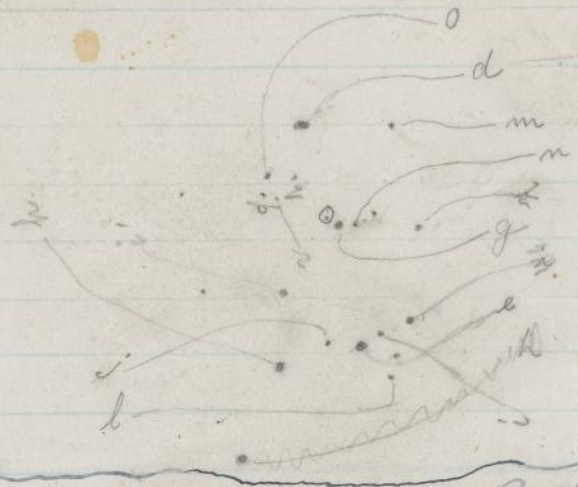
432 S Cassiop.



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1855 R Aurigae



(this star is really f in new notation. Error discovered July 14. 1893.

2478 R Lyncis.



3425 R Urs. Maj.



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2511 τ Ursæ Majoris.



κ 5 γ Ursæ Majoris.



5157 π Boötis.



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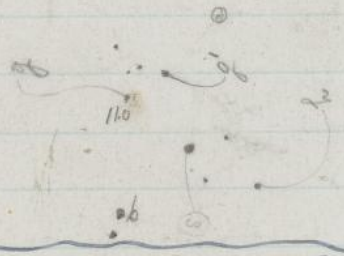
1883phae.proj..460S

ν190 R Camelop.

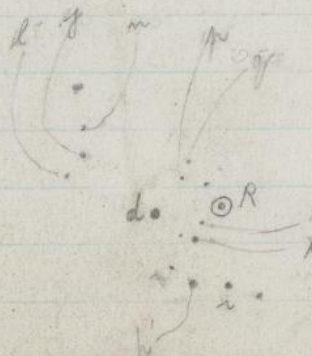


ν9KA R Mon. Gem.





ν9νν R Draconis.



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1883phae.proj..460S

7220 S Cygni.



7609 T Cephei.



7779 S Cephei.



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1883plate..proj..460S

4600 R Cassiop.



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Selection of Comp. Stars for Circumpolar Variables

Name.	Book	Page.
107 T Cassiop.	51 50 53	127 ~~40~~ 194
432 S "	~~50~~	~~144~~
T Persei.	50	150
S "	50	150
R Arrigae	52	170
R Lyncis	50	203
R Urs. maj.	50	206
T Urs. maj.	50	211
S Urs. maj.	50	216
S Bootis	51	38
R Draconis	51	101
S Cygni	52	182
T Cephei	51	115
S Cephei	51	116
R Urs Min	51	29
R Camelop.	52	211
R Cassiop	53	41

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Chronometer Comparasons

Date	Chron.	Comp. with	Time by Chron.	Time by Ch.	Error
Dec 21	B & C 1182	B 394	22 43 38.7	22 45 00	$1^m\ 21.3^s$ slow.
" "	B 236	B 394	17 4 22.4	22 48 00	$3^m\ 41.8^s$ "
" 29	B & C 1182	B 394	1 41 25.7	1 43 00	$1\ 34.3^s$ "
" "	B 236	B 394	20 30 1.5	1 46 00	$4^m\ 7.8^s$ "

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1888phae.proj..46



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