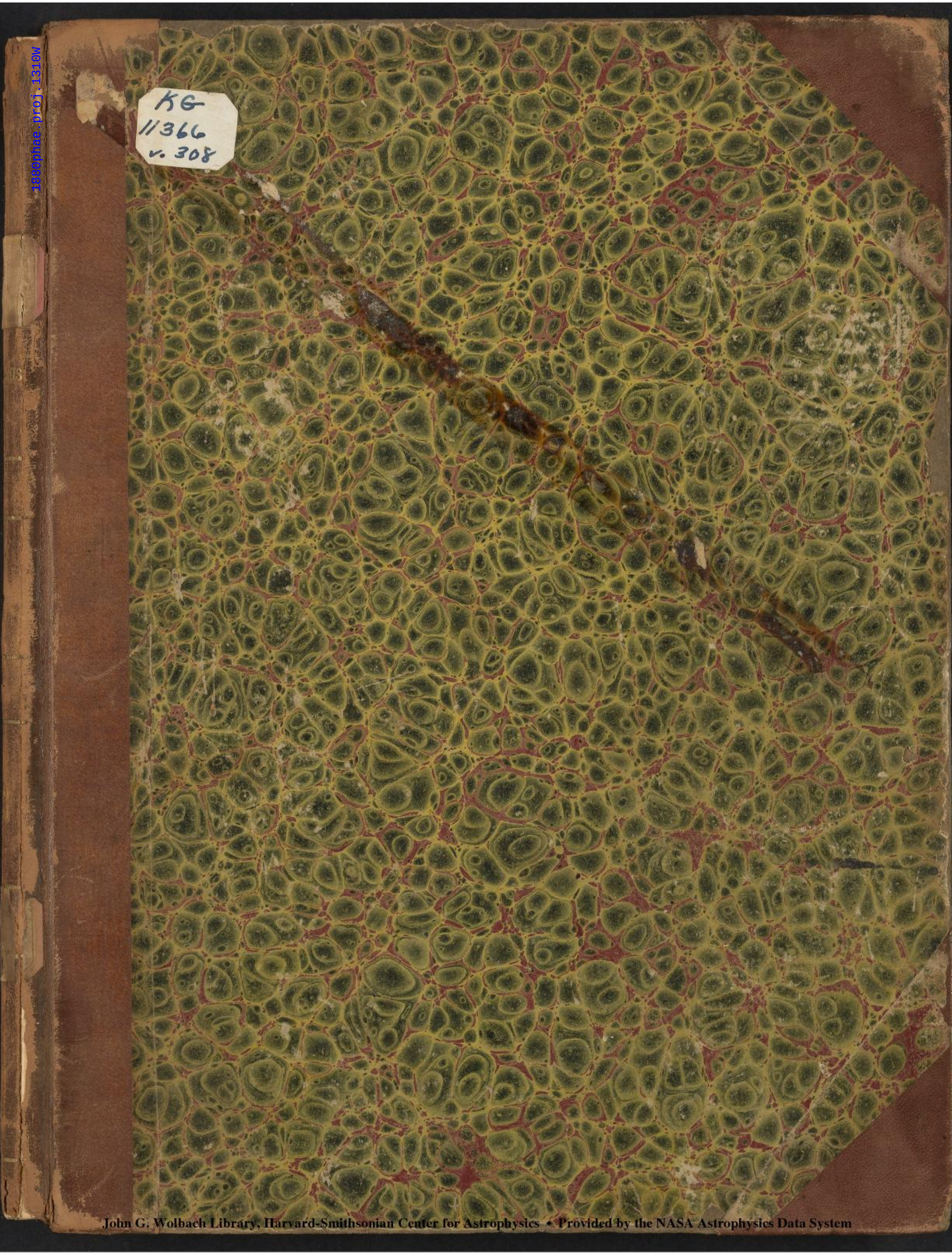


KG
11366
v. 308

1880phae.proj.131OW

Sept 28, 1880.

Dm +81°.25

8 02 Star near meridian P. obs.

R 81.30

8 04 1.55 2.09

Rolling Clouds

8 30 1.45 clouds

8 32 1.73 2.73 P. obs.

1.53 ~~3~~2.37

8 34 1.47 2.43

17 3 15 3

1.58 clouds 2.51

0.99 1.99

Here 3 sec fast of Bond 394

9 13 1.52 2.05 P. obs.

1.46 ~~2.13~~ 2.32

1.70 2.29

6 6

16 1.57 2.22

62 5 1.73

31 25

1.562

0.96

17 1.59 2.59 P. obs.

1.57 2.12

1.70 2.16

21 1.70 87

6.5 6. 2.29

3.28 1.80

1.64

1.07

22 1.64 2.53

1.53 clouds.

9 37 m.t 22h 10m sid. time

Sept. 28, 1880.

9 38 10 1.89 2.19 P. obs.
~~2.19~~
1.49 2.08
1.57 2.25
41 10 1.45 2.17
64.0 1.68
32
1.60
1.02
42 50 1.42 2.02 S. obs.
1.32 1.92 same focus as P.
1.53 1.92
46 53 1.63 2.86
19.0 1.95
1.48 1.45
0.85

Neb. G.C. 4487.
22 18
19 12 + 6.3
+3 6

9 50 5 1.70 2.33 W obs.
2.16 2.90
1.90 2.51 Focus changed
9 55 37 2.10 17.4
7 8 6 2.58+
3 9 3 2.06
1.965+
1.46

δ Aquilae 19 19 2 53"
G.C. 4487 19 12 6.3

9 52½ δ Aquilae h 3 5 2.8

Sept. 28, 1880.

~~9 56 37~~	~~1.81~~		reject; focus afterwards changed. P. obs.
9 57 45	1.88	2.11	
	1.61	1.90	
	1.83	2.05	
10 0 28	1.83	0 6 2.02+ 1.53	
	7 1 5 3 5 7 5 1.7 8 8+ 1.55		
10 1 44	1.55	1.66	S. Obs.
	1.57	1.80	
	1.52	1.94	
10 5 26	1.77	24 0 1.80+ 1.27	
	64 1 1.60+ 1.02		

Neb. G.C. 4487.

10 4 Seeing so poor that no details can be made out. [Spectrum gaseous] W. Obs.

10 7 14	2.25	2.55	W. obs.
	2.11	2.09	
	2.03	2.19	
10 12 58	2.05	8 3 2.28+ 1.79	
	4 4 2.11+ 1.62		

10 9 46 neb G.C. 4487 P. obs.

star 8' n. having spectrum [illegible] [illegible] banded.

Sept. 28. 1880.

10 14 26	2.43	2.12	P. Obs.
	2.16	2.07	
~~16~~	2.22	2.20	
		39	
10 16 41	1.97	2.13+	
	78	1.64	
	2.20+ 1.71		Variable appears slightly brighter than 81°30
	G.C. 4487		
10 10	Spectrum. Gaseous	P.	
10 15	"	" S.	
10 17 50	1.82	1.93	S. obs
	2.08	2.06	
	2.01	1.94	
		29 3	
10 21 20	1.98	1.98+	
	38 9	1.48	
	1.97+		
	1.47		
10 23 35	2.20	2.51	W. obs
	2.62	2.84	
	2.47	2.30	
		16 5	
28 40	2.20	2.55+	
	14 9	2.03	
	2.37+		
	1.87		
			P. Obs.
			Var. 1 grade brighter than. 81° 30
10 31 18	2.21	2.31	P. Obs.
	2.45	2.30	
	2.32	2.21	
		2 2	
10 33 25	2.24	2.27+	
	12 2	1.78	
	6 1		
	2.30+		
	1.81		

5 5.

Sept. 28. 1880.

10h 35m 0s	2.28	1.60	N. Ob.
	1.89	1.76	
	2.03	1.48	
40 7	2.20	18 4	
	4 0	1.61+	
	2.10+	1.03	
	1.61		
10 41 55	2.39	2.29	W. obs.
	2,42	2,01	
	2,98	2,62	
10 47 30	3,00	9 2	
	27 9	2.31+	
	2.70+	1.82	
	2.16		
10 48 55	2,94	2,14	P. obs. 81° 25 0.3 magn. >
	2,77	2,18	81° 30
	2,76	2.20	
10 51 0	2,98	2 2	16
	34 5	2.17+	
	2.86+	1.68	
	2.28		
10 52 31	2.47	1.91	S. obs
	2.67	1.69	
	2.32	1.55	
10 57 12	1.88	21 5	
	13 4	1.72+	
	2.34+	1.18	
	1.85		
10 59 02	3.03	2.67	W. obs
	2.96	2.55	Last 3 or 4 readings
	3.40	2.71	taken with stars farther
11 3 50	3.49	19 3	from prism in field.
	8 8	2.64+	
	3.22+	2.10	
	2.54		

Sept. 28. 1880.

11 5 36	3.92	2.68	P. Obs.
	2.71	2.47	
	3.01	2.25	
		140	
11 7 36	3.27	2.47+	
	91	1.96	
	3.23+		
	2.55		
11 8 52	3.08	2.26	S. Obs.
	2.75	2.00	
	2.88	2.07	
		33	20
11 13 19	2.88	2.11+	
	359	1.62	
	2.90+		
	2.31		
11 15 25	4.04	2.73	W. obs.
	3.86	2.79	
	3.59	2.78	
		20	
11 22 3	4.24	2.77+	
	373	2.21	
	3.93+		
	2.97		

G. C. 4487, μ Aquilae

11 15	19.3	10.6	P. obs.
	18.3		
	Reject; dome interferes.		
	a	b	
11 18	4.6	20.4	
	3.4	17.8	
	3.2	16.2	
	22	244	
	3.73+	18.1+	
	2.86	1.29	

Sept. 28, 1880.

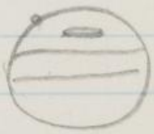
11 23 28 4,55 3,38 P. obs.
3.09 2,28
2,70 1,91
11 26 28 3,64 ~~7 3 7~~ 7.57
~~2.46~~
13 9 8 2.52+
6 9 9 2.00
3.50+
2.72

11 27 31 4,0,3 2,39 S. obs. 24
2,69 2,60 eyepiece removed and replaced after 3d reading
5,09 1,72 haze over Pole Star.
13.94+
Pole Star varied owing to haze.

G. C. 4487 W. obs. ~~2d Plane for Aquilae~~
B Stevens
11 33 17.5 7.8 v Aquilae Comp. star.
17.5 8.0 1/3 Object glass cut off.
17.2 8.0 Reject this.
17.4+ 7.93+

G. C. 4487.
5,8 11.3 S. Obs.
11 51 4.4 10.9 Comp. star v Aquilae.
4.0 12.1
4.73+ 11.4+
3.37 0.28

11 58 Looked at Jupiter
57 Red Spot on centre of disk P. obs.
11 59 " " .45 W. obs.



Seeing remarkably good.

Sept. 28. 1880.

12 5 12	4.66	~~Variable~~ 3.24	P. Obs.
	4.23	2.89	
	4.31	2.44	Variable + 81° 30
12 7 20	4.55	2 5 7:	
	17 5:	2.86+	
	4.44+	2.28	
	3.24		
12 9 00	5.10	3.43	U. obs
	4.78	3.13	
	4.12	3.12	
12 13 50	4.53	138	
	2 5 3	3.23+	
	4.63+	2.55	
	3.33		

9 37
12 18
2 41
22 10
0 51

Slight aurora low in north with two or three broad, vertical bars of light at different portions.

Sept. 28. 1880.

Sweeps for new planetary neb. P. Obs.
Tel. 10m west of meridian.
Sweeps upward from −25° to −20°

12	28	7s		
		53		
	29	0	−21°.2	6th mag.
		55		
	31	8		
		17	−20.1	5th " "
	33	12		
		25	−20.7	5th " "
	34	10		
		53		
	35	38		
	36	42		
	37	40		
	38	32	−24.1	6th " "
		46	−24.5	6th " "
	39	7		
		55	−24	6th " "
	41	10		
	42	2		
		47		
	43	37		
		42	−20.5±	4th " "
	45	4	−20.2	peculiar?
		22	−22.	4th mag.

Sept. 28. 1880.

~~55~~ P. Obs.

12	47	55	-22.0	two *s. 6 + 7 mag.
	49	8	-24	5th mag.
		17	-24.5	" "
	50	30		
	51	19		
		28	-21.	7th " "
		40	-22	" "
	53	0	-21.3	Suspected spectrum.
		30	-24.9	" "
		50		
	54	52		
	55	32	-22	Bright *
	56	15		
		40	-24.5	" "
		52		
	57	43		
	58	43		
	59	11	-23.	5th mag.
		38		
		54	-21.	Bright *
13	0	36		
		50	-21	Two 5th mags.
	1	37		
	2	34		
		50	-22	3d mag.
	3	22		
	4	6		
		50		
	6	25		Ended at Aub #13 7

Sept. 28. 1880.

Sweep no. Set at 15 m West.

Began at Sweeps from 25 to 20

13^h 10^m	20	1		
10	35		25.0	5 mag.
~~11~~	~~43~~	2		
12	25		21.0	7 mag
13	5		25.0	
		? one sweep omitted		
14	5	4		
15	0	5		
15	57	6		
16	5		6 mags.	25.5
17	13	7		
17	25	~~8~~	6 mags	20.6
		? one sweep omitted		
19	25		5 mags.	19.9
19	55	9		
21	50	10		
23	5	11		
23	10		4 mag.	25.7
24	25	12		
25	10	~~10~~	5 mag.	21 2
25	35	13		
26	22	14		
27	17	15		
28	8	16		
29	18	17		
30	10	18		
31	8	19		
32	6	20		

Sept. 28, 1880.

Sect.

13	32	18	21		
	~~33~~ 33	40		23°.9	7 mag.
	34	15		23.0	4 magn
	35	25	. 22		
	36	20		23.8	ft imperfect
	36	55	23		
	37	30		21.5	4 magn.
	38	45	24		
	39	20	25		
	40	5	26		
	40	25		24.3	6 magn
	41	20	27		
	42	50	28		
	43	50	29		
	44	53	30		
	45	19		21°.7	7 mag.

Ended at 46 0

Sept. 28. 1880.

Dis. of Jup. II. Phot. II. P. Obs
Bond 394. R. 112.

13 [53] 0.0 13 53 25
[54] 0.8 . 54 25

Compared with Sat. III.

t

13 48 1.8
23 41.1
14 11 42.9

13 59 27. 193.2
46.0 265.6 72.4
14 0 24.5 189.4
49.0 266.6 77.2
7 9 6
7 4 8
37.40
13 09 5 29 2 6 6 6 6 14 00 06 1 6.5 9148 4574 22870 190.8
23.0 265.1 74.23
2 9.5 190.7 74.9
25.0 265.6 1 2 7 4 6 37.30
1 09 1 8 4 1 46 38.0 9122 4561 228.05 190.0 74.7
51.0 264.7
3 8.5 192.9 71.5
25.0 264.4 6 2 7 3 1 36.55
2 23 24 2 6 0 3 00 42.0 9120 4560 228.00 193.0 72.8
54.5 265.8
4 13.5 193.1
28.0 265.7 72.6
.4
72.7
36.35
3 27 25 8 6 4 4 04 41.5 9176 4588 229.40 193.8

Sept. 28, 1880.

		14	4	57		263,3	69.5
			5	10		193,5	
				22,0		264,6	71.1 6 70.3
		25	0				
			62	54,0	9152	192,7	3515 8.1
4	25	5	02		45760		71.6
			6	11,0	22880	264,3	
				30,0		195,3	
				41,5		262,7	67.4 1390 6950 34.75
		7	6				
5	42	6	19	51,0	9150	193,7	
					4575		68.4 ~~15.8~~ 8 ~~67.9~~ ~~33.95~~
			7	3,0	22.8.75	262,1	
				15,0		196,2	
							67.1 15 5 6.775 33.88
				27,5		263,3	
			36				
6	32	7	09	39,5	9153	195,0	
					45765		
				51,5	228.82	262,2	67.2 ~~67.25~~ 3 ~~33.58~~
			8	4,5		196,9	
				17,0		260,5	63.6 10 65.4 8 32.70
		23	2				
7	21	7	58	28,5	9146	195,3	69.0
					45730		
				45,0	228.65	264,3	
			9	7,5		191,9	
				21,5		264,2	72.3 .1 3 70.65 35.32
		22	2				
8	19	8	56	37,5	9157	191,3	
					45785		70.5
				51,0	228.92	261,8	
			10	7,5		192,8	70.5
9	22			21,0		263,3	35.25
		23	7				
10	02	9	59	39,0	9092	197,0	64.7
					4546		
	11			48,5	227.30	261,7	
	21			58,5		197,9	62.0
	32		11	9.0		259,9	
	42			19,0		199,1	57.1
	51			28,5		256,2	

Sept. 28, 1880.

11	01	14	11 38	200.6	
	11		48.5	257.7	57.1
	21		58.5	204.0	
	32		12 9.0	252.6	48.6
	45		21.5	203.3	46.6
	55		32.5	249.9	
12	04		41.0	205.2	42.4
	15		51.5	247.6	
	25		13 2.0	212.2	35.2
	37		14.0	247.4	
	51		27.5	214.6	24.8
13	01		38.5	239.4	
	17		54.0	216.5	
	31		14 8.5	Suspected.	

Limit of Visibility.

	14	15	216.5	21.9
15	~~4~~	–	238.4	
			217.8	22.4
	16		240.2	4 3
			1129	22.15
			228.22	11.08

Sept. 28. 1880

Phot. I. ~~Comp. *~~ Polaris in prism.

Richard	Variable	+ D-M. 81° 30	P. Obs.
14 23 10	3.15	1.80	
	3.21	2.03	
	3.85	2.02	
14 25 44	3.14	28 5	
	13 5	1.95	
	3.34		
14 27 23	3.66	2.25	W. d
	3.83	2.23	
	4.20	~~2.36~~	
32 18	3.63	2.35	
	33 2	83	
	3.83	2.28	

	Bond 394.			R. 112.	
14	38	0,0	14	38	22.5
	39	0,0		39	22,0
	40	0,0		40	22.5

Sept. 29. 1880.

19h 49m 5.5 = 7h 14m M. S.
15 44
+4 5 −21.4

Set for Kepler's star but clouds and low altitude (close to horizon) make it impossible to do anything. ~~W.~~ Cloudy in the immediate locality. W.

T Coronae.

15h 53m 22s
1 3
15 54 25
20 1 0
+4 1 6

26° 34'
−7
+26° 27' = 8.5 mag. star.

4/+2.52,4
63

4/−11."76,
294

15 55
1
15 56
20 25
+4 29

26 35
−7
26 28

20 29
15 56
4 33

7 50
7 14
36
49
20 25

7 50 β Urs. Min. 2 α Urs. Min. S. obs.
ε Urs. Maj. 2 α Urs. Min.
α Urs. Min. 1 γ Cass.
α Urs. Min. 3 β Urs. Maj.
Some haze; stars seem variable.

Sept. 29, 1880.

T. Coronae.

[8 23] Noticed that spectrum seemed to be broken into bands at times In other words. bands of light and darkness melting into each other. Noticed a little of the same ~~ap~~ appearance in other stars. but seemingly not quite so strongly marked. - not absolutely sure however.

8 28 Banded spectrum suspected but not seen with certainty P. Obs.

Comparisons of β Persei & π Persei by Phot. R

8 45 82.3

46 115.5 33.2 P. Obs.

264.0 29.1

8 47 293.1 62.3

8 46.0 7 5 4 9

3 7 7 4 5

1 8 8.72 ~~4.8~~ 31 15 15.58 ~~4.77~~

8 47 1/2 83.6 ~~4.77~~ 2.77

113.1 29.5 P. obs

49 264.5 33.7

8 51 298.2

8 49.2 7 5 9 4

3 7 9 7

1 8 9.85 63.2

4.7 31.6

15.80 2.74

8 51 1/2 85.0

52 113.2 28.2 P. Obs

265.3 29.0

8 53 294.3 57.2 28.6 2.97

8 52.2 7 5 7 8 5.0 14.3

3 7 8 9 0

1 8 9.45

Sept. 29, 1880

1 Coronae, α Cor. Borealis Phot. I. & Equat.

8 52′ 4.26
4.75 W. obs
4.64
16 5
4.55 9m.

~~9 00~~
~~8 56.0~~ 5.33
5.58 W. obs.
5.00
91
5.30

1 Coronae Images poor.

914 4.53
3.93 P. obs
3.47
293
9m 3.98
9 15½ 3.13
3.92 P. Obs.
3.79 In finder it appeared 0.2
184 ftr than 9.0
3.61

Comp. of β + π Persei by Phot. R.

9 5 81.1
111.4 30.3° < > W. obs
16 256.9
37.1° < >
9 16½ 294.0
7347 1734 67.4° < > 33.7°
9 15.8 < > 185.85 4.6 < 16.85 2.59 < >
9 18 75.9
107.0 31.1° < >
18 260.9 W. obs
36.0° < >
9 19 296.9
7347 0735 67.1° < > 33.55°
9 18.5 < 18518 4.6 < 16.78 2.60 < >
~~75.2~~

Sept. 29. 1880

9 19 75.2
104.1 28.9^s >
20 247.8 34.8^s > H. obs.
9 21 292.6 63.7^s >
9 20.0^s 72.97 4.4^s 31.85^s 2.73^s >
36.485 15.92
18.242

Neb. G. C. 4487.

9 25
7 14
2 11
19 49
22 0
19 12
+2 48

9 25 Spectrum Gaseous P. obs

9 33 Spectrum Gaseous. [Seeing poor.] H. obs

9 34 Spectrum Gaseous. S. obs

Sept. 29, 1880.

Comparisons of β + π Persei Phot. R.

9 37 78.0
117.0 39.0< >
~~38~~ 263.3 28.8< > P. obs
9 38½< 292.1 67.8< >
9 37.8< > 7504 4.6<
37502
187.60 33.90< 2,58< >
16.95

9 39 83.7
113.8 30.1< >
~~40~~ 258.6 36.8< > P. obs.
9 40½ 295.4 66.9< >
9 39.8< > 75175 4.6<
37575
187.88 33.45< 2,61< >
16.72

9 41½ 75.6
114.0 38.4< >
~~42~~ 261.5 P. obs
9 42 293.8 32.3< >
9 41.8< > 7449 70.7< >
37245 4.5< 35.35< 2.48< >
176.22 17.68

9.45 α Ursae Min = β Ursae Min P. obs
9.45 α Ursae Min .2 γ Cass P. obs.

* G.C. 4487 ~~η~~ Aquilae

9 48 Focus

7.8 15.8
7.4 16.2 S. obs.
7.5 15.3
17 23
7.57+ 15.77+

Sept. 29, 1880.

S.C. 4487 ν Aquilae

Focus

9 52 7.2 12.2 P. obs.

7.6 13.7

7.3 12.3

7.37+ 12.73+

Comparisons of β + π Persei, Phot. R.

apparently no correction for time.

9 59 81.5

111.5 30.0< >

~~00~~

257.5 S. obs.

10 01 291.6 34.1< >

10 00< > 7421 64.1< >

37105 4.7<

18552 32.05< 2.71< >

16.02

10 02 75.9

108.4 32.5< > S. obs

x

256.6

35.1< >

10 03½ 291.7 67.6< >

10 2.8< > 7326 4.6< 2.59 >

3663 33.80< ~~2.58~~<

183.15 1690

10 04 74.6

105.9 31.3< >

5 267.0 S. obs.

10 06 296.3 29.3< >

10 5.0< > 7438 60.6< >

3719 4.8<

180.95 30.3< 2.84< >

15.15

10 20 Looked at Secchi's 4th type Star No 148

Sept. 29, 1880.

R. 112. Bond 394.

13	47	30.5	13	46 ~~47~~	44.5 ~~0.0~~
	48	30.5		47 48	44.5 ~~0.0~~

Sept. 29. 13h 51m 34.4
 23 41.1
14 15 15.5
 30.5
14 15 46.0

Dis. Jupiter I.
Comp. Sat. I. with II. Phot. R. S. Obs.
Pos. of I. from II = 300° dist. 20"

13h 56m 87.0
 187.5 100.5
56 291.0
57m 12.0 81.0
 5775 181.5
 28875 90.75
 144.38 45.38

57m 86.3
 191.7 105.4
57 289.0
58m 29.7 100.7
 5967 61
 29835 103.05
 149.18 51.52

59m 88.2 103.8
 192.0
59 284.2
14 0 15.8 91.6
 5802 1954
 2901 97.70
 145.05 48.85

Sept. 29. 1880.

	14h	5m			88.0	
					189.0	101.0
5					284.2	
		6 —			12.3	88.1
					5735 28675 143.38	1891 9455 47.28
	14	9	21.0		91.5	
			35.5		191.0	99.5
			47.0		95.2	
		10	0.5		190.2	95.0
8 54		16 3 41		5679 28395		97.25 48.62
			13.5		93.0	96.0
			26.5	141.98	189.0	
			46.0		90.2	
		11	0.0		194.0	104.8
9 49		14 6 36	10.5	5662 2831 141.55	87.0	100.48 50.20 98.0
			19.5		185.0	
			32.5		90.8	
			22.0		189.0	98.2 98.1 49.05
10 34		8 5 21	52.5	5518 27590 137.95	94.8	93.3
		12	10.5		88.1	
			30.0		94.1	
			42.0		187.2	93.1 93.2 46.60
11 32		4 5 19	53.5	5642 2821 141.05	92.0	96.9
		13	4.0		188.9	
			15.0		91.7	
			25.5		189.5	97.8
12 23		38 10	36.5	5621 28105 140.52	89.3	97.35 48.68

Sept. 29, 1880.

	14	13	49.0		185.5	96.2
		14	3.0		92.0	
13 08			12.5		190.0	98.0 97.1 48.55
13 39		22 1 55	26.0	5578	99.0	86.0
51			38.5	27890	185.0	
14 01			48.0	139.45	103.3	85.6
08			55.0		188.9	
15		15	2.5		108.8	
25			12.0		182.0	77.2
35			23.0		101.3	
45			31.5		170.0	68.7
53			40.0		116.0	
59			46.5		165.8	49.8
15 07			53.5		116.9	42.3
14		16	1.0		159.2	
22			9.0		126.8	
35			21.5		160.3	

Limit of Vis.

	14	17m	127.1	
			156.5	29.4
17			129.3	
		18m	158.0	28.7
			570.9	29.05
			285.45	14.52
			142.72	

Seeing 7. 6. 7.

Sept. 29. 1880.

R. 112.			Bond 394.		
14	24	31.5	14	~~24~~ 23	~~0.0~~ 44.5
	25	31.5		25	0.0

Sept. 30. 1880.

7h ~~19m~~ 10m M.T. = 19h 50m S.T.

Kepler's Star.

6 mag. near.

~~15m 44s~~ ~~-21° 22'~~
~~1~~ ~~-7~~
~~15 45~~ ~~-21° 29'~~ Pos. 6th mag.
~~20 0~~
~~+ 4 15~~

17h 15m 44s -21° 22'
1 2 -7
17 17 -21 29
20 40
+ 2 53
3 23

No star found in the place where
8 28 Kepler's star apparently should be.
P. & W. ~~F. P.~~

HC. 3 6 0.2 fainter than prec. 9 mag. P. obs
HC 0.3 brighter " " " W. obs

4 3 3 1

Sept. 30, 1880.

S. Coronae Phot. I. P. Obs.

4.23 Centered with α Corona

8 58 3.81

4.67

7 1

4.24

9.1 mag. preced .1 min. and 1' north.

4.81

8 59 5.06

4.92

2 7 9

4.93

9 0 9.1 est in finder to be 0.2 brighter than T. P obs

T Coronae W obs

9 01 5~~30~~.24

4.79

5.20

2 3

5.08

9.1 mag W obs

9 04 5.34

5.08

4.95

3 7

5.12

9 07 9.1 est in finder to be 0.2 brighter than T.

W obs

Sept. 30. 1880.

9 05 Spectrum continuous P & W.

Middle part of spectrum seems to be brighter than ~~in other~~ ~~usual~~ in other stars at times. ~~Pr~~, or brighter than corresponding part of comparison 9 mag star. Pr.

~~15 9~~

15 9 27

3 12 15'
28
3 40

9 27
12 16
2 49

56 7
33 53
31
2

11 24
9 27
1 57

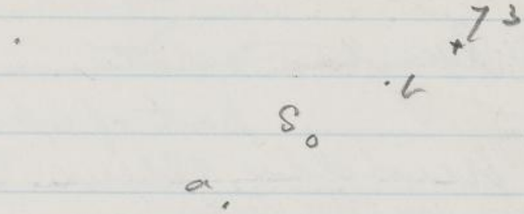
15
9 27
5 33

Looked at U Coronae but found no suitable Comparison star for Photometer R.

Sept. 30, 1880.

S Coronae

S = a



Neb. G. C. 4754 V. obs.

Transits (watch of A. Searle, 11m star)

Oeltzen 21875	~~G. C. 4754~~ Star	Star
10 13 30	10 15 17	10 15 34
		{suspected neb. 1st bar for 4754 10 15 42

Oeltzen 21875 identified by No. 21876}

		1st bar	2d bar
δ5; 8 mg.	Oeltzen 21875 —— ~~Suspected nebula~~	10 22 45	10 23 35
δ4}; 10 mg.	Star	23 33	24 20
~~δ7~~ δ6;	Star	24 33	~~20~~ 25 20
	~~Suspected neb.~~	4	
δ5;	Star	24 49	25 38
	neb	24 57 8	25 45 7
δ4;	Star	25 10 13	26 0 15

Last 3 stars & neb.

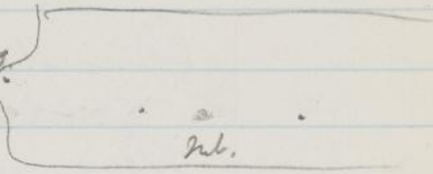
~~Neb. in line with 2d & 3d stars,~~ a little north, 0.4 of the way from 2d to 3d

δ6	Star	10 27 51	10 28 40
δ5	Star	28 8	28 55
	Susp. neb.	28 15 7	29 2 7
δ4	Star	28 31 16	29 18 16

Neb. slightly south of line from 1st to 2d star.

Sept 30 1880.

Spect. of nebula apparently C. Pobs.
" " " v.ft. " " S ob.



Transits as before. P.obs.

δ 6	Star	10	52	32		10	53	20	
δ 5	Star		52	49			53	38	
	Neb		52	57	8		53	45	7
δ 4	Star		53	11	14		53	59	14
	Star	10	54	23				12	
	Star		~~Ø~~	41				28	
	Neb			48	7			36	8
	Star			62	14			50	14
	Star	10	56	29				17	
	Star			45				33	
	Neb			52	7			40	7
	Star			67	15			55	15

S.obs.

11 15 β Urs. Min. 2 α Urs. Min.
ε Urs. Maj 1 α Urs. Min.
α Urs. Min. 2 γ Class.

Oct. 1, 1880.

Opened at 6.00

Venus noticed near W. Horizon, very bright although low

T. Cor. Phot I R. obs

7 00 4.20
4.27
4.31
78
4.26

9.1 mag 61s prec. R obs

7 02 433
4.81
4.94
208
4.69

15 5 3 +26.3
20 2
+4 9

T Coronae
3.46 W. Obs.
7 28 3.79
4.19
244 4
3.81

9.1 mag. 61 secs. prec.
4.68 W. Obs.
7 30 5.00
5.21
289
4.96

Oct. 1, 1880.

Spectrum Com.

Imagined at times a tendency to a band in the brighter portion but nothing very definite. W. Obs.

Neb. G.C. 4386. W. Obs.

18 3 −33.9
20 28
+2 25
Too low.

Neb. G.C. 4754

22 0 −29.6
20 30
~~30~~
−1 30

8 5 β Urs. Min. 2 α Urs. Min. S. obs.
ε Urs. Maj. 1 α Urs. Min.
α Urs. Min. 2 γ Cass.

8 20 Spectrum 4754 prob. C. P obs
mainly C W obs

Oct ~~1~~. 1880.

Transits Altazim. 21875 & GC

Inst 1' north

2 12
2 12
2 10

Hour	1st bar		2nd Bar	
Cal.	8 23 30.5		8 24 18.3	
	25 41.0		26 30.0	
	2 10.5		11.7	

R. 112.			Bond 394.		
8	29	52.5	8	29	0.0
	30	52.0		30	0.0

Dis. Jup. I. Phot. R. P. Ob.
Comparison with sec. sat.

8 20 23.8
23 41.1
8 44 4.9

8 34 58.0 — 265.7
35 14.0 — 176.6 90.9
27.5 — 171.7 83.8 / 174.7 / 87.35 / 43.68
43.0 — 255.5

8 34 12 — 35 $\overset{8}{20}$ 2 — 57.0 — 869.5 / 179.0 73.6
4 347.5
36 13.5 — 217.38 252.6

44

80 12

~~Sept.~~ Oct. 1. 1880.

8 36 25,0 174,7
29,5 255,4 80.7
76 5 1543
35 11 36 19 58,0 8617 180,0 7765 38.58
43085
37 10,0 215.42 253,9 73.9
26,5 181,2
41,0 255,0 73.8
7,5 77 7385
36 11 37 19 53,5 8701 181,0 36.92
43505 73.3
38 5,0 217.52 254,3
18,0 185,6 69.6
30,5 255,2 729 7145
47
37 04 38 12 41,5 8761 185,6 35.72
43805 67.4
55,5 219.02 253,0
39 8,0 188,3 61.7
20,5 250,0 1293 6455
5
37 53 39 01 31,5 8769 182,8 32.28
43845 69.6
52,0 219.22 252,4
40 6,5 183,4
16,5 256,8 73.4 1430 7150
226
38 48 39 56 32,0 8754 185,7 35.75
49,0 43770 65.8
218.85 251,5
41 0,5 185,1
9,5 251,6 66.5
211 1323 6615
39 45 40 53 24,0 8739 182,9 33.08
36,5 43695 253,1 70.2
218.48
52,5 188,7 60.3
42 4,5 249,0 1305 6525 32.62 66.0
1778 15,5 8737 185,0
40 36 41 44 43685
218.42
41 08

Oct. 1. 1880.

8 41	20	8 42	28.0	249.5	66.5
	30		38.0 ±	182.9	66.6
	42		50.0	249.0	66.1
41½	54	43	2.0	183.4	65.6
42	06		14.0	248.2	64.8
	21		29.0	190.4	57.8
	34		42.0	244.8	54.4
	44		51.5	190.0	54.8
	56	44	4.0	245.2	55.2
43	06		13.5	193.6	51.6
	17		25.0	240.0	46.4
	26		34.0	194.8	45.2
	39		47.0	239.6	44.8
	46		54.0	198.5	41.1
	55	45	3.0	237.8	39.3
44	04		12.0	205.8	32.0
	14		22.0	232.5	26.7
	23		31.0	seen	

Limit of Vis. P. An.

8h 47m

205.6

234.8 29.2

46

205.5

47

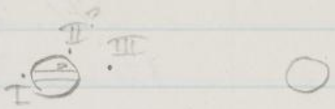
234.4 28.9

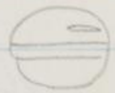
803
2 4015
1 20.08

181
29.05
14.52

Image of Sat. very close to Jupiter
Photometer will not go quite into focus.

Oct 1.1880





Dumb Bell Neb. = G.C. 4532.

19 54 +22.3
21 40
+1 46

ε Cygni

Phot. 2. P. Obs.

Southern Part. outside.

Focus

~~Focus~~ 9.8 18.6

9 21 9.6 18.0

9.8 18.0

22 6

9.73+ 18.20+

9.7

8.5

Central Part of Neb. P. Obs.

9.6 24.8

9.6 23.6

9.3 20.7

15 91

9.50+ 23.03+ 13.5

~~Northern portion brighter than southern.~~

~~Southern~~ Northern Part of Neb. 17 9 P. Obs.

10.0 16.8

9 27 10.1 16.2

9.4 14.9

9.83+ 15.97+

9.8
15.97
6.2

Southern part to eye brighter than northern

Oct. 1, 1880.

B 394			R 112		
10	23	00	10	23	53
10	24	00		24	53
10	25	00		25	53

Also examined Androm. Nebula. Rifts seen.

Looked at Nebula Variable & tried Phot. Clouds interfered.

Oct 2, 1880.

Hum
6 55   19 41

Telescope at 1h West.

Began at 7 06

					m	°
7 08	25°.2		18 55	25.0	13	.2
13	28.1	3 mag	18 59	27°.9	14	.2
17	29.8	6 m	~~2~~ 3	~~30.2~~ 29.7	14	.1
19	26.9	5 m	6	26.1	13	.8
21	26.0	4 m	8	25.5	13	.5
28	29.5	two *	14	29.8 29.7	14	.3
30	28.2		17	28.1	13	1
31	24.9	4 m	18	24.7	13	.2
34	28.1	Sextic	22	27.2	12	
36	27.2	4	2 ? xx [illegible]			0
42	25.2 x	4	28	25.0	14	2
46	24.1	5.5	2 ~~x~~ 32	23.7	14	4
57	25.8	? Rec. [illegible]				
8 0	26.1					
1	27.0	7 mag two	48	26.6	13	4
2	26.8	4 mag.	51	26.5	11	3

Number of stars in ~~[illegible]~~ field
2, 1.2, 1.5 = 2.2

Many more in field in beginning

Oct. 2. 1880.

Birmingham's List.

19 27 26 −16° 38'
21 21
+1 54

21 15
19 27
+1 48

33
15
21 18

21 18
1 52 −16.7

21 20

Birmingham's List 625.

20 10 −21.7
19 27 16.6
43 −5.1

21 20
20 10
1 10

Looked at Spectrum of 505 and 545

Birmingham's List 648

23 46
21 37 +2.8
2 13

648 bright dark lines well marked

Oct. 2, 1880.

D'Arrest's Singular Star.

21 35
20 43 24 +22 52
+ 52

Birmingham's List 625.

22 3
22 52
- 49 -25.8

19 59 -27.6
22 15
+2 16

Region near Nova Cygni,
8 mag.
$21^h\ 36^m\ 52^s$ 42° 20′
22 30
+ 53

9 45 β Urs. Min. 2 α Urs. Min. S. obs.
α Urs. Min. 2 γ Cass.

Cloudy at 10h.

Prof. P. says "assume that the times on +81° 25' need no corrections on this date."

Oct. 3, 1880.

DM. +81° 25' compared with 81° 30'.
Time by watch of E.C.P., 4s slow.
Photometer R; E. Equatorial, full aperture.

8 0 20 46.6 P. obs.
1 112.2 112.5 Images not reversed during this set. Rej.
8 1.0
224.7
8 1 41 286.2 1204
669.7 2329
334.85 2.95
167.42 ~~7.0~~
1 16.45
~~58.22~~

8 4 4 15.5 — 25 disappears 122.1 P. obs.
5 137.6
8 ~~4.5~~ 5.0
198.0 123.3 57°.30
~~12 50~~ 1.31
5 39 321.3 2.81
672.4 245.4 ~~0.7~~
336.2 ~~0.7~~
118.10 122.70
~~61.35~~

8 6 8 15.5 — 25 disappears 126.2 P. obs.
141.7
7 8 7.0
199.5 118.5
~~12 82~~
7 46 318.0 ~~0.7~~ 57°.65
674.7 244.7 1.30
337.35 ~~0.7~~
118.68 122.35 2.81
~~61.18~~
8 8 29 13.2 121.7 P. obs.
140.9
9 8 9.0
196.8 123.2
9 40 320.0 ~~0.6~~ 54°.55
670.9 250.9 250.9 1.44
335.45 0.6
167.72 1 25.45 2.77
~~62.48~~

Oct 3 1880

8 10 57 15.0 125.7 S. obs

140.7

12 8 12.0 207.0 110.0 ~~0.9~~ 62°.15

13 26 317.0 1.10

24 23

12 12

4 44 34

~~13 23 10~~

12 56 43

679.7 235.7 2.98

339.85

169.92 117.85

~~58.92~~

Focus altered after this set.

15 13 199 113.0 S. obs.

8 16.0 132.9

16

200.5 117.3 ~~1.0~~ 64°85

16 50 317.8 0.98

732 3

16 2

4 44 34

13 0 37.

671.1 230.3

335.55

167.78 ~~1.0~~ 115.15 2.96

~~57.58~~

17 17 9.0 133.0 S. obs

8 18.0 142.0

18

203.3 115.5 ~~0.6~~

18 58 318.8 55°.75

36 15.

12 2

4 44 34.

~~0 54.~~

13 2 43.

673.1 248.5 1.38

336.55

168.28 ~~.6~~ 124.25 2.78

~~62.12~~

8 20 2 15.8 P. obs.

139.6 123.8

8 20.57

21 197.6 120.8 57°.70

21 20 318.4 ~~0.7~~ 1.29

41 22.

20 45.

4 44 34.

13 5 16.

671.4 244.6

335.7

167.85 ~~0.7~~ 122.30 2.81

~~61.15~~

8 22 23 13.2 P. obs.

125.0

8 23.5 138.2 61°.25

24

204.5 112.5 1.14

24 55 317.0 ~~0.9~~

47 18

23 39

4 44 34

13 8 14

672.9 237.5 2.88

336.45

168.22 118.75

~~59.38~~

2

3

46

Oct. 3, 1880.

8 24 25 — 16.7 — P. obs. — 3
8 25 25.0 — 138.9 — 122.2
197.8 — 123.0 — 57°40'
25 43 — 320.8 — 1.31'
50 8. — 674.2 — 245.2
25 4. — 337.10 — ~~0.7~~ 0.7
4 44 31. — 168.55 — ~~0.7~~ 122.6 ~~2.84~~
13 9 39. — ~~61.30~~

8 26 34 — 11.0 — 129.1 — S. obs.
27 8 27.5 — 140.1
203.0 — 114.5 — 58°20'
28 27 — 317.5 — 1.27'
55 1. — 671.6 — 243.6
27 30. — 335.80 — ~~0.7~~
4 44 31. — 167.90 — ~~0.7~~ 120.80 ~~2.83~~
13 12 ~~6~~ 1. — ~~60.90~~

~~29~~ ~~28~~ 28 59 — 15.1 — 121.5 — S. obs. — 4
8 29.5 30 — 136.6
203.3 — 113.4 — 62°55'
30 24 — 315.7 — 1.08'
59 28. — 669.7 — 234.9
29 44. — 334.85 — ~~0.9~~
4 44 31. — 167.42 — 117.45 ~~3.91~~
13 14 18. — ~~58.72~~

30 56 — 16.0 — 120.3 — S. obs.
8 32 34.5 — 136.3
203.9 — 108.6 — 65°55'
32 23 — 312.5 — 0.96'
63 19. — 668.7 — 228.9
31 40. — 334.35 — ~~1.0~~
4 44 31. — 167.18 — ~~1.0~~ 114.45 ~~2.97~~
13 16 14. — ~~57.22~~

8 33 28 — 15.2 — P. obs.
8 34 34.0 — 138.4 — 123.2
198.2 — 121.7 — 57°55'
34 49 — 319.9 — 1.30'
68 17. — 671.72 — 244.9
8 34 8. — 335.85 — ~~0.7~~
4 44 31. — 167.92 — ~~0.7~~ 122.45 ~~2.81~~
13 18 43. — ~~61.22~~

Oct. 3, 1880

8 3~~7~~8 28 9.6 129.8·1 P.obs.
38 8 38.0 139.4
202.5 116.1·1 57°.05 √
39 0 318.6 245.9·1 1.32
76 24. 6701·1
2 32 14. 33505·1 ~~0.7~~
4 44 31. 16752·1 122951·1 2.80 ~~0.7~~·
13 22 48. ~~61.48~~·
8 39 27 16.1 P.obs.
121.7·1
137.8
40 8 40.0
197.2 122.6·1 57.85
40 40 319.8 1.29
20 7. 6709·1 244.3·1 2.82
40 4. 33545·1 122.15·1
4 44 3. 16772·1 ~~61.08~~·
13 24 38. ~~0.7~~
41 49 13.5 121.4·1 ~~0.7~~· S.obs
42 8 42.5 134.9
202.5 116.4·1 61°.10
43 10 318.9 1.14 √
24 59. 6698·1 237.8·1
42 30. 33498
4 44 35. 167.485 118.90·1 2.88 ~~0.9~~·
13 27 47. ~~59.45~~·
43 30 18.0 120.8·1 S.obs
44 8 44.5 138.8
197.1 119.7·1 59°.75
45 6 316.8 0.8· 1.20 √
22 36. 6707·1 240.5·1
44 12. 33535·1 120.25·1
4 44 35. 16768·1 2.86
13 24 52. ~~60.12~~
45 32 10.0 128.5·1 S.obs
8 46.5 138.5 67°.15
46 208.8 .89 √ 6
46 47 306.0 97.2·1 ~~1.1~~·
92 19. 6635·1 225.7·1 3.0
46 10. 33165·1 112.85·1
4 44 31. 16582·1 ~~56.42~~ Clock stopped
13 30 44. and telescope moved; star in new part of field.

Oct. 3, 1880

8 49 44 10.9 127.0·1 P. obs.

50 8 50.5 137.9 49°.30

192.2 134.4·1 1.69

51 0 326.6 ~~0.3~~

100 44. 6676·1 261.4·1

2 50 2~~2~~. 3338·1 ~~,3~~ Eye-stop removed after preceding set.

4 44 35. 166.90·1 1307·1 ~~2.66~~

13 34 5~~6~~. 8345 ~~65.35~~·

8 52 20 9.3 136.~~4~~8·1 P. obs.

53 8 53.0 146.1 47°.50

191.6 128.2·1 1.78

54 10. 319.8 ~~0.2~~·

106 30. 6668·1 26~~4~~5.~~4~~0· 2.64

53 1~~5~~. 3334·1 132.5·

4 44 3~~2~~1. 166.70·1 ~~66.10~~·

13 37 ~~4~~9. ~~.2~~

8 54 50 11.3 130.2·1 P. obs.

56 8 55.5 141.5 47°.90

189.8 134.0·1 1.76

56 13 323.8

111 3. 6664·1 264.2·1 2.64 ~~0.2~~·

55 42. 33320·1 132.1·1

4 44 3~~2~~1. 16660·1 ~~66.05~~

13 40 1~~5~~. ~~.2~~

8 57 46 9.6 131.3·1 S. obs.

58 8 59.0 140.9 58°.15

201.4 112.4·1 1.2~~8~~7

59 37 313.8

117 23. 66 57·1 243.7·1 0.7·

52 4~~2~~. 33285·1 121.85·1 2.83

~~4~~ 44 31. 166.42 ~~60.92~~

13 43 1~~5~~. ~~.7~~

9 0 3 21.3 112.5·1 S. obs.

1 9 1.0 133.8 59°.95

191.5 1~~1~~276·1 ~~1.28~~ 1.19

1 57 319.1 0.8·

2 0. 6657·1 2~~3~~40.1·1

~~9~~ 1 0. 33285·1

4 44 ~~2~~31. 166.42·1 ~~1.0~~ 3.96

13 45 3~~3~~. 120.05·1

~~60.02~~ ~~57.52~~

7

8

Oct 3. 1880

9 2 21 10.2 132.3·1 S obs

3 9 3.0' 142.5

200.0 115.5·1 56°.10'

3 48 315.5 1.37'

6 9. 668.2·1 247.8·1 ~~0.6~~

9 3 ~~4.~~ 334.1·1

4 44 31. +167.05·1

13 ~~47~~ 3~~7~~. 1 23.90·1 ~~61.95~~ 2.79

9 5 9 12.4 130.7·1 P. obs.

6 9 6.0' 143.1

188.4 134.9·1 47°.20'

6 35 323.3 1.80'

11 44. 667.2·1 265.6·1 ~~0.2~~

9 5 52. 333.6·1 132.8·1 2.68

4 44 34. 166.80·1 ~~66.40~~

13 50 23.

9 7 5 6.5 P. obs.

8 9 8.0' 146.9 140.4·1 44°.75'

192.1 1.92'

8 32 322.2 130.1·1

15 37. 667.7·1 270.5·1 ~~0.1~~

9 7 48. 333.85·1 135.25·1

4 44 37. 166.92·1 ~~67.62~~ 2.59

13 52 21.

9 9 5 11.2 131.7·1 P. obs.

10 9 9.5' 142.9 46°.45'

189.1 135.4·1 1.84'

10 8 324.5 267.1·1 ~~0.2~~

19 13. 667.7·1

9 9 36. 333.85·1 133.55·1

4 44 35. 166.92·1 ~~67.02~~ 2.61

13 54 29. 67.75

9 22 28 15.2 117.8·1 S obs

23 9 22.0' 133.0 65°.50'

203.0 111.2·1 .96'

24 12 314.2 229.0·1 ~~1.0~~

46 40. 665.4·1

9 23 20. 332.70·1

4 44 34. 166.35·1 114.5·1 2.94

14 7 52. ~~57.25~~

9

Oct 3, 1880

9 24 51 18.4 115.1·1 Sats
25 9 25.5 133.5
195.2 121.7·1 61°.60
26 16 316.9 1.12
√1 7.
6640·1 236.8·1
2√ 3K.
3320·1 ~~0.9~~
K KK 3√.
166.00·1 ~~0.9~~ 118.4·1 2.89
1K 1 0 ~~0~~.
~~59.20~~

10

26 40 13.0 122.0·1 Sats
27 9 27.5 135.0
203.8 112.2·1 62°.90
28 8 316.0 ~~0.9~~ 1.07
√K K2.
6678·1 234.2·1
27 2K.
3339·1 117.1·1
K KK 3√.
1669√·1 ~~0.9~~ 2.91
1K 11 √0.
~~58.55~~

9 28 55 15.3 124.9·1 P. obs.
30 9 29.5 140.2
193.2 127.0·1 54°.05
30 3 320.2 1.46
√K √2.
6689·1 251.9·1 ~~0.5~~
9 29 29.
33445·1 ~~0.5~~
K KK 3√.
167.22·1 125.9√·1 2.75
1K 1K K.
~~62.98~~

9 30 26 12.1 P. obs.
31 9 31.0 138.2 — 25 disappears 126.1·1 55°.30
194.0 1.40
32 15 317.3 123.3·1 ~~0.6~~
62 K1.
6616·1 249.4·1
9 31 20.
33080·1 124.7·1
K KK 3√.
165.40·1 ~~62.35~~
1K 1√ √2.

11

9 33 23 16.7 P. obs.
34 9 34.0 138.0 121.3·1 56°.40
193.7 125.9·1 1.35
34 50 319.6 ~~0.6~~
62 13.
6680·1 247.2·1 2.79
9 3K 6.
3340·1 ~~0.6~~
K KK 3√.
167.00·1 123.60·1
1K 12. 32.
~~61.80~~

Oct. 3, 1880.

~~36 8 157~~ S obs

9 39 35 147 1221 ~~1219~~

40 9 40.5 136.8

200.7 106.5 65°70

41 0 307.2 .95

20 35 | 6594 | 228.6

9 40 12. | 3297.0 | ~~1.1~~

4 44 31. | 164.85 | 114.3 2.97 ~~1.1~~

14 24 50. | ~~57.16~~

~~41 33 [30.0] reject too bright~~

42 36 26.0 1010 S obs

43 9 43.5 127.0 79°55

205.9 99.9 .40

44 1 305.8 ~~1.6~~

26 37. | 6647 | 200.9

9 43 12. | 33235 | ~~1.6~~

4 44 31. | 166.18 | 100.45 3.26

14 27 50. | ~~50.22~~

44 38 12.0 113.3 S obs

45 9 46.0 125.3

209.0 96.5 ~~1.1~~

46 32 305.5 75°10

91 10. | 6518 | 209.8

9 45 35. | 32590 | ~~1.4~~ .57

4 44 31. | ~~164.95~~ | 104.90 3.16

14 30 7. | ~~52.45~~

9 47 24 19.2 114.7 P obs.

133.9

48 9 48.5 ~~138.2~~ 62°25

196.2 120.8 1.10

49 42 317.0 235.5

97 6. | 6663 | ~~0.9~~ ~~0.9~~

9 42 33. 0. | 33315 |

4 44 31. | 166.58 | 117.75 2.90

14 33 4. | ~~58.88~~

12

Oct. 3, 1880.

9 50 0 18.2 114.1^ P obs.
51 9 50.5' 132.3
197.8 115.1^ 65°.40'
51 25 312.9 229.2^ ~~1.0~~ .96'
101 25. 6612^
9 50 42. 3306^ ~~1.0~~
8 44 31. 165.30^ 114.60^
18 35 13. ~~57.30~~ 13

9 51 48 17.8 114.1^ P obs.
52 9 52.5 131.9
197.3 117.5^ ~~1.0~~
53 2 314.8 231.6^ 64°.20'
104 50. 6618^
9 52 25. 3309^ 1.01'
8 44 31. 165.45^ ~~1.0~~
18 36 56. 115.80^
~~57.90~~

9 53 57 19.0 107.0^ S obs.
55 9 55.0' 126.0
~~205.0~~ not used 78°.70'
207.9 95.6^ .43'
56 0 303.5
109 57. 6564^ 202.6^
9 54 58. ~~214.6~~ ~~1.6~~
8 44 31. 32820^ ~~13~~ 101.3
18 39 29. 164.10^ ~~107.30~~
~~53.65~~

9 56 31 31.7 90.3^ S obs. 14
57 9 58.0' 122.0
205.0 102.0^ ~~83.50~~
58 43 307.0 83°.85
115 14. 6657^ .24'
9 57 37. 33285^ 192.3^
8 44 31. 166.42^ ~~1.8~~
18 42 8. 96.15^
~~48.08~~

9 59 18 28.8 99.4^ S obs.
60 10 0.0' 128? 80°.35'
206.1 99.9^ .36'
10 01 13 306.0 199.3^
20 0 31. 6691^ ~~1.6~~ 99.65^
10 0 56. 3345^ ~~49.82~~
8 44 31. 167.28^

Oct. 3, 1880

10 1 55 22.9 105.3 P. obs.

3 10 2.5' 128.2 72°.20'

200.9 110.3 .69'

3 15 311.2 215.6

5 10.

10 2 35. 663.2 ~~1.5~~

4 44 31. 331.6 107.80

14 47 6. 165.80 ~~53.90~~

10 3 34 21.1 P. obs.

107.7

4 10 4.5' 128.8

205.3 105.8 73°.25'

4 38 311.1 .64'

2 12. 666.3 213.5

10 4 6. 333.15 ~~1.4~~

4 44 31. 166.575 106.75

14 48 37. ~~50.87~~

10 5 4 24.3 P. obs.

103.2

6 10 5.5' 127.5

197.6 113.1 71°.85'

6 12 310.7 .70'

11 16. 660.1 216.3

10 5 38. 330.05 ~~1.3~~ 108.15

4 44 31. 165.02 ~~108.15~~

14 50 9. ~~54.07~~

15

10 7 12 26.0 S. obs.

95.9 Images blurred [illegible]

8 10 8.0' 121.9

208.0 97.0 83°.55'

8 33 305.0 .24'

15 45. 660.9 192.9

10 7 52. 330.45 ~~1.6~~

4 44 31. 165.22 96.45

14 52 23. ~~48.225~~

10 10 44 28.8 92.7 S. obs.

11 10 11.5' 121.5

204.5 101.5 82°.90'

12 21 306.0 .27'

23 5. 660.8 194.2

10 11 32. 330.4 ~~1.7~~

4 44 31. 165.2 97.10

14 56 3. ~~48.55~~

16

4

Oct 3. 1880

10 12 42 27.4 95.1 S. obs
13 10 13.5 122.5
210.5
89.7 87°.60
14 04 300.2 .09
26 46 660.6 184.8
10 13 23 330.3 ~~1.9~~
4 44 -1 31 165.15 92.40
14 57 53. ~~46.20~~

10 14 55 28.2 P. obs.
99.4
16 10 15.5 127.6
201.8
16 13 310.9 109.1 75°.75
31 8. 668.5 208.5
10 15 34. 334.25 .54
4 44 -1 31. 167.12 ~~1.5~~ 104.25
15 0 4. ~~52.12~~

10 16 29 20.3 P. obs.
110.8
17 10 17.0 131.1
~~202.2~~ not reversed
203.4
106.5 71°.35
17 43 309.9 .72
34 12. 664.7 217.3
10 17 6. 332.35 108.63
4 44 -1 31. 166.17 ~~54.32~~
15 1 36.

17

10 18 3 27.2 P. obs.
100.9
19 10 18.5+ 128.1
202.3
106.5 76°.30
19 14 308.8 +.52
37 17. 666.4 207.4
10 18 38. 333.20
4 44 -1 31. 166.6 ~~1.5~~
15 3 8. 103.70
~~51.85~~

20 30 349 87.6 S. obs
21 10 21.0 122.5
213.7 88.8 88°.20
21 57 302.5 -.07
42 27. 673.6 176.4
10 21 14. 336.8 88.20
4 44 -1 31. 168.4 ~~44.10~~
15 5 44.

Oct 3. 1880.

10 22 47 34.5 88.8 S obs

23 10 24.0 123.3

241.1 85.9 87°.35

24 47 297.0 — .10

47 34. 665.9 174.7

10 23 47. 332.95

4 44 31. 166.47 ~~21~~ 87.35

15 8 17. ~~43.67~~

10 25 22 32.3 87.0 S obs

26 10 26.0 119.3

212.8 85.2 86°.10

26 43 298.0 — .15

52 5. 662.4 172.2

10 26 2. 331.2 86.10

4 44 31. 165.6 ~~43.05~~

15 10 32.

Clock shifted.

18

10 35 35 30.5 P obs.

36 10 36.5 123.2 92.7

213.5 87.4 89°.95

36 44 300.9 .00

21 72 19. 668.1 180.1

10 36 10. 334.05 ~~21.0~~

4 44 31. 167.02 90.05

15 20 40. ~~45.02~~

10 37 9 32.2 85.6 P obs.

38 10 37.5 117.8

~~38 21~~ 211.7 91.5 88°.55

38 21 303.2 — .06

75 30 664.9 177.1

10 37 45. 332.45

4 44 31. 166.22 88.55

15 22 15. ~~44.27~~

19

10 38 43 27.2 94.3 P obs.

39 10 39.5 121.5

218.2 80.5 87°.40

39 41 298.7 — .10

78 24. 665.6 174.8

10 39 12. 332.8

4 44 31. 166.4 ~~21~~ 87.40

15 23 42. ~~43.70~~

Oct. 3. 1880

10 41 49 39.8 77.2 S. obs.

43 10 43.0' 117.0

211.0 89.9 83°.55'

43 50 300.9 -.24'

85 39.

10 52 50. 668.7 167.1

4 44 -2. 31. 334.35

15 27 19. 167.18 ~~22~~ 83.55 ~~41.77~~

10 44 21 30.9 84.1 S. obs.

45 10 45.0' 115.0

219.3 77.6 80°.85'

45 44 296.9 -.35'

90 5.

10 45 2. 662.7 161.~~8~~7

4 44 -2. 31. 331.05

15 29 31. 165.52 ~~23~~ 80.85 ~~40.43~~

10 46 4 38.8 75.2 S. obs.

47 10 46.57' 114.0

216.0 79.4 77°.30'

47 15 295.4 -.49'

93 19.

10 46 40. 664.2 154.6

4 44 -2. 31. 332.1

15 31 9. 166.05 ~~21.5~~ 77.30 ~~38.65~~

10 48 4 36.8 83.8 P. obs.

49 10 48.54' 120.6

207.8 Images nearer than in former sets by P.

49 28 302.3 94.5

97 32

10 48 46. 667.5 178.3

4 44 -2. 31. 333.75 89°.15'

15 33 15. 166.88 89.15 ~~44.57~~ .03' P. obs.

10 49 43 28.6 89.4

50 10 50.5' 118.0 86°.20'

215.4 83.0 .14'

50 50 298.4

100 33

10 50 16. 660.4 172.4

4 44 -2. 31. 330.2

15 34 45. 165.1 ~~2.1~~ 86.20 ~~43.1~~

20

21

Oct. 3, 1880

10 51 13 33.3 83.5' P. obs.
52 10 51.5'' 116.8
212.7 93.2' 88°.35'
52 26 305.9 .06'
103 39. 668.7' 176.7'
10 51 50. 334.35' 88.35'
4 44 -2. 31. 167.15^{8}' ~~44.17~~
15 36 19.

10 53 40 33.4 79.6' S. obs.
54 10 54.5' 113.0 77°.40'
218.0 .48'
55 22 293.2 75.2'
109 2 657.6' 154.8'
10 54 31. 328.8' 77.40'
4 44 -2. 31. 164.4' ~~2.5~~
15 39 0. ~~38.70~~

10 55 52 34.0 83.8' S. obs.
57 10 56.5+' 117.8 79°.30'
221.0 74.8' .41'
22
57 24 295.8
113 16. 668.6' 158.6'
10 56 38. 334.3' 79.30'
4 44 -2. 31. 167.15' ~~2.4~~
15 41 7. ~~39.65~~

10 57 55 36.7 81.0' S. obs.
59 10 58.5' 117.7
216.0 82.8' 81°.90'
59 11 298.8 .31'
117 6. 669.2' 163.8'
10 58 33. 334.60' ~~2.3~~
4 44 -2. 31. 167.30' 81.90'
15 43 2. ~~40.95~~

11 0 10 37.6 P. obs.
01 11 0.5+' 116.0 78.4' 78°.30'
217.6 78.2' .45'
1 14 295.8
1 25. 667.0' 156.6'
11 0 42. 333.5'
4 44 -2. 31. 166.75' ~~2.4~~
15 45 11. 78.3'
~~39.15~~

Oct. 3, 1880

11 1 47 39.4 76.3 P. obs.
2 〃 2.5'
115.7
216.2 80.8 78°.55'
2 58 297.0 .44'
4 45.
668.3 157.1
11 2 22. 334.15
-2. 167.058
4 44 31. ~~2.4~~
15 46 51. 785.5
~~392.7~~

11 3 22 34.0 81.7 P. obs.
4 〃 3.5'
115.7
221.4 74.9 78°.30'
4 23 296.3 .45'
7 45.
667.4 1566
11 3 52. 333.70
-2. 166.85
4 44 31. 78.3
15 48 21. ~~2.4~~
~~39.15~~

}23

11 5 35. 37.8 76.5 S. obs.
6 〃 6.5
114.3
220.0 72.1 74°.30'
6 45 292.1 .60'
12 20.
664.2 1486
11 6 10. 332.1
-2. 166.05 74.3
4 44 31. ~~2.6~~
15 50 39. ~~37.15~~

11 7 8 29.3 90.9 S. obs.
8 〃 8.0'
120.2 81°.30'
221.0 71.7 .33'
8 41 292.7
15 49.
663.2 1626
11 7 54. 331.6 81.3
-3. 165.80 ~~2.3~~
4 44 31. ~~40.15~~
15 52 22.

11 9 8 42.7 72.1 S. obs.
10 〃 10.0'
114.8 79°.95'
213.0 87.8 .38'
10 34 300.8
19 42.
671.3 1599
11 9 51. 335.65 799.5
-3. 167.82 ~~2.4~~
4 44 31. ~~399.75~~
15 54 19.

}24

Oct, 3, 1880

11 11 22 37.3 80.1·^ P.obs.

12 11 12.0' 117.4

218.5 74.7·^ 77°.40'

12 37 293.2

23 √79. 666.4·^ 154.8·^ .48'

11 12 0 -3: 333.2·^ ~~2.5~~

4 44 31. 166.60^ 77.4·^

1√ √6 2A. ~~38.7·~~

11 13 2 32.2 P.obs.

14 11 13.5' 111.4 79.2·^

220.8

13 52 292.4 71.6·^ 75°.40'

26 √4. 656.8·^ 150.8·^ .56'

11 13 27. -3. 328.40^ ~~2.6~~ 2√

4 44 31. 1642·0^ 75.4·^

1√ √7 √√. ~~37.7~~

11 14 10 38.9 P.obs.

15 11 14.5+' 115.6 76.7·^

219.0 79.6·^ 78°.15'

15 23 298.6

29 33. 672.1·^ 156.3·^ .45'

11 14 46. -3: 336.05^ ~~2.5~~

4 44 31. 168.02^ 78.1√·^

1√ √9 14. ~~39.07·~~

11 16 27 36.8 77.7·^ S.obs

17 11 17.0' 114.5

214.0 87.0·^ .82°.35'

18 15 301.0 .29'

34 42, 666.3·^ 164.7·^ Clock Stopped

11 17 21. -3 333.15^ ~~2.3~~

4 44 31. 166.58^ 82.35·^

16 1 49. ~~41.17·~~

11 20 58 409 71.9·^ S.obs.

22 11 21.5' 112.8

218.2 70.0·^ 70°.95'

22 3 288.7 .74' 26

43 1. 660.1·^ 141.9·^

11 21 30. -3: 330.05^ 70.95·^

4 44 31. 165.02^ ~~2.7~~

16 5 √A. ~~35.47·~~

Oct 3, 1880

11 24 26 36.3 81.4 ^ S obs

25 11 25.0s 117.7 Images towards one side of field

208.9 91.2 ^

26 30 300.1 172.6 ^

50 56. 663.0 ^

11 25 28. 331.50 ^ ~~2.1~~ 86°.30'

4 44 −3. 31. 165.75 ^ 86.3 ^

16 9 56. ~~43.15~~ .14'

11 29 9 40.9 73.8 ^ P. obs.

30 11 29.5s 114.7

221.8

73.2 ^

30 20 295.0

59 29. 672.4 ^ 147.0 ^ 73°.50'

11 29 44. 336.20 ^ .63'

4 44 −3. 31. 168.10 ^ ~~2.6~~

16 14 12. 73.5 ^ ~~36.75~~

11 30 38 36.6 76.2 ^ P. obs. 27

31 11 31.5s 112.8

219.3

31 48 294.0 74.7 ^ 75°.45'

62 26. 662.7 ^ 150.9 ^ .56'

11 31 13. 331.35 ^ ~~2.6~~

4 44 −3. 31. 165.68 ^ 75.45 ^

16 15 41. ~~37.72~~

11 32 10 40.3 69.9 ^ P. obs.

33 11 32.5 +s 110.2

219.9 74.0 ^ 71°.95'

33 10 293.9 .70'

65 20. 664.3 ^ 143.9 ^

11 32 40. 332.15 ^ 71.95 ^

4 44 −3. 31. 166.08 ^ ~~2.7~~

16 17 8. ~~35.97~~

11 34 12 37.8 71.2 ^ S obs

35 11 35.5s 113.0

224.8 68.9 ^ 72°.05'

36 35 293.7 .69'

70 47. 669.3 ^ 144.1 ^

11 35 24. 334.65 ^ 72.05 ^

4 44 −4. 31. 167.32 ^ ~~2.7~~

16 19 51. ~~36.0~~

Oct 3. 1880

11 39 53 42.3 68.4·^ S. ob.
40 11 40.0' 110.7 2 d
222.8 71.3·^ 69°.85'
40 19 294.1 .78'
79 12. 669.9·^ 139.7·^
11 39 36. 334.95·^ 69.85·^
4 44 −4. 31. 167.48·^ ~~34.90~~
16 24 3.

11 40 58 39.9 77.1·^ S. ob.
42 11 41.5+' 117.0
223.0 66.0·^ 71°.55'
42 22 289.0 .71'
43 20. 668.9·^ 143.1·^
11 41 40. 334.45·^ 71.55·^
4 44 −4. 31. 167.22·^ ~~35.77~~
16 26 7.

11 44 7 44.3 62.2·^ P. obs.
45 11 44.5+' 106.5 64°.80'
225.1 67.4·^ .99'
45 24 292.5
89 31. 668.4·^ 129.6·^
11 44 46. 334.2·^ 64.8·^
4 44 −4. 37. 167.10·^ ~~3.0~~ ~~32.4~~
16 29 13.

11 45 48 41.2 66.2·^ P. obs.
46 11 46.5' 107.4 29
221.3 66.3·^ 66°.25'
46 55 287.6 .92'
92 43. 657.5·^ 132.5·^
11 46 22. 328.75·^ 66.25·^
4 44 −4. 31. 164.38·^ ~~2.9~~ ~~33.2~~
16 30 49.

11 47 24 41.4 70.8·^ P. obs.
48 11 47.5+' 112.2 64°.80'
225.3 58.8·^ .99'
48 30 284.1
95 54. 663.0·^ 129.6·^
11 47 57. 331.50·^ 64.80·^
4 44 24. 31. 165.75·^ ~~3.0~~ ~~32.4~~
16 32 24.

Oct 3. 1880

11 49 40 43.8 65.0" S. do
50 11 50.5s 108.8
224.8 63.4" 64°.20s
51 28 288.2 1.01s
101 2. 665.6" 128.4"
11 50 34. 3328.0" 64.2"
4 44 31. 1664.0" ~~3.0~~
16 35 1. ~~32.1~~

11 51 55 47.2 63.0" S. do.
53 11 53.0s 110.2
227.0 62.1" 62°.55s
53 48 289.1 1.08s
105 43. 673.5" 125.1"
11 52 52. 3367.5" 62.55"
4 44 35. 1683.7" ~~3.1~~
16 37 19. ~~31.27~~

11 54 16 42.7 66.2" S. do
55 11 55.0s 108.9
228.0 60.0" 63°.10s
56 12 288.0 1.06s
110 28. 667.6" 126.2"
11 55 14. 3338.0" 63.10"
4 44 37. 1669.0" ~~3.1~~
16 39 41. ~~31.55~~

30

12 7 35 36.9 73.2" P. obs.
8 12 8.5s 110.1
225.8 60.2" 66°.70s
8 52 286.0 .91s
16 27. 658.8" 133.4"
12 2 14. 3294.0" 66.70"
4 44 35. 1647.0" ~~33.35~~
16 52 40.

12 9 17 46.7 59.3" P. obs.
10 12 9.5+s 106.0
223.8 68.6" 63°.95s
10 28 292.4 1.02s
19 45. 668.9" 127.9"
12 9 52. 3344.5" 63.95"
4 44 35. 1672.2" ~~3.0~~
16 54 12. ~~31.97~~

31

Oct. 3, 1880

12 10 45 42.2 P. obs.
11 12 11.5 110.5 68.3
227.9 58.6 63°.45
11 45 286.5 1.04
22 30. 667.1 126.9
12 11 15. 333.55 63.45
4 44 −5: 31. 166.78 ~~30~~
16 55 41. ~~31.72~~
12 13 49 37.9 67.3 S. obs
15 12 15.0 105.2
226.8 65°.30
16 9 633.3
290.1 .97
29 52. 660.0 130.6
12 14 59. 330.0 65.3
4 44 −5: 31. 165.0 ~~30~~
16 59 25 ~~32.60~~
12 16 48 38.9 71.4 S. obs.
17 12 18.0 110.3 32
227.8 61.2 66°.30
18 46 289.0 .92
35 34. 666.0 132.6
12 17 47. 333.0 66.3
4 44 −5: 31: 166.5 ~~29~~
17 2 13. ~~33.15~~
12 19 18 39.2 71.0
20 12 19.5+ 110.2
225.0 61.9 S
20 27 286.9 66°.45
39 45. 661.3 132.9 .92
12 19 52. 330.65 66.45
4 44 −5: 31. 165.32 ~~29~~
17 4 12. ~~33.27~~

Here is Prof. P's watch.

Bond 394

12 26 6 12 ~~26 57~~

Oct 4 1880

Tried Phot R on E. Equat and find emergent results widely divergent

7 5 G.C. 4386, Large
Spectrum Gaseous P. Obs

7 12 Spectrum gaseous. W. Obs.
Comp. *

Focus.

7 19 6.2 16.9 P. Obs.
5.1 15.7
5.5 17.1
16 8 19 7
5.60+ 16.57+

5.3 20.9 ~~nebula~~ W. Obs.
7 37 5.8 23.8 Seeing rapidly
6.0 24.8 growing bad from
2 1 9 5
5.70+ 23.17+
low altitude and cloudiness — nebula has changed very much in distinctness within a short time.

20 40 S.T. = 7 47 M.T.

Oct. 4. 1880.

6th mag.

17h ~~17~~m N. 44 — 21° 22′
20 43

+3 27

8 0 W. searched neighborhood of Kepler's temporary star; found the 8.9 and 9.0 stars entered on chart of region, but altitude was too small and sky too hazy to make sure of the faint stars near.

8 10 β Urs. Min. 2 α Urs. Min. S. Ls.
α Urs. Min. 2 γ Cassiop.

Looked at Comet; clouds came up and prevented observations.

Z. D. ≡ = 64°.6 Abs. = 0.44
" " * = 72.0 " = 0.57
0.13

Oct. 5, 1880.

Comet near Corona Borealis.

8 0 Spectrum continuous. S. obs.

Photometer Q

Comet, α Coronae

8 18 3.3 10.7 Lg. ~~7.8 = 0.89209~~ Lg. 3.90 = 0.59106

3.4 11.6 11.10 ~~5~~ 5

3.2 11.0 3.30 ~~4.46045~~ 2.95530

9 3 2|7.80 ~~2.11~~ 2.11

3.3+0 11.1+0 3.90 ~~2.37~~ 2.37

~~8.94 Unc. mag.~~ 7.44 Unc. mag.

.13

S. obs. 7.57 Cor. "

8 28 β Urs. Min. 1 α Urs. Min.

ε Urs. Maj. = α Urs. Min.

α Urs. Min. 3 γ Cass.

Comet. α Coronae P. obs.

8 38 11.8 3.3 ~~Lg. 8.36 = 0.~~

10.3 2.7 ~~Lg. 8.36 = 0.92221~~

11.6 2.6 ~~5~~

7 26 ~~4.61105~~

11.23+ 2.87+ ~~2.11~~

~~2.37~~

~~9.09 Uncor. mag.~~

8 40 Image much elongated [illegible]

11.23
2.87
2|8.36
Lg. 4.18 = 0.62118
5
3.10590
2.11
2.37
7.59 Uncor. mag.
.13
7.72 Cor. "

Oct 5, 1880

Sweep No.

Telescope 1h 30m W. −20° to −25°

21 55 5.7

Began at 8 55 m 1.　　20h 30m to 21h 0m

　　　　　　　　　　−20° to −25°

8	58	31	24.7	24.8	6.8	5 mag	
	59			22.9		5	
	60	30	24.7	24.7	6.4	4	
9	2			21.2		5.2	
	6			22.9		3	
	7	39	21.9	21.4		5	
	10			24.0		6	
	13			21.8		4	
	15	45	24.2	24.2		4	
	17			22.9			? unknown +
	29	59	20.7	20.9		4	
	31	1	21.7	21.8		4	
	34	2	20.7	20.9		6	
	35			23.2		5	
	37			20.9		4	

Ended at 9 41

+ Not confirmed doubtful 7 mag.

22 50

R Aquarii 4th type　　• ⊙R

Clouds at about 10 o

Z D. o = Abs. = 0.75
" " ★ = " = $\frac{1.20}{0.85}$

Oct. 6, 1880.

Sweep for Planetary Nebulae 20° to 25° S. P. obs.

Telescope clamped at 2^h ~~2~~ 07^m W. Sweep began 7^h 25^m

7	25	20			
7^h	30^m		−24°.0		6th mag.
7	31	26	−24.0	24.1	5 "
7	33	28	−20.9	20.9	5 "
7	33~~.5~~^{m} 18	29	−23.9	24.0	Cluster
7	35	30	−21.4	21.5	6 mag
7	41		−25.0		6 "
7	42		−20.9		Two stars foll.g each other.
7	43	39	−22.2	22.5	5 mag. Zone closed.

∴ Limits of Zone 18^h 20^m − 18^h 38^m, −20° 5 − 25°

Oct. 6, 1880

7 35 β Urs. Min. 2 α Urs. Min. S. obs.
ε Urs. Maj. 1 α Urs. Min.
α Urs. Min 2 γ Cass.

7 55 Plan. neb. H. C. 2 P. obs.

	h	m	s					
Star	7	58	36.5	Decl. 3	2d side of square			
Neb.		59	9	4½	1st	"	"	"
Neb.		59	56		2d	"	"	"
Star	8	0	35	8½	2d	"	"	"
Star		0	41.5	8½	2d	"	"	"

8 30 ~~α Urs. Min.~~
β Urs. Min. 1 α Urs. Min. W. Obs.
α Urs. Min. 3 γ Cass.

Phot. I. Neb. H. C. 2
Comp. * λ Sagittarii.

1.02
8 33 1.15 S. Obs.
0.90
1.02+

Nebula somewhat difficult to identify in field of photometer after examination with spectroscope. All the stars are large.

Z.D. ⊙ = 75.6 Abs. = 0.75
" " * = 80.6 " = 1.20
0.45

Oct. 6, 1880

Photometer I

Plan. neb. H.C. 2, λ Sagittarii.

8 38 1.65 W. obs.
1.30 Neb very ft.; near
1.41 136 horizon.
1.45

W. afterwards identified the nebula again with the spectroscope, and felt sure that the object observed was the nebula and not a star.

Comet near Corona Borealis.

8 55 Spectrum continuous or mostly continuous. Possibly some of the fainter part gaseous, but this is not certain with a simple prism. S. obs.

Spectrum of nucleus continuous; of exterior portions probably gaseous. W. obs.

Phot. I. Comp * ε Coronae. S. Obs.

	Inside	Outside
	4.6 ±	11.4
9 7	2.7	10.3
	3.2	10.9
	10.5	2.6
	3.50	10.87

10.87
2)7.37
Log. 3.68 = 0.56585
5
2.82925
2.11
2.37
7.31 Uncorr. mag.
7.45
7.76 Cor.

~~10.87~~
~~3.50~~
~~Log. 7.37 = 0.8675~~
~~4.3373~~
~~2.11~~
~~2.37~~
~~8.82 Uncorr. mag.~~

Oct 6. 1880

[9 15]

Outside.
11.0
11.5
11.7
12
11.4±8

Focus. ~~11.0~~
7.0
7.2
7.2
4
7.13+
11.40
4.27

U. obs
Log. 427 = 0.63043
5
3.15215
2.11
2.37
7.63 Un cor. mag.
45
8.08 Cor. "

9 18

~~Focus.~~
~~6.7~~
9.70
4.13
2)5.57
2.78

Outside.
9.6
9.5
10.0
21
9.70

Inside.
4.3
4.2
3.9
4
4.13+

P. obs
Log. 278 = 0.44404
5
2.22020
2.11
2.37
6.70 Un. mag.
45
7.15

9 25

Outside.
11.2
11.0
11.2
4
11.13+

Inside
4.2
4.0
4.0
2
4.07+

11.13
4.07
2)7.06
3.53

W. obs
Log. 353 = 0.54777
5
2.73885
2.11
2.37
7.22 Un. mag.
45
7.67 Cor. "

9 30 Comet elongated in position. P. obs

Dumb-bell

19 54
22 35
2 41

Oct. 6. 1880.

~~XV~~ ~~16~~ ~~10 mag.~~

~~15~~ ~~11 "~~

~~15~~

~~18.0~~ Vicinity of Dumbbell Nebula

0ʰ 0ˢ 36 17 22 10 mag.
5.5 47.8 36.5 16.5 20.7 4.3 10 "
12.0 48 36 9 14.0 5 9.2 ~~7.0~~ "
14.5 50.5 18 23 10 "
19.5 55.5 17 22 11 "
24.0 0.0 16 21 double 13 "
34.5 70.5 15 20 12 "
41.5 neb. 17.5 14 19
47 23 16 21 midst of neb. 13 "
57.2 33.2 16 21 3 stars. (12 + 16 = 13 mag. 18 = 12 mag.)
1 ~~8.5 44.5 · 18 23~~ ~~11 mag.~~
14.5 50.5 36 14 19.1 5 9.0 ~~9.2~~ mag.
20.5 57.5 36.3 15 18.9 4 9.5 ~~9.4~~ ~~11~~ mag.

0.0
6.0
12.3
14.5
19.5
23.8 double.
34.4
42.4 neb.
47.1
57.6 3 stars 12, 16, 18 dec
14 5 9 mag.
21.0 9.4 "

Oct. 6. 1880.

Comp. * ε Cygni.

S. pre. W. As Dumbbell nebula

G.C. 4532.

10 09 ~~8.9~~ 8.7 Tone

7.8 20.0

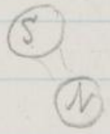
7.7 19.5

7.4 21.6

19 1.1

7.63+ ~~2.37~~ 20.37+ ✓

Portion between lobes S. N.



7.9 25.2

7.9 23.8

10 15 7.4 21.9

22 10 9

~~7.53~~ 7.07+ 23.63+

7.73 ✓

Reject

Dome cuts

off Objective

N. foll.

10 16 7.3 23.8

7.8 24.4

7.8 24.1

19 3

7.63+ S. prec. 24.1+

10 21 7.4 19.3

7.2 18.8

7.8 17.8

44 259

7.47+ 18.6+

7.5

W. dns

11.1 = 1.04532

0.22660

2.11

2.69

10.03

Contrast doubtful

Washed

10 23 7.8 22.5

7.6 22.5

7.5 21.0

19 0

7.6+ 22.0+

7.6

14.4

14.4 = 1.15836

0.79180

2.11

2.69

10.59

Oct 6 1880.

N. fol. Wobs

10 26 7.8 21.8 13.9 = 1.14302
7.7 21.8 5.71510
7.3 20.9 2.11
18 15 2.69
7.6+ 21.5+ 10.52
7.6
13.9

~~Sutto~~ Sf tapering and

10 28 7.6 32.3 W obs
7.4 31.9 24.0 = 1.38021
7.8 30.5 6.90105
18 47 2.11
7.6+ 31.57+ 2.69
~~7~~7.6 11.70
24.0

No chr. correction No correction in time

Variable D.M. 81.30 comp. P. Obs,

11 11
4 44 31.
15 55 31.
11 11.5

26.2 (with star in upper
88.6 62.4 part of field! Phot. R.
212.7 East Equat.
256.0 43.3
105.7
52.85 52°.85
1.52

R, with star in centre of field.
P. Obs.

11 14
4 44 31.
15 58 31.
11 14.5

25.2
93.1 67.9 67.9 63°.30
206.3 58.7 1.05
265.0 58.7 126.6
126.6 ~~63~~
63.3

Oct. 6. 1880.

R. with star in lower part of field P. Obs.

11 16 20.2 70.6'
4/16 44 31 0 11 31 96.5" 90.5 70.6'
201.8 65.1' 65.1'
266.9 135.7' 135.7' 67°85"
67.85' .86"

11 19 21.0 73.5' lower part of field W. d.
4/16 44 31. 3 11 31. 19.5" 94.5 73.5'
207.0 61.1' ~~59.1~~ 61.1' 67°30"
268.1 134.6' .88"
~~132.6~~ 67.30'
13K.6

Upper edge of field W. d.

11 24 19.6 72.6' 72.6'
4/16 44 31. 2 31. 11 24.5" 92.2 57°75"
213.9 42.9' 42.9' 1.29"
256.8 115.5'
1155' 57.75

11 25 28.2 61.3' Center field
4/16 44 31. 9 11 31 2 51.5" 89.5 61.3' 61°90"
203.1 62.5' 62.5' 1.11"
265.6 123.8'
12~~4~~.8 3 61.90'

11h 23m = Comp. time.

Chron. corr. = −1.m5 ✓

This correction is assumed by me to be −1.m5 exam.- aug. 1. 1896.

Oct 7, 1880

β [illegible] [illegible] E [illegible]

6 44 | 337.6 | 32.2'< > Pots.
9.8
6 43.5 ✓ > | 159.4
337'< >
46 | 193.5
659'< > 4.6'< 2.65 > ~~2.64~~ <
~~6 45.0~~
~~6 43.7~~
32.95'

47 | 337.7 | 36.2'< >
13.9
46.5 ✓ > | 158.6
335'< >
49 | 192.1
69.7'< > 4.5'< 2.52 < >
~~6 48.0~~
~~6 46.7~~
34.85'

49 | 339.7 | 32.1'< >
120
48.5 ✓ > | 153.6
32.1'< >
51 | 185.7
64.2'< > 4.7'< 2.71 < >
~~6 50~~
~~6 48.7~~
32.10'

55 | 341.3 | 29.8'< > left of field
11.1
55 ✓ > | 156.3
31.9'< >
56 | 188.2
61.7'< > 4.8'< 2.80 < >
~~6 56.5~~
~~6 54.4~~
30.85'

59 | 339.9 | 32.8'< > Centre
12.7
58.5 ✓ > | 156.0
331'< >
7 01 | 189.1
65.9'< 4.6'. ~~2.64~~ 2.65 >
~~7 0.0~~
~~6 58.9~~
32.95'

Oct 7. 1880
Bottom field

7 01 — 332.2 — 34.2″ >
6.8
00.5″ > — 1564 — 34.3″ >
7 03 — 190.7
~~7 2~~ — 68.9″ — ~~4.5″~~
~~7 0.9~~ — 34.45 — 4.6
~~2.55″~~
2.54

7 14 — 335.0 — 34.0″
9.0
13.0″ > — 1558 — 33.1″
7 15 — 1889
~~7 14.5~~ — 67.1″ — 4.6″ — 2.60″ >
~~7 13.4~~ — 33.55″

7 15 — 7 30 = 20 37
20 22 — 19 45
45 — 42

~~[illegible]~~

7 20 — 336.9 — 32.0″
8.9
19.5″ > — 1536 — 33.8″
7 22 — 189.4
~~7 21.0~~ — 65.8″ — 4.6″ — 2.65″ >
~~7 19.9~~ — 32.90″

23 — 337.4 — 30.4″
7.8
22.0 > — 1551 — 33.2″
7 24 aug. 7-96 E.K.C.ram. — 1883
~~7 23.5~~ — 63.6″ — 4.7″ — 2.73″ >
~~7 22.4~~ — 31.80″

Oct 7. 1880.

7 26

~~3 35,6~~
~~6,1~~

Oct 7. 1880

Search 19" for planet Nebulae

Telescope 42m W. -25° to -30°

New distant cross pieces inserted.

Began at 7 38 53

30.5 19 53 280 28.0 4 lights 4.7

33.0 29.2 6 lt

34.5 27.5 4 lights 7

35.3 28.0 4 ? 8

39.0 25.8 6 images

42.5 27.3 4 images

19 53 - 20 7

Closed at 7 47

- R. obs.

reduced Aug 6. 1896

7 50 331.5 38.2' < >

97

7 49 < > 157.8 40.6' < >

192.4

51 78.8' < > 42' 2.23 < >

39.40°

~~7 50.5~~

~~7 49.4~~

7 52 336.0 39.3' < >

53

7 51.5 < > 152.6 35.1' < >

187.7

54 64.4' < > 47' 2.20 < >

32.20°

~~7 53.0~~

~~7 54.9~~ 53

333.4 36.7' < >

10.1

54.0

7 54 > 152.8 35.5' < >

168.3 49.2' < > 44' 2.43 < >

36.10°

~~7 55.5~~

~~7 54.4~~

7 56 Aug 7-96 Eichelberger

Oct. 7, 1880. Photometer R.

8 0 335.8 β Persei, φ Persei. P. obs.
8.1 32.3°< >
7 59.5 <>
153.7
8 2 192.0 38.3°< >
70.6°< > 4.5<
35.30°
2.49< >
~~8 1~~
~~7 59.9~~

8 2 331.2 33.8°< > P. obs.
5.0
8 1.5 >
151.8
8 4 189.8 38.0°< >
71.8°< > 4.4<
35.90°
2.45< >
~~8 3~~
~~8 1.4~~

8 5 333.0 P. Ob.
8.2 35.2°<
8 4 <>
153.7
8 6 187.4 33.4°<
68.6°< 4.6<
34.30°
2.55< >
~~8 5.5~~
~~8 4.4~~

8 6 β Urs. Min. 2 α Urs. Min. S. obs.
ε Urs. Maj. 1 α Urs. Min.
α Urs. Min. 2 γ Cass.

8 14 332.2 S. Obs.
9.2 37.0°< > Images not reversed in this set.
8 13.5 <>
152.2
8 16 187.9 35.7°< >
72.7°< 4.4<
36.35°
2.42< >
~~8 15~~
~~8 13.9~~

Oct. 7. 1880.

8 14 α Urs. Min. = β Urs. Min. W. Obs,
8 21 α " " 2 γ Cass. W. Obs.

8 17 329.1 38.9'< > S. Obs,
8.0
8 16.5< > 151.2 Images reversed, but they
8 19 189.6 38.4'< > do not pass across each other.
77.3'< > 4.3<
~~8 18~~ 38.65
~~8 16.9~~ 2,28< >

8 20 331.5 37.3'< > S. Obs.
8.8
8 20< > 151.0 36.0'< > Same remark as in
8 23 187.0 73.3'< > 4.4< last set.
~~8 21.5~~ 36.65
~~8 20.4~~ 2,40< >

8 25 332.1 34.3'< > W. obs.
6.4
8 26< > 152.4 Images not reversed.
8 30 187.6 35.2'< >
69.5'< > 4.5<
~~8 27.5~~ 34.75
~~8 26.4~~ ~~4.58~~ 2,52< >

8 31 332.0 32.8'< > W. obs,
4.8
8 30< > 152.0 Images not reversed
8 32 187.3 35.3'< >
68.1'< 4.6< 2,57< >
~~8 31.5~~ 34.05
~~8 30.4~~

Oct. 7, 1880.

8 32 332,2 32,6°<>   W. obs.
4.8
8 31.5<> 150.6   Images not reversed.
8 34 185,6 35,0°<>
67.6°< 4.6< ~~2,88<~~
33.80°   2.59
~~8 33~~
~~8 31.9~~

8 42 329,2 40,0°<>   S. Obs.
19.2   Images adjusted to
8 42.5<> 145.5   Cross each other and
8 46 191.4 45.9°<>   reversed in this &
85.9°<> 4.0< subsequent sets.
42.95°
~~8 44~~
~~8 42.9~~   ~~2.0,2<~~
2.03>

8 46 327.2 43.5°<>   S. Obs.
10.7
45.5<> 144.5
8 48 190.1 45.6°<>
89.1°<> 3.9< 1.94<>
44.55°
~~8 47~~
~~8 45.9~~

8 49 324.9 ✓ 43.1°<>   S. Obs.
7.0
8 48.5<> 147.0
8 51 188.9 41.9°<>
85.0°< 4.1< 2.08<>
4
42.00°
~~8 50~~
~~8 48.9~~

8 56 326.1 39.5°<   W. obs.
5.6
8 55<> 147.5
8 57 189.1 41.6°< Images rev.
81.1°< 42< 2.16<>
40.55°
~~8 56.5~~
~~8 55.4~~

Oct. 7, 1880

8 58 323.1 43.9°< > W. obs.
7.0 ~~Images~~
8 57< > 149.5 Images rev.
8 59 182.9 33.4°< >
77.3°< > 4.3<
386.5°
8 — 58.5 2.28< >
8 — 57.4

9 0 328.0 34.5°< > W. obs.
2.5
8 59< > 144.0 Images rev.
9 1 187.2 43.2°< >
77.7°< > 43<
388.5°
9 — 0.5 ~~2.27~~<
~~9~~ 8 — 59.4 2.26 >

9 3 324.1 42.7°< > S. Obs.
6.8
9 3< > 140.2
9 6 190.0 49.8°< >
92.5°< > 3.8< 1.85< >
46.25°
9 — 4.5
9 — 3.4

9 8 319.5 47.6°< > S. Obs.
7.1 Images again readjusted.
9 7.5< > 142.3 45.9°< >
9 10 188.2 93.5°< > 3.8<
46.75°
9 — 9 1.8~~5~~2 >
9 — 7.9

9 11 322.1 44.1°< > S. Obs.
6.2
9 10.5~~7~~< > 139.8 47.3°< >
9 13 187.1 91.4°< > 3.9<
9 — 12 1.88< >
9 — 10.9
45.70°

Oct. 7, 1880.

9 14 324.1 W. obs.
1.9 37.8° < >
9 13< > 141.9
9 15 188.7 46.8° < >
84.6° < > 4.1<
~~9 14.5~~ 42.30° 2.06< >
~~9 13.4~~

9 16 322.2 W. obs.
6.2 44.0° < >
9 15< > 143.3
9 17 186.7 43.4° < >
87.4 < > 4.0<
~~9 16.5~~ 43.70° 1.98< >
~~9 15.4~~

9 17 323.9 36.0° < > W. obs.
359.9
9 17.5< > 142.3 Reject; images in bad part of field.
~~9 19~~ 139.7
9 21 188.9 49.2° < >
85.2° < > 4.0<
~~9 19~~ 42.60° 2.05< >
~~9 17.9~~

9 23 321.5 S. Obs.
44.4° < >
9 22< > 5.9
140.5
9 24 184.6 43.9° < >
88.3° < > 4.0<
~~9 23.5~~ 44.15° 1.96< >
~~9 22.4~~

9 25 320.2 46.0° < >
6.2
9 24.5< > 141.2
9 27 188.2 47.0° < >
93.0° < > 3.8<
~~9 26~~ 46.50° 1.83< >
~~9 24.9~~

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9 27   321.8   40.3° < >   S. Obs.
2.1
9 265 < >   141.2
9 29   191.2   50.0° < >
90.3° <   39'
~~9 28~~
~~9 26.9~~
45.15°   ~~1.90'~~
1.91 >

9 30   318.5   43.7° < >   P. Obs.
2.2
9 29.8< >   140.6   42.5° < >
9 31   182.9   86.0° < >   4.0'
~~9 30.5~~
~~9 29.4~~
43.00°   2.02 < >

9 32   319.8   41.8° < >   P. Obs.
1.6
9 31< >   136.9   49.6° < >
9 33   186.5
91.4° < >   39'
~~9 32.5~~
~~9 31.4~~
45.70°   1.88 < >

9 34   320.6   44.7° < >   P. Obs.
5.3
9 33< >   139.0   439° < >
9 35   182.9
88.6° < >   4.0'
~~9 34.5~~
~~9 33.4~~
44.30°   1.95 < >

9 36   317.9   44.4° >   W. obs
2.3
9 35< >   137.4
9 37   186.8   49.4° < >
93.8° >   38'
~~9 36.5~~
~~9 35.4~~
46.90°   1.81 < >

Oct 7. 1880

9 39 320.6 45.6' < > Webs
5.6
38 < > 136.2 51.7' < >
9 40 1879
97.3' < > 3.7' 1.72 >
~~9 39.5~~
~~9 38.4~~ 48.65' ~~1.73~~

9 40 319.2 45.8' < > Webs
9 39' < > 5.0
1357 48.9' < >
9 41 aug 7-96 ErGram. 184.6
~~9 40.5~~ 94.7' < > 3.8' 1.79' >
~~9 39.4~~ 47.35'

9 46 318.0 47.0' < > P. Obs.
5.0
45 < > 134.7
9 47 180.7 46.0' < >
93.0' < > 3.8' 1.83' >
~~9 46.5~~ 46.50'
~~9 45.4~~

9 47 321.0 38.8' < > P. Obs.
359.8
46.5 < > 135.7
9 49 189.9 54.2' < >
93.0' < > 3.8' 1.83' >
~~9 48~~ 46.50'
~~9 46.9~~

9 50 320.6 44.6' < > P. Obs.
5.2
9 49 < > 134.1
9 51 183.4 47.3' < >
91.9' < > 3.6' 1.81' >
~~9 50.5~~ 46.95'
~~9 49.4~~

Oct 7. 1880.

~~9 59~~
10 07 316.0 51.0° < > U. obs
70
10 6.0 > 134.1 49.6° < >
08 1837
~~10 7.5~~ 100.6° < > 3.6 < 1.64 < >
~~10 6.4~~ 50.30°

10 08 317.7 42.2° < > U. obs
359.9
10 7 < > 1285 60.4° < >
09 1589
~~10 8.5~~ 102.6° < > 3.6 < 1.59 < >
~~10 7.4~~ 51.30°

10 10 311.0 54.2° < > U. obs
52
10 9 >
~~10 9~~ 5 < 138.8 43.4° < >
10 11 aug 7-96 Erhram 182.2
~~10 10.5~~ 97.6° < > 3.7 < 1.72 < >
~~10 9.4~~ 48.80°

10 14 313.3 P. obs.
4.6 51.3° < >
10 13.5 < > 132.7 51.2° < >
10 16 183.9
~~10 15~~ 10.2.5° < > 3.6 < 1.60 < >
~~10 13.9~~ 51.25°
10 17 312.0 51.2° < > P. Obs.
3.2
10 16 < > 131.4 49.6° < >
10 18 181.0
~~10 17.5~~ 100.8° < > 3.6 < 1.64 < >
~~10 16.4~~ 50.40°

Oct. 7. 1880.

10 19 314.4 P. Obs.

3.8 49.4′ < >

10 18.5 < > ~~18~~

130.9

10 21 184.2 53.3′ < >

~~10 20.0~~

~~10 18.9~~ 102.7′ < > 3.6″ 1.59″ >

51.35′

10 22 314.0 47.4′ < > W. obs

1.4

21.5 < > 133.0

49.1′ < >

24 182.1

~~10 23.0~~

~~10 21.9~~ 96.5′ < > 3.7″ ~~1.75″~~ 1.74 >

48.25′

10 25 315.0 44.8′ < > W. obs

359.8

10 24 < > 130.5

55.0′ < >

10 26 185.5

~~10 25.5~~

~~10 24.4~~ 99.8′ < > 3.7″ 1.66″ >

49.90′

10 27 314.2 47.8′ < > W. obs

2.0

10 26 > 135.8

47.3′ < >

10 28 Aug 7-96 Ekram. 183.1

~~10 27.5~~ 95.1′ < > 3.8″

~~10 26.4~~ 47.55′ 1.78″ >

10 30 312.6 49.6′ < > P. Obs.

2.2

10 29.5 > 132.0

10 31 179.7 47.7′ < >

~~10 30.5~~ 97.3′ < > 3.7″ ~~1.73″~~ 1.72 >

~~10 29.4~~ 48.65′

Oct. 7. 1880.

10 32 315.0 44.0' < > P. Obs.

0
31.5 > 359.0

129.1 53.2' < >

10 33 182.3 97.2' < > 37'

~~10 32.5~~

~~10 31.4~~

48.60' 1.73' < >

10 33 312.6 49.2' < > O. obs.

1.8

32.5 > 128.3 55.7' < >

10 35 184.0 104.9' < > 3.5'

~~10 34.0~~

~~10 32.9~~

52.45' 1.54' < >

10 37 ~~315.9~~ rejected images at edge of field W. obs

311.8 48.7' < >

36.5' > 0.5

127.1 57.7' < >

10 39 184.8 106.4' < > 3.5'

~~10 38.0~~

~~10 36.9~~

53.20' 1.50' < >

10 39 311.5 53.3' < > W. obs

4.8

38' > 130.3 50.4' < >

10 40 180.7 103.7' < > 3.6'

~~10 39.5~~

~~10 38.4~~

51.85 1.57' < >

10 41 310.8 51.1' < > W. obs

40' > 1.9

129.1 55.4' < >

10 42 184.5 106.5' < > 3.5'

~~10 41.5~~

~~10 40.4~~

53.25 1.50' < >

Oct. 7. 1880.

10 46 309.8 P. Obs.
1.1 51.8°< >
45< > 128.1
10 47 179.6 51.5°< >
~~10 46.5~~
~~10 45.4~~
102.8°< > 3.6<
51.40°
1.59< >

10 47 308.2 P. Obs.
1.6 53.4°< >
46.5< > 131.2
10 49 181.1 49.9°< >
~~10 48.0~~
~~10 46.9~~
103.3°< > 3.6<
51.65°
1.58< >

10 49 307.8 P. Obs.
0.6 52.8°< >
48< > 128.0
10 50 181.9 53.9°< >
~~10 49.5~~
~~10 48.4~~
106.7°< > 3.5<
53.35°
1.49< >

10 51 310.2 48.6°< > W. de
358.8
50< > 127.5
52 185.2 57.4°< >
~~10 51.5~~
~~10 50.4~~
106.0°< > 3.5<
53.00°
1.51< >

10 53 307.8 54.3°< > W. de
2.1
52< > 129.9 47.5°< >
10 54 177.4
~~10 53.5~~
~~10 52.4~~
101.8°< > 3.6<
50.90°
1.61< >

Oct 7 1880

10 54 312.8 43.1° < > V. obs.
359.9
5 3 > 127.0 52.1° < >
10 55 aug 7-96 E.R.Cram 177.1
~~10 54.5~~
~~10 53.4~~
95.2° < > 3.8' 1.78' >
47.60°

Watch 1m 4s fast.

11 14 308.2 49.5° < > P. Obs.
357.7
13.5 < > 129.0 53.4° < >
11 16 182.4
~~11 15.0~~
~~11 13.9~~
102.9° < > 3.6' 1.59' >
51.45°

11 16 308.6 49.4° < > P. Obs.
358.0
15.5 < > 125.9 57.1° < >
11 18 183.0
~~11 17.0~~
~~11 15.9~~
106.5° < > 3.5' 1.56' >
53.25°

11 19 311.4 46.4° < > P. Obs.
357.8
18.5 < > 127.1 53.8° < >
11 21 180.9
~~11 20.0~~
~~11 18.9~~
100.2° < > 3.7' 1.65' >
50.10°

11 23 308.4 50.0° < > S. Obs.
358.4
22.5 < > 128.1 49.9° < > 3.7'
11 25 178.0
~~11 24.0~~
~~11 22.9~~
99.9° < > 49.95 1.66' >

Oct. 7. 1880.

11 25 309.8 49.0° < > S.-Obs.
358.8
24 < > 126.0
11 26 181.0 55.0° < > 3.6 <
104.0° < >
~~11 25.5~~
~~11 24.4~~
52.00° 1.56 < >

11 27 303.2 62.8° < > S. Obs.
6.0
27 < > 124.8
52.~~2~~° < >
30 177.0 3 <
115.0° < > 3.~~4~~
~~11 28.5~~
~~11 27.4~~
57.50° 1.30 < >

11 30 306.2 51.2° < > W. obs
357.4
29 < > 129.7 50.1° < >
11 31 179.8
101.3° < > 3.6 <
~~11 30.5~~
~~11 29.4~~
50.65° ~~1.62~~ < 1.62 >

11 32 308.0 4
4~~8~~.4° < > W. obs.
352.4
31 < > 124.5 55.9° < >
11 33 180.4 104.3° < > 3.6 <
~~11 32.5~~
0
~~11 31.4~~ 50~~1~~5 1.65 < >

11 34 305.5 51.6° < > Fr. Obs.
357.1
33 < > 129.0 47.2° < >
11 35 176.2 98.8° < > 3.7 <
~~11 34.5~~
~~11 33.4~~ 1.69 < >
49.40°

Oct. 7, 1880.

11 36 304.0 55.3° < > P. Obs.
359.3
35 < > 125.0
11 37 175.6 50.6° < > 5 <
105.9 < > 3.6
11 — 36.5
11 — 35.4
1,51 < >
52.95°

11 37 305.4 48.2° < > P. Obs.
353.6
36 < > 123.8
11 38 181.4 57.6° < > 3,5 <
105.8 < >
11 — 37.5
11 — 36.4
1,52 < >
52.90°

11 39 308.3 47.8° < > P. Obs.
356.1
38 < > 124.9
11 40 175.2 50.3° < > 3.7 <
98.1° < >
11 — 39.5
11 — 38.4
~~1.71 <~~ 1.70 >
49.05°

11 43 305.8 48.5° < > S. obs
354.3
43 < > 123.2
50.8° < >
46 174.0
99.3 < > 3.7 <
11 — 44.5
11 — 43.4
~~1.68 <~~ 1.67 >
49.65

11 47 305.0 50.1° < > S obs
355.1
46 < > 127.0
47.0° < >
48 174.0
97.1° < > 3.7 <
11 — 47.5
11 — 46.4
48.55°
1.73 < >

C

assumed to be 50^m cylinder.

Oct 7, 1880.

11 50 — 298.7 — 54.4˙ < > — S obs.
353.3
49.5 < > — 123.0
52 — 176.7 — 53.9˙ < >
11 51.0 — 108.3˙ < > — 3.5 < — 1.46 < >
11 49.9 — 54.15˙

11 53 — 306.3 — 46.9˙ < > — W. obs.
52.5 < > — 353.2
130.2 — 43.6˙ < >
11 55 — 173.8 — 90.5˙ < > — 3.9 <
11 54.0 — 1.90 < >
11 52.9 — 45.25˙

11 55 — 312.2 — 35.0˙ < > — W. obs.
347.2
54 < > — 126.0
11 56 — 177.0 — 51.0˙ < >
11 55.5 — 86.0˙ < > — 41.0 < — 2.02 < >
11 54.4 — 43.00˙

11 57 — 305.5 — 48.2˙ < > — W. obs.
353.7
56 < > — 125.2
11 58 — 170.1 — 44.9˙ < >
11 57.5 — 93.1˙ < > — 3.8 <
11 56.4 — 1.83 < >
46.55˙

11 59 — 302.2 — 48.7˙ < > — P. Obs.
350.9
58.0 < > — 127.1 — 47.2˙ < >
12 0 — 174.3 — 95.9˙ < > — 3.8 < — 1.76 < >
11 59.5
11 58.4 — 47.95˙

Oct. 7. 1880.

12 0 306,8 41,9˙< > P. Obs.

348,7

0< > 120,6 49,9˙< > 3,9<

12 3 170,5 91,8˙< >

~~12 1.5~~ 45.90˙ 1,87< >

~~12 0.4~~

12 3 #19 P. Obs.

2>

12 4 aug 7-96 Exeram

~~12 3.5~~ 69< >

~~12 2.4~~

8

12 05 S. obs

4,5< >

07 3,7<

~~12 6.0~~ 1,66< >

~~12 4.9~~

12 08 S. obs

7,5< >

6<

10 1038< > 3.~~7~~

~~12 9.0~~ 51,90˙

~~12 7.9~~ 1,56< >

12 10 304.0 48.0˙< > S. obs

352.0

9.5< > 120.0 57.1˙< >

12 177.1

~~12 11.0~~ 105.1˙< > 3.5<

~~12 9.9~~ 5255˙ 1,53< >

Oct. 7. 1880.

12 0 306.8 41.9°< > P. Obs.

348.7

0< > 120.6 49.9°< > 3.9<

12 3 170.5 91.8°< > 1.87< >

~~12 1.5~~

~~12 0.4~~

45.90°

12 3 303.0 48.2°< > P. Obs.

351.2

2> 123.3 50.5°< > 3.7<

12 4 aug 7-96 Exeram 173.8 98.7°< > 1.69< >

~~12 3.5~~

~~12 2.4~~

49.35°

E

12 05 302.5 50.6°< > S. obs.

353.1

4.5< > 124.0 49.~~1~~2°< >

07 173.2 ~~100.8~~ 99.8°<> 3.7<

~~12 6.0~~

~~12 4.9~~

49.90° 1.66< >

12 08 295.8 54.7°< > S. obs.

350.5

7.5<> 123.1 49.1°< > 6<

10 172.2 103.8°< > 3.~~7~~

~~12 9.0~~

~~12 7.9~~

51.90°

1.56< >

12 10 304.0 48.0°< > S. obs.

352.0

9.5< > 120.0 57.1°< >

12 177.1 105.1°< > 3.5<

~~12 11.0~~

~~12 9.9~~

52.55° 1.53< >

e

Oct. 7, 1880.

assumed to be 306.9 ERCham.

12 13 306.9 39.0° < > W. obs.
345.9
12 < > 123.5
50.4° < >
12 14 173.9
3.9 <
89.4° <
~~12 13.5~~ 1.93 < >
~~12 12.4~~
44.70°

12 15 307.0 42.2 } Reject; reset images W. obs.
15.5 ~~14~~ 349.2

12 19 307.2 W. Obs.
~~18~~ ~~17.0~~ 345.0 37.8° < >
18.5 < >
124.3
46.6° < >
12 21 170.9 4.1 <
84.4° < > 2.07 < >
~~12 20.0~~
~~12 18.9~~
42.20°

12 21 304.2 W. obs.
44.0° < >
348.2
20.5 < > 126.2
41.4° < >
12 23 167.6
85.4° < >4.0 < 2.04 < >
~~12 22.0~~
~~12 20.9~~
42.70°

12 24 305.3 44.2° < > P. Obs.
349.5
23.5 < > 126.1
43.4° < >4.0 <
12 26 169.5
87.6° < > 1.98 < >
~~12 25.0~~
~~12 23.9~~
43.80°

Oct. 7. 1880.

12 26 303.0 42.5°< > P. Obs.
385.5
25.5 < > 126.4 4.0<
12 28 172.3 45.9°< >
~~12 27~~ 88.4°< > 1.96< >
~~12 25.9~~ 44.20°

12 28 303.8 42.9°< > P. Obs.
346.7
27< > 125.8 43.4°< > 4.0<
12 29 169.2
~~12 28.5~~ 86.3°< > 2.01< >
~~12 27.4~~ 43.15°

12 31 297.8 52.1°< > S. obs
349.9
31< > 123.3
12 34 168.2 44.9°< >
~~12 32.5~~ 97.0°< > 3.7<
~~12 31.4~~ 48.50° 1.73< >

12 35 296.7 52.3°< > S. obs
349.0
35< > 126.0 45.0°< >
38 171.0
~~12 36.5~~ 97.3°< > 3.7<
~~12 35.4~~ 48.65° ~~1.73<~~ 1.72 >

12 43 304.6 46.3°< > S. obs
350.9
42< > 119.6 44.6°< >
44 164.2
~~12 43.5~~ 90.9°< > 3.9<
~~12 42.4~~ 45.45° 1.89< >

Oct. 7, 1880.

12 45 309.8 33.2° < > W. obs.
343.0
44.5 < > 121.2
12 47 169.3 48.1° < >
~~12 46.0~~ 81.3° < > 4.2° 2.16 < >
~~12 44.9~~ 40.65°

12 49 309.7 33.1° < > W. obs
342.8
48.5 < > 126.4
12 51 168.3 41.9° < >
~~12 50.0~~ 75.0° < > 4.3° 2.35 < >
~~12 48.9~~
37.50°

12 52 305.0 39.1° < > W. obs.
344.1
51 < > 129.2
12 53 166.2 37.0° < >
~~12 52.5~~ 76.1° < > 4.3°
~~12 51.4~~ ~~2.32~~ < 2.31 >
38.05°

12 55 303.9 42.9° < > P. Obs.
346.8
54 < > 122.4 4.0°
12 56 166.0 43.6° < >
~~12 55.5~~ 86.5° < >
~~12 54.4~~ 43.25° 2.01 < >

12 57 304.8 44.4° < > P. Ob.
349.2
56 < > 125.9
12 58 168.9 47.0° < > 4.0°
~~12 57.5~~ 87.4° < >
~~12 56.4~~ 43.70° 1.98 < >

Oct. 7. 1880.

12 58 3048 39.6 < > P. Obs.
3444
57.5< > 125.0 4.1
13 0 170.0 45.0 < >
~~12 59.0~~ 84.6 < > 2.06 < >
~~12 57.9~~ 42.30

13 01 302.3 S. obs.
45.2 < >
347.5
05< > 120.6 50.3 < >
03 170.9
~~13 2.0~~ 95.5 < > 3.8
~~13 0.9~~ 47.75 1.77 < >

13 05 303.1 43.0 < > S. obs
346.1
4.5< > 126.1 45.1 < >
13 07 171.2
~~13 6.0~~ 88.1 < > 4.0
~~13 4.9~~ 44.05 ~~1.97~~ < 1.96 >

13 08 ~~305.1~~ Removed to 2 Balcony. S. obs.
13 25 303.5 42.7 < > S. obs
346.2
24> 121.6 45.4 < >
13 26 aug 7-96 167.0
ERCram
~~13 25.5~~ 88.1 < > 4.0
~~13 24.4~~ 44.05 ~~1.97~~ < 1.96
13 30 305.8 36.7 < > W. obs
342.5
29< > 125.2 40.5 < >
31 165.7
~~13 30.5~~ 77.2 < > 4.3
~~13 29.4~~ 38.60 2.28 < >

o

Oct. 7. 1880.

13 31 305.0 38.0° < > W. Obs.
343.0
30.5 < > 126.3
164.0 37.7° < >
13 33 75.7° < > 4.3″
~~13 32.0~~ 37.85° ~~2.33<~~ 2.32>
~~13 30.9~~

13 35 306.0 37.2° < > W. Obs.
343.2
34.~~5~~ < > 126.0
163.3 37.3° < >
13 36 74.5° < > 4.4″
~~13 35.5~~ 37.25 ~~2.37<~~ 2.36>
~~13 34.4~~

13 37 307.5 33.1° < > P. Obs.
340.6
36.~~4~~ < > 124.3
165.9 41.6° < > 4.4″
13 38 74.7° < > ~~2.35<~~ 2.36>
~~13 37.5~~ 37.35°
~~13 36.4~~

13 39 300.5 43.3° < > P. Obs.
343.8
38.~~4~~ < > 125.0 4.2″
167.0 37.0° < >
13 40 81.3° < > 2.16 < >
~~13 39.5~~ 40.65°
~~13 38.4~~

13 40 305.7 34.4° < > P. Obs.
39.5 < > 340.1
4.2″
13 42 122.0
~~13 41.0~~ 165.9 43.9° < >
~~13 39.9~~ 78.3° < > ~~2.24<~~
39.15 2.25>

Oct 7, 1880

13 43 — 305.3 — 38.1 — S. ds.
343.4

Reject. Stars lost in [illegible] images

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13 58 — 309.8 — 33.7° < > — S. ds.
340.5
57 < > — 120.3 — 39.7° < >
59 — 160.0
~~13 58.5~~
~~13 57.4~~
73.4° < > — 4.4°
36.70° — 2.40 < >

2 0 — 308.3 — 37.7° < > — S. ds.
346.0
59 < > — 123.5 — 39.5° < >
2 1 — 163.0
~~2 0.5~~
~~19 39.4~~
77.2° < > — 4.3°
38.60° — 2.28 < >

2 3 — 307.5 — 38.0° < > — S. ds.
345.5
2 < > — 123.4 — 34.8° < >
2 4 — 158.2
~~2 3.5~~
~~14 2.4~~
72.8° < > — 4.4°
36.40° — 2.42 < >

2 8 — 307.2 — 31.3° < > — W. ds.
338.5
7 < > — 124.6 — 39.9° < >
2 9 — 164.5
~~2 8.5~~
~~14 7.4~~
71.2° < > — 4.5°
35.60° — 2.47 < >

Oct. 7, 1880.

2 10 305.2 W. obs.
341.9 35.7°< >
~~11~~ 9.5< > 125.0
2 12 159.9 34.9°< > 4.5<
2 11.0
14 9.9 70.6°< > 2.49< >
35.30°

2 13 307.2 W. obs
341.7 34.5°< >
12 >
~~14~~ < 129.1
162.8 33.7°< >
2 14 4.6< 2.57< >
2 13.5 68.2°< >
14 12.4
34.10°

2 15 308.4 P. obs.
340.0 31.6°< >
14 >
129.5 4.7<
2 16 161.1 31.6°< >
2 15.5 63.2°< > 2.74< >
14 14.4
31.60°

2 16 306.4 P. Obs.
339.9 33.5°< >
15.5< > 120.9 4.3<
2 18 163.6 42.7°< >
2 17.0 76.2°< > 2.31< >
14 15.9
38.10°

2 19 305.7 P. Obs.
345.8 40.1°< >
18< > 124.3
77.4°< > 4.3<
2 20 161.7 77.5°< > 2.27< >
2 19.5
14 18.4
38.75°

C

Oct. 7, 1880.

14 21 | 304.8 | 39.5°< > | S. obs.

344.3

20 <>

124.0 | 39.2°< >

14 22 | 163.2

~~14 21.5~~ | 78.7°< > 4.2<

~~14 20.4~~ | 39.35° | 2.23< . >

14 23 | 306.4 | S. obs.

35.5°< >

341.9

22 <>

125.0 | 39.2°< >

14 24 | 164.2

~~14 23.5~~ | 74.7°< > 4.4<

~~14 22.4~~ | 37.35° | ~~2.[illegible]5<~~ 3 | 2.36>

14 25 | 305.3 | 36.7°< > | S. obs.

342.0

24 <>

128.9 | 33.1°< >

14 26 | 162.0

~~14 25.5~~ | 69.8°< > 4.5<

~~14 24.4~~ | 34.90° | 2.51< >

14 28 | 307.7 | 27.3 } reject; images too low. | W. obs.

335.0

14 30 | 303.7 | 35.8°< > | W. obs.

339.5

29.5< >

125.0

14 32 | 163.2 | 38.2°< >

~~14 31.0~~ | 74.0°< > 4.4<

~~14 29.9~~ | 37.00° | 2.38< >

Oct. 7, 1880.

14 32 305.0 33,1°< > W. obs.
338,1
31< > 126,8
14 33 161.0 34,2°< > 4.6<
~~14 32.5~~ 67,3°< > 2,60< >
~~14 31.4~~ 33.65°

14 34 305.0 35.0°< > W. obs
340.0
33< > 127.0
14 35 162.0 35.0°< > 4.5<
~~14 34.5~~ 70.0°< > 2,51< >
~~14 33.4~~ 35.00°

14 36 305,6 31.4°< > P. obs
337.0
35< > 125.3 4.6<
14 37 160,7 35.4°< >
~~14 36.5~~ 66.8°< > 2,61< >
~~14 35.4~~ 33.40°

14 38 307.0 30.6°< > P. Obs.
337,6
37< 124,9 4.6<
162.8 37.9°< > 2.56< >
~~14 38.5~~ 68.5°< >
~~14 37.4~~ 34.25°

14 39 301,0< 38.8°< > P. Obs.
339.8
38< > 126.6 4.5<
14 40 158.2 31.6°< >
~~14 39.5~~ 70.4°< > 2.49< >
~~14 38.4~~ 35.20°

Oct 7. 1880.

14 42 — 304.3 — 38.9°< > — Sdm.
343.2
41.5 < > — 123.0 — 37.2°< >
44 — 160.2
~~14 43.0~~
~~14 41.9~~
76.1°< > 4.3<
38.05° — ~~2.32<~~ 2.31 >

14 45 — 304.9 — 34.0°< > — Sdm.
338.9
44.5 < > — 124.3 — 35.7°< >
14 47 — 160.0
~~14 46.0~~
~~14 44.9~~
69.7°< > 4.5< 2.52< >
34.85°

14 48 — 303.5 — 37.1°< > — Sdm.
340.6
47.5 < > — 120.6
14 50 — 162.1 — 41.5°< >
~~14 49.0~~
~~14 47.9~~
78.6< > 4.2<
39.30° — 2.24< >

14 53 — 305.7 — 33.4°< > — Wils.
339.1
52 < > — 128.9 — 32.1°< >
14 54 — 159.0
~~14 53.5~~
~~14 52.4~~
65.5°< > 4.7<
32.75° — 2.66< >

14 54 — 305.0 — 32.2°< > — Wils.
337.2
53< > — 125.2 — 33.8°< >
14 55 — 159.0
~~14 54.5~~
~~14 53.4~~
66.0° > 4.6<
33.00° — 264< >

Oct. 7, 1880.

14 57 305.2 W. obs.

335.9 30.7° < >

56.7 < > 123.5

14 58 160.3 36.8° < > 4.6 <

~~14 57.5~~

~~14 56.4~~

67.5° < > ~~2.58 <~~ 2.59 >

33.75°

14 59 305.1 P. Obs.

337.1 32.0° < >

58 < > 119.3

15 0 161.6 42.3° < > 4.4 <

~~14 59.5~~

~~14 58.4~~

74.3° < > 2.37 < >

37.15°

15 1 301.1 40.9° < > P. Obs.

342.0

00 < > 124.0

15 2 156.6 32.6° < > 4.4 <

~~15 1.5~~

~~15 0.4~~

73.5° < >

36.75° 2.39 < >

15 2 299.0 40.7° < > P. Obs.

339.7

1.5 < > 124.1 4.4 <

15 4 156.6 32.5° < >

~~15 3.0~~

~~15 1.9~~

73.2° < >

36.60° 2.40 < >

15 4 302.2 34.8° < > S. Obs.

337.0

3 < > 325.1

160.6 35.5° < >

5

~~15 4.5~~

~~15 3.4~~

70.3° < > 4.5 <

35.15°

~~2.49~~ <

2.50 >

Oct 7, 1880.

15 06 303.8 32.6° < > S. obs.
336.4
5 < > 124.8 32.2° < >
15 07 167.0
~~15 6.5~~
~~15 5.4~~
64.8° < > 4.7 <
32.40° 2.68 < >

15 08 302.1 35.5° < > S. obs.
337.6
7 < > 123.8 36.5° < >
15 09 160.3 4.4 <
~~15 8.5~~
~~15 7.4~~
72.0° < >
36.00° 2.44 < >

15 13 304.4 29.4° < > W. obs.
333.8
12.5 < > 124.6 34.0° < >
15 15 158.6 4.7 <
~~15 14.0~~
~~15 12.9~~
63.4° < >
31.70° 2.73 < >

15 15 302.4 W. obs.
337.6 35.2° < >
14.5 < > 125.6
15 17 157.0 31.4° < >
~~15 16.0~~
~~15 14.9~~
66.6° < > 4.6 <
33.30° 2.62 < >

15 17 303.6 W. obs.
333.6 30.0° < >
16.5 < > 123.9 35.6° < >
15 19 159.5
~~15 18.0~~
~~15 16.9~~
65.6° < 4.7 <
32.80° 2.66 < >

Oct. 7, 1880

15 20 302.8 P. obs.
332.6 29.8°< >
19< > 123.5
15 21 161.2 37.7°< > 4.6<
~~15 20.5~~
~~15 19.4~~
67.5°< >
33.75° ~~2.58<~~ 2.59>

15 22 300.1 P. obs.
336.0 33.9°< >
21< > 126.5
15 23 156.6 30.1°< > 4.6<
~~15 22.5~~
~~15 21.4~~
66.0°< > 2.64<>
33.00°

15 24 304.2 P. obs.
332.0 27.8°< >
23.5< > 123.7
15 26 162.5 38.8°< > 4.6<
~~15 25.0~~
~~15 23.9~~
66.6°< > 2.62< >
33.3°

Good settings this evening

B 394 Head
15 ~~28~~ 27 ~~0.0~~ 44.5 15 29 17
15 ~~29~~ 28 ~~0.0~~ 44.5 15 30 17
15 ~~30~~ 29 ~~0.0~~ 44.5 15 30 17

Corr. to chron. −1.5m

Oct 8. 1880

5 45 Tried Phot. R a large [illegible] and found that magnet [illegible] could not be brought together.

7 45 Comet near Corona Borealis and star n f. 1 obs.
Star runs on bar for reading of position circle 78°.0

Time	Stopwatch	Comet p star
7 57	9.3	9.3
	17.7	8.4
	25.8	8.1
	33.8	8.0
8 1	41.2	7.4
	8.24	
8 3	7.3	7.3
	13.3	6.0
	19.3	6.0
	25.2	5.9
8 5	31.0	5.8
	6.20	

8 13 Star runs on bar at 79°.5
77.7
78.8

8 15 Comet p star 1s.

Oct. 8. 1880
Pos. Zero. 78.6

Set at 33.6 W. Obs.
6 complete sets.
Reject 2d, 3d and 8th sets or partial sets.
☄ + * both in southern half of square.
Order ☄. ☄. *. *
Comp. star D. M. +22° 2998.

22 42
6 8
22.7
1634

Oct. 8. 1880.

Parallax Work. S. Obs.

Pos. Zero.

11 57 91.5 91° 30′
91.5 91 30

D. M. 27 on S. – 28 on V.

Images unsteady.

S. 9 54.0 + –
60.2 4.14 6.86
65.0 1.64 0.66
62.5 1.74
62.6 7.52 7.52
60.86 4.3 1504
±3.08
16.6086 5.8182

a on V – 27 on S.

a scarcely visible; this set has little value.

S 3 6.6
98.9 + –
95.0 8.78 2.82
98.0 1.08 8.82
89.0 0.18 11.64
99.4 1.58
586.9 11.62
97.82 23.26
±3.88

28 on S – 27 on V.

E 2 13.0 + –
6.0 6.60 0.40
2.0 2.60 4.40
9.0 4.40
2.0 9.20 9.20
32.0 18.40
6.40 ±3.68
5.0640 5.7264

5.8182
5.7264
11.5446
5.7723 Δδ 27 & 28

Oct. 8. 1880.

Pos. ang. of DM +70° 27 + 28.

DM. 27 sp DM. 28

p = 237° 0'

58° 9'
58 43
12 34 58 38
58 30

120

58° 30'
Image runs on wire at 91 30
33° 0

Photometer R.

Re. ~~Dis.~~ of Jupiter I.

R. 112.
12 42 1.0
43 1.2

S. Ob.
Bond 394.
12 40 0.0
41 0.0

12 25 37.1
23 41.1

12 49 18.2
41 0.0

8 18.2
12 43 1.2

12 51 19.4 approx. time Eclipse.

Oct. 8. 1880.

Limit of Vis. S. Obs.

	128.0			
		13.3		
12 48	141.3			
~~4~~	129.0	13.5		
	142.5	13.4		~~5.0~~
	540 8	6.70		
	135.20			

Set at 126.5

49	09	Seen		12 51	26.5
	25	124.0			42.0
	38	142.0			55.0
	50	124.3		52	7.5
50	05	146.0			21.5
	18	122.5			35.0
	28	149.0			45.0
	35	124.3			52.5
	47	153.3	29.0	53	3.5
	59	116.0			15.5
51	12	156.3	40.3		29.0
	27	110.3			44.5
	35	163.3	53.0		52.5
	49	103.8		54	6.5
52	04	165.0	61.2		21.0
	18	103.2			35.0
	29	163.0	59.8		46.0
	45	104.5		55	1.5
53	00	169.2	64.7	55 32 12 9	17.0
53 15	25	95.8			41.5
	44	167.2	71.4	56	1.0
		5367 26835 134.18	1361 6805 34.02		

Oct. 8. 1880.

96.0 75.0 12 5 6 17.0
5 4 23 171.0 16 2 / 40 34.0
102.8 47.5
169.8 67.0 / 14.2.0 / 7.1.0 / 35.5 5 7 — 3.5
5 396 / 2698 / 134.90 102.0 16.0
61.8 139 28.0
5 5 18 163.8 35 39.0
197.2 Undoubtedly 97.2 — 56.5
164.7 67.5 / 12.9 3 / 32.32 / ~~64.4~~ 5 8 13.5
5 277 / 26385 / 131.92 100.3 24.5
65.7 13 3 / 33 41.5
5 6 16 166.0 — 53.5
94.0 5 9 4.5
171.0 77.0 / 14.2 7 / 7135 / 35.68 17.5
5 313 / 26565 / 132.82 107.5 8 6 / 47 26.5
63.7 — 37.0
5 7 24 171.2
105.8
164.2 58.4 / 122 1 / 61.05 / 30.52
5 4 8 7 / 27 435 / 139.18

Sat. I. so close to limb ~~that~~ it is difficult to compare it. Compared with sat next to this. Sat used in comps. was second in order of dist. from preceding limb of Jupiter. Object used in comparison was sat. ~~B~~, II.

13 5 β Urs. Min. 1 α Urs. Min. S. obs.
α Urs. Min. 2 γ Cass.

Oct. 8. 1880.

	R. 112.			Bond 236.	
13	12	1.5	13	10	0.0
	13	1.5		11	0.0

Oct. 9, 1880.

6 50 Looked at H.C. 3. HC.3 0.3 mags brighter than 9
2 mags fst

Sagitt. or U Aquil.

6 51 18 17 54 −20 36.3 Spectrum not peculiar.
P. do

Scutum.
18 25 35 −14 57.3

6 55 Bands well-defined, but faint P. obs
⊙.

7 30 R. Aquilae Very red.
banded
See A.N. 2209

7 38 α 1 β Ursae Min. P. obs.
α 2 γ Cas P. obs

P. Found a nebula with comet-seeker & prism
probably D.M. +41 4004

8 8 Neb. 9 magn. 300° d 11
7 " 90° d 7
2 8 " 200° } 205° } d 7
8 " 190° d 3
2 7 " { 0° d 10 } { 10° d 11 }

Observer facing a little east of South
Neb. passes out of field at about 140°

Oct. 9. 1880.

~~8 32 7.5~~

R. 112.			Bond 394.		
8	32	7.5	8	30	0.0
	33	7.5		31	0.0

Reap. of Jupiter II. P. Obs.
Phot. H.

8 16 32.1
20 41.1

---

8 40 13.2
31 0.0

---

9 13.2
32 7.5

---

8 42 20.7

Compar. with sat. at right (3.²)
Image set opposite upper edge of belt at distance from limb equal to ½ width of belt.

Limit of Vis.

8 38 112.6 23.0°
36 135.6
112.1 22.8°
134.9 45.8°
22.9
95 2 Set at 112.
1 2 3.80 11.45

Oct. 9. 1880.

8 17 55 | 8 20 18 suspected ~~= 0 18~~

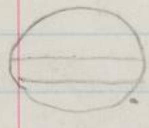
8 21 Sat. moving – set at dist. = ½ &c.

8 20½ set now at dist. equal to diam. of belt.

8	40	01	8	42	23.5		
		19			41.5	100.8	
		31			54.0	139.8	39.0
		41		43	4.5	99.2	
		50			13.0	145.4	51.2
		57			20.0	94.6	
	41	08			31.0	146.2	51.6
		17			40.5	92.6	
		27			50.0	146.3	53.7
		37		44	0.0	93.9	
		44			7.0	148.4	54.5
		57			19.5	92.0	
	42	05			28.5	150.2	57.2
		17			39.5	90.3	
		25			47.5	151.6	61.3
		38		45	1.0	91.3	
		45			8.5	155.5	64.2
		56			19.0	91.0	
	43	07			30.0	154.6	63.6

Oct. 9. 1880.

8 45 39.5 88.6
43 14 147 37 58.5 154.2 65.6 129 2 646 32.30
46 10.5 4884 90.8
2442 61.9
122 21.0 122.10 152.7
44 07 30 39.5 85.3
50.5 156.3 71.0 1329 5 6645 33.22
47 2.5 4851 24255 89.7
14.0 121.28 156.0 66.9
91
45 00 23 31.0 89.9
43.5 155.3 65.4 123 6615 33.08
54.0 4903 24515 86.2
48 7.5 122.58 155.7 69.5
45 49 49 12 17.0 87.6
30.0 154.8 66.2 157 6785 33.92
40.5 4843 24215 86.9
00 121.08 64.7
46 37 50.5 151.6
49 8.5 86.3
20.5 154.9 68.6 133 66.65 33.32
31.5 4797 88.4
23985 67.5
47 31 215 54 43.0 155.9
119.92
50 0.5 87.2
10.0 153.6 66.4 139 66.95 33.42
22.0 4851 24255 87.6
32.5 121.28 153.6 66.0
48 18



164 45 50.0 88.3
59.0 150.7 62.4 84 6420 32.10
4802 2401 120.05

Images large and blurry.
Sat. appeared very close to limb - nearer than anticipated.

Oct. 9. 1880.

R. 112. Bond 394.

8 56 7.7 8 ~~54~~ 53 ~~0.0~~ 44.5

57 8.0 ~~55~~ 54 ~~0.0~~ 44.5

Corr. − 2.4 ✓

Photometer R.

R 112 undoubtedly used in obs. of β Persei.

β Persei. comp. with ω

9 12.5 34.0 ~~34.0~~ P. Obs.

63.8 29.8 < > ~~63.8~~

~~11~~ 10.8 >

212.0

9 14± 244.4 32.4 < >

62.2 < > 4.8 <

9 13.2 <

9 10.8 < 31.10 2.78 < >

9 14.5 35.0 P. Obs.

64.6 29.6 < >

~~12.5~~ 12.8 >

210.3

9h 15m 48s.5 244.9 34.6 < >

64.2 < > 4.7 <

9 15.2 <

9 12.8 < 32.18 2.71 < >

9 16 10.0 33.8 P. Obs.

63.2 29.4 < >

~~14.5~~ 14.4 >

212.3

9 17 31.0 243.9 31.6 < >

61.0 < > 4.8 <

9 16.8 <

9 14.4 < 30.50 2.82 < >

Oct. 9. 1880.

~~38.2~~ ~~9 24 40~~

β Persei &c. W. obs.

~~38.2 ref. 9 24 40~~

Started anew. β lost.

9 30 30 — 32.2 — 33.6˙< > — W. obs. — 9 30 30

65.8

30.5

214.3

27.4˙< >

9 33 10 — 241.7

61.0˙< > — 4.8<

9 31.8<

9 29.4< > — 30.50 — 2.82< >

9 34 55 — 31.0 — 33.2˙< > — W. obs.

64.2

33

213.5

29.4˙< >

9 36 20 — 242.9

62.6˙< > — 48<

9 35.6<

9 33.2< > — 31.30 — 2.76< >

9 38 45 — 31.5 — W. obs.

66.6 — 35.1˙< >

37

213.1

28.7˙< >

9 40 22 — 241.8

63.8˙< > — 4.7<

9 39.~~8~~6<

9 37.~~8~~2 > — 31.90 — 2.72< >

Swept with Comet seeker, Nebulae found proved to be D.M. +41°, 4004.

Oct. 9. 1880.
β Persei comp. with co

9 44 8 31.2 30.6° <> S. Obs.
61.8
42.5
212.8
9 46 6 244.2 31.4° <>
62.0° <> 4.8<
9 45.1< 3100°
9 42.7< > ~~2.78<~~ 2.79 >

9 47 15 32.8 S. Obs.
61.5 28.7° < >
45.5
214.0
9 49 7 244.3 30.3° < >
59.0° < > 4.9<
9 48.2< 2950°
9 45.8< > 2.90< >

9 50 57 30.9 S. Obs.
63.0 32.1° < >
49.5
214.2
9 53 30 242.5 28.3° < >
60.4° < > 4.8<
9 ~~51.2~~< 52.2 3020° ~~2.85<~~ 2.84 >
9 ~~48.8<~~
49.8 >

9 55 β Urs. Min. 1 α Urs. Min. S. obs.
α Urs. Min. 1 ε Urs. Maj.
α Urs. Min. 3 γ Cass.

10 25 Comet and star {W. obs.
Star runs on bar 198°.5 {Chronograph
Square set at 153°.5
Order ☄ ☄ * *
All in southern half of square.
Comp. star (mid of three nearly in line - one ~~south~~ of north of star used follows perhaps 3 secs.)

Oct. 9, 1880.

Decl. 21.9.

2 3   5 0
7   5
1 6   4 5   α

The star was the middle one of three.

Search for planetary nebulae. P. obs.

chron B. 236.   azim.   alt.
Polestar at 0 1½   283°.6   175°.7
set   284.3

Began sweep at 0h 2m 35s chron. B. 236.

α Cas 17.3 28.4 Star   0 5   ~~236.0~~   +29°   236.0
β Cas 2.9 58.5 Star   0 5½   +58.8   206.2
2.3 28.4 Star 2d mag.   0 7½   +28.9   236.1
4th sweep at 0. 8
a 5.0 mag. ~~at~~ 152.1   at 11.7   +67.1 d.C.
5th sweep at 12m
7.2 14.5 3d mag. at 250.0   at 13.1   +15.0
6th sweep at   15.2
7th " "   18.2
4th mag. at 328.6   20.3   ~~+~~63.6
8th at   21.6
6th mag. at 294.2   22.0   -29.2
13.4 9.5 4th " at 274.3   22.5   -39.3
9th sweep at   25.6
28.5 70.4 3 stars at 155.0   29.1   +70.0 d.C.
10th   29.7
Star at 298.3 same time (southern limit   -33.3
of sweep.

Oct. 9. 1880.

δ Urs. Min. 2 β Urs. Min. W. Obs.

11 13 δ " " 3 γ Cass.

Continuation of sweeps. P. Obs.

2^{d} mag at 238.0 +27.0 35"

Another sweep at 35.0

Timing of one sweep omitted.

2^{d} mag. at 208.9 56.1 37.3

35 40.5 Nebula (not plane) 224.4 40.9 40.2

prob. neb. in Androm.

Another sweep 36.5

37.7 -18.5 2 mag. star 283.4 -18.4 37

Sweep 45.4

2 mag. 283.4 -18.4 46.3

141.2 56.2 49.0

Sweep 49.0

49.6 60.1 Sw. 2 mags 204.8 60.2 52.6

Suspect neb. 262.3 2.7 53.4

Suspect pass? 260.3 4.7 56.8

Sweep 58.5

0.1.3

4 mags 294.8 29.8 1.7

0 54 4.0 pass 290.1 4.4 ~~25.6~~ 2.9

Sweep at 5.2

229.8 35.2 7.3 < 8.5

α Ursa Mi 176.0 89.0 9.0

Probably 17 sweeps in 66 min.

Began at 0^{h}.0^{m} ended at 1^{h} 0^{m}

Oct. 10. 1880

β 3940 R 112

5 21 ~~22~~ 44.5 ~~0.0~~ 5 24 14.0
5 23 ~~24~~ 44.5 ~~0.0~~ 5 26 14.0
5 24 ~~25~~ 44.5 ~~0.0~~ 5 27 14.0

Prism set so that its outside surface shall be ½ inch within tube of Obet. R.

Tube set at 23 to prevent inner tube striking objective.

β Persei, ω Persei.

Chron. error = +2.5

6 29.5 429 51.1˙< > v ft Idas
94.0
28 229.3 41.3˙< >
31.5 270.6
6 30.5< 92.4˙< > 39< 1.85< >
6 28.0< > 4620˙
32.5 454 429˙< >
31 883
34.0 226.9 46.7˙< >
273.6
6 33.2< 89.6˙< > 39<
6 30.7< > 4480˙
35.0 43.6 46.2˙< > 1.92< >
33 89.8
229.3 44.2˙< >
36.5 273.5
6 35.8< 90.4˙< > 39<
6 33.3< > 4520˙ 1.90< >

c

Oct 10 1880:

6 39.5 41.8 53.4° < > Robs
95.2
37.5 225.0 46.9° < >
41.0 269.9
6 40.2 < 98.3° < > ~~40~~ 3.7
6 37.7 < > 49.15° 1.70 < >

42.0 40.8 52.5° < > Images poor.
93.3
40.5 225.8 45.0° < >
43.5 270.8
6 ~~42.8 <~~ 42.75 > 97.5° < > 3.7
6 ~~40.2 <~~ 40.2 48.75° 1.72 < >

45.0 45.5 49.7 <
95.2
1.1
43.0 > 221.7 5~~1.9~~ <
46.0 272.8
~~100.6~~ 3.6
6 45.5 <
6 43.0 < 100.8° < 1.64 < >
50.40°

Oct. 10, 1880

Eclipse of Jupiter I. R. obs

Phot R Comparison with ○ ⊙ ⊖ . .

7 18 09 17 20.39.

15 45 71.6 43.2 26.3. 37.5 89.1

25 55 114.8. 49.5 228 57 20. 126.6. 120 860 43.00

39 21 9 65.3 52.9 23 27 43. 3318 16590 82.95 34.8. 93.0

46 16 118.2 58.2 9 2 53. 127.8.

55 25. 60.0. 57.8 24 32 11. 40.4. 86.4 1792 8960 4480

19 05 35 117.8. 65.8 22 3298 82.45 126.8.

15 45 52.0. 67.7 Limit of the visibility

26 56 119.7. 68.1 53. 78.8. 25.5

39 22. 9 51.6. 72.1 28. 4 104.3

20 00 30 123.7 73.9 54 ~~2334~~ 9 58 12 76.2 29.1 146

09 39 39.8 76.2 25 39 ~~08~~ 45 3646 91.15 106.3 27.30 13.65

10 probably 49.8 40 124.0 74.6 58 37.3. 88.6

25 55 49.4 77.6 29. 12 125.9.

40 23 10 127.0. 80.3 3 31 35.6. 88.6

55 25 46.7. 79.0 90 22 52 49. 124.2. 886 44.3

21 7 37 125.7 86.4 26 3230 80.75

25 55. 39.3. 84.8

t 24. 4. 124.1. ~~83.6~~

21 42 47 12 17 40.5.

31 127.4 86.9 117 8585 42.92

44 3313 16565 82.82 36.0 135 15 4

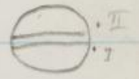
22 04 55 128.2 92.2

25 12 42.4.

24 121.0 78.6 170 8540 42.70

36 3276 1638 81.90 44.9 82.9

49 127.8



R. 112

Oct. 10, 1880.

β Persei, ω Persei.

7 50½ 27.4 51.4° < > P. obs.
78.8 Much fog;
49.5 > 209.0 49.6° < > stars dim.
7 53½ 258.6
7 52.0< 101.0° < > 3.6<
7 49.5 < > 50.50° 1.63 < >

7 54 29.1 P. obs.
52 > 80.3 51.2° < >
210.0
7 55 262.8 52.8° < >
7 54.5< 104.0° < > 3.6<
7 52.0< 52.00° 1.56 < >

7 56 29.8 P. obs.
54 82.9 53.1° < >
210.6
7 57½ 260.3 49.7° < >
7 ~~56.8<~~ 56.7 102.8° < > 3.6<
7 ~~54.3<~~ 54.2 > 51.40° 1.59< >

8 01 26.8 53.2° < > S. obs
00 80.0
212.0
04 261.0 49.0° < >
8 2.5< 102.2° < > 3.6<
8 0.0< > 51.10° 1.60<

8 07 30.8 48.2° < > S. obs
6.5 > 79.0
209.8
11 260.6 50.8° < >
8 9.0< 99.0° < > 3.7<
8 6.5< 49.50° 1.68<

Oct. 10. 1880

8 12½ 28.4 53.5° < > S obs.
81.9
11.5 211.4 51.5° < >
8 16 262.9
8 14.22 < 105.0° < > 3.5' 1.54 < >
8 ~~11.42~~ < 11.8 > 52.50°
assume it 18 except

8 28 27.2 52.4° < > P. obs.
79.6
16.0 210.6
51.4° < >
8 19 262.0 103.8° < > 3.6' 1.56 < >
8 18.5 < 51.90°
8 16.0 < >

8 19½ 25.3 53.9° < > P. obs.
17.5 79.2
214.0
49.1° < >
8 20½ 263.1
8 20.0 < 103.0° < > 3.6' 1.58 < >
8 17.85 < > 51.50°

8 21 29.9 51.1° < > P. obs.
81.0
19.5 204.8
57.5° < >
8 22½ 262.3
8 21.8 < 108.6° < > 3.5' 1.45 < >
~~8 19.3~~ < 19.2 > 54.30°
8 26. 28.0 51.3° < > S. obs
79.3
24.5 > 210.4
49.6° < >
28 280.0
8 27.0 100.9° < > 3.6' ~~1.64~~ 1.63 >
8 24.5 < 50.45°

Oct. 10. 1880

8 28.5 31.2 46.4° < > S. obs.
77.6
27.0 > 207.9
51.3° < >
30.5 259.2
8 29.5 <
8 27.0 < 97.7° < > 3.7 < ~~1.72~~ <1.71 >
48.85°

8 32.0 30.7 49.7° < > S. obs.
80.8
~~29.5~~ 210.4
50.4° < >
34 260.8
100.3° < > 3.6 <
8 33.0 <
8 30.5 < > 1.65 < >
50.15°

8 36½ 27.9 P. obs.
49.0° < >
35.5 76.9
211.2
48.5° < >
39 259.7
8 37.8 < 97.5° < > 3.7 <
8 35.3 > 1.72 < >
48.75°

8 39½ 28.6 P. obs.
49.8° < >
78.4
215.3
48.5° < >
40½ 263.8
3.7 <
8 40.0 < 98.3° <
8 37.5 <
37.5 > 49.15° > 1.70 < >

8 41 25.2 P. obs.
57.4° < >
82.6
39.5 > 210.6
46.0° < >
43 256.6
~~97.4~~ ~~3.7~~
8 42.0 <
8 39.5 < 103.4° < > 36 <
51.70° 1.57 < >

Oct. 10. 1880.

8 47.0 32.0 48.6° < > S. obs.
80.6
48 > ~~206.2~~ images not resolved Seen only at intervals
reject.
212.8 44.9° < > owing to fog.
8 54 257.7
8 50.5 < 93.5 < > 3.8 <
8 48.0 < 1.82 < >
46.75°

8 53.5 33.0 45.9° < > S. obs
78.9
54.5 209.9 48.8° < >
258.7
58 94.7 < > 3.8 <
8 56.8 < 1.79 < >
8 54.3 < > 47.35°

9 00 31.5 45.4° < > S. obs.
76.9
58.5 213.0 48.1° < >
1.5 261.1 93.5 < > 3.8 <
9 0.8 <
8 58.3 < > 46.75° 1.82 < >

9 3 33.2 48.8° < > P. obs.
82.0
1.5 > 211.8 48.4° < >
5 260.2 3.7 <
9 4.0 < 97.2° < >
9 1.5 < 48.60° 1.73 < >

9 5.5 32.7 46.6° < > P. obs.
79.3
4.5 209.6 48.7° < >
8 258.3
9 6.8 < 95.3° < > 3.8 < ~~1.78~~ 1.77 >
9 4.3 < > 47.65°

Oct, 10, 1880.

P. obs.

9 9 30.3
77.6 47.3° < >
7.5 209.8 51.6° < >
11 261.4
9 10.0 < ~~48.9~~ 98.9° < > 3.7 ' ~~1.69~~ ' 1.68 >
9 7.5 < > 49.45°

Images go close when prism drawn towards eye. Prism distance moved also quarter of an inch toward the eye.

9
9 21.5 32.0 42.0° < > S. obs.
74.0
20.5 213.4 44.9° < >
25.0 258.3
9 23.2 < 86.9° < > 4.0 '
9 20.7 < > 43.45° 2.00 ' >

9 26.5 32.3 43.0° < > S. obs
25.5 75.3
(30.0) 214.1 43.9° < >
~~(29.5)~~ 258.0
9 28.2 < 86.9° < > 4.0 '
9 25.7 < > 43.45° 2.00 ' >

9 30.5 33.1 40.5° < > S. obs
29.5 73.6
212.9 45.3° < >
9 33.0 258.2
9 31.8 < 85.8° < > 4.0 '
9 29.3 < > 42.90° 2.03 ' >

Oct. 10, 1880.

9	34.5	31.7	45.2° < >			P. obs.
		76.9				
	33.5	214.2	41.0° < >			
	37.5	255.2				
9	36.0 <		86.2° < >	4.0 <		
9	33.5 < >		43.10°		2.02 < >	
9	39	34.2	44.1° < >			P. obs.
		78.3				
	37.5	212.2	45.6° < >			
	41.5	257.8				
9	40.2 <		89.7° < >	3.9 <		
9	37.7 < >		44.85°		1.92 < >	
9	42	32.4	44.6° < >			P. obs.
		77.0				
	40.5	245.1	41.5° < >			
	43.5	256.6				
9	42.8 <		86.1° < >	40 <	2.02 < >	
9	40.3 < >		43.05°			
9	45.0	32.8	42.2° < >			S. obs.
		75.0				
	44.5	212.4	41.1° < >			
	49.0	253.5				
9	47.0 <		83.3° < >	4.1 <	2.10 < >	
9	44.5 < >		41.65°			
9	50.0	36.8	39.3° < >			S. obs.
		76.1				
	49.5	216.5	37.6° < >			
	52.5	254.1				
9	51.8 <		76.9° < >	4.3 <	2.29 < >	
9	49.3 < >		38.45°			

Oct. 10. 1880.

9 53.5 35.0 39.9° < > Sch
74.9
51.5
215.3
9 55.0 257.5 42.2° < >
9 54.2 < 82.1° < > 4.1 < ~~2.14 <~~ 2.13 >
9 51.7 < > 41.05°

9 57 33.6 40.7° < > P. obs.
74.3
55
216.0
9 58 254.4 38.4° < >
9 57.5 < 79.1° < > 4.2 <
9 55.0 < > 39.55° 2.22 < >

9 58.5 33.4 P. obs.
76.3 42.9° < >
56.5
214.7
10 0 258.5 43.8° < >
9 59.2 < 86.7° < > 4.0 < 2.00 < >
9 56.7 < > 43.35°

10 0.5 34.4 39.0° < > P. obs.
73.4
58.5 217.5
(2.0) 252.7 35.2° < >
10 1.2 < 74.2° < > 4.4 < 2.37 < >
9 58.7 < > 37.10°

10 3.5 35.1 39.2° < > Sds
74.3
2.5 214.2
6.0 256.4 42.2° < >
10 4.8 < 81.4° < > 4.2 < 2.15 < >
10 2.3 < > 40.70°

Oct 10, 1880.

10	6.5	34.5	39.6° < >			S.obs.
		74.1				
	4.5	215.0				
	8.5	253.6	38.6° < >			
10	7.5 <		78.2° < >.	4.2'		
10	5.0 < >		39.10°		2.25' < >	
10	10.0	36.1	36.4° < >			S.obs.
		72.5				
	8.5	214.1				
10	11.5	255.8	41.7° < >	4.3'		
10	10.8 <		78.1° < >		2.25' < >	
10	8.3 < >		39.05°			
10	13.5	35.0	40.3° < >			P.obs.
		75.3				
	11.5	218.7				
10	14.5 <	257.3	38.6° < >	4.2'		
10	14.0		78.9° < >		2.23' < >	
10	11.5 >		39.45°			
10	15.5	37.9	35.0° < >			P.obs.
	13.5	72.9				
		214.1	41.9° < >			
10	17.0	256.0		4.3'		
10	16.2 <		76.9° < >		2.29' < >	
10	13.7 < >		38.45°			
10	18.0	34.3	39.1° < >			P.obs.
	16	73.4				
		217.1				
10	19.0	254.1	37.0° < >			
10	18.5 <		76.1° < >	4.3'		
10	16.0 < >		38.05°		~~2.22'~~ 2.31 >	

c

Oct 10. 1880.

10 20.5 35.2 39.6° < > S. obs

19.0 74.8

213.2

22.5 255.3 42.1° < >

10 21.5 < 81.7° < > 4.1 <

10 19.0 < > 40.885° < ~~2.15~~ 2.14 >

10 23.0 35.2 S. obs

36.3° < >

21.0 71.5

215.6

24.5 256.6 41.0° < >

10 23.8 < 77.3° < > 4.3 <

10 21.3 < > 38.65° 2.28 < >

10 ~~25.0~~ 33.0 S. obs

26.0 42.2° < >

75.2

24.0 214.2

40.8° < >

28.0 255.0

10 27.0 < 83.0° < > 4.1 <

10 24.5 < > 41.50° 2.11 < >

10 29.0 34.2 P. obs.

38.0° < >

27.5 72.2

217.4

41.8° < >

10 30.5 259.2

10 29.8 < 79.8° < > 4.2 <

10 27.3 < > 39.90° 2.20 < >

10 31.0 35.8 P. obs.

40.5° < >

29.5 76.3

215.8

39.2° < >

10 33.0 255.0

4.2 <

10 32.0 < 79.7° < > ~~2.21~~ < 2.20 >

10 29.5 < > 39.85°

Oct. 10, 1880.

10 33.5 36.3 P. obs.
74.2 37.9'< >
31.5 213.6
42.4'< >
34.5 256.0
10 34.0< 80.3'< > 4.2<
10 31.5< > 40.15 ~~2.18<~~ 2.19 > =

10 37.5 35.1 36.8'< > S. obs.
71.9
36.5 216.9
33.5'< >
40.0 250.4
10 38.8< 70.3'< > 4.5<
10 36.3< > 35.15' ~~2.49<~~ 2.50 >

10 41.0 38.0 36.0'< > S. obs.
74.0
39.0 214.3
39.2'< >
42.5 253.5
10 41.8< 75.2'< > 4.3<
10 39.3< > 37.60' 2.34< >

10 43.0 33.5 42.4'< > S. obs.
75.9
42.0 218.0
36.3'< >
45.5 254.3 4.2<
10 44.2< 78.7'< >
10 41.7< > 39.35' 2.23< >

10 47.0 36.7 P. obs.
35.6'< >
72.3
45.0 215.7
36.9'< >
10 48.0 252.6 4.4<
10 47.5< 72.5'< >
10 45.0< > 36.25' 2.43< >

c

Oct. 10, 1880.

10 48.5 36.6 37.5°< > P. obs.

47.0 74.1

219.6

10 50.0 255.3 35.7°< >

10 49.2< 4.4<

10 46.7< > 73.2°< >

36.60° 2.40< >

10 50.5 33.1 reject; too near edge of field. P. obs.

10 51.5 39.0 36.3°< >

50.0 75.3

214.6

10 53.0 256.9 42.3°< >

10 52.2< 78.6°< > 4.2<

10 49.7< > 39.30° 2.24< >

10 55.0 37.4 35.9 S. obs

73.3 Clouds forming

Reject owing to clouds.

B 394 R 112

11 ~~7~~ 6 ~~0.0~~ 44.5 11 9 16.0

11 ~~10~~ 9 ~~0.0~~ 44.5 11 12 16.0

Oct. 11, 1880

8 15 β Urs. Min. 2 α Urs. Min. S. obs.
ε Urs. Maj. = α Urs. Min.
α Urs. Min. 2 γ Cass.

16 45 21.9
16 31 22.7
14 .8

16 45 21.9
28 1.6
17 13 +20.3
22 8
+4 55

8 50 Comet in approx. α $17^h 13^m$ δ +20°
107°.5 Star runs on bar. W. obs.
62°.5 Set square. [illegible]
See also foot of next page.

8 17 Comet
At 22 39 Dec. 19° 57'
5 42.5
16 56.5

22 50
5 50
17 0 Transits by stopwatch.

8.8 7.0
9.5 18.6
9.3 28.0
6.2 50.4

Oct 11. 1880

Identification of comparison stars
Star found to be D.M. +19° 3211
~~D.M. +19° 3211~~ RA 55 16^h 55^m 6,9° +19° 59,0'

16 45
23 4
6^h 19^m 21°.9

23 75
6 215 22°.15
16^h 46^m

23 13
16 4~~9~~ ~~40~~ 21°2
6 24

45 33. 0.0
~~47 30~~ 21.0
~~5~~47 31 1 51.5
48 6

0 34
1 9

16 46

Completion of record on obs. of Comet. W. Obs.
Comp. star
Order * * ☄ ☄
Comet in northern and star in southern half of square.

Oct. 11, 1880.

B 236	F 1327
23h 51m 20s	23h 50m 0s

{ F. 1327 had a large rate, losing some six seconds a day, so that the gaining rate of the chronometer B. 236 was less than would appear by the comparisons. Supposing it to gain 0.s75 in an hour, the gain in 15m would be 0.s19, too little to affect the observations materially.

Transits of α Urs. Min., & comp. pr. over movable wire of micrometer, by chron. B. 236. S. obs.

		h m s	
C 3	0.00	0 13 54	
	1.00 rev.	14 25	31
		14 9.5	
D 7	0.00	15 20	
	4.00 rev.	15 47	27
		15 33.5	
F 5	0.00	17 10	
	8.00 rev.	17 37	27
		17 23.5	
H 1	0.00	18 56	
	12.00 rev.	19 29	33
		19 12.5	
J 7	0.00	20 48	
	16.00 rev.	21 17	29
		21 2.5	
K 2	0.00	22 10	
	19.00 rev.	22 42	32
		22 26.0	
L 9	0.00	24 0	
	23.00 rev.	24 34	34
		24 17.0	
N 7	0.00	25 51	
	27.00 rev.	26 27	36
		26 9.0	
P 5	0.00	0 27 42	
	31.00 rev.	28 16	34
		27 59.0	
Q 8	0.00	29 5	
	34.00 rev.	29 38	33
		29 21.5	

3 rev.

Position circle at 0°1.5; star increasing its distance from transverse wire throughout observations but slightly.

B 236	F 1327
0h 48m 21s	0h 47m 0s

Place of α Urs. Min. Oct. 12.5, 1880, (Am. Eph.)

1h 16m 3.s25 88° 40′ 31.″4

log cos δ	8.363927
log 15	1.176091
	9.540018
	0.34675

Rev. 1 – 19	(18 rev.)	496.s5
4 – 23	(19 rev.)	523.5
8 – 27	(19 rev.)	525.5
12 – 31	(19 rev.)	526.5
16 – 34	(18 rev.)	498.0
1 – 34	(33 rev.)	912.0

Log 496.5	2.695919	0.980664	9.5645
523.5	2.718917	0.980181	9.5539
525.5	2.720573	0.981837	9.5904
526.5	2.721398	0.982662	9.6086
498.0	2.697229	0.981974	9.5934

Log 912.0	2.959995		With corr. for rate	29108
Ar. co. log 33	8.481486			9.582
	9.540018	9.583	9.581	
	0.981499			

Log 18 & ar. co.,	1.255273	8.744727
		9.540018
Log 19 & ar. co.	1.278754	8.721246
		8.284745
		8.261264

Oct. 11. 1880.

α Urs. Min. 2. γ Cass. Nr. Obs.

11 41 β " " 1. α Urs. Min.

Oct. 12, 1880.

$20^h\ 56^m$ ~~Si. T.~~ = $7^h\ 27^m$ ~~S. T.~~ M. T.

21

$17^h\ 0^m$ +18 45

~~+4~~

36
27
9

~~21~~ $21^h\ 5^m$
4

Comet found at $17^h\ 5^m$ a R. +19°.3 Dec.

Pos. Zero. 130°.6 Wr. Obs.
Set at 85.6

7 55 β Urs. ~~Mins.~~ 1 α Urs. Min S. ob.
ε Urs. Maj. = α Urs. Min.
α Urs. Min. 3 γ Cass.

20 56
7 31
13 27

8 20
13 27
21 47
4 ~~49~~ ½
17 8

4 39
13 27
18 6

19.15

22 0
16 58 24
5 2

8 21
13 27
21 48
4 ~~44~~ 2.5
17 5.5

9
31
20

29
08
390

49
28
17 18

8 33
13 27
22 60

6.0 At 8 37 $5^h\ 0^m.5$ 19.7 ~~55~~ 17
39 5 0 19.15 ~~53~~ 3

Oct. 12, 1880

Transit of 4 stars

				10
8	45	10		8
	46	56	Comp. Star	3.25
	47	18		3
	48	9		1.75

26′ 5

8 6

4 6

5 4

43 56 30.
44 26 1075
46 13,5

17.5
12

137.5

⊙

Oct. 12. 1880.

Comet. W. Obs.

Order ✱ ✱ ☄ ☄

Both in northern half of square.

Transits at dis.

Comp. star D. M. + 19° 3234.

Seven couple sets — reject sixth set. also partial sets.

~~tried experiments in transit of spectra of stars of 4th type~~ No watch correction to be made on this date.

Photometer R

C. M. T. β Persei, ω Persei. S. obs.

10 14 32.0 39.2° < >

71.2

218.1 35.0° < >

16 253.1

10 15.0 < > 74.2° < > 4.4 <

37.10° 2.37 2.37 < >

10 18 39.4 29.8° < > S. obs.

69.2

218.2 39.9° < >

19 256.1

10 18.5 < > 69.7° < > 4.5 <

34.85° 2.52 < >

10 20 34.1 38.1° < > S. obs.

72.2

219.0 34.2° < >

21 253.2

10 20.5 < > 72.3° < > 4.4 <

36.15° 2.43 < >

Oct. 12, 1880.

10 23 37.7 34.3 < > P. obs.

72.0

219.7 33.2 < >

10 24 252.9 67.5 < > 4.6 <

10 23.5 < >

3 3.75 ~~2.62~~ 8

~~2.59~~ → 2.59 >

10 25 39.0 36.2 < > P. obs.

75.2

219.6 31.3 < >

10 26 250.9 67.5 < > 4.6 <

10 25.5 < >

33.75 ~~2.59~~ 8 < 2.59 >

10 26½ 39.0 32.7 < > P. obs.

71.7

220.7 29.3 < >

10 27½ 250.0 62.0 < > 4.8 <

10 27.0 < >

31.00 ~~2.99~~ 8 2.79 >

No watch correction.

β Urs. Min. 1 δ Urs. Min. W. Obs.

9h 35 δ " " 3 γ Cass.

These obs. were taken from the window of Mer. Phot. room after coming down from Dome and recorded this A.M. Wed. ~~[illegible]~~. Oct. 13.

Oct. 13. 1880.
20h 5m S.T. = 6h 33m M.T.

20 12
17 10 +18°,7
+3 2

20 13
3 2

6 41 17 11 +18°.75 Pos. of ☄

Pos. Zero. 154°.9
Set. at 109.9 for transits,
Comp. star D.M. + 18° 3330.
Order * * ☄ ☄
Star in southern and comet in northern half of square.

17 15 +18,0
22 35
5 20

5 20 18.0

Oct. 13, 1880.

17 13 56 18 14
8 43 17 58
5 13 − 16

52 21
56 9
3 48

10 8 17 9
13 55 24 4
3 47 6 55

20. +18. 3326 = 7.5 mag.

17 14 17 3
23 47
+6 33
6 37

10 20 β Urs. Min. 1 α Urs. Min. S. Obs.
α Urs. Min. 1 ε Urs. Maj.
α Urs. Min. 2 γ Cass.

Oct. 13. 1880.

10 40 δ Urs. Min. 1. β Urs. Min. W. Obs.
δ " Min. 2. γ Cass.

Oct. 14. 1880.

17 15 +18°.6
20 49
+3 34

20 52
+3 35 ~~+18.0~~
7h 18m 17 17 +18.0 Pos. Comet,

8 43
10 8
1 25
3 42 +18.1
20 58
17 16
13 56
16 21
2 27
2 25
17 9 9.9
30
39.9
17 8
3 52.5 18.0
21 8
17 15.5

Pos. Zero. 154.8 M. Obs.
Set at. 109.8 for transits
Comp. star D. M. + 18° 3356.
Con. on next page.

7 40 β Urs. Min. 2 α Urs. Min. S. obs.
ε Urs. Maj. = α Urs. Min.
α Urs. Min. 3 γ Cass.

Oct. 14. 1880.

Continuation of record of
comet from preceding page.
Order ☄ ☄ * *
Both in southern half of square,
Some 8 or 9 complete sets, beside
partial sets. Use first four
and last complete sets.

1 30
1 58.
2 34

8 40
1 58
10 38

8 40
2 34
11 14

Birmingham No. 648.

23 40

Dark band in green at 0.50 P. Obs.
" " at 3.79
" " " 4.53
" " " 5.17

Over again
Dark Band at 0.75 P. Obs.
" " " 3.84
" " " 4.58
" " " 5.35
Yellow comes between third and fourth.

Oct. 14. 1880.

Birmingham # 625. P. Obs.

22 52 35 -25° 48'
22 58

5

d'Arrest Star 20h 43m +22° 32'

3 dark bands in green.

0.81
2.86 1.95
4.42 3.61

0.27 0.00
3.06 2.79
4.17 4.46

0.15
3.30 2.15
4.18 4.03

10 0

Spectrum too faint

11 43 β Urs. min. 1. δ Urs. min. Tr. Obs.
δ " " 2 γ Cass.
These obs. taken after leaving Obs. last night and copied in this A.M. Friday Oct. 15. 1880.

Oct. 15. 1880.

20 39
17 24
+3 15 +17.3

Comet.
20 51
3 27
17^h 24^m +17°.25 Approx. pos. Comet.

Pos. Zero. 135.8
set at 90.8 for transits.

7 25 β Urs. Min. 2 α Urs. Min. S. obs.
ε Urs. Maj. = α Urs. Min. Some fog.
α Urs. Min. 2 γ Cass.

22 5.5
4 43.0 +17°.05
~~18 12~~
17 22.5

22 28
5 6 17.0
17 22

5 7.5
22 29
17 21.5

Oct. 15. 1880

Comet.

Comp. star D. M. +17° 3245. 8.3 mag.
Star in southern and comet in northern
half of square.
Order * * ☄ ☄
Use all but second complete set.
Clock 1327 used.

9 13 α Urs. Min. 2 γ Cass. W. Obs.
Haze coming over Polaris so that no
other comparison was taken.

9 50 β Urs. Min. 1 α Urs. Min. W. Obs.
α " " 2 γ Cass.

B 236	B. 394
4 0 41.6	14 20 0

Micrometer. Pos. circle 1°.5
α Urs. Min. & companion fr. L. obs.

P 9 0.00 4 6 4
32.00 rev. 6 29 (rej.; flexure mistaken for line?)

N 7 0.00 4 8 23 Rev. 27 − 22 $2^m\ 18^s$
2 22
27.00 rev. 8 50 $140^s.0$
Result for 1 rev. 9".706;

none of these observations were considered satisfactory at the time, and the distance is too short. The observations of the companion, which were thought the best, give the result of p. 163.

Oct, 15, 1880

Lo 5 0.00 4 10 41 Rev. 32 − 22 $4^m 37^s$

22.00 rev. 11 12 4 43

$\frac{9.5398 7 2}{1.447158}$ 0.987030 9".706 (including the rejected observation) 1 rev. 28.s00 280.s0

See p. 163 for a more complete set.

R. 112. Bond 394.

14	35	46.8	14	35	0.0
	36	46.8		36	0.0

Phot. R. Eyepiece of Mer. Phot.

~~Focus very bad.~~

Reap. Jup. I.

14 20 51.2

23 41.1

14 44 32.3

36 0.0

14 8 32.3

36 46.8

14 45 19.1

Limit of Vis. Jup. II.

S. ~~B.~~ Obs.

14 43 41.7

78.0 36.3

42 40.2

41.2

81.4 77 5

24 1 3

1 20 65 3875

60 32 79.38

R. 112. Bond 394.

15	15	47.1	15	15	0.0
	16	47.2		16	0.0

Oct. 15. 1880.

43	59	14	45	2.0		suspicion, not confirmed,	
44	~~05~~ 25		~~[illegible]~~	28.0		susp.	
	31			34.0		seen.	
	36			39.0		43.0	
	46			49.0		87.8	
	56			59.0		34.6	
45	34		46	6.5		85.5	
	12			15.0		28.0	
	19			22.0		92.8	
	28			31.0		22.0	
	36			39.0		93.0	71.0
	45			47.5		24.2	
	53			55.5		92.7	68.5
46	02		47	5.0		15.3	
	15			18.0		103.2	87.9
	25			28.5		17.2	
	37			40.5		105.5	88.3
	47			50.0		13.3	
46	59		48	1.5		108.0	84.7
47	9			12.0		11.7	96.3
	20		117 37	23.0		107.4	
47	34 32			35.0		8.3	
	44			47.0		110.3	102.0 198 3 99 15 49.58
				58.5	2371 11855 59.28	16.0	91.7
48	29		49 128 32	11.0		107.7	
				23.0		7.6	102.4
				36.0		110.0	1941
				44.5	2413 12065 60.32	6.0	9705 48.52

Oct. 15. 1880.

105.7

14 49 55,0 111,7

50 5 8.5 ± 8,8

48 58 19,5 111,7 102.9

2086

1043

52.15

33,0 2382 6,0

1191

20 0 / 50 44,5 59.55 112,2 106.2

49 50 54,5 6,2

57 8,0 109,0 1028

2090

1045

52.25

29,0 2334 9,0

50 46 19 7 / 49 41,5 11770 106,7 97.7

58.85

55,5 15,2

52 10,5 107,0 91.8

1895

9475

47.38

2379

11895

59.48

14 53 23 ± ~~12,0~~ 12,0 94.3

53 106,3

55 287,3 < 188,0 99.3

1936

968

48.40

5936

2968

148.40

55 6,1

55 111,3 105.2

193,3

56,5 286,1 92.8

1980

99.0

49.50

5968

2984

149.20

Oct. 15, 1880 S. obs.

Micrometer. V DM. 27 & 28 (70°)

Stars run on wire V 271° 17′

272 0

271 49

271 47

272 1

254 234 true mean 271° 47′

271 51 setting for Δδ

+ −

13 30

14

29 30

± 12′

Coincidence T & V (apparently S on V).

10.8212 rev. G 7 81.0

84.0

82.6

80.5

82.5 82.12

10.6

+ −

188 112

48 162

38

274 274

± 1.10

0.011 rev.

Δδ; DM. 27 on T (apparently on S)

DM. 28 ε 2 8.0

5.0938 rev. 12.7

5.7274 11.0

7.2

8.0

46.9 9.38

+ −

332 138

162 218

138

494 494

± 1.976

a ε 8 72.0

6.6804 rev. 68.5

4.1408 63.0

Δδ DM. 28 & a 1.5866 71.7

65.0 68.04

340.2

+ −

396 504

46 304

366

808 808

± 1.616

Oct. 15, 1880.

DM. 28 on. T (apparently on S).

DM. 27 I 9 54.0 + − 58
16.5458 rev. 59.7 ~~58~~ 358
5.7246 56.0 512 238
142
~~713~~ 654
654
51.0 ±2.608
52.2 54.58
22.9

Micrometer turned 180°. 271° 51′ as before
Illumination Opposite 91° 55′ reduced.

DM 27 on T

DM 28 I 3 16.1 + −
94
15.1704 rev. 19.5 246 384
5.8204 17.8 76
156
13.2 478 478
± 1.912
18.6 17.04
352

{After turning the micrometer, the fixed wire seems actually to be I; as the Coincidence is eliminated, it may be taken to be 9.3500 (see R 92, p. 167).}

a H 6 60.7 + −
242 388
13.5828 rev. 54.4 192 28
18
4.2328 60.2 434 434
± 1.736
ΔδDM. 28 & a 1.5876 58.0
58.1 58.28
291.4

k L 2 11.4 + −
22.1064 rev. (or 21.1064) 1.4 76 924
976 64
11.7564 20.4 64
1052 1052
ΔδDM. 28 & k 5.9360 10.0 ± 4.208
10.0 10.64
53.2

Δδ
DM. 27 & 28
5.7274
5.7246
5.8204
5.7030
2.9754
Mean 5.7488
(The last two are reduced from an assumed coincidence; the coincidence from the two sets would be 9.4087).

DM. 27 & 28, measured from a, pp. 158–160, 5.7799; from k, 5.7624.

5.7488 weight 4
5.7799 " 1
5.7624 " 1
Mean 5.756

Oct. 15, 1880.

DM. 28 on I

k I 4
15.3454 rev.
5.9954
Δδ, DM. 27 & k, 11.6984

43.0
28.0
34.6
34.3
32.8
172.7
34.54

+ −
846 654
6 24
174
852 852
± 3.408

a 7 4
7.8398 rev.
1.5102
Δδ, DM. 27 & a, 4.1928

81.0
83.0
87.7
82.7
85.5
19.9
83.98

+ −
298
372 98
152 128
524 524
± 2.096

DM 27 D5
3.6470 rev.
5.7030

64.5
63.0
68.8
61.2
66.0
23.5
64.70

+ −
410 20
130 170
350
540 540
± 2.160

In order to measure all the stars, the micrometer must have its second position; the scale on the side of the field where the stars enter, the comb on the side where they quit the field.

D. M. 27 & 28.

16^h 45^m m.t. Position reading 58° 40'. Wire V
DM. 27 from 28
236° 45' with adopted zero 1° 50'

58 26
58 26
58 38
58 47
177 58° 35'

+ −
5 9
3 9
12
20 18
± 8'

Oct. 15, 1880

p.
DM 27 from 28
236° 45′
236 54
Mean 236° 49′.5

DM.27 from a
235° 7′

From k
223° 6′

a from DM 28
240° 41′

k from DM 28
20° 15′

DM 27 & a
DM.27 from a
235° 7′

56° 38′ + −
57 40 43 19
56 37 20
56 57 4
56 53 43 43
285 ±17′
56° 57′

DM 27 & k
DM.27 from k
223° 6′

44 41 + −
45 20 24 15
45 5 9 20
44 58 2
44 36 35 35
280 ±14′
44° 56′

DM 28 & k
k from DM.28
20° 15′

22 14 + −
22 45 9 20
21 45 40 35
21 30 7
22 12 56 55
26 ±22′
22° 5′

DM 28 & a
a from DM.28
240° 41′

61 38 + 53
63 46 ~~7~~ 4
62 27 75 4
62 27 14
62 17 75
155 ±30′
62° 31′

$17^h 20^m$ m.t. DM 27 & 28
DM.27 from 28°
236° 54′

58 30 + −
58 40 5 14
58 49 16 4
59 10 4
58 40 21 22
219 ±9′
58° 44′

Oct. 15, 1880.

Star runs on wire V 92° 3'
91 56
91 45
91 53
91 48
265 91° 53'

+	−
10	8
3	5
13	13

±5'

B 236 B 394
7 31 15.7 17 50 0

Pos. circle 1° 53'
α Urs. Min.

C 3 0.
1.000 Rev.

7 44 51
45 29
46 13
} Platinum wires V.

E 9 0
7.000 rev.
47 38
48 14
49 0

Rev. 1–34 $15^m\ 16.^s5$
15 13.0
15 14.0
$914.^s5$

Rev. 1–18 $7^m\ 52^s$
7 51
7 50
$471.^s0$

H 0 0
12.000 rev.
49 58
50 32½
51 18

J 6 0
18.000 rev.
52 43
53 20
54 3

Oct 15, 1880

L 8 0 23.000 rev.	55 2 55 37 56 22½	Rev. 1 – 23	$10^{m}\ 11^{s}$ 10 8 10 9½ $609^{s}.5$
O 5 0 29.000 rev.	57 47½ 58 23 59 9	Rev. 7 – 29	$10^{m}\ 9^{s}.5$ 10 9.0 10 9.0 $609^{s}.2$
Q 9(about) 0 34.000 rev.	8 0 7½ 0 42 1 27	Rev. 12 – 34	$10^{m}\ 9^{s}.5$ 10 9.5 10 9.0 $609^{s}.3$
			Mean $609^{s}.33$

B 236   B 394

8 6 21.5   18 25 0

$20^{h}\ 10^{m}$ m.t. Rate of B. 394 insignificant, according to F. W. The comparisons (pp. 154, 162, 163) give differences of mean and sidereal time of $34^{s}.1$ and $5^{s}.8$; by the tables these would be $34^{s}.5$ and $5^{s}.8$; no correction apparently needed for rate of B. 236 during 15 minutes.

Place of α Urs. Min. Oct. 15.7, 1880, (Am. Ephemeris)

$1^{h}\ 16^{m}\ 3^{s}.24$ $88^{\circ}\ 40'\ 33''$

log cos δ 8.363781

log 15 1.176091

9.539872

1.442480

0.982352

22 rev. = $609^{s}.33$ 33 rev. = $914^{s}.50$

11 " = 304.665   11 " = 304.833

1 rev. = 27.697   1 " = 27.712

Adopted value for 1 rev. $27^{s}.700$

In seconds of arc $9''.602$

Oct. 18. 1880.

6 20 Spectrum of a Herculis

1 band in reddish orange
2 greenish yellow
3 ft. in green
4 " " "
5 F ?
6 blue.

6 53 Seeing unusually bad; α Hercules barely seperated with low power. P. Obs.

7 07 Looked at star ~~Burlingham~~ Birmingham 545; broad band in yellow + another in green P. obs.

7 08 Color of star deep red P. obs

Star 505 ~~Burlingham~~ Birmingham
7 12 Broad Bands in red yellow + green contrasts well with star a little preceeding + 6m north P. obs.

7 17 Star H. C. 6 probably of 3d type. P. obs

7 20 H. C. 6 probably 4th type P. obs

7 20 H. C. 5 in small finder 230° dist: 7. P. obs

Oct. 18, 1880.

Transits of two bands in red + two in green of H.C. 6 P. obs.

7 33 Long rattle P. obs.

7 35 Long rattle after five P. obs.

7 37 Long rattle after ten P. obs.

7 39 Turned on α Hercules + took transits in same way. P. obs

7 39 Long rattle preceding P. obs

7 40 In first transit missed 3+4 P. obs

7 41 Reject 4 P. obs.

7 43 Long rattle after 1st 6 P. obs

~~1, 2, 3.~~

7 44 In 4, 3+4 bands uncertain P. obs

7 45 Long rattle of N. P. obs

Oct. 18. 1880.

$17^h\ 40^m$ +15° 45'
21 50
+4 10

22 0
17 40
+4 20

22 30
17 40
+4 50

$22^h\ 40^m = 8^h\ 50^m$

8 51 Pos. 0 352.2 W. Obs
4

8 50 β Urs. Min. 2 α Urs. Min. S. As.
α Urs. Min. 2 ε Urs. Maj.
α Urs. Min. 3 γ Cass.

8 57 Set at 307.2 for transits W. Obs

Oct. 18. 1880.

23 2 2 9''
5 25
---
17 37

Comet.

Comp. star D.M. +15° 3251. mag 8.5

Order * * ⋐ ⋐

Both in southern half of square.

Five complete sets.

23 30 S.T. = 9^h 39^m M.T.

Doub. St. H.C. # 203.

19^h 32^m −10° 24'
23 36
+4 4

23 42
19 32
+4 10

3 56
23 41
19 45

Possibly the star but too low. Tr. Obs.

Oct. 18. 1880.

Double Star H. C. # 218

20 35 −9° 2′
23 47
+3 12

23 52
3 15 −9.1 ~~#~~
20 37

54	51.0		1
		23,0	
55	14,0		2
		16.0	
	30,0		11
		21.0	
	51,0		9
		31,5	
56	22,5		1

from lower edge
of field

Est. 250° Dist. 5″ P. ds.
235° ″ Unequal Mags.

Oct 20. 1880

Put Simms Spectroscope in order.

~~100.0~~	~~B.6 C~~		
.85.	B	~~700~~ 687	170
1.12	C	656	224
1,90	D	589	380
3.11	b	518	
393	F	486	
4,55			
6,00	G Band 431		
640			

2 05	54,2	✓ ~~a~~		705				
	85	✓	B	687	686.7	~~170~~	42.5	
	1.12	✓	C	656	656.2	~~224~~	56.0	
	42	✓	a	628	629.7	~~282~~	71.0	698.7
	89	✓	D.	586	588.9		94.5	683.4
	30	✓		560	561.4		115.0	676.4
	82		E	532	532.8		141.0	673.8
	94		E	526	526.9		147.0	673.9
	3.12	✓	b	518	518.3		156.0	674.3
	45			500	500.5		172.5	673.0
	.66			493			183.0	
	3.93	✓	F	485	486.0		196.5	682.5
	.52			465				
	.60		?	460				
	5.96		group	454				
	35			444				
	06			432				

Oct. 20. 1880.

Doub. Star H.C.# 201.
19 25 −27° 5′
21 35
+2 10

U. A. Sagittarii No. 193.
39 38
−20
21h 39′ 18s −27.°05
2 15
19 24 18s Pos. of H.C. 201

7 48 Estimated dist: 8″ W. Obs.

Doub. Star H.C. # 203.
19 32 −10° 24′
21 50
+2 18 U. A. Aquilae No. 66.

21 53 32 Est. 7 + 8.
20
21 53 12 Dist. 4.″ W. Obs.
2 19 30 Dist. 3″ S. Obs.
19 33 42 −10°. 3¼
Pos. doub. star.

8 10 β Urs. Min. 2 α Urs. Min. S. obs.
α Urs. Min. = ε Urs. Maj.
α Urs. Min. 3 γ Cass.

Oct. 20. 1880.

Doub. Star. H. C. #204.

19 34 −15°
22 16
+2 42

Not found. Original record very indefinite.

Doub. Star. H. C. #205.

19 51 −9° 20′
22 50
+2 49 $22^h 42^m 10^s$

Hour Ang $2^h 47^m$ Decl. 9.85
22 42 10
19 55 10 = not the star

(after adjusting position)

Pos. Ang. 70° ~~[illegible]~~ dist. 4″ Mags. 10½, 11 S. Ob.

" " 70° " 4″ " 10 & 10½. W. Ob.

S. looked in place given for H.C. 205 and came upon two double stars near each other.

t 22 57 33 Pr. double in middle of field.
h 3 4 δ −9°.30
α 19 53 33

S. est.

	Position angle	Distance	Mags.	
Preceding	120°	10″	7½, 9	
Following	160°	5″	8, 11	
Preceding	120°	8″	7, 8½	W. est.
Following	155°	5″	8, 11	

Oct. 20. 1880.

Transit – time 3m 45s (?)

Sid. time 23h 26 28

3 37 0 – 8°.35

19 49 28

Pos. of bright star not far from preceding double.

~~[illegible]~~. Rev. Jas. Freeman Clarke and Mr. Whitman visited obs. this evening – showed them Jupiter, Saturn, α and ε Lyrae.

Oct. 23, 1880.

S. obs.

9 18 β Urs. Min. 2 α Urs. Min.
ε Urs. Maj. = α Urs. Min.
α Urs. Min. 3 γ Cass.

9 19 β Urs. Min. 1 α Urs. Min. W. Obs.
α " " 2 γ Cass.

Jupiter.

2 40
6 48 +3° 25′
+1 52

R. 112.

12 30 25.5
31 25.5

Bond 394.

12 30 0.0
31 0.0

12 44 3.2
23 41.1
13 7 44.3
31 0.0
12 36 44.3
31 25.5
13 8 9.8 approx. time eclipse.

Oct. 23, 1880.

Reap. of Jupiter III. IV

Phot. R. P. Obs.

Comp. with star

Star ⊕ III

{Dm +30° 120}

12 54 + Urs. min. 1 γ Cass. P. Obs.

+ " " = β Urs. min.

h m s			
13 4 26	13 5	7	45.9
46		27.0	135.8
57		37.0	39.7
5m 06		47.0	146.4
17		58.0	41.7
30	6	11.0	152.4
45		26.0	38.4
55		35.5	147.6
6m 05		45.5	33.5
14		55.0	153.8
25	7	6.0	31.2
35		16.5	155.1
45		26.0	29.9
54		35.0	156.3

Clouds over Jupiter.

7 17		58.0	33.7	
41	8	22.0	162.8	129.1
59		40.0 Sat ft.	27.1	
8 23	9	4.5	164.5	137.4
9 38	10	19.0	26.3	
51		32.0	167.9	141.6
			4385.8	139.5
			96.4	

Oct. 23. 1880.

13 10 47.0 18.6 147.7

11 8.5 166.3

10m 39s 11 81 20 36.0 22.9

50.0 170.2 147.3 10 147.5

12 8.0 3780 1890 9450 21.9 148.1

6 2 25.0 170.0

11m 52s 33 42.0 16.7

57.0 170.6 153.9 20 151.0

13 16.0 3792 1896 9480 19.0 151.6

156 39 32.5 170.6

12m 58 46.5 18.7

14 0.5 170.0 151.3 9 151.4

19.0 3783 18915 9458 19.4

14m 11s 20 6 52 42.0 170.1 150.7

15 6.5 19.9

18.5 169.7 149.8 5 150.2

30.5 3791 18955 94785 15.6 157.0

15 23 16 4 43.5 172.0

16 22.0 18.3

40.0 168.3 150.0 7 153.5

17 5.5 3742 1871 93.55 20.9 150.1

16m 43s 96 24 16.5 171.0

29.5 17.5

44.5 171.3 154.0 152.0

18 27.5 3805 19025 95.12 17.5 155.5

17m 13s 218 54 49.0 173.0

19 1.0 18.8

21.0 173.9 155.1 6 155.3

3832 1916 95.80

Oct. 23, 1880.

~~Reap.~~

Limit of Vis. of Star.

13 22 48.5 40.3

23 13.5 125.0 84.7

27.0 49.6 83.6

47.5 133.2 3

~~84.55~~

84.2

3,481

17405

87.02

77

19

h m s
13 22 138

Comp. of Jup. III. with *.

13 24 16.5 19.3 147.6

28.0 166.9

41.5 18.9 153.5

52.0 172.4 11

150.6

3775

18875

94.38

h m
13 24

Observations much interfered with by clouds.
Satellite unexpectedly early.

Reap. Jupiter II.

13 26 59.8

23 41.1

13 50 40.9

12 31 0.

1 19 40.9

12 31 25.5

13 51 6.4 approx. time eclipse by R. 112.

Phot. II. P. Obs.
Comp. with Sat. III.

Oct. 23, 1880.

Limit Vis. Sat. III.

	13	48	28.0		195.2	20.0
			44.0		215.2	
48^m		49	0.0		193.4	19.8
			24.5	8170 4085 204.25	213.2	19.9

Set at 198. → 198.0

49 27	13	50	7.5	198.0	14.8
38			19.0	212.8	18.3
49			30.0	194.5	21.9
50 9			49.5	216.4	28.3
19			59.5	188.1	31.6
25		51	6.0	219.5	30.9
33			13.5	188.6	
56			~~27.0~~		34.6
51 05			37.0	223.2	38.0
			46.0	185.2	42.9
13			54.5	228.1	
26		52	7.0	180.0	
36			17.0	230.2	
48			29.0	177.8	
52^m 01			42.0	236.6	
15			56.5	176.7	
23		53	4.0	235.0	
41			22.0	174.3	
53			33.5	236.7	62.4

Oct. 23, 1880.

53 04 13	53	45,0		173.2	
17		58,5		240.7	67.5
29	54	10,0		170.7	
37		18,5		239.0	68.3
		29,0		170.6	
54m 07	19 0 48	41,5		241.1	70.5
		53,5		170.0	
	55	5,5		242.4	72.4 29 71.4
		15,0	8241 ~~36205~~	167.2	
	14 6 36	27,5	~~18102~~ 41205 206.02	241.4	74.2
54m ~~55~~ 55		47,5		168.8	
		55,5		241.4	72.6 68 73.4
	56	3,5	8188	168.4	
	7 2	12,5	40940 204.70	242.4	74.0
55 37	18	23,0		168.7	
		33,0		241.3	72.6 66 73.3
		41,0	8208 4104	167.0	
56m 16s	22 8 57	51,5	205.20	241.6	74.6
	57	2,5		171.4	
		12,5		243.7	72.3 69 73.4
		24,0	8237	166.2	
56m 59s	16 1 40	33,5	41185 205.92	242.3	76.1
		46,5		166.9	
		56,5		241.6	74.7 108 75.4
			8170 4085 204.25		

B 394
14 5 0.0

R 112
14 5 26.0

~~Oct. 23. 1880.~~
Oct. 24. 1880.

Mr Clark brought Obj. S. to Obsew.
Prism partially adjusted by Lantern attached
6 - 7 to dome

Search for E. Equat. 20° - 25°

Telescope 2h east of Meridian

Began at 21 50

50.4 23.5 7 mg.
51.7 52.3 22.2 22.5 5 mg.
53.3 54.0 23.0 23.0 5 mg
55.5 56.3 22.8 22.9 6 mg
58.0 22.1 Nebulosity
0.0 24.3 6 mg? by Search
2.5 19.6 5 mg
9.0 21.6 4th order 6 mg
9.7 23.0 5 mg
16 21.4 6
20.5 21.3 21.2 24.4 5 mg
21 22.2 22.9 22.8 5 mg
23.0 22.6 7 mg
24.5 21.0 5 mg
32 22.0 4 mg
35 22.9 6 mg

Limits
19h 50m to 20h 35m
-20° to -25°

Ended at 22 37

Oct 24, 1880.

Nebula at 2 45 at 22 43
∴ RA = $20^h 0^\circ$ − 22°.″
Apparently G.C. 4543 Spectrum Contin.

No stars in field 3, 2, 3, 2, 1 = 2.2

7 30 β Urs. Min. 1 α Urs. Min. S. obs
ε Urs. Maj 1 α Urs. Min.
α Urs. Min. 3 γ Cass.

B 3914			R 112		
9	~~18~~ 17	~~0~~ 44.5	9	18	34
9	~~19~~ 18	~~0~~ 44.5	9	19	34
9	~~20~~ 19	~~0~~ 44.5	9	20	34

β Persei Phot. R. E. Pickering
~~5 obs.~~ (Screw down)
5 obs

9 26 ~~348.5~~ ~~41.4~~
~~29.9~~
~~172.9~~ 403
9 28 ~~213.2~~
517

14

Oct. 24. 1880

9 29 ~~346.8~~ 46.2 S.obs

~~33.0~~

9 29 ~~170.4~~

41.3

9 31 ~~212.7~~

87.3

Reject. Previous lots probably read backwards
S.obs.

Chron. error = + $0^{s}.8$

~~9 32~~ ~~353.5~~

9 33 346.5 45.0˙ < >

31.5

33 166.6

39.4˙ < >

9 35 206.0

9 34.0 < 84.4˙ > ~~1.77~~

9 33.2 < > 42.20˙ ~~2.017~~

2.07 < >

9 36 349.7 38.6˙ < > S.obs

28.3

36

169.8 38.0˙ < >

9 37 207.8

9 36.5 < 76.6˙ < > 2.30 < >

9 35.7 < > 38.30˙

9 38 348.7 39.4˙ < > S.obs

28.1

38

171.9 36.1˙ < >

39 208.0

9 38.5 < 75.5˙ < >

9 37.7 < > 37.75˙ 2.33 < >

9 41 355.0 31.6˙ < > P.obs.

26.6

41 171.3

32.9˙ < >

43 204.2 64.5˙ < > ~~2.09~~ 170 2.69 >

9 42.0 <

9 41.2 < > 32.25˙

Oct. 24, 1880

9 43 353.5 33.9° < > P. obs.
27.4
43 171.6
32.6° < >
44 204.2
66.5° < ~~2.67~~ 2.62 >
9 43.5 <
9 42.7 < >
33.25°

9 45 354.4 34.6° < > P. obs.
29.0
45 170.6
34.4° < >
47 205.0
69.0° < 2.54 < >
9 46.0 <
9 45.2 < >
34.50°

9 49 349.2 Thin passing clouds S. obs.
29.0 39.8° <
49 172.0
35.0° <
51 207.0
74.8° < 2.35 >
9 50.0 <
9 49.2 < >
37.40, 37.2, 35 <

9 52 349.9 39.1° < S. obs.
29.0
52 169.9
37.8° <
9 54 207.7
76.9° < 2.29 < >
9 53.0 <
9 52.2 < >
38.45°

9 55 347.1 41.7° < S. obs.
25.8
55 169.0
39.0° <
9 57 208.0
80.7° < 2.17 < >
9 56.0 <
9 55.2 < >
40.35

Oct. 24, 1880

9 58 352.2 32.1°< P.obs.
58 24.3
170.2 36.9°<
59 207.1
69.0°< ~~1.94~~ 2.54< >
9 58.5<
9 57.7< > 34.50°

10 0 353.7 33.4°< P.obs.
27.1
59 173.3
32.4°<
10 0 205.7
65.8°< ~~2.65~~
10 0.0<
9 59.2< > 32.90° 2.65< >

10 1 353.6 33.2°< P.obs.
26.8
10 1 170.7
32.1°<
2 202.8
65.3°< 2.67< >
10 1.5<
10 0.7< > 32.65°

10 05 349.2 38.3°< S.obs
5 27.5
171.2 37.4°<
10 7 208.6
75.7°< ~~2.37~~< 2.32>
10 6.0<
10 5.2< > 37.85°

10 ~~8~~9 350.8 38.4°< S.obs
29.2
~~29.2~~
4 170.0
39.1°<
10 209.1
77.5°< 2.27< >
10 9.5<
10 8.7< > 38.75°

Oct. 24. 1880

10	11	345.8			S. obs.
		26.0	40.2° <		
	11	172.0			
			33.8° <		
	13	205.8			
10	12.0 <		74.0° <		
10	11.2 < >		37.00°	2.38 < >	
10	14	351.3			P. obs.
		26.0	34.7° <		
	14	173.8			
			30.1° <		
	15	203.9			
10	14.5 <		64.8° <	2.68 < >	
10	13.7 < >		32.40°		
10	15	353.6			P. obs.
			34.2° <		
	15	27.8			
		173.7			
			29.2° <		
	16	202.9			
10	15.5 <		63.4° <	2.73 < >	
10	14.7 < >		31.70°		
10	17	352.6			P. obs.
			32.1° <		
		24.7			
	17	173.6			
			32.1° <		
	18	205.7			
10	17.5 <		64.2° <	2.71 < >	
10	16.7 < >		32.10°		

Oct. 24. 1880.
Reap. Jupiter I. Phot. R. S. Obs.
Comp. of Sat. I. with Sat. II.

10	44	59.8
	23	41.1
11	8	40.9
9	20	0.0
1	48	40.9
9	20	34.0
11	9	14.9

approx. time eclipse by R. 112.

Limit Visibility.

11^h	4^m	161.3	22.6
		183.9	
	5	161.3	23.7
		185.0	3
			23.2

6915
34575
172.88

Set at 161.

				Seen:
8^m $\overset{5}{24}$	11	9	15.0	
~~47~~ 27			18.0	161.0
38			29.0	188.5
49			40.0	152.0
59			49.5	198.0
9^m 9		10	0.5	143.7
19			9.5	202.7
27			17.5	146.0

Oct. 24, 1880.

	36	11	10	27,0		204,0	
	44			35,0		138,5	
	51			42,5		210,0	
	59			50,0		142,1	
10	08			59,0		218,9	
	20		11	11,0		138,5	
	30			21,0		219,2	80.7
	39			30,5		136,4	
	49			39,5		219,0	82.6
	57			48,5		135,1	
11	05			56,5		220,0	84.9
	13		12	4,0		135,1	
	21			12,0		225,2	90.1
	33			23,5		129,7	
	43			33,5		224,9	95.2
				45,0		132,2	
12	09			57,0		224,7	92.5
			13	6,0		131,0	
				16,5		231,2	100.2 192.7 96.4
				33,5	7198	124,7	
13 ~~17~~	06		227 57	48,0	35955	229,5	104.8
			14	4,5	17978	127,5	
				20,5		225,0	97.5 23 101.2
				32,5	7067	125,0	
14	5 04		219 55	47,5	35335	223,2	98.2
			15	1,5	17668	126,5	
				17,5		224,3	97.8 0
				29,0	6990	129,0	98.0
					3495		
					174.25		

Oct. 24, 1880.

11 15 38.0 — 220.0 — 91.0

$14^m 55^s$ — 183 46 — 52.0 — 127.0

16 8.0 — 227.1 — 100.1 / 191.1 / ~~95.64~~ / ~~47.75~~

176 20.0 — 7031 — 128.8 — 98.4

$15^m 53^s$ — 44 34.0 — 35155 — 227.2

53.5 — 175.78 — 125.2

17 9.0 — 226.1 — 100.9 / 199.3 / 99.6

7873 / 35365 / 176.82

R, 112.

11 23 36.0

24 36.0

25 36.0

Bond 394.

11 ~~23~~ 22 ~~0.0~~ 44.5

~~24~~ 23 ~~0.0~~ 44.5

~~25~~ 24 ~~0.0~~ 44.5

Oct 25. 1880

0 0 Tried Phot. S. Adjusted pencils. Second double image prism did not separate pencils sufficiently Replaced it by another prism

1 37

	1 41 forceb	1 56		R	λ	2R	
✓ B	82.6	73.3	-.7	83.0	6867	415	7282
✓ C	109.6	100.4	-.8	110.0	6561	550	7011
α	138.6	29.4	-.8	13~~9~~8.0	6275	690	6965
✓ D₁	86.4	76.2	+.2	186.3	58~~89~~94	932	6826
D₂	87.2	77.1	+.1	187.2	58~~94~~89	936	6825
b. from bd.	27.5	17.5	0	227.5	5614	1138	6752
near 1474	79.3	69.3	0	279.3	5328	1396	6724
E	91.6	81.2	+.4	291.4	5269	1457	6726
✓ b₁	09.7	99.5	+.2	309.6	5183	1548	6731
b₂	12.1	02.4	-.3	312.2	5172	1561	6733
b₃	13.0	93.6 mid. line	-.6	313.3	5166	1566	6732
	41.8	31.7	+.1	341.8	(5041)	1709	6750
	63.5	53.2	+.3	363.4	(4957)	1817	6774
✓ F	90.0	79.4	+.6	389.7	4860	1948	6808
d fine edge	49.3	39.3	0	449.3	(4690)	2246	6936
fl. band	6.6	86.1	+.5	496.4	(4536)	2482	7018
✓ line	58.8	48.6	+.2	558.7	4340	279.4	7134
cut Sh.	93.9	83.4	+.5	593.6	4307	296.8	7275
G₂?	33.1	23.4	-.3	633.2	4227	316.6	7393
	04.4	94.4	0	704.4	([illegible])	3522	

↓ ↑

~~56~~

Σ+ ~~40~~ 41
Σ− ~~46~~ 35
~~86~~ 76

∴ Backlash = 10.0   Av. Dev. = 0.4 × .7 = 0.3

Oct. 25, 1880

6 5 β Urs. Min. 2 α Urs. Min. Pick.
ε Urs. Maj. 1 α Urs. Min.
α Urs. Min. 2 γ Cass.

Neb. G. C. 4415.

21 54
18 24
+3 30   +74°.5

22 5
18 24
+3 41

22 15
18 24
+3 51

22 11
14 51
7 20   74,6

8 25 Spectrum partly continuous + partly gaseous. W. Obs.

Wholly or partly continuous. S. obs.

Comp. star ξ Urs. Min.

8 35 Focus.	Outside.	
5.6	17.3	
5.6	17.4	S. obs.
5.8	16.7	
20	4	
5.7+	17.1+	

Oct. 25, 1880.

Eye-piece No. 2.

8 41

Focus.	Outside.	
6.5	19.2	
6.4	21.6	W. obs.
6.3	20.7	
6.4	1.5 20.5	

2 52
23 37 −1.7
2 29
2 20
9 −0.9
0.8
2 44
23 41
25 85
60
26 25

G.C. 5240 too faint and small to be observed

Spectrum exceedingly faint, – seems however to be mainly gaseous W. Obs.

Oct. 25, 1880.

15/324 ($21^h.6$
30
24
15
90

26° 30
10
26° 20

21^h 36^m
5
−21 41
24 20
+2 39

+25°
$1\frac{1}{2}$
+$26°\frac{1}{2}$

21^h 39^m
3
21^h 42

+27

2 32
0 23
~~2 55~~
21 51

251

21 36
3
21 39

24 31
21 41
+2 50

25

24 26
21 41
+2 45

160 128.0
48

−21^h 43^m
24 40

+27° 30′

160
$2\frac{2}{3}$

24 55
21 43
+3 12

25
21 43
3 17

25 9
21 43
3 26

Oct. 25, 1880.

Object. (Comet?)

1 1 3 +28°.6
3 2 1
21 5 2

Object supposed to be comet found by W.
Transits with stop watch S. obs.

11 5 1st $3\frac{1}{2}^s$ 9 { Star pr. object. 3^s
2nd 3^s 8^s Object
3rd 3^s 8^s Star foll. object. 5^s

The two stars are in the same δ, the suspected object about 1′ south of the line joining them. The point observed is stellar with some appearance of coma on the following side.

12 30 This object (Comet) has moved about 8^s to fol. and 3′ north since 11^h when found. W. Obs.

Oct 27 1880

[illegible] 22 Cent [illegible]
6 0 Chron = 20 29

6 02   45.°8 Az 175.°0
Set at 46.6
Began at 6 03

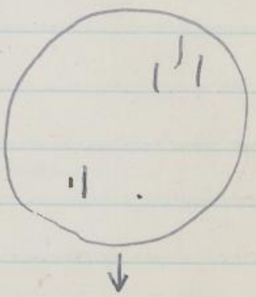
20 33 6 04 30.7 234.3 5
35 19 6 06 63.0 63.6 202.0 5 6 mg.
36 6 07 132.0 [illegible]
38 09 + 45.3 219.7 [illegible]
38 47.6 218.4 6 – [illegible] fell

40 28 11 + 62.8 62.6 202.2 fell 1 min. 4 mg
42 13 + 70.4 194.6 ? not fell
43 32 14 } + 11.4 11.0 253.6 6.6
45 16
45 33 16 } + 14.8 15.4 250.2 [illegible]
46 17
45 16 + 18.3 246.7 [illegible] ?
46 37 17 + 45.1 219.7 2nd mg α Cygni
48 39 19 + 25.0 - 25.7 290.0 5 mg, ψ Cephei ~~α Cygni~~
51 37 22 + 45.3 219.7 2 mg [illegible] α Cygni

58 46 29 - 9.6 - 9.4 274.6 5 mg. μ Aq.
21 0 31 + 61.9 b.c 146.9 5 mg,
26 33 ended

∴ Plan [illegible] at 20h 27m + 45°.3
? Dm 45°.3196 20h 25m 12s.1 45° 26.6

20 21 5 20 50



Oct. 28. 1880.

21 45 S.T. = 7^h 14^m M.T.

H. C. Double # 206.

19 57 +40.0

21 51

+1 54

Chron Time. 21^h 58^m 40^s W. Obs.

+1^h 59.5 Coarse Hour Circle.

14^h + 1.4 div.

+40°.6 Coarse dec. Circ.

1.75 div. Fine Circle.

Pos. Ang. 125°; dist 12", mags. 10 + 10½

Two stars about 7 to 8 magn. np & sf $\Delta\alpha$ 6^s $\Delta\delta$ 3'½. The sf star has a companion, p est. 290° s est. 15" mg. est. 11.

h 2^h 42½ δ 40°.0

t 22 41½

~~141 142~~ Resulting α 19^h 59^m 3^s; δ 40° 26'

Approximate h 2 45 δ 40°.0

t 22^h 46^m 5^s ~~δ 40°.0~~

Graduated circles h 14 46 0 δ 40° 0'

Approximate h 2 12 δ 44°.9

α Cygni t 22 51 34

Graduated circles 14 13 12 δ 44° 25'

20 38 22

Am. Eph. α 20 37 20 δ 44 51

Oct. 29 1880.

5 40 Phot. § tried in Σ Equat.
Prism returned in afternoon with concave perhaps a clear face.

Group ~~23~~ C.S.K.

Alesa 170°.3 270°.2
Sebat 171.0 Began at 20 47

		~~225.1~~		225.1 ~~170.8~~		Plan. neb. north
20.53	20	47 40.7	+ 41.0	221.0	4	4
		57	+ 40.8	220.8		3
		5~	- 32.3	147.7		5
		535 ~~53~~.5	- 21.6	168.4		Plan. neb.

18
h 27 Telescope W. Plan. neb. supposed to be G.C. 4628

Star	p 20°	6	6 magn.	
"	22	6	6½ "	
"	35	7	6½ "	
"	90	18	5½ "	
"	240	18	4 "	ν Capricorni
"	280	4	7 "	

19
h 46 Meteor, equal to star of 2d magn., with train, through μ Persei, towards the east.

Oct. 29, 1880

$21^h 45^m$ S.T. = 7 10 M.T.

Sweep ~~24~~ 23

α Urs Min.

AZ. 170.2

Alt. 269.2

AZ set at 170.7

First sweep at $21^h 54^m$ Obs.

Star 150.8, 5 mag. 54 -29.2 -29.0

Second sweep at $21^h 57^m$

Star 5 m at 165.8 -10.2

3d mag. at 237.7 58 +57.7 +57.4 6

Third sweep at 22^h 00

3d mag. 185.8 4 +5.8 5.6 3.5

Fourth Sweep at $22^h 04^m$

Fifth " 22 07

Two stars at 138.1 -41.9

Sixth sweep at 22 10

Star at 225.8 4th m 9 +45.8 44.9 6

Seventh sweep at 7 39 [Mean Time]

4th m 178.0 15 -2.0 -2.0 3.7

5 m 254.9 with singular spectrum. +74.7

4 m 255.7 +75.7

Eight Sweep at 7 43

9th sweep at 7 46

3d m. 179.4 23 -0.6 -0.6 3.5

3d m. 222.8 25 +42.8 42.75 5

3d m 229.7 +49.7 69.6 4

Oct. 29, 1880.

10th Sweep at 7 49
5th m 147.2 -32.8 -32.8
11th Sweep at 7 51
12th Sweep at 7 54
13th Sweep at 7 56
5th m 152.4 34 -27.6 -27.6 4
2nd m. 190.2 35 +10.2 +10.2 3.5
3d m 209.8 37 +29.8 +29.6 3
14th Sweep at ~~22h 34~~ 7h 59m
4th m 245.6 45 +65.6 65.6 3.5
5th m 275.2
15th Sweep at 8h 03m
16th Sweep at 8h 05
17th Sweep at 8h 08
18th Sweep at 8h 10
Ended at 22h 47m [Sid. time]
21h 54m – 22h 47m

S. Obs.

~~Phot. R β H and δ ω Persei~~
Phot. R ; β + ω Persei.

8 39	131.4		8 42	134.3	[2.]
	168.0	[1.] S. obs.		165.8	S. obs.
	314.6			313.5	
8 41	345.0		8 44	350.0	
8 47	132.8	[3.]	8 55	44.7	[4.]
	169.1			77.3	
	314.1	S. obs.		222.1	S. obs
8 48½	344.7		8 57	257.5	

8 58	39.0	[5.]	9 06½	45.9	[6.]
	79.3	S. Obs		77.5	S. obs
	225.2			226.6	[Obs. perhaps affected by Variable haze. S.obs]
9 00	254.5		9 03	255.9	

Neb. G.C. 4415

9 26 Spectrum probably partly continuous and partly gaseous W. Obs

Comparison star δ Urs. Min. W. Obs

Focus
9 33 6.9

9 37 Clouds over Comparison star.

Oct 31. 1880.

Zone 24 Sib on c Sagittarii.
Began at 21 52
Telescope at ~~1 55~~ 1 54 west Sweep -20 -25

22	07	221	6 5
	19	228	6 8
	33	230	5
	36	229	6 0
	40	253	5
	42	241	5
	49	193	5

Ended at 22 50
No Stars 2,1,3 1,2 Av. = 1.8
~~20 13~~ - $19^h 58^m$ to $20^h 55^m$ -20° to -25°

Zone 25 Comet Swift.
α Ursae Min at Az 280.5 Alt. 175.7.
Sib at 287.0 Began at 23^h 15.
23 Interrupted by clouds.

Oct. 31, 1880.

Zone 25 Comet [illegible]

Begun at 1 03

1 07 275.1 −9.9 2 sta 5 5

9 03 229.7 +34.3 35.0 2 B[illegible] 3 β Andro.

16 175.8 α Urs Min

18 205.0 +49.0 3[illegible]

27 18 273.3 −9.3 −8.8[illegible]

31 139.9 lc +59.9 [illegible] Ʒ

32 25 230.0 +44.0 [illegible]

33 30 223.7 +40.3 40.5

36 257.4 +6.6 [illegible]

39 257.4 +6.6 [illegible] edge [illegible]

40 202.0 +60.0 [illegible]

42 203.8 +60.2

43 201.3 +62.7 edge [illegible]

Two [illegible] in RA of Cluster

Ended at 1 44

1 00 6 1 40

B 394 R 112

12 20 0 12 21 23

21 0 22 23

Oct 31. 1880.

Jup I Comp III by Mict R

Faint Vis.

P. obs. P.mer

50 20 128.9 11.4

48 140.3

51 21 129.9 10.5

46 140.4 21.9

10.95

135 5395

~~34~~

15

49 22 51 04 26975

134.88

Stipulated 5 rev. i.

Sat Decl at 5 23

Sus.

Set at 130.0

3 46 5 28 130.0

15.8

4 03 45 145.8

26.4

23 05 129.4

35.0

40 6 22 154.4

45.7

5 01 43 108.7

51.3

18 7 0 160.0

51.7

32 7 14 108.3

57.1

52 34 165.4

61.7

6 13 55 103.7

61.9

30 12 165.6

66.0

51 33 99.6

71.8

7 16 8 58 171.4

78.1

42 9 24 93.3

80.9

8 06 48 174.3

77.6

10 96.6

75.5

9 10 33 172.1

189

9 05 47 58 96.0

75.0

~~74.4~~

11 28 171.0

75.25

53 5357

26785 93.7

18 13392 171.3 77.6

12 44 95.3 78.4

124

31

10 49 09 09 173.7 16.0 78.0

38 5340

2670 97.3

12 32 14 04 133.50 72.8

170.1

14 22 95.6

54 173.8 78.2 75.5

15 23 5368

2684 97.6

134.20 73.0

14 20 49 170.6

16 14 97.1

42 170.4 73.3

5357 73.15

26785

133.92 Jupiter was nearly at edge of field.

moved back to orig position

18 28 99.3 71.3

~~399~~ 57 170.6

17 27 39 23 95.4

19 49 174.4 79.0

5397 75.15

26985

134.92

13 25 00 13 25 24

25 00 26 24

Allow 2 seconds for interval between observ and time observed

Stopwatch started when satellite was seen, stopped when last equalled III at 1300

Nov. 2. 1880.

Opened dome at 4 30 Adjusted pencils of Phot. A S.

Error of R 112 =
$+1^{m}\ 55.5^{s}$ at beginning
+1 58.5 " end
mean = $+1^{m}\ 57.0^{s}$ = $+2^{m}\ 0.0^{s}$

	β 394			R 112	
5	~~20~~ 19	~~0.0~~ 44.5	5	21	40.0
	~~21~~ 20	~~0.0~~ 44.5		22	40

β Persei Phot R.

6 04 100.8 50.5° < > β
157.8
3 284.7 45.1° < >
05 329.8
95.6° <> 1.77 <>
6 4.5 <
6 2.5 < >
47.80°

[illegible]

10 103.7 47.0° < > β
9 150.7
262.6 52.2° < >
12 334.8
99.2° <> 1.68 <>
6 11.0 <
6 9.0 < >
49.60°

13 101.0 50.2° < > β
12 151.2
280.9 54.0° < >
14 334.9
104.2° < >
6 13.5 <
6 11.5 < >
52.10° ~~1.80~~ 1.55 >

Nov 2 1880

6 15 102,8 48.9·< > P
151.7
14 178.3 15 89· >
16 337.2
6 15.52 ~~97.8~~ 107.8 > ~~1.71~~ 1.47 >
6 13.52 > 48.90

17 102.3 50.0·< > P
152.3
16 281,7 50.5·< >
18 332.7
6 17.52 100.5·< > ~~1.64~~ 1.65< 1.64 >
6 15.52 > 50.25

19 100,6 47.8·< > P
148.4
18 255.6 49.8·< >
20 335,6
6 19.52 97.6 < > 1.72 < >
6 17.52 > 48.80

20 99.8 53.4·< > P
153.2
20 281.2 50.9·< >
23 332,1 1.55 < >
6 21.52 104.3·< >
6 19.52 > 52.15

24 100.7 50.9·< > P
151,6
23 282,3 49.0·< >
26 331.3
6 25.02 99.9·< > 1,66 < >
6 23.02 > 49.95

Nov. 2, 1880

6 27 104.6 P. obs.
148.9 44.3° <>
26 279.5
523° <>
28 331.8
6 27.5<
96.6° > 1.74' <>
6 25.5< >
48.30°

4

6 32 98.1 S. obs.
56.2° >
154.3
31 280.0
48.0 <>
34 328.0
6 33.0<
104.7 > 1.55 <>
6 31.0< >
52.10°

6 36 99.0 S. obs.
54.0° <>
153.0
35 280.8
53.1° <>
37 333.9
6 36.5<
107.1° <> ~~1.48~~ 1.49 >
6 34.5< >
53.55

6 39 93.8 S. obs.
60.9° <>
154.7
38 280.9
55.4° <>
41 336.3
6 40.0<
116.3° <>
6 38.0< >
58.15 127 >

5

6 43 98.8 P. obs.
57.0' <>
155.8
42 280.6
51.7° <>
44 332.3
6 43.5<
108.7° <>
6 41.5< >
54.35° 1.45 >

Nov. 2, 1880

6 45 101.4 Pickering
148.8 47.4° < >
44 276.2
330.2 54.0° < >
46
6 45.5 <
6 43.5 < > 101.4° > 1.62 < >
50.70°

6 47 102.3 Pickering
148.9 46.6° < >
46 278.7
331.0 52.3° < >
48
6 47.5 <
6 45.5 < > 98.9 ° > ~~1.67~~ 9 < 1.68 >
49.45°

6

6 49 97.7 56.1° < > Searle.
153.8
48 275.9 51.3° < >
51 327.2
6 50.0 <
6 48.0 < > 107.4° < > 1.48 >
53.70°

6 53 99.9 49.5° < > Searle.
149.4
52 277.3 52.6° < >
55 329.9
6 54.0 <
6 52.0 < > 102.1° < > 1.61 < >
51.05°

6 56 100.1 51.5° < > Searle.
151.6
55 279.9 56.1° < >
58 336.0
6 57.0 <
6 55.0 < > 107.6° < >
53.80° 1.47 >

Nov. 2, 1880

6 59 100.4 P. obs.
145.8 45.4° < >
58
281.3
47.7° < >
7 1 329.0
7 0.0 <
~~7~~6 58.0 < >
93.1 >< 183 >
46.55°

7 1 100.3 P. obs.
151.4 51.1° < >
00
279.0
49.3° < >
7 2 328.3
7 1.5 <
~~7~~6 59.5 < >
100.4° > 1.65 < >
50.20°

7 3 103.0 P. obs.
152.4 49.4° < >
2
278.7
50.3° < >
7 4 329.0
7 3.5 <
8 7 1.5 < >
99.7° > ~~1.68~~ 1.66 >
49.85°

7 5 98.4 S. obs
152.2 53.8° < >
~~8~~ 4
279.0 49.0° < >
7 7 328.0
102.8° > ~~1.69~~ 1.59 >
7 6.0 <
7 4.0 < >
51.40°

7 8 103.9 S. obs.
146.8 42.9° < >
7
279.6
49.2° < >
7 10 328.8
92.1° < > 1.86 < >
7 9.0 <
7 7.0 < >
46.05°

7 11 100.3 S. obs.
149.3 49.0° < >
10
275.9
50.1° < >
7 12½ 326.0
99.1° > 1.68 >
7 11.8 <
7 9.8 < >
49.55°

Nov. 2, 1880.

9

7 14 105.8 H. obs.

143.3 37.5°< >

13 276.2

56.3°< >

7 16 332.5 93.8°< > 1.81< >

7 15.0<

7 13.0< > 46.90°

7 17 96.2 H. obs.

157.3 55.1°< >

16 286.1

35.8°< >

7 18 321.9 90.9°< > 1.89< >

7 17.5<

7 15.5< > 45.45°

~~142.~~

7 19 104.2 H. obs.

142.8 38.6°< >

18 277.2

52.7°< >

7 21 329.9 91.3°< > 1.88< >

7 20.0<

7 18.0< > 45.65°

10

7 23 22.0 P. obs.

157.4 135.4°< wrong image dis.

42.5

22 200.9 133.4°<

7 24½ 334.3 268.8°< 47.7

7 23.8< 134.4° 90.2 1.88

7 21.8< > 45.6

7 25 153.4 P obs

49.6°< >

203.0

24 335.8

42.0°< >

7 26 17.8 91.6°< >

7 25.5<

7 23.5< > 45.80° 1.87 >

Nov. 2, 1880.

7 26½ 153.4 153.4 P. Obs.

203.6 50.2< 203.6 50.2

25

323.9 143.9

7 27.5 92.4 12 8.5 92.4 $\frac{51.5}{50.85}$ 1.62

7 27.0<

7 25.0< assumed Aug 11-96 EKCram

Reap. Jup. I. Phot. H. S. Obs.

7 9 27.0

5 23 41.1

7 33 8.1

5 21 0.0

2 12 8.1

5 22 40.0

7 34 48.1

Comp. with Sat. III

Satellite used in comparison was that nearest Jupiter on the following side.

Limit of Vis. Sat. S. Obs.

7h. ~~16~~ 31m 165

31.5 27.0 10.5

29.5 16.6 9.0

32m 25.6 .95

9.75

857

4285

21.42

Nov. 2. 1880.

Images at opposite extremities of diameter of field: first computations difficult; Jupiter almost always entirely out of field.

32 45 7	34	40.0		Suspected	
51		45.5		seen	
33 4		59.0		16.0	
17	35	12.0		29.2	
33		27.5		15.7	
44		39.0		34.0	
54		49.0		358.0	
34 5		59.5		49.9	
14	36	9.0		351.2	
25		19.5		48.2	57.0
35		29.5		340.8	
47		42.0		47.6	66.8
35 01		56.5		348.0	
15	37	10.5		58.2	70.2
29		24.0		331.3	
41		36.5		68.5	97.2
		51.0		337.8	
	35 50	6.5		61.5	84.1
36. 17	38 12	19.0		332.9	
		34.0		65.7	92.8 176 88.45
		49.0	7975	326.0	
	39 84	1.5	39875	62.3	96.3
37 26	39 21	18.0	199.38	337.4	
		35.5		74.4	97.0 133 96.65
		53.0	8001	330.2	
	40	9.5	40005 200.02	60.7	90.5
38 46	40 85 41	30.5		340.9	
		51.5		64.3	83.4 1739 86.95
			7961 39805 199.02		

Nov. 2, 1880.

7 41 6.5 338.9

25.5 59.3 80.4

$39^m\ 53^s$ 42 $41^m\ 19.05^s$ 48 10.0 328.9

28.0 60.7 91.8

~~42 00.5~~ 98 78 17 22

13939 86.10

196.95

11

7 45 150.6 P. obs

199.7 49.1' < >

44 337.8

7 47 16.0 38.2' < >

7 46.0 <

7 44.0 < > 87.3 < > ~~1.96~~ 9 < 1.99 >

43.65'

7 47½ 153.7

203.0 49.3' < > P. obs

46 333.3

7 49 19.3 46.0' < >

7 48.2 <

7 46.2 < > 95.3' < > ~~1.74~~ 8 < 1.77 >

47.65'

7 49 153.0 P. obs

199.9 46.9' < >

48 337.2

7 50 17.9 40.7' < >

7 49.5 <

7 47.5 < > 87.6' <> 1.98 < >

12 43.80'

7 51 153.9 P. obs

199.8 45.9' < >

50 334.9

7 52 17.0 42.1' < >

7 51.5 <

7 49.5 < > 88.0' < > 1.97 < >

44.00'

7 52 151.2 P. obs

198.3 47.1' < >

51 332.1

7 54 17.0 44.9' < >

7 53.0 <

7 51.0 < > 92.0' < > 1.86 < >

46.00'

Nov. 2, 1880.

7 54 151.3 P. Obs
195.7 44.4° <>
53 330.6
7 55 18.2 47.6 <>
7 54.5 <
7 52.5 < > 92.0 <> 1.86 <>
46.00

7 58 153.8 P. obs
197.0 43.2 <>
57 335.2
7 59 14.4 39.2 <>
7 58.5 <
7 56.5 < > 82.4 <> ~~2.14~~ 2.12 >
41.20

7 59 150.7 P. obs.
192.3 38.6 <>
58 337.7
8 1 17.7 40.0 <>
8 0.0 <
7 58.0 < > 78.6 <> 2.24 >
39.30

8 1 151.9 P. obs.
195.8 43.9 <>
8 00 332.0
8 2½ 17.9 45.9 <>
8 1.8 <
7 59.8 < > 89.8 <> 1.92 <>
44.90

8 5 154.0 P. obs
199.3 45.3 <>
4 336.9
8 6 15.8 38.9 <>
8 5.5 <
8 3.5 < > 84.2 <> 2.07 >
42.10

8 6 155.5 P. obs
193.7 38.2 <>
5 329.9
8 7 16.3 46.4 <>
8 6.5 <
8 4.5 < > 84.6 <> 2.06 >
42.30

Nov. 2, 1880.

8 6 153.6 P obs

195.5 41.9° < >

5

334.7

8 8 11.1 36.4° < >

8 7.0<

$1^{8}5$ 5.0< > 78.3° <> ~~2.2[illegible]~~ 4 < 2.25 >

39.15°

8 10 152.8 P. obs.

9 192.4 39.6° < >

333.4

8 11 15.9 42.5° < >

8 10.5< 4 ~~2.17~~ < 2.13 >

8 8.5< > 82.1° < >

41.05°

8 11 152.2 43.3° < > P. obs.

195.5

10

335.1 36.1° < >

8 12½ 11.2

8 11.8< 79.4° <> 2.21 < >

8 9.8< >

39.70°

8 13 153.9 P. obs.

190.2 36.3° < >

12

333.3

8 14 16.4 43.1° < >

8 13.5< 79.4° <> 2.21 < >

$1^{8}6$ 11.5< >

39.70°

8 18 152.3

196.0 43.7° < > P. obs

16

337.0 36.0° < > 8 s

8 18½ 13.0

8 18.2< 79.7° <> ~~2.24~~ 1 < 2.20 >

8 16.2< >

39.85°

8 19 152.3 P. obs

18 191.7 39.4° < >

331.2 8 s

8 20 17.0 45.8° < >

8 19.5< 85.2° < > 2.05 < >

8 17.5<

42.60°

Nov. 2, 1880.

8 20 155.1 P. obs
195.0 399° < >
19
331.1
8 21 9.3 38.2° < >
8 20.5 <
8 18.5 < > 87.1° < > ~~1.97~~ < 2.25 >
44.05

8 23 154.0 P. obs.
190.4 36.4° < >
21 333.9
39.4° < >
8 23½ 13.3
8 23.2 <
8 21.2 < > 75.8° < > 2.32 < >
37.90°

8 24 152.7 P. obs
194.2 41.5° < >
23
335.7 34.8° < >
8 25 10.5
8 24.5 <
8 22.5 < > 76.3° < > ~~2.31~~ < 2.31 >
38.15°

8 25 154.0 36.0° < > P. obs
~~190.0~~
24
329.8
40.9° < >
8 26 10.7
8 25.5 <
8 23.5 < > 76.9° < > 2.29 < >
38.45°
18

8 29 150.2 P. obs.
191.8 41.6° < >
28
334.4 37.6° < >
8 30 12.0
8 29.5 <
8 27.5 < > 79.2° < > 2.22 < >
39.60°

8 30 153.3 36.5° < > P. obs.
189.8
29
331.4 41.9° < >
8 31 13.3 78.4° < > 2.24 < >
3(?)
8 30.5 <
8 28.5 < > 39.20°

assumed to be 331.4
Aug-11-96
E.S.Gray

Nov. 2, 1880

8 32 150.3 P. obs
190.0 39.7˙ < >
31
334.2 35.8˙ < >
8 33 10.0
8 32.5 <
8 30.5 < >
75.5˙ <> 2.33 < >
37.75˙
19
8 35 153.2 . P. obs.
192.0 38.8˙ < >
34
332.9
8 36 12.9 40.0˙ < >
8 35.5 <
8 33.5 < >
78.8˙ <> 2.23 < >
39.40˙
8 36 152.6 P. obs
194.1 41.5˙ < >
35
334.8
33.6˙ < >
8 37 8.4
8 36.5 <
8 34.5 < >
75.1˙ < > ~~2.34~~ < 2.34 >
37.55˙
8 38 154.1 37.1˙ < > . P. obs
191.2
37
329.7 38.7
~~46.6~~˙ <
8 39 16.3
8 38.5 <
8 36.5 < >
Repeated 8.4
~~83.7~~˙ < ~~2.09~~ < 2.32 >
41.85˙
75.8 >
Repeated assumed correct
Aug-11-96

8 45 β Urs. Min. 2 α Urs. Min. S. obs.
α Urs. Min. 1 ε Urs. Maj.
α Urs. Min. 3 γ Cass.

1880phae.proj.131OW