

KG  
11366  
v.321 a



















July 8, 1888

B. & C. 1182 8 04 12.5

Ballou 103 8 09 00

Reap. Jup. II, S. obs. S. rec.,  
Phot. R., comp. with Sat. I.

8 30. 00 cloudy; Sat. invisible

34 00 Still cloudy

B. & C. 1182 11 36 11.5

Ballou 103 11 41 00

Reap. Jup. I

Cloudy at time of reappearance.



July 15, 1888

B 6 1182

10 55 0.5  
56 0.5

B 6 Ballon 103

10 56 0.0  
57 0.0

Reap. Jup. II. comp. with  
Sat. III. Phot. R. S. Obs., G. Rev.  
Phot. R. without eyestop.

Limit of visibility

11 09 4.0 142.2

23.5 172.1

45.0 138.8

10 2.5 172.4

12 16.5 sum

26.0 133.8

46.0 177.0

54.5 133.1

13 5.0 183.0

15.0 138.1

25.0 185.1

33.0 130.0

54.5 192.0

57.5 124.0

14 8.5 191.0

17.5 131.2

30.5 194.2

40.0 119.3

53.0 189.8

15 2.5 125.4

12.5 192.0



July 15, 1888.

15      24.0    117.3  
          33.5    195.3  
          44.0    113.0  
          52.5    201.8    -

16      7.5    118.0  
          18.5    199.1  
          28.5    120.0  
          40.5    192.5    -  
          55.0    119.2

17      6.0    193.9  
          45.0    119.1  
          58.5    194.2    -

18      13.5    118.0  
          30.5    194.6  
          49.5    118.9  
          59.5    199.0    -

19      11.0    119.3  
          23.0    197.9  
          38.5    118.0  
          52.0    202.2    -

20      13.5    113.0  
          38.0    199.1  
          58.5    115.4

21      13.5    198.0  
          26.5    117.0  
          45.0    193.9

22      2.5    118.3  
          16.5    200.9  
          30.5    117.1  
          50.5    197.8



July 15, 1888,

11	23	06.5	114.9	
		27.0	199.1	-
		42.5	121.1	
		57.5	200	
	24	10.5	114.5	
		26.0	197.0	
		42.5	116.4	-
	25	01.5	196.9	
		18.5	115.9	
		36.0	194.3	
		53.5	116.1	-
	26	10.5	199.0	

Seeing pretty good considering  
the small amplitude. ✓

Balloon 103

11 34 00  
11 35 00

B+E 1182

11 33 00  
11 34 00

July 16 1888

Experiments with eye piece of 25' angle in order to see if the angle between the ruled lines can be taken with the same degree of accuracy in different parts of the field

(Too cloudy for mer. Photometry)

~~Case 1~~ 1<sup>st</sup> trial (5 sets)

One of the lines as far north in the field as possible & the other at about right angles to it

gh or

99.4	99.4	99.3	99.5	99.4
<u>8.7</u>	<u>9.0</u>	<u>8.8</u>	<u>8.7</u>	<u>8.5</u>
90.7 ✓	90.4 ✓	90.5 ✓	90.8 ✓	90.9 ✓

~~Case 2~~ 2<sup>d</sup> trial (5 sets)

angle between the lines in the center of the field.

337.5	337.5	337.4	337.3	337.5
<u>247.0</u>	<u>246.9</u>	<u>246.9</u>	<u>246.5</u>	<u>246.8</u>
90.5 ✓	90.6 ✓	90.5 ✓	90.8 ✓	90.7 ✓



July 16. 1888.  
Angles between lines in center  
of field. (3<sup>d</sup> & 4<sup>th</sup> Trial) 10 sets.

2470	246.8	246.9	246.8	247.2
<u>337.4</u>	<u>337.4</u>	<u>337.5</u>	<u>337.5</u>	<u>337.5</u>
90.6	90.4	90.4	90.3	90.3
90.1	90.6	90.6	90.7	90.3

2470	2470	247.1	247.0	246.8
<u>337.7</u>	<u>337.6</u>	<u>337.5</u>	<u>337.5</u>	<u>337.5</u>
93	94	94	95	93
90.7	90.6	90.4	90.5	90.7

One of the lines as near edge  
as possible.

357.1	357.2	357.0	357.1	357.0
<u>267.5</u>	<u>267.5</u>	<u>267.4</u>	<u>267.6</u>	<u>267.6</u>
89.6	89.7	89.6	89.5	89.4
357.0	356.9	357.0	356.8	356.9
<u>267.4</u>	<u>267.7</u>	<u>267.6</u>	<u>267.8</u>	<u>267.5</u>
89.6	89.2	89.4	89.0	89.4

In the 3<sup>d</sup> and 4<sup>th</sup> trials above, the  
telescope was moved each time by the hand  
so that the star should travel on the bar,  
in order to save time, as the star was getting  
rather low and would be probably affected  
by refraction otherwise. at least.

The star had to be taken near the  
moon (and so is now necessarily low) in  
order to see the lines.





July 17. 1888.

Too cloudy for Photometry and  
becoming worse.

B. + C. 1182.			Ballon 103.		
A	4	34.1	A	6	0.0
	5	34.1		7	0.0

Reps. Sup. I. Phot. R. <sup>without eyestop.</sup> S. obs.  
Corr. with est. III.

L	33	33
	2	12
<hr/>		
A	41	45
A	6	0
<hr/>		
	35	45
A	4	34
<hr/>		
A	40	19

App. time est.

Limit of Vis.

L	36	25.0	197.0
		43.0	222.0
		57.5	193.2
	37	9.5	220.1

8 36 49

July 17. 1888.

2 39 42. Thin clouds.

40 16.0 seen,

22.0 129.3

32.5 223.0

40.0 176.0

49.0 235.0

59.5 171.2

41 7.0 242.0

15.0 174.7

24.0 245.0

31.0 173.1

39.5 256.0

42.0 169.0

57.0 244.3

42 4.0 171.2

12.0 253.1

20.5 162.0

30.0 246.5

42.0 171.2

51.0 246.2

43 0.0 162.2

2.0 254.2

17.5 162.7

27.0 242.2

40.0 164.0

13

42

5 44

52.5 251.1

2.5 162.2

12.0 245.1



July 17 - 1925			
f	44	22.0	162.2
		31.0	247.0 2 -
(add 1)	- - -	41.0	169.1
		52.5	246.4 -
	45	9.5	167.2
		21.0	245.1 -
		34.5	167.2 3
		56.5	244.5 -
	46	9.0	171.1
		23.5	245.4 4
		35.0	167.1
		51.5	243.0 -
	47	3.0	162.1
		16.5	250.6
		31.5	160.5 5
		43.0	248.0
		52.0	160.0 -
	48	3.5	255.0
		14.5	163.7 6
		23.5	249.4 -
		37.0	160.6
		46.0	244.4
		55.0	162.1 7
	49	5.0	249.4 -
		14.5	156.2
		26.0	249.4
		43.0	154.5 8
		56.0	253.0 -

July 17. 1888.  
 All the preceding observations  
 through thin clouds.

B. + C. 1142.			Ballou 103.		
9	0	33.0	9	2	0.0
	1	33.0		3	0.0

Experiments with eye piece of 25' angle  
 in order to see if the angle between the  
 two ruled lines can be taken with the  
 same degree of accuracy in different  
 parts of the field.

### 1st Trial

Angle between lines about in center of  
 the field.

9h 20 <sup>m</sup>	321.5	321.5	321.6	321.7	326.3
	<u>231.0</u>	<u>230.9</u>	<u>230.8</u>	<u>230.8</u>	<u>230.7</u>
	90.5	90.6	90.8	90.9	90.6

### 2nd Trial

at One of the lines at extreme edge of  
 the field

203.5	202.8	203.0	202.8	202.9
<u>293.2</u>	<u>292.9</u>	<u>293.1</u>	<u>293.4</u>	<u>293.0</u>
89.7	90.1	90.1	90.6	90.1



July 17 1888.

3<sup>rd</sup> Trial

One of the lines in extreme edge of the field

293.0	293.2	293.2	293.2	293.1
<u>202.6</u>	<u>203.0</u>	<u>202.9</u>	<u>203.0</u>	<u>202.5</u>
90.4	90.2	90.3	90.2	90.6

293.1	293.0	293.0	293.2	293.0
<u>202.5</u>	<u>203.0</u>	<u>202.4</u>	<u>202.5</u>	<u>203.1</u>
90.6	90.0	90.6	90.7	89.9

Lines very faint. #

4<sup>th</sup> Trial

One of the lines in extreme edge of the field

125.1	125.1	125.0	125.2	125.0
<u>215.3</u>	<u>215.0</u>	<u>215.0</u>	<u>215.2</u>	<u>215.0</u>
90.2	89.9	90.0	90.0	90.0

125.0	125.2	124.8	124.9	124.9
<u>214.9</u>	<u>214.9</u>	<u>215.0</u>	<u>215.0</u>	<u>215.0</u>
89.9	89.7	90.2	90.1	90.1

lines in this last trial better seen than in the previous ones.

July 17. 1888.

Time of an Equatorial star crossing  
11<sup>h</sup> 0<sup>m</sup> field  $\pm 102$  sec.

Too cloudy still for Mer. Phot.

### Resumé of Results.

<u>1<sup>st</sup> trial.</u>	
90.5	-2
90.6	-1
90.4	1
90.9	2
90.6	-1
<hr/>	
90.6 <sup>r</sup>	$\pm 1.4$

<u>2<sup>d</sup> trial.</u>	
89.7	-4
90.1	0
90.1	0
90.6	5
90.1	0
<hr/>	
90.12 <sup>r</sup>	$\pm 1.6$
<hr/>	
100	

<u>3<sup>d</sup> trial.</u>	
90.4	0
90.2	-2
90.3	-1
90.2	-2
90.6	2
90.6	2
90.0	-4
90.6	2
90.7	3
89.9	-5
<hr/>	
90.35 <sup>r</sup>	$\pm 2.3$

<u>4<sup>th</sup> trial.</u>	
90.2	2
89.9	-1
90.0	0
90.0	0
90.0	0
89.9	-1
89.7	-3
90.2	2
90.1	1
90.1	1
<hr/>	
90.01	$\pm 1.1$



July 24, 1888.

By 6 1182      Ballow 103  
 9 05 21.5      9 08 00  
 9 06 21.5      9 09 00

Re. Jup. I. S. <sup>P</sup> obs. G. rec. Phot. R.  
 Comp. with 1<sup>st</sup> sat. preceding. (II.)  
 Limit vis:

10 28 56.0 282.3  
 29 12.5 309.2  
 25.0 280.6  
 36.0 311.8

~~33 7.5 Suspected~~

33 34.5 seen

42.5 278.6

51.0 319.0

34 0.5 271.2

8.0 318.9

16.5 271.1

25.5 321.4

35.0 262.1

44.0 328.2

51.0 264.2

35 3.0 329.6

11.0 260.4

21.0 329.7

32.0 254.3

47.0 334.8

57.0 252.2

36 7.5 335.3

July 24, 1888

10 36 21.0 252.2  
31.5 335.6  
 47.5 250.7

37 2.5 335.3  
15.0 251.4  
27.5 337.4  
 45.0 254.3  
 54.5 339.4

38 6.5 250.1  
17.5 339.0  
38.5 248.8  
 55.0 339.3

39 4.5 250.3  
16.5 338.4  
~~33.0~~

— (add 2) — 40 7.5 250.2

25.0 341.8  
35.0 243.9  
48.5 338.4

41 01.0 244.3  
 13.5 340.7  
23.5 245.1  
42.5 337.3

42 46.5 248.6

43 18.5 340.7

32.2 250.4  
44.0 345.7

57.5 244.3

44 8.0 342.3



July 24. 1888

10	44	23.0	247.2	
		35.0	344.0	
		50.0	246.5	
	45	2.0	344.0	8
		17.0	244.4	
		33.0	345.0	
		47.2	248.0	
	46	1.5	340.6	9
		23.0	245.6	
		40.0	342.1	

Seeing medium; clock not running

B + Q 1182

13 12 19.5

13 13 19.5

Bellow 103

13 15 00

13 16 00

July 29, 1888

12 45 Examination of the vicinity of  
Alphonse to detect possible  
change in a crater since the  
photograph of Mrs. Rutherford.  
Seeing unsteady; results of recent  
photograph apparently confirmed.  
P. obs.



August 9, 1888

B+C. 1182 7 58 14.6

Ballou 103 7 58 00

Ballou 103 7 59 00

B+C. 1182 7 59 14.7

Aug. 10, '88,

Examined Comet Bickels.

As compared with Deneb,  $\delta = 45^{\circ} 0'$   
 As determined of circle,  $\alpha$  is not far from  
 10 h 14<sup>m</sup>. Comet too low to determine  
 $\alpha$  with accuracy.



Aug. 22. 1866.

Comet c 1866 (Brooks) Gr. obs.  
Search made for new comet. but so  
much cloud that comet not found.

Aug. 24. 1888.

Comet C 1888 (Brooks) Gr. obs.

Too much cloudiness for spec. Photometry.

$$\begin{array}{r}
 18 \quad 48 \\
 \hline
 7 \quad 24 \\
 12 \quad 11 \quad 22 \\
 \hline
 12 \quad 14 \quad 47 \\
 \hline
 17 \quad 50 \\
 +5 \quad 32
 \end{array}
 \qquad
 \begin{array}{r}
 2/5 \quad 2.6 \\
 \hline
 29.0 \\
 41 \quad 49.1 \\
 \hline
 41 \quad 19.2
 \end{array}$$

$$\begin{array}{r}
 12 \quad 14 \quad 47 \\
 \hline
 \quad \quad -1 \quad 41 \\
 \hline
 (HST) \quad 12 \quad 17 \quad 6
 \end{array}
 \qquad
 \begin{array}{r}
 41 \quad 19.2 \\
 \hline
 \quad \quad -11. \\
 \hline
 41 \quad 9
 \end{array}
 \qquad
 \begin{array}{r}
 3.07 \\
 70 \\
 \hline
 921 \\
 \hline
 101.3
 \end{array}
 \qquad
 \begin{array}{r}
 -20.0 \\
 70 \\
 \hline
 660
 \end{array}$$

$$\begin{array}{r}
 6 \quad 05 \\
 \hline
 18 \quad 24 \\
 \hline
 12 \quad 19 \quad 42^0
 \end{array}$$

$$\begin{array}{r}
 E \quad 12 \quad 17 \quad 6 \quad +41' \quad 9' \\
 * \quad 12 \quad 17 \quad 29 \quad +42' \quad 2' \\
 \hline
 \quad \quad 23 \quad \quad 59
 \end{array}$$

Comet found.

Comp. Posn = +41° 22' 9" (7.5 K)

$$\begin{array}{r}
 6 \quad 52 \\
 \hline
 12 \quad 17 \\
 \hline
 5 \quad 25
 \end{array}$$



Aug. 24, 1944.

Pos. zero  $\begin{array}{r} 2187 \\ 1425 \\ \hline 1062 \end{array}$

Clouds

13m

30.0 sec

13

50.4

Clouds

$\begin{array}{r} 12 \quad 17 \\ 19 \quad 23 \\ \hline 7 \quad 06 \end{array}$

Stopped finally by very heavy masses of clouds covering the whole sky.

Aug. 25, 1888.

Comet c 1888 (Brooks) St. obs.

$$\begin{array}{r}
 1K \quad 42 \quad 52.6 \\
 + 7 \quad 2K \quad - 29. \\
 12 \quad 17 \quad + K1 \quad 32 \\
 \hline
 12 \quad 24 \quad + K1 \quad 3
 \end{array}$$

$$\begin{array}{r}
 12 \quad 26 \quad + K2 \\
 20 \quad 2 \quad 28 \quad 8 \\
 + 7 \quad 36 \quad 12 \quad 26 \\
 \hline
 \quad \quad \quad 44
 \end{array}$$

Clouds in northwest which will probably prevent seeing comet, and clouds over pole, (and still rising), which prevents mer. Photometry.

$$\begin{array}{r}
 12 \quad 27 \quad + K2.1 \\
 20 \quad 22 \\
 + 7 \quad 55
 \end{array}$$

Too cloudy still for comet, and no farther chance for mer. Photometry resuming mer. Photometry at present.

- A little clearer round pole now, so that possibly some more mer. Photometry can be taken.



Aug. 27, 1888.

Cloudy every <sup>where</sup> except in extreme north and north-west. No chance for any mer. Photometry, at least at present.

Comet c (1888) Brooks.

W. v. h.

Comet 1888 III.

E (55)

$$\begin{array}{r}
 12 \quad 40 \quad 32 \quad +39 \quad 45 \\
 \quad \quad -1 \quad 41 \quad \quad \quad +11 \\
 \hline
 12 \quad 38 \quad 51 \quad +39 \quad 56
 \end{array}$$

$$\begin{array}{r}
 12 \quad 38 \quad +40. \\
 18 \quad 0 \\
 \hline
 +5 \quad 22 \\
 \quad \quad 5 \quad 30 \\
 \quad \quad 18 \quad 9 \\
 \quad \quad \hline
 \quad \quad 12 \quad 39
 \end{array}$$

$$\begin{array}{r}
 4 \quad 40 \quad +50.0 \\
 18 \quad 15 \\
 \hline
 13 \quad 35 \\
 \quad \quad 12 \quad 38 \\
 \quad \quad 18 \quad 28 \\
 \quad \quad \hline
 \quad \quad 5 \quad 50 \\
 \quad \quad \quad 4 \\
 \quad \quad \hline
 \quad \quad 5 \quad 54
 \end{array}$$

$$\begin{array}{r}
 \text{Pos. Jra } 105.5 \\
 \quad \quad 45. \\
 \hline
 \text{Setting } 150.5
 \end{array}$$

Aug. 27, 1888.

18 <sup>h</sup>	40 <sup>m</sup>	8.6 <sup>sec</sup>	*
	40	34.1	E
	40	59.2	*
	41	6.2	OE
	41	36.0	
	42	2.0	
	42	26.5	
	42	33.7	
	42	58.2	
	43	24.4	
	43	49.4	
	43	56.6	
	44	25.4	
	44	53.1	
	45	17.0	
	45	24.5	
	45	57.2	
	46	26.0	
	46	49.0	
	46	57.4	



Aug 27 1888

18 <sup>h</sup>	47	44.0
	48	72.5
	48	36.0
	48	43.9

Order in preceding transits star, comet, star, comet, Both in Southern half.

Comet has a fan-shaped tail, somewhat fan shaped, about ~~7.5~~<sup>5.5</sup> ~~5~~<sup>6</sup> ' long  
Nucleus rather poorly defined

Comp. Star =  $+39^{\circ} 25' 59''$  (9.5 B.)

Too cloudy still for Meridian  
Photometry

Second Series on Comet

19 <sup>h</sup>	6 <sup>m</sup>	1.5 sec	*
	6	38.1	E
	6	56.3	*
	7	8.9	E

Aug 27, 1888.

19 <sup>h</sup>	47	47.7
	8	25.3
	8	43.0
	8	55.4

9	25.5
10	3.8
	2.1

11	44.0
----	------

13	22.1
14	2.5
14	19.0
14	31.9

14	56.5
15	37.1
15	53.6
16	6.1

16	35.0
17	16.2
17	32.5
17	45.9

Same comp. star for both series.  
" conditions also.



Aug. 27. 1888.

Fr. 3451.

Ballon 103.

21	49	4.5
	50	4.7

11	6	0.0
	7	0.0

$\therefore$  3451 is 20.6 fast.

Aug. 29. 1888.

Count c 1888 (Brooks) Gr. obs.

12 52 + 34.7

12 49  
19 53  
—  
77 4

Pos. zero 105.5  
45  
Setting 150.5

20 <sup>h</sup>	17 <sup>m</sup>	0.1 sec.	*
	18	3.5	*
	18	20.6	E
	19	7.4	E
	20	6.4	
	21	7.9	
	21	27.0	
	22	12.1	
	23	8.0	
	24	8.7	
	24	29.0	
	25	13.7	



Aug 29 1888.

20<sup>h</sup> 25 46.3  
 26 46.0  
 27 8.0  
 27 52.3

~~28 26.0~~  
~~29 23.6~~  
~~29 48.0~~  
~~30 32.0?~~ } rej.  
 Clouds.

~~32 18.4~~  
~~33 14.0~~  
~~33 42.0?~~  
~~34 23.5?~~ } rej.  
 Clouds.

35 39.4  
 36 33.4 } V. faint,  $\frac{1}{2}$  wt.  
 37 2.7  
 37 44.0

Order in preceding points star, star,  
 Comet, comet, &c Both in northern half  
 Comp. Star =  $+34^{\circ} 23' 49''$  (A.6 K)

Fr. 3451.

Ballou 103.

20 51 42.7  
 52 42.9

10 1 0.0  
 2 0.0

Count rather low and faint in above obs.

$\therefore$  3451 is 16.4 feet.

Sept. 2, 1888  
 Wedge Photometer. S. obs.  
 Region of variable No. 93  
 Star 1 (SD -10° 4094) 6.77 too bright

9 30 b 4.44  
 4.81

a 5.60  
 5.69

Region of (93) identified certainly, but with some difficulty in the absence of a chart, and too low for measurement in increasing haze. It can be found most readily by the stars SD. <sup>12°</sup>4655, 4651, 4640, 4634. The variable 93 is SD -12° 4633 and not visible tonight.



Sept. 3. 1888.

Quite cloudy. Too cloudy for photometry and probably for comet, but will try.

Comet c 1888 (Brooks.) Tr. obs.

$$\begin{array}{r} 13 \quad 26 \quad +35.7 \\ 18 \quad 45 \\ \hline +5 \quad 19 \end{array}$$

$$\begin{array}{r} 13 \quad 31 \quad +37.0 \\ 18 \quad 54 \\ \hline +5 \quad 23 \end{array}$$

$$\begin{array}{r} 13 \quad 31 \\ 19 \quad 0 \\ \hline +5 \quad 29 \end{array}$$

$$\begin{array}{r} 13 \quad 31 \\ 19 \quad 12 \\ \hline +5 \quad 41 \end{array}$$

$$\begin{array}{r} 13 \quad 31 \\ 19 \quad 25 \\ \hline +5 \quad 54 \end{array}$$

Sept. 3, 1884.

$$\begin{array}{r}
 13 \quad 31 \\
 19 \quad 31 \\
 \hline
 76 \quad 0
 \end{array}$$

Too cloudy for work, and  
steadily growing worse.



Comet c 1888. Brooks. Fr. obs.

$(\infty, 1.55)$

$$\begin{array}{r} 10 \text{ KK} \quad 95,0 \\ 20 \quad 27 \\ \hline + 6 \quad 43 \end{array} \qquad \begin{array}{r} 20 \quad 30 \\ 6 \quad 35 \\ \hline 13 \quad 55 \end{array}$$

Pos zero 150.5  
Setting 45  
195.5

20 <sup>h</sup>	46	36.0	*
	47	31.2	*
	47	44.1	⊗
	48	32.9	⊗

49	3.7
50	0.6
50	13.5
51	2.9

Sept. 5, 1888.

51	38.5
52	36.5
52	49.2
53	38.8

54	5.5
55	5.2
55	16.6
56	7.4

56	29.8
57	31.1
57	42.5
58	33.7

Order in preceding transits Star, Star,  
Comet, Comet. Both in Southern half

Comet rather low & indistinct

Comp. Star =  $+33^{\circ} 23' 66''$  (9.1 K)  
Prod. 3451 used in transits.

For 3451.

21	12	3.5
	13	3.6

$\therefore$  3451 is 2.5 feet.

Ballou 103

9	54	0.0
	55	0.0



Sept. 5, 1888.

Peters' New Variable. Gr. obs.

$$\begin{array}{r} 19 \quad 11 \\ 21 \quad 20 \\ \hline + 2 \quad 9 \end{array}$$

$$\begin{array}{r} \cancel{21} 9 - 21^{\circ} 9' \end{array}$$

$$\begin{array}{r} 19 \quad 11 \\ 21 \quad 33 \\ \hline 2 \quad 22 \\ 21 \quad 35 \\ 2 \quad 42 \\ \hline 18 \quad 53 \end{array}$$

Variable follows L.D.  $-21^{\circ} 53' 40''$

27.6 sec. 2' South.

Examined variable with direct vision spectroscope. Star getting somewhat low

10<sup>h</sup> 45<sup>m</sup> Two or three strongly marked bands certainly seen & others suspected.

The bands seemed to be rather in central & more refrangible part of the spectrum.

Sept. 6. 1888.

Comet c 1888 (Brooks) Fr. obs.  
 E 1888. III.

$$\begin{array}{r}
 +11 \quad 43 \quad -1^{\circ} \quad 22.6 \\
 +5 \quad 52 \quad -KK.3 \\
 \hline
 13 \quad 37 \quad 12 \quad 33 \quad KK \\
 13 \quad 43 \quad 4 \quad 33^{\circ} \quad 0'
 \end{array}$$

$$\begin{array}{r}
 13 \quad 55 \\
 12 \quad 55 \\
 \hline
 25 \quad 0
 \end{array}
 \quad + 25.2$$

Pos zero 110.9  
 45  
 Setting 155.9

18 59 21.5 + 33^{\circ} 2 377  
 59 45.9 0E  
 19 60 11.8 + 33^{\circ} 2 377  
 0 11.8 0E

0 43.2  
 1 8.1  
 1 33.3  
 1 33.4

2 6.2  
 2 31.8  
 2 57.1  
 2 57.3



Sept. 6, 1888.

19	3	50.1
	4	16.6
	4	40.5
	4	40.9
	5	17.0
	5	43.7
	6	7.7
	6	8.3

Order in preceding series Star. Comet,  
 Star. Comet. Both in Southern half  
 (See p. 41 for further explanation)  
 fr. 3451 Chronometer used in transits this  
 evening as usual

	8	24.5	
	8	36.5	
		50.6	
19	9	23.4	+ 33° 237A
	9	35.6	2377
	9	49.1	2377
	9	55.4	237A
	10	30.1	
	10	41.3	
	10	55.8	
	11	2.0	

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19	71	35.9
	71	47.2
	12	2.8
	12	7.6

	12	43.8
	12	55.1
	13	10.0
	13	15.5

	13	57.2
	14	7.7
	14	23.0
	14	28.5

	14	58.5
	15	9.1
	15	24.2
	15	30.0

		<del>20.9</del>
	16	20.9
	16	31.3
	16	47.0
	16	51.5

	17	26.9
	17	36.9
	17	52.8
	17	57.3



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19	18	40.8
	18	50.1
	19	<del>68</del>
	19	<del>108</del> 10.9

20	<del>14.2</del>
20	<del>23.0</del>
	40.2

<del>23</del>	<del>56.7</del>
24	<del>14.6</del>
	32.5

25	7.1
25	22.4
25	33.0
25	42.5

Order in preceding series lettered  
star, unlettered star, ~~lettered~~ star  
lettered star

lettered star in northern half  
unlettered star in southern half

Comet has tail visible for about 5' from  
Nucleus. Tail not quite so long on following  
side as on preceding side of same, as  
nearly as one can judge. Comet's nucleus  
moderately well defined but not very  
sharp. Nucleus & surrounding

Sept. 6 1888.

Magnitude about equal to a 9.5 mag star

Comet at some little distance in Dec. from a lettered star, so that transits were taken between comet and +33° 2377 (unlettered star) in the series 1 (five sets), and then the unlettered star was joined to the lettered star (+33° 2378) in the last series (10 sets)

Peters 'Star Variable G. obs.

$$\begin{array}{r} 19^h \ 11^m \ -21^{\circ} \ 9' \\ 19 \quad 46 \\ \hline +3 \checkmark \end{array}$$

Spectrum of variable about the same as last night, <sup>except that</sup> bands are more distinctly seen & others suspected, then, rather more fully confirmed. There seem to be two or three bands quite strongly defined, & others suspected.

Spectrum looks rather broken about center & towards more refrangible end.

Probably also a somewhat faint band in the orange



Sept. 6, 1888.

## Meridian Circle Stars.

$$\begin{array}{r}
 17^h \ 08^m \quad +50 \\
 20 \quad 25 \\
 \hline
 3^h \ 17^m
 \end{array}$$

$$\begin{array}{r}
 \text{Pos zero } 153.5 \\
 \quad \quad 45 \\
 \hline
 \text{Setting } 98.5
 \end{array}
 \quad
 \begin{array}{r}
 \text{D. M. } +50^\circ \ 2358 + 2359 \\
 \hline
 \end{array}$$

21 <sup>h</sup>	2 <sup>m</sup>	56.1 <sup>sec</sup>	2356
	3	13.0	"
	3	49.0	2359
	4	7.4	"
	4	40.4	58
	4	57.5	58
	5	33.3	59
	5	57.6	59
	6	24.3	58
	6	41.0	58
	7	16.6	59
	7	35.0	59
	8	5.7	58
	8	23.5	58
	8	59.0	59
	9	17.0	59

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21 <sup>h</sup>	9	47.7	58
	10	5.4	58
	10	41.1	59
	10	59.1	59

Order in preceding transits 2358, 2358,  
2359, 2359.

2358 in Northern half outside square  
& 2359 in Southern half outside square

Both stars rather near opposite edges of the  
field & so the images somewhat poorly  
defined but nothing better can be done  
without going some distance off in  
Right Ascension.

D. M. + 51 2171 & 2172

21 <sup>h</sup>	28	58.7	2171
	29	18.3	2172
	30	6.0	2171
	30	24.1	2172
	30	53.5	71
	31	13.0	72
	32	0.7	71
	32	19.0	72



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21h

32	49.1	71
33	8.5	72
33	56.5	71
34	14.7	72
34	54.0	71
35	13.3	72
36	1.4	71
36	19.7	72
36	49.1	71
37	8.7	72
37	56.7	71
38	15.0	72

Order in preceding transits 2171, 2172,  
 2171, 2172. Both in Southern half.  
~~Obs. rather difficult on account of proximity of~~  
~~adjacent star, and rather bad atmospheric conditions.~~  
 D.M. + 54° 1431

This star is followed by 1432 in 2.9 secs.  
 1.5 south, which may give rise to the  
 trouble. ~~from its~~ The fol. star is 4.4 and  
 the preceding, and one in question, is 9.5.  
 The former has already been observed once.

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Fr. 3451.  
 22    3    5.6  
       4    5.7

Balloon 103.  
 10<sup>h</sup>    41    0.0  
       42    0.0

Clouds

∴ 3451. is 0.8 feet.



Sept. 7. 1888.

Mer. Circle Stars.

Gr. obs.

(Too much cloud for other work.)  
Setting of circle apparently unchanged since last night.

$$\begin{array}{r} 12 \quad 41 \quad + 51. \\ 19 \quad 35 \\ \hline + 6 \quad 54 \end{array}$$

$$\begin{array}{r} 13 \quad 44 \quad + 53.0 \\ 19 \quad 34 \\ \hline + 5 \quad 50 \end{array}$$

$$\begin{array}{r} 14 \quad 08 \\ 19 \quad 40 \\ \hline 5 \quad 32 \end{array}$$

$$\begin{array}{r} 19 \quad 43 \\ 14 \quad 08 \\ \hline 5 \quad 35 \end{array}$$

D. M.  $+53^\circ$  1697, 1698, 1699.

19 <sup>h</sup>	52 <sup>m</sup>	37.4 <sup>sec</sup>	1697
	52	51.5	"
	53	18.6	1698
	53	29.8	"
	54	54.0	1699
	55	25.0	"

Sept. 7, 1888.

<del>54</del>	54.0	
56	8.2	97
56	21.5	"
<del>56</del>	49.3	98
57	0.2	"
58	24.8	99
58	56.0	"
<del>58</del>	<del>56.0</del>	

19 <sup>h</sup>	59	44.4	97
	59	57.5	"
20 <sup>h</sup>	0	24.9	98
	0	36.5	"
	2	0.3	99
	2	32.5	"
	3	24.9	97
	3	37.1	"
	4	5.0	98
	4	17.4	"
	5	40.5	99
	6	13.5	"
	<del>6</del>	<del>53.4</del>	
	6	53.4	97
	7	5.3	"
	7	33.0	98
	7	45.6	"
	9	8.2	99
	9	41.9	"



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Order in preceding transits 1697,  
1697, 1698, 1698, 1699, 1699.  
1697 in Northern half 1698 & 1699 in  
Southern half.

D.M. +  $\sqrt{4}^{\circ}$  1831, 1832, 1834.  

16	35	+ 56.2
20	28	
3	53	

~~D.M. + 54<sup>0</sup>~~

The difficulty with 1831 may be due to the close proximity of another star.

The star assumed to be 1831 is the northern <sup>very</sup> slightly preceding & brighter of a pair.

The interval between 1831 & 1832 seems somewhat than as given in the D.M. but the star wanted is probably the one assumed.

Companion star 0.3' South. Interval between 1831 & 1832 about 2.3<sup>2</sup>.

For transits see next page.

Sept. 7, 1888.

~~20h~~      ~~41~~      ~~41.3~~  
              ~~41~~      ~~58.8~~  
              ~~42~~      ~~55.0~~  
              ~~43~~      ~~11.8~~  
              ~~43~~      ~~43.0~~

20h      44      43.2      1231  
           45      0.1      1232  
           45      31.0      1232  
           45      41.7      1231  
           46      45.8      1234  
           47      4.0      "  
           47      49.0      31  
           48      6.0      32  
           48      37.4      32  
           48      47.8      31  
           49      51.7      34  
           50      10.0      "  
           52      1.0      31  
           52      18.0      32  
           52      50.0      32  
           53      0.5      31  
           54      4.5      34  
           54      22.0      "



Sept 7, 1888.

20 <sup>h</sup>	55	10.9	31
	55	27.7	32
	55	59.9	32
	56	10.0	31
	57	14.5	34
	57	31.5	"
	58	13.0	31
	58	30.0	32
	59	2.5	32
20 <sup>h</sup>	59	13.0	31
21 <sup>h</sup>	0	17.4	34
	0	34.0	'

Order in preceding transits 1831,  
1832, 1832, 1831, 1834, 1834.

1831 & 1832 in Southern half, 1834 in  
Northern half.

Obs. rather difficult on account of proximity of  
adjacent star and rather bad atmospheric conditions.

" 2 m. + 50° 2354, 2359. Gr. obs.

16 52 + 50.2

21 19  
4 27 21.19

Clouds

Stopped by clouds.

Sept. 7. 1888.

Hr. 3451.  
 21<sup>h</sup> 56 57.5  
       57 57.7  
       58 57.2

Balloon 103.  
 10<sup>h</sup> 31 0.0  
       32 0.0  
       33 0.0

Sept. 8. 1888.

Hr. 3451.  
 13 8 25.2  
    9 25.5

Balloon 103.  
 1 40 0.0  
   41 0.0



Sept. 10, 1888.

Comet c (1866) Brooks. It. obs.

of (1855)

$$\begin{array}{r}
 14 \quad 6 \quad 22 \quad + 29^{\circ} \quad \sqrt{6.2} \\
 \quad -1 \quad 24 \quad \quad \quad + 9.4 \\
 \hline
 14 \quad 4 \quad 54 \quad + 30 \quad 6.2 \\
 \hline
 D.M. + 50^{\circ} \quad 2358 + \underline{2359}
 \end{array}$$

$$\begin{array}{r}
 -17.1 \\
 \quad 33 \\
 \hline
 \sqrt{1.5} \\
 51.3 \\
 \hline
 568.0
 \end{array}
 \quad
 \begin{array}{r}
 14 \quad 26 \quad + 31. \\
 19 \quad 45 \\
 \hline
 + 5 \quad 19
 \end{array}$$

$$\begin{array}{r}
 2.67 \\
 \quad 33 \\
 \hline
 + 0.1 \\
 20.1 \\
 \hline
 22.1
 \end{array}$$

$$\begin{array}{r}
 14 \quad 08 \\
 20 \quad 21 \\
 \hline
 6 \quad 13
 \end{array}$$

$$\begin{array}{r}
 20 \quad 10 \\
 \quad 23 \\
 \hline
 6 \quad 17 \\
 \hline
 14 \quad 18
 \end{array}$$

After thorough search failed to find comet. Too cloudy.

Sept. 10. 1888.

Mer. Circle Stars.

H. obs.

17	1	+ 49.0
20	5.5	
+ 3	54	

Fr. 3451.

Ballou 103.

21	4	31.6
	5	31.7

9	27	0.0
	24	0.0

2.1	16	51.0	235A
	17	16.5	"
	18	46.7	2359
	18	2.8	"
	18	34.8	58
	18	54.6	"
	19	30.5	59
	19	46.1	"
	20	23.2	58
	20	43.5	"
	21	19.0	59
	21	34.8	"
	21	58.1	58
	22	18.5	"
	22	54.5	59
	23	10.0	1



Sept. 10, 1888.

21 <sup>h</sup>	23	38.5
	23	38.7
	24	34.5
	24	49.8

Order in preceding transits 2358,  
2358, 2359, 2359.  
2358 in northern half outside, 2359 in  
southern half outside.

Considerable cloud. Stars seen with  
difficulty.

Sm. +51° 2171 & 2172

17	2	+54.7
21	45	
+K	K3	

21 <sup>h</sup>	48 <sup>m</sup>	32.9 sec	2171
	48	52.5	2172
	49	38.5	2171
	49	57.0	2172

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21	50	23.5	71
	50	43.3	72
	51	29.5	71
	51	48.0	72
	52	20.8	71
	52	40.0	72
	53	26.5	71
	53	45.0	72
	54	22.1	71
	54	41.7	72
	55	28.1	71
	54	46.5	72
		<del>46</del>	
	56	16.8	71
	56	36.5	72
	57	23.0	71
	57	41.5	72

Order in preceding transits 2171.  
2172, 2171, 2172  
Both in Southern half.



Sept. 10. 1888.

Sun. + 50° 2410, 2411, 2415. Gr. obs.

$$\begin{array}{r} 17 \quad 27 \quad +52.4 \\ \hline 22 \quad 12 \\ \hline 4 \quad 45 \end{array}$$

22h	10m	31.4 <sup>sec</sup>	2410
	11	2.0	2411
	11	25.0	2410
	11	34.1	2415
	11	51.4	2411
	12	27.5	2415

12	57.5	10
13	28.7	11
13	51.3	10
14	1.0	15
14	17.6	11
14	53.6	15

15	30.0	10
16	1.5	11
16	23.9	10
16	33.5	15
16	50.0	11
17	26.0	15

Sept. 10, 1888.

22 <sup>h</sup>	17	55.5 10
	18	27.0 "
	18	49.9 10
	18	59.0 15
	19	15.3 "
	19	51.0 15
	20	24.3 10
	20	56.1 "
	21	18.7 10
	21	28.4 15
	21	44.0 "
	22	20.0 15

Order in preceding transits 2410, 2411.  
 2410, 2415, 2411, 2415  
 2410 in Southern half 2411 & 2415 in  
 Northern half.

Somewhat clearer in last series  
 than in that of on the stars immediately  
 preceding.



Sept. 10. 1888.

Flr. 3451.

22 34 46.3

35 46.5

Barlow 103.

10 57 0.0

58 0.0

Sept. 12. 1888.

B. + C. 1122.			Barlow 103.		
7	27	23.0	7	33	0.0
	28	23.0		34	0.0

Reap. dup. III. Phot. Pr. A. obs.  
Comp. with Sat. I.

7	49	41
	2	12
<hr/>		
7	57	53
7	33	0
<hr/>		
	24	53.

7	27	23.
7	52	16.
<hr/>		

Ap. time eclipse.

Limit of Vis.

7	50	21.0	175.2
		39.0	284.2
		51.0	120.2
	51	4.0	289.1



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7	51	17.0	Snep.
		20.0	seen.
		25.5	175.6
		26.5	205.5
		26.0	179.6
	52	0.0	240.0
		4.5	176.2
		17.5	214.4
		29.0	177.2
		27.0	245.5
	Lat not contin. seen.		
	53	6.0	140.0
		14.5	240.6
		24.5	140.0
		29.0	240.0
		53.5	172.3
	54	14.5	245.7
		14.5	166.1
		27.5	250.0
		27.0	165.0
		26.5	245.1
		57.5	172.0
	55	9.5	245.2
		12.0	165.7
		22.0	252.2
		20.5	163.0
		54.0	259.0

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7	56	4.5	16 3.2	
		14.5	257.0	
		24.0	16 3.2	2
		30.0	249.0	
		42.0	16 3.5	
		54.5	257.0	
	57	7.5	16 3.2	
		19.0	242.7	X
		30.0	159.5	
		42.5	256.2	
		54.5	157.0	X
	58	6.0	260.2	
		17.0	169.3	rej.
	58	39.0	159.0	
		52.5	255.2	
	59	2.0	153.0	X
		22.0	254.4	
		35.0	161.0	
	0	9.0	266.0	X
		21.5	154.9	
		37.5	269.0	
		53.0	151.2	
	1	14.0	262.5	
		25.0	157.0	
		36.5	262.0	
	2	5.0	161.2	
		17.5	269.0	
		31.0	154.2	1
		42.5	265.4	



Sept. 12, 1888,

2	2	58.5	150.0
2	3	7.0	267.1 -
		20.5	160.5 2
		30.5	269.0 -
		50.5	152.0
	4	8.0	262.0 -
		19.0	186.5 3
		35.5	278.2 <del>186.9</del>
		57.0	186.9
	5	12.0	265.2 -
		30.5	151.2 4
		48.5	270.2 -
		54.0	182.0
	6	15.0	263.5 5
		22.0	152.0 -
		41.0	267.5
		59.0	186.0
	7	12.5	267.5 6
		22.0	182.3 -
		41.5	272.0 -
		56.5	180.5
	8	12.5	268.2 7
	Lat. scarcely vis.		
	9	40.0	150.0
		0.0	277.0 -
		12.5	187.1 -
		33.0	274.7 8
		55.5	187.9
	10	12.5	267.0 -

Sept. 12. 1888.

P	11	3.0	147.0	9
		19.0	274.0	
		34.0	145.2	-
		50.5	267.9	-
	12	11.0	140.3	-
		34.5	271.9	-
add 1		52.0	142.0	10
	13	12.0	270.1	-
		47.5	149.3	-
	14	4.0	262.0	11
		42.5	142.5	-
	15	29.0	269.5	-

Last readings difficult and somewhat doubtful.

B. + C. 1182.  
~~For 345 = 1.~~

A	57	21.6
	58	21.5

Ballon 103.  
 3 0.0  
 4 0.0



Sept. 12, 1888,

Comet c (1888) Brooks. H. obs.

$$\begin{array}{r}
 14 \quad 16 \quad 31 \quad +24 \quad 23.2 \\
 \quad \quad -1 \quad 24 \quad \quad \quad +9.4 \\
 \hline
 14 \quad 15 \quad 3 \quad +24 \quad 33.2 \\
 20 \quad 21 \\
 \hline
 \quad \quad -6
 \end{array}$$

or 1455.

$$\begin{array}{r}
 14 \quad 34 \\
 20 \quad 21 \\
 \hline
 +5 \quad 43
 \end{array}$$

Comet evidently not to be seen,  
the atmospheric conditions are so  
bad at this altitude, together with  
the moon.

Mer. Circle Stars. H. obs.

$$\begin{array}{r}
 20 \quad 45 \\
 2 \quad 47 \\
 \hline
 -6
 \end{array}$$

Sept. 12, 1888.

Fr. 3451.  
 20 50 16.7  
     51 16.2

Ballon 103.  
 9 5 0.0  
   6 0.0

2 m. + 51.0 ~~2~~ 649.657. 658.  
 2 54 + 52.0  
 20 55  
 - 5 59

Pos. zero 120.4  
           45

Setting 165.4

21<sup>h</sup> ( ~~12 m 34.6 sec~~  
~~12 52.1~~  
~~14 21.0~~  
~~14 27.0~~  
~~14 50.5~~  
~~15 0.7~~

15 30.2 649  
 15 48.2 "  
 17 17.4 652  
 17 22.5 657  
 17 46.7 "  
 17 57.0 654



Sept. 12, 1888.

21<sup>h</sup>

18	36.9	49
18	55.0	"
20	23.5	58
20	28.7	57
20	<del>23.0</del>	" = 53.0
21	3.3	58

21	30.2	49
21	48.5	"
23	17.1	58
23	22.5	57
23	46.6	"
23	57.4	58

24	26.9	49
24	45.5	"
26	14.0	58
26	19.4	57
26	43.6	"
26	54.0	58

28 — 46.1

~~Order in forecast~~

Sept. 12, 1888.

21	29	24.7	49
	29	43.3	"
	31	11.3	58
	31	17.0	57
	31	41.9	"
	31	52.1	58

Order in preceding transits 649, 649.  
658, 657, 657, 658.

649 in Southern half outside & 657 & 658  
in Northern half inside.

This star in question & two others moderately near it seem to be in about the relative position indicated by D. M. Stars not sufficiently near to be confounded with each other & no star near sufficiently near the one in question (approaching to it in brightness,) to be mistaken for it.



Sept. 12. 1888.

Dr. + 51° 750 4751

3 14 49.3  
 21 54  
 - 5 20

~~21<sup>h</sup> 55<sup>m</sup> 20.6<sup>sec</sup>  
 55 38.8~~

21<sup>h</sup> 56 25.3 750  
 56 43.6 751  
 57 7.4 "  
 57 21.7 750

57 57.2 50  
 58 15.0 51  
 58 39.2 "  
 58 52.8 50

59 20.3 50  
 21 59 38.4 51  
 22<sup>h</sup> 0 2.6 "  
 0 16.0 50

1 15.2 50  
 1 33.5 51  
 1 57.9 "  
 2 11.7 50

Sept. 12, 1888.

22	2	50.5
	3	8.5
	3	32.5
	3	46.5

22	5	27.0	50
	5	45.5	51
	6	9.7	"
	6	23.5	52

Order in preceding transits 750, 751,  
751, 750.

Both in northern half.

Star in question looks a little faint  
& makes transits <sup>tonight</sup> ~~inconvenient~~  
difficult. These ~~stars~~ two stars seem  
to be about the relative position & no  
other stars particularly near them.



Sept. 12, 1888.

(D)  $M. +51^{\circ}$  817; 818.

21 <sup>h</sup>	246	53.6	217
	25	17.9	212
	25	35.5	217
	26	15.0	212

26	55.8	17
27	20.5	18
27	37.7	17
28	16.8	18

29	2.5	17
29	27.0	18
29	44.5	17
30	23.3	18

31	2.6	17
31	27.4	18
31	44.6	17
32	24.1	18

33	8.4	17
33	32.8	18
33	50.5	17
34	29.6	18

Sept. 12. 1888.

Order in preceding transits  
817.818, 817.818.  
Both in Northern half

Star in question quite faint.

Transits tonight taken with a  
little more difficulty than usual  
Stars rather faint <sup>atmospheric</sup> conditions  
somewhat bad.

Fr.	3451.	Ballou	103.
22	46	35.7	11
	47	35.2	1
			2
			0.0
			0.0



Sept. 13. 1888.

Camp. Stars for Var. Gr. obs.

143 R Cassio.

23 52 + 89.6

19 31  


---

 4 21

8h 04m

1 F

5.00

5.29

5.08

5.47

1.50

5.01

5.65

5.25

6.825 >

4 a

3.52

3.60

3.72

3.86

4.31

3.70

3.91

3.72

4.886 >

6 m

2.77

3.00

3.01

3.38

.22

2.88

3.18

3.04

8.952 >

7 R

5.60

5.59

5.40

5.70

3.63

5.59

5.65

5.60

7.28 >

Sept. 13 1888.

.8b  
 3.98 3.98  
 4.00 4.19  
 3.99 4.21 4.35  
 4.06

5.2787

.12c  
 4.10 4.15  
 4.18 4.04 .51  
 4.04 4.00 4.08

5.3047

18e  
 4.22 4.35  
 4.39 4.56 2.34  
 4.35 4.47 4.39

5.7077

2d  
 4.25 4.72  
 4.38 4.97 3.11  
 4.30 4.49 4.52

5.8767

5k  
 5.40 5.58  
 5.48 5.41 2.78  
 5.40 5.51 5.46

7.0987

sh 52

K 1 B

Measurements of "m" made with  
 much difficulty from its being so close  
 to "B" a relatively very faint (over)



Sept. 13, 1888.

Seems fainter than its nominal magnitude would indicate.

Measurements thought to be pretty good as stars are in the North east & moon in opposite quarter of the heavens & only at the half. Sky seems pretty clear. The remaining <sup>comet</sup> stars of R. Cassiopeian not taken as they are easily available for Meridian Photometer.

62 Urs. Maj. Gr. obs.

12	33	+61.7
21	12	
8	39	

10<sup>h</sup> 3<sup>m</sup>

2<sup>th</sup>

3.37	3.32	1.53	
3.29	3.37	3.26	
3.30	2.88		3.8
			4.226

5<sup>th</sup>

2.39	2.59		
2.58	2.69	3.43	
2.78	2.40	2.57	3.841

Sept. 13, 1888.

9m

2.88	2.61	
2.57	2.43	4.04
3.06	2.49	2.67

3.471

10m

3.39	3.35	
3.47	3.39	1.82
3.30	2.92	3.30

4.29

12c

3.74	3.82	
3.98	4.00	5.25
3.91	3.80	3.88

5.044

15c

4.43	4.42	
4.30	4.48	
4.38	4.61	2.62
		4.46

5.772

4J.

Invisible (see notes)

7g

2.98	2.72	
2.69	2.17	3.82
2.28	2.98	2.64

3.402



Sept. 13, 1888.

8<sup>h</sup>

284 3.18

3.12 2.92

3.10 2.90

 $\begin{matrix} * \\ .06 \\ 3.01 \end{matrix}$ 
13<sup>a</sup>3.918<sup>+</sup>

4.42 4.93

4.73 4.59

5.01 4.40

 $\begin{matrix} 4.08 \\ 4.68 \end{matrix}$ 
14<sup>h</sup> 11<sup>b</sup>6.084<sup>+</sup>

4.77 4.97

4.99 5.11

5.11 5.08

 $\begin{matrix} .03 \\ 5.00 \end{matrix}$ 
6.50<sup>+</sup>10<sup>h</sup> 50<sup>m</sup>

T. probably not seen

There is a faint star not very far from the position of T. but it differs too much in position from "g" (both as regards R.A. & Dec.) to be the right star.

the star assumed for 7.5<sup>e</sup> is undoubtedly the correct one as indicated by chart but it seems to be <sup>a little</sup> brighter than is indicated either by chart or by D.M.

Stars getting somewhat low but not particularly faint. Sky seems pretty clear.

10<sup>h</sup> 58<sup>m</sup>

Sept. 13, 1888.

S. Urs. Maj.

2.27      2.40

2.30      2.44

2.50      2.68

This is undoubtedly S. Urs. Maj. being  
in the position of that star according  
to chart.

Other comparison stars for S. Urs.  
Maj. available for Meridian Photometer  
& so not needed here



Sept. 14, 1888.

Comp. Stars for Var.

W. St.

62 Pers. Traj.

12 33 +61.7

19 25

6<sup>h</sup> 52<sup>m</sup> H. A.

2t

3.65

3.48

3.60

3.60

3.65

3.60

3.58

3.60

4.68 <

5d

2.93

2.93

3.06

2.89

3.10

2.75

5.66

2.94

3.822 <

9m

3.73

3.30

3.46

3.45

3.42

3.39

2.75

3.46

4.498 <

10m

3.83

4.10

4.18

3.81

3.97

3.79

5.68

3.95

5.185 <

Sept. 14, 1888.

72 C

4.22	4.50	
4.60	4.75	3.33
4.69	4.57	4.56

5.928 &lt;

15 e

4.42	4.46	
4.32	4.68	2.98
4.40	4.70	4.50

5.85 &lt;

4 J

1.70	2.04	
1.90	1.97	5.77
2.05	2.11	1.96

2.548 &lt;

79 9

2.80	2.75	
2.60	2.70	4.27
2.76	2.66	2.71

3.523 &lt;

8 1/2

2.90	3.12	
2.88	2.98	.09
3.21	3.00	3.02

3.926 &lt;



Sept. 14, 1888.

13 a

4.94	5.00	
5.18	5.28	.60
5.12	5.08	5.10

6.63 "

11 b

4.30	4.75	
4.58	4.86	3.64
4.52	4.63	4.61

5.993 "

8 h 55 m

There is a star preceding "g" about 1 m & 31 sec. which may be "T". Although "T" should precede "g" by about 1 m & 16 sec. but "T" seems to be in right position relative to "k" which is a preceding star. The declination of "T" seems to be about right relative to both "g" & "k" & agrees with the list hence this it may be "T". It was. The "T" of tonight was also seen last night but being wrong with respect to "g" it was assumed not to be "T". Star quite faint. No color perceptible.

Sept. 14, 1888.

64 S Urs Maj.

9h 15m

	1m	
4.74	4.63	
5.05	4.49	
4.61	4.85	4.37
		4.73

	2g		6.149 z
5.28	5.52		
5.27	5.40	2.33	
5.35	5.51	5.39	
			7.007 z

	4b		
3.37	3.43		
3.28	3.30	1.90	
3.20	3.32	3.32	
			4.316 z

5c

(see note at end.)

	6l		
2.93	3.20		
3.19	3.35	74	
3.17	2.90	3.12	
			4.056 z



Sept. 14, 1888.

7 J.

2.49	2.62	
2.52	2.72	3.77
2.73	2.69	2.63

~~8~~ 99

4.00	4.68	3.419
4.22	4.55	
4.32	4.43	2.20
		4.37
		5.681

~~9~~ 8 t

3.42	3.57	
3.44	3.33	2.54
3.48	3.30	3.42

4.446

10 k

2.65	2.82	
2.60	2.70	4.43
2.77	2.89	2.74

3.562

11 x

1.93	2.30	
2.40	2.32	1.77
2.32	2.50	2.30

2.99

13 y

2.22	2.27	
2.18	2.17	
2.23	2.32	

1.39	
2.23	2.899

Sept. 14, 1888.

14a

3.00	3.08	
3.00	3.28	
3.04	3.38	.78'
		3.13'

4.069

15h

5.08	5.41	
5.44	5.34	1.20'
4.93	5.30	5.20'

6.76

9<sup>h</sup> 48<sup>m</sup>

Star "50" is the same as star "15e" taken with 62 Uss. Maj. tonight whence is not repeated in this set. Other stars so not taken are sufficiently bright for Meridian Photometer.

Star assumed to be "14a" is the preceding southern and brighter of two. It is in about the same R.A. as "y" whereas by chart it should follow "y" about 14 sec. The following star of the pair would have about the right difference of R.A. with respect to "y" but the Dec. would be wrong so that. Taken altogether it is probable that the star assumed to be "14a" is the correct one with possibly a slight relative error in charting as the scale is compressed at this Dec.



~~143 R Cassiope~~  
 143 R Cassiope. Gr. obs ~

23 51 +89.7  
 22 05  
 1 46

10<sup>h</sup> 24<sup>m</sup>

1<sup>st</sup>  
 5.61 5.88  
 5.97 5.98 4.92  
 5.60 5.88 5.82  
 7.566 >

2<sup>d</sup>  
 4.77 4.60  
 4.53 4.65 3.90  
 4.82 4.53 4.65

18<sup>e</sup>  
 4.82 4.35 6.045 >  
 4.70 4.12 3.04  
 4.51 4.52 4.51

6<sup>m</sup>  
 3.22 3.20 5.863 >  
 3.34 3.38  
 3.17 3.28 1.59  
 3.26 4.238 >

Sept. <sup>14</sup>~~15~~ 1888.

7 R  
 5.80 6.59  
 5.72 5.40 3.81  
 5.63 5.67 5.64

8 b 7.333  
 4.40 4.32  
 4.00 4.22 .94  
 4.00 4.00 4.16

4 d 5.408  
 3.81 4.13  
 4.20 3.90  
 4.21 3.98 .23  
 4.04

~~5.252~~ 12 c 5.252  
 4.52 4.40  
 4.28 4.47 2.57  
 4.48 4.42 4.43

5.759  
 120 5 k  
 6.14 5.72  
 5.87 5.99  
 5.70 5.78 5.20  
 5.87

10<sup>h</sup> 55<sup>m</sup>

k 2 R

7.631

Other stars sufficiently bright to  
 be observed with Meridian Photometers



Sept. 14, 1888.

Position in these last measurements  
rather constrained as stars are getting  
pretty well up to the zenith.

Sept. 15. 1888.

Hr. 3451			Barlow 103.		
19	17	43.0	7	21	0.0
	18	43.2		22	0.0

Too much cloud for Photometry.

Sm. + 55° 2014704

St. obs.

3	56	+53.7
7	30	
3	84	

3	56
19	45
15	49

2	40	+55.2
19	53	
17	13	

Pos. Zero 1385  
45.  
 Setting 183.5



Sept. <sup>15</sup> 4, 1888.

20 <sup>h</sup>	11 <sup>m</sup>	50.0 sec.	701
	12	33.2	"
	13	44.9	704
	14	<del>28.7</del>	"
	15	0.6	01
	15	44.0	"
	16	55.6	04
	17	39.9	"
	18	15.2	01
	18	58.5	"
	20	9.8	04
	20	54.3	"
	21	44.0	01
	22	26.6	"
	23	38.5	04
	24	23.1	"
	25	0.4	01
	25	42.7	"
	26	54.1	04
	27	39.8	"

Order in preceding transits 701, 701.  
 704 704. 701 in Southern half &  
 704 in Northern half.

Sept <sup>15</sup> 1888.

There is no particular trouble with this star according to list only that it is unlettered in the D. M. & has but one observation with Meridian circle.

Everything looks natural in the sky & there could be no possible confusion with any other stars.

$2m. + \sqrt{2}^{\circ} 753 \pm 757$

3	$\sqrt{6}$
<u>20</u>	<u>45</u>
14	49

$+53.7$

4 <sup>h</sup>	06 <sup>m</sup>	53.2
<u>20</u>	<u>38</u>	
16	52	

21 <sup>h</sup>	3 <sup>m</sup>	29.0 sec	753
	4	5.0	757
	4	27.1	"
	4	37.0	753

4	58.5
5	34.5
5	56.9
6	6.8



Sept. <sup>15</sup> 14 1888.

21<sup>h</sup>      6<sup>m</sup>      27.7  
              7<sup>m</sup>      3.8  
              7      26.4  
                  3

21      8      1.2  
          8      37.0  
          9      0.0  
          9      10.0

         9      35.4  
          10      11.5  
          10      35.1  
          10      44.9

         11      9.3  
          11      45.2  
          12      9.0  
          12      18.8

Order in preceding transits 753, 757, 757,  
 753. Both in Northern half.

The star in question is not double & there is  
 other star near it. no

Sept. 15, 1888.

D. M. + 52° 750, 752 &amp; 758.

21 <sup>h</sup>	2.0 <sup>m</sup>	17.6 <sup>sec</sup>	750
	21	7.7	752
	21	16.9	750
	21	27.0	752
	22	7.9	752
	22	45.6	"
	23	13.6	50
	24	4.0	52
	24	13.4	50
	24	23.5	52
	25	4.1	58
	25	42.0	"
	26	12.3	50
	27	2.3	52
	27	12.2	50
	27	22.0	52
	28	2.9	58
	28	40.5	"



Sept. 15, 1888.

21 <sup>4</sup>	29	13.2	50
	30	3.5	52
	30	13.5	50
	30	24.0	52
	31	4.0	
	31	42.4	
	32	11.9	
	33	2.1	
	33	12.9	
	33	22.9	
	34	2.7	
	34	41.5	

Order in preceding transits 750, 752,  
750, 752, 758, 1758. All in northern  
half.

No star sufficiently near the one in  
question to be confounded with it.  
Star is of about the mag. indicated  
by D. M. and is not double.

Sept. 15, 1888.

$$D.M. + 54^{\circ} \overset{818}{18094} \overset{819}{18}$$

21	49	10.1	209
	50	18.5	"
	51	25.0	219
	52	15.4	"
	54	16.5	209
	55	22.5	"
	56	4.0	216
	56	30.9	219
	56	59.8	215
	57	18.6	219
	58	9.4	09
	59	16.2	09
21	59	57.1	18
22	0	24.0	19
	0	54.0	18
	1	13.0	19
	1	59.9	09
	3	7.0	"
	3	47.5	18
	4	14.1	19
	4	44.5	18
	5	3.5	19



Sept. 15, 1888.

21	5	32.4
	6	40.0
	7	19.8
	7	47.0
	8	17.7
	8	36.5

Order in preceding transits 809, 809,  
818, 819, 818, 819. All in northern  
half.

It is probable that the D.M. is wrong  
in the position of the star in question  
as the note in list would indicate.

The interval between 818 & 819 in D.M.  
is some ~~3~~ sec. by ~~assuming the~~ Whereas  
it is some 23 sec. by ~~the~~ assuming the  
two stars through the corner of the square.

This would account for the 18 sec.  
discrepancy spoken of in the list.  
assuming at the same time that 819  
is the star that is wrong. This  
discrepancy between This relative  
error in the D.M. between 818 & 819  
was noticed after the first set &  
accordingly 818 was included in the  
last four sets.

Sept. 15, 1888.

D. M. + 50° 1074 + 1076

$$\begin{array}{r}
 4 \quad 32 \quad +49.8 \\
 \underline{22 \quad 34} \\
 18 \quad 2
 \end{array}$$

22 <sup>h</sup>	35 <sup>m</sup>	14.0 <sup>sec</sup>	107 <sup>K</sup>
	35	37.4	"
	35	56.0	1076
	36	7.0	"

36	28.2
36	51.5
37	10.2
37	21.3

37	48.6
38	12.5
38	31.2
38	42.3

39	6.1
39	29.1
39	48.0
39	59.5



Sept. 15, 1888.

22 <sup>h</sup>	40	25.0
	40	48.0
	41	6.5
	41	18.0

Order in preceding transits 1074, 1074,  
1076, 1076.

1074 in Southern half outside

1076 in Northern half inside

No other star than 1074 available for  
comparison without going to some  
distances

Fr. 3451.

22	55	14.5
	56	14.7

Ballou 103.

10	54	0.0
	59	0.0

Sept. 24. 1888.

Comet c ~~1888~~ (Brooks), H. obs.

$\approx 1255.$

$$\begin{array}{r} 15 \quad 2 \quad 17 \\ - 1 \quad 30 \\ \hline 15 \quad 6 \quad 47 \end{array}$$

$$\begin{array}{r} + 19^\circ \quad 19.2 \\ + 7.6 \\ \hline + 19 \quad 26.8 \end{array}$$

$$\begin{array}{r} + 2.73 \\ 33 \\ \hline 219 \\ 219 \\ \hline 90.02 \end{array}$$

$$\begin{array}{r} - 13.2 \\ 33 \\ \hline 414 \\ 414 \\ \hline 828.4 \end{array}$$

$$\begin{array}{r} 15 \quad 7 \\ 20 \quad 5 \\ \hline + 45 \quad 4 \\ \hline 20 \quad 17 \\ 15 \quad 19 \end{array}$$

$$\begin{array}{r} 15 \quad 8 \\ 20 \quad 17 \\ \hline 18 \quad 51 \end{array} \quad \begin{array}{r} 20 \quad 17 \\ 15 \quad 8 \\ \hline 5 \quad 9 \end{array}$$

Pos. zero. 1853

Setting.  $\begin{array}{r} 45 \\ \hline 230.3 \end{array}$

20<sup>h</sup>

43 <sup>m</sup>	59.5 sec.	*
44	56.6	*
47	42.9	$\approx$
48	1.2	$\approx$



Sept. 24, 1888.

20 <sup>h</sup>	49	22.0
	50	15.0
	53	7.0
	53	19.1

	54	39.1
	55	33.7
	58	25.4

20	58	39.0
----	----	------

21	0	4.8
	1	1.0

lost

<del>4</del>	<del>41.5</del>
<del>5</del>	<del>39.0</del>

Comet rather low & faint. Moon rising  
~~also observations~~ Only three sets could be  
 taken. Observations  $\frac{2}{3}$  weight.

Order in preceding transits star, star,  
 comet, comet. Both in southern half.

In looking out, find that there is  
 considerable fog which probably makes  
 the comet much fainter, and was the  
 special reason of its disappearing  
 so suddenly.

Fr. 3451 used in previous transits.  
 Comp. Star is  $\text{Dec. } +19^{\circ} 29' 32''$  (A.V.K.)

Sept. 24. 1888.

Fr. 3451  
 21 26 4.9  
 27 5.1  
 $\therefore$  3451 is 40.5 sec.

Ballou 103.  
 A 54 0.0  
 55 0.0

Vesta (4)

H. H.

0 50 -7.4  
 21 52  
 21 A

0 50  
 22 2  
 21 12

Vesta undoubtedly found Bright star  
 not on chart.

Transits

9<sup>h</sup> 35<sup>m</sup>

29.2  
 29.8  
 29.2  
 31882  
 29.4

Vesta follows star 29.4 sec. & is .1' north.



Sept 24 1888

Comparison stars for Vesta

S.D.  $-10^{\circ} 173$  mag. 6.5

" " 164 mag 7.8

" " 180 mag 8.7

Vesta and Comp. Stars. H. obs.

S.D.  $-10^{\circ} 164$

Foggy.

Too foggy for wedge measure.

Transits

28.2

28.1

28.0

mean 28.1

10<sup>h</sup> 11<sup>m</sup>

Vesta now follows star 28.1 sec 4 is 01' south  
Motion of Vesta right in both co-ordinates

Sept. 24, 1888.

Iris (7)

(1455)

$$\begin{array}{r}
 2 \quad 35.3 \\
 - 1.5 \\
 \hline
 2 \quad 33.8 \\
 \end{array}
 \qquad
 \begin{array}{r}
 + 24 \quad 17 \\
 - 2 \\
 \hline
 + 24 \quad 9
 \end{array}$$

$$\begin{array}{r}
 2 \quad 40 \\
 23 \quad 08 \\
 \hline
 20 \quad 28
 \end{array}
 \qquad
 + 24.5^\circ$$

$$\begin{array}{r}
 2 \quad 40 \\
 23 \quad 14 \\
 \hline
 20 \quad 34
 \end{array}
 \qquad
 \begin{array}{r}
 23 \quad 12 \\
 20 \quad 48 \\
 \hline
 2 \quad 24
 \end{array}$$

Iris undoubtedly found. Rather bright star in field not on chart.

Comparison stars for Iris

11      0  
 D M +24° 39.6 Mag 6.0  
 "    +25° 44.9    "    8.0  
 "    +25° 44.1    "    6.7

Still foggy.



Comet 1888 c (Brooks.)

$$\begin{array}{r} 15 \quad 15 \quad 37 \\ -1 \quad 310 \\ \hline 15 \quad 14 \quad 7 \end{array} \quad \begin{array}{r} +17^{\circ} \quad \sqrt{K} \\ +2 \\ \hline +12 \quad 2 \end{array}$$

1855

15 13  
~~14 16~~

~~28~~

20 25

$$+ \sqrt{12}$$

17 45

Pos. Zero 1848  
Setting 45  

---

229.8

20<sup>h</sup> 55

201

20<sup>th</sup>

30 m

24.51

15.5 sec \*

30

38.7

31

5.8 \*

31

21.0 E

~~31 - 562~~

Sept. 26, 1888.

20	32	39.0 *
	33	3.3 $\equiv$
	33	29.9 *
	33	45.1 $\equiv$
	34	32.0 *
	34	56.3 $\equiv$
	35	23.0 *
	35	38.1 $\equiv$
	36	55.2 *
	37	20.0 $\equiv$
	37	47.0 *
	38	2.5 (?) $\equiv$
	38	32.5 *
	38	57.9 $\equiv$
	39	24.5 *
	39	40.4 $\equiv$
	40	18.1
	40	43.0
	41	10.5
	41	26.4

Order in preceding transits star, comet,  
 star, comet.  
 Star in southern half. Comet in  
 Northern half



Sept. 26, 1888.

Comet rather faint & nucleus rather poorly defined.

Comp. Star =  $2^m +17^\circ 24' 54''$  (9.1)  
 " " is unlettered, but the same joined to  $+17^\circ 24' 63''$  (A. & K.) in transits below.

20	56	22.5	(2454)
20	56	51.5	"
21	0	29.8	(2463)
	1	17.9	"

2	7.5	54
2	37.9	"
6	13.9	63
7	3.5	"

7	48.0	54
8	20.0	"
11	54.6	63
12	46.1	"

13	37.5	54
14	11.2	"
17	43.9	63
18	37.2	"

Sept. 26. 1888

20 <sup>h</sup>	19	33.3	<del>54</del>
	20	10.0	"
	23	40.4	63
	24	36.2	"
	25	30.6	54
	26	11.0	"
	29	38.5	- Very near err. of eq.
	30	37.0	

Order in preceding transits unlettered  
unlettered, lettered star, lettered star.  
Both in southern half  
For 3451 used.

Prod. 3451.			Ballon 103.		
21	39	55.7	9	0	0.0
	40	55.9		1	0.0

∴ 3451 is 43.9 slow

Cont

Notes and Comp. Nov. Gr. ob.

$$\begin{array}{r} 0 \quad 49 \quad - 4.1 \\ \underline{22 \quad 0} \\ 21 \quad 11 \end{array}$$

$$\begin{array}{r} 0 \quad 49 \\ \underline{22 \quad 12} \\ 21 \quad 23 \end{array}$$



Sept. 26 1888

Transits

30.5  
 31.0  
30.8  
 3 123  
 30.77 mean

Vesta and Comp. Stars, Gr. obs.

S.D. - 10° 164

9<sup>h</sup> 42<sup>m</sup>

4.93

~~5.77~~ 4.50

4.73

~~5.68~~ 4.79

18.95

9.475

6.16

4.742

1.422

6.16

Vesta.

~~5.77~~~~5.68~~

5.77

5.90

5.64

5.77

23.12

11.56

5.78

1.734

7.514

7.52

S.D. - 10° 173

5.44

5.71

5.47

5.69

11.155

22.31

5.58

1.674

7.254

7.25

Vesta.

600

5.18

5.84

5.72

5.67

22.23

11.615

5.81

1.743

7.553

7.55

S.D. - 10° 180

4.60

4.67

4.61

4.39

Ended at 10<sup>h</sup> 01<sup>m</sup>

9.135

4.58

1.371

5.94

18.27

5.94

Sept. 26, 1888.

Transits

~~30.0~~

28.9

28.9

29.2

This is Vesta as is proved also by transits.

Iris and Comp. Stars. Gr. obs.

2	40	+24.6
<u>23</u>	<u>4</u>	
20	24	

Transits

40.2

40.8

40.8

40.6 Mean

over



Sept. 26. 1886.

Iris and Comp. Stars. W. Sts.

10<sup>h</sup> 35<sup>m</sup>
~~+2~~ + 24° 396  
 6.50 6.23  
 6.42 6.12

Iris.

 5.20 5.32  
 5.39 5.10

+ 25° 449

 4.48 4.83  
 4.70 4.66

Iris.

 5.49 5.13  
 5.39 5.28

+ 25° 441

 5.87 5.68  
 5.70 5.70

Transits

 40.4  
 41.2  
 41.2  
 40.6  
 40.85

 25.27  
 12635  
 6.317  
 1895  
 8.212
8.21<sup>2</sup>
 21.01  
 10.505  
 5.252  
 1.576  
 6.828
6.82<sup>on</sup>
 18.617  
 9.335  
 4.667  
 1406  
 6.067
6.07<sup>on</sup>
 21.29  
 10.645  
 5.322  
 1.597  
 6.919
6.92<sup>on</sup>
 22.95  
 11.475  
 5.737  
 1.721  
 7.458
7.46<sup>on</sup>

Sept 26 1888<sup>A</sup>

11 0 This is Iris beyond question. The <sup>also</sup> motion, although small (necessarily) is in the right direction.  
No such star on chart

Comet 1 f f e (Barnard) Tr. ob.

$$\begin{array}{r} 6 \quad 39 \quad + 42 = \\ 26 \quad \quad \quad \checkmark \\ \hline 19 \quad 26 \end{array}$$

$$\begin{array}{r} \text{Pos. Zero } 175.6 \\ 45.0 \\ \hline 220.6 \end{array}$$

See next page  
for transits.

This "e" turned out to be G. C. 1237, which was a bright nebula near the place and the only nebulous object visible in the bright moonlight.



Sept. 26. 1888.

3	√9	37.4	⊖
	√9	51.0	⊖
4	1	36.9	*
	1	51.5	*
4	3	41.6	
	3	54.6	
	√	39.5	
	√	56.2	

This "E" or as  
S.C. 1437 (see  
previous page)

6	47.2	⊖
7	1.0	⊖
8	45.2	*
9	2.0	*

9	√3 K	⊖
10	7.0	⊖
11	√1.5	*
12	8.0	*

13	17.5	
13	31.0	
15	15.2	
15	31.9	

Order in preceding transits, ⊖, ⊖,  
\* \*

Comet south inside - and \* north  
outside.

Comp. star is double - Southern, slightly  
fol. and btr. comp. used.

8.6<sup>h</sup>.1002 = Comp. star = +9° 12' 45". (7.0 K)

Sept. 27. 1888.

Vesta and Comp. Stars. W. obs.

0	40	-2.1
20	40	
19	52	
20	52	
2	4	

0	48
20	45
19	57

	48
20	55
20	7

Transits

17.0  
17.2  
17.5  
17.23 Mean

8 h 30 m

S.D. -10° 164

4.91 5.17  
5.22 5.28

20.58  
5.145 6.69

Vesta

5.93 5.65  
5.88 5.86

23.32  
5.83 7.58

S.D. -10° 173

5.65 5.56  
5.40 5.51

22.12  
5.53 7.18



Sept. 27, 1888.

J.D. -10 Vesta

5.51 5.80

5.77 5.83

22.91  
5.73 7.44

J.D. -10° 180

4.61 4.71

4.61 4.61

18.54  
4.62 6.02

Transits

18.7

19.2

19.3

3(572

19.07 Mean

This is Vesta as proved by D.M. &  
transits  
Ended at 9.00

Comp. Stars for Var. H. Ab.

121  $\pi$  Aquilae

20 1 +16.2

22 5

2 4

Sept. 27, 1888.

Comp. Stars for Var. Gr. ds.  
126 a N Cygni.

20	44	+47.~
22	22	
<hr/>		
+1	3 f	

22	~v
+1	41

9<sup>h</sup> 5-4<sup>m</sup>

1e

4.57	4.62	
4.40	4.50	2.09
		4.52 >

2f

4.72	4.52	
4.60	4.58	2.42
		4.60 >

5.876 &gt;

3d

4.40	4.25	
4.11	4.18	.94 >
		4.24 >

5.98 &gt;

4c

3.35	3.18	
3.27	3.30	1.10 >
		3.28 >

5.512 &gt;

5-BV

2.72	2.81	
2.60	2.70	2.83
		2.71 >

4.264 &gt;

3.523 &gt;



Sept. 27, 1888.

6a

3.20

3.40

3.45

3.32

1.37

3.34 &gt;

4.342 &gt;

7b

2.48

2.61

2.55

2.72

2.36

2.59 &gt;

3.367 &gt;

K  
8<sup>\*</sup>X rather faint  
for wedge.

1.90

1.75

1.98

1.83

3.46

1.86 &gt;

2.418 &gt;

9

5.19

5.25

5.10

5.30

5.84 &gt;

5.21

6.773 &gt;

The chart seems to be slightly in error but "V" although somewhat faint is unmistakably identified by its red colour.

Star "7b" assumed to be star following "N" 27 sec 1.5 south. "7b" also has a faint companion slightly preceding it & a little south.

Ended at 10<sup>h</sup> 17<sup>m</sup>

Sept. 27. 1866.

Iris and Comp. Stars. H. obs.

$$\begin{array}{r} 2 \quad 40 \quad + 24.6 \\ 23 \quad 10 \\ \hline 20 \quad 30 \end{array}$$

$$\begin{array}{r} 2 \quad 40 \\ 23 \quad 17 \\ \hline 20 \quad 37 \end{array}$$

10<sup>h</sup> 40<sup>m</sup>

+ 24° 39' 6"

6.43

6.40

6.39

6.31

25.53<sup>1</sup>8.30<sup>29</sup>

$$\begin{array}{r} 12.765 \\ 6.382 \\ 19.15 \\ \hline 8.297 \end{array}$$

Iris

5.18

5.30

5.23

5.35

$$\begin{array}{r} 21.06^1 \\ 10.53 \\ 5.265 \\ 15.79 \\ \hline 6.844 \end{array}$$

6.84<sup>4</sup>

+ 25° 41' 49"

4.89

5.01

5.20

5.05

$$\begin{array}{r} 20.15^1 \\ 10.075 \\ 5.038 \\ 15.11 \\ \hline 6.549 \end{array}$$

6.54<sup>5</sup>

Iris

5.42

5.47

5.31

5.47

$$\begin{array}{r} 21.67^1 \\ 10.835 \\ 5.417 \\ 16.25 \\ \hline 7.042 \end{array}$$

7.04<sup>5</sup>

+ 25° 44' 1"

5.61

5.90

5.84

5.92

$$\begin{array}{r} 23.27^1 \\ 11.635 \\ 5.8175 \\ 17.45 \\ \hline 7.562 \end{array}$$

7.56<sup>5</sup>



Sept 27 1888

Dris

Clouds in the vicinity during a portion of Observations but as watch was kept of them probably observations not perceptibly affected.  
 Ended at 10<sup>59</sup> m

Sept. 28. 1888.

Fr. 3451.  
 12 46 10.0  
 K7 15.1

Ballon 103.  
~~#2~~ 0 0.0  
 1 0.0

3451 is 46.0 slow.

Sept. 24. 1888.

Comp. Stars for Var. Tr. obs.  
143 R Cassio.

23	51	+49.7
20	25	
<del>20</del>	<del>54</del>	

23	51	23
20	<del>30</del>	
20	39	

Clouds, delay obs.

1t

8<sup>th</sup> 3596

6.09	6.10	
6.11	6.05	
6.13	6.12	6.60
		6.10
		7.93

2d

4.86	4.70	
4.60	4.70	
4.88	4.66	4.40
		4.73
		6.149

18c

4.38	4.82	
4.20	4.66	
4.59	4.67	3.32
		4.55
		5.915



Sept. 28, 1888.

6m

2.82	3.12	
3.08	3.32	
3.12	3.19	.65
		3.11

4.043 &gt;

7R

5.99	5.62	
5.99	5.78	
5.68	5.86	4.92
		5.82

8b

7.566 &gt;

42

4.02	3.99	
4.32	4.13	.84
4.16	4.22	4.14

5.382 &gt;

4a

4.00	4.11	
3.80	4.07	
3.90	4.11	5.99
		3.998 = 4.00

12C

5.23

4.30	4.44	
4.09	4.22	1.63
4.30	4.28	4.27

5k

5.551 &gt;

5.90	5.68	
5.83	5.80	4.85
5.82	5.82	5.81

k 1 R in finder

End of at 9:07

7.553 &gt;

Sept. 24. 1888.

Comp. stars for 143 Cassio. getting  
at a rather inconvenient altitude during  
latter part of night, but probably not  
so high as to affect observations.  
Beginning of night delayed by clouds.

Vesta and Comp. Stars. Gr. obs.

$$\begin{array}{r} 0 \quad 44 \quad -2.1 \\ 22 \quad 4 \\ \hline 21 \quad 16 \end{array}$$

Transits

20.2

20.9

20.0

20.37 Mean

9h 40m

S.D. -10°16.4

5.11

5.20

5.02

5.30

20.63

10.315

5.16

1548

6.708

6.71

Vesta

5.99

5.81

5.92

5.88

23.60

7.67

292.25

180

472.25

59.00

S.D. -10°17.3

6.10

5.94

5.98

6.03

11.80

590

177

7.67

12.025 24.05

6.013

1403

7.89



Sept. 28, 1888.

Vesta

5.81 5.65

5.87 5.68

S.D. -10° 180

4.80 4.65

4.82 4.70

$$\begin{array}{r} 23.01 \\ 11.505 \\ 5.752 \\ \hline 17.25 \\ 7.477 \end{array}$$

7.48

$$\begin{array}{r} 18.97 \\ 9.485 \\ \hline 4.74 \\ 14.22 \\ \hline 6.162 \end{array}$$

6.17

Transits

20.1

19.2

19.0

19.2

19.4

This is Vesta & motion is in right  
direction.

Entered at 10:07<sup>h</sup> m

Locis and Comp. Stars. Tr. ob.

2 40

+24.6

23

3

20

23

Transits

29.9

29.5

30.0

29.8 Mean

Sept. 28, 1888.

10<sup>h</sup> 28<sup>m</sup>
 $+ 24^{\circ} 396$   
 6.48      6.37  
 6.48      6.14

$$\begin{array}{r} 25.47 \\ 12.735 \\ 6.367 \\ 19.10 \\ \hline 8.277 \end{array}$$

" 8.28 "

~~25~~ Iris

 5.12      5.32  
 5.25      5.22

$$\begin{array}{r} 20.91 \\ 10.455 \\ 5.227 \\ 15.68 \\ \hline 6.795 \end{array}$$

 " 80<sup>h</sup> 6.79

 $+ 25^{\circ} 449$ 

 5.28      4.88  
 5.17      5.15

$$\begin{array}{r} 20.48 \\ 10.24 \\ 5.12 \\ 15.36 \\ \hline 6.656 \end{array}$$

 " 6.65<sup>6</sup>

Iris

 5.32      5.37  
 5.22      5.39

$$\begin{array}{r} 21.30 \\ 10.65 \\ 5.325 \\ 15.97 \\ \hline 6.922 \end{array}$$

 " 6.92<sup>1</sup>
 $+ 25^{\circ} 441$ 

 5.92      5.90  
 6.05      5.90

$$\begin{array}{r} 23.77 \\ 11.885 \\ 5.942 \\ 17.83 \\ \hline 7.725 \end{array}$$

 " 7.72<sup>2</sup>

Transits

30.0

30.0

29.8

29.93

Mean

Ended at 10<sup>h</sup> 53<sup>m</sup>



Sept. 29. 1888.

~~143 R Cassio.~~

~~Tr. ob.~~

64 N. W. W. W. W.

Tr. ob.

12	40	+6	1.1
20	26		
<hr/>			
7	46	12	40
		20	41
		8	1

7h 40m

1m

4.85	4.63	
4.72	4.78	4.46
4.60	4.88	4.74

6.162 >

2g

5.45	5.22	
5.35	5.28	1.40
5.10	5.30	5.23

6.799 >

4h

3.35	3.08	
3.20	3.38	1.37
3.26	3.10	3.23

4.199 >

~~5C~~

Sept. 29, 1888.

6l

3.00	3.08	
3.22	3.12	.92
3.15	3.35	3.15'

4.095'

70

2.65	2.68	
2.52	2.72	3.78
2.60	2.61	2.63'

3.419'

99

4.47	4.42	
4.32	4.52	2.58
4.30	4.55	4.43'

5.759'

8t

3.45	3.52	
3.27	3.38	2.42
3.50	3.30	3.40'

4.42'

10k

2.82	2.75	
2.60	2.85	4.49
2.68	2.79	2.74 <sup>5</sup> 3.575'
		3.563

11x

2.40	2.43	
2.25	2.18	1.64
2.22	2.16	2.27 2.951



Sept. 29, 1888.

13 y

2.25	2.12	
2.32	2.28	1.52
2.18	2.37	2.25.

2.925 >

14 a

3.27	3.18	
3.00	3.05	.67
3.15	3.02	3.11

4.043 >

15 h

5.33	5.18	
5.38	5.10	1.50
5.20	5.31	5.25

6.825 >

Ended at 8<sup>h</sup> 15<sup>m</sup>

123 R Delfahini I. Obs

9<sup>h</sup> 20<sup>m</sup>

19 y

3.69	3.80	
3.71	3.82	4.49
3.43	4.04	3.75

4.875 >

2 h

3.60	3.82	
3.55	4.29	5.03
3.87	3.90	3.84

4.992 >

Sept. 29, 1888.

3m

4.20	4.20	
4.47	4.10	1.18
4.21	4.00	4.20

L.

5.46

4d

3.31	3.40	
3.50	3.52	2.54
3.42	3.39	3.42

4.4467

5x

2.60	2.61	
2.70	2.60	3.95
2.90	2.54	2.66

3.4587

6f

2.80	2.50	
3.40	3.00	5.78
2.98	3.10	2.96

3.8487

7y

2.20	1.91	
2.40	1.92	5.2
2.10	1.99	2.09

8b

3.20	3.62	
3.49	3.20	2.78
3.78	3.49	3.46

2.7177

4.4987



Sept. 29, 1888.

9a  
not seen see book 42 page 124

10g  
see book 40 page 143

2.10

2.28

2.40

2.00

2.39

2.28

1.45

2.24

2.912

11B

1.00

1.21

1.30

1.58

1.22

1.14

1.45

1.24

1.612

12e

3.38

3.05

3.10

3.33

3.22

3.56

1.64

3.27

4.251

13e

3.40

3.61

3.61

3.70

3.59

3.66

3.57

3.59

4.667

14c

3.37

3.48

3.60

2.70

3.08

3.30

1.53

3.26

4.238

Sept. 29, 1888.

15 b

4.03	4.01	
4.00	4.00	.93
4.49	4.40	4.16
		5.408

16 g  
see book 40 page 143

2.80	2.70	
2.77	2.90	4.75
2.68	2.90	2.79
		3.627

17 h  
see book 40 page 143  
but the place there <sup>should be</sup> given as 9<sup>h</sup> 30<sup>m</sup> 31<sup>s</sup>  
8<sup>h</sup> 31<sup>m</sup> instead of ~~8~~ 10<sup>m</sup> 31<sup>s</sup>

3.20	3.46	
3.17	3.60	
3.04	3.70	2.17
		3.36

18 d  
see book 40 page 143

4.20	4.41	
4.38	4.50	3.09
4.60	5.00	4.52
		5.876

19

5.60	5.89	
5.69	5.90	4.53
5.68	5.77	5.76
		7.488



Sept. 29, 1888

209  
prob. same as no. 13.

21  
prob. same as no. 45  
Kw  
Star following  $\gamma$  4 sec 0.5 south  
see book 42 page 124.

1.10

1.08

1.23

1.01

0.83

0.98

.23

1.04

Ended at 11<sup>h</sup> 15<sup>m</sup>

1.352

11 15

$\gamma$  4 R

w 1 R

Sept. 30, 1888

Comparison stars for T. Delphini (128)  
 Clouds delay observations  
 S. obs.

9 55 d 4123  
 4135  
 4103

a 3.91  
 3.99  
 3.56

Clouds interrupt.



Oct. 2. 1888.

Cloudy still.  
Possibly can get a 2m. star.  
2m. + 53°, 843. 848. 849. 850. 851. 852.

$$\begin{array}{r} 4 \quad \sqrt{K} \quad + 53.2 \\ 21 \quad 27 \\ \hline 16 \quad 33 \end{array}$$

Cloudy still.

$$\begin{array}{r} 4 \quad 46 \quad + 53.5 \quad \overline{843.} \\ 21 \quad 36 \quad \wedge \quad \underline{848, 849, 850.} \\ \hline 16 \quad 50 \end{array}$$

$$\begin{array}{r} 21 \quad 45 \\ \hline 16 \quad 57 \\ 7 \quad 12 \\ \hline 16 \quad 58 \end{array} \quad \begin{array}{r} 21 \quad 45 \\ \hline 16 \quad 57 \\ 7 \quad 12 \\ \hline 16 \quad 58 \end{array}$$

Only one star visible in finder & scarcely any in large telescope.

Somewhat clearer.

$$\begin{array}{r} \text{Pos. Jno } 354.2 \\ \hline 45 \\ \hline 309.2 \end{array}$$

$$\begin{array}{r} \text{Setting } 309.2 \end{array}$$

More cloudy again.

Oct. 2, 1888.

Star in question invisible from clouds

21 <sup>h</sup>	56 <sup>m</sup>	19.0 <sup>sec</sup>	
	56	47.5	Rej.
	58	10.4	Through clouds.
	58	43.0	
	59	30.1	
22 <sup>h</sup>	0	0.0	

preceding set through clouds  
 Star 849 not taken in previous transits  
 Too cloudy for transits at present.

22 <sup>h</sup>	5	45.0	AK3
	6	14.4	"
	7	24.9	AK9
	7	38.5	AKA
	8	19.2	AKA
	8	28.9	AK9
	8	56.1	AK0
	9	27.3	AK0

	10	10.5
	10	46.5
	11	50.8
	12	4.5
	12	35.0
	12	54.5
	13	22.0
	13	53.6



Oct. 2, 1888.

22	14	32.2	PK3
	15	3.5	"
	16	13.5	PK9
	16	27.1	PKK
	16	57.2	PKK
	17	16.7	PK9
	17	43.9	PK50
	18	16.5	PK50

18	57.4
19	28.9
20	39.0
20	52.5
21	22.0
21	41.3
22	8.8
22	42.5

22	23	58.9
	24	31.6
	25	41.5
	25	55.1
	26	23.5
	26	43.0
	27	10.5
	27	44.5

Order in preceding transits 843843, 849,  
 848, 848, 849, 850, 850,  
 843 & 850 in northern half, - 848 & 849 in southern

Oct. 2, 1888.

Mr. next set to last, stars somewhat dim.

There is Star 848 (the one in question) has a quite faint star several seconds preceding & a little south, but not near enough, or bright enough, to be confounded with it.

Star 849 has a companion, considerably fainter, a little south preceding. Estimated distance of companion to 849, 28".

Cloudy again

Growing clearer again, and perhaps will be clear enough for  
Vesta and Comp. Stars. W. obs.

0	44	- 41
23	3	
22	15	

Transits

Vesta, per se I.D. 7m 20.4 sec.  
& is 1.2 north of it.

Transits

15.0

15.4

15.2

15.2

For obs. see  
next page.



Oct. 2, 1888  
Transits

150

154

152

154

15.3 mean

Clouds  
Clear again

S.D. -10° 164

10 30

5.21

5.40

4.98

5.23

2082

10.41

5.20

156

6.76

6.76

Vesta

5.83

5.98

5.70

6.02

23.53

11765

588

1764

7.644

7.645

S.D. -10° 173

5.87

6.02

5.88

6.20

23.97

11985

599

1797

7.787

7.79

Vesta

5.90

5.80

6.00

6.00

23.70

1185

592

1776

7.696

7.70

Oct. 2, 1888.

J.D. -10° 180

4.67

4.62

4.50

4.91

18.70  
 9.35  
 14.65  
 1.40  
 6.87

608  
~~2.88~~

Somewhat slightly troubled by  
 clouds <sup>once</sup> during preceding observations, but  
 as watch was kept of them & they passed  
 off rather rapidly, probably observations  
 not affected.

Ended at 10 52



Oct. 3, 1888.

Comp. Stars for Var.

Gr. obs.

20 33 +15.5

21 25  
+ 52

127 *S* Delphini.

8<sup>h</sup> 55<sup>m</sup>

3.33 d<sup>(1)</sup>  
~~2.93~~ (wrong)  
3.40

3.48

3.20

1.41  
3.357

a

4.3557

3.88

3.93

4.00

3.98

3.79  
3.957

b

5.1357

4.70

4.60

4.66

4.40

2.36  
4.597

c

5.9677

4.53

4.67

4.65

4.77

2.62  
4.667

6.0587

d

4.12

4.43

4.45

4.47

1.47  
4.377

5.6817

Oct, 30, 1888.

$\begin{matrix} 3.29 \\ 3.62 \end{matrix}$ 
 $\begin{matrix} g \\ \end{matrix}$ 
 $\begin{matrix} 3.58 \\ 3.59 \end{matrix}$ 
 $\begin{matrix} 2.08 \\ 3.52 \end{matrix}$

$\begin{matrix} 2.28 \\ 2.37 \end{matrix}$ 
 $\begin{matrix} m^{(1)} \\ \end{matrix}$ 
 $\begin{matrix} 2.67 \\ 2.70 \end{matrix}$ 
 $\begin{matrix} 2.02 \\ 2.50 \end{matrix}$ 
 $4.576 >$

$\begin{matrix} 4.47 \\ 5.02 \end{matrix}$ 
 $\begin{matrix} d^{(2)} \\ \end{matrix}$ 
 $\begin{matrix} 4.79 \\ 4.90 \end{matrix}$ 
 $\begin{matrix} 3.18 > \\ 4.80 > \end{matrix}$ 
 $3.25 >$

$\begin{matrix} 2.75 \\ 2.99 \end{matrix}$ 
 $\begin{matrix} f \\ \end{matrix}$ 
 $\begin{matrix} 3.10 \\ 3.10 \end{matrix}$ 
 $\begin{matrix} 3.94 > \\ 2.98 > \end{matrix}$ 
 $6.24 >$

$\begin{matrix} 3.20 \\ 3.20 \\ \hline 6.40 \end{matrix}$ 
 $\begin{matrix} m^{(2)} \\ \end{matrix}$ 
 $\begin{matrix} 3.20 \\ 2.90 \\ \hline 6.10 \end{matrix}$ 
 $\begin{matrix} 3.12 > \\ 1.3 \\ \hline 3.936 \\ 4.056 > \end{matrix}$ 
 $3.874 >$ 
 $\text{Wrong star}$

$\begin{matrix} y \\ \end{matrix}$ 
 $\text{The star measured next above was "y."}$

$\begin{matrix} 2.62 \\ 2.62 \end{matrix}$ 
 $\begin{matrix} m^{(2)} \\ \end{matrix}$ 
 $\begin{matrix} 2.90 \\ 3.02 \end{matrix}$ 
 $\begin{matrix} 3.16 > \\ 2.79 > \end{matrix}$ 
 $\begin{matrix} 2.99 \\ 3.37 \\ 3.77 \\ 8.13 \end{matrix}$ 
 $3.62 >$



Oct. 3, 1888.

L

5.21

5.38

5.45

5.18

1.22

5.30

6.29

Ended at 9<sup>h</sup> 33<sup>m</sup>10 46 ~~10 46~~ S 3 a

Vesta and Comp. Stars. W. ds.

0	42	-A.1
<u>23</u>	<u>4</u>	
22	16	

9 55

J.D. -10° 164

5.00

5.09

5.01

4.95

20.05

10.025 6.52

5.012

1.503

6.515

Vesta

5.73

5.75

5.52

5.98

22.98

11.49

7.46

5.745

1.723

7.468

J.D. -10° 173

6.32

5.98

6.12

6.42

5.90

6.22

25.08

12.54

6.27

1.881

8.151

8.15

Oct. 3, 1888.

Vesta

5.98	5.92		
5.90	5.86	23.66	7.68
		11.83	
		5.915	
		1.774	
		7.689	
L.D. -10° 180			
5.00.	5.41		
5.12	5.38	20.91	6.79
		10.455	
		5.227	
		1.568	
		6.795	

Ended at 10 14

Iris and Comp. Stars. H. obs.

2	40	+24.6
23	30	
20	50	

10 34

	+24° 39.6	
6.47	6.32	
6.40	6.33	25.52
		12.76
		6.38
		1.914
		8.294

Iris

5.62	5.41	
5.49	5.46	21.98
		10.99
		5.495
		1.648
		7.143
		7.14
		5.1
		4.1
		6.98
		10.685
		5.342
		1.603
		6.98

+25° 44.9

5.33	5.35
5.28	5.40



Oct. 3, 1888.

Iris

5.07

5.55

5.22

5.61

21.45  
10.725  
5.362  
16.09  
6.971

+25° 441

5.80

5.83

5.96

5.90

23.49  
11.745  
5.872  
17.62  
7.634

Ended at 10 53

Oct. 5. 1888.

D m. + 49° 13034 + 1303 / 1300 + 1306 Gr. obs.

$$\begin{array}{r} 4 \quad 55 \quad + 51.3 \\ 21 \quad 23 \\ \hline 16 \quad 28 \end{array}$$

Stars. Cloudy Impossible to identify

Stars seen for a short interval but only long enough to identify region & obtain position of zero

1303 is probably the north following & slightly brighter of two. both however rather faint

9<sup>h</sup> 30<sup>m</sup>

Still thickly cloudy  
Apparently closed in for the night

~~a stop watch comparison of 1303 with 1305 shows that the star in question must be the north following of two faint stars, both being however about equally bright.~~

~~Cloudy again. No stars visible~~

(This remark written accidentally on this page - see page 155)



Oct. A. 1888.

Comet a 1888 (Brooks)

Gr. obs.

$$\begin{array}{r}
 \cancel{6} \quad \cancel{30} \quad \cancel{11} \quad \cancel{+7} \quad \cancel{37} \\
 15 \quad 54 \quad A \quad +10 \quad 15 \\
 \quad \quad -1 \quad 35 \quad \quad \quad +6 \\
 \hline
 15 \quad 52 \quad 33 \quad +10 \quad 21 \\
 21 \quad 0 \\
 \hline
 +5 \quad A
 \end{array}$$

$$\begin{array}{r}
 \cancel{3.27} \\
 +2.47 \\
 \hline
 30 \\
 \hline
 461 \\
 \hline
 94.71
 \end{array}$$

$$\begin{array}{r}
 -10.4 \\
 \hline
 33 \\
 \hline
 212 \\
 \hline
 243.2
 \end{array}$$

$$\begin{array}{r}
 15 \quad 52 \quad 33 \\
 21 \quad 14 \\
 \hline
 5 \quad 22
 \end{array}$$

Pos zero 138.5

Setting 183.5

21 <sup>h</sup>	19 <sup>m</sup>	24.7 sec.	E
	19	42 1.8	E
	20	46.5	*
	21	10.7	*

Oct. 8, 1888.

<del>21</del>	<del>51</del>	<del>59.5</del>
	(22)	(32.0)

21	23	22.8
	23	55.5
	24	57.0
	25	8.7

	25	58.6
	26	31.5
	27	33.7
	27	44.5

	28	44.8
	29	19.5
	30	20.0
	30	29.5

	<del>31</del>	<del>21.7</del>
	<del>31</del>	<del>56.0</del>

	33	2.5
	33	37.9
	34	38.0
	34	46.0

	35	31.9
	36	7.8
	37	8.2
	37	14.9



Oct 8 1888

Order in preceding transits, Comet,  
Comet, star, star.Comet in southern half & star in  
northern half.Comet extremely faint & observations  
difficult.

Comparison star = D.M. +10° 2943 (9.2303)

Last set a little more uncertain than  
the others

	Fr. 3451		Ballou 103.
21	53	44.2	27 0.0
	54	44.4	28 0.0

∴ 3451 is 1" <sup>v</sup> at slow

Comp. Stars for Var.

Yr. obs.

20 40 +15.6

22 15

+1 35

12 A T Delphin.

2d

2 59

358

3.11

3.43

3.20

1.327

3.337

4.3297

3a

3.12 avg  
3.67  
3.51

3.80

3.74

2.747

3.687 4.7847

Oct. 8, 1888.

4h

2.12	240	
2.28	2.62	1.42 >
		2.36 >

5m

2.80	<del>2.06</del>	3.068 >
3.08	2.91	3.85
		2.96 >

6h

2.10	1.82	3.848 >
1.99	1.91	3.82
		1.96 >

7J  
Invisible.

2.548 &gt;

8g

2.01	1.88	
1.99	1.80	3.68 >
		1.92 >
		2.486 >

9f

2.65	2.62	
2.68	2.77	2.72
		2.68 >

10h

3.25	3.35	
3.52	3.21	1.33
		3.33 >
		4.329 >



Oct. 8, 1888.

11c

4.38

4.40

4.13

4.47

1.38

4.34 &gt;

12d

5.642 &gt;

5.64

5.30

5.26

5.18

1.38

5.34 &gt;

14y

6.942 &gt;

1.50

1.47

1.48

1.51

1.96

1.49 &gt;

1.93 &gt;

Star assumed to be "89" has a faint  
 star slightly south preceding.  
 "5m" assumed to be the preceding  
 northern & brightest of three.  
 "2d" has a star somewhat fainter following  
 1 sec & 1.5 north.

"6x" assumed to be a star having another  
 one about equally bright following it  
 a few sec & slightly south.

~~Last part of observations certainly affected~~  
 Last two stars quite certainly affected  
 by clouds & possibly some of the others  
 as the presence of clouds was only known  
 by noticing that the stars were growing  
 dim.

Ended at 9<sup>h</sup> 35<sup>m</sup>

Oct. 8, 1888,

10 35

Still cloudy everywhere & no further  
chance for work.



Oct. 10. 1888.

Comet 1888c (Brooks) Obs.

$$\begin{array}{r} 15 \quad 59 \quad 42 \quad + \quad 2 \quad 43 \\ 21 \quad 00 \\ + 5 \quad 11 \\ \hline \end{array}$$

Pos. zero 146N

$$\begin{array}{r} 45.0 \\ \text{Setting } 191.5 \end{array}$$

21<sup>h</sup>

17 <sup>m</sup>	29.5 <sup>sec</sup>	OE
18	8.0	E
19	29.5	*
19	46.8	*

20	55.7
21	34.0
22	54.6
23	12.9

<del>24</del>	<del>5.8</del>
<del>24</del>	<del>44.6</del>

Oct. 10, 1888

21 — 27 — 8.6

21	28	29.6
	29	7.0
	30	27.0
	30	44.2

31	45.0
32	22.0
33	41.3
33	59.5

35	10.4
35	47.2
37	6.0
37	25.4

Order in preceding transits comet, comet, star, star, comet in southern half inside. Star in northern half outside.

Comparison star = D. M. +8° 3141 (6.4 H)

Comet extremely faint & proper at about the quarter as well as comet low. ~~No central condensation~~ Scarcely any central condensation but rather a diffused patch of nebulous light.

For Chron. (3451) comparisons, see p. 154 & c.



Oct 10 1888  
~~Chirinus~~  
 Comp. Stars for Var. Gr. ob.

20	25	+17.0
21	59	
<hr/>		
	24	

12 A J Delphin.

8 42

3.90 2d  
 seen to be wrong ~~3.24~~ 3.72  
 4.19 3.84 3.65  
 3.91 >

3a

5.083 >

3.57	3.38	
3.50	3.50	1.95
		3.49 >

4h

4.537 >

2.51	2.30	
2.50	2.40	1.72
		2.43 >

5m

3.159 >

2.90	3.09	
3.04	2.98	.01
		3.00 >

3.9 >

6x

1.82	1.64	
1.77	1.74	2.97
		1.74 >

7T

2.262 >

Invisible

Oct. 10, 1888.

8g

1.70

1.84

1.70

1.61

2.85

1.71 &gt;

2.223 &gt;

9f

2.96

2.90

2.99

3.10

3.95

2.99 &gt;

10b

3.42

3.48

3.38

3.39

1.67

3.42 &gt;

3.887 &gt;

11e

4.27

4.32

3.89

4.08

.56

4.14 &gt;

4.446 &gt;

12d

4.75

4.78

4.43

4.46

2.42

4.60 &gt;

5.383 &gt;

5.98 &gt;

14y

1.77

1.87

1.88

1.98

3.50

1.88 &gt;

2.4447

Ended at 9 29  
 Star (13) is the same as "8g."



Oct. 10. 1888.

Vesta and Jup. Stars. Gr. M.

0	52	-2.0
22	57	
<hr/>		
22	9	

0-3

Transits

11.0

11.2

11.5

~~11.35~~ 11.35 mean

9 38

JD - 10° 164

5.00

5.35

5.14

5.37

20.86

10.143

5.215

15.64

6.789

6.78

Vesta

5.61

6.22

5.89

6.21

23.93

11.965

5.9825

17.977

7.777

7.78

JD - 10° 173

6.20

6.18

6.42

6.14

24.94

12.47

6.235

18.79

8.105

8.10

Vesta

5.98

5.73

5.88

5.68

23.27

11.635

5.817

17.45

7.54

Oct. 10, 1888.

S.D. -10° 180

4.88

5.10

4.80

4.87

19.65

6.39

9.825

4.912

1.474

6.386

Transit

12.9

12.2

12.1

12.4

10 12

This is Vesta as is indicated by its motion as well as by its absence from D. M. chart.

Pos and Comp. Stars. G. obs.

2	40	+ 24.6
12	00	
9	20	

10 32

+ 24° 396

6.20

6.38

6.26

6.41

25.25

8.21

12.625

6.312

1.894

8.206

Ins

11.08

5.47

5.60

5.54

5.40

5.69

22.16

7.20

1.662

7.202



Oct. 10, 1888.

+25° 449

5.50

5.22

5.20

5.58

21.50 6.99  
 10.75  
 5.875  
 16.12  
 6.987

Iris

5.42

5.39

5.61

5.60

22.02 5.1  
 11.01 7.14  
 5.505  
 16.51  
 7.156

+25° 441

5.80

5.79

5.80

5.78

23.17 7.53  
 11.585  
 5.792  
 17.38  
 7.530

10 53

This is Iris beyond any doubt as motion is right in amount & direction relative to position in last observation. No I.D. star of this brightness on I.D. chart.

Oct. 11. 1888.

For. 3451.

3 26 20.4  
 27  
 28 20.8

Ballou 103.

1 49 0.0  
 50 0.0  
 51 0.0

∴ 3451 is 1" 16.5 slow.

Oct. 11. 1888.

Too cloudy for Photometry, as yet but possibly may be clearer before long.

Not clear enough yet for Photometry.

Dec. + 49° <sup>1298</sup> 1303, ~~1300~~ + 1306. N.O. hr

4	56	+ 51.2
22	00	
17	4	

4	56
22	10
17	14

Region identified

Cloudy. Stars invisible

Pos. Zero 315.7

Setting  $\frac{45}{270.7}$

A stop watch comparison of 1303 with 1305 shows that the stop in question must be the north following of two faint stars, both being however about equally bright

Cloudy again. No stars visible.



Oct. 11, 1888.

~~23<sup>h</sup>~~      ~~1<sup>m</sup>~~      ~~43.0<sup>sec</sup>~~  
~~2~~      ~~29.5~~  
~~2~~      ~~42.1~~

23<sup>h</sup>      3<sup>m</sup>      57.5<sup>sec</sup>      1292  
 4      38.2      "  
 4      55.7      1303  
 5      26.5      1306  
 5      54.4      1303  
 6      41.5      1306

8      37.3  
 9      23.4  
 9      41.0  
 10      11.9  
 10      39.9  
 11      26.5

~~12      20.5~~

13      44.4  
 14      29.9  
 14      47.5  
 15      18.6  
 15      46.1  
 16      33.0

Oct. 10, 1888.

23	17	32.8
	18	18.5
	18	35.9
	19	7.5
	19	35.1
	20	21.9
	21	46.8
	22	31.6
	22	49.0
	23	21.5
	23	49.5
	24	35.0

Order in preceding transits 1298, 1298.  
 1303, 1306, 1303, 1306. 1298 & 1306 in southern  
 half & 1303 in northern half.

Probably clear enough now for  
 Photometry in region of Vesta.



Oct. 11. 1888.

Vesta and Camp. Mars. Gr. obs

0	42	-4.0
23	44	
22	56	

10 0

S.D. -10° 164

5.01 5.38

5.48 5.25 21.12 6.87

10.56
5.28
15.84
6.864

Vesta

6.03 6.05

6.08 6.02

24.18

S.D. -10° 173

5.99 6.08

6.20 6.29

12.09
6.045
18.13
7.858

7.85

Vesta

6.40 6.32

6.41 6.27

25.40

S.D. -10° 180

5.10 5.09

5.02 5.00

12.70

8.26

6.35
19.05
25.55

20.21

10.105
5.052
15.16
6.568

6.87

10 20

Oct. 11, 1888.

Iris &amp; comp. stars

N. obs

$$\begin{array}{r}
 2 \quad 40 \quad +24.6 \\
 \underline{24} \quad \underline{14} \\
 21 \quad 34
 \end{array}$$

10 32

+24°396

6.22

6.24

6.42

6.23

25.11

12.555

6.277

1.883

8.160

"

"

8.16

Iris

5.69

5.62

5.61

5.64

22.56

11.28

5.64

16.92

7.332

"

"

7.33

+25°449

5.50

5.01

5.41

5.30

21.22

10.61

5.305

1.591

6.896

"

"

6.9

Iris

5.23

5.24

5.50

5.37

5.51

21.61

10.805

5.402

1.621

7.823

"

"

7.02

+25°441

5.82

5.82

5.77

5.75

23.16

11.58

5.79

1.67

7.547

"

"

7.53

10 55



Oct. 15, 1888,

2 m. + 53° 929.934.

Fr. obs.

$$\begin{array}{r} 5 \quad 27 \quad + 53.2 \\ 21 \quad 10 \\ \hline 15 \quad 43 \end{array}$$

$$\begin{array}{r} 5 \quad 27 \\ 21 \quad 39 \\ \hline 16 \quad 12 \end{array}$$

5 30

cloudy

$$\begin{array}{r} 5^h 30^m \\ 21 \quad 53 \\ \hline 16 \quad 23 \end{array}$$

Still cloudy

Still too cloudy to see stars

Pos. Zero 115.6

45

Setting 160.6

22 <sup>h</sup>	16 <sup>m</sup>	25.5 <sup>sec.</sup>	929
	16	36.5	"
	16	56.3	934
	17	15.0	"

Oct. 15, 1888.

22	17	46.9	<del>429</del>	Un.*
	18	3.6	+	"
	18	23.4	934	
	18	35.4	"	

19	4.5
19	21.3
19	41.0
19	53.7
	<del>21.5</del>

20	21.5
20	38.0
20	57.6
21	10.3

21	40.0
21	56.8
22	16.4
22	29.0 $\frac{1}{4}$

Order in preceding transits. unlettered  
star, unlettered star, & lettered star,  
lettered star.

Unlettered star in northern half &  
lettered star in southern half.

Lettered star above. is  $+53^{\circ} 9' 34''$  (6.3 A.)



Oct. 15, 1888.

## Transits

~~37~~~~29~~ ~~37~~

22	30	35.9	929
	31	5.1	"
	31	45.4	W
	32	26.9	"
	33	14.8	929
	33	44.6	"
	34	24.5	W
	35	6.0	"

<del>35</del>	<del>39.2</del>
<del>36</del>	<del>9.5</del>
<del>36</del>	<del>49.0</del>

Clouds

45	57.4	929
46	29.3	"
47	9.1	W
47	48.0	" Clouds

49	8.6
49	41.5
50	21.0
50	59.8

Oct. 15, 1888.

22	52	16.8
	52	50.0
	53	29.9
	34	7.6
	56	16.2
	56	50.1
	57	30.2
	58	7.6

Order in preceding transits 929,  
 929, unlittered star, unlittered star.  
 929 in northern half, unlittered star  
 in southern half.

Star 929 (the one in question) is a moderately  
 close double. Components nearly equal  
 in brightness. In preceding transits the  
 north following & slightly brighter com-  
 ponent taken.

As no lettered star was near in declination,  
 929 was joined to 934 through the  
 unlittered star.



Oct. 15, 1888.

$$\begin{array}{r} D. M. + 54^{\circ} 35' 35'' \quad 44.0 \quad N. obs \\ \hline 1 \quad 38.5 \\ \hline 37 \quad 13.5 \end{array}$$

D. M. + 54 943, 944, 947.

The D. M. does not quite agree with the sky.

Assuming 943 & 944 to be the stars seen in the sky 944 follows 943 .8.5 sec by stop watch & is  $2.0^{\circ}$  south of it. Mag. of 943 9.3 & of 944 8.6 whereas by D. M. 944 follows 943 only 0.7 sec. & is  $2.0^{\circ}$  south of it.

The difference of R. A. between 944 & 947 is  $1^h 38.5$  by stop watch

The above, wrong region.

D. M. + 54° 942 & 943

Clouds

There are four faint stars angularly near together of which three are in the D. M.

The places of these three agree as it in the sky agree with the D. M.

Oct. 15, 1884.

within the limits of its probable error  
No doubt as to the star counted.

Clouds again, star invisible

23 55 21.0

55 47.3

56 3.9

lost, star invisible

Somewhat clearer

0 12 9.0 943

12 24.3 942

12 41.2 "

13 3.2 943

13 33.4 43

13 48.8 42

14 5.8 "

14 28.8 43

15 9.2

15 24.6

15 41.0

16 13.9



Oct. 15, 1888.

0	16	40.5	43
	16	56.5	42
	17	12.6	"
	17	35.9	43
	18	18.0	
	18	33.4	
	18	50.5	
	19	13.3	

Order in preceding transits 943,  
 942, 942, 943.  
 942 in southern half, 943 in  
 northern half.

D. M. + 55° 1017, 1022.

K obs

oh	27 <sup>m</sup>	44.5	1017
	28	49.6	"
	30	19.5	1022
	30	42.5	"

Oct. 15, 1888.

0	31	21.4
	32	25.3
	33	55.9
	34	19.5
	<del>34</del>	<del>59.7</del>

	34	59.7
	36	3.7
	37	34.1
	37	57.4

	38	31.9
	39	35.3
	41	5.9
	41	29.6

	42	8.7
	43	13.9
	44	44.4
	45	7.3

Order in preceding transits 1017, 1017,  
1022, 1022.  
1017 in southern half, 1022 in northern  
half.

Several stars in the neighborhood of 1017  
but no one sufficiently bright or near  
to be confounded with it.



Oct. 17, 1888.

Dir. + 53° 958 + 961

Obs.

5	44	+ 54.3
22	31	
16	43	

22 <sup>h</sup>	42 <sup>m</sup>	43.5 <sup>sec.</sup>	958
	44	9.4	"
	44	41.8	961
	45	12.9	"
	45	49.0	958
	47	15.5	"
	47	47.1	961
	48	19.0	"
	48	46.6	
	50	13.6	
	50	45.0	
	51	17.0	
	51	53.4	
	53	21.1	
	53	51.5	
	54	24.0	
	54	53.0	
	56	21.5	
	56	51.2	
	57	24.0	

Oct. 17, 1888.

Order in preceding transits 958, 958,  
~~969 969~~ 961, 961.  
 Both in northern half.

D. M. +52 1020, ~~1021~~ 1023 1024 N. obs.

23<sup>h</sup>.  
 19 11.3 1020  
 19 36.1 "  
 20 3.5 1023  
 20 11.2 1024  
 20 56.0 1023  
 21 26.0 1024

22 5.2 1020  
 22 30.5 "  
 22 57.5 1023  
 23 4.9 1024  
 23 50.0 1023  
 24 20.0 1024

24 48.9 1020  
 25 15.0 "  
 25 41.8 1023  
 25 49.4 1024  
 26 33.7 1023  
 27 3.9 1024



Oct. 17, 1888.

23	27	28.8
	27	55.1
	28	21.5
	28	29.5
	29	13.1
	29	43.5
	30	9.6
	30	35.2
	31	2.5
	31	10.0
	31	54.5
	32	24.7
	32	50.3
	33	17.6
	33	44.1
	33	52.0
	34	35.0
	35	5.2

Order in preceding transits 1020, 1020,  
 1023, 1024, 1023, 1024.  
 1020 in northern half, 1023 & 1024 in  
 southern half.

Oct. 17, 1888.

D. M. +55° 1044 1045 1049 Mobs

23 45 3.8 1045

45 19.7 1044

45 <sup>3</sup>3.2 1044

45 50.6 1045

46 52.1 1049

47 13.0 "

48 <sup>\*</sup>18.1 45

48 34.0 44

48 47.7 "

49 4.5 45

50 5.9 49

50 27.5 "

50 50.8 45

51 6.6 44

51 20.4 "

51 37.6 45

52 38.9 49

52 59.8 "



Oct. 17 1888

23	53	31.3	45
	53	47.0	44
	54	1.0	"
	54	17.4	45
	55	19.0	49
	55	40.5	"
	56	17.7	
	56	33.0	
	56	47.1	
	57	4.0	
	58	5.2	
	58	27.0	

Order in preceding transits 1045, 1044.  
 1044, 1045, 1049, 1049.  
 1044 & 1049 in northern half. 1045 in  
 southern half

In all the preceding stars (in question)  
 the stars <sup>are</sup> distinctly separated from  
 all others, with no possibility of  
 being confounded with them <sup>there</sup> <sup>is</sup> <sup>a</sup> <sup>single</sup>.

Oct. 17. 1868.

Vesta and Comp. Stars. W. obs.

$$\begin{array}{r}
 0 \quad 30 \quad -9 \quad 19 \\
 \hline
 0 \quad 29 \quad -11 \\
 0 \quad 29 \quad -9 \quad 30 \quad (55)
 \end{array}$$

$$\begin{array}{r}
 0 \quad 42 \quad -2.1 \\
 \hline
 0 \quad 18 \\
 \hline
 11 \quad 30 \\
 \hline
 -0 \quad 30
 \end{array}$$

Vesta is rather too near Meron  
for obs.

Iris and Comp. Stars. W. obs.

$$\begin{array}{r}
 2 \quad 40 \quad +24.6 \\
 \hline
 0 \quad 23 \\
 -2 \quad 17
 \end{array}$$

10 30

+24° 396

6.15

6.14

5.95

6.37

24.61

12.30

6.15

18.45

7.995

8.00

Iris

5.51

5.79

5.62

5.67

22.59

11.295

5.647

5.847

18.45

7.34

7.341

7.547



Oct. 17, 1888

+ 25° 449

5.47 ~~5.67~~

5.18

5.36 ~~5.91~~

5.47

21.48

$$\begin{array}{r} 10.74 \\ 5.27 \\ \hline 16.01 \\ 6.981 \end{array}$$

6.98

Dis

5.85

5.71

5.89

5.77

23.22

11.61

5.805

17.41

7.546

7.54

+ 25° 441

5.67

5.80

5.91

5.92

23.30

11.65

5.825

17.47

7.572

7.57

10 52

Oct. 18. 1888.

D. M. Jones. (+19°)  
(Series 20)

Tr. obs.

17	57	+197
<u>21</u>	<u>46</u>	
3	49	

7 59

# 3530

2.07

2.40

2.19

6.66' 2.88'

~~8.66~~

3536

3.02

2.89

2.82

8.73' 3.78'

~~11.35~~

3541

2.50

2.58

2.58

7.66' 3.32'

~~9.96~~

3544

3.75

3.68

3.58

11.01' 4.76'

3561

2.38

2.46

2.39

7.23' 3.13'

~~9.40~~

3562

3.07

3.20

3.06

9.33' 4.04'

~~12.13~~



Oct, 18, 1888.

3564	3.61		
	3.51		
	3.53	10.6 <sup>5</sup>	<sup>60</sup> <del>4.56</del>
3569	2.30		
	2.52		
	2.38	7.80	3.12
		<del>7.36</del>	
3576	2.02		
	1.98		
	1.88	5.88	2.55
		<del>7.64</del>	
3579	2.69		
	2.60		
	2.50	7.79	3.37
		<del>10.13</del>	
3582	2.75		
	2.60		
	2.74	<sup>8</sup> 10.09	3.50
		<del>10.52</del>	
3586	3.28		
	3.15		
	3.30	9.73	4.21
		<del>12.65</del>	
3590	2.40		
	2.18		
	2.22	6.80	2.94
		<del>8.84</del>	

Oct. 18, 1888.

3596	2.32			
	2.62			
	2.59	7.53	3.26	
		<del>9.79</del>		
3601	2.90			
	2.83			
	2.87	8.60	3.72	
		<del>11.18</del>		
3604	2.60			
	2.49			
	2.71	7.80	3.38	
		<del>10.14</del>		
3605	3.31			
	3.24			
	3.42	9.97	4.32	
3611	<del>3.00</del>	2.61	<del>12.96</del>	
	<del>2.98</del>	2.72		
	<del>2.88</del>	2.70	8.03	3.48
			<del>10.44</del>	
3614	2.11			
	2.20			
	2.27	6.58	2.85	
		<del>8.55</del>		
3617	3.43			
	3.51			
	3.52	10.46	4.53	



Oct. 18, 1888.

3619 3.12  
 3.08  
 2.90 9.10' 3.94'  
~~11.83~~

3624 2.20  
 2.34  
 2.50 7.04'  
 3631 ~~19.15~~ 3.05'  
~~8.4~~

2.15  
 1.12  
 1

2.70  
 2.70  
 2.60 8.00'  
 3654 3.46'

1.92  
 1.98  
 1.93 5.83'  
 3659 2.52'

3.09  
 3.10  
 3.10 9.29'  
 3670 4.02'

3670 2.48  
 2.59  
 2.62 7.69'  
 3.23'

3679 2.51  
 2.48  
 2.60 7.59'  
 3.29'

Oct. 18, 1888.

3695 3.09  
 3.10  
 3.04 9.23  
 4.00

3704 2.09  
 2.30  
 2.30 6.69  
 2.90

3705 2.81  
 2.88  
 2.77 8.46  
 3.66

3706 2.22  
 2.29  
 2.54 7.05  
 3.05

3708 2.81  
 2.80  
 3.00 8.61  
 8.78

3716 4.50  
 4.48  
 4.58 13.56  
 5.87

3729 2.20  
~~1.90~~ 2.18  
 2.42 6.80  
 2.94



Oct. 18, 1888.

3736	3.91		
	4.07	12.1.0	
	4.12		5.24

3744	3.40		
	3.70	10.85	
	3.75		4.70

3747	2.19		
	2.20	<sup>5</sup> <del>6.84</del>	
	2.15		<sup>3</sup> <del>2.88</del>

3750	2.16		
	2.22		
115	2.20	6.58	
			2.85

3751	2.38		
	2.44		
	2.52	7.34	
			3.18

3753	4.02		
	3.99		
	4.15	12.16	5.26

3758	2.80		
	2.67		
	2.58	8.05	
			3.49

Oct. 18, 1888.

3764	2.55		
	2.77		
	2.83	8.15	
			3.53
3767	2.40		
	2.40		
	2.58	7.38	
			3.20
3768	3.20		
	3.12		
	3.05	9.37	
			4.06
3770	3.02		
	3.11		
	2.97	9.10	
			3.94
3771	2.83		
	3.02		
	3.02	8.87	
			3.84
3776	2.52		
	2.53		
	2.46	7.51	
			3.25
3778	2.90		
	3.07		
	2.87	8.84	
			3.83



Oct. 18, 1888

3779	5.23		
	5.07		
	5.18	15.48	6.70

3782	2.65		
	2.50		
	2.47	7.62	3.30

3789	2.90		
	2.93		
	2.97	8.80	3.81

3790	3.94		
	4.12		
	4.20	12.26	5.31

3792	3.40	} <del>following</del> following of a faint	
	3.22		
	3.10		
		9.72	4.21

3793	1.78	} very faint	
	1.84		
	2.13		
		5.95	

3801	3.10		2.49
	3.27		
	3.04	9.41	4.07

Oct. 18, 1888.

3804	2.71	
	2.79	
	2.79	8.29
		3.59

3806	2.57	
	2.84	
	2.87	8.28
		3.58

3810	2.81	
	2.78	
	2.62	8.21
		3.56

3825	1.94	
	2.08	
	2.04	6.56
		2.62

3831	2.15	
	2.10	
	2.19	6.44
		2.79

3838	2.29	
	2.55	
	2.51	7.35
		3.18

3842	2.22	
	2.12	
	2.01	6.35
		2.75



Oct. 18, 1888.

3846	2.48		
	2.47		
	2.38	7.23	3.17
3852	2.61		
	2.68		
	2.58	7.87	3.41
3854	3.88		
	3.97		
	4.00	11.85	5.13
3869	3.07		
	2.90		
	2.80	8.77	3.80

10 13

Vesta and Comp. Stars. W. obs.

0	30	-9	30
0			

10 30

P.D. -10° 164		
5.25	5.35	
5.29	5.37	21.26
		10.63
		5.315
		1594
		6.909
		6.91

Oct. 18, 1888.

Vesta

5.80  
5.925.87  
5.67
$$\begin{array}{r}
 23.26 \\
 1163 \\
 5815 \\
 1744 \\
 \hline
 7.559
 \end{array}$$

7.56

S.D. -10° 173

~~5.25~~ 6.02

5.90

~~5.29~~ 6.11

6.08

24.11

$$\begin{array}{r}
 12.055 \\
 6.027 \\
 1808 \\
 \hline
 7.835
 \end{array}$$

7.83

Vesta

6.12

5.91

6.07

6.10

24.20

$$\begin{array}{r}
 12.10 \\
 6.05 \\
 1815 \\
 \hline
 7.865
 \end{array}$$

7.86

S.D. -10° 180

5.28

5.09

5.28

5.02

$$\begin{array}{r}
 0 \\
 24.67 \\
 10.335 \\
 5.167 \\
 1.556 \\
 \hline
 6.717
 \end{array}$$
6.72  
~~8.01~~

10 56



Oct. 22. 1888.

Cloudy.

Still too cloudy and growing worse.

Apparently, no chance for work.

Pct. 24. 1888.

Comet c 1888 (Brooks)

W. obs.

Oct. 23	16	24	22	+ 2	14.9
25		34	26	+ 1	21.5
		4	26		20.1
		+ 2	14		- 25.0
	16	36	40	+ 1	46.9
		- 1	20		+ 10
(1+55) =	16	35	10	+ 1	57

16	24	+ 2.3
<del>22</del>	16	
6	8	

16	24
22	20
+ 5	56

Telescope right in line with steeple and practically set also.

It was very faint before the moon, so that, of itself, it would probably be invisible, <sup>even</sup> were other conditions favorable.



Oct. 24. 1888.

Comp. Stars for Var. Gr. obs.  
 Not fully clear near horizon, so must  
 keep a little higher up than usual.

129 U Cypricornu.

$$\begin{array}{r} 20 \quad 37 \quad -15.5 \\ 22 \quad 33 \\ \hline 1 \quad 56 \end{array}$$

$$\begin{array}{r} 20 \quad 37 \\ 24 \quad 20 \\ \hline 3 \quad 43 \end{array}$$

clouds in heavy masses.  
 1 f

2c

3g

Oct. 24, 1888.

4 U

5 ~~f~~

6 a

7

8



Oct. 24, 1888.

9

10

There are two stars about in the position of "2C". The preceding however agrees a little more nearly with the place on the chart. The following follows the preceding 3.5 sec. & is a ~~very~~ little brighter. "2C" must be one of these so will pass <sup>take</sup> the following of the two by eye, the preceding of the two being taken above.

2C (fol. of two) (see above)

Oct. 24, 1888.

9 45

Heavy masses of clouds continually passing have prevented observations of comparison stars up to the present time. & now the preceding series getting too low for observation. A little clearer just at the present moment, although there are still heavy masses in the north, but will turn on Iris

Iris.

Gr. obs.

$$\begin{array}{r}
 2 \quad 80 \quad + 24.6 \\
 0 \quad 3 \checkmark \\
 \hline
 - 2 \quad 5
 \end{array}$$

Clouds continually passing

10 13

+ 24.396

6.30

6.13

Iris

5.75

5.71

+ 25.449



Oct. 24, 1888.

Iris

+25° 44'

10 40

Clouds everywhere. No possible  
chance for farther work.

Oct. 25. 1888.

Comp. Stars for Var.

W. obs.

129 U Capricorni.

20	37	-15.5
21	<del>57</del>	
1	20	

7 44

2.25	1f	2.15	
2.37		1.97	.86
2.12		2.00	2.147

2.782 &gt;

2c (faded &amp; fainter)

2.40	2.10	
2.16	2.25	1.31
2.13	2.27	2.22 >

2.886 &gt;

3g

1.68	1.62	
1.70	1.61	3.80
1.72	1.47	1.63 >

2.119 &gt;

4 U

2.00	2.00	
1.86	2.00	5.74,
1.91	1.97	1.96 >

2.548 &gt;



Oct. 25, 1888.

5-b

3.11	3.07	
3.20	2.99	
3.09	2.99	.45
		3.08 >
		4.004 >

6a

2.42	2.78	
2.70	2.80	3.95
2.69	2.56	2.66 >
		3.458 >

7

4.78	4.50	
4.68	4.32	
4.76	4.52	3.56 >
		4.59 >

8

wrong star	(4.58)	4.88	5.11	
	(4.58)	5.20	4.88	.10
	(4.50)	5.07	4.96	5.02 >
				6.526 >

9

1.57	1.82	
1.60	1.61	3.86
1.73	1.53	1.64 >
		2.132 >

10

4.37	4.12	
4.28	3.90	
4.14	4.14	.95
		4.16 >
		5.408 >

Oct. 25, 1888.

8 25

2C (following & brighter)

2.58	2.50	
2.53	2.62	3.27
2.54	2.50	2.54 >
		3.30 D >

For explanation with reference to "2C" see page 190 of this book.

"1f" has a fainter star a little north preceding

"3g" assumed to be the south preceding & brighter of two

5b has a fainter star north following as on chart.

"g" is very faint & quite difficult - almost too faint for wedge.

2C (the preceding of the pair) is rather difficult in wedge from proximity to following component.

8 30

"4U" = 2C (preceding component.)



Oct. 25. 1888.

93 a V Herculis.

Tr. obs.

$$\begin{array}{r} 16 \quad 52 \quad +35.0 \\ 23 \quad 25 \\ \hline +6 \quad 27 \end{array}$$

$$\begin{array}{r} 16 \quad 58 \\ 23 \quad 30 \\ \hline 6 \quad 32 \end{array}$$

8 58

1b

$$\begin{array}{r} 2.98 \\ 3.29 \\ 3.22 \end{array} \quad \begin{array}{r} 3.07 \\ 3.29 \\ 2.98 \end{array} \quad \begin{array}{r} .83 \\ 3.14 \end{array}$$

4.0827

2a

$$\begin{array}{r} 2.33 \\ 2.32 \\ 2.46 \end{array} \quad \begin{array}{r} 2.27 \\ 1.99 \\ 2.16 \end{array} \quad \begin{array}{r} 1.53 \\ 2.26 \end{array}$$

2.9387

3 v

$$\begin{array}{r} 2.26 \\ 2.22 \\ 2.28 \end{array} \quad \begin{array}{r} 2.12 \\ 2.28 \\ 2.21 \end{array} \quad \begin{array}{r} 1.37 \\ 2.23 \end{array}$$

2.8997

4c

$$\begin{array}{r} 2.50 \\ 2.38 \\ 2.50 \end{array} \quad \begin{array}{r} 2.32 \\ 2.49 \\ 2.67 \end{array} \quad \begin{array}{r} 2.86 \\ 2.48 \end{array}$$

3.2247

Oct 25 1888.

5d

2.80	2.22	
2.50	2.34	
2.80	2.28	2.90
		2.48

6

4.57	4.42		3.224
4.63	4.53	2.67	
4.33	4.19	4.44	

#8

3.58	3.51		
3.23	3.31	2.20	
3.20	3.37	3.37	4.381

#7

4.62	4.42		
4.50	<del>4.42</del> 4.42	2.66	
4.40	4.30	4.44	

9 22

5.772

9 22

V 1 a

Region now getting rather low &  
moon rising.



Oct. 25. 1888.

Vesta and Comp. Stars. Gr. obs.

$$\begin{array}{r} 14 \\ 3 \\ \hline \sqrt{42} \\ -6 \end{array}$$

$$0 \quad 24$$

$$\begin{array}{r} 25 \\ 2 \\ \hline \sqrt{25} \\ 15 \end{array}$$

$$-9 \quad 29$$

$$-9 \quad 39$$

$$\begin{array}{r} 0 \quad 4A \quad -A.1 \\ 204 \quad 5 \\ \hline -0 \quad 43 \end{array}$$

$$\begin{array}{r} 0 \quad 48 \\ 0 \quad 21 \\ \hline -0 \quad 27 \end{array}$$

$$\begin{array}{r} 0 \quad 12 \\ 0 \quad 26 \\ \hline 14 \end{array}$$

9 53

S.D. -10°164

5.18

5.51

5.47

5.62 21.78

Vesta

$$\begin{array}{r} 10.89 \\ 54.15 \\ 16.33 \\ \hline 7.078 \end{array}$$

7.07

5.82

6.28

5.90

6.17

24.17

S.D. -10°173

5.97

6.39

6.11

6.15

24.62

12.31

6.155

8.01

Oct. 25, 1888.

Vesta

5.92

6.31

6.07

6.11

24.41

12.205

6.102

1831

7933

7.93

D. -10° 180

4.94

5.39

6.17

5.11

5.14

20.58

10.29

5.145

1543

6688

6.68

Iris and Comp. Star. Gr. obs.

2

20

+22

27

2

40

+24.5

1

08

-1

32

132

296

79

+24° 396

6.58

6.50

6.59

6.63

2630

13.15

6.575

1972

8.547

8.55

Iris

6.16

6.20

6.14

6.14

24.64

12.32

6.16

1848

8.008

8.01

+25° 449

5.59

5.21

5.68

5.21

21.69

10845

5.422

1627

7049

7.05



Oct. 25, 1888.

Iris

6.11  
6.156.11  
6.11
$$\begin{array}{r}
 24.48 \\
 12.24 \\
 6.12 \\
 18.36 \\
 \hline
 7.956
 \end{array}$$

7.956

+25° 441

6.07  
5.995.87  
5.98
$$\begin{array}{r}
 23.91 \\
 11.955 \\
 5.977 \\
 17.43 \\
 \hline
 7.770
 \end{array}$$

7.770

10 51

Oct. 29. 1888

Comp. Stars for Var.

W. obs.

121 *N* Aquilae.

$$\begin{array}{r} 20 \quad \text{f} \quad +14.7 \\ 22 \quad 55. \\ \hline +2 \quad 87 \end{array}$$

$$\begin{array}{r} 20 \quad 08 \\ 23 \quad 00 \\ \hline +2 \quad 52 \end{array}$$

Region partly identified. Clouds.

Somewhat cloudy still but moderately clear in region of *Iris*,

*Iris*. + Comp. Stars. W. obs.

$$\begin{array}{r} 2 \quad 40 \quad +24.6 \\ 0 \quad 18 \\ \hline -2 \quad 22 \end{array}$$

Somewhat cloudy in this region also.

Clearer again.

9<sup>h</sup> 40<sup>m</sup>

$$\begin{array}{r} +24^{\circ} 396 \\ 6.45 \quad 6.47 \\ 6.51 \quad 6.40 \end{array}$$

$$\begin{array}{r} 25.83^{\circ} \quad 40^{\circ} \\ 12.915 \\ 6.457 \\ 1937 \\ \hline 8.394 \end{array}$$



Oct. 29, 1888.

Iris

6.22

6.08

6.03

6.17

24.50

12.25

6.125

1837

7.962

7.96

+25° 449

5.31

5.32

5.38

5.44

21.45

10.725

5.362

1609

6.971

6.97

Iris

6.20

6.20

6.18

6.11

24.69

12.345

6.172

1852

8.024

8.02

+25° 441

5.81

5.90

5.92

5.87

23.40

11.75

5.875

1762

7.637

7.63

9.57

Vista and Comp. Stars. Yr. 16.

0	42	- 2.1
2	01	
1	13	

Oct. 29, 1888.

10 06

S.D. -10° 164

5.30

5.28

5.42

5.42

Vesta

6.00

5.90

5.89

6.05

S.D. -10° 173

6.21

6.15

6.11

6.29

Vesta

5.78

5.99

5.97

5.92

S.D. = 10° 180

5.22

5.13

5.08

5.19

10 25

21.42

10.71

5.355

16.06

6.961

6.97

23.84

11.92

5.66

17.88

7.748

7.75

24.76

12.38

6.19

18.57

8.047

8.05

23.66

11.83

5.915

17.74

7.689

7.69

20.62

10.31

5.155

15.46

6.701

6.70



Oct. 29. 1888.

Comet 1888 (Barnard) W. obs.

Comet 1889 I.

$$\begin{array}{r}
 5 \quad 36 \quad + 3.6 \\
 \hline
 1 \quad 29 \\
 - 4 \quad 7
 \end{array}$$

$$\begin{array}{r}
 \sqrt{25} \quad 14 \quad + 3 \quad 29 \\
 - 1 \quad 20 \quad - 10 \\
 \hline
 \sqrt{22} \quad 44 \quad + 3 \quad 19
 \end{array}$$

Comparison star =  $+3^{\circ} 1001 (9.013)$ 

Pos zero 335.0

$$\begin{array}{r}
 45 \\
 \hline
 \text{Setting } 290.0
 \end{array}$$

46	48.8	<del>48.8</del>	X
47	10.0	<del>10.0</del>	X
47	44.5	c	<del>44.5</del>
48	22.0		<del>22.0</del>
48	54.4		
49	15.7		
49	49.6		
50	27.5		

Oct. 29, 1888.

1 <sup>h</sup>	51	7.7
	51	29.0
	52	2.7
	52	40.2
	53	15.7
	53	37.4
	54	11.2
	54	48.1
	55	16.5
	55	38.0
	56	11.0
	56	48.0
	57	20.8
	57	42.5
	58	15.8
	58	52.1

Order in preceding transits Star, Star,  
Comet, Comet, Star in northern half  
Comet in southern half.

Comet moderately bright with a nucleus  
equal to a 9.5 mag. star. Total nebulosity  
some 5' or 6' in diameter. Nucleus moderately  
well defined & thought to be a little eccentric.  
For comparison star see beginning of  
series



Oct. 29. 1888,

Fr. 3451.  
 2 14 9.1  
 15 9.2

Ballou 103.  
 11 25 0.0  
 26 0.0

$\therefore$  Fr. 3451 is  $\sim 0.3$  slow.

Oct. 30, 1888.

Comp. Stars for Var. *W. obs.*121 *S Aquilae*.

$$\begin{array}{r}
 20 \quad 2 \quad + (4) \\
 22 \quad 20 \\
 \hline
 + 2 \quad 12
 \end{array}$$

$$\begin{array}{r}
 20 \quad 08 \\
 22 \quad 35 \\
 \hline
 2 \quad 27
 \end{array}$$

Clouds.

Some preliminary experiments with Wilson's dynameter.

Now clear, in fact clear enough for

Tris and Comp. Stars. *W. obs.*

$$\begin{array}{r}
 2 \quad 40 \quad + 24.6 \\
 1 \quad 0 \\
 \hline
 -1 \quad 40
 \end{array}$$



Oct. 30, 1888.

+24° 396  
 6.35 6.50  
 6.47 6.37  
 Iris  
 25.69  
 12.845  
 6.422  
 19.27  
 8.35  
 8.349

6.22 ~~5.42~~ 6.22  
 6.10 6.10  
 24.64  
 12.32  
 6.16  
 18.48  
 8.008  
 8.02

+25° 449  
 5.47 5.42  
 5.22 5.35  
 Iris  
 21.46  
 10.73  
 5.365  
 16.09  
 6.974  
 6.98

6.08 6.07  
 6.28 6.22  
 24.65  
 12.325  
 6.162  
 18.49  
 8.012  
 8.01

+25° 441  
 5.92 5.87  
 5.83 5.90  
 23.52  
 11.76  
 5.788  
 17.64  
 7.64  
 7.64

Perfectly clear in this region during observations

By records of hour angle compared with those of Oct. 29, these observations of Iris may have been made about 10.<sup>h</sup> 38<sup>m</sup> Eastern time.

Oct. 30, 1888.

Comet 1888 (Barnard) Gr. obs.

$$\begin{array}{r} \sqrt{\phantom{00}} \quad 36 \quad + 3.6 \\ 1 \quad 25 \\ \hline - 4 \quad 11 \end{array}$$

$$\begin{array}{r} \sqrt{\phantom{00}} \quad 32 \quad + 3.3 \\ 1 \quad 30 \\ \hline - 4 \quad 2 \end{array}$$

Comparison star = D.M. + 3° 988  
(908)

Pos. zero 246.9

Setting  $\frac{45}{201.9}$ 

1 hr	46 <sup>m</sup>	3.7 <sup>sec</sup>	<del>E</del> E
	46	33.5	<del>E</del> E
	46	50.1	*
	47	7.0	*
	47	28.0	
	47	57.6	
	48	14.4	
	48	31.5	



Oct. 30, 1888.

1	49	37.9
	50	8.0
	50	24.9
	50	42.1
	51	18.8
	51	49.5
	52	6.0
	52	23.5
	52	48.0
	53	19.1
	53	35.7
	53	53.2

Order in preceding transits comet, comet,  
star, star. Both in northern half.

For comparison star see at beginning  
of series.

For. 3451.

<del>2</del>		
2	7	1.7
	8	1.9

Ballou 103.

<del>11</del>	<del>13</del>	<del>0.0</del>
11	14	0.0
	15	0.0

∴ 3451 is 2" 25' slow.

Oct. 31. 1888.

Comp. Stars for Var.

Gr. obs.

20 2 +14.7

22 40

+2 32

Probably the region of  $\delta$  Aquilae

7 45

(wrong star)  $\begin{array}{r} 3.64 \\ 3.44 \\ 3.61 \end{array}$   $\begin{array}{r} 3.51 \\ 3.57 \\ 3.81 \end{array}$

$\begin{array}{r} 3.50 \\ 3.59 \\ 3.31 \end{array}$  29

36-6d

$\begin{array}{r} 2.64 \\ 2.60 \\ 2.60 \end{array}$

4C

$\begin{array}{r} 3.30 \\ 3.43 \\ 3.29 \end{array}$

5J

$\begin{array}{r} 3.59 \\ 3.40 \\ 3.21 \end{array}$

329



Oct. 31, 1888.

~~6d~~ 3b

2.29	2.40
2.35	2.21
2.50	2.17

7a

3.91	3.99
3.88	4.20
3.91	4.27

8

4.42	5.02
4.68	5.13
4.60	4.60

9

5.19	4.97
5.13	5.10
5.03	4.96

10

5.00	5.03
5.00	4.89
4.98	4.92

Stopped by clouds &amp; haze

Oct. 31. 1888.

Expts with R. W. Millson's new dynamometer <sup>W. obs.</sup>

Pos Zero 250.6

Setting  $\frac{95.0}{160.6}$ 

0	38	-14.6
1	15	
<hr/>		
	+37	

35.5	17.7	18.0	5.0	55.9
60.1	41.9	42.3	29.5	20.3
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
17.7	24.2	24.3	24.5	24.4
41.9				
24.6				

14.7	5.2	52.7	40.9	31.0
39.4	29.5	17.1	4.9	55.4
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
24.7	24.7	24.4	24.0	24.4

43.9	28.8	13.4	3.1	46.0
8.1	52.9	37.8	27.4	10.1
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
24.2	24.1	24.4	24.3	24.1

21.8	4.4	52.1	16.0	4.2
46.4	29.2	16.5	14.8	28.5
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
24.2	24.8	24.4	39.1	24.3
			24.3	

Star used in preceding transits is  $\beta$  Ceti  
 From the above transits the power of the No. 1.  
 eyepiece comes out 102. By the "chords" it is  
~~102~~ 103.



214.

Oct. 31. 1888,

Comet e 1888 (Barnard) Fr. obs.

$$\begin{array}{r} \sqrt{\phantom{00}} \quad 36 \\ 1 \quad \sqrt{1} \\ \hline -3 \quad \times 6 \end{array}$$

$$+ 3.6$$

$$\begin{array}{r} -3 \quad 32 \\ 1 \quad \sqrt{5} \\ \hline \sqrt{\phantom{00}} \quad 27 \end{array}$$

$$+ 2.7$$

Comparison star = D.M. + 3° 958 (8.1 K)

Pos. zero 166.6

Setting  $\frac{45}{161.6}$ 

2 h

1 <sup>m</sup>	50.5 <sup>sec</sup>	☉
2	13.4	*
2	34.1	☉
2	42.7	*

3	9.4	☉
3	32.5	*
3	53.0	☉
4	1.8	*

4	31.5	☉
4	54.8	*
5	15.0	☉
5	24.0	*

Oct. 31, 1888.

<del>2<sup>h</sup></del>	5	<del>52.1</del>
	6	<del>15.6</del>
2 <sup>h</sup>	7	14.2
	7	37.5
	7	57.5
	8	7.0
	8	33.4
	8	57.0
	9	16.1
	9	26.1

From camp. below 3451 was 2<sup>m</sup> 5.4 slow at time of above obs.

Order in preceding transits comet, star, comet, star. Comet in southern half star in northern half.

Nov. 1. 1888.Fr. 3451.

15 13 1.9

14 2.1

=

=

Ballou 103.

0 14 0.0

15 0.0

∴ 3451 is 2<sup>m</sup> 7.0 slow. ✓









