

KG.  
11366  
v.322b























Nov. 1. 1888.

Camp. Stars for Var.  
121  $\gamma$  Aquilae.

Gr. obs.

$$\begin{array}{r} 20 \quad 9 \quad +14.2 \\ 23 \quad 20 \\ \hline +3 \quad 1.1 \end{array}$$

$$\begin{array}{r} 20 \quad 09 \\ 23 \quad 37 \\ \hline 3 \quad 28 \end{array}$$

A 30

4.01  
4.10  
4.22

3.72

4.00

5.85

3.80

3.98

5.174  
7.605

3.48  
3.85  
3.79

3.59

3.68

3.48

3.87

3.64

3b

4.732

2.20  
2.33  
2.49

2.20

2.32

2.38

1.92

2.32

4c

3.016

3.02  
3.20  
3.42

3.10

3.18

3.17

1.09

3.18

4.184



Nov. 1, 1888.

5d

3.70  
3.85  
3.803.60  
3.68  
3.40 4.03  
3.67

avg = 4.77

6d

2.95  
3.18  
3.103.13  
3.10  
3.12 .58  
3.10

4.03

7a

3.82  
3.91  
3.813.91  
4.16  
3.99 5.60  
3.93

5.11

8

4.27  
4.32  
4.284.61  
~~4.28~~  
4.38  
4.52 2.38  
4.340

5.72

9

4.67  
4.30  
4.294.78  
4.81 3.71  
4.86 4.62

6.006

10

5.08  
4.98  
4.904.74  
4.99  
4.91 5.60  
4.93 6.409



Nov. 1, 1888.

9 08

22 S in large telescope.

Vesta and Comp. Star. St. obs.

(1455)

$$\begin{array}{r}
 0 \quad 20.6 \\
 \underline{-1.5} \\
 0 \quad 19.1
 \end{array}
 \qquad
 \begin{array}{r}
 -9 \quad 32 \\
 \underline{-10} \\
 -9 \quad 42
 \end{array}$$

$$\begin{array}{r}
 0 \quad 19 \\
 0 \quad 30 \\
 \hline
 11
 \end{array}$$

$$\begin{array}{r}
 0 \quad 2 \\
 0 \quad 48 \\
 0 \quad 39 \\
 \hline
 -9
 \end{array}$$

Vesta

9 30

 $-10^{\circ} \quad 164$ 

$$\begin{array}{r}
 5.17 \\
 5.12
 \end{array}$$

5.20

5.21

20.70

10.35

6.73

5.175

1552

6.727

Vesta

$$\begin{array}{r}
 5.79 \\
 5.98
 \end{array}$$

5.92

5.80

23.49

11.745

5872

1762

7.634



Nov. 1, 1888.

 $-10^{\circ} 173$ 

6.35

6.38

6.28

6.35 2536

$$\begin{array}{r} 12.68 \\ 6.34 \\ 19.02 \\ \hline 8.242 \end{array}$$

Vesta

5.89

6.01

5.97

6.02 2389

$$\begin{array}{r} 11.945 \\ 5.9725 \\ 17.917 \\ \hline 7.764 \end{array}$$
 $-10^{\circ} 180$ 

5.29

5.29

5.40

5.30 2128

$$\begin{array}{r} 10.64 \\ 5.32 \\ 15.96 \\ \hline 6.916 \end{array}$$

Iris and Comp. Stars. Gr. obs.

2 16.3

+21 51

 $-1.3$  $-1.0$ 

2 15.

+21 41

2 40

+24.6

1 05

-1 35

 $+24^{\circ} 396$ 

6.43

6.51

6.38

6.40 2572

$$\begin{array}{r} 12.86 \\ 6.43 \\ 19.29 \\ \hline 8.359 \end{array}$$

10. 05



Nov. 1, 1888.

Jus

4.82 6.10 6.05

4.97 6.20 5.87

$$\begin{array}{r} 24.22 \\ 12.11 \\ 6.055 \\ 18.16 \\ \hline 78.71 \end{array}$$

+25° 449.

5.10 4.82

5.28 4.91

20.11

+25° 441

$$\begin{array}{r} 10.055 \\ 5.027 \\ 15.08 \\ \hline 65.35 \end{array}$$

Jus

6.12 5.85

6.15 5.93

$$\begin{array}{r} 24.05 \\ 12.025 \\ 6.012 \\ 18.04 \\ \hline 78.16 \end{array}$$

+25° 441

6.10 6.08

6.06 5.98

$$\begin{array}{r} 24.22 \\ 12.11 \\ 6.055 \\ 18.16 \\ \hline 78.71 \end{array}$$

10 25

Count e 1889 I. (Barnard) 7.81

Count 1889 I.

$$\begin{array}{r} 5 \\ 1 \\ \hline -3 \end{array}$$

$$\begin{array}{r} 24 \\ 45 \\ \hline 39 \end{array}$$

5 24

1 49

$$\begin{array}{r} -3 \\ \hline 35 \end{array}$$

$$\begin{array}{r} 5 \\ 1 \\ \hline -3 \end{array}$$

24 46

Comparison star = 2 M + 2° 76' (762)



Nov. 1, 1888.

Comparison Star = D M. + 2° 968 (93 B)

Pos. Year 1755

45

Setting 220.5

2<sup>h</sup>~~6~~~~56.3~~~~7~~~~18.0~~

7

44.7

\*

8

6.8

\*

8

15.4

E

8

49.0

E

~~48~~

22.5

10

51.0

11

13.2

11

21.0

11

55.0

12

26.4

12

48.5

12

56.0

13

30.6



Nov. 1, 1888

<del>24</del>	<del>14</del>	<del>1.4</del>
	<del>14</del>	<del>23.5</del>
	14	5.38
	15	4.4
	15	22.5
	15	45.9
	16	33.8
	16	44.5
	17	2.3
	17	25.6
	17	47.6
	17	58.4
	18	16.0
	18	39.5
	19	12.2
<del>Order in for</del>	19	23.0
	19	40.3
	20	3.5

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

Nucleus fairly well defined & about  
equal to a 9.5 mag. star



Nov. 1, 1866,  
 (f 1244) Dec. 30, 1866.  
 New Comet, Barnard, <sup>1244 V</sup> W. O. B.

$$\begin{array}{r}
 9 \quad 43 \quad 22 \quad -15 \quad 16 \quad 52 \\
 \quad +3 \quad 4 \quad +14 \\
 \hline
 9 \quad 46 \quad 26 \quad -15 \quad 1 \\
 \quad -1 \quad 30 \pm \quad +10 \pm \\
 \hline
 9 \quad 45 \quad 0 \quad -14 \quad 51 \\
 \quad 16 \quad 0 \\
 \hline
 -3 \quad 45
 \end{array}$$

$$\begin{array}{r}
 -3 \quad 42 \\
 6 \quad 10 \\
 \hline
 9 \quad 52
 \end{array}$$

$$\begin{array}{r}
 \text{Pos. Zero.} \quad 220.2 \\
 \quad 45.0 \\
 \hline
 265.2
 \end{array}$$



Nov. 1. 1888.

6	49	32.5	*
	49	43.5	*
	50	44.0	$\equiv$
	51	3.0	$\equiv$

	51	45.7	*
	51	56.4	*
	52	57.6	$\equiv$
	53	15.9	$\equiv$

	53	57.3
	54	8.4
	55	9.3
	55	27.3

	56	42.0
	56	53.5
	57	54.5
	58	12.8

	58	54.6
6	59	6.8
7	0	7.1
	0	25.2

over



Nov. 1. 1888.

Order in preceding transits  
 $\times \times \infty \infty$

Star in northern half and  
 comet in southern half.

Comp. Star = S.D.  $-14^{\circ} 29' 57''$  (S.B.K.)

Comet rather faint (about 11 mag.)  
 nucleus rather stellar but not  
 sharply defined. Total nebulosity  
 about 1.5 in diam.

Nov. 2. 1888.

<u>Fr. 3451.</u>				<u>Balloon 103.</u>			
12	34	24.0	=	9	24	0.0	
	35	24.2	=		29	0.0	

$\therefore$  3451 is  $2^{\sim} 10.6$  slow.



Nov. 3. 1888.

Comp Stars for Var.  
122 R Sagittae

Prob.

20 7 +16.3  
22 35  
2 28

20 7 +15.8  
22 41  
2 34

id

7 52

2.42

2.00

2.21

2.20

1.15

2.12

2.20

2.19

2.847

2f

4.05

4.19

4.12

4.43

4.30

4.11

1.20

4.20

5.46

3g

4.71

4.30

4.61

4.35

3.14

4.77

4.40

4.52

5.876

4a

4.61

4.78

4.91

5.01

5.18

4.99

4.88

4.86

6.318



Nov. 3, 1888.

5B

4.00	4.08	
4.12	4.10	.42
4.00	4.12	4.07
		5.291

6C

4.03	3.80	
4.10	3.70	5.14
4.00	3.51	3.86
		5.018

7b

3.91	3.99	
4.20	4.13	.36
4.21	3.92	4.06
		5.278

8a

3.40	3.13	
3.49	3.24	1.82
3.34	3.22	3.30
		4.29

9b

2.98	3.87	
3.22	3.56	2.45
3.20	3.62	3.41
		4.433

10C

3.37	3.60	
3.39	3.69	3.31
3.29	3.97	3.55
		4.615
		4.303



Nov. 3, 1888.

11e

3.59

336

3.60

3.68

3.58

3.87

3.68

3.61 -

4.6937

12c

4.30

403

~~"1d" very d~~

4.40

4.17

4.15

4.00

1.05

4.18 -

5.4347

8 30

"1d" very difficult to measure on account of close proximity of "8a"

5 Scarcely any suspicion of redness to "5 B."

8 43

"B" 3 "6c" in large telescope.

"9 b" is difficult to separate from "1d" in magn. on account of close proximity of latter.

It is and Comp. Sun. H. obs.

$$\begin{array}{r}
 2 \quad 40 \quad + 246 \\
 0 \quad 5 \\
 \hline
 - 2 \quad 35
 \end{array}$$



14

Nov. 3. 1888.

(1455)

2 13.5 +21 25

9 04

+24° 396

6.12

6.53

6 "

6.39

6.52

25.58

12.78

6.39

19.17

8.307

8.30

Iris

5.97

5.90

5.88

6.10

23.85

11.925

5.962

17.89

7.751

7.75

+25° 449.

+25° 419

5.20

5.30

5.22

5.20

20.92

10.46

5.23

15.89

6.799

6.80

Iris

5.84

6.03

5.79

5.88

23.54

11.77

5.885

17.65

7.650

7.65

+25° 441.

+25° 401

6.14

6.02

6.12

5.97

24.25

12.125

6.062

18.19

7.881

7.88

9 34



Nov. 3, 1888.

Vesta &amp; comp stars.

No obs.

1455)

$$\begin{array}{r}
 0 \quad 14 \quad -9 \quad 46 \\
 0 \quad 56 \\
 \hline
 + \quad 38
 \end{array}$$

$$\begin{array}{r}
 0 \quad 40 \\
 1 \quad 00 \\
 \hline
 + \quad 20
 \end{array}$$

$$\begin{array}{r}
 -10^\circ \\
 \hline
 =19^\circ 164
 \end{array}$$

9 50

5.00  
5.105.49  
5.28

$$\begin{array}{r}
 20.87 \\
 10.435 \\
 5.217 \\
 1.565 \\
 \hline
 6.782
 \end{array}$$

6.78

Vesta

5.81  
5.985.97  
6.05

$$\begin{array}{r}
 23.81 \\
 11.905 \\
 5.952 \\
 1.786 \\
 \hline
 7.738
 \end{array}$$

7.74

$$\begin{array}{r}
 -10^\circ \\
 \hline
 =19^\circ 173
 \end{array}$$

6.17  
5.796.10  
6.12

$$\begin{array}{r}
 24.18 \\
 12.09 \\
 6.045 \\
 1.813 \\
 \hline
 7.858
 \end{array}$$

7.85

Vesta

6.10  
5.885.93  
6.02

$$\begin{array}{r}
 23.93 \\
 11.965 \\
 5.9825 \\
 1.7947 \\
 \hline
 7.7772
 \end{array}$$

7.78

$$\begin{array}{r}
 -10^\circ \\
 \hline
 =19^\circ 180
 \end{array}$$

5.33  
5.075.38  
5.18

$$\begin{array}{r}
 20.96 \\
 10.48 \\
 5.24 \\
 1.512 \\
 \hline
 6.812
 \end{array}$$

6.81

10 22



Nov. 3, 1888.

$$= 19^\circ 180$$

Comet # 1888 (Barnard) Tr. ob.

$\sqrt{\quad}$	<del>14</del>	<del>24</del>	<del>+2</del>	<del>9.9</del>
$\sqrt{\quad}$	13	24	+2	7
	-1	24		-2
$\sqrt{\quad}$	12	0	+2	$\sqrt{\quad}$
1	46			
- 3	26			

Comp. star = D.M. +  $1^\circ 965$  (9.3 B)

Pos. zero 265.2

Setting ~~220.2~~ 220.2

1 <sup>h</sup>	57 <sup>m</sup>	34.3 <sup>sec</sup>	*
	57	44.2	*
	58	2.6	$\infty$
	58	40.8	$\infty$

	59	8.1	
	59	18.2	
2 <sup>h</sup>	59	36.3	
	0	14.5	



Nov. 3, 1888.

2<sup>h</sup>

0 42.7

0 53.0

1 10.5

1 49.1

2 26.7

2 37.0

2 54.4

3 32.4

3 58.0

4 7.8

4 24.8

5 2.5

5 28.6

5 38.5

5 55.5

6 43.5

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

Nucleus moderately well defined but not  
wholly stellar.



Nov. 3, 1888.

Fr. 3451.			Balloon 103.		
2	19	34.0	11	11	0.0
	20	38.0		12	0.0

$\therefore$  Fr. 3451 is 2<sup>m</sup> 11.9 slow.



Nov. 7. 1888.

Somewhat Cloudy.

Willson's New Dynameter. W. ob.

Pos. zero. 220.1

90

Setting 265.1

310.1

180

130.1

~~530~~

~~55.8 66.0 25.5~~

~~37.6 48.4 22.6 33.1 54.4~~

~~5~~

37.6

22.6

~~54.4~~ 31.5 0.6

48.4

33.1

~~67~~ 41.8 11.5

10.8

10.5

10.3 10.9

~~56.0~~ 27.5

~~58.8~~ 41.9

32.0

57.4

~~43.9~~

38.0

52.5

42.4

8.0

10.5

10.6

10.4

10.6

1

16.5

14.6

42.9

22.5

~~55.0~~

27.3

25.0

53.3

33.0

10.8

10.4

10.4

10.5



Nov. 7. 1888.

~~23.4~~ 54.0

30.8	16.2	59.6	27.5	55.9
<u>41.0</u>	<u>26.9</u>	<u>10.0</u>	<u>38.0</u>	<u>6.2</u>
10.2	10.7	10.4	10.5	10.3

30.0	57.5	<del>23.4</del> 10.2	<del>4.5</del>
<u>40.3</u>	<u>8.0</u>	<u>20.7</u>	
10.3	10.5	10.5	

22.7	<del>46.5</del> 26.0	57.4	27.0	59.8
<u>33.0</u>	<u>36.6</u>	<u>7.9</u>	<u>37.6</u>	<u>10.2</u>
10.3	10.6	10.5	10.6	10.4

Measurements difficult. Difficulty in seeing second bar by light thrown into the field.

Now clearer.  
Iris and Comp. Stars W. d.

Blondy again

2	40	2	40	+24.6
<u>1</u>	<u>0.5</u>	<u>0</u>	<u>35</u>	
1	3.5	-2	0.5	

(5.5)

2

11

20

50



Nov. 7. 1888.

Clear again

+ 24° 396

9 42

6.58

6.58

6.68

6.55

26.39

13.195

6.597

19.79

8.576

8.58

+ 20° 409

~~5.42~~ 5.59~~5.29~~ 4.49~~5.49~~ 4.58~~5.24~~ 4.61

19.27

9.635

4.817

1445

6.262

6.26

Iris

5.80

5.82

5.75

5.72

23.09

11.545

5.772

17.87

7.509

7.5X

+ 25° 449

5.42 +

5.29

5.49

5.24

21.44

10.72

5.36

16.08

6.968

6.97

+ 20° 416

5.59

5.59

5.60

5.68

22.46

17.23

5.615

16.84

7.299

7.27

Iris

5.82

5.80

5.78

5.79

23.19

11.595

5.797

17.39

7.536

7.54

+ 25° 441

5.71

5.70

5.78

5.61

22.80

11.40

5.70

17.1

7.41

7.41



Nov. 7, 1888.

10 08

 $+19^{\circ} 367$   
 4.72  
 4.77

 4.90  
 4.57

 $18.96^{\circ}$   
 $6.16^{\circ}$ 

More clouds coming, which will  
 prevent observations of Vesta & comp.  
 stars.

Comet e 1888 (Barnard) G. obs.

4	52	+0	50
2	01		
-2	53		

Comparison star = D.M.  $+0^{\circ} 905 (8.5R)$

Pos zero 132.5

Setting 177.5

2<sup>h</sup>

12	28.1	*
12	51.0	*
13	17.6	E
13	54.4	E



Nov. 7, 1888.

14	30.0
14	52.7
15	19.1
15	55.6

16	28.7
16	51.5
17	16.3
17	53.5

18	31.8
18	54.5
19	20.3
19	56.6

20	28.8
20	51.4
21	16.5
21	52.6

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

Nucleus of comet somewhat eccentric  
with reference to total nebulosity, thus  
showing an incipient tail. In fact  
tail quite distinctly visible for a short  
distance.



Nov. 7. 1888.

Fr. 3451.			Balloon 102.		
2	35	13.2	11	11	0.0
	36	13.4		12	0.0

$\therefore$  Fr. 3451 is 2<sup>m</sup> 22.8 slow.



Nov. 12. 1888.

Series 21.

Dim. +19°

Gr. obs.

19	52	+19.0
<u>23</u>	<u>23</u>	
3	31	

Clouds

19	52
<u>23</u>	<u>36</u>
3	44

Clearer again

7 56 S.T.

23 40.5 4290

297  
3

2.97

3.06

2.90

6.93

3.87

4294

2.90

3.12

3.22

9  
~~8.24~~

4.00

4302  
~~4294~~

2.41

2.57

2.60

7.58

3.28



Nov. 12, 1888.

~~4304~~  
~~4302~~

2.87

2.52

2.77

8.16

2.53

~~4305~~  
~~4304~~

3.18

3.40

3.40

9.98

4.32

~~4318~~  
~~4305~~

3.30

3.15

3.29

9.74

4.22

~~4327~~  
~~4318~~

3.77

3.70

3.92

11.39

4.93

~~4329~~  
~~4327~~

3.18

3.52

3.52

Rather close  
double~~4338~~  
~~4329~~

2.98

3.12

3.20

10.22

4.42

~~4347~~  
~~4338~~

3.18

3.20

3.15

9.30

4.03

9.53

4.13



Nov. 12, 1888.

4355	4.02		
<del>4347</del>	3.88		
	3.92	11.82'	
			5.12'
4357	3.72		
	3.90		
	4.01	11.63'	
			5.04'
4369	3.90		
	3.88		
	4.00	11.78'	
			5.10'
4383	2.69		
	2.78		
	2.58	8.05'	
			3.49'
4385	3.80		
	3.82		
	3.80	11.42'	
			4.95'
4391	5.08		
	4.99		
	4.80	14.87'	6.44'
4394	2.80	Preceding northern	
	2.70	9 brighter of two	
	2.62		
		8.12'	
			3.52'



Nov. 12, 1888.

4401	2.89		
	2.88		
	2.84	8.61	3.73
4410	3.10	following & brighter	
	3.02	of two.	
	3.10		
		9.22	
4420	2.58		3.99
	2.62		
	2.89	8.09	3.50
4424	3.14		
	3.09		
	2.99	9.22	3.99
4428	2.59		
	2.49		
	2.52	7.60	3.29
4429	3.32	preceding of two	
	3.32		
	3.25		
		9.89	4.28
4433	2.50		
	2.42		
	2.32	7.24	3.14



Nov. 12, 1888.

4446	3.27			
	3.26			
	3.14	9.67		
			4.19	
4451	3.57			
	3.80			
	3.66	11.03		
			4.78	
4458	3.57			
	3.29			
	3.58	10.44		
			4.52	
4459	3.58			
	3.73			
	3.58	10.89		
			4.72	
4464	3.79			
	3.70			
	3.52	11.01		
			4.76	
4465	3.24			
	3.18			
	3.50	9.92		
			4.30	
4473	3.50			
	3.73			
	3.69	10.92		
			4.73	



Nov. 12, 1888.

4477	2.42	Double. Combined
	2.80	light.
	2.89	
		8.11 ' 3.54
4480.	3.10	
	2.91	
	2.89	8.90 ' 3.85
4483	2.37	
	2.49	
	2.45	7.31 ' 3.16
4485	2.97	
	2.74	
	2.62	8.33 ' 3.61
4489	3.00	
	2.99	
	2.80	8.79 ' 3.81
4496	3.01	
	3.04	
	2.99	9.94 ' 3.91
4498	3.05	
	3.18	
	3.05	9.28 ' 4.02



Nov. 12, 1888.

4501	5.29		
	5.61		
	5.10	15.40	
			6.67
4503	2.78		
	3.02		
	2.95	8.75	
			3.79
4509	3.22		
	3.30		
	3.11	9.63	
			4.17
4515	3.59		
	3.40		
	3.32	10.31	
			4.46
4525	4.10		
	4.20		
	4.09	12.39	
			5.36
4526	2.43		
	2.42		
	2.65	7.50	
			3.25
4530	5.07		
	4.83		
	4.99	14.89	
			6.45



Nov 12, 1888.

4543

3.49

3.30

3.34

10.13

4.38

4545

3.16

3.29

3.04

9.49

4.11

4547

3.44

3.43

3.61

10.48

4.53

4553

3.99

3.78

3.78

11.55

5.00

4554

3.42

3.70

3.49

10.61

4.59

4556

2.69

2.79

2.50

7.98

3.46

4560

2.59

2.69

2.61

7.89

3.42



Nov. 12, 1888.

4564

4.89

4.87

4.61

14.37

6.23

4565

3.42

3.28

3.30

10.00

4.33

10

✓

4567

2.78

2.97

3.07

8.82

3.82

Comet e 1888 (Barnard) W. St.

$$\begin{array}{r}
 4 \quad 24 \quad -0.7 \\
 2 \quad 15 \\
 \hline
 2 \quad 9
 \end{array}$$

Comparison star =  $-0.702$  (7.5 H)

Pos. zero 179.4

$$\begin{array}{r}
 45 \\
 \hline
 224.4
 \end{array}$$



Nov. 12, 1888.

2<sup>h</sup>

27 9.9 \*

27 23.5 \*

28 58.8 ☉

29 44.9 ☉

30 45.5 \*

30 59.0 \*

32 32.9 ☉

33 19.3 ☉

34 2.1 \*

34 15.5 \*

35 48.9 ☉

36 35.4 ☉

37 43.0 \*

37 56.5 \*

39 28.5 ☉

40 15.8 ☉

40 44.9 \*

40 58.0 \*

42 29.5 ☉

43 16.4 ☉

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



Nov. 12. 1888.

Fr. 3451.

Ballon 103.

2	52	41.7
	53	41.9

11	9	0.0
	10	0.0

 $\therefore 3451$  is  $2^m$  36.5 plow.



Nov. 13. 1888.

Iris and Camp. Mass. Woods.

(55)

2 4.5 + 20.5

2 5 + 20.5

23 14  
21 9

2 40 + 24.6  
23 23  
20 43

Abandoned for the present - tel  
later in the evening.

14 5.5 + 20.0  
23 40  
4 45

18 5.5 + 19.5  
23 53  
4 58

Series 22.  
D.M. + 19°

8<sup>h</sup> 06<sup>m</sup> 3871

3.20

3.19

3.03

Following northern  
a brighter of two.  
9.42 4.08



Nov. 13, 1888.

3880

4.77

4.74

4.81

14.32

6.20

3881

2.84

2.90

2.93

8.67

3.75

3887

3.37

3.11

3.48

9.96

4.31

3892

3.30

3.30

3.44

10.04

4.35

3898

2.70

2.60

2.63

7.93

3.43

3904

3.38

3.47

3.58

10.43

4.52

3912

2.50

2.78

2.79

8.07

3.49

preceding northern  
a brighter of two



Nov. 13, 1888.

3914	2.81	
	3.02	
	3.12	8.95
		3.88
3915	3.48	
	3.27	
	3.42	10.17
		4.40
3923	3.70	
	3.89	
	3.81	11.40
		4.94
3929	2.60	
	2.61	
	2.73	7.94
		3.44
3932	3.51	
	3.71	
	3.53	10.75
		4.65
3936	2.49	
	2.35	
	2.38	7.22
		3.13
3940	2.93	
	3.18	
	2.87	8.98
		3.89



Nov. 13, 1888.

3949

4.32

4.27

4.19

12.78

5.53

3952

3.97

3.89

3.99

11.85

5.12

3956

5.60

5.60

5.71

16.91

7.32

3965

3.37

3.60

3.61

10.58

4.57

3969

2.40

2.37

2.38

7.15

3.10

3971

3.40

3.40

3.48

10.28

4.44

3972

4.12

4.21

4.30

12.63

5.47



Nov. 13, 1888.

3995	3.91	
	3.88	
	3.67	11.46
		4.96
3997	5.17	
	5.29	
	5.10	15.56
		6.74
4000	5.60	
	5.31	
	5.31	16.22
		7.02
4002	3.61	
	3.62	
	3.35	10.58
		4.58
4008	3.71	
	3.58	
	3.81	11.10
		4.81
4009	5.71	
	5.72	
	5.58	17.01
		<del>7.37</del>
		<del>5.07</del>
4013	3.34	
	3.37	
	3.40	10.11
		4.87



Nov. 13, 1888.

4019	5.37		
	5.35		
	5.28	16.00	
			6.93
4021	2.88		
	2.91		
	2.87	8.66	
			3.75
4023	3.49		
	3.39		
	3.19	10.07	
			4.36
4027	3.70		
	3.75		
	3.62	11.07	
			4.79
4028	4.87		
	4.91		
	4.90	14.68	
			6.85
4029	3.03		
	3.03		
	2.92	8.98	
			3.89
4037	3.28		
	3.17		
	3.12	9.57	
			4.14



Nov. 13, 1888.

4039	5.59	
	5.52	
	5.70	16.81 7.27

4044	2.97	
	2.95	
	3.01	8.93 3.87

4048	3.35	
	3.58	
	3.50	10.43 4.52

4054	2.60	
	2.68	
	2.69	7.97 3.45

4056	2.68	
	2.82	
	2.74	8.24 3.57

#9 12

20

The following additional stars were a continuation of same series. The last star above was getting rather low for a continuance at that point, and, as the stars had also been once observed between the ~~above~~ 4056 and 4565, a new start was made with the latter.



Nov. 12, 1888.

20 <sup>h</sup>	52	+19.8
<u>25</u>	<u>12</u>	
4	20	

Series 22 con. (See previous page for intro.)

9 28	4585	3.71		
		3.90		
		3.91	11.52	
				4.99
	4594	2.39		
		2.58		
		2.67	7.64	
				3.31
	4596	w. 2.		
		<del>2.57</del>	3.10	
		<del>2.68</del>	3.00	
		<del>2.44</del>	2.90	9.00
				3.90
	4597	3.61		
		3.52		
		3.43	10.56	
				4.57
	4603	2.81	Double combined	
		3.07	light.	
		2.99	8.87	
				3.84
	4605	3.62		
		3.72		
		3.78	11.12	
				4.82



Nov. 13, 1888.

4607

3.31

3.08

3.20

9.59

4.15

4615

3.79

3.68

3.68

11.15

4.83

4618

4.28

4.30

4.08

12.66

5.48

4626

2.77

2.92

3.02

8.71

3.77

4628

3.08

3.30

3.14

9.52

4.12

4631

2.87

3.12

3.00

8.99

3.89

4630

2.31

2.51

2.68

7.50

3.25



Nov. 13, 1888

10 4      46 36      3.22  
                                  3.38  
                                  3.25    9.85    4.26

Stars 4630 and 4636 accidentally  
 reversed.

Vesta and Comp. Stars. Gr. obs.

(v)      0    16      9'    0'

0    48      -2.0  
2    10  
 1    22

0    48  
2    14  
 1    26

10 18

-10' 164

4.86

5.20

5.20

5.15

20.41  
 10.205  
 5.102  
1531  
 6.633

6.63

Vesta

5.38

5.32

5.37

5.28

21.35  
 10.675  
 5.338  
1601  
 6.939

6.93



Nov. 13, 1888.

 $-10^{\circ} 173$ 

5.80

5.63

5.96

5.89

23.28

Vesta

$$\begin{array}{r} 1164 \\ 582 \\ 1746 \\ \hline 7566 \end{array}$$

7.58

5.20

5.39

5.63

5.20

21.42

 $-10^{\circ} 180$ 

4.64

4.77

4.96

4.52

18.89

4.52

$$\begin{array}{r} 9.445 \\ 4.722 \\ 1417 \\ \hline 6.139 \end{array}$$

6.14

Field quite bright, especially when on the region of Vesta, the moon being not far distant. Observations possibly a little more uncertain from brightness of field.

10 49



14.  
Nov. 13. 1888.

Pretty clear at present in region  
of D.M.  $+19^\circ$  at the altitude ~~sets~~ set  
on.

$$\begin{array}{r} 19 \quad 22 \quad +200 \\ 23 \quad 21 \\ \hline 3 \quad 53 \end{array}$$

$$\begin{array}{r} 21 \quad 4 \\ 20 \quad 20 \\ \hline +2 \quad 16 \end{array}$$

Too much cloud and haze at present  
for photometry, even in this region.

Count e 1888. (Barnard) Fr. obs.

$$\begin{array}{r} 4 \quad 10 \quad -1.5 \\ 23 \quad 40 \\ \hline 19 \quad 30 \end{array}$$

$$\begin{array}{r} 4 \quad 10 \quad 4 \quad 10 \quad 23 \quad 59 \\ 23 \quad 40 \quad 23 \quad 37 \quad 19 \quad 48 \\ \hline 19 \quad 40 \quad 19 \quad 47 \quad 4 \quad 11 \end{array}$$

Comparison star = D.M.  $-1^\circ 605$  (88 K)



Nov. 14, 1888.

Pos. zero 231.8

$$\begin{array}{r} 45 \\ \hline \text{Setting } 276.8 \end{array}$$

0

17	20.0	*
18	7.5	*
18	26.0	$\pm$
19	6.8	$\pm$

19	54.8
20	34.4
20	59.3
21	33.7

22	6.7
22	46.5
23	11.1
23	44.8

25	13.4
25	53.7
26	16.7
26	51.9

27	33.5
28	13.6
28	36.5
29	11.4



Nov. 14, 1888.

0	29	56.8
	30	37.0
	30	58.2
	31	33.9

	32	9.3
	32	49.5
	33	10.2
	33	46.1

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

Comet quite faint from moon light & cloud, hence observations somewhat uncertain, & only  $\frac{1}{2}$  weight. Third set thought to be the poorest.

Somewhat clearer comet much better seen.

New series on same comet.

0	37	47.5	*
	38	28.5	*
	38	46.6	†
	39	24.0	†



Nov 14, 1888.

0	39	58.7
	40	39.7
	40	57.0
	41	34.3
	42	12.5
	42	53.5
	43	10.0
	43	48.0
	44	22.4
	45	3.3
	45	19.1
	45	57.2
	46	28.3
	47	9.7
	47	24.6
	48	3.1

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

Clearer than in preceding series &  
comet much better seen although some-  
what faint from bright moonlight.

Observations full weight

Same comparison stars used as in pre-  
vious series.



Nov. 14. 1844.

Now quite clear.

Lercis 23.

Sun +19°

Gr. ob.

21	4	+19.9
25	24	
4	20	

21	16
25	25
4	9

9 28 4639

2.58

2.63

2.52

7.73

8.35

4661

3.59

3.32

3.47

10.38

4.49

4670

3.28

3.35

3.60

10.23

4.43

4674

4.45

4.60

4.52

13.57

5.88



Nov. 14, 1888.

4694	2.95		
	2.79		
	2.88	8.62	3.73
			<del>4.16</del>
4699	2.30		
	2.32		
	2.27	6.89	
			2.98
4720	3.11		
	3.12		
	2.97	9.20	
			3.98
4727	3.12		
	3.15		
	3.17	9.44	
			4.09
4728	2.92		
	3.19		
	3.08	9.19	
			3.98
4732	3.41		
	3.04		
	3.19	9.64	
			4.17
4736	3.20		
	3.03		
	3.16	9.39	
			4.07



Nov. 14, 1888.

4741	2.69			
	2.50			
	2.61	7.80		
			3.38	
4743	3.28			
	3.27			
	3.17	9.72		
			4.21	
4746	3.11			
	2.99			
	3.12	9.22		
			3.99	
4755	4.40			
	4.60			
	4.30	13.30		
			5.76	
4766	2.87			
	3.02			
	3.12	9.01		
			3.90	
4776	3.11			
	2.91			
	3.02	9.04		
			3.91	
4779	2.74			
	2.88			
	2.90	8.52		
			3.69	



Nov. 14, 1888.

4782	2.76		
	3.09		
	2.98	8.83	
			3.82
4790	3.81		
	3.85		
	3.82	11.48	
			4.97
4794	2.88		
	2.98		
	3.10	8.96	
			3.88
4796	3.02		
	3.00		
	3.03	9.05	
			3.92
4804	2.60		
	2.95		
	2.90	8.45	
			3.66
4808	3.11		
	3.26		
	3.17	9.54	
			4.13
4813	2.80		
	2.88		
	3.07	8.75	
			3.79



Nov. 14, 1888.

4824	3.53		
	3.30		
	3.50	10.33	
			4.47
4838	2.49		
	2.58		
	2.60	7.67	
			3.32
4843	2.29		
	2.62		
	2.40	7.31	
			3.16
4845	3.30		
	3.10		
	3.30	9.70	
			4.20
10 45 4846	2.32		
	2.35		
	2.40	7.07	
			3.06

Stopped finally by increasing haze. Perfectly clear at beginning of zone but although watch was kept of the sky it was suddenly found that it had become quite hazy again, so that the last part of the zone must have been somewhat affected.



Nov. 15, 1888.

Fr. 3451.Ballou 103.

$\frac{14}{2}$	32	16.3	=	$\frac{22}{10}$	41	0.0
	39	16.6	=		42	0.0

 $\therefore$  Fr. 3451 is  $2^{\sim}$  45.4 slow.



Tris and Comp. Mass.

Fr. ab.

(55) 2 5 +19 20

$$\begin{array}{r} 2 \\ 28 \\ \hline 21 \end{array}$$

~~0-589~~

7 ~~58~~ E.T.

+24° 396  
409

& 6.57 6.57

6.40 6.61

26.15

13.075

6.537

19.61

8.498

Iris

5.70 5.80

5.77 5.72

22.99

11.495

5.747

17.24

7.471

+25° 449

5.40 5.24

5.23 5.45

21.32

10.66

5.33

15.99

6.929

Iris

5.61 5.90

5.70 5.79

23.00

11.50

5.75

17.25

7.475



Nov. 17, 1888.

 $+25^{\circ}44'$ ~~034519~~

L 35 E. Y.

6.23

6.12

6.25

6.29

$$\begin{array}{r} 2489 \\ 12.4145 \\ 6.222 \\ 1867 \\ \hline 8.089 \end{array}$$

This & comp. stars at a pretty high altitude so that position is rather ~~strained~~ constrained.

Vesta and Comp. Stars. N. obs.

(55)

0 16

-L 42

0 52

36

1 0

0 48

16

63

60

15

44

 $-10^{\circ}16'$ 

8 55

5.12

5.26

5.01

5.24

20.63

$$\begin{array}{r} 10.315 \\ 5.157 \\ 15.47 \\ \hline 6.704 \end{array}$$

6.71

Vesta

5.19

5.22

5.37

5.34

$$\begin{array}{r} 1056 \\ 528 \\ 1584 \\ \hline 21.12 \end{array}$$

6.87



Nov. 17. 1888.

 $-10^{\circ} 173$ 

5.70

5.78

5.89

5.77

23.14

 $-10^{\circ} 180$ 

Vesta

1157

5.785

1735

7.520

7.52

5.00

5.07

4.88

4.83

19.78

9.89

4.945

1483

6.428

6.43

 $-10^{\circ} 180$ 

5

Vesta

5.27

5.25

5.38

5.32

21.22

10.61

5.305

15916

6.896

6.90

9 19

The four observations immediately above were accidentally credited at first to star  $-10^{\circ} 180$  whereas they belong to Vesta. Consequently, the readings of these two objects have been interchanged.

Comet e 1888 (Barnard) Gr. obs.

3

50

-2

35

3

52

-2.0

Comet faintly suspected but not sure of it. Field bright & moon not far distant.  
Abandoned.



char. 17. 1st 1st.

Wydze Zone.

Lewis 24.

Sm. + 19°

Gr. obs.

$$\begin{array}{r} 22 \quad 17 \\ 22 \quad 14 \\ \hline 3 \quad 57 \end{array} \quad +20.1$$

$$\begin{array}{r} 22 \quad 28 \\ 26 \quad 17 \\ \hline 3 \quad 49 \end{array} \quad \begin{array}{r} 22 \quad 50 \\ 26 \quad 21 \\ \hline 3 \quad 31 \end{array}$$

10 26 4908

232

238

240

faint

7.10

3.07

4914

2.61

2.72

2.60

7.93

3.43

4918

2.60

2.69

2.49

7.78

3.37

4923

3.37

3.26

3.21

9.84

4.26



Nov. 17, 1888.

4928	3.47		
	3.37		
	3.37	10.21	4.42
4930	3.69		
	3.79		
	3.50	10.98	4.75
4943	2.40		
	2.60		
	2.38	7.38	3.20
4945	2.28		
	2.18		
	2.34	6.80	2.94
4952	2.10		
	2.13		
	2.30	6.53	
4959	2.47		2.82
	2.53		
	2.49	7.49	3.24
4961	3.59		
	3.48		
	3.60	10.67	4.63



Nov. 17, 1888.

4963	2.62	
	2.58	
	2.67	7.87
		3.41
4967	2.90	
	3.08	
	2.92	8.90
		3.85
4969	2.96	
	3.12	rather bright
	2.92	9.00
		3.90
4970	1.89	
	1.87	faint
	1.83	5.59
		2.42
4971	2.90	
	3.00	rather bright
	3.01	8.91
		3.86
4973	2.02	
	2.11	
	2.07	6.20
		2.68
4979	2.25	
	2.33	
	2.09	6.67
		2.89



Nov. 17, 1888.

4986

3.00

3.08

3.19

9.27

4.01

4987

3.07

3.01

2.98

9.06

3.92

4996

1.85

2.12

2.02

5.99

2.59

11 0



Nov. 20. 1888

Iris and Comp. Stars. K. ob.

(55)

2	3	+12	55
23	48		
21	45		

2	3
23	52
21	49

+24° 396

7 42

6.62	6.54
6.53	6.54

26.23	8.52
13.115	
6.557	
1967	
8.524	

Iris

5.71	5.72
5.84	5.81

23.08	7.50
11.54	
5.77	
1731	
7.501	

+25° 449

5.50	5.70
5.50	5.60

22.30	7.25
11.15	
5.575	
1.672	
7.247	

Iris

5.67	5.86
5.82	5.87

23.22	7.54
11.61	
5.805	
1741	
7.546	



Nov. 20. 1888.

+25° 441

8 12	6.01	6.00	
	6.05	6.05	24.11
			12.055
			6.027
			1808
			<u>7.835</u>

Vesta and Cneph. Stars. It. do.

(55) 0 15 - 2 53

0	42	-9.0
0	39	
<hr/>		
	9	

-10° 164

8 22	5.18	5.68	
	5.39	5.68	21.93
			10.965
			5.482
			1645
			<u>7.127</u>

Vesta

5.61	5.61	
5.59	5.63	22.44
		11.22
		5.61
		1683
		<u>7.293</u>

-10° 173

5.95	6.01	
5.90	5.98	23.84
		11.92
		5.96
		1788
		<u>7.748</u>

Vesta

5.51	5.52	
5.60	5.60	22.23
		11.15
		5.67
		1224
		<u>7.224</u>



Nov. 20, 1888.

 $-10^{\circ}180$ 

8 52

5.09

5.20

5.10

5.18

$$\begin{array}{r} 20.57 \\ 10.285 \\ 5.1425 \\ 15.427 \\ \hline 6.6852 \end{array}$$

6.68

Moon on other side of place of  
e 1444 (Barnard), but relatively  
about as near, as well as full,  
as on Nov. 17. As it was not  
seen then, it is probably useless  
to look for it to night.

Sun. Tredge Photometer Zone.

Series 25. (+19°) Gr. ob.

22 81 +20.

25	21	23 45	23 27
2	40	27 08	26 45
		3 23	3 18

9 13

5005

3.95

3.78

3.82

11.55

~~5007~~

5.00

5007

3.32

3.22

3.15

9.69

4.20



Nov. 20, 1888.

5011	3.22		
	3.24	a faint companion north preceding.	
	3.00		
		9.46	
5016	2.80		4.10
	2.82		
	2.71	8.33	
			8.61
5022	2.72	8.10	3.51
	2.67	following southern & slightly brighter of pair observed.	
	2.71		
5023	3.22		
	3.22		
	3.18	9.62	
			4.16
5031	2.97		
	3.00		
	3.14	9.11	
			3.94
5036	6.17		
	6.08		
	6.18	18.43	
			7.98
5039	4.50		
	4.68		
	4.52	13.70	
			5.93



Nov. 20, 1888.

5041	2.50		
	2.55		
	2.40	7.45	3.22 <sup>3</sup>
5042	3.65		
	3.42		
	3.50	10.57	4.5 <sup>7</sup> *
5045	2.58	following southern	
	2.57	& slightly brighter of	
	2.41	two	7.56
5046			3.27
	2.48		
	2.52		
	2.51	7.51	
			3.25
5053	3.62		
	3.34		
	3.55	10.51	
5056			4.55
	2.82		
	2.98		
	2.99	8.79	
			3.81
5061	3.62		
	3.49		
	3.67	10.78	4.67



Nov. 20, 1888.

5068	2.71		
	2.99		
	2.93	8.63	
			3.74
5071	2.12		
	2.30		
	2.39	6.81	
			2.95
5081	3.38		
	3.40		
	3.42	10.20	
			4.42
5088	3.05		
	3.04		
	3.09	9.18	
			3.97
5085	2.32		
	2.62		
	2.63	7.57	
			3.28
5091	4.29		
	4.28		
	4.15	12.72	
			5.51
5095	1.92		
	2.09		
	1.80	5.81	
			2.52



Nov. 20, 1888.

5101	3.10		
	3.22		
	3.28	9.60	
			4.16
5114	2.60		
	2.78		
	2.80	8.18	
			3.54
5118	2.80		
	2.71		
	2.87	8.38	
			3.63
5126	2.51		
	2.61		
	2.68	7.80	
			3.38
5127	4.60		
	4.80		
	4.67	14.07	6.09
			<del>4.97</del>
5136	2.94		
	2.90		
	3.02	8.86	
			3.84
5141	2.30		
	2.58		
	2.51	7.39	
			3.20



Nov: 20, 1888.

5152

3.11

3.29

3.31

9.71

4.20

8

5153

2.92

rather bright

2.81

3.08

8.81

3.81

5156

2.65

2.80

2.77

8.22

3.56

5157

3.10

3.02

2.93

9.05

3.92

5162

2.50

2.62

2.68

7.80

3.38

5165

3.15

3.27

3.20

9.62

4.16

5166

3.08

3.14

3.31

9.53

4.13

10 53

1



Nov. 21. 1888.

Iris and Comp. Stars. Tr. ob.

(55) 2 2 +12 46

2	40
23	59
21	19

7 40

+24°396

6.59  
6.446.56  
6.50

26.09	
13.045	8.48
6.522	
19.57	
8.476	

Iris

5.72

5.59

5.72

5.60

22.63	
11.315	7.34
5.657	
16.97	
7.354	

+25°449

5.45

5.54

5.62

5.40

22.01	
11.005	7.15
5.502	
1.651	
7.153	

Iris

5.71

5.59

5.80

5.78

22.88	
11.44	7.44
5.72	
17.16	
7.436	

+25° 441

6.10

5.99

6.23

6.01

24.33	
12.165	7.90
6.082	
18.247	
7.907	

8 14



Nov 05 0 \* 13 6

## SEARCHING REPORT

Heading (Check one box only)

- ☐ Identification guaranteed  
☐ Identification **not** guaranteed  
☐ Conflict  
☐ No conflict

Other headings searched and Comments:

## Edition Report

Latest Widener edition

Year

Call number

☐ Only edition☐ No edition☐ Earlier☐ Later☐ 5 or more

} editions in Widener

☐ Earlier☐ Later

} editions in K

Author number (unless shown above)

1.4 \*

6.6 \*

1.5 =

2.1 =

2.2

7.3

1.7

2.2

17.5

2.5

56.1

36.4

18

18

19



Nov. 21, 1888.

Comet e 1444. (Barnard) Gr. obs.

(55) 3 22 - 3 54

3 24 - 5.6

24	45
21	21

Comparison star =  $-3^{\circ} 55' 2''$  (9.154)

Pos zero 269.2

Setting	45
	224.2

1 <sup>h</sup>	12	31.4	*
	12	56.6	*
	13	41.5	≡
	14	22.1	≡
	15	12.2	
	15	37.3	
	16	21.7	
	17	2.2	
	17	47.5	
	18	12.5	
	18	56.1	
	19	36.4	



Nov. 21, 1888.

1	20	50
	20	30.2
	21	13.2
	21	53.4

22	35.6
23	1.0
23	43.5
24	23.5

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

Tredge Photometer Zone. W. St.  
Series 26 +9°

21	52	+9.9
25	45	
3	53	

9 32# 4948

5.32

5.12

5.12

15.56

6.73

4954

2.80

3.02

3.09

8.91

3.86



~~Nov. 21~~ Nov. 21 1888.

4956

3.35

3.31

3.18

9.84

4.26

4958

2.90

3.18

3.20

9.28

4.02

4961

2.62

2.48

2.52

7.62

3.30

4965

3.11

3.10

2.95

9.16

3.97

4966

2.80

3.00

3.12

8.92

3.86

4968

2.31

2.61

2.69

7.61

3.30

4981

2.67

2.67

2.73

8.07

3.49



Nov. 21, 1888.

4987

3.59

3.49

3.59

10.67

4.63

4997

3.51

3.52

3.52

10.55

4.57

4999

2.68

2.78

2.70

8.16

3.53

5001

3.00

2.91

3.02

8.93

3.87

5007

3.48

3.40

3.45

10.33

4.47

5018

2.52

2.59

2.71

7.82

3.39

5022

2.78

3.02

2.88

8.68

3.76



Nov. 21, 1888.

5024	3.90		
	3.79		
	3.80	11.49	
			4.98
5029	4.63		
	4.91		
	4.73	14.27	
			6.48
5033	3.90		
	4.20		
	4.02	12.12	
			5.25
5036	3.22		
	2.97		
	3.15	9.34	
			4.04
5047	2.63		
	2.90		
	2.77	8.30	
			3.59
5050	3.10		
	3.30		
	3.00	9.40	
			4.07
5055	4.69		
	4.49		
	4.61	13.79	
			5.97



Nov. 21, 1888.

5062

2.83

2.90

3.01

8.74

3.78

5067

2.79

2.94

3.11

8.84

3.83

5071

2.49

2.76

2.70

7.95

3.44

5075

4.26

4.40

4.27

12.90

5.60

5092

1.60

1.55

4.85

1.70

2.10

Star very faint & almost  
invisible in wedge. Seems  
to identify well with ad-  
jacent stars.

5093

3.08

9.02

2.90

8.90

3.04

~~5095~~

5092 very faint & almost invisible in wedge  
Seems to identify very well however with ad-  
jacent stars. 9.5 mag. tonight in general



Nov. 21, 1888.

5110

frankly quite easily seen. This star  
however was wholly invisible  
except by careful scrutiny.

10 52

~~5119~~

Fr. 3451.

Ballow 103.

3	19	45.5
<del>5124</del>	20	45.5

11	1	0.0
	2	0.0

$\therefore$  Fr. 3451 is 3<sup>m</sup> 0.6 slow.



Nov. 22, 1888.

Iris and Comp. Stars, Tr. obs.

(55)

2 1 +12 40  
 23 52  
 21 51

646

7 28

+24° 396

646

6.64

652

6.62

26.24

13.12

6.56

19.68

8.528

8.53

Iris

5.64

5.72

5.88

5.76

23.00

11.50

5.75

17.25

7.475

7.48

+25° 449

5.70

5.66

5.76

5.51

22.63

11.315

5.657

16.97

7.354

7.35

+25° 441 Iris

5.81

5.89

5.87

5.81

23.38

11.69

5.845

17.53

7.598

7.59

+25° 441

6.09

6.12

6.02

6.18

24.41

7.93

12.205  
 6.102  
 183.06  
 7.93

7 55



Nov. 22. 1888.

Vesta and Comp. Stars. Obs.

(55) 0 15 -A 47

0 42 -A.5

0 31

17

0 12

0 43  
31

+ 10 164

8 7

5.72

5.56

~~5.60~~ 5.59

wrong object.

5.59

22.46

7.30

11.23  
5.615  
1.684  
7.299

Vesta

5.50

5.50

5.56

5.50

22.06

11.03  
5.515  
1.654  
7.169

7.17

+ 10° 173

5.78

5.75

5.79

5.63

22.95

11.475  
5.738  
1.721  
7.459

7.46

Vesta

5.60

5.60

5.50

5.62

22.32

11.16  
5.58  
1.674  
7.254

7.26

+ 10° 180

5.12

5.25

5.18

5.30

20.85

10.425  
5.212  
1.564  
6.776

6

7.77

(See note)

(over)

24  
9 5 X



Nov. 22, 1888.

Observations of Vesta & comparison stars on previous page, finished before clouds came except last two readings on star "164".

Delayed for a considerable time in finishing observations on this star, but finally set completed through a temporary clearing. So that all the measures seem to be available.

All cloudy again after finishing previous measures.

Now temporarily pretty clear again west of meridian, will try for a

Now Yedger Zone.

Gr. It.

+ 9°

Sirius 27.

22 36 + 9.9

26 20

3 24

Clouds again

Clear again

22 34

26 44

4 10



Nov. 22, 1888.

10 30	5095	<del>2.84</del> 2.44		
		<del>3.10</del> 2.60		
		2.40	7.44	
				3.22
	5110	2.55		
		2.58		
		2.43	7.56	
				3.27
	5119	2.30		
		2.27		
		2.42	6.99	
				3.03
	5124	2.84		
		2.90		
		3.10	8.84	
		<del>2.68</del>		3.83
	5127	3.11		
		2.83		
		3.08	9.02	
				3.91
	5131	2.81		
		2.88		
		2.89	8.58	
				3.72
	5132	3.38		
		3.50		
		3.39	10.27	
				4.450



Nov. 22, 1888.

5137	3.49		
	3.43		
	3.48	10.40	
			4.50
5148	2.63		
	2.89		
	2.70	8.22	
			3.56
5149	3.28		
	3.30		
	3.26	9.84	
			4.26
5168	3.17		
	3.08		
	3.24	9.49	
			4.11
5179	3.12		
	3.35		
	3.09	9.56	
			4.14
5181	3.57		
	3.68		
	3.43	10.68	
			4.62
5184	5+3.36		
	3.38		
	3.51	10.25	
			4.44



Nov. 22, 1888.

5192

3.22

3.17

3.32

9.71

4.20

5198

3.48

3.40

3.58

10.38

4.49

5207

2.68

2.83

2.87

8.38

3.60

5216

3.85

3.78

3.75

11.38

4.93

5220

3.28

3.29

3.22

9.79

4.24

18 53



Nov. 23. 1888.

Iris and Corp. Stars. H. obs.

Insertion of Stars on Photographic  
Chart of Pleiads. Fr. obs.

Clouds

Clouds

Clouds again & moon

Very much troubled by clouds continually.  
A few stars inserted on chart through gaps in  
clouds but now clouds everywhere with no  
possible chance of ~~far~~ for farther work of any  
kind.

9 38



Nov. 30. 1888.

Examination of ~~stars~~ region of Pleiades.  
to identify and fill in Stars on Photo-  
graphic Chart. W. H.

Troubled by clouds.

Clearer again

Cloudy again

10<sup>h</sup> 30<sup>m</sup>

Clouds thick all over the sky with no  
prospect for farther work.



Dec. 1. 1888.

Examination of region of Pleiades  
to identify and fill in stars on Pho-  
tographic Chart. H. obs.

10 56 Considerable work done on the Pleiades  
although much troubled by clouds



Dec 2, 1888

7 15 Examination of Pleiades E.C. P. obs.  
 faintest stars photographed widely for a faint  
 15<sup>th</sup> lens with 15 inch aperture  
 With 1 inch lens smallish appears fainter also  
 seen than with R. Mic. No. 1.

Also examined spectrum with direct view prism.

Thypha clear 2 U. Mic. with 6 inch eye.



Dec. 4. 1888.

Region of Pleiades. Continuation  
of previous examination for insertion  
and confirmation of Photographic  
Chart. Light not the best. Somewhat  
hazy. Cleared suddenly. Pleiades high.  
Light moisture found on object  
glass at end.  
Closed at 11<sup>h</sup> 15<sup>m</sup>                      W. O. O.



Dec 6. 1888.

$$0 \quad 52 \quad 52. = 7 \quad 25 \quad 8.7.$$

Iris and Camp. Stars.

Y. obs.

(rr)

$$\begin{array}{r} 2 \quad 2 \\ 1 \quad 7 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \quad 2 \\ 1 \quad 25 \\ \hline 37 \end{array}$$

$$\begin{array}{r} 2 \quad 2 \\ 1 \quad 50 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 2 \quad 9 \\ 7 \quad 25 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \quad 52 \\ 1 \quad 36 \\ \hline 2 \quad 2 \\ \hline \end{array}$$

$$\begin{array}{r} -17 \quad 15 \\ +17 \quad 25 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 48 \\ 6 \quad 33 \\ \hline 1 \quad 15 \\ 10 \end{array}$$

$$\begin{array}{r} 8 \quad 13 \\ 6 \quad 33 \\ \hline 1 \quad 40 \\ 2 \quad 02 \end{array}$$

$$\begin{array}{r} 8 \quad 20 \\ 6 \quad 33 \\ \hline 1 \quad 47 \end{array}$$

$$\begin{array}{r} 2 \quad 40 \\ 1 \quad 42 \\ \hline 53 \end{array} + 24.7$$

8 15

+ 24° 396

6.54

6.62

6.58

6.58

$$\begin{array}{r} 26.3 \quad 2 \quad 57 \\ 13.16 \quad 8.58 \\ 6.58 \\ \hline 1974 \\ 8.554 \end{array}$$



Dec. 6, 1888.

Ins

6.00 5.72 5.58.

6.17 5.70 5.68

$$\begin{array}{r}
 22.68 \\
 11.34 \\
 5.67 \\
 \hline
 17.01 \\
 7.371
 \end{array}$$

+25°449

5.56

5.68

5.71

5.67

$$\begin{array}{r}
 22.82 \\
 11.31 \\
 5.65 \\
 \hline
 16.96 \\
 7.351
 \end{array}$$

Ins

5.68

5.72

5.69

5.72

+25°441

6.10

6.16

6.02

6.18

$$\begin{array}{r}
 22.81 \\
 11.405 \\
 5.702 \\
 \hline
 17.11 \\
 7.413
 \end{array}$$

8 37

$$\begin{array}{r}
 24.46 \\
 12.23 \\
 6.115 \\
 \hline
 18.34 \\
 7.949
 \end{array}$$

First two measurements on Ins  
 seem to be wrong and so repeated.  
 Altitude high and position rather con-  
 strained but measurements considered good



Dec. 6. 1888.

Vesta and Comp. Stars. W. obs.

(rr) 0 20 -7 12

2 46  
 7 25  
 1 21  
 6 52  
 2 13  
 0 22  
 + 1 53

2 13  
 0 52  
 + 1 25

8 62  
 6 33  
 2 19  
 0 48  
 + 1 31

900  
 855

+ 10° 164

5.61

5.39

5.47

5.41

21.88

10.94

5.47

16.41

7.111

7.10

Vesta

4.95

4.90

5.00

4.85

19.70

9.85

4.925

12.77

6.402

6.40

+ 10° 170

5.80

5.49

5.52

5.73

22.54

11.27

5.635

16.80

7.315

7.32



Dec. 6, 1888.

Vesta

4.98

4.99

4.97

5.00

19.94

9.97

6.48

4.985

1.495

6.480

+10° 180

4.90

4.90

5.00

5.13

19.93

9.965

6.48

4.982

1.495

6.477

9 15

Comet e 1888 (Barnard) W. st.

1 47

-7.4

3 2

+1 15

1 47

3 13

+1 26

Comparison Star = G.D. -7° 319 (7.9 H)

Pos. zero 199.0

45

Setting 244.0



Dec 6, 1888.

3 <sup>h</sup>	52	59.8	☉
	53	22.1	☉
	56	7.7	*
	57	0.1	*

	57	36.4
4 <sup>h</sup>	57	57.6
	0	45.0
	1	36.1

	2	25.8
	2	47.7
	5	36.0
	6	27.2

	7	16.5
	7	38.2
	10	27.5
	11	19.4
		16

	12	16.7
	12	38.2
	15	29.5
	16	19.8

Order in preceding transits. Count, Count  
Star, Star. Both in northern half



Dec. 6. 1888.

Flr. 3451.			Ballon 103.		
4	26	17.2	11	9	0.0
	27	17.4		10	0.0

 $\therefore$  Flr. 3451 is  $3^m 38.4^s$  slow



Dec. 7. 1888  
 Comp. Stars for Var.  
 125 U Cygni.

Tr. 125

$$\begin{array}{r} 20 \quad 9 \\ 24 \quad 56 \\ \hline 4 \quad 47 \end{array} \quad + 46.2$$

1 15 29

4.98  
 4.82  
 4.80

1 p

3.80  
 3.98  
 4.10

2 q

4.53  
 4.32  
 4.33

3 k

3.78  
 3.57  
 3.42

4 l



Dec. 7, 1888.

5d

2.62

2.67

2.68

6c

2.59

2.62

2.66

7m

3.10

3.05

3.00

8u

3.20

3.22

3.45

1 308.5

9a

10b



Dec. 7, 1888.

11 g

12 x

13 y

Stopped by clouds which probably affected  
meas'ts on A U, as it was seen to vary  
in light.

Comet c 1888 (Barnard) N. W.

1 40 -7.2

~~a bright star 6 m south slightly  
preceding~~

Pos Zero 219.5

Setting  $\overline{45}$   
264.5

Comparison star about 8 to 8.5 mag,  
as nearly as could be estimated



Dec. 7, 1888

through the coming clouds.

Comparison star precedes comet.

Comparison star has another star  
slightly preceding (about 7 mag) 6' south

Clouds now cover the whole sky  
Too cloudy to see comet or stars



Dec. 12. 1888.

Iris and Comp. Stars. W. etc.

$$\begin{array}{r}
 (rr) \\
 7 \quad 33 \\
 \hline
 2 \quad 2 \\
 1 \quad 10 \\
 \hline
 52
 \end{array}$$

$$\begin{array}{r}
 1 \quad 15 \\
 \hline
 55 \\
 1 \quad 70 \\
 2 \quad 10 \\
 \hline
 2 \quad 40 \\
 1 \quad 36 \\
 \hline
 1 \quad 4
 \end{array}$$

+240396.

7 33

$$\begin{array}{r}
 \cancel{5.62} \quad 6.65 \quad 6.63 \\
 \cancel{5.59} \quad 6.61 \quad 6.53 \quad 26.42
 \end{array}$$

Iris.

$$\begin{array}{r}
 5.62 \quad 5.50 \\
 5.59 \quad 5.48
 \end{array}$$

+250449

$$\begin{array}{r}
 5.32 \quad 5.42 \\
 5.43 \quad 5.45
 \end{array}$$

Iris

$$\begin{array}{r}
 5.47 \quad 5.59 \\
 5.58 \quad 5.42
 \end{array}$$

$$\begin{array}{r}
 13.21 \\
 6.605 \\
 1981 \\
 \hline
 8586
 \end{array}$$

$$\begin{array}{r}
 22.19 \\
 11.095 \\
 5.547 \\
 1.664 \\
 \hline
 7.211
 \end{array}$$

$$\begin{array}{r}
 21.62 \\
 10.81 \\
 5.405 \\
 1621 \\
 \hline
 7.026
 \end{array}$$

$$\begin{array}{r}
 22.06 \\
 11.03 \\
 5.515 \\
 1654 \\
 \hline
 7.169
 \end{array}$$



Dec. 12, 1888.

 $+25^{\circ}441$ 

2 7

6.02

5.99

6.32

6.24

24.57

12.285

6.142

1843

7985

7.98

Vesta and Comp. Stars.

W. obs.

(r-r)

0

22

-6

42

1

50

+1

22

0

22

0

48

+1

36

2

18

1

30

2 20

 $10^{\circ}164$ 

5.29

5.42

5.28

5.32

21.81

10.655

5.327

15918

6.925

6.92

Vesta

4.80

4.87

4.80

4.82

19.29

9.645

4.822

1447

6.269

6.27

 $10^{\circ}173$ 

5.88

5.83

5.80

5.76

23.27

11.635

5.817

1745

7.562

7.56



Dec. 12, 1888.

Vesta

4.80

4.80

4.81

4.76

19.17

9.585 6.23

4.792

1.438

6.230

 $\times 10^0 180$ 

4.80

4.85

4.92

4.71

19.28

9.64

4.82

1.446

6.266

6.26

Comet e 1888. (Barnard) *St. obs.*

1	17
2	35
1	18

-7.5

1257

(55)

1 15 20

-7  $\times 2$ 

Pos. zero 240.6

45

Setting 285.6

2

51

3.8

E

51

49.4

E

53

2.2

\*

53

23.5

\*



Dec. 12, 1888.

2	53	56.0	E
	54	41.6	E
	55	54.7	*
	56	16.0	*

56	59.1
57	44.5
58	58.5
59	19.4

3	0	6.9
	0	52.0
	2	6.6
	2	27.2
	3	29.1
	4	14.0
	5	29.5
	5	50.5

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

Wind rather strong at times during  
observations. Slightly shakes telescope.

Nucleus of comet moderately well  
defined.

Comparison star =  $\delta$  L.D. -  $7^{\circ} 22' 3''$  (6.0 H)



Dec. 12. 1888.

Sun. Wedge Zone. Gr. obs.

+29° Series 2A.

23	14	+29.7
<u>27</u>	<u>28</u>	
4	14	

10 4 4864

3.84

3.96

3.73 11.53

4.99

4871

3.28

3.48

3.32 10.08

4.36

4880

3.41

3.48

3.63 10.52

4.56

4886

2.90

2.97

3.17 9.04

3.91

4889

2.92

2.93

2.80

8.68<sup>5</sup>3.7<sup>4</sup>



Dec. 12, 1888

4890

4.68

4.60

4.48 13.76

5.96

4891

3.80

3.80

3.99 11.59

5.02

4894

2.72

2.89

3.02 8.63

3.74

$$\begin{array}{r} 2.88 \\ 8.64 \\ 2.88 \\ 8.64 \\ 2.88 \\ 8.64 \\ 2.88 \\ 8.64 \\ 2.88 \\ 8.64 \end{array}$$

4896

3.58

3.40

3.53 10.51

4.55

4907

3.28

3.30

3.38 9.96

4.31

4912

2.71

2.88

2.93 8.52

3.69

4915

3.63

3.60

3.50 10.73

4.65



Dec. 12, 1888.

4918

4.22

4.50

4.32

13.04

5.65

4920  
~~4919~~

4.99

4.90

5.12

15.01

6.50

4919  
~~4920~~

3.99

3.97

4.38

12.34

5.35

4923

3.18

3.42

3.38

9.98

4.32

4928

3.10

3.00

3.05

9.15

3.96

$$\begin{array}{r} 3.05 \\ 0.95 \\ \hline 2.10 \end{array}$$

4939

2.31

2.23

2.40

6.94

3.00

$$\begin{array}{r} 2.31 \\ 0.60 \\ \hline 1.71 \end{array}$$

4941

3.30

3.30

3.07

9.67

4.19



Dec. 12, 1888.

$$\begin{array}{r} 3.94 \\ 11.79 \\ \hline 3.93 \\ 5.10 \end{array}$$

4951

3.88

4.00

3.91

11.79

5.10

4960

3.47

3.72

3.62

10.81

4.68

4962

3.78

3.89

3.88

11.55

5.00

4970

2.98

3.09

2.90

8.97

3.88

4971

4.98

5.09

5.17

15.24

6.60

4976

3.15

3.29

3.39

9.79

4.24

4982

3.53

3.44

3.41

10.38

4.49



Dec. 12, 1888.

4983

2.78

2.99

3.19

8.96

3.88

11 0 4984

2.10

2.30

2.48

6.88

2.98

Fr. 3451.

Ballow 103.

4	45	40.7
	46	40.9

11	5	0.0
	6	0.0

 $\therefore$  Fr. 3451 is  $3^m 53.6^s$  slow.

Dec. 12, 1888.

Fr. 3451.

Ballow 103.

16	36	35.2
----	----	------

=

22	55	0.0
----	----	-----

 $\therefore$  Fr. 3451 is  $3^m 55.6^s$  slow.



Dec. 13. 1881

Wedge Photometer Zone. Tr. obs.

+ 9° Series. 29.

$$\begin{array}{r} 23 \quad 36 \quad +9.5 \\ 25 \quad 14 \\ + 1 \quad 38 \end{array}$$

$$\begin{array}{r} 23 \quad 36 \\ 25 \quad 22 \\ + 1 \quad 46 \end{array}$$

7 55 5227

3.35

3.30

3.42

10.07

4.36

5237

3.75

3.60

3.55

10.90

4.72

5238

~~2.45~~ ref. 284 (Seem to be wrong.)

3.02

3.03

8.89

3.85

5239

3.00

2.90

3.00

8.90

3.85



Dec. 13, 1888.

5242	2.75		
	2.80		
	3.02	8.57	3.71

5243	3.92		
	3.72		
	3.70	11.34	4.91

5249	3.44		
	3.28		
	3.20	9.92	4.30

5256	3.00		
	3.00		
	2.99	8.91	3.89

5275	2.82		
	2.87		
	3.01	8.70	3.77

5278	3.72		
	3.70		
	3.60	11.02	4.77

5284	3.42		
	3.48		
	3.19	10.09	4.37



Dec. 13, 1888.

5288

3.10

2.99

3.18

9.27

4.01

5293

2.74

2.59

2.72

8.05

3.49

5294

2.92

2.81

2.92

8.65

~~3.7~~ 4.18

5201

3.29

3.25

3.14

9.68

3.74

5302

3.62

3.37

3.41

10.40

4.19

4.50

5306

2.80

3.02

3.10

8.92

3.86

5309

3.29

3.35

3.20

9.84

4.26



Dec. 13 1888.

5313

4.31

4.50

4.40

13.21

5.72

5314

4.12

4.10

4.19

12.41

5.37

~~5321~~ Stopped for a few minutes to warm up

continuation of same series

$$\begin{array}{r}
 23 \quad 55 \quad 1 \quad 4 \\
 \hline
 27 \quad 7 \\
 3 \quad 12
 \end{array}$$

5321

4.22

4.08

3.90

12.20

5.28

~~426~~ 131

3.09

2.89

3.14

2.59

2.67

2.40

following  
northward  
pass

~~124~~ 135

3.33

3.29

3.30

9.92

4.30

7.66

3.32



Dec. 13, 1888.

~~+35~~ 139

3.69

3.58

3.60

10.87

4.71

~~+39~~ 146

4.90

5.18

5.00

15.08

6.53

~~5.01~~~~+46~~ 150

2.99

2.98

3.20

9.17

3.97

126

2.75

2.84

2.80

8.39

3.63

154

2.88

2.79

2.93

8.60

3.72

162

4.30

4.03

4.29

12.62

5.47

173

2.99

2.98

3.12

9.09

3.93



Dec. 13, 1888.

185	2.80		
	2.73		
	2.58	8.11'	
			8.51'
190	2.98		
	2.90		
	2.92	8.80'	
			8.81'
195	3.13		
	3.10		
	3.11	9.34'	
			4.04'
196	2.87		
	3.15		
	3.30	9.32'	
			4.04'
201	4.26		
	4.10		
	4.22	12.58'	
			5.45'
208	3.67		
	3.32		
	3.31	10.30'	
			4.46'
224	3.58	Star rather bright	
	3.40		
	3.20	10.18'	
			4.1
			<del>4.38</del>



Dec. 13, 1888

235	5.69		
	5.40		
	5.57	16.66	7.21
247	<del>4.43</del>	3.28	
	<del>4.24</del> Wrong	3.15	
	<del>4.53</del> Star	3.15	9.58
251	2.46 Starfaint		4.15
	2.52		
	2.38	7.36	
253			3.19
	4.59		
	4.43		
	4.51	13.53	
			5.86
256	3.24		
	3.53		
	3.34	10.11	
			4.37
268	2.73		
	2.73		
	2.91	8.37	
			3.62
272	3.27		
	3.41		
	3.60	10.28	
			4.45



Dec. 13, 1888.

Ended at 10:50. Stars getting <sup>rather</sup> too near  
the moon to so judiciously continuing

Stars, rather more difficult to identify than  
usual from an unusual preponderance of  
faint stars, large intervals of time &  
rather bright field

Star 5242 in preceding series has another  
star following at 12 sec about 3' North

10 5-5

not in D.M. Slightly brighter than itself



Dec. 14, 1888.

Cornet e 1888, Barnard, G. obs.

$$\begin{array}{r} 1 \quad 7 \\ 1 \quad 24 \\ \hline 17 \end{array}$$

-7 kv

Pos. zero 87.8  
 $\underline{45}$   
 Setting 132.8

X  
 1 40 34.9 OE  
 41 6.1 OE  
 42 26.5 \*  
 42 59.5 \*

43 33.7  
 44 4.9  
 45 25.5  
 45 58.7

46 46.1  
 47 17.8  
 48 38.8  
 49 12.5

49 43.0  
 50 14.0  
 51 35.7  
 52 9.5



Dec. 14, 1888.

1	52	52.1
	53	23.0
	54	45.0
	55	18.7

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

Comparison <sup>star</sup> is a rather close double.  
Middle point of the two components taken  
in transits.

Following component is slightly brighter.  
Following component follows middle point  
0.1 sec. on first bar while both components  
pass second bar together.

Comparison star is F.D. -78 204 (8.7 K)

	Fr. 3451		Ballou 103.
2	14	2.5	26 0.0
	15	2.8	27 0.0

Still too cloudy for photometry

$\therefore$  Fr. 3451 is 3<sup>m</sup> 58.8" slow



Dec. 14, 1888.

Second series on Comet Barnard.  
Too cloudy for photometry.

1	7
2	47
1	40

2	46	48.5
---	----	------

47	23.7
----	------

48	54.6
----	------

49	24.6
----	------

49	52.9
----	------

50	27.9
----	------

51	59.4
----	------

52	29.8
----	------

53	0.6
----	-----

53	35.7
----	------

55	7.5
----	-----

55	38.4
----	------

56	32.2
----	------

57	7.0
----	-----

58	39.5
----	------

59	10.1
----	------



Dec. 14, 1888.

2	59	43.5
3	0	18.0
	1	50.6
	2	22.5

Same conditions in all respects as in first series tonight, & same comparison star used.

Still too cloudy for photometry.



Dec. 15. 1888.

Waited some time to see if work  
could be done but apparently no  
chance. Growing worse instead of  
better.



Dec. 12. 1888,  
 Iris and Coup. Stars. Y. obs.

$$\begin{array}{r} 2 \\ 25 \\ \hline 23 \end{array} \quad \begin{array}{r} 7 \\ 28 \\ \hline 21 \end{array}$$

$$+ 16 \quad 10$$

$$\begin{array}{r} 2 \\ 25 \\ \hline 23 \end{array} \quad \begin{array}{r} 5 \\ 33 \\ \hline 28 \end{array}$$

$$240$$

$$+ 24.5$$

$$\begin{array}{r} 258 \\ \hline 18 \end{array}$$

7.35

6.63

$$+ 24^{\circ} 396$$

6.61

6.59

6.58

26.41

13.205

6.602

19.81

8.583

8.58

Iris.

5.32

5.54

5.40

5.56

21.82

10.91

5.455

16.36

7.09

$$+ 25^{\circ} 449$$

5.45

5.52

5.53

5.47

21.97

10.985

5.492

16.48

7.140

7.14

Iris

5.62

5.38

5.40

5.60

22.00

11.00

5.50

16.5

7.15

7.15

$$+ 25^{\circ} 441$$

6.02

5.92

5.95

5.90

23.79

11.895

5.847

17.87

7.28

7.28

7.28

7.28

\* Searp. 130 for notation Iris.



Dec. 12. 1844.

Comet 1844. (Barnard)

$$\begin{array}{r}
 0 \quad 53 \quad -7 \quad 50 \\
 2 \quad 21 \\
 \hline
 1 \quad 28
 \end{array}$$

$$\begin{array}{r}
 0 \quad 48 \\
 2 \quad 29 \\
 \hline
 1 \quad 41
 \end{array}$$

Comparison star =  $\text{P.D. } -7^{\circ} 15' 3''$  (9.1)

$$\begin{array}{r}
 \text{Position zero } 268.0 \\
 45 \\
 \hline
 223.0
 \end{array}$$

2h

51	10.6	*
51	36.8	*
51	52.0	$\infty$
52	35.0	$\infty$

53	10.9
53	37.3
53	52.5
54	35.5



Dec 18, 1888.

2 <sup>h</sup>	55	15.5
	55	41.2
	55	56.0
	56	39.2

	57	6.5
	57	32.5
	57	47.2
	58	30.2

	59	2.2
	59	28.5
	59	42.5
3 <sup>h</sup>	6	26.1

Order in preceding transe stay, stay,  
count, count. Star in Northern half  
count in southern half.

Vesta and Comparison Stars Mobs

9 2

~~10~~ 10° 164

5.27	4.80		
4.95	5.01	20.03	6.51

10.015
5.007
15.012
6.509

Vesta

4.80	4.70		
4.63	4.65	18.78	6.10

9.39
4.695
4.708
6.103



Sept. 18 1888.

 $\overline{10}$  173

5.77

5.70

5.68

5.69

$$\begin{array}{r} 22.84 \\ 11.42 \\ 5.71 \\ 17.13 \\ \hline 7.42 \end{array}$$

Vesta

~~4.90~~ 4.71

4.52

~~4.73~~ 4.60

4.50 18.33

$$\begin{array}{r} 9.165 \\ 4.582 \\ 13.75 \\ \hline 5.957 \end{array}$$
 $\overline{10}^0$  180

490

480

473

4.68

19.11

$$\begin{array}{r} 9.555 \\ 4.777 \\ 14.33 \\ \hline 6.210 \end{array}$$

9 34

$$\begin{array}{r} 0^h \quad 27 \quad -5 \quad 51 \\ 3 \quad 27 \\ \hline 3 \quad 00 \end{array}$$

Wedge Photometer Lane - Lobs.

Series 30. +19°

$$\begin{array}{r} 1 \quad 0 \quad +19. \quad 54 \\ 3 \quad 47 \\ \hline 2 \quad 47 \end{array}$$

10 00

162

4.12

3.80

3.80

11.72

5.08



Dec 18, 1888.

~~412~~

173

2.60

2.78

2.77

8.15

3.53

177

2.30

2.50

2.58

7.38

3.20

183

2.13

2.12

2.55

6.80

2.94

184

2.54

2.60

2.71

7.85

3.40

185

5.47

5.30

5.47

1624

3.4  
7.08

203

3.29<sup>c</sup>

3.00

3.07

9.36

4.05

211

2.00

2.25

2.00

6.25

2.71



Dec. 18, 1888.

215	3.72		
	3.69		
	3.62	11.03	
			4.77
220	3.53		
	3.37		
	3.55	10.45	
			4.52
221	3.18		
	3.32		
	3.18	9.60	
			4.16
223	4.10		
	3.99		
	4.09	12.18	
			5.27
227	2.72		
	2.39		
	2.51	7.62	
			3.30
228	2.98		
	3.09		
	2.98	8.97	
			3.88
235	3.30		
	3.50		
	3.71	10.51	
			4.55



Dec. 18, 1888.

241	3.40	
	3.40	
	3.32	10.12
		4.38

244	2.98	
	2.97	
	3.09	9.04
		3.91

251	2.00	
	2.18	
	2.10	6.28
		2.72

258	3.80	
	3.90	
	4.10	11.80
		5.11

259	2.50	
	2.14	
	2.31	6.95
		3.01

10	50	269	4.19	
			4.29	
			4.40	12.88
				5.57

over.



Dec. 18, 1888.

Some light streaks of cloud noticed while taking Iris and comp. stars, but observations thought not to have been seriously affected.

Flr. 3451.

5	2	3.5
	3	3.6

Ballou 103.

10	58	0.0
	59	0.0

$\therefore$  Flr. 3451 is  $4^m 8.9^s$  slow.



Dec. 19. 1888.

Too cloudy for Photometry.  
Possibly can see comet.  
Comet 2 1888 (Barnard)

Y. H.

$$\begin{array}{r} 0 \quad 47.7 \quad -7 \quad 46 \\ 1 \quad 43 \\ \hline +55 \end{array}$$

Comp. star =  $\sqrt{2}$ . -  $2^{\circ} 16' 3''$  (A. A. K.)

Pos. zero 88.0  
Setting  $\frac{45}{133.0}$

<del>2<sup>h</sup></del>	0	11.8	
	0	25.0	
2 <sup>h</sup>	3		
	#	56.5	*
	#	10.0	*
	3	11.0	E
	5	42.1	E
	6	25.9	
	6	39.5	
	7	39.6	
	8	16.8	



Dec. 19, 1888.

2 <sup>h</sup>	8	44.7
	8	58.7
	9	58.8
	10	29.8
	10	59.0
	11	12.5
	12	12.5
	12	43.2
	13	18.4
	13	32.4
	14	32.0
	15	2.6

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

Observations to join Unlettered star  
of used with comet last night with  
let a lettered star.

Unlettered star =  $\sqrt{2} - 7^{\circ} 153$ , (9.1)  
Lettered " =  $\sqrt{2} - 7^{\circ} 159$  (7.3 K)

Obs. on next page and fol.



Dec. 19, 1888.

2	30	41.7	Unlet. *
	30	56.4	" "
	33	44.8	Saltord "
	3 <sup>3</sup> <del>7</del>	59.4	" "
	34	30.9	
	34	45.8	
	37	34.2	
	37	48.1	
	38	30.5	
	38	45.7	
	41	34.2	
	41	48.1	
	42	29.7	
	42	45.0	
	45	33.6	
	45	47.4	
	46	52.4	
	47	8.0	
	<del>49</del>	56.5	
	50	10.1	
	51	3.1	
	51	19.4	
	54	7.9	
	54	21.0	



Dec. 19, 1888.

~~2      54      52.5~~  
~~9.0~~

2	55	34.4
	55	50.6
	58	39.1
	58	52.0

	59	28.4
2	59	45.0
3	2	33.5
	2	46.0

3	39.6
3	56.5
6	45.0
6	57.1

8	14.4
8	32.0
11	20.6
11	32.0

Order in preceding transits, unlettered star, unlettered star, lettered star, lettered star. Unlettered star in southern half & lettered star in northern half.



Dec. 19. 1888.

Mr. 3451.			Ballow 103.		
3	39	43.2	9	32	0.0
	40	43.4		33	0.0

 $\therefore$  Mr. 3451 id.  $4^m$   $11.7^s$   $\frac{1}{2}$  slow

Dur. Wedge True. Gr. ob.

Series 31.

0	7	+19.3
3	30	
3	43	

10 00 17

3.17

2.84

2.90 8.91

3.86

21

3.91

3.82

4.09 11.82

5.12

24

4.02

3.71

3.80 11.53

4.99

32

3.80

3.75

4.00 11.55

5.00



Dec. 19, 1888.

34

3.42

3.59

3.60

10.61

4.59

42

3.30

3.41

3.68

10.39

4.50

44

3.79

3.67

3.89

11.35

4.91

49

3.59

3.89

3.82

11.30

4.89

50

3.75

3.66

3.72

11.13

4.82

52

4.13

3.80

4.17

12.10

5.24

54

2.98

3.24

2.93

9.15

3.96



Dec. 19, 1888.

58	3.18		
	2.90		
	3.24	9.32	
			4.04

69	2.40		
	2.77		
	2.82	7.99	
			3.46

73	4.98		
	5.20		
	4.90	15.08	
			6.52

80	2.72		
	2.98		
	2.80	8.50	
			3.68

86	3.48		
	3.47		
	3.80	10.75	
			4.65

87	3.38		
96	3.30		
	3.32	10.00	
			4.33

94	3.84		
	3.72		
	3.78	11.34	
			4.91



Dec. 19, 1888.

96                      3.73  
                          3.80  
                          3.73    11.26  
                                  4.87

111                    4.11  
                          4.19  
                          3.91    12.21    5.28

120                    3.18    following  
                          3.03    a northern of two  
                          2.82    9.03  
                                  3.91

6  
 132                    3.42  
                          3.30  
                          3.58    10.30  
                                  4.46

133                    3.25  
                          3.27  
                          3.68    10.20  
                                  4.42

130                    3.18  
                          3.26  
                          3.48    9.92  
                                  4.30

10   51   157                    2.97  
                                  3.20  
                                  3.38    9.55  
    4.14



Dec. 19, 1888.

Some light clouds passing during  
series but probably observations not  
affected.



Dec. 20. 1955.

Series 32  
Dim. Yedge-Lane

Tr. obs,

$$\begin{array}{r} 23 \quad \sqrt{6} \quad +19 \quad \sqrt{2} \\ 25 \quad 39 \\ \hline 1 \quad 43 \end{array}$$

$$\begin{array}{r} 23 \quad 56 \\ 25 \quad 47 \\ \hline 1 \quad 51 \end{array}$$

7 35 5191

3.58

3.40

3.41

10.39

4.49

5196

3.40

3.70

3.65

10.75

4.65

5197

5.20

5.13

4.90

15.23

6.59

5201

~~3.57~~

~~3.20~~

~~3.41~~



Dec. 20, 1888.

~~5202~~
~~3.32~~  
~~3.51~~  
~~3.38~~
~~5206~~
~~3.18~~  
~~3.38~~  
~~3.38~~
*preceding northern  
& highest of three*

21

 4.27  
 4.21  
 4.20

12.68

5.48

17

 2.97  
 3.20  
 3.08

9.25

4.00

24

 3.42  
 3.60  
 3.57

10.59

4.58

5201

 3.09  
 3.20  
 3.39

9.68

4.19

5202

 3.53  
 3.60  
 3.57

10.70

4.68



Dec. 20, 1888.

5206

3.10 preceding northern  
 3.19 & brightest of them  
 3.45 9.74 4.22

5201-2-6 were taken a second  
 time as clouds were noticed when  
 immediately after 5206 was taken  
 No other stars could have been  
 affected even if these were.

Same Series Continued

32

3.88  
 3.99  
 3.78 11.65 5.04

34

3.59  
 3.69  
 3.67 10.95 4.74

42

3.25  
 3.40  
 3.46 10.11 4.37

44

3.70  
 3.60  
 3.58 10.88 4.71



Dec. 20, 1888.

49

3.62

3.81

3.88

11.31

4.89

50

3.47

3.42

3.60

10.49

4.54

52

4.30

4.29

4.30

12.89

5.57

54

2.99 following northern

2.87 brighter of two

2.97

8.83

3.82

58

3.20

3.15

3.42

9.77

4.23

69

3.20

3.18

3.09

9.47

4.10

73

5.00

5.25

5.33

15.58

6.74



Dec. 20, 1888.

80

2.88

3.09

3.20

9.17

3.97

86

4.22

4.31

4.30

12.83

5.56

87

4.01

3.65

3.99

11.65

5.04

94

4.09

3.91

3.90

11.90

5.15

96

3.89

4.20

4.08

12.17

5.26

111

4.46

4.48

4.48

13.42

5.81

120

2.70

2.98

2.71

following of two

8.39

3.63

~~Star 120~~ There is a faint star about in position of 120 in P.A. but is some 5" south of 133 whereas by the D.M. it is some Dec. Only star to be found



Dec. 20, 1888.

133	3.39		
	3.47		
	3.65	10.51	4.55
136	3.30		
	3.28		
	3.46	10.04	4.38
450	3.58		
	3.33		
	3.50	10.33	4.47
157	3.22		
	3.24		
	3.30	9.76	4.28
162	4.33		
	4.22		
	4.29	12.84	5.56
173	3.40		
	3.33		
	3.41	10.14	4.38
177	4.38		
	4.18		
	4.29	12.85	5.56



Dec 20, 1888.

183	2.73		
	2.91		
	2.80	8.44	
			3.65
184	2.82		
	3.14		
	3.20	9.16	
			3.97
185	6.65		
	6.38		
	6.68	19.71	
			8.53
203	3.30		
	3.50		
	3.19	9.99	
			4.33
211	2.28		
	2.49		
	2.49	7.26	
			3.14
215	3.61		
	3.62		
	3.79	11.02	
			4.77
220	3.60		
	3.49		
	3.71	10.80	
			4.68



Dec. 20, 1888.

221

3.30

3.20

3.30

9.80

4.24

223

402 ~~3.71~~ wrong

4.60

4.45

13.57

5.87

227

3.40

3.30

3.23

9.93

4.30

228

2.82

2.81

2.91

8.54

3.70

235

3.87

4.02

3.93

11.82

5.12

241

3.40

3.20

3.30

9.90

4.29

244

2.90

2.90

3.13

8.93

3.87



Dec 20, 1888.

251

2.13

2.18

2.40

6.71

2.90

258

4.08

3.98

4.12

12.18

5.27

259

3.18

3.02

2.90

9.10

3.94

269

443 ~~4.10~~ seemed to be wrong

4.47

4.60

13.50

5.85

276

4.00

3.94

4.09

12.03

5.21

283

3.23

3.20

3.41

9.84

4.26

293

3.54

3.51

3.38

10.43

4.52



Dec. 20, 1888.

$$\begin{array}{r} 4.03 \\ 1204 \\ \hline 4039 \\ 5239 \end{array}$$

294	4.09		
	3.91		
	4.10	12.10	
		<del>2.09</del>	
		5.24	
295	2.85		
	3.01		
	3.01	8.87	
		3.84	
301	3.59		
	3.35		
	3.63	10.57	4.57
302	3.63		
	3.58		
	3.73	10.94	
		4.74	
303	3.69		
	3.83		
	3.78	11.30	
		4.89	
314	3.51		
	3.38		
	3.60	10.49	
		4.54	
321	3.48		
	3.60		
	3.53	10.61	
		4.59	



Dec. 20, 1888.

324

5.32

5.35

5.22

15.89

6.87

326

388 ~~3.27~~ <sup>wrong</sup> difficult bright star

3.50 near

3.72

11.10

4.76

327

3.21

3.27

3.29

9.77

4.23

334

4.81

4.87

4.90

14.58

6.30

341

2.85

3.01

3.30

9.16

3.97

349

2.95 preceding bright star

3.08

3.37

9 southern of pair

9.40

4.07

358

4.13

4.02

4.20

12.35

5.35



Dec. 20, 1888.

364

3.10 brightest of four

3.09

3.35

9.54

4.13

10 58



Dec. 21. 1888.

Vesta and Comp. Mars. H. obs.

$$\begin{array}{r} 15 \\ 9 \\ \hline 2 \overline{) 13.5} \\ 6.2 \end{array}$$

$$\begin{array}{r} 169 \\ 9 \\ \hline 2 \overline{) 152.1} \\ 76 \end{array}$$

$$\begin{array}{r} 632 \\ 16 \\ \hline -516 \end{array}$$

$$\begin{array}{r} 0 \quad 29 \\ 1 \quad 42 \\ \hline 1 \quad 13 \end{array}$$

$$-5 \quad 25$$

$$\begin{array}{r} 0 \quad 418 \\ 2 \quad 5 \\ \hline 1 \quad 17 \end{array}$$

$$-10^{\circ} 164$$

$$\begin{array}{r} 5.31 \\ 5.69 \end{array}$$

$$5.11$$

$$5.04$$

$$\begin{array}{r} 20.55^{\wedge} \\ 10.275 \\ 5.137 \\ 15.41 \\ \hline 6.678 \end{array}$$

$$6.68^{\wedge}$$

Vesta

$$4.58$$

$$4.53$$

$$4.57$$

$$4.58$$

$$-10^{\circ} 193$$

$$5.79$$

$$5.80$$

$$5.82$$

$$5.81$$

$$\begin{array}{r} 18.26^{\wedge} \\ 9.13 \\ 4.565 \\ 13.69 \\ \hline 5.934 \end{array}$$

$$5.94^{\wedge}$$

Vesta

$$4.92$$

$$4.89$$

$$4.92$$

$$4.89$$

$$-10^{\circ} 180$$

$$4.72$$

$$4.89$$

$$4.84$$

$$4.78$$

$$\begin{array}{r} 23.22^{\wedge} \\ 11.61 \\ 5.805 \\ 17.41 \\ \hline 7.546 \end{array}$$

$$7.55^{\wedge}$$

$$\begin{array}{r} 19.62^{\wedge} \\ 9.81 \\ 4.905 \\ 14.71 \\ \hline 6.376 \end{array}$$

$$6.38^{\wedge}$$

$$8 \quad 00$$

$$\begin{array}{r} 19.23^{\wedge} \\ 9.615 \\ 4.602 \\ 14.42 \\ \hline 6.242 \end{array}$$

$$6.25^{\wedge}$$



Dec. 21. 1888.

Dm. Fred's Lane. Wicks.

Leris 33.

$$\begin{array}{r}
 23 \quad 32 \quad + 30 \\
 26 \quad 24 \\
 \hline
 2 \quad 46
 \end{array}$$

blonds all through this region

Comet e 1888 (Barnard) Wicks

(rr)

$$\begin{array}{r}
 0 \quad 42.3 \quad -7 \quad 50 \quad 34 \\
 2 \quad 55 \\
 \hline
 2 \quad 13
 \end{array}
 \qquad
 \begin{array}{r}
 6.2 \\
 50.6 \\
 \hline
 40.4
 \end{array}$$



Dec. 22. 1888.

Iris and Comp. Stars. G.D.S.

$$\begin{array}{r}
 (55) \quad 2 \quad 10 \quad +16 \quad \cancel{7} \\
 \underline{2 \quad 48} \quad \quad \quad 2 \quad 40 \\
 \quad \quad 38 \quad \quad \quad \underline{2 \quad 32}
 \end{array}$$

8  $\begin{smallmatrix} 2 \\ 7 \end{smallmatrix}$

+24° 396

6.70

6.49

6.75

6.75

$$\begin{array}{r}
 26.69^{\wedge} \\
 13.345 \\
 6.672 \\
 \underline{2.062} \\
 8.674
 \end{array}
 \quad 8.67^{\wedge}$$

Iris

5.51

5.52

5.48

5.45

+25° 449

5.40

5.53

5.48

5.42

$$\begin{array}{r}
 21.96^{\wedge} \\
 10.98 \\
 5.49 \\
 16.47 \\
 \underline{7.137}
 \end{array}
 \quad 7.14^{\wedge}$$

Iris

5.37

5.41

5.49

5.50

$$\begin{array}{r}
 21.83^{\wedge} \\
 10.95 \\
 5.457 \\
 16.37 \\
 \underline{7.094}
 \end{array}
 \quad 7.09^{\wedge}$$

+25° 441

5.83

5.97

5.92

5.90

$$\begin{array}{r}
 21.77^{\wedge} \\
 10.885 \\
 5.442 \\
 16.33 \\
 \underline{7.075}
 \end{array}
 \quad 7.07^{\wedge}$$

8  $\begin{smallmatrix} 26 \\ 34 \end{smallmatrix}$

$$\begin{array}{r}
 23.62^{\wedge} \\
 11.81 \\
 5.905 \\
 17.21 \\
 \underline{7.676}
 \end{array}
 \quad 7.68^{\wedge}$$

Rather more difficulty than  
experienced in identifying Iris



Dec. 22, 1888.

D m. Wedge Zone. (+9°) W. obs.  
Lercis 33.

$$\begin{array}{r} 23-3 \approx +9 \\ \underline{26 \ 58} \\ 3 \ 53 \end{array}$$

855<sup>0</sup> 5168

11.22 4.86

- 3.89 3.80 has a fainter  
 ' wrong 3.78 3.72 companion to  
 star 3.75 3.70 south.

5179

3.23

2.95

9.49

3.31

4.11

5181

4.12

4.11

12.32

4.09

5.34

5184

3.97

3.81

11.51

3.73

4.98

5192

3.37

3.30

9.79

3.12

4.24



Dec. 22, 1888.

5198

3.70

3.61

3.50

10.81

4.68

5207

2.58

2.79

2.87

8.24

3.57

5216

4.45

4.20

4.18

12.83

5.55

5220

seemed  
to be wrong ~~3.37~~

3.75 3.77

3.81

has a fainter star  
preceding slightly  
to south

11.33

5227

2.89

2.92

2.85

8.66

4.90

3.75

5237

3.67

3.73

3.97

11.37

4.91

5238

3.00

2.79

2.89

8.68

3.76



Dec. 22 1888.

5239	2.91		
	2.79		
	2.96	8.66	
		3.75	
5242	2.67		
	2.60		
	2.80	8.07	
		3.49	
5243	3.60		
	3.88		
	3.80	11.28	
		4.87	
5249	<i>wrong for interfer</i> 3.10335		
	3.44		
	3.47	10.26	
		4.44	
5256	2.74		
	2.98		
	2.73	8.45	
		3.66	
5275 <sup>8</sup>	3.79		
	3.63		
	3.59	11.01	4.76
			<del>4.8</del>
5278 <sup>5</sup>	2.48		
	2.48		
	2.40	7.36	
		3.19	



Dec. 22, 1888.

5284	3.01		
	3.07		
	3.15	9.23	
			4.00
5288	2.40		
	2.78		
	2.89	8.07	
			3.49
5291	2.80		
	3.00		
	3.09	8.89	
			3.85
5293	2.91		
	2.90		
	2.79	8.60	
			3.72
5301	2.84		
	2.94		
	2.81	8.59	
			3.72
5302	2.80	preceding & southern of triangle	
	2.80		
	2.82	8.42	
			3.64
5306	2.59		
	2.58		
	2.70	7.87	
			3.41



Dec. 22, 1888.

5309

2.85 rather

2.70 bright

2.70

8.25

3.57

5313

4.03

3.95

4.08 12.06

5.21

5314

3.92

3.89

3.90 11.71

5.07

5321

3.71

3.70

3.72 11.13 4.82

10 5 19

3.80

3.82

4.00 11.62 5.03

Further observations of wedge zone  
stopped by light cloud which was  
beginning to cover quite a portion of  
the sky - possibly two or three of  
the last stars affected



Dec. 22. 1888.

Comet 1888 (Barnard) Tr. obs.

[55]

0	39.5
4	44
4	5

-7 44

0	48
4	53
4	5

-8 0

Pos. zero. 86.9  
45  
 Setting 131.9

5<sup>h</sup>

0 17.1 E

0 37.0 E

1 17.0 \*

1 52.6 \*

2 21.5

2 40.7

3 21.9

3 56.5

4 23.0

4 40.6

5 23.3

5 57.1



Dec. 22, 1888.

5	6	41.2
	6	57.4
	7	41.5
	8	14.0
	8	48.7
	9	3.8
	9	49.1
	10	20.6

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

Comparison star = S.D. -70 123 (9.5)

Comet rather faint.

Fr. 3451.			Ballou 103.		
5	31	40.0	11	12	0.0
	32	40.1		13	0.0

$\therefore$  Fr. 3451 is  $4^m 20.9^s$  slow.



Dec. 24, 1888,

Comp. Stars for Var. Yelbo.  
62 I Mrs. May:

12	33	+61.6
<u>23</u>	<u>58</u>	
17	25	

Too low at present.

137 a R. (?) Lacertae. Y. obs.

22	3A	+41.0
<u>26</u>	<u>5</u>	
3	27	

7 58

1 m

2.40	3.00	
2.60	2.98	
2.50	3.28	16.76 <sup>^</sup>
		3.64 <sup>^</sup>

2 k

2.47	2.65	
2.60	2.63	
2.61	2.78	15.74 <sup>^</sup>
		3.42 <sup>^</sup>



Dec 24, 1888.

3 b e

2.53

2.77

2.79

3.22 has northern ?  
3.30 brightest of three

3.23

17.84<sup>^</sup>  
3.87<sup>^</sup>

4 y

2.12

2.12

2.03

2.40

2.32

2.38

13.37<sup>^</sup>2.90<sup>^</sup>

5 d

3.60

3.50

3.55

3.53 wrong

3.82 preceding & brighter  
3.29 of pair.

3.78

21.25<sup>^</sup> 4.61<sup>^</sup>  
~~2.44~~

6 R

3.03

3.24

3.32

3.45

3.47

3.43

19.94<sup>^</sup>4.33<sup>^</sup>

7 X

2.18

2.10

2.23

2.46

2.52

2.40

difficult

13.89<sup>^</sup>3.01<sup>^</sup>

8 a

4.25

4.21

4.31

3.89

3.95

3.98

24.59<sup>^</sup>5.33<sup>^</sup>



Dec. 24, 1888.

9 m

2.72  
2.67  
2.69

2.30

2.22

2.44

difficult

15.0%<sup>^</sup>3.27<sup>^</sup>

10 c

3.82

3.92

3.81

3.80

3.97

3.96

23.28<sup>^</sup>5.05<sup>^</sup>

11 f

3.49

3.54

3.57

3.53

3.45<sup>^</sup>

3.71

21.29<sup>^</sup>4.62<sup>^</sup>

12 b

4.16

3.94

4.29

3.93

4.31

4.30

24.93<sup>^</sup>5.41<sup>^</sup>

13 g

3.14

3.31

3.12

3.49

3.48

3.35

19.89<sup>^</sup>4.31<sup>^</sup>

14

4.68

4.75<sup>^</sup>

4.90

5.02

4.99

5.00

29.34<sup>^</sup>6.37<sup>^</sup>



Dec. 24, 1888.

8 58

	15	4.81	
4.70		<del>3.49</del>	
4.68		4.52	2781 <sup>1</sup>
4.50		4.60	6.03 <sup>1</sup>

9 00

f 3 R in large telescope  
 f 375 R in finder

9 R Piscium

M. obs

1	25	+ 3.0
3	50	
2	25	

4.28 19  
 4.08  
 4.05

3.91 24  
 3.93  
 4.20



Dec. 24, 1888.

3 m (seq.)

3.50

3.41

3.20

4a

4.11

4.11

4.20

5x

\* see note at end

6 B

7r

8 q



Dec. 24, 1888.

9h

10h

11e

12s

13t

14d



Dec. 24, 1888.

15c

16b

More or less cloud west of the meridian which probably may have affected observations of comparison stars of  $\gamma$  Piscium. Apparently clear east of the meridian at present.

40 T Can. Min.

M. obs

7	24	+13	0
4	<del>26</del>		
2	58		

1c

3.10

3.00

2.80

see note at end



Dec. 24, 1888.

2 *h*

3 *h*

4 *T*

5 *X*

6 *y*

7 *z*



Dec. 24, 1888.

8a

9  
9c

10

11

Clouds ~~above~~<sup>in</sup> this region also so that  
measurements are impossible. Continually  
troubled by clouds after taking first  
series of comparison stars.

10 32 Now growing very thick all over  
the sky.



Dec. 26. 1888.

Seems to be clear enough now on the  
meridian for  
Iris and Comp. Stars. Gr. obs.

$$\begin{array}{r} 2 \quad 13.0 \quad +16.0 \\ 2 \quad 8 \\ \hline - \quad 5 \end{array}$$

$$\begin{array}{r} 2 \quad 40 \\ 2 \quad 26 \\ \hline 14 \end{array}$$

7 44

+24° 396

6.60

6.63

6.55

6.48

Iris

5.45

5.35

5.52

5.40

+25° 449

5.42

5.45

5.48

5.50

Iris

5.33

5.35

5.39

5.48

+25° 441

11.84  
5.92  
1.776  
7.696

5.93

5.86

5.97

5.92

8 10

Clearer than it was, & if there is any  
slight haze in these parts, it is pretty  
faded



Dec. 26, 1888.

uniformly distributed, but apparently  
it is pretty clear.

Comp. Stars for Var.      Gr. obs.

1	26	+1.2
2	51	
1	25	

9 R Piscium

824

4.23	1g	4.23	
4.21		3.90	
3.88		3.99	24.44 <sup>1</sup>
			530 <sup>1</sup>

4.22	2f	4.10	
3.92		3.99	
4.21		4.38	24.82 <sup>1</sup>
			538 <sup>1</sup>

3.60	3m (seq)	3.61	
3.82		3.62	
3.92		3.69	22.26 <sup>1</sup>
			483 <sup>1</sup>



Dec. 26, 1888.

4a

4.71	4.57	
4.78	4.69	
4.58	4.51	27.84 <sup>^</sup>
		6.04 <sup>^</sup>

5x

3.40	3.37	
3.59	3.48	
3.41	3.40	20.65 <sup>^</sup>
		4.48 <sup>^</sup>

6B

2.70	2.72	
2.72	2.87	
2.65	2.72	16.38 <sup>^</sup>
		3.56 <sup>^</sup>

$$\begin{array}{r} 2.73 \\ 1.3 \\ \hline 8.19 \\ 273 \\ \hline 3.549 \end{array}$$

7v

1.80	1.73	
1.95	1.60	very difficult
1.70	1.68	10.46 <sup>^</sup>
		2.27 <sup>^</sup>

$$\begin{array}{r} 1.74 \\ 13 \\ \hline 3.22 \\ 174 \\ \hline 2.262 \end{array}$$

too faint for wedge

9h

2.29	2.47	
2.29	2.33	
2.38	2.24	14.00 <sup>^</sup>
		3.04 <sup>^</sup>



Dec. 26, 1888.

10 p

2.19	1.62	
1.80	1.70	
1.59	1.73	10.63 <sup>^</sup>
		231 <sup>^</sup>

11 e

3.90	3.98	
3.80	4.03	
3.95	4.10	23.76 <sup>^</sup>
		5.15 <sup>^</sup>

12 d

2.81	2.79	
3.02	2.99	
2.92	2.90	17.43 <sup>^</sup>
		3.79 <sup>^</sup>

13 t

2.78	2.77	
2.82	3.08	
2.89	2.79	17.13 <sup>^</sup>
		3.72 <sup>^</sup>

14 d

4.10	4.39	
4.18	4.20	
4.20	4.38	25
		18.45 <sup>^</sup>
		5.51 <sup>^</sup>

15 c

5.08	5.14	
5.22	5.11	
5.21	5.02	30.78 <sup>^</sup>
		6.67 <sup>^</sup>
		5.52 <sup>^</sup>

2  
4.24  
1.3  
12.72  
4.24  
5.512

5.13  
1.3  
15.39  
5.13  
6.269



Dec. 26, 1888.

16 b

4.88

5.00

4.73

4.79

4.99

4.81

29.20<sup>h</sup>  
6.34<sup>m</sup>

Possibly slight haze but if so  
 pretty uniformly distributed. Altitude  
 considerably high so that stars look  
 9 25 pretty bright.

Comp. Stars for Var. Tr. obs.  
 40 I Can. Min.

7 26 +12.6  
 14 8  
 — 3 18

10 6  
8

1 c

2 d



Dec. 26, 1888.

3 b

4 T

5 X

6 y

7 z

8 a



Dec. 26, 1888.

9e

10

3.75

3.40

11

12

4.11

3.89

4.12

3.97

3.83

4.12

As trouble from clouds had already been experienced & it seemed probable that more clouds would come before long, it seemed necessary to gain time by finishing each star at once. But even this was prevented by clouds coming during measurement of second ~~star~~ <sup>comp.</sup> star.



Dec. 24. 1888.

Camp. Stars for Var.      Shots.

40 T Cam. Minis.

7	26	+12%
2	0	
<hr/>	<hr/>	
5	26	

1C

7 47

3.29

3.74

3.29

3.52

3.31

3.55

20.70<sup>^</sup>

4.49<sup>^</sup>

2d

3.22

4.00

3.22

3.82

3.40

3.76

21.42<sup>^</sup>

4.64<sup>^</sup>

3h

3.40

3.41

3.39

3.24

3.21

3.38

20.03<sup>^</sup>

4.35<sup>^</sup>

4J

1.18

1.82

1.19

2.00 very difficult.

1.22

1.60 see note at end

9.01<sup>^</sup>

1.96<sup>^</sup>



Dec. 28, 1888.

5X

1.60	2.28	
1.68	2.03	
1.75	2.10	11.44 <sup>^</sup> 2.48 <sup>^</sup>

6y

2.15	2.60	
2.32	2.70	
2.58	2.68	15.03 <sup>^</sup> 3.27 <sup>^</sup>

7y

2.91	2.71	
2.82	2.89	
3.01	2.84	17.18 <sup>^</sup> 3.73 <sup>^</sup>

8a

3.32	3.40	
3.32	3.52	
3.41	3.48	20.45 <sup>^</sup> 4.44 <sup>^</sup>

9c

4.09	4.11 following
4.01	4.28 northern
4.20	4.22 brighter of pair
	24.91 <sup>^</sup>

10

5.24	5.22	
5.09	5.26	
5.14	5.11	31.06 <sup>^</sup> 6.74 <sup>^</sup>



Dec. 28, 1888.

11

5.01

4.78

5.03

4.92

5.10

4.98 29.82<sup>^</sup>6.47<sup>^</sup>

12

4.70

4.70

4.72

4.77

4.71

4.62 28.22<sup>^</sup>6.12<sup>^</sup>

8 35

8 37

X 4.5 T

There are two faint stars preceding X, one of them by 7.0 sec .2" south the other by 3.5 sec 1.3" south. The star, assumed to be "T" is the preceding of these two. One of these is undoubtedly "T" & it would seem that the one assumed to be "T" was undoubtedly the right one. "T" is quite faint & difficult for wedge

Note Feb. 1, 1893. Perhaps the two stars here mentioned are the same as T and its companion described on former occasions (1886 Nov. 28, book 42, p. 214; 1886 Dec. 28, book 43, p. 28; 1887 Feb. 12, book 43, p. 72; 1887 Feb. 19, book 43, p. 102.) As some actual variation seems to have been observed on these occasions in the north following star of the pair, the identification of T with the preceding star on this page becomes doubtful.



Dec. 28. 1886.

~~7 S Cassiope.~~

Some cloud about but apparently clear at

7 S Cassiope.

Gr. St.

$$\begin{array}{r}
 1 \quad 0 \quad +72.0 \\
 3 \quad 48 \\
 \hline
 2 \quad 48
 \end{array}$$

$$\begin{array}{r}
 1 \quad 26 \\
 3 \quad 58 \\
 \hline
 2 \quad 32
 \end{array}$$

clouds

Too much cloud west of the meridian for observations

47 S Cancer

Mobs

$$\begin{array}{r}
 8 \quad 36 \quad +18.7 \\
 4 \quad 8 \\
 \hline
 - \quad 4 \quad 28
 \end{array}$$



Dec. 28, 1888.

9 42

1d

5.01	4.90	
4.97	5.18	
5.13	5.12	30.31 <sup>^</sup>
		6.58 <sup>^</sup>

2f

3.28	3.10	
3.18	3.11	
3.22	3.21	19.10 <sup>^</sup>
		4.14 <sup>^</sup>

3b

3.80	3.84	
3.89	3.77	
3.90	3.80	23.00 <sup>^</sup>
		4.99 <sup>^</sup>

~~4e~~ 10(d)

<del>4.61</del> 4.12	4.47	
<del>4.61</del> 4.20	4.40	
4.50	4.50	26.19 <sup>^</sup>
		5.68 <sup>^</sup>

5d

4.61	4.90	
4.61	4.80	
4.80	4.75	28.47 <sup>^</sup>
		6.17 <sup>^</sup>

6g

3.61	4.11	
3.82	4.00	
3.97	3.98	23.49 <sup>^</sup>
		5.09 <sup>^</sup>



Dec. 28, 1888.

7h

4.18

4.52

4.47

4.48

4.30

4.59

26.54<sup>^</sup>5.76<sup>^</sup>

8c

5.51

5.51

5.72

5.54

5.60

5.50

33.38<sup>^</sup>7.25<sup>^</sup>

9a

4.92

5.30

5.20

5.30

5.41

5.25

31.38<sup>^</sup>6.81<sup>^</sup>~~10 (d)~~ 4c

3.50

3.78

3.39

3.72

3.67

3.80

21.86<sup>^</sup>4.74<sup>^</sup>

11 (g)

2.49

2.35

2.65

2.73 see note

2.77

2.91 at end.

15.90<sup>^</sup>

12x

3.45<sup>^</sup>

2.68

3.10

2.99

2.92

2.99

2.86

17.54<sup>^</sup>3.81<sup>^</sup>



Dec. 28, 1888.

10 37

I 1 a in finder

~~Delayed by clouds~~  
 Interrupted by clouds but probably  
 no stars affected

There is a line of four stars of  
 which "12X" is the southernmost &  
 "119" the one next north. "119" identifies  
 correctly with respect to "3.6" but seems  
 considerably fainter than its mag. (9.5)  
 as scaled from the chart.

More clouds but possibly  
 can get

Iris and Comp. Stars, W. Dr.

2	14	+16.0
5	27	
3	13	

10 48

+24° 396

6.60

6.70

6.68

6.55

26.53<sup>^</sup>

6.55

8.62<sup>^</sup>

13.265
6.632
1.990
8.622



Dec. 28, 1888.

Iris

5.43

5.32

5.47

5.30

21.52<sup>^</sup>

$$\begin{array}{r} 10.76 \\ 5.38 \\ \hline 16.14 \\ 6.994 \end{array}$$
6.99<sup>^</sup>+ 25<sup>0</sup> 449

5.47

5.41

5.50

5.45

21.83<sup>^</sup>

$$\begin{array}{r} 10.915 \\ 5.457 \\ \hline 16.37 \\ 7.094 \end{array}$$
7.09<sup>^</sup>

Iris

5.37

5.35

5.42

5.40

21.54<sup>^</sup>

$$\begin{array}{r} 10.77 \\ 5.385 \\ \hline 16.15 \\ 7.000 \end{array}$$
6.99<sup>^</sup>+ 25<sup>0</sup> 441

5.92

5.85

5.87

5.90

23.54<sup>^</sup>

$$\begin{array}{r} 11.77 \\ 5.885 \\ \hline 17.65 \\ 7.650 \end{array}$$
7.68<sup>^</sup>

11<sup>h</sup> 7<sup>m</sup> Considerably troubled by clouds.  
 during the latter half of the evening  
 but as careful watch was kept prob-  
 ably no stars affected. apparently  
 clear while taking Iris.



Dec. 31. 1888.

Too cloudy for Photometry.  
Comet e 1888 (Barnard) Gr. 10.

0	1A	-7.3
3	35	
<hr/>		
+3	17	

Clouds.

Still too cloudy to see comet.  
Some tendency to clearing.

10 15 Still cloudy with no prospect of  
clearing.



Jan. 1. 1889.  
Vesta and Comp. Stars.

W. obs.

$$\begin{array}{r} 0 \quad 37 \quad -3 \quad 54 \\ 2 \quad 27 \\ \hline 1 \quad 50 \end{array}$$

7 34

$$\begin{array}{r} -10^{\circ} 164 \\ +24^{\circ} 396 \\ \hline \end{array}$$

5.29  
5.10

5.30  
5.22

$$\begin{array}{r} 20.91^{\wedge} \\ 10.455 \\ 5.227 \\ \hline 1568 \\ 6.795 \end{array}$$

Vesta

4.80  
4.49

4.78  
4.72

$$\begin{array}{r} -10^{\circ} 173 \\ +25^{\circ} 449 \\ \hline \end{array}$$

$$\begin{array}{r} 18.79^{\wedge} \\ 9.395 \\ 4.697 \\ \hline 14.09 \\ 6.106 \end{array}$$

5.78  
5.88

5.75  
5.98

$$\begin{array}{r} 33.39^{\wedge} \\ 11.695 \\ 5.847 \\ \hline 17.54 \\ 7.601 \end{array}$$

Vesta

4.48  
4.49

4.40  
4.57

$$\begin{array}{r} -10^{\circ} 180 \\ +25^{\circ} 441 \\ \hline \end{array}$$

$$\begin{array}{r} 17.94^{\wedge} \\ 8.97 \\ 4.485 \\ \hline 13.45 \\ 5.830 \end{array}$$

4.79  
4.98

4.70  
4.73

$$\begin{array}{r} 19.20^{\wedge} \\ 9.60 \\ 4.80 \\ \hline 14.4 \\ 6.24 \end{array}$$

8 11

Perfectly clear at time of taking  
Vesta & comp stars



Jan. 1. 1889.  
 Iris and Comp. Stars. Obs.

$$\begin{array}{r} 2 \quad 17 \\ 3 \quad 14 \\ \hline 57 \end{array} \quad +15 \quad 48$$

+24° 396

Iris

+25° 449

Iris

+25° 441

Iris identified but clouds noticed  
 at about time to begin measurements  
 Too cloudy at present for Iris.



Jan. 1. 1889.

Comet 1889 (Barnard) Gr. 5th

$$\begin{array}{r}
 0 \quad 16 \quad -7 \quad 26 \\
 3 \quad 52 \\
 \hline
 3 \quad 38
 \end{array}$$

$$0 \quad 16 \quad -97$$

Star a has a faint star preceding it 2 sec 1' south & has another star following it 1 sec. 5.5 north also has a faint star preceding it 25 sec 11' south = Comp. A.

$$\begin{array}{r}
 \text{Pos. zero } 117.7 \\
 \quad 45 \\
 \hline
 162.7
 \end{array}$$

$$\begin{array}{r}
 4^h \quad 22 \quad 29.7 \\
 \quad 22 \quad 52.5 \\
 \quad 23 \quad 0.5 \\
 \quad 23 \quad 17.8
 \end{array}$$

$$\begin{array}{r}
 \cancel{23 \quad 44.7} \\
 \cancel{24 \quad 7.6} \\
 \cancel{24 \quad 40.1} \\
 \cancel{24 \quad 53.1} \\
 \quad 70.5
 \end{array}$$



Jan. 1, 1889.

4 <sup>h</sup>	<del>25</del>	<del>42.5</del>
	<del>26</del>	<del>1.2</del>
	<del>26</del>	<del>13.0</del>
	<del>26</del>	<del>25.6</del>
	<del>27</del>	<del>6.5</del>
	<del>27</del>	<del>25.5</del>

Only the first of the preceding sets were of any value, and that through cloud. Comp. Star was  $\alpha$  S D -  $7^{\circ} 43' (9.0)$

Order \* \*  $\infty$   $\infty$

Both in southern half, but probably the set should not be used. Clouds, especially at this low altitude prevented any farther transits.

10 20 Still cloudy with no prospect of clearing



Jan. 3. 1889.  
 Vesta and Comp. Stars. N. St.

0	34	-3	36	16.9
2	44			2.4
2	6	0	48	16.4
		3	18	
		2	30	-3 26

-10°164

7 52

5.22

5.20

5.03

5.12

20.57<sup>1</sup>

10.285

5.142

1.543

6.685

6.68<sup>1</sup>

Vesta

4.58

4.78

4.61

4.88

18.85<sup>1</sup>

9.425

4.712

1.414

6.126

6.13<sup>1</sup>

-10°173

5.75

5.79

5.85

5.80

23.19<sup>1</sup>

11.595

5.797

1.436

7.536

7.54<sup>1</sup>

Vesta

4.59

4.67

4.80

4.80

18.86<sup>1</sup>

9.43

4.715

1.414

6.129

6.13<sup>1</sup>

-10°180

4.97

4.74

4.92

4.74

19.37<sup>1</sup>

9.685

4.842

1.453

6.295

6.29<sup>1</sup>

8 21



Jan. 3. 1888.  
Comet 1888 (Barnard) H. 10.

$$\begin{array}{r} 0. \quad 13 \quad -7 \quad 20 \\ 3 \quad 35 \\ \hline 3 \quad 22 \end{array}$$

Comparison star = L.D.  $-7^{\circ} 48'$  (7.6 S.J.)

Pos. zero 139.6

~~45.0~~

Setting 1840

3h

53	33.6	E
54	20.9	E
57	26.1	X
57	32.5	X

3

58	7.2
<del>58</del>	<del>3.2</del>
<del>59</del>	<del>3.2</del>

4

621	59.5
622	5.0

3	36.9
---	------

4	27.8
---	------

7	29.5
---	------

7	39.6
---	------



Jan. 3, 1889.

#	8	29.4
	9	18.7
	12	22.0
	12	31.0

	13	13.6
	14	2.1
	17	6.4
	17	14.6

~~Fr. 3~~  
 Order in preceding transits,  
 comets, comets, star, star, Both in  
 northern half.

Fr. 3451  
 4 22 10.5  
 23 10.7

Ballou 103.  
 9 16 0.0  
 17 0.0

∴ Fr. 3451 is 4<sup>m</sup> 49.9<sup>s</sup> slow.



Jan. 3, 1889.  
 Iris and Comp. Stars, W. obs.  
 2 19 +15 ~~88~~

2 16  
 4 40  
 2 24

9 37

+24°396

6.70

6.62

6.70

6.72

26.74<sup>1</sup>

13.37

6.685

2.905

8.68<sup>1</sup>

Iris

5.28

5.04

5.29

5.10

20.71<sup>1</sup>

10.355

5.177

1.553

6.73<sup>1</sup>

+25°449

5.27

5.30

5.49

5.41

21.47<sup>1</sup>

10.735

5.367

1.810

6.98<sup>1</sup>

Iris

5.01

5.13

5.16

5.17

20.41<sup>1</sup>

10.205

5.102

1.531

6.63<sup>1</sup>

+25°441

11.995

5.997

1.796

7.796

6.00

6.07

5.97

5.95

23.99<sup>1</sup>7.80<sup>1</sup>

9 56



Jan. 3. 1889.

D. M. Hodge - True St. ob.

+ 29°

Series 34.

$$\begin{array}{r}
 0 \quad 20 \quad + 29.9 \\
 \sqrt{\quad} \quad 13 \\
 \hline
 +4 \quad 53
 \end{array}$$

10 18 75

3.55

3.66

3.89

11.09

4.80

79

2.89

3.03

3.10

9.02

3.90

85

3.91

3.89

4.09

11.89

5.15

87

3.30

3.28

3.30

9.88

4.28



Jan. 3, 1889.

89

2.82

2.87 preceding, northern

3.01 &amp; brighter of pair

100

2.66

2.66

2.89

8.70

3.77

8.21

3.55

103

3.58

3.52

3.60

10.70

4.63

120

2.95

3.17

3.18

9.30

4.03

1

122

3.23

3.30

3.21

9.74

4.22

137

3.79

3.89

3.78

11.46

4.96

138

3.27

3.51

3.48

10.26

4.44



Jan. 3, 1889.

150

4.71

4.69

4.99

14.39

6.23

153

3.30

3.41

3.38

10.09

4.37

161

2.99

3.15

3.32

9.46

4.10

166

~~wrong~~  
3.38 3.50

3.68

3.72

10.90

4.72

169

2.49

2.88

2.95

8.32

3.60

171

3.20

3.38

3.19

9.77

4.23

10 50



Jan. 5. 1889.  
 Comp. Stars for Var.      Tr. obs.

129 W Capricorni,  
 20      40      -15.4  
 26      55  
 ———  
 6      15

Already set.

131 T Aquarii.

20      40      -5.2  
 26      55  
 ———  
 46      15

Already set.

Cloudy also.

126 a V Cygni.

Tr. obs.

20      43      +47.2  
 27      7  
 ———  
 6      24

Region identified but clouds.



Jan. 8, 1889.

9

~~1e~~

1e

~~2f~~

2f

3e

4c

5v



Jan. 9, 1889.

6a

7b

8~~7~~6

9 10

Still cloudy with no prospect  
for work



Jan. 11. 1889.  
Comp. Stars for Var.

Gr. obs.

126 a V Cygni

$$\begin{array}{r} 20 \quad 43 \quad + 47.2 \\ 26 \quad 55 \\ \hline 6 \quad 12 \end{array}$$

9

5.80

5.96

5.87

5.82

5.90

5.69

35.04<sup>^</sup>

59<sup>^</sup>  
7.61

1e

3.98

4.02

4.17

4.17

4.47

4.17

24.98<sup>^</sup>

5.42

2f

4.23

4.31

4.21

4.42

4.21

4.32

25.70<sup>^</sup>

5.58

3d

3.37

3.35

3.39

3.41

3.37

3.35

20.24<sup>^</sup>

4.39



Jan. 11, 1889.

wrong 4C

~~3.18~~ 3.38

3.41

3.42

3.55

3.44

3.42

20.62<sup>^</sup>4.47<sup>^</sup>

5V

1.61

1.40

1.71

1.67

1.68

1.75

9.82<sup>^</sup>2.13<sup>^</sup>~~6a~~

6a

2.82

2.88

3.03

2.92

2.74

2.97

17.36<sup>^</sup>3.76<sup>^</sup>

7b

3.10

3.21

3.16

3.21

3.08

3.28

19.04<sup>^</sup>4.18<sup>^</sup>

10Z

2.00

2.10

2.03

2.01

2.20

2.18

12.52<sup>^</sup>2.77<sup>^</sup>

There seems to be a slight discrepancy between the chart and the sky. The variable seems to be identified beyond doubt both by its general position and



reddish color. Variable follows star "a"  
about 8 sec.  $9\frac{1}{2}'$  south. The only star

Several stars somewhat near the position  
of  $\kappa$ . All of them are faint but the one  
most nearly in position follows 14.5 sec.  
4' south. Another star slightly brighter  
6 sec. 4.5 both of these too faint for  
wedge tonight.

"b" precedes "a" 2 sec. 17' south

"z" follows var. 28 sec 2' north.

8 26

z 4.5 Variable

125	U Cygni.	
20	14	+47.5
28	12	
<u>7</u>	58	

Too low.

Dr. Sk.



Jan. 11. 1859.

2d S' brionis.

Y. obs.

$$\begin{array}{r} \sqrt{19} \quad -5.7 \\ 4 \quad 31 \\ \hline 48 \end{array}$$

9 18

1b

4.70

4.72

4.84

4.68

5.07

4.90 28.91

6.27

5c

wrong

~~4.77~~ 5.40

5.15

5.29

5.07

5.21

5.27 31.39

6.81

4b

4.00

3.80

3.89

3.89

3.70

3.81 23.09

5.01

2m

seemed to be 3.08 340

wrong

342

3.41

3.48

3.25

3.38 20.34

4.41

3a

5.16

5.28

5.20

5.50 32.02

5.38

5.50 6.94



Jan. 11, 1889.

6 X

2.92

3.21

3.16

3.30

3.30

3.28

19.17

4.15

7 S

3.02

2.89

3.00

2.98

3.12

3.12

18.13

3.93

8 y

2.30

2.12

2.42

2.39

2.12

2.28

13.63

2.96

9 z

1.90

1.92

1.80

2.00

1.64

1.96

11.22

2.43

18 g

3.48

3.78

3.48

3.77

3.72

3.88

22.11

4.80

13 m

3.49

3.61

3.63

3.70

3.51

3.72

21.66

4.70



Jan. 11, 1889.

12 h

4.40	4.17	
4.16	4.16	
4.13	4.12	25.14
		5.46

15 e

4.30	4.28	
4.32	4.37	
4.20	4.28	25.75
		5.59

14 f

3.98	3.85	
3.87	4.08	
3.74	3.99	23.51
		5.10

16 d

4.60	4.75	
4.90	5.08	
4.99	5.06	29.38
		6.37

10 h

3.40	3.59	
3.60	3.50	
3.61	3.51	21.21
		4.60

17 g ~~18 h~~

1.06	1.02	very
0.90	0.91	difficult
0.87	0.92	5.68
		1.23

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Jan. 11. 1889.

"6X" 179 is undoubtedly the same as

10 12 S 1.5 X

Variable is certainly a little brighter  
in the telescope than  $\chi$  although  
the wedge makes it a little fainter.

Variable considerably red.

346 V Gem.

Gr. 10.

$$\begin{array}{r}
 7 \quad 21 \quad +13.0 \\
 \underline{5 \quad 56} \\
 - \quad 1 \quad 25
 \end{array}$$

40 S Can. Min.

Gr. 10.

$$\begin{array}{r}
 7 \quad 26 \quad +12.0 \\
 \underline{6 \quad 20} \\
 - \quad 1 \quad 6
 \end{array}$$



Jan. 11, 1889.

1c

10 43

3.45

3.47

3.40

3.32

3.35

3.35

20.34

4.41

2d

3.56

3.56

3.62

3.40

3.50

3.48

20.62

4.47

3b

3.35

3.37

3.27

3.20

3.20

3.25

19.64

4.26

4T

1.43

1.55

1.62

1.30

1.50

1.38

8.78

1.90

5X

1.90

1.87

1.72

1.70

1.80

1.73

10.72

2.32

6y

2.55

2.42

2.42

2.50

2.35

2.40

14.64

3.18



Jan 11, 1889.

3.00	7g	2.87	
2.85		2.80	
2.80		2.90	17.22
			3.73

	8a		
3.42		3.51	
3.33		3.35	
3.50		3.38	20.49
			4.44

	9e		
4.20		4.22	
4.11		4.10	
4.17		4.13	24.93
			5.41

	10		
5.10		5.12	
5.22		5.23	
5.30		5.27	31.24
			6.78

<del>5.02</del>	11		
4.82		4.92	
4.78		4.88	
5.02		4.81	29.23
			6.35

	12		
4.80		4.77	
4.62		4.67	
4.70		4.70	28.26
			6.13



Jan. 11, 1889.

11 12

$\chi$  3  $\mathcal{T}$



Jan. 12. 1869

Camps. Stars for. Ver. Gr. sk.  
125 U Cygni.

20	9	+46?
27	8	
<hr/> 6	59	

734

1 hr

4.59	4.59	
4.68	4.52	
4.53	4.52	27.437
		5.967

(29) wrong star.

3.53	3.99
3.69	3.97
3.91	3.90

3 hr

3.78	4.20	
3.97	4.23	
4.17	4.20	24.557
		5.337

29 (right star)

4.20	4.20	
4.16	4.39	
4.37	4.49	25.817
		5.607



Jan. 12, 1888.

5d

2.30	2.54	
2.60	2.56	
2.62	2.70	15.32
		3.32

4l

3.08	3.00	
3.12	3.11	
3.09	2.99	18.39
		3.99

6c

2.25	2.28	
2.21	2.39	
2.15	2.25	13.53
		2.94

7m

2.68	2.83	
2.98	2.83	17.10
2.97	2.81	3.91

8u

3.78	3.80	
3.98	3.90	
3.79	3.62	22.87
		4.96

9a

4.62	4.57	
4.61	4.59	
4.68	4.49	27.56
		5.98



Jan 12 1889

10 b

2.35

2.51

2.40

2.64

2.63

2.68

15.217

3.307

119

3.29

3.30

3.47

3.23

3.38

3.41

20.087

4.367

12 X

1.60

1.80

1.70

1.75

1.78

1.88

10.517

2.287

13 y

1.23

1.60

1.37

1.67

1.22

1.52

8.617

1.877

~~5.01~~

(14)

5.01

5.30

4.92

4.98

4.92

5.00

30.137

6.547

829

~~a 4 H~~ a 4 H 6 g



Jan. 12, 1889.

Star assumed to be (29) follows  
bright star 1.5 sec. 3.5 south.

Star assumed to be "29" follows bright  
star 15 sec 7.5 south.

Probably star (29) is the star wanted.

Star "y" is 2' north of x and ex-  
ceedingly faint in this moon and at  
this altitude.

"x" also is faint but not quite as  
faint as "y".

"y" seen with great difficulty in  
wedge & probably measurement  
should not be attempted; "x" also  
very faint in wedge.

Clouds were noticed during meas-  
urement above this region & may  
have passed over it without being  
noticed & thereby thus possibly  
affecting measures.

The star "29" wanted is found on  
further examination of the chart  
to be the one following bright star  
15 sec 7.5 south.



Jan. 12. 1889.

Hr. 3451.			Ballon 103.		
4	5A	23.5	9	21	0.0
	59	23.7		22	0.0

Experiments with new tin foil squares upon glass. The obs.

Star used in transits below is (41 e Orionis, Keis) which is 1620 B.A.C.

Bar parallel to diurnal motion.

Star

Star transits near Southern Bar.

5 to

10 40.3

11 40.4

Transits

5<sup>h</sup> 10 40.3 13 46.5 15 6.0

11 40.4 14 46.8 16 6.4

~~13 46.5~~ 60.3 60.4

16 40.4 18 24.6

17 40.7 19 25.0

60.3 60.4



Jan. 12, 1889.

5  
Transits  $\frac{1}{4}$  way towards <sup>north</sup>5<sup>n</sup> 29<sup>m</sup> 10.5 sec  
30 11.1 ~~66~~  
~~66~~ 60.6

30 42.5

31 43.0

~~65~~ 60.5

32 29.6

33 30.1 &amp;

~~65~~ 60.5

34 3.0

35 3.5

~~65~~ 60.5

35 31.2

36 31.9 ~~67~~~~67~~ 60.7Transits  $\frac{3}{4}$  way towards <sup>north</sup>

5 46 47.0

47 47.6 60.6

60.6

48 19.5

49 20.1

60.6

50 6.1

51 6.8

60.7

51 32.0

52 32.4 60.4

53 4.1

54 4.8 60.7

Transit across middle. ~~5~~

5 38 31.0

39 31.3 60.3

40 7.1

41 7.2 60.6

41 38.2

42 38.7 60.5

43 13.0

44 13.5 60.5

44 37.8

45 38.2 60.4

5 56 26.1

57 26.8

57 55.8

58 56.5

5 59 21.6

6 0 22.1

0 53.9

1 54.4



Jan. 12, 1888.

2.17

5  
Transits near northern bar.

5	56	26.1	
	57	26.8	60.6
	57	53.8	
	58	56.5	60.7
5	59	21.6	
6	0	22.1	60.5
	0	53.9	
	1	54.4	60.5
	2	18.5	
	3	19.1	60.6
		16.0	

16.0

Square turned 90°

Transits near Southern bar.

6	15	31.6	
	16	32.5	60.9
	18	14.0	
	19	15.0	61.0
	19	41.4	
	20	42.3	60.9
	21	46.5	
	22	47.4	60.9
	23	27.0	
	24	28.0	61.0

6	25	20	
	26	2.6	60.6
	26	44.2	
	27	45.0	60.8
	28	8.1	
	29	9.0	60.9
	29	38.0	
	30	38.7	60.7
	31	3.5	
	32	4.2	60.7

~~6 32 28.0~~  
 6 36 13.5  
 37 14.2  
 clonets, ageing star disc  
 disappearing & reappearing  
 continually

(over)



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Jan 12, 1889

Very much troubled by clouds during transits. Star visible only a part of the time & images bad.

Stopped by clouds  
11<sup>th</sup> 2<sup>nd</sup>

Fr. 3451

Ballou 103.

6	48	41.3
	49	41.5

11	11	0.0
	12	0.0











g



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