1879phae.proj..481S

KG
11365
480

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KG 11365.480

-1979plac.proj..401S

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1879phae.proj...481S

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1879phae.proj..481S

KG 11365.4.80

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1879phae.proj..481S

April 22, 1879.

Adjustment of Photometer P.

Watch Montandon 1263.

BAC 3572 in middle of field at $10^h 21.^m25$

Leaves field at 25,50

BAC 3607 in middle of field at $10^h 26.^m5$

Readjusted.

BAC 3639(?) in middle of field at $10^h 31.^m7$

3718

Phot. Q Neb. Gem. bat. 1861.

Focus on star s.f nebula.

9 5

358.0	a.	S. obs.
361.2		
369.0		
362.7+	1882 362.7	

ε Lemnis compared with nucleus

9 9

13.1		S. obs.
13.3		
13.2		
13.2+	b 13.2	

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1879phae.proj..481S

April 22, 1879.

ε Leonis compared with part 7 net apparently above under.

9 11

	S. obs.
19.8	
22.6	
25.1	
22.5 +	75 = 22.5

Star s.f. net, compared with ε Leonis at 22.5

9 13

	S. obs.
265.1	
234.2	
232.7	
244.0 +	1320 = 244.0

Star compared with ε Leonis at 13.2

9 16

	S. obs.
314.8	
312.0	
310.6	
312.5 +	374 = 312.5

Star n.f. net. (11 mag) compared with ε Leonis at 13.2

9 21

	S. obs.
335.2	
338.4	
335.2	
336.3 +	188 = 336.3

This star is in the same field with the nebula and has a faint companion ~~south~~ more nearly p.

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1879phae.proj.1401S

April 22, 1879

9 24 Star n.p. nebula compared with ε Leonis at 225

	321.6	S. obs.
	319.6	
	314.4	556
	318.5+	3185

Focus on star s.f. nebula

9 30

	369.2	U. obs.
	376.0	
	370.8	
	60	2160
	372.0+	3720

ε Leonis compared with nucleus.

9 33

	9.7	U. obs.
	11.2	
	12.2	331
	33.1	11.0
	11.0+	

ε Leonis compared with part of nebula apparently above nucleus.

9 35

	26.8	
	29.1	U. obs.
	25.0	
	20.9	209
	27.0+	~~26~~ 270

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1879phae.proj..481S

April 22, 1879

Star s. f. nebula compared with ε Leonis at 11.0

9 37

324.0 M. obs.
323.9
327.0
14.9
325.0+

749
325.0

Star s. f. nebula compared with ε Leonis at 27.0

9 40

247.8 M. obs.
249.8
241.3
18.9
246.3+

1389
246.3

Star n. f. nebula compared with ε Leonis at 27.0

9 47

304.0 M. obs.
307.7
314.8
26.5
308.8+

265
308.8

Star n. f. nebula compared with ε Leonis at 11.0

9 50

369.3 M. obs.
371.1
361.9
2023
367.4+

2023
367.4

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1879phae.proj.1.481S

April 22, 1879.

Photometer I

Star s. f. nebula compared with ε Leonis

10 4

4.02 U. obs.
3.71
4.01
11.74
3.91 3+
11 7 4
3.9.1 3

Prism above.

Star n. f. nebula compared with ε Leonis

10 7

1.61 U. obs.
1.70
1.32
1.543+
16 3
1.543

Prism above

Star ~~s. f.~~ n. p. S. obs.

10 9

1.66
2.11
1.70
1.823+
547
1.823

Prism above

10 11 Star s. f. S. obs. Prism above.

At 6.0v scarcely equal.

s. f. follows net. 10.0[s] and is 6′ south S. obs.
n. f. precedes net. 22.5 and is 4′ north

The finder interfered with setting the prism of photometer I perpendicular to the path of the stars, so that the intervals are only approximate. The first interval should probably exceed 10[s] and the second be less than 22.5[s]

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1879phae.proj..481S

April 23, 1879

Photometer Q

Star s.f. neb. G.C. 1861 (Star a)

8 37

Focus	S. obs.
386.0	
383.1	
383.7	
12|8	
384.3+	

1 2 8
3.8 4.2 7

Central part of nebula, E Leonis.

8 48

	S. obs.
11.9	
11.8	
12.1	
28	
11.9+	

5 8
1 1.9

Outer part of nebula, E Leonis

8 53

	S. obs.
26.6	
28.8	
29.8	
25 2	
28.4+	

2 5 2
2 8.4

Star a (s.f. neb.), E Leonis at 28.4

8 58

	S. obs.
283.2	
256.3	
274.0	
213.5	
271.2+	

2 8 3 5
~~3 4 7 8~~
2 7 1. 2

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1879phae.proj.481S

April 23, 1879

Star b (n.f. neb.), ε Leonis at 28.4

9 4

351.1	P. obs.
350.5	
340.0	
1416	1416
347.2+	347.2

Star b, ε Leonis, at 11.9

9 8

366.1	P. obs.
362.9	
359.9	1889
8.9	363.0
363.0+ ~~353.0~~	

9 13

340.9	Star a s.f. at 11.9
334.8	P. obs.
330.7	
164	1064
335.5+	335.5

Star a. Focus.

9 17

399.3	P. obs.
391.2	
390.2	
10.7	107
393.6+	393.6

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1879phae.proj..481S

April 23, 1879

Central part of nebula, ε Leonis

9 19	13.6	P. obs.	
	13.3		
	11.7	86	
	8.6	12.87	
	12.9+		

Outer part of nebula, ε Leonis.

9 22	35.6	P. obs.	
	31.4		
	34.2		
	112	112	
	33.7+	33.7	

Star a, ε Leonis at 12.9

9 24	336.0	P. obs.	
	338.1		
	335.4		
	19.5	19.5	
	336.5+	336.5	

Star a, ε Leonis at 33.7

9 25	274.4	P. obs.	
	270.6		
	265.6		
	06	06	
	270.2+	270.2	

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1879phae.proj.481S

April 23, 1879.

Star b, ε Leonis at 33.7

P. Obs.

9 29

342.2
348.7
338.7
9.6
343.2+

96
343.2

Star b, ε Leonis at 12.9

P. Obs.

9 32

357.8
368.2
362.7
8.7
362.9+

87
362.9

Shut I, Star b. Sol

9 57

1.61
1.23
1.29
.11 3
1.38+

Prism to left.

113
1.377

9 58

P. Obs.

2.30
1.86
2.02
.18
2.06+

Prism to left.

18
2.06

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1879phae.proj..481S

April 23, 1879.

Star 2

10 2

4.52
3.83
4.67
10 2
4.34+

Phobs.

10 2
~~4 01~~
4.34

Seeing 7.7.7. (8)

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1879phae.proj..481S

April 24, 1879

Photometer I. (5 inches aperture)
Star a near Nch. G. C. 1861
Too cloudy for measures.

Photometer H.
Star a near pole.
Clouds became too thick for observation.

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1879phae.proj..481S

April 28, 1879.

Aperture of West Equatorial

5.25 inches

0^h

13.410 cms.

=13.30

2.54

2100

2625

1050

13.3350

Tail-piece bent so that the light is partly cut off.

Small diameter 12.25 estimated.

Large " 13.35

mean 12.80

Adopted value 12.7 cms., same as 5 inch aperture of E. Equatorial, the uncertainty being too considerable to make greater appearance of precision desirable.

37.95 cms. aperture E. Equatorial.
12.70 " " W. Equatorial & E. Equatorial with 5 inch cap.
7.65 " " E. Equatorial with 3 inch cap.

log 37.95	1.5792	2 log 37.95	3.1584
" 12.70	1.1038	" 12.70	2.2076
" 7.65	0.8837	" 7.65	1.7674
Log. ratio light of apertures 37.95 & 12.70			0.9508
Corresponding diff. magnitude			2.38
Log. ratio light of apertures 37.95 & 7.65			1.3910
Corresponding diff. magnitude			3.48

Tin plate 1.1, aperture 12.61 cms.

log 12.61	1.1007	2 log 12.61	2.2014
Log ratio light of apertures 37.95 & 12.61			0.9570
Corresponding diff. magnitude			2.39

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1879phae.proj..481S

April 30, 1879. Photometer K.

α Hrs. Min.			δ obs.	
	34.0			3.3
	37.3	3.3		3.8
8.40	213.2		5015	1
		3.8	25075	3.55
	217.0		12538	1.78
	5015	71		
	25075	355		
	125.38	1.78		

Cloudy later

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1879phae.proj..481S

May 1, 1879. Photometer K.

Focussing pinion ~~[illegible]~~ 401.5

Eye-piece pushed as far in as it can be = 5.4 cms.

~~Last~~ 6.0
6.1
5.8
5.97 = setting adopted in all observations by S.

Settings of eye-piece for equally good focus of two images. S. obs.

8 43

α − α Ursæ Min.		S. obs.
34.3	2.7^	2.7
37.0		
213.1	2.9^	2.9
216.0		
5004^		5004
25020^	2.8^	2502 2.8
125.10^	1.40^	125.10 1.40

Eye-piece setting adopted in all observations by H. 5.4 (in as far as possible). H. obs.

8 55

α Urs. Min.		H. obs.	
34.5	3.3^		3.3
37.8		5004	3.9
212.1		2502	3.6
216.0	3.9^	125.10	
5004^	12		
25020^	3.6^		
125.10^	1.80^		

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1879phae.proj..481S

May 1, 1879

DM 88° 4, 2 Urs. Min.

U. obs.

	23.5	27.0	
	50.5		
9 2	200.5	30.5	5055
	231.0	57 5	25275
	5055	2875	126.38
	25275	14.38	
	126.38		

27.0	
30.5	
57 5	
2875	
14.38	

S. obs

S.	26.7	19.5	5000
	46.2		25000
9 7	201.3	24.5	125.00
	225.8		
	5000	440	
	25	22	
	125.00	11.00	

19.5
24.5
4 0
22 0
11.00

DM 88°, 9 — 2 Urs. Min.

S. obs.

	14.5	40.2	
	54.7		
U. 9 13	196.8	40.2	5030
	237.0		2515
	5030	40.2	125.75
	2515		
	125.75	20.10	

40 2
40 2
20.1

U. obs.

	18.6	35.8	
	54.4		
9 19	191.0	48.6	5036
	239.6		2518
	5036	44	125.90
	2518	42	
	125.90	21.10	

358
486
44
42
21.1

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1879phae.proj..481S

May 1, 1879

δ Ursæ Min? + α Urs. Min.

S. obs.

9 27

26.2
46.2 20.0^
201.5 22.4^
223.9

4978^ 424^
2489^ 21.2^
124.45^ 10.60^

Probably DM 86° 272

4978 20.0
2489 22.4
124.45 21.2
10.60

U. obs

16.0
49.8 33.8^
200.6
229.7

9 35

4961^ 29^
24805^ 3145^
124.02^ 15.72^

Probably DM 88° 272

4961 33.8
24805 29.1
124.02 29
3145
15.72

51 Cephei + α Urs. Min.

U. obs.

29.2
41.3 12.1^
207.5
223.6

9 43

5016^ 282^
2508^ 141^
125.40^ 7.05^

12.1
5016 16.1
2508 8 2
125.40 14.1
7.05

S. obs.

28.5
41.4 12.9^
207.2 15.6^
~~15.8~~
222.8

9 47

4999^ 287 285^
24995^ 1435
124.98^ 7.18 7.12^

4999
24995
124.98

12.9 12.9
14.6 15.6
5
13.75 8 5
6.88 14.25 7.12

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1879phae.proj..481S

May 1, 1879.

δ Urs. Min. / α Urs. Min. &c. obs.

10 0

26.8 15.0^
41.8
205.2 16.1^
221.3
4951 311^
24755^ ~~24855~~ 15.55^
123.78^ ~~124.28~~ ~~7.75~~ 7.78^

15.0
4951 16.1
24755 311
123.78 1555
7.78

[19.5] rej. too bright

10 4

27.8 11.4^
39.2
207.2 11.3^
218.5
4927^
24635^ 1135^
123.18^ 5.68^

δ obs.

114
4927 11.3
24635 1135
123.18 5.675

λ Urs. Min. – α Urs. Min.

10 13

22.3 27.2^
49.5
199.7 28.9^
228.6
5001^ 161^
25005^ 2805^
125.02^ 14.02^

δ obs.

272
5001 289
25005 1
125.02 2805
14.02

10 18

19.2 ~~20.1~~ 30.1^
49.3
201.3 24.0^
225.3
4951^ ~~54.1~~ ~~22.05~~
24755^
123.78^ ~~11.02~~ 13.52^

α obs.

30.1
4951 24.0
24755 541
123.78 2705
13.52

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1879phae.proj...481S

May 1, 1879.

ζ Ursae Majoris.

30.9
35.7 4.8^

10 24 [208.6] reject; very much too bright

209.1
213.4 4.3^

4891^ 9.1 ~~1.55~~
24455^ ~~2.78~~ 2.28^
122.28^

4891 4.8
24455 4.3
122.28 4.55 9.1
2.22 4555
2.28

10 27 32.1
34.6 2.5^

210.1
213.1 3.0^

4899^ 5.5^
24495^ 2.75^
122.48^ 1.38^

ζ Ursae Majoris.

4899 2.5
24495 3.0
122.48 2.75
1.38

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1879phae.proj..481S

May 5, 1879

Photometer K

δ Cancri Focus piping 401 Eye-piece 6 cons.

P. obs.

	32.9	3.6	3.6
	36.5		3.3
9 8	211.0	3.3	3.45
	214.3		1.72 at 300; effect not very marked.
	4947	9	4947 Moonlight.
	24735	3.45	24735
	123.68	1.72	123.68

	210.6	3.6	P. obs.	Eye-piece 6 cons.
	214.2			3.6
9 18	31.3	3.5	4909	3.5
	34.8		24545	3.55
	4909		122.72	1.78
	24545	3.55		
	122.72	1.78		

ζ Cancri, δ Cancri

P. obs.

	19.0	27.2		27.2
	46.2			29.2
9 29	198.0	29.2	4904	56.4
	227.2		2452	28.2
	4904		122.60	14.1
	24520	28.2		
	122.60	14.1		

Star e, δ Cancri

P. obs.

	357.7	63.2		63.2
	60.9		8464	53.4
9 31	187.2	53.4	42320	116.6
	240.6		21.60	58.3
	8464	116.6		29.15
	4232	58.3		
	21.60	29.15		

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1879phae.proj..481S

May 5. 1879.

ε-δ Cn Schr.

	29	49.4			49.4
9 37	52.3				48.0
	187.0	48.0		477 2	174
	235.0			2386	487 0
	4772	974		1 19,30	24.35
	2386	4870			
	1 19.30	24.35			

S - δ Cancri

Schr

	21,8				
9 40	42.0	20.2			20 2
	204.7			4908	17.6
	2283	17.6		24540	378
	4908	378		122.70	189
	2454	189			9,45
	122.70	9.45			

S Cancri, δ Cancri

P. Schr.

	15,3				
	44.6	29,3			29,3
9 49	201.2	26.0		4883	26.0
	227,2			24415	153
	4883	553		122.08	2765
	24415	2765			13.82
	122.08	13.82			

Stur ε, δ Cancri

P. Schr.

	3.1				
	62.6	59.5			59 5
9 51	183.3	61.3		4931	61,3
	244.6	08		24680	60.4
	4936	60.4		123.40	30.20
	24680	30.20			
	123.40				

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1879phae.proj..481S

May 5, 1879.

e-δ Cam.

9 55

8.0 51,2 8 obs.

59.2

188.2 50.9

239.1 21

49 45 51.05

24725 25.52

123.62

51 2

50 9

51 05

25 52

~~12.76~~

49 45

24725

123.62

δ-δ Camelii.

10 0

20,0 21,7

41.7

201.3 21,9

223.2 43 6

486 2 21 8

2431 10,90

121.55

21 7

21 9

21 8

10,90

486 2

24310

121.55

δ-δ Camelii

10 5

33.2 3.2

36.4

210,9 3.3

214,2

4947 3.25

24735 1.62

123.68

8 obs

3,2

3.3

3 25

1,62

4947

24735

123.68

32.6 4,2

36.8

10 6 210.6 4.1

214.7

4947 4.15

24735 2.08

123.68

Pole.

4.2

4.1

4.15

2.08

4947

24735

123.68

Sun 5.3.- S

6.6.3 P

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1879phae.proj..481S

May 8, 1879

S – δ Cancri

8 17 10.7 54.8 44.1
187.8 46.9
234.7
4880 1110
24400 455
122.00 22.75

E. – δ

2.7 54.7
22 57.4
186.0 49.8
235.8 45
~~5 1 1 9~~ 5225
4819 26.12
24095
120.48

S
6.7 53.0
23 59.7
189.0 44.2
233.2
4886 972
2443 486
12215 24.30

E
11.1 41.6
26 52.7
187.4 51.4
236.6 930
4900 465
2450 23.25
122.50

44.1 4880 46.9 1110 455 22.75

54.7 4819 49.8 24095 45 5225 120.48 26.12

4886 53.0 24430 44.2 122.15 972 4860 24.30

416 514 4900 930 2450 465 122.50 23.25

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1879phae.proj..481S

May 8 1879

S

29

49
57.2
162.6
237.0
4817
24085
120.42

52.3
54.4
106.7
5335
26.68

4877
24385
121.92
24085
120.42

523
544
67
5335
26.68

E

31

10.2
53.2
192.2
236.7
4923
24615
123.08

43.0
44.5
87.5
43.75
21.88

4923
24615
123.08

43.0
44.5
75
4375
21.88

S

33

305.8
69.8
174.0
250.3
8499
42495
212.48

74.0
76.3
10 3
75 15
37.58

Josh Lingle

8499
42495
212.48

740
763
75 15
37.58

35

11.2
53.8
188.3
236.3
4876
2438
121.90

42.6
50.0
92.6
463
23.15

4876
2438
121.90

426
500
926
4630
23.15

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1879phae.proj.481S

May 8, 1879

S

0.2
57.3
1632
24.5
4852
2426
12.1.3

57.1
61.3
118.4
59.2
29.60

4852
2426
12130

57.1
61.3
1184
5920
29.60

38

10.9
52.2
1931
23.2
4904
2452
122.60

e
41.3
41.1
4
41.2
20.6

41.3
41.1
4120
22.60

4904
24520
122.60

40

S

3.7
62.6
182.1
241.6
4900
2450
122.50

58.9
59.5
4
59.2
29.60

4900
2450
122.50

58.9
595
4
59.2
29.60

43

e

S.

7 neg.

e in Rasc due to a
1 2/3 min preceding
S 13 north of e nearly same RA

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1879phae.proj:481S

May 8, 1879

9 31

e

3.0
75.3
184.7
243.9
5089
25345
12672

72.3
59.2
131.5
65.75
32.88

U. obs.

5069
25345
12672

72.3
59.2
131.5
65.75
32.88

s

3.9
58.7
178.6
246.7
4879
24395
12198

54.8
68.1
122.9
61.45
30.72

U. obs.

4879
24395
12198

548
681
1229
6145
30.72

9 45

e

1.3
60.9
183.7
242.7
4886
24430
12215

59.6
59.0
59.3
29.65

U. obs.

4886
24430
12215

596
590
593
29.65

s

353.2
681.
1756
248.0
8451
42255
21128

74.9
72.2
71
36.88

U. obs.

8461
42285
21128

749
722
1471
7355
36.88

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1879phae.proj.481S

May 8, 1879.

9 53

e

359.6 61.6
61.2
179.7 65.3
245.0
8455
42275
211.38

6.9
6345
31.72

U. obs.

61.6
65.3
1269
6345
3172

S

357.9 69.9
67.8
173.1 72.2
245.3
8441
42205
211.02

1421
7105
35.52

U. obs

69.9
72.2
8441
1421
42205
7105
211.02
3552

10 1

e

1.3 57.9
59.2
252.2 68.6
183.6
4963
24815
124.08

65
6325
31.62

P. obs.

57.9
68.4
1265
6325
31.62

10 3

S

352.2 80.7
72.9
170.2 90.1
260.3
8556
4278
213.90

1708
854
4270

P. obs.

80.7
901
8
854
4270

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1879phae.proj.:481S

May 8, 1879.

e

10 5

354.3 78.3
72.6
184.7 70.7
255.4
8670 90
4335 745
~~2167.5~~ 37.25
2167.5

P. Obs.

78.3
70.7
90
745
37.25

8670
4335
2167.5

s

10 8

~~854.3~~ rej.
349.7 95.5
85.2
164.9 100.1
265.0 1956
8648 9780
4324 4890
2162.0

P. Obs.

95.5
100.1
1956
9780
4890

8648
4324
2162.0

e

10 16

356.7 72.7
69.4
174.8 85.4
260.2 1581
8611 7905
43055 3952
21528

P. Obs

72.7
85.4
1581
7905
3952

8611
43055
21528

s

(10 22)

347.3 93.4
80.7
174.0 72.9
246.9 1663
8489 8315
42445 4158
212.22

P. Obs.

934
729
63
8315
4158

8489
42445
212.22

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1879phae.proj.481S

May 8. 1879.

e

352.3
63.6
176.7
250.6
8452
4226
211.30

71.3

71.9
12
71.6
35.8

P. Obs.

71.3
71.9
71.6
35.80

8452
4226
211.30

S.

346.2
62.9
176.9
258.6
8486
41243
212.15

74.7

79.7
144
77.2
38.6

(10 32)

Pobs

74.7
79.7
144
77.2
38.60

8486
42430
212.15

10 37

345.8
91.5
270.0
1580
8653
43265
216.32

105.7

1120
177
10885
54.42

S

W obs.

105.7
172.0
277
10885
54.42

8653
43265
21632

10 46

? ~~355.0~~

(335.8)

600
330.0
84.4

87.0
175.0
273.0
81.8
324.2

111.2

980

e

W obs

8624
43112
215.6

2092
1046
523

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1879phae.proj.:481S

May 8. 1879.

				P. Obs.
	ℓ			
	354.8	73.4		73 4
10 53	68.2		8538	73.0
	174.9		4 2690	73 2
	251.9	73.0	2 13,45	36.60
	8538	4 73.2		
	4269			
	2 13.45	36.6		

				P. Obs.
	S			
	344.8	105.1 ~~97.1~~		105.1
10 55	89.9		8658	102.5
	164.3	102,5	4329 0	207 6
	266.8		216.45	103 80
	8658	197.6		51.90
	4329	98		
	216.45	49.4 51.90		

				P. Obs.
	ℓ			
	354.6	78.5		78 5
	73.1		8536	90.1
10 56	167.9		42680	168 6
	258.0	90.1		843
	8536	168 6	2 13,40	42.15
	42680	843		
	2 13.40	42.15		

				P. Obs.
	S.			
	346.2	88.1	8494	88.1
10 54	74.3		4247	89.7
	169.6		212.35	178
	259.3	89.7		88.90
	8494	177.8		44.45
	4247	889		
	212.35	44.45		

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1879phae.proj,.481S

May 8. 1878.

		e			P. Obs.
11	1	357.3			70.7
		68.0	70.7		75 2
		174.6		8 497	145 9
		249.8	75.2	4 2485	72 95
		8 4 9 7	14 5 9	2 12.42	36.48
		4 2 4 8 5	72.95		
		2 12.42	36.48		

		s			P. Obs.
11	3	271.9			80.3
		352.2	80.3	8747	94 2
		76.2		4 37 35	174 5
		172.4	94.2	2 18,68	87 25
		8 7 4 7	174 5		43 62
		4 37 35	87 25		
		2 18.68	43.62		

		e			P. Obs.
11	7	4.4			60.5
		64.9	60.5	4890	63.8
		178.2		2445	38
		241.5	63.3	122.25	6 19 0
		4890	38		30.95
		2445	6 19		
		122.25	30.95		

		s			P. Obs.
11	9	354.3			73.8
		67.6	73.3	8516	85.5
		172.1		4 2580	158 8
		257.6	85.5	2 12.90	794
		8 5 1 6	158 8		39.70
		4 2 5 8 0	794		
		2 12.90	39.7		

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1879phae.proj.;481S

May 8. 1878

e

W. Obs.

342.5
84.0
139.5
272.5
838.5
4 19 25
2096.25
8 5 50
4 2 75
2 1 3.75

156.0
another read.
11 35

101.5
116.5
133.0
180.5
1090
54.50

The reading 156.0 was used in the reduction in place of 139.5 W (the observer) advises it.

8550
4275
213.75

104.5
116.5
218.0
1090
54.50

S

339.6
95.5
145.0
291.0
8711
4355
217.75

11 48

9
115.X
Shutter interfers
146.0
611
13055
65.48
65.48

W. Obs.

8711
4355
217.75

115.9
146.0
2619
13095
65.48

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1879phae.proj..481S

May 9, 1879. Photometer K.

δ Cancri, δ Cancri

P. obs.

S in bottle from other night

	188	26.4			
	45.2				
8 17	199.2				
	227.1	27.9		26.4	
	49 03	14	4903	27.9	
	245 15	27 15	245.15	54 3	
	122.58	13.58	122.58	27 15	
				13.58	

o Star e, δ Cancri

P. obs.

	2.9	57.3		59.3	60.3
	62.2				64.9
8 19	181.9	64.9	4938	64.9	3 6.
	246.8	54.9	24690	124 2	16.30
	4938	14 2	123.45	62 1	
	24690	571		31.05	
	123.45	~~28.55~~ 31.05			

e − δ

S. obs.

	1.2	− 58.9		58.9
	60.1			58.2
8 21	183.0	58.2	485.5	58.55
	241.2	11	24275	29.28
	4855	58 55	121.38	
	24275	29.28		
	121.38			

S − δ Cancri

S. obs.

	19.5	23.6		23.6
8 24	43.1			30.0
	195.0	30.0	4826	53 6
	225.0	53 6	2413	2 680
	4826	26.80	120.65	~~13.40~~
	2413	13.40		13.40
	120.65			

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1879phae.proj.:481S

May 9, 1879.

δ Cancri, δ Cancri P. obs.

17.9
45.0
δ 28 198.1 26.1
224.2
48 55
24 26
121.30

27.1
26.1
13.30
26.6
13.30

48 55
24 26
121.30

27.1
26.1
13.30
26.6
13.30

Star c, δ Cancri P. obs.

1.2
64.7
δ 30 181.8 67.1
248.9
49 66
2483
124.15

63.5
130 6
653
32.65

49 66
2483
124.15

63.5
67.1
106
6530
32.65

e, δ Cancri S. obs.

4.8
56.1
δ 34 179.8 65.4
245.2
48 59
24 295
121.48

51.3
116.7
5835
29.18

48 59
24 2.95
121.48

51.3
65.4
116.7
5835
29.18

S - δ Cancri S. obs.

17.3
45.6
δ 35 195.6 34.5
230.1
48 86
2443
122.15

28.3
628
314
15.70

48 86
2443
122.15

28.3
34.5
28
3140
15.70

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1879phae.proj..481S

May 9, 1879.

δ Cancri, δ Cancri P. obs.

8 42

14.6 31.6
46.2
195.3 30.7
226.0 2 3
4821 31.15
24105 15.58
12052

~~8~~ 31.6
30.7
2 3
31.15
10.58

4821
24105
12052

Star δ Cancri P. obs.

8 45

359.4 66.6
66.0
174.8 71.4
246.2 138 0
8464 69.0
4232 ~~#~~ 34.5
21160

66.6
71.4
138 0
69.0
34.50

8464
4232
21160

e

8 50

352.8 68.9
61.7
184.2 62.1
246.3 11.0
8450 6 5 5
4225 32.75
211.250

e S. obs.

68.9
62.1
11 0
6 5 5
32.75

8450
42250
211.25

S

8 53

20.2 23.3
43.5
200.7 30.5
231.2 53.8
4956 26.90
24780 13.45
12390

S. obs.

23.3
~~30~~ 5
53 8
26 90
13.45

4956
24780
12390

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1879phae.proj.:481S

May 9, 1879.

δ Cancri, δ Cancri

19.3 23.9
43.2
8 58 199.7 25.5
225.2 9 4
4874 2470
2437 12.35
12185

δ Cancri, δ Cancri U. obs.

23.9
25.5
49 4
2470
12.35
4874
2437
12185

Star e, δ Cancri

186.8 48.0
234.8
9 2 2.5 47.9
50.41 15.9
4745 47.95
23725 23.98
118.62

Star e, δ Cancri U. obs.

} Not the star

~~0.5~~
5.2 51.3
56.5
9 9 187.6 49.0
236.6 03
4859 50.15
24295 25.08
121.48

δ Cancri, δ Cancri U. obs.

51.3
49.0
1003
50.15
25.08
4859
24295
121.48

21.8
43.5 21.7
9 12 201.4 25.2
226.6 69
4933 2345
24665 11.72
123.32

U. obs.

21.7
25.2
469
2345
11.72
4933
24665
123.32

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1879phae.proj..481S

May 9, 1879.

Star ε, S Canis U. Ma.

	5.2	57.8			57.8
	63.0				
9 20	184.3	60.5		4973	60.5
	244.8			24865	118 3
	4973	118.3			59 15
	24865	59.15		124.32	29.58
	124.32	29.58			

Photometer I; aperture 12.7 ems.
ε Canis the brightest star which can be reached with the prism. This is not bright enough for comparison with S Canis!
S. & U.

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1879phae.proj.:481S

May 10, 1879. Photometer K.

Focus/inion 403 Eye-piece ⟵ 2.6 cms ⟶

2 Hrs. Min.

S. obs.

	31.5	3.0^		3.0
	34.5		4905	3.1
δ 38	210.7	3.1^	245.25	3.05
	213.8		122.62	~~1.58~~ 1.52
	4905^	3.05^		
	24525^	1.52^		
	122.62^			

P. obs.

	31.1	3.7^		
	34.8		4906	3.7
δ 45	210.4		24530	3.9
	214.3	3.9^	122.65	3.8
	4906^	16^		1.90
	24530^	3.80^		
	122.65^	1.90^		

DM 88° 4

	20.0	25.1^		25.1
	45.1		4903	26.0
δ 48	199.6	26.0^	24515	11.1
	225.6		122.58	2.555
	4903^	11.1^		12.78
	24515^	2.555^		
	122.58^	12.78^		

P. obs.

	22.8	22.5^	225	S. obs.
	45.3		205	
δ ~~49~~ 51	202.2	205^	30	
	222.7	30^	215	Star near edge
	4930^	215^	10.75	of field.
	4925^	10.75^	4930	
	123.25^		4925	
			123.25	

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1879phae.proj..481S

May 10, 1879

DM 88° 9

8 55

13.2
51.5 38.3^
186.2 50.0^
236.2 8 8 3^
4 8 7 1^ 4 4 1 5^
24 3 5 5^ 22.08^
12 1.78^

P. ob.

38.3
4871 50.0
24355 8 8 3
12178 4415
22.08

8 57

10.8
50.2 39.4^
195.7 30.4^
226.1 6 9.8^
4 8 2 8^ 3 4 9 0^
2 4 1 4^ 17.45^
1 2 0.70^

S ob

39.4
4828 30.4
2414 6 9 8
12070 3490
17.45

DM 89° 3

9 03

331.6 101.8^
73.4
172.8 88.4^
261.2 190.2^
8 3 9 0^ 95 1^
4 1 9 5^ 47.55^
2 0 9.75^

S. ob.

101.8
8390 88,4
4195 1902
20975 9510
47,55 thick haze coming up

342.9 104.4^
87.3
166.2 99.5^
265.7 20 3 9^
8 6 2 1^ 181.95^
4 3 1 0 5^ 50.98^
2 1 5 5 2^
215.52

P. ob.

104.4 from
8621 99.5 west
43105 2039
21552 10195
5098

1879phae.proj.,481S

May 10, 1879.

α − α

9 12

30.4
34.6 4.2^

208.0 ~~too~~ very bright

208.4 4.7^

213.1 8.9^

4865 4.5^

24325 2.22^

~~121.82~~

121.62^

thick haze; images faint

4865 4.2
24325 4.7
4.45
2.22

P. Sta.

9 15

209.9
214.1 4.2^

30.8
35.4 4.6^

4902 8.8^

24510 4.4^

122.55 2.2^

Images very faint.

4902 4.2
24510 4.6
4.4
2.20

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1879phae.proj..481S

May 10, 1879.

Rand ~~256~~ 236 B. 2. 7.

16 53 7 = 13 38 0.0

16 55 7 = 13 40 0.0

Mean time of transit 11h 19h 25m

11 13 46

5h 37m

Jupiter IV

14	34		14	10	40
14	41	50		23	41
	23	41	14	34	21
15	5	31			

Camb. M. J.

h	m	s					
14	22	18	17h	37m	47s	15.6	P. 065.
					~~15.6~~		
14	22	54	17h	38m	23s(?)	25	0.7
14	24	35	17h	40m	5s		Sat. gone in small telescope
	25	14	17h	~~35~~ 40m	44s		" seen very faintly in large tel. with minor sy. piece
	25	55	17h	41m	25s		Sat. still seen,
	26	26	17h	41	56s		Sat. suspected,
	26	46	17h	42m	16s		Do.
	26	59	17h	42m	29s		Certainly seen.
	27	22	17h	42m	52s		
	27	50	17h	43m	20s		Suspected,
	28	18	17h	43	48s		

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1879phae.proj..481S

June 10, 1879.

Images in photometer H so faint that it was replaced by No. 4, my micrometer eyepiece.

χ Cygni only slightly brighter than α
.1 mag. P. and W. Ds.

i x β

Photometer I.

Jupiter 1.

18h 5m 46s 3.43
2.09.
2.84.
2.55.
2.84.
37 5
2.7 5 0

14h 57m 13s HH I

Limit of Visibility.

1d 6 3r .54.
.60.
.49.
.49.
.34.
24 6
.49 2

24 6
.49 2

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1879phae.proj..481S

	18h	9m	47s	2.69.	
54 40	18	10	1.	2.60.	
1H 55	18	10	18 15.4	2.27.	
	18	10	29	2.43.	226 2.452
		10	42	2.27	
		10	55	2.17	
14 56 1		11	14	2.32	
		11	39 35.8	2.28	
		11	58	2.27	
		12	10	2.11	115 2.230
		12	27	2.49	
		12	54	2.28	
14 58 30		13	5 4.6	2.60	
		13	19	2.46	
		13	38	2.45	228 2.456
14 59 22		14	26	2.81	
1500		14	42	2.27	
		14	56 57.8	2.53	
		15	12	2.52	
		15	33	2.30	243 2.486
		15	48	2.31	
		16	2	2.44	
15 02 47		16	25 21.6	2.32	
		16	36	2.54	
		16	55	2.53	247 2.494
		17	18	2.42	
		17	40	2.87	
15 04 22		18	2 57.4	2.64	
	18	18	16	2.41	

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1879phae.proj..481S

Comb. M.T. h
15

m	s	h	m	s		
	1	18	31		2.6.0.	301 = 2.60.2
3	311	18	47		2.13.	
3	26	19	2		2.03.	
3	38	19	14		2.07.	
3	51	19	27		2.60.	
4	03	19	39		1.96.	
4	16	19	52		2.08.	
4	34	20	10		1.99.	
4	48	20	24		1.85.	
5	01	20	38		1.52.	< Edge of Jupiter just out of field
5	16	20	53		1.20.	
5	27	21	4		1.06.	
5	38	21	15		1.22.	
5	48	21	25		.76.	
5	55	~~21~~	~~32~~		Seen	
6	06	21	43		Suspected.	

14 41 51
23 41
5 31

Comparison of Chromo * ~~824~~ 236.

18h 34m 23.5 Sid. t.
35 23.5 = 15h 20m 44.5 M.T.
44 24 24
18 45 25 15 30 0

S.T. B.M.T. h C.M.T.
18 35 23.5 = 15 20 = 15 19 44.5
18 48 47
16 36

35 23.5

35 23.5
19 44.5
15 38 23.5 } 15 39 0
32 23.5 }
32 23.5 } 15 38.0
26 23.5 }
26 23.5 } 15 37.0
20 23.5 }
20 23.5 } 15 36.0
18 14 23.5

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1879phae.proj..481S

May 14, 1879.
Phot. K

	α − α	Nos. Nos.	N − obs	
8 34	29.8	6		6.6
	36.4	6.8	4877	4.5
	208.5		24385	11.1
	213.0	4.5	121.92	5.55
	4877	11		2.78
	24385	5.55		
	121.92	2.82 2.78		

	88 9 − α		N − obs	
8 44	359.3			59.8
	59.1	59.8	8415	65.9
	178.6		42075	12.57
	244.5	65.9	210.38	6.285
	8415	57		31.42
	42075	6.285		
	210.38	31.42		

	89.3? − α		N − obs	
8 49	10.8			54.3
	65.1	54.3	5006	71.3
	176.7		25030	12.56
	248.0	71.3	125.15	6.280
	5006	125.6		31.40
	25030	6.280		
	125.15	31.40		

Photometer slips out of position in tube and readjusted; obliged to alter focus.

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1879phae.proj..481S

May 14, 1879.

88, 4 — α

9 7

19.6
44.3 24.7^
194.0
223.6 29.6^
4815^ 143^
24075^ 2715^
120.38^ 13,58^

U. obs.

4815
24075
120.38

24.7
29 6
543
27.15
13,58

α — α

9 13

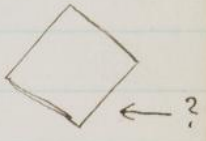
29.0
34.7 5.7^
208.3
212.7 4.4^
4847^ 1
24235^ 505^
121.18^ 2,52^

U. obs.

4847
24235
121.18

5.7
4.4
1
505
2.52

U searches for (185) Eunike with chronograft. Having found it compares by eye & ear with DM. 13, 3091. Chron.



(185)	~~3091~~			(185) ~~Eunike~~	3091		
18	38	22.8	49.7	18	41	35.2	1.7
	44	7.7	33.2		47	19.5	lost [45.5]
	48	45.9	11.8		51	58.2	24.2
	54	29.2	58.7		57	41.5	7.8

Chron. $19^h\ 6^m\ 4.7^s$ = Bmd. 394 $\frac{3}{15}$ $3^h\ 5^m\ 0^s$

Reduced on p. 57

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1879phae.proj..481S

May 15, 1879

Comparison Stars for R Virginis - Phot. K
Rule 1.2 Pinion 3.91
δ - δ Virginis

δ 30

30.2 5.1
35.3
210.6 3.9
214.5
8 9 0 6 9 0
4 4 5 3 4 5
2 2 2.6 5 2.25

P. obs.

29.1 7.0
35.1
δ 35 210.1 4.2
214.3
4 8 9 6 11 2
2 4 4 8 5 6
1 2 2.4 0 2.80

S. obs.

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1879phae.proj..481S

May 16, 1879

Photometer K

Pinion 400 Eye-piece 185

α Urs. Min.

30.5
3.7^
34.2

9 29 208.8 3.6^ Dome probably interfered somewhat.
212.4
485 9^ 3.65^
2429 5^
121.48^ 1.82^

α Urs. Min. Repeated after moving dome.

30.3
4.0^
34.3

9 34 209.2 3.7^
212.9
4867^ 77^
2435^ 385^
121.68^ 19.2^

δ Urs. Min.

24.6
15.4^
40.0

9 53 206.0 9.9^
215.9
4865^ 253^
2432 5^ 1265^
121.62^ 6.32^

27.3
9.7^
37.0

9 58 205.1 10.3^
215.4 0
4848^
2424^ 5.60^
121.20^

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1879phae.proj..481S

May 16, 1879

λ Urs. Min. I. obs.

19.3 27.7^
47.0
10 16 193.3 30.0^
223.3 57.7^
48 29^ 28.85^
241 45^ 14.42^
120.72^

482.9	27.7	
241.45	30.0	
120.72	57.7	
	~~19.23~~	
	28.85	
	14.42	

51 Cephei I. obs.

24.0 18.3^
42.3
10 30 198.5 20.0^
218.5 38.3^
4833^ ~~5 8 4 3~~ 1915^
24165^ ~~2 6 9 15~~ 9.58^
120.82^ ~~1 3 5.58~~

4833	18.3	
24165	20.0	
120.82	383	
	19.15	
	9.58	

DM 88° 4 I. obs.

22.4 16.9^
39.3
10 50 196.0 24.6^
220.6 415^
4783^ 2075^
23915^ 10.38^
119.58^

4783	16.9	
23915	~~24.6~~	
119.58	415	
	2075	
	~~10.38~~	

DM. 88° 9 I. obs.

15.0 34.6^
49.6
11 0 178.8 52.8^
231.6 874^
4750^ 437^
23750^ 21.85^
11875^ ~~8 7 4~~

Passing clouds.

4750	34.6	
23750	52.8	
11875	874	
	4370	
	21.85	

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1879phae.proj..481S

DM. 88° 9 Repeated,

9.4 39.0^ 1 obs.
48.4 Passing clouds.

11 8 185.8 51.8^ 39.0
237.6 90.8^ 4812 51.8
4812^ 45.4^ 2406 90.8
2406^ 22.70^ 120.30 4540
120.30^ 22.70

2 Hrs. Min, 1 obs.

29.5 2.7^
11 16 32.2 Clouds continue
207.7 troublesome. 2.7
210.8 3.1^ 4802 3.1
4802^ 5.8^ 24010 5.8
24010^ 2.9^ 120.05 2.9
120.05^ 1.45^ 1.45

Seeing 6, 7, 5.

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1879phae.proj..481S

May 20, 1879. Photometer K.

Focussing pinion 398 Eyepiece 1.4 cms.

α Ursæ Min.

	29.7	3.5	
	33.2		
8 37	208.4		
	211.3	2.9	
	4826	4	
	2413	32	
	120.65	1.60	

δ Ursæ Min. 88° 9

	15.0	
		30.0
	45.0	
	184.9	40.2
8 48	2251	
	4700	351
	2350	17.55
	1175	

δ. obs. Wrong stars; reject

δ. obs.

α Ursæ Min.

	29.0	5.0^
	34.0	
9 0	206.2	
	212.3	6.1^
	4815^	111^
	24075^	555^
	120.38^	2.78^

δ. obs.

5.0	
6.1	
11.1	
555	
2.78	

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1879phae.proj - 481S

May 20, 1879

Focus finion 402 Eyepiece 1.7 cms.

	29.1	2 Urs. Min.	5 obs.	5.3
	34.4	5.3	4821	4.6
9	15	207.0	24105	9 9
		4.6	120.52	495
	211.6	9 9		248
	4821	495		
	24105	248		
	120.52			

Readings of the last set taken at intervals through clouds, which may have been coming on during previous set, in which, however, there was no difficulty in seeing the images. The change of focus was made to obtain a better focus for 2 Urs. Min., but this does not seem to change the readings materially.

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1879phae.proj..481S

May 21, 1879.

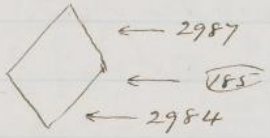
Cloudy till after ten.

W. U. observed (185) Eunike, comparing with DM 14, 2984 and 2987

Record made on chronograph with Bmd 312.

Compared with Mean time Bmd 394.

Order 2984, 2987, 2984_2 2987_2 (185), $(185)_2$



6hmm. record.

Minutes of R.A. arbitrary.

2984		2987		(185)		Mean times corresp. to (185) times	
1	~~44.8~~ 46.8	1	~~49.1~~ 51.1	2	57.2	11 13	27.0
1	59.1	2	30.5	3	41.1	14	10.5
4	10.3	4	14.5	5	23.0	15	52.0
4	24.7	4	56.3	6	7.3	16	36.5
6	32.8	6	37.3	7	45.2	18	14.0
	46.9	7	19.0	8	29.5		58.0
9	1.7	9	5.9	10	14.0	20	42.0
	15.7		47.6		58.1	21	26.0
11	45.4	11	49.0	12	57.9	23	25.5
	59.0	12	31.2		41.3	24	9.0
13	59.2	14	3.0	15	11.7	25	39.0
14	13.5		45.1		55.7	26	23.0

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1879phae.proj.:481S

Reduction in R.A.

Mean time	2984	2987	(185)	2984 − (185)	2987 − (185)
h m s	m s	m s			
11 13 48.8	1 51.95	2 9.80	3 19.15	−1 27.20	−1 9.35
16 ~~4~~4.2	4 17.50	4 35.40	5 45.15	27.65	9.75
18 36.0	6 39.85	6 58.15	8 7.35	27.50	9.20
21 4.0	9 8.70	9 26.75	10 36.05	27.35	9.30
23 47.2	11 52.20	12 10.10	13 ~~1~~9.60	27.40	9.50
26 1.0	14 6.35	14 24.05	15 33.70	27.35	9.65
11 19 55.3				−1 27.41	−1 9.46

Reduction in Dec.

2984	2987	(185)	(185) − 2984	(185) + 2987
14.3	41.4	43.9	29.6	85.3
14.4	41.8	44.3	29.9	86.1
14.1	41.7	44.3	30.2	86.0
14.0	41.7	44.1	30.1	85.8
13.6	42.2	43.4	29.8	85.6
14.3	42.1	44.0	29.7	86.1
14.12	41.82	44.00	~~30.05~~	2 | 85.82
			2 | 29.88	
			14.94	42.91
			.97	.97
			1449	41.62
			724	2081
			217.3	24
				6179.3
			−3′ 37.″3	889.8
				45
				270.5
				+4′ 30.″5
				25

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1879phae.proj..481S

May 22, 1879 s.

Photometer K.

Focus/union 408 Eyepiece 1.95 cms.

2 Urs. Min.

29.9 2.1^ 1. obs.

32.0

δ 25

209.4 2.1^

211.5

48 28^ 2.1^

2414^ 1.05^

120.70^

DM 88° 9

10.3 50.9^ 1. obs.

61.2

δ 30

187.1 48.9^

236.0

494 6^ 99.8^

247 3^ 49.90^

123.65^ 24.95^

DM. 88° 4

23.1 17.1^ 1. obs.

40.2

δ 41

197.0 25.0^

222.0

482 3^ 421^

241 15^ 2105^

120.58^ 10.52^

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1879phae.proj.:481S

May 22 1879

δ Urs. Min. S. obs.

25.2 10.0^
35.2

8 54 200.3 14.9^
215.2
475 9^ 24 9^
2 3 7 9 5^ 1 2.4 5^
1 1 8.9 8^ 6.2 2^

9 15 λ Urs. Min. S. obs.

3.0 49.1^
52.1

195.0 33 2^
228.2 8 2 3^
4 7 8 3^ 4 1 1 5^
2 3 9 1 5^ 20.58^
1 19.58^

Star & reflected image identified by P. who thought last setting too bright; S. looked again, but found it satisfactory.

9 26 24 3 12.0^ 51 Cephei
36.3 S. obs.

201.7 14.2^
215.9
478 2^ 13.1^
2 3 9 1^ 6.55^
1 19.55^

342.4 81.0^ DM. 89°.3
65.4 S. obs.

9 37 170.3 86.9^
257.2
8 3 7 3^ 16 7.9^
4 1 8 6 5^ 8 3.9 5^
2 0 9.3 2^ 41.98^

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1879phae.proj..481S

May 22 1879.

α − α Circle Minutes

S. obs.

9 42

30.2
32.3 2.1^
208.6
211.3 2.7^
4824^ 8^
2412^ 2.4^
1 20.60^ 2.20^

Photometer Q with direct vision prism inserted in end of its tube nearest object-glass.

Ring nebula in Lyra. (G.C. 4447)

The form of the nebula remains substantially unchanged, but there is a faint light extending from all parts of it in two opposite directions. P. set the nebula so that no stars were in the field, and turned the instrument from its previous position; S. then estimated the direction of the elongation of the fainter light, and afterwards moved the telescope so as to bring some stars into the field, when it appeared that the elongations of the faint light and of the stars had the same direction.

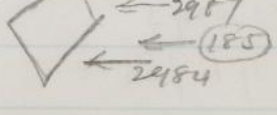
Gaseous with faint continuous spectrum. Am. Eff.

10 30

U. obs. (185) + Eumika, compared with Dm 14.2984 + 2987

6 sets taken.

Seeing poor.



Order 2984, 2987, 2984, 185, 2987, 185

Obsn. record on p. 58.

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1879phae.proj.:.481S

May 23, 1879.

Photometer Q with prism as yesterday.
Nebula G.C. 2102. S. obs.
More distorted than the ring nebula was,
but on the whole retaining its shape.
Very much less distorted than the star
south of it.

M. C.

Reduction of observations of Lunike (185) made on May 14, v. p. 45.

R.A.

(185) ~~3091~~		~~(185)~~ 3091	(185) − 3091		Red. in time
18 38 36.25	41	48.45	∓3m 12.20		19 6 4.7
44 20.45	47	32.65	12.20		18 49 51.7
48 58.85	52	11.20	12.35	Int	16 13.0
54 42.45	57	54.65	12.20	Corr.	−2.7
	49	51.7	∓3 12.24	Mean Int	16 10.3
				Mean	15 35 0.
		Dec.		Mean Cand.t	15 18 50.

~~(185) 3091~~	3091 ~~(185)~~	(185) − 3091
26.9	26.5	+0.4
25.5	26.3	[∓0.8]
25.9	26.0	∓0.1
26.5	26.3	+0.2
		2|∓0.08
		∓0.04

2 | +.12
+ .06
3

Δδ (185) − 3091 = +0".6 or = −0".9 ; rej. incomplete obs.

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1879phae.proj..481S

record
Chronograph ^ of observations
of (185) Eunike, made May 22, 1879. v. p. 56
Prod. 1327

		2984		2987		(185)	
14	37	—	37	21.6	37	48.5
		31.5		59.3 ~~48.5~~	38	15.2
	38	34.8	38	42.2	39	9.5
		52.3	39	20.4		36.0
	39	58.0	40	5.0	40	32.8
	40	15.0		43.8		58.4
	41	13.2	41	20.0	41	48.0
		29.8		59.0	42	13.7
	42	27.2		—	43	1.4
		43.6		—		27.5
	43	39.0	43	44.8	44	13.5
		54.5	44	24.6		37.9

1327 / Cor. S.T. Noon Int Cor. M.T.

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1879phae.proj..481S

Reduction in R.A.

h	2984 m	2984 s	2987 m	2987 s	(185) m	(185) s	2984 − (185) s	2987 − (185) s
14		—	37	40.45	38	1.85	—	− 21.40
14	38	43.55	39	1.30	39	22.75	− 39.20	21.45
	40	6.50	40	24.40	40	45.60	39.10	21.20
	41	21.50	41	39.95	42	0.85	39.35	20.90
	42	35.40		—	43	14.45	39.05	—
	43	46.75	44	4.75	44	25.70	38.95	20.95
~~14~~	~~41~~	~~18.7~~	~~40~~	~~34.1~~	14	41 18.5	− 39.13	− 21.18

Red. in t.

1927	14	41	18.5
Corr.			−37.0
S.T.	14	40	41.5
Noon	3	59	44.7
Put	10	40	56.8
Corr.		1	45.0
M.T.	10	39	12

Reduction in Dec.

	2984 s	2987 s	(185) s	(185) − 2984 s	(185) + 2987 s
	—	37.7	26.7	—	64.4
	17.5	38.2	26.5	9.0	64.7
	17.0	38.8	25.6	8.6	64.4
	16.6	39.0	25.7	9.1	64.7
	16.4	—	26.1	9.7	—
	15.5	39.8	24.4	8.9	64.2
	16.60	38.70	25.83	2 | 19.08	2 | 64.48
				4.53	32.24
				.97	.97
				4.39	31.27
				274	1564
				68.9	469.1
				1′	85.8
				− 1′ 10.9	420.7
				5	+ 7 0″.7

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1879phae.proj..481S

May 24, 1879.

Photometer Q with prism as on May 22 & 23.

Nebula G.C. 2102. P.obs.
Little if any distortion; not more than with the ring nebulæ. Bh.

Nebula G.C. 3258. P.&S.obs.
Elongated; no evidence of any gaseous spectrum. C

Nebula G.C. 3305

48 9.1	48 6 32	41°.7	Diff. of α & δ used in finding A.
44 17.2	42 43 7	5.4	
3m 52s	5° 23' 25"	47.1	
	5°.4		

P.&S.obs.
Doubtful, perhaps owing to difference of powers of plain and prismatic eye-pieces. Doubtful

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1879phae.proj..481S

May 26, 1879.

Clear Photometer K.

9 10 δ Cancri – δ Cancri, 5 obs.

19.8 22.2
42.0
197.9 26.3
224.2 85
48 39 24.25
24 195 12.12
120.98

Intermediate star not seen

Star e – δ Cancri. 5 obs.

9 15 358.6 62.7
61.3
179.4 61.1
240.5 38
8398 6190
41990 30.95
209.95

357.4 65.8 P. obs.
9 21 63.2
179.1 57.5
236.6 1233
8363 6165
41315 30.82
209.08

δ Cancri, δ Cancri P. obs.

15.0 28.0
43.0
9 28 197.1 29.8
226.9 47.8
48 20 2590
2410 14.40
120.50

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1879phae.proj..481S

May 26, 1879

At 9 40 P tried to get another nt but could not see S Comes ang[le] large.

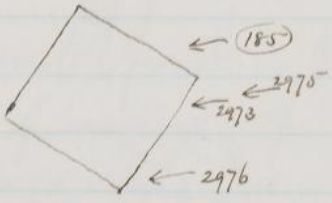
10 15 U observes (185) Ennike, comparing with DM 14, 2973 a, 75 b, 76 a (transit over square inclined 45°

Order a_1 b_1 a_2 Pl.$_1$, c_1 c_2 b_2 Pl.$_2$

Rej. first two obs too. square inclined 35° instead of 45°.

Mag. estimated U. 11.5

W.A.R. 11.0 or 2 right 11.



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1879phae.proj..481S

Chron. record

	2973	2975	2976	(185)
14	39 59.6	40 35.4	—	40 56.6
	40 42.2	41 22.0	—	41 26.2
	41 45.3	42 21.2	42 43.1	42 41.7
	42 27.8	43 7.6	11.8	43 11.9
	43 29.0	44 4.7	44 26.9	44 25.2
	44 11.4	51.3	33.3	56.0
	45 14.2	45 50.1	46 12.0	46 10.0
	[56.5]	36.3	18.5	40.8
	47 5.4	47 41.2	48 3.1	48 0.9
	47.5	27.4	9.7	32.0
	48 45.0	49 20.9	49 42.9	49 40.6
	27.0	50 6.9	49.2	50 11.7
	50 25.0	51 0.9	51 23.1	51 20.6
	51 7.1	46.9	29.3	51.8
	52 11.9	52 47.9	53 9.9	53 7.1
	54.0	53 33.9	16.5	38.7

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1879phae.proj..481S

Reduction in R.A.

	2973	2975	2976	(185)	(185)-2973	(185)-2975	(185)-2976
	h m s	m s	m s	m s	s	s	s
	14 40 20.90	40 58.70	—	41 10.90	+50.00	+12.20	—
	42 6.55	42 44.40	42 46.45	42 56.80	50.25	.40	+10.35
	43 50.20	44 28.00	44 30.10	44 40.60	50.40	.60	.50
	45 38.35	46 13.20	46 15.25	46 25.40	50.05	.20	.15
	47 26.45	47 34.30	48 6.40	48 16.45	50.00	.15	.05
	49 6.00	49 43.90	49 46.05	49 56.15	50.15	.25	.10
	50 46.05	51 23.90	51 26.20	51 36.20	50.15	.30	10.00
	52 32.95	53 ~~40~~.90	53 13.20	53 22.90	+49.95	.00	9.70
1927	14 47 18.2			14 47 18.2	+50.12	+12.26	+10.12
Corr.	-40.6						
S.T.	14 46 37.6						

Reduction in Dec.

		a	b	c	(185)	a+R	b+R	c+R
Sun	4 15 30.9	2973	2975	2976				
S. Rat	10 31 6.7	s 42.6	s 46.6	~~6.7~~	s 30.6	s 73.2	s 77.2	—
Corr.	-1 43.4	.5	.4	6.7	30.2	72.7	76.6	36.9
M.T.	10 29 23	.4	.6	.4	30.8	73.2	77.4	37.2
		.3	.2	.5	30.8	73.1	77.0	37.3
		.1	.2	.6	31.1	73.2	77.3	37.7
		.0	.0	.3	31.1	73.1	77.1	37.4
		.1	.0	.2	31.2	73.3	77.2	37.4
		.1	.0	.6	31.6	73.7	77.6	38.2
		42.26	46.25	6.47	30.92	2) 73.18	77.18	37.44
						36.59	38.59	18.72
						.968	.968	.968
						35.43	37.36	18.12
						1772	1868	906
						531.5	5604	271.8
						889.8	889.8	889.8
						358.3	329.4	618.0
						5′ 58.″3	5′ 29.″4	10′ 18.″0



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1879phae.proj..481S

May 28, 1879. Photometer K

Focus pinion 402 Eyepiece 1.95 cms.

α Urs. Min.

	29.7	2,3^	S. obs.
	32.0		
9 21	208.7	3.1^	
	211,8		
	48 2 2^	5 4^	
	24 1 1^	2 7^	
	120.55^	1.35^	
	29,3	2.9^	P. obs.
	32,2		
9 25	208,4	2,9^	
	211,3		Meridian clear.
	48 1 2^		
	240 60^	2.9^	
	120.30^	1.45^	

Dll 89° 3

	347.6		P. obs.
	83.0	95.4^	
9 37	162.7		
	255,40	92.3^	
	8 48 3^	18 7 7^	
	4 24 15^	9 38 5^	
	2 12.08^	4 6.92^	
	352,1	79.9^	Schr.
9 38	72.0		
	~~159~~	too bright myself	
	162.9	94.0^	
	256.9		
	8 4 3 9^	17 3 9^	
	4 2 19 5^	8 6 9 5^	
	2 10.98^	4 3.48^	

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May 28, 1879

δ Urs. Min. P. obs.

26,4 8.8^
35.2

9 52 205.3 7.1^

212.21
4793^ 159^
23965^ 795^
11982^ 398^

2 Urs. Min. S. obs

17.2 25.5^
42.7

9 58 199.2 26.3^
225.5
4846^ 518^
25900^
2423^
12115^ 12.95^

15.4 30.8^ P. obs.
46.2

10 3 195.3 32.4^
227.7
4846^ 632^
2423^ 316^
12115^ 15.80^

51 Cephei

204.1 13.1^ P. obs.
217.2

10 9 20.8 16.5^
37.3
4794^ 296^
2397^ 148^
11985^ 7.4^

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1879phae.proj..481S

May 28, 1879

α Ursae Min. – α

Sols.

29.2
31.5 2.3"

10 15 207.9
210.4 2.5"

4790"
2395" 2.4"
1197.5" 1.2"

29.0
31.6 2.6" P. Obs.

10 18 208.2
210.6 2.4"

4794"
2397" 2.5"
1198.5" 1.25"

seeing 6 6 5 P.
5 7 5 S.

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1879phae.proj..481S

May 29, 1879.

Photometer Q (without direct-vision prism). Images will not come to focus in small telescope. At reading 0, Polaris can be seen, but indistinctly.

Comparison of α Ursæ Min. at reading 0 in small telescope and DM. 88° 9 in large telescope.

Focus of large telescope	
368.8	S. obs.
377.2	
366.7	

Observations discontinued for adjustment of object-glass of small telescope.

Focus of small telescope on α Ursæ Min.

9 25

14.6	P. obs.
15.3	
14.8	
14.9	

Focus of large telescope on DM 88° 9.

9 28

362.8	P. obs.
361.3	
361.4	
361.8	

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1879phae.proj..481S

May 29 1879

Large telescope set at 411.8
Readings of small telescope.
Too bright for satisfactory settings

9	33	12.4	17.5	P. obs.		
		11.8	17.0			
		12.0	17.7			
		12.1	17.4	29.5	14.75	5.3

Large telescope set at 311.8

9	35	12.6	16.9	P. obs.		
		12.1	17.1			
		11.9	16.8			
		12.0	16.9	28.9	14.45	4.9

Large telescope set at 261.8

9	38	10.3	18.7	P. obs.		
		10.3	18.4			
		9.7	18.8			
		10.1	18.6	28.7	14.35	8.5

Large telescope set at 211.8

9	41	8.1	20.4	P. obs.		
		9.4	20.0			
		9.3	19.4			
		8.9	19.9	28.8	14.40	11.0

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1879phae.proj..481S

May 29, 1879.

Large telescope set at 161.8

9 45

8.3	21.2	Pl. obs.
7.7	21.1	
6.7	21.4	
7.6	21.2	28.8 1440 13.6

Large Telescope set at 111.8

9 49

5.4	22.2	Pl. obs.
5.8	22.6	
4.7	23.1	
5.3	22.6	27.9 1395 17.3

Sobs from large telescope.

9 (53)

371.0	-3.7
369	+2.2
376.1	+1.6
370	
140	
374.7	

from small telescope Sobs

9 (54)

13.6
13.7
14.1
13.8

53				
49	36	36	35	+1 4
85	36	7.2	70	+15
11.0	25	10.8	105	+5
13.6	26	14.4	140	-4
17.3	37	180	175	-2

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May 29. 1879

	Sol at	4247	Sols			
9 57	11.6	15.9				
	18.3	16.4				
	11.2	16.0				
	11.4	16.1	27.5	13.75	4.7	~~2.35~~
10 2	Sol at	3247				
	12.6	15.3				
	11.6	16.0				
	11.9	16.0				
	11.0	15.8	26.5	13.40	4.8	
10 5	Sol at	2747				
	10.2	17.1				
	10.6	17.0				
	10.3	17.3				
	10.4	17.1	27.5	13.75	6.7	
10 8	Sol at	2247				
	8.0	19.5				
	8.1	19.6				
	7.7	19.5				
	7.9	19.5	27.4	13.70	11.6	
10 (12)	Sol at	1747				
	6.5	19.9				
	6.0	20.4				
	6.4	19.3				
	6.3	19.9	26.2	13.10	13.6	

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May 29. 1879

Set at 12h 7 Sids

10 15	4.0	22.3			18.3
	4.0	22.4			18.4
a little light	5.5	22.4			
	2.5				
	4.0	22.4	26.4	13.2	18.4

Clouds cloudy around zenith

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1879phae.proj:.481S

May 30 1879.

Focal length of lens. Photometer 2

69.54 Points in contact
70.08 Lens
0.54 cms. Thickness of lens

23.80 Point in contact with wire
Set at 93.80

20.62 Point in contact with wire
Set at 98.62

36.82 1st Position of lens
54.75 2d " " " "
D = 78.00 54.57 2d " " " " better setting than last
37.24 1st " " " "

17.93
17.33 17.63 mean diff

Set at 95.62

49.46	1st	position of lens	49.88
39.32	2d	" "	39.35
D = 75.00 38.32	2d	" "	38.92
29.90	1st	" "	28.53
10.14			10.53
11.62		41.90 / 10.47 mean	9.61

20.65 Point in contact with wire

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May 30, 1879.

$D = u + v = 78.00$ $\quad D' = 75.00$

$d = u - v = 17.63$ $\quad d' = 10.47$

Cor. D $\quad = 77.82$ $\quad 74.82$

$2u = 95.45$ $\quad u = 47.72$ $\quad 2u' = 85.29$ $\quad 42.64$

$2v = 60.19$ $\quad 30.10$ $\quad = 64.35$ $\quad 32.17$

$\frac{1}{u}$ = 20955 $\quad$ .23452

33226 $\quad$ .31085

.54181 $\quad$ .54537

18.46 $\quad$ 18.34

18.4 = focal length

Checked by S. May 31, 1879.

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May 30. 1879.

Bond 394

Bond # 236. $19^h\ 47^m\ 31^s = 15$ $14^m\ 05^s$
$19\ 47\ 31 = 15^h$ $15^m\ 05^s$

Photometer H.

Jupiter II near disappearance compared with Jupiter III.
measure of light.

P. Obs.

93.6

15
4 22 00 ~~3447.4~~ 1674 (2 disappears at 4^h 00^m)
-15 29 346.4 166.4 ~~38~~ 73.8
93.1 75.3
15 06 31 888 25 74.6
-.16 441 25
15 06 15 220.62

~~Limit of visibility~~
measure of light.

P. Obs.

93.6 75.0
15 25 00 168.6
15 29 89.8 80.4
15 09 31 170.2 155.4
15 09 15 5 22.2 77.7
2611 38.85
130.55

77.7

15
2 24 00 measure of light. S. Obs.
15 29 82.4 86.0
15 12 31 168.4
15 12 15 268.4 79.7
348.5 165.1
8681 82.85
43405 41.42 82.8
217.02

1879phae.proj..481S

May 30. 1879.

Measures of light. S. Obs.

15		96.0		
4	30 00	190.0	74.0	
	15 29	269.4	80.6	77.3
15	16 31	350.4	15 46	
15	14 15	8862	77.3	
		4431	38.65	
		221.55		

S. Obs.

15		92.3		
4	31 00	171.7	79.4	
	15 29	272.0	79	
15	15 31	349.9	17 3	78.6
15	15 15	8859	7865	
		442945	39.32	
		221.48		

S. Obs.

15		95.4		
4	32 00	169.2	73.8	
	15 29	274.3	70 9	
15	16 31	346.2	4 7	72.4
15	16 15	8861	72.35	
		443.05	36.18	
		221.52		

S. Obs.

55.1	281.4	20h 8m 40s	34 50	Sid. time.
	336.5	53	35 03	
	342.2	12½	22.5	
54.2	287.0	29.5	39.5	
40.5	328.5	40	50	

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May 30. 1879.

				m	s
44.5	274.0	20	9	51	36 01
43.2	327.2		10	0	10
32.5	294.7			11.5	21.5
				29.5	39.5

Last prob. disappeared 3 secs. previous to last tip.

Limit of Visibility, S. Obs.

119.0	
139.0	20.0
299.5	18.5
318.0	38.5
875.5	19.25
437.75	9.62
218.88	

	h	m	s	
B 394	15	45	0	} Seconds confirmed by
B 236	20	18	36	} next minute

15 11 59.8 M. M. T. Dio.
23 41.1
15 35 40.9 C. M. T. Dio.
-15 29.
15 20 11.9 E. T. Dio.

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1879phae.proj..481S

May 31, 1879.

Photometer Q.

Distance from diaphragm to eye-piece prism.

1st measure 11.62 cms.

5	57.44	58.43	{Mean of 3
6	69.08	70.03	11.62 cms}
2d "	11.64	3d " 11.60	

Prism

1.36 } Mean 1.37
1.38 } Less 1/3 .46 to allow for glass.
0.91

11.62

12.53 cms. total distance from diaphragm to focal plane of eyepiece focussed on the prism.

Achromatic eye-piece focussed on the prism. Distant advertisement (at ~~the~~ Beacon Park) observed through small telescope of Photometer Q. P. obs.

Focus readings. Eye-piece moved and refocussed on prism at each setting

16.1
16.0
16.1
16.3 Total
16.1 = mean

Focus of eyepiece on dust in the same part of the field with advertisement.

6 20

15.7 } focussed on eyepiece (dust and scratches)
15.3 } below advertisement.
15.3

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May 31, 1879.

S.b.

6 30 16.1
16.1
16.1
16.1 = mean

Focussed eye-piece on dust in same part of field with advertisement observed. Care taken to reduce parallax to a very small amount.

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June 4 1879

Mag. power of micrometer eyepiece measured
R.3 Dz

Obj. ½ Eyepiece ¼ power

		2.25	P	200
		2.30	P	209
		3.20	P	291
		3.12		284
¼ Eye	305 ÷ 96			
½ Obj			R	
		3.33	R	303

½ Eyepiece ¼ Obj

.004 = .8		R	200	182
2.06		P	206	187

½ Eyepiece ¼ Obj

.003	1.95	R	617	561
4	2.45	P	612	556

33.92 ¼ Eyepiece ½ Obj

2	195	975	890
3	2.80	933	850

200	291	561	890
209	284	556	850
182	303		
187			
378	878		
194	290	560	870
9			
200	300	560	870

9/34

1 2.8

560 | 194

560
290
5040
112

1624 | 194
840
1552
720

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June 6 1879.

Wash, 11 Jack. Bk. 7

Rhombic Chrysa

5 14 33 - 41

H. Draper on telephone

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Abst. of June 8, 1879

Nebulae from General Catalogue observed for character of spectrum.

Nebula 3846

φ Vdg. R.A. 14 21.7 1.7
22.2 1.7

3848 doubtful. S obs.

9 34 3846 dearly continuous S obs. P. extreme
3845 continuous S obs faint

9 52 Looked for 3850 – 1
found a third neb. 10' N of brightest
and
Compared.

a *

15 14 * b 2nd. 6' 2nd. N.

28.5

	0	27.5	41.5	28.5	7	
	1	9	1 23.8	27.5	3	14.0 3
Corr.				27.5	3	14.8 5
-.5	1	57.8	-2 5.8	28.0	2	14.0 3
	2	33.2	2 47.5	27.4	4	14.3 0
				39		11 11
				27.8±.38		14.3 ±2.7

Transits to determine place of this nebula.

b This nebula, between the stars called a and b, is probably G.C. 3853, in which case this catalogue place is wrong 1m.

*a – 2nd. 3851 * b

0 19.1 41.8 42.1

pair each of * b 2' and less preceding. b brightest

3851 continuous S obs
3850 " also. S obs. mainly or wholly

S. obs. 3855(?) new nebula nearly invis. thought to be less elongated

Note Sept. 24, 1892. In N.G.C. 5576 = G.C. 3851 and 5577 = G.C. 3855
Δα 8s. The nebula taken in the above record for G.C. 3855 is therefore probably correctly identified.

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Transits as before.

15 39 Transits of *a nb and *b

	a			
0	25.6	41.5	25.6	15.7
	7.2	23.2	25.7	16.0
	49.6	5.2	26.4	15.6
	31.9	27.0	26.7	15.1
	14.0	28.4	27.0	14.4
			31 6	26 4
			26.3	15.4

3.8 = diam

1h 31m at 3 15

3°.9

15 46 − 1 31 = 14 15

41.7

27.8	26.3	1.5	
14.3	15.4	1.1	

{G. C. 3855(?) Cent}

Star a Star b.

16h	7m 24.6	52.0	6.5	27.4	13.5
	8 19.0	46.0	0.8	27.0	14.8
	9 29.8	57.3	11.3	27.5	14.3
	10 24.0	51.9	6.0	27.9	14.1
	11 15.8	44.0	58.0	28.2	14.0
				30	17
				27.6	14.3
				41.9	

Description of G.C. 3855(?) S. obs.

Tail rather large and long sp – nf.

direction 250° position angle

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June 9 1879

Watch Mean Sun

Nb. 3851 3855

0 8.7 not seen bright star included about

Probably clock of 1 min in 3855 should be

R.A. 14h 14m 40s. [Catalogue Place wrong 1m; see Dreyer's Supplement to G.C.]

Photometer Q

Nebula G.C. 3851

~~Small telescope 16x~~ } Eyepiece in focus for edge of prism.

Focus small telescope

9 52	13.8	P. obs.
	13.7	
	14.0	
	13.8+	

Central part of nebula compared with a star about 5 magn.

9 54	17.2	P. obs.

Reject. Comparison star lost; ~~star~~ star employed afterwards perhaps a different one.

9 54	17.6	P. obs.
	18.2	
	17.4	τ virginis comp. star
	17.7+	3.9 5.13

Nebula G.C. 3850 Same star

10 2	25.2	P. obs.
	23.5	
	25.3	
	24.7+	10.9 7.54

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1879phae.proj.481S

June 9, 1879.

Nebula thought to be G.C. 3855 (10' n. 89s foll. G.C. 3851). Note Sept. 24, 1892. This is about right by N.G.C.

10 4 36.5 Probs. 9.6 ±
37.4
37.6
37.2+

Compare * = τ Virginis

Set tel B at 13.8 Shs.

10 12 16.0 Neb. 3851
17.3
15.7
16.3+ 2.5 4.0

10 15 Neb. 3850
19.8
18.7
18.6
19.0+
13.5 5.5 5.9
G.C. 3855

10 19 29.0
31.7
29.4
30.1
20.0+
13.8 16.2 8.59 10 38 by watch

Set tel on a comp star 1 54m at 15h 5-2
+2°
RA = 13h 58m

comp star for P τ Virginis
" " " S perhaps 4 Vir.

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June 13, 1879

Clear in Meridian at 14.30

26

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1879phae.proj.,481S

June 17, 1879.

Nebula or cluster dec. +2.5
α about −15h 13m
Prob. G. C. 4083. Spectrum uncertain.
Prob.
Clear in meridian at 9h 35m

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1879phae.proj..481S

June 18. 1879.

Clear at 9 20 except a cloud between Virgo and Leonis

Sgl a ☌ Serpentis

Eclipsed by ☌ Serpentis

" "

G. C. 4173 Spectrum continuous. P. & S. obs.

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1879phae.proj..481S

June 18. 1879.
Eclipse of Jupiter's Satellite.

18d 13 8 26.1
23 41.1

13 32 7.2 C. M. V. Computed.
12 56 (M.V.) = 18 44 18.5 (S.T.
36 7.2 36 13.2

19 20 34.7

B 394
12 54 0
55 0
56 0

B. 235
18 42 17 ×
43 18
44 18.5 adopted.

Comparison of Sat. 1. with Jupiter.

V. 22
4.V 7
4.V 2
V. 13
3.7 6

2320
4.6 40

P. Obs.
V. rad.

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June 18. 1879.

4.2	19h 16m	5.0		P. Obs.
4.20	17	8.0		
3.70		18.5	18	
3.92		47.0	17	
4.09		57.0		
4.40	18	10.0		
3.84		23.5	13 0	
3.52		38.5	19 0	
3.23		52.5	18 38	
3.14	19	5.5		c.m.j.
3.03		18.5	30	25.5
2.71		30.0	~~30~~	38.5
2.90		40.0		50.0
2.34		52.0	31	00.0
2.34	20	3.0		12.0
2.23		13.5		23.0
1.53		24.0		33.5
1.66		37.0		44.0
1.46		47.0		57.0
1.31		55.5	32	07.0
.99	21	4.0		15.5
1.03		13.0		24.0
Seen		21.0		33.0
barely seen		29.0		41.0
.52		35.0		49.0
not seen		43.0		55.0
Suspected. reject		53.5	33	03.0
				reject

Seen ~~7 6~~ 7 5.5

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1879phae.proj..481S

June 18. 1879.

Limit of Visibility. P. Obs.

$19^h\ 23^m$ S. $\sqrt{}$

34^m

.$\sqrt{2}$
.43
.$\sqrt{2}$
.44
.$\sqrt{1}$
$\overline{m\ \ s}$
.48 8

Bond 394 236

13	46	0.0	19	35	27.0
	50	0.0	19	38	27.5

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1879phae.proj..481S

June 19. 1879.

8 obs.

9 30 G.C. 4106 not found with spectroscope.
4118 "
4140 "
9 55 4148 "

Sat on α Serpentis and found circles set accurately; looked for 4148 with ordinary eyepiece. Not found.
[Sky doubtless too bright for nebulae].

10 3 G.C. 4173 Spectrum continuous; no distinct evidence of being gaseous in any part.

10 15 G.C. 4193 Seen with difficulty. Spectrum thought to be continuous.

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1879phae.proj..481S

June 20, 1879.

Nebula G.C. 4083. Spectrum continuous. S. obs.

Nebula G.C. 4093. Seen doubtfully through the prism; spectrum thought to be continuous S. obs.

G.C. 4106. Doubtful. P. obs.

G.C. 4234.

No 4234 —o—

Resembles Uranus. faint extinct Spectrum nebula seen very clearly. Pickering.

Note Sept. 24, 1892. The last remark is assumed to mean that the spectrum was mainly gaseous, with the faint continuous spectrum additional.

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1879phae.proj..481S

June 21, 1879.

25.8 14 35 − 32 14 3

14 54
Looked for 3801

14 5.2 − 4° 4

3801 Stellar, Spectrum continuous S. P

3806 fainter than 3808 S.
Spectrum too faint 3806 S.
" " 3808. ~~Stellar~~ Spectrum continuous S.

15 32
14 13
1 19.

3855 is nearly north of 3851

3845 contin? S
3846 contin S
3850 contin. S.
3851 contin. S.
9 42 3855 not seen

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1879phae.proj.481S

June 21, 1879

10 3 4148 ~~contin~~ S. indistinct. prob. contin
4150 not seen with comm eyepiece

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1879phae.proj..481S

June 23, 1879.

Bolt dropped out of friction roller and could not be replaced, the roller having shifted. Thought most prudent not to use the telescope until the defect has been repaired, for fear of increasing the damage.

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1879phae.proj.:481S

June 24, 1879.

S finds two companions of θ Virginis about equally bright, the more distant one a little brighter.

P finds nearer one blue, more distant one yellow and a little fainter.

S agrees on color.

9 20 G.C. Nebula 3092 not seen S.

30 " 3273 Spectrum continuous

47 " 3397 " " position circle turned so that direction of spectrum was preceding and following.

10 0 " 3900 Spectrum continuous. Bright star in vicinity makes observation uncertain.

Comparison of time-pieces

Chronometer B. 236 $17^h\ 41^m\ 35^s.5$; Clock B. 394 $11^h\ 30^m\ 0^s$

Jupiter II disappears by prediction $12^h\ 37^m\ 24^s.8$ C.M.T.

15.5

12	37	40.3	Both times
11	30	0	
1	7	40.3	
	7	10	gain of B. 236
17	41	35	
18	49	25	by B 236

Predicted time of eclipse

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1879phae.proj..481S

9

June 24 1879

Swift's comet at $18^h\ 23^m$ B 236

$h = 3^h\ 35^m$ $\delta = 67.8$

O. C. W. found comet at about 11th m. s.

Eclipses of Jupiter's Sat. II.

Looked with photometer 1st. and found it could not be used.

Photometer I.

Limit of Visibility.

18^h 40 Sid. T. S. Obs.

1.29
0.67 ← Lowered curtain.
0.56
0.50 4)2.32 Mean omitting 1st reading of 1.29
0.59 .58
3.61
.722

Chron. B. 236

Time.		Read.	S. Obs.
15 42	31	1.64	
	52	1.67	
43	12	1.45	
	39	1.60	2.89
	57.5	1.49	1.578
44	14	1.67	
	41.5	1.23	
	59	1.54	
45	17	1.52	

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1879phae.proj.:4815

June 24. 1879.

		Time	Read	
18h	45	35	1.61	1.61 / 1.522
	46	0	1.19	
		25.5	1.33	
		43.5	1.31	
	47	2	1.49	1.49 / 1.398
		18	1.67	
35	35	37	1.33	
	54.5	56.5	1.25	
36	12	14	1.32	
	27.5	29.5	1.16	
	40	42	0.97	
	58	49 0	1.15	
37	12	14	0.91	
	24	26	1.00	
	36	38	1.15	
	46	48	0.79	
	58.5	50 0.5	0.97	
38	09.5	0 1	0.74	
	21	23	0.90	
	37	39	0.64	
	47	49	0.70	
39	13.5	1 1.5		Thought to be visible. Not seen afterwards.

Seeing 5, 4, 3.

Comparison of time-pieces.

Chronometer B. 236 $18^h\ 56^m\ 47^s.5$ Clock B 394 $12^h\ 45^m\ 0^s$

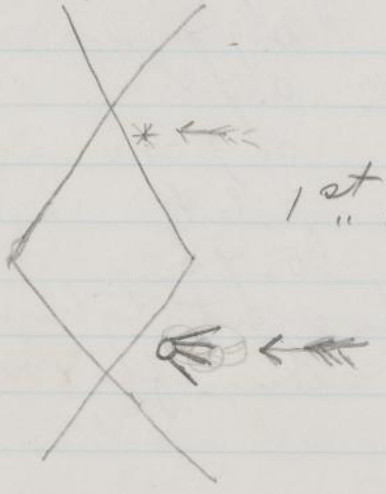
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1879phae.proj.481S

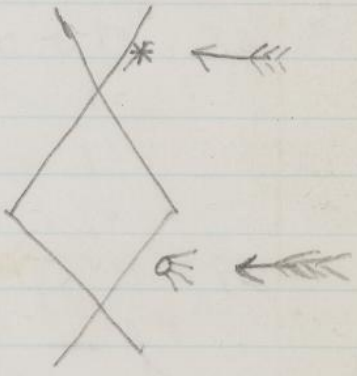
June 24, 1879.
O.C.W. obs.

Star assumed to be DM +67° 234
compared with Swift's Comet.
Reject first taps.
The star has on preceding it 1m 25s and about 21' south of it, which may be DM. +67° 233, but DM. +67° 235 & 236 do not agree well in α; δ apparently correct. The first comes 4s too late, the last about 4s too soon.

Comet north of star & following it.
In first set both objects pass inside the square; taps on the outer edges of the lines (first tap disappearance, second reappearance).
In subsequent sets Comet inside square, star outside; all taps denote disappearances.



1st set.



Foll. sets.

These diagrams merely for description

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1879phae.proj.:.4815

June 25, 1879

8 55 G. C. 2734 not seen S. obs.
9 2 2806 spectrum scarcely seen, apparently continuous.
9 7 2878. Spectrum scarcely seen apparently continuous.

Moonlight too bright for further observations in this region.

Swift's comet,

At 9h 45m mean time, reading of declination circle 68.9, hour circle 1h 7m, approximately.

Examined with prism. S. found spectrum, certainly in part continuous, but probably in part monochromatic. P. thought a monochromatic spectrum appeared but was hindered by clouds from completing the observation.

Night cloudy.

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1879phae.proj.481S

June 26, 1879.

Visitors: Hon. R. C. Winthrop & others.
Exhibited Moon and Venus.

At $10^h\ 0^m$ mean time, Swift's Comet; declination circle 70°.0, hour angle $1^h\ 26^m$ past lower culmination.

At about $17^h\ 4^m$ sid. time, ($10^h\ 45^m$ mean time), Comet follows D.M. 69° 182 $10^m\ 52^s$, and is south of it about 6'.

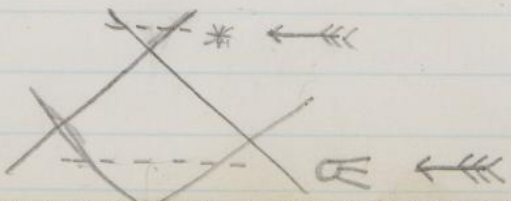
Place of comet by D.M. therefore
$2^h\ 47^m\ 58^s$, 69° 47'.

At about $17^h\ 32^m$ sid. time ($11^h\ 15^m$ mean time), comet precedes D.M. 69° 196 $5^m\ 52^s$ and is north of it 11'.

O.C.Z. Obs.

Place of comet by D.M. therefore
$2^h\ 48^m\ 0^s$, 69° 51'.

Transits by chronograph of Swifts' comet with D.M. 196.
Order ⊏ ⊏ * *
Star runs on bar with Pos. Circ. at 81°.5
Pos. Circ. set at 126°.5
Transits taken in each case at disappearance.



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1879phae.proj.:4815

June 26. 1879.

Six sets of transits by chronograph, — reject third.

At 19h 28m Sid. T. (1h 8m M.T.) comet precedes D. M. 196. 5m 49s by Stop Watch, and is 15' north of it.

Place of comet by D. M. 2h 48m 3s + 69° 54'.7

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1879phae.proj..481S

June 27, 1879.

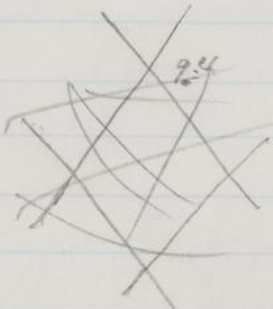
Cleared off about 11^h mean time — Swift's comet precedes DM. +70° 225. at 11^h 45^m.

DM. +70° 222 is much brighter than 9.4, about 8.5. Region well identified.

At 11^h 53^m comet precedes DM. +70° 222 91^s + 10′ (width of square). Decl. of comet nearly same as ~~that~~ of DM. +70° 225;

O. C. W. observes comet with chronograph. Order of taps, Comet Comet DM. +70° 225 DM. +70° 223 DM. +70° 223 DM. +70° 225. All in southern half of square.

Five complete sets, — reject partial set after first complete set.



See note above as to positions in transit.

Transits taken in all cases at disappearance.

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1879phae.proj.4015

June 27. 1879.
Parallax work.
27 obs B + w_2 and # 28 obs B + w_3
– next clear obs B + x_2
Copied into book 53.

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1879phae.proj..481S

Chronograph observations of Swifts Comet.
made June, 24th 1879. v.p. 100

	D.M. Star +67° 233		Comet.	
19h	35m	4.2s		
19	35	49.2	38	38.8
	36	2.2	39	5.0
	41	234	44	7.1
	41	49.7	44	52.1
	45	46.8	48	31.3
	46	12.1	49	11.0
	49	46.5	52	33.5
	50	12.6	53	11.4
	53	46.2	56	36.5
	54	14.5	57	13.2

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1879phae.proj.:4815

Reductions in R. A.

	Star + 67° 233	Comet	233 − comet.	Comet − 233.
19h	41m 36.s5	44m 29.s60	−2 53.05	
	45 59.40	48 51.15	−3 06.90	+ 2m 53.s05
	49 59.55	52 52.45	−2 51.70	
	54 00.35	56 54.85	−3 08.25	+ 2 51.70
		19h 50 47.01 or	−2 52.90	
	+9 47 53.95	50 47.01 X	−3 07.10	+ 2 52.90
			−2 54.50	
			−3 05.50	+ 2 54.50
			−3 06.94	+ 2m 53.04

Reductions in Declination.

Star + 67° 233	Comet	$\frac{\text{Col 1} - \text{Col 2}}{2} \times 15 \cos \text{dec.}$	Diff + Col 3.
26.s3	45.s0	3.9	5.9
25.6	39.7	− 5 4.12	8 3 5.56
26.1	37.9	1.5	8.3
28.3	36.7	− 4 0.81	8 4 9.19
26.58	39.82	3.9	5.9
		− 3 4.15	8 5 5.85
		.2	.6
		− 24.31	8 6 5.69
			+8 51.4

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1879phae.proj..481S

Chronograph observations of Swift's Comet.
made June 26th 1879. V. p. 102.

	Comet		D.M. +69° 196.	
17h	42	2.8	48	44.4
	44	11.2	49	21.0
	50	24.6	57	3.2
	52	26.0	57	40.2
	59	1.2	18 5	30.5
18	0	58.0	6	15.5
	7	28.7	13	56.5
	9	15.1	14	37.5
	16	46.4	23	8.6
	18	25.2	23	51.8
	24	50.0	31	8.0
	26	24.0	31	52.4

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1879phae.proj.,4815

Reduction in R.A.

Comet.		D.M. +69° 196		Comet − D.M. 196.	
17^h 43^m	$7^s.00$	17^h 49^m	$02^s.70$	-5^m	$55^s.71^0$
51	25.30	57	21.70	−5	56.40
18 08	21.90	18 14	17.00	−5	55.11
17	35.80	28	30.20	−5	54.40
25	37.00	31	30.20	−5	53.20
18 05	13.40	18 11	08.37	−5	54.96

Reduction in Declination.

Col. 1. Comet.	Col. 2. D.M. +69° 196.	Col. 3. $\frac{(\text{col. 2})-(\text{col. 1})}{2}$ × 15 cos. dec.	Diagonal + Col. 3.
2^m $08^s.4$	$36^s.7$	−237.3	652.5
2 01.4	37.0	−218.1	671.7
1 46.4	41.0	−169.0	720.8
1 38.8	43.2	−143.6	746.2
1 34.0	44.4	−128.1	761.7
1 49.82	40.46		+710.″6

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1879phae.proj..481S

Chronograph observations of Swift's Comet made June 27 1879 v. p 104

Comet.	DM +70° 225	DM +70° 223
18h 26m 44.0sec	30 41.3	31 16.2
28 38.7	33 08.3	31 49.6
34 22.0		
36 20.4		
37 50.0	41 53.0	42 28.8
39 52.6	44 19.5	42 58.4
45 05.9	49 12.0	49 46.5
47 17.7	51 36.7	50 16.6
52 23.3	56 32.9	57 06.9
54 43.3	58 56.2	57 36.7
59 30.7	19 03 43.9	19 04 18.4
19 01 56.7	06 08.9	04 47.3

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1879phae.proj..481S

Reduction in R.A.

	Comet	+70° 225	+70° 223	∈ − 225	∈ − 223.
18h	27m 41.35	31m 54.8 ~~0~~	31m 32.90	−4m 13.~~5~~ ~~45~~	−3 57.55
	~~35 21.20~~	—	—	—	—
	38 51.30	43 06.2 ~~5~~	42 43.60	−4 14.9 ~~5~~	−3 52.30
	46 11.80	50 24.35	50 01.55	−4 12.55	−3 49.75
	53 33.30	57 44.55	57 21.80	−4 11.25	−3 48.50
19	00 43.70	19 04 ~~56.40~~ 54.85	19 04 32.85	−4 ~~11.~~ 11.15	−3 49.15
18	45 24.~~29~~ 45	18 49 37.27	18 49 14.54	−4 12.67	−3 50.25

Reduction in Declination.

	Comet	+70° 225	+70° 223	225 − comet	comet − 223
	1m 54.7	2m ~~26.9~~ 27s.0	33.4s	+ 32.2s	1m 21.3s
	1 58.4	—	—	—	—
	2 02.6	2 26.~~6~~ 5	29.6	24.0	1 33.0
	2 11.8	2 24.7	30.1	12.9	1 41.7
	2 20.0	2 23.3	29.8	03.3	1 50.2
	2 26.0	2 ~~25.0~~ 21.9	28.9	− 01.0	1 57.1
	1 56.4	~~2 25.3~~	30.4	2)+ 14.28	2)1 40.66
				7.14	50.33

(225 − comet) × 15 cos dec.	(comet − 223) × 15 cos dec.	$\frac{\in - 225}{2} \times 15 \cdot \sin \cdot dec.$	$\frac{\in - 223}{2} \times 15 \cdot \sin \cdot dec.$
166.47	420.32	− 75.71	+ 196.6
124.08	480.81	− 58.23	+ 224.1
66.69	525.79	− 31.45	+ 248.3
17.06	569.73	− 8.06	+ 269.0
− 5.17	605.41	+ 10.00	+ 285.5
2)73.63	2)520.41	5)−166.45	5)1228.5
36.81	260.20	− 33.3	+ 245.7

First three columns of "Reduc. in Dec." now correct — last two cols. correct, — intermediate columns not corrected, but not having

1879phae.proj...481S

June 30. 1879. Photometer M.

β Cephei. S. Obs.

9 7 H.P. a.P. 88° 0'

ε = 267.0 t = 27.5 27.5 } 27.60
55.2 27.7 }

ε = 277.0 t = 35.8 35.8 } 36.80
73.6 37.8 }

aP = 87 30

ε = 267.0. t = 30.0 30.0 } 29.50
59.0 29.0 }

9 30 ε = 277.0 t = 31.0 31.0 } 30.50
61.0 30.0 }

aP = 88 30

9 32 ε = 267.0 t = 25.2 25.2 } 25.40
50.8 25.6 }

ε = 277.0 t = 41.8 41.8 } 38.80
77.6 35.8 }

AP 88° 0' H. Obs.

9 48 ε 267.0 t = 26.0
49.0

ε 277.0 t = 30.8

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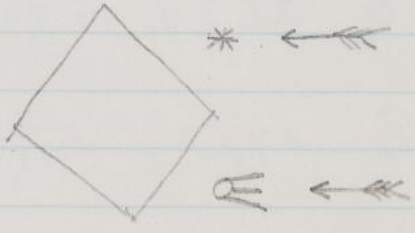
June 30, 1879.

	AP 88° 0′			U. obs.	
g 48	ε 267.0	t =	26.0	26.0	24.50
			49.0	23.0	
	ε 277.0	t =	30.8	30.8	30.95
			61.9	31.1	
	AP 87° 30′				
g 54	ε 267.0	t =	29.1	29.1	29.00
			58.0	28.9	
	ε 277.0	t =	30.9	30.9	30.90
			61.8	30.9	
	AP 88° 30′				
10 2	ε 267.0	t =	28.0	28.0	27.50
			55.0	27.0	
	ε 277.0	t =	36.3	36.3	35.50
			71.0	34.7	

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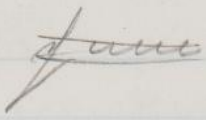
1879phae.proj..481S

June 30. 1879.
Swifts' Comet.
Region well identified.
O. C. W. 0h. (+74°)
Comparison star D. M. 737.
Order ∈ ∈ * *
Transits by chronographs.
" taken at disappearance.
Star runs on line with Pos. Circ. at
276°.5 — set at 321°.5
Five complete sets.
Comet in ~~southern~~ northern, and star
in southern half of square.
D. M. position of star 2h 06m 15s +
dec. +74° 2'.4



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Chronograph observations of Swift's comet made June 30th " 1879. vp. 114.

Comet.		D.M. +74° 137	
19^h 4^m	26.2^s	19^h 10^m	44.5^s
6	4.9	12	33.1
13	33.5	19	46.0
15	1.3	21	37.1
22	42.4	28	51.3
24	0.6	30	40.0
31	30.7	37	33.5
32	39.9	39	22.7
40	13.6	46	14.6
41	13.4	48	0.4

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Reduction in R.A.

Comet.		D.M. +74° 137		$\Delta\alpha$ = −13ˢ.7	
19ʰ 5ᵐ	15ˢ.55	19ʰ 11ᵐ	39ˢ.75	−6	24ˢ.20
14	17.40	20	41.55	−6	24.15
23	21.50	29	45.70	−6	24.15
32	5.30	38	29.10	−6	23.80
40	43.50	47	7.50	−6	24.00
19ʰ 23ᵐ	8ˢ.65	19ʰ 29ᵐ	44ˢ.7	−6	24.06

Reduction in Declination.

Comet		D.M. +74° 137		Col 1 + ½ Col 2 × 15 cos. dec.	Obs. − Col 3
1ᵐ	38ˢ.7	1ᵐ	50ˢ.7	+427.65	+462.15
1	27.8	1	51.1	+406.13	+483.67
1	18.2	1	48.7	+381.55	+508.25
1	9.2	1	47.2	+360.04	+529.76
0	59.8	1	45.8	+337.94	+551.86
1	18.7	1	48.6		2)1035.69
					+517.″1

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July 1. 1879.

Swift's Comet. O.C.W. Obs.
Region well identified.

Comparison star R.A. +7°5° 124. mag. 7.4
Order ∈ * ∈ *
Five complete sets.
Reject first partial set.
Both objects in southern half of square.
Star runs on bar at 5.5
Pos. Circ. set at 50.5
Transits at disappearance.

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1879phae.proj.:481S

July 1. 1879.

Eclipse of Jupiter's Satellite,

Chr. Bond #236. $21^h\ 14^m\ 43^s$

M.S. " #394. $14^h\ 35^m$

Chr. Bond, #236 $21^h\ 15^m\ 43^s.2$

M.S. " #394 14 36

Photometer H tried but cannot be used.

Limit of Visibility, S. Obs, Photometer S. W. rec.

$21^h\ 35^m$ 0,35

$14^h\ 55^m$,35

.36

.33

.42

.312

Measures of full brightness.

2.09

2.04

$21^h\ 40^m$ 2.12 W. M. S. 14 48 19.7

2.48 23 41.1

2.27 15 12 0 0 8

100

2.200

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July 1. 1879.

	2.37		21^h	42^m	20^s
	2.84				42
3 01	2.9v			43	0.v
	2.69	346			34
	2.v7	2.692			v7
	3.39			44	28
	2.80				v3.v
5 11	2.94			45	1v
	2.71				43
	2.87	471		46	6.v
	3.12	2.942			30
	2.86				v3.v
	2.60			47	20.v
7 08	2.v4	331			3v
	2.19	2.662			v1.v
	2.19			48	6
	2.2v				21
	2.v8				34.v
	2.48	197			vv
8 32	2.47	2.394		49	14.v
	2.80		9m 27.5		31.v
	2.11		50.5		v4.v
	2.07		10m 7	v0	11
	2.21		23.v		27.v
	2.3v		42.5		46.v
	2,21		56.0	v1	0
	2.04		11 13.5		17.v

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1879phae.proj.:481S

July 1. 1879.

1.44	11m 32.5	21h	√1m	36.5
1.36	45.5			49
1.31	55		√2	0
1.02	12m 9.5			14.5
0.86	22.			27
0.78	33			34
0.68	43			48
0.72	55		√3	0
0.56	13m 11			16
0.49	22.5			27.5
0.42	34.			39
Sat. lost sight of — was seen	45.			√0
Sat. seen — not seen afterwards, √4	13m 58.5			3.5

Limit of Visibility.

	0.35	
	.41	
21h √6m	.47	
	.46	
15 16	.49	
	.42 36	

Chr. Bond	# 236	21h	√9m	√0.2
M. S. "	# 394	15	20	
Chr. "	# 236	22	0	√0.3
M. S. "	# 394	15	21	

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1879phae.proj..481S

Chronograph Observations Swift's Comet.

July 1 1879 p 118

Comet DM +75° 124

19 12 9.0

13 21.7 14 41.1

15 7.8 15 52.0

16 36.8 17 57.3

18 24.7 19 06.6

19 58.4 21 21.8

21 52.4 22 31.1

23 16.1 24 38.7

25 11.1 25 46.3

26 26.0 27 53.7

28 28.0 29 01.5

v. P. 131

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1879phae.proj.4015

July 2/ 1879 Photometer N

β Leporis.

Focus 342. 8.0 lo

Image disappears at 52 reappears at 56

Zero 54 Images equal at 99.

Wire parallel to images ℰ = 93

BP = 87.32

ℰ = 88 t = 31.2

60.6

9 20 ℰ = 98 31.2

63.0

N = 141.0 RD = 72.0

9 40 BP = 69° 47′

68.33

71.16 = 67.0

69.33

9 55 BP = 49° 30′ RD = 69.70

69.62

= 85.28 = 69.60

69.94

10 0 N = 650

BP = 66° 5′ RD = 50.0

67 11

65 28 = 56.0

64 13

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1879phae.proj..481S

July 2, 1879

Sol.

10 14 BP = 46° 1⅓ RD = 53.90
53.68
85 6 53.68
53.60
= 57 32 N = 99

10 20 ξ = 88 t = 29.8
57.2
= 98 29.0
61.8

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1879phae.proj.14815

July 2, 1879.
Swifts' Comet,
O. C. Yr. Obs.

Comparison star D. M. +76° 117 Aug. 8.7
Region well identified,
Transits at disappearance,
Star runs on bar at 9 v.v
Pos. Cir. set at 140°.5
Order ∈ ∈ * *
Comet in northern and star in southern half of square.
Five complete sets — reject partial set after third complete set, — reject also two partial sets after fourth complete set.

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1879phae.proj..481S

Chronograph observations of Swift's Comet.
made July. 2nd. 1879. v.h. 125.

Comet.			D.M. +76° 117.		
19h	28m	22.7	19h	38m	27.6
	30	28.0		39	38.8
	41	4.3		50	57.6
	42	51.0		52	9.8
	53	12.5	20	2	58.0
	54	43.8		4	6.6
20	5	32.5			
	5	56.2			
	6	33.8		16	15.4
	7	48.6		17	20.4
	18	33.7			
	19	24.4			
	19	27.5			
	20	10.8		29	39.4
	21	4.0		30	43.2

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1879phae.proj.:.4815

Reduction in R.A.

Comet.			Diff. + 76° 117			∈ − 117.	
19	29	45.35	19	39	3.45	− 9	37.80
	41	57.65		51	33.45	− 9	35.70
	53	57.90	20	3	32.50	− 9	34.40
20	7	12.05		16	47.90	− 9	35.65
	20	37.40		30	11.30	− 9	33.70
19h	54m	42.11	20h	4m	13.62	− 9m	35.50

Reduction in Declination.

Comet.		Diff. + 76° 117.		$\frac{\text{Col. 1} + \text{Col. 2}}{2} \times 15 \cos \text{dec.}$	Diff. − Col. 3.
2m	5.3	1m	11.7	347.05	542.75
1	46.7	1	11.7	315.12	574.68
1	30.2	1	8.6	281.27	608.53
1	12.7	1	5.0	243.19	646.61
0	53.3	1	3.8	206.73	683.07
1m	29.74	1m	8.04		730.64
					+611.13

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1879phae.proj..481S

July 5. 1879.
Swifts Comet. O. C. Fr. Obs.

Region well identified.
Comparisons in class D.M. +79°, 94 & 95
mags. respectively 7.3 & 8.9
All in southern half of square.
Order E, E, 94, 95, 95, 94.
Nuclei at disappearance.
Five complete sets.
Reject partial sets before and after first complete set - also partial set after second set.

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1879phae.proj.1811S

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1879phae.proj..481S

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1879phae.proj.1481S

Swifts' Comet. July 1.

Reduction in R.A.

Comet		Star 75° 124		Δ - 124.	
19^h	14^m 14.75^s	19	15^s 16.6	-1^m	1.8^s
	17 30.75		18 31.95	- 1	1.20
	20 55.40		21 56.45	- 1	1.05
	24 13.60		25 12.5	- 0	58.9
	27 27.00		28 27.60	- 1	00.60
19	20 52.30	19	21 53.03	- 1	0.71

Reductions in Dec.

Comet	Stars	$\frac{\Delta 1 - \text{cal.}^2}{2} \times 15 \cos \text{dec.}$
1 46.1	1 10.9	66.82
1 47.9	1 9.3	73.27
1 54.0	1 9.3	84.84
1 55.0	1 7.6	89.96
2 2.0	1 7.8	102.85
		5/417.74
		+ 83."5

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1879phae.proj..481S

Chronograph observations of Swift's Comet.
made July 5th. 1879. p. 178

Comet.			DM. 79° 94.			DM 79° 95.		
18h	52m	58.6						
18	54	30.6	18	58	2.5	18	59	20.2
	57	29.7	19	0	47.6	19	0	26.8
19	1	49.9						
19	3	31.4	19	7	15.0	19	8	32.5
19	6	39.0	19	9	50.1	19	9	29.0
19	11	23.9						
19	14	45.4						
19	15	23.0	19	19	17.9	19	20	37.9
19	18	36.3	19	21	50.1	19	21	30.0
19	22	46.5	19	26	47.9	19	28	7.0
	26	30.3		29	19.1		28	39.2
19	30	41.1	19	34	12.4	19	35	30.9
	34	2.0		36	41.5		36	20.5

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1879phae.proj.1481S

Reduction in R.A.

Comet.	D.M. 79°94.	D.M. 79°95	δ = −94	δ = −95
18 56 0.15	18 59 23.05	18 59 ~~20.20~~ 53.50	−3′ 24.″90	−3 53.35
19 5 5.20	19 8 32.55	19 9 0.75	−3 27.35	−3 55.55
17 9.~~74~~ .65	20 34.50	21 8.95	−3 24.35	−3 54.30
24 38.40	28 3.50	28 33.10	−3 25.10	−3 54.70
32 3.35	35 26.95	35 55.70	−3 23.60	−3 52.35
			−3′ 25.″06	−3′ 54.″05

$19^h\ 14^m\ 59.^s35$

Reduction in Decl.

Comet.	D.M. 79°94.	D.M. 79°95.	$\frac{\text{Col 1} - \text{Col 2}}{2} \times 15 \cos \text{dec.}$	$\frac{\text{Col 1} - \text{Col 3}}{2} \times 15 \cos \text{dec.}$
2 59.1	2 45.1	1 6.6	18″.~~77~~ .82	151.52
3 7.6	2 35.1	56.5	43.~~59~~ .69	176.52
8 39.~~4~~ .3	2 32.2	52.1	82.07	216.93
9 43.8	2 31.2	52.2	97.~~86~~ .50	230.88
3 57.3	2 29.1	49.6	118.~~28~~ .42	252.47
			√360.50	√1028.32
			+72.10	+205.7

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1879phae.proj..481S

July 8. 1879.

Swifts' Comet.

Comparison star D. M. +82° #82. Mag. 7.5

Order ⊏ ⊏ * *

All in northern half of square.

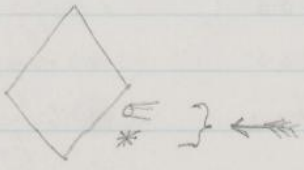
Transits at disappearance.

Five complete sets.

Star runs on bar at 170°

Pos. Circ. set at 223°.

At close of observations ⊏ preceder * 7m 24s by stop watch and is about 1 3/4 m south of it.



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1879phae.proj.1481S

July 9, 1879.

6h

Stopwatch loses 6.5 on S. Clock in 25m, (wound up before and after comparison).

Photometer M. S. Obs.

RD 50.0 E94 Scale with 5 double lines in field. 2 Urs. Min. running on transverse line.

	55.2		Interval between two images on 1st line,
1m	49.3	54.1	" " " " " 2d " "
2	45.0	55.7	" " " " " 3d " "
3	39.4	54.4	" " " " " 4th " "
4	34.3	54.9	5th " "
Mean		54.86	for rate of watch Corr time 55.10

4 6 24 3 3 9

1500/65 130 230 200

E 94 RD 80.0

1m	30.2	90.2	Interval on 1st line
2	59.4	89.2	2d " "
4	30.3	90.9	5th " "
Mean		90.10	Corr. time 90.49

6 9 1 39

E 94 RD 90.0

0.0 pr. image on 1st wire

1m	9.0	"	"	2	"
2	16.0	foll.	"	1	
2	19.0	pr.	"	3	
3	27.0	foll.	"	2	
3	30.0	pr.	"	4	
4	37.0	foll.	"	3	
4	39.0	pr.	"	5	
5	47.0	foll.	"	4	
6	56.4	"	"	5	

1st wire diff.	2m	16.0	
2 " "	2	18.0	
3 " "	2	18.0	
4 " "	2	17.0	
5 " "	2	17.4	
		86.4	

Mean 2m 17.28

137 23/25 135 60 5

Corr. time. 137.88

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1879phae.proj..481S

Chronograph Observations. Swifts Comet. July 8 - 1879

Comet			DM +82° 82		
20	7	59.2	20	17	59.7
	13	58.8		19	4.85
	20	46.8		30	30.0
	26	16.1		31	40.3
	33	40.2		43	01.1
	38	33.7		44	14.0
	46	35.9		55	40.1
	50	58.8		56	57.6
	57	58.3	21	6	45.0
21	1	55.1		8	10.7

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1879phae.proj.:481S

Reduction in R.A.

Comet		Star		E − 82.
20^h	$10^m\ 59^s.00$	20^h	$18^m\ 32^s.15$	$-7^m\ 33^s.15$
	23 31.45		31 05.15	−7 33.65
	36 6.95		43 37.75	−7 30.75
	48 47.35		56 18.85	−7 31.75
	59 56.70	21	07 28.30	−7 28.30
	$20^h\ 35^m\ 52^s.29$			$-7^m\ 32^s.6$

Reduction in Dec.

Comet	Star	$\frac{\text{Col 1} - \text{Col 2}}{2} \times 15$ corr. dec.
$5^m\ 59^s.6$	$1^m\ 4^s.9$	267.5
5 29.3	1 10.3	234.9
4 53.5	1 12.5	200.3
4 22.9	1 17.4	168.0
3 56.8	1 25.7	136.8

$5)1007.5$

$-201.''5$

(Red. by sines.)

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1879phae.proj..481S

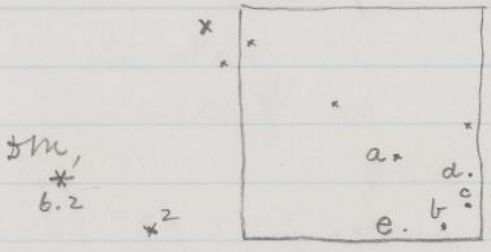
July 9, 1879

(185)?

A. obs.

10 0

Stars in vicinity, to be examined for motion on another evening.



DM compared with a b c d e (order of brightness)

1. $*_1$, $*_2$ d_1 c_1 b_1, b_2 c_2 d_2

2. a_1 d_1 c_1 b_1 a_2 b_2 c_2 d_2 Faint stroke before c_2 / bet for ab_2

3 "

4 a_1 d_1 e_1 b_1 c_1 e_2 a_2 b_2 c_2 d_2

cloudy

5 " "

6 7 8 $*_1$, $*_1^2$ $*_2^1$ $*_2^2$ " " Lost d_2 on 8.

Wrong region.

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1879phae.proj.481S

July 9. 1879.

Swifts Comet.

Found comet but too hazy to observe it.

July 11, 1879.

Eclipse of Jupiter's satellite I
invisible owing to clouds.

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1879phae.proj..481S

July 12, 1879.

Photometer M. S. obs.

Polaris. Focus 350 N99 E94

RD 30 Transits over lines on glass plate.

1st image lines 1, 2, 3
2d " " 1
1st " " 4
2 " " 2
1 " " 5
2 " " 3, 4, 5

3 taps for each line.

RD ~~60~~ 90 1st image lines 1, 2
2 " " 1, 2
1 " " 5
2 " " 5

Reject 3 taps between sets RD 60 & RD 150

RD 150 1 image lines 1, 2, 3, 4, 5.
On line 2 only 2 taps; first for centre, second for last of the pair of lines.
2d image lines 1, 2, 3, 4, 5.

Seeing 3, 2 2. Focus could not be well determined; probably 342 might have been better, as on July 2.

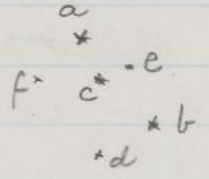
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1879phae.proj..481S

July 12, 1879

90

11 observers stars in region of (185) to be examined for motion later.



lettered in order of brightness.

Order - 1. DM 11° a f e c d b, f d a c e b
2.3. " "
4.5. ec nebs
6.7 like 2,3

Seeing very poor.

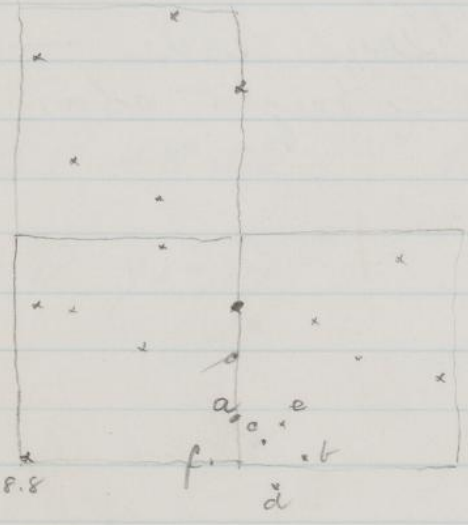


Chart of other stars in vicinity.

July 14. None of these stars show motion.

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1879phae.proj..481S

July 12. 1879.

Swifts' Comet. D. C. M. Obs.

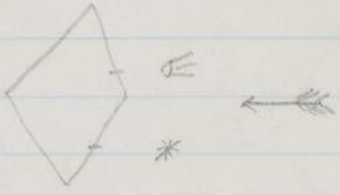
Comparison star D. M. 87°. # 26, Mag. 8.7

Order * ∈ * ∈

Two sets of transits.

Reject fourth tap in first set.

Comet in southern and star in northern half of field.



Cluster No. 10 hour angle $5^h 15^m$ at $22^h 7^m$ by Chron. B. 236 (2 fields) Decl. circle $-3°.9$.

M. 10. about 50' preceding bright star and a little north.

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1879phae.proj.1481S

July 14, 1879.

Photometer M. 8 Cephei. 5 obs,
Focus 340, 344, 341. Mean 341.7
One image disappears at N 552; reappears
at 60.2; mean 57.7 57.7 + 45 = 102.7
N 103 E 93 BP 73° 24'

8 50 E 88 33.0
1m 9s.3
E 98 ~~1m 9s.3~~ 28s.0
~~=~~ 57.8

N 142

9 3 RD 68.0 BP 56° 51'
58° 14'
9 7 RD 72.0 55° 4'
55° 40'

9 9 BP 43° 58' RD 69.89
9 14 BP 71° 17' 70.10
70.00
69.89

N 227.8

9 20 RD 52.00 BP 53° 14'
53° 49'
9 23 RD 56.00 51° 42'
51° 55'

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1879phae.proj..481S

July 14. 1879. S. Obs.

9 27 B P 39° 5' R A 54.28
53.80

9 29 B P 68° 48' 54.12
54.18

R A 15 5 ~~E 88~~ B P 73 24

E 88 38.0
117.9

9 40

E 98 27.3
54.8

Stars near (145) U. Obs.

10 00



July 19. Star marked with a circle is not there.

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1879phae.proj.1481S

Reading Chronograph sheet of Page 140.

19	54.5	58.0	1.5		22	16.2	18.4	22.6	
21	4.9	7.8	13.3		23	25.6	29.0	34.8	3.90 3.00
21	17.7	22.6	26.4		24	48.0	52.2	57.2	4.30 4.30
22	29.5	33.0	36.8		25	59.6	3.2	8.4	
23	38.8	43.4	48.1		30	55.7	59.7	4.6	

8.38 5.34 2.96 3.90

1st — 2nd

RD 30.

18	45.5	48.3	51.4		21	17.7	22.6	26.4	
19	54.5	58.0	1.5		22	29.5	33.0	36.8	
21	4.9	7.8	13.3		23	38.8	43.4	48.1	
22	16.2	18.4	22.6		24	48.0	52.2	57.2	
23	25.6	29.0	34.8		25	59.6	3.2	8.4	
	14 6 7	16 1 5	18 3 6			19 3 6	2 1 4 4	2 3 6 4	
	2 6 7	41.5	6 3 6						
Mean. 21	5.34	8.30	12.72		23	38.72	42.88	47.38	

Computation of local Transits

296 416 3.45 3.88 14 45 3.81 49.00 45.12

4.42 4.50 4.30 4.96 4.32 2 5 0 4.50

4.50 381 8.31 52.50 44 2 45.12 6 44.7

26 36 8.79 8.98 42.99

21m 8.79 23m 42.99

RD 90

1st	30	55.7	59.7	4.6	33	17.3	20.6	24.0
2nd	32	7.4	12.3	16.0	34	27.6	30.8	36.7
5th	35	41.7	44.5	48.8	37	58.5	1.0	4.6
		10 4 8	11 6 5	12 9 4		10 3 4	11 2 4	12 5 3
Mean.	32	54.93	58.83	3.13	35	14.47	17.47	21.77

2689 2371

32m 58.96 35m 17.90

RD 150

44	31.2	36.1	40.1		51	44.8	48.6	51.9
45	44.7	49.0	52.5		52	56.0	59.7	4.2
46	54.8	58.9	4.1		54	6.2	9.7	14.0
48	5.9	10.0	16.0		55	15.8	20.7	24.8
49	15.6	17.9	24.0		56	27.1	30.6	36.0
	15 8 12 8 3 7 2 2	17 1 9 2 9 1 9	13 6 7 1 6 7			14 9 9 2 9 9	16 9 3 4 9 3	13 0 9 7 0 9
Mean. 46	54.44	58.38	3.34		54	5.98	9.86	14.18

2616 30 02

46m 58.72 54m 9.s 54m 10.01

1st set =	2m	34.20
2nd " =	2	18.94
3d " =	7	11.29

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1879phae.proj..481S

Continuation of work on page 145

$\delta = 88^\circ\ 39'\ 47.^s2$

~~Cos δ = 8.367951~~ $1^{s.\,Eq.\,in.} = 15'' \times \cos\delta$.

l. Cos δ = 8.36793

L. 15: 1.17609

9.54402

~~.02209~~

~~0~~

".34947 . = Equat. int. Corresp. to 1^s, for Polaris

$1^s = 154.^s20$	= 53."964	9.54402	9.54402	9.54402
$2^s = 138.94$	= 48."624	2.18808	2.142827	2.634769
$3^s = 481.29$	= 150."94	1.73210	1.68685	2.17879

Using Sine. 5.3144251 5.3144251 5.3144251

6.4177438 6.3723681 6.8644787

1.7321689 1.6867932 2.1789038

53."972 48."618 150."97

ab. 30 ~~60~~ 90 150

53.972
48.618
102.59
102.35
6 | 102.47 mean

1.708 = mean val. of 1 dir.

1.708 | 48.618 | 90 / 28.46 / 61.54 Zero.

1.708 | 53.972 | 60 / 31.89 / 30. / 61.60 Zero.

53.96
48.62
6 | 102.58
1."7097

150.94
53.96
120 | 20490 | 1.701
120
849
720
90

1.708 | 150.97 | 150 / 88.39 / 61.61 Zero

61.61
61.54
61.6
61.58 Mean. Zero.

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1879phae.proj..481S

July 15. 1879.

	~~12~~	~~20~~	~~0.0~~	~~23~~	~~40~~	
Band 394	~~25~~	~~0.0~~		~~23~~	~~44~~	Band 236
Comp.	12	25	0.0	23	45	3.0
	12	32	0.0			
		~~23~~	~~44~~			
	12	55	41.0	0	15	44.0

11 20 18.5

Comp. with Lat. II.

P. Obs.

	94.6	~~80.3~~ 80.3			57	3.5	III dis á peine	
	174.9					15		
	99.3					37	25.8	12 37 6
5396		71.5	151 8	75.9				
13490	170.8		37.95			42		
	95.9				54	2		
	173.2	77.4				15		
5406	98.7					24	22.2	12 38 2
13515	172.7	74.0	151.4	75.7				
			37.85			44		
	99.4					57		
	173.2	73.8			59	10	16.	12 3 38 56
5429	97.2					22		
27145		75.9	1497	74.4				
13572	173.1		37.42			35		

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1879phae.proj...481S

July 15. 1879.

175.8
274.6
170.8
8941 102.1 ω 09
22.3.52 272.9 50.22
170.8
271.8 101.0

8938 174.2
22445 277.0 102.8 2038
169.3 50.95
279.3 110.0

9006 171.8
22515 280.2 108.4 2184
175.8 54.60
276.1 100.3

173.4
9005 275.2 101.8 2021
22512 50.52

Limit of Visibility.

215.5 17.3
230.8
215.6 14.8
230.4
8903
2422.58 8.02

0 3 43 II disappears
4 22 9.8 12 43 49
37
6
23 14.5 12 44 52
37
9
6 24 18. 12 45 56
41
7
19
49 34. 12 47 12
5

0 8 32
46
48 63 12 48 31
9 16

1879phae.proj.:4815

July 15. 1879.

	182.8		0	10	39	50	16	
	271.7	88.9			44		26	
9007	179.9				59		36	30.8
225.18	266.3	86.4	1753 4382	11	8		45	
	183.8				22	50	59	
	266.6	82.8			34	51	11	
9007	183.1		1669		46		23	16.2
225.18	267.2	84.1	8345 4172		55		32	
	185.3			12	6		43	
	263.2	77.9			14	51	51	
	185.5	77.7			25	52	02	36.7
	261.3	75.8			34		11	
	185.1	73.2			43		20	
	255.8	67.7			54		31	
	193.4	62.4		13	4		41	35.2
	254.8	61.4			12		49	
	191.4	63.4			22	52	59	
	251.4	60.0			30	53	07	
	196.6	54.8			38		15	
	248.3	51.7			47		24	
	197.3	51.0			58		35	
	246.4	49.1		14	7		44	
	202.3	44.1			17	53	54	
	242.2	39.9			26	54	03	
	205.3	36.9			35		12	
	240.3	35.0			46		23	
	209.0	31.3			56	54m	33	

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1879phae.proj..481S

July 15. 1879.

236.6	27.6	0	15	5	54	45
211.7	24.9			15	54	51
232.8	21.1			25		01
213.7	19.1			42		18
228.7	15.0			54		30
218.4	10.3		16	6		42
228.2	9.8			20	55m	56s

Sat. faintly seen setting prob. too bright

Bond 394. 13h 8m 0.s0 = 0h 28 10,0 Bond 236

" 10 0.0 = 30 10.5 "

11 20 26.0

3.0m	10.5s	
9	44.5	
20m	26.0s	30
	25.0	27
	24.0	21
	23.0	15
	22.0	9
	21.0	3

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1879phae.proj.,4015

July 15. 1879.

Bond 394.

15h	59m	0s	= 3h	19m	38.0
16	0	0	=	20m	38.5

	15	59	54.5			
		23	41.			
III Reap.	= 16	23	35.5	= 3h	44	14.0 app.

Cloudy early part of evening.
Began clearing at about ½h.

236.

Limit of Visibility. P. Obs.

S. S.
3 40

207.6	28.6	
236.2		
209.1	31.3	
240.4	14.98	
933		
22332		

Set at 210.0 at distance from limb of Jupiter equal to its diameter.

Compared with Sat. II.

Suspected		3h 21m 21s	42m	16s
210.0		21 27		24
242.7	32.7	21 38		35
206.4	36.3	21 51		48
246	35.4	22 04	43	1
2 42 57 21				

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1879phae.proj..481S

July 15. 1879.

204.3	37.5	3	22m 14s	43m 11s
246.3	42.0		22 27	24
200.7	45.6		22 36	33
248.8	48.1		22 48	45
197.2	51.6		23 00	57
255.2	58.0		23 10	44 7
190.3	65.1		23 25	22
258.1	67.8		23 40	37
190.0	68.1		23 50	47
262.3	72.3		24 00	57
190.6	71.7		24 13	45 11
263.6	73.0		24 32	30
183.0	80.6		24 52	50
286.9	103.9 [must be 266.9]		25 07	46 5
180.4	106.5		25 19	17
270.6	90.2		25 34	32
175.3	95.3		25 56	54
275.1	99.8		26 15	47 13
176.6	98.5		26 56	54
276.2	99.6		27 12	48 10
170.8	105.4		27 29.	27
275.2	104.4		27m 48s	46

Image of Sat. II at four times image of Sat. III from edge of Jupiter.

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1879phae.proj.,481S

July 15. 1879.

	186.6	90.1	~~29~~	~~27~~	3h	15m 25s
	276.7		29	45		43
9135	167.8	114.6	30	15		14
228.38	282.4	2047 51.18	30	58		57
	165.3		31	14		13
	280.6	115.3	31	30		29
8967	166.2		31	47		46
44835	282.6	116.4	32m	00s		59
224.18		2317 11585 57.92				

Twilight strong — Sat. blurred, Cirrus cloud forming.

Bond 394.

16h	39m	0.0	=	
	40	0.0	=	

Bond 236.

3h	59m	44.5s	
4	0	44.5	

3	59	44.5		
	38	44.5		
dif:	21	00	at	~~4h 0m 59 44~~
	20	59		3 57m
	20	58		3 51
	20	57		3 45
				3 39

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1879phae.proj..481S

July 17, 1879.

8 40 Nebula 3900 S. obs.
Not seen probably too early in the evening.

8 50 4024 not seen

8 57 4045 Spectrum continuous S obs.

9 30 4026 Spectrum continuous S obs.

CS. 17 16 4053 Not seen Nebulosity-gas spectrum like that of Pleiades S; that is, the tint of the field was not quite uniform.

17 40 4302 ~~Faint~~ Nebulosity ⊙ Galaxy S obs. Pots

17 58 4361. Suspd. Prob. Contin. Obs not certain dark notches appear & also as prism is turned.
Doubtful S.

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1879phae.proj.481S

July 18, 1879

Passing Clouds.

Looked at η Draconis comp. nf lens. p
Seeing 8.3.3
" 8,5,4 S
" 8.3.3 a

Looked at Fixed nebula with 1/2 inch gauge
4355 Spectrum nebulous a continuous ~~spectrum~~. R. Chs.

4302 Annulus.

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1879phae.proj..481S

July 18. 1879.

Bond 394.				Bond 236.	
14^h	$\sqrt{}^m$ 0.0	=	22^h	41^m	9.0
	$\sqrt{}7$ 0.0	=		43	9.$\sqrt{}$

$1\sqrt{}^h$	$13\not{7}^m$	49.9			
	23	41.1		40	31.0
Ecl. =	15	37	31.0 =	23	23 40.$\sqrt{}$ app

Images in opposite edges of field.
Photometer H.
Full light of Sat. I. P. Obs.
Compared with Satellite II.

100.3		
167.8	67.5	23^h $\not{4}^m$ Sid. $\sqrt{}$.
95.$\sqrt{}$	71.7	
167.2	~~137 2~~	1392
5308	~~846~~	691
2654	~~4230~~	3480
132.70		

Limit of Visibility.

128.7	
135.3	6.6
128.3	7.9
136.2	145
5285	725
132.12	3.62

23^h 6^m Sid. $\sqrt{}$.

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1879phae.proj.481S

July 14. 1879.

99.3 67.3
166.6
92.4 65.4
158.2 127
5169 61 51
129.22 33.18
105.3 55.1
160.4
106.4 58.5
5370 164.9 — 113 6
134.25 28.40
104.3 56.5
160.4
5296 101.2 62.1
132.40 118 6
163.3 → 29.45
161.7 (?106.7)
~~898~~ 162.2 55.0
5348 105.2 55.5
133.70 55 25
160.7 — 27.62
103.7
157.4
107.3
159.6
113.3
152.7
114.4
154.0

S. S.

30 23 17 16 37
25 36 55
40 17 10
31 1 31
6
32 23 36 19 6
49 56 19
33 2 32
15 45
28 55
40 20 10
56 48 26
34 4 → 40
26 57
41 21 12
55 47 26
35 7 — 38
35 20 51
35 22 6
47 18
57 28
36 08 39
18 49
30 23 1
41 12

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1879phae.proj..481S

July 14. 1879

			S.	S.
117.8	36m 52s	23h	23	23
141.2	37 01			32
119.6	13			44
142.3	24			√√
122.6	37		24	8
140.2	46			14
Seen faintly.	37 59			31

Bond 394,

15h 47m	0,0	
48	0,0	
√0	0,0	

33	17.5	
46	44.5	
46	33.0	

33	17	= 46 33
30	17	
24	17	46 32
18	17	46 31

Bond 236,

23	33	17.5
	34	17.5
	36	16,0

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1879phae.proj.481S

July 19, 1879.

η Draconis S. obs.

8 45 A companion visible; p about 135°, s about 5".

Photometer H

η Draconis S. obs. 260°, 5".

	127.3	14.8
	142.1	
9 01	311.0	
	319.7	8.7
	90 10.1	23.5
	450.05	11.75
	225.02	5.88

Companion seen with difficulty.

Companion not seen with other image; seeing worse than before.

Ring nebula in Lyra; wire gauze & prism; lines seen both ways.

Nebula G. C. 3801 P. obs.

9 35 ~~23m 42.0 8m stars~~ Continuous.

G. C. 3806 & 3808 P. obs.

Both doubtful.

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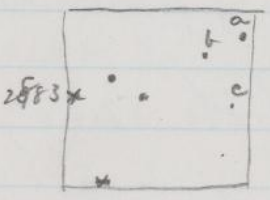
1879phae.proj..481S

July 19. 1879

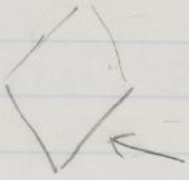
v. p. 166

U examines region near (185)

10 30



Observes a b c 4 2 8 3



Order 2 8 3 b 2 8 3 a c c b a
1 1 2 1 1 2 2 2

2d set false tap before b_1

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1879phae.proj..481S

July 20 - 1879

	Band 394		Band 726		
9	15	0.0	17	8	1.5
9	16	0.0	17	9	1.5

Eclipse of Jupiter I
Obsd. H. out with Sat.

~~17~~ 17

Cloud in each. Jupiter seen at intervals
Satellite seen dimly.
Satellite ~~seen~~ at 17 58 49.5 interpolated.
Satellite III to W too far distant for Obsd. H.

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1879phae.proj..481S

Chronograph Observations. Swift's Comet.
made. July 12th 11h 1879. p. 14½.

D.IV. 87° 26. Comet.

19h	17	56.7	21	4 7.4	
	25	33.0	38	29.7	
	41	50.3	47	18.6	
	52	47.0	30	4 14	12.8 5

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1879phae.proj..481S

Reduction in R.A.

	D.DI. 87° 26.		Comet.			C − 26.
19	21	29.85	19	30	8.55	+8 38.70
	47	17.65		3	45.55 / +5.60	+8 26.90
			19h	42m	54.05	+8 32.80

Reduction in Declination.

D.DI. 87° 26.		Comet.			Diff. − Col. 3.
7	36.3	16	42.3	495.7	394.1
10	36.7	16	53.9 / +5.40	565.7	324.1
				2)71 5.2	
				− 359.1	

(Red. by eries.)

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1879phae.proj..481S

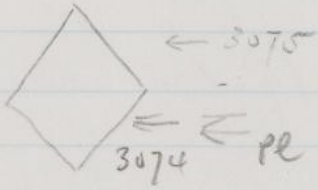
July 23, 1879

Cloudy till 9.30

Dq 30 U. observes Eumiker (185) Star marked a July 19 is not seen ∴ is planet probably.

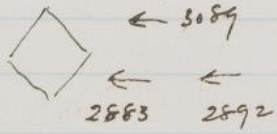
DM 2883 -	15	30	32	10	1
Δ			+40		-4
Pl	15	31	12	9	57
Comp.		30	2	10	3
Corr. to Epl.		+ 1	10		- 6
Comp. July 23	15	30	44	9	25
	15	31	54	9	19

Compares star in about this position with DM 9, 3074, 75
Order = 3074_1 3075_1 3074_2 Pl_1 Pl_2
3075_2 not observed; it precedes Pl_1 by $^s.3$



10 50 DM 10, 2883 compared with 10, 2892 & 9, 3089
1. 2883_2 to 2892_1 by $^s.2$ Order = $'83_1$ 83_2 92_1 89_1 92_2 89_2
2. to 1

89_1 92_2 compared a no. of times.



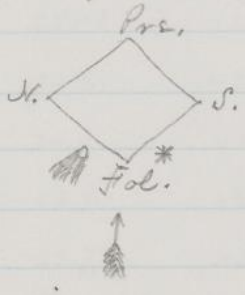
v. p. 168

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1879phae.proj.481S

July 23. 1879.
Swifts' Comet. O.C.W. 065.

Comparison star D.M. +80° #466. Mag. 8.1
Order ∠ ∠ * *
Transits at disappearance.
Comet in northern and star in southern half of square.
Pos. Circ. set at 247° – star runs on bar at 202°.
Six complete sets – reject two partial sets after second complete set.



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1879phae.proj..481S

Chron. record of observations of
(185) Eunike, July 19, 1879.

v. p. 160

DM 10, 2883 (185)

18	38 5.6	38	35.9
	29.2	39	18.7
39	30.0	40	0.5
	54.0		43.1
41	49.8	~~50~~ 42	20.1
~~50~~ 42	13.7	43	2.9
43	24.9	43	55.3
	48.6	44	38.0
45	14.0		
~~44~~	~~46.0~~	45	44.3
	37.6	46	27.0
46	34.7	47	4.9
	58.1		47.3
47	57.0	~~48~~	27.0
~~48~~	20.4	49	10.0

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1879phae.proj..481S

Reduction in R.A.

	2883	(185)	Δ				
18	38 17.40	38 57.30	39.90	1377 ☾	18	44	5.4
	39 42.00	40 21.80	.80	corr.		1	0.5
	42 1.75	42 41.50	.75	Sid. ☾	18	43	4.9
	43 36.75	44 16.65	.90	Noon	7	48	25.0
	45 25.80	46 5.65	.85	Sid Int	10	51	39.9
	46 46.40	47 26.10	.70	corr.		1	47.2
	48 8.70	48 48.50	.80	Mean.	10	52	53
		18 44 5.4	39.814				

Reduction in Dec.

2883	(185)	Δ
23.6	42.8	19.2
24.0	42.6	18.6
23.9	42.8	18.9
23.7	42.7	19.0
23.6	42.7	19.1
23.4	42.4	19.0
23.4	43.0	19.6
23.66	42.71	2)19.06
		9.53
		.985
		9.39
		469
		140".8 = 2′ 20".8

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1879phae.proj..481S

Chron. record of observations of
(185) Eunike made July 23, 1879.

v. p. 164

Eunice 3075 $\frac{1}{2}$ weight.

3074	3075	(185)
18 35 19.0	35 38.0	36 7.0
47.1	36 6.7	38.4
36 54.2	37 13.2	37 42.1
37 22.3	41.8	38 14.0
38 49.3	39 8.0	39 37.0
39 17.1	36.7	40 9.2
40 19.2	40 38.0	41 7.0
40 47.1	41 6.7	39.1
41 50.5	42 9.3	42 38.3
42 18.2	38.0	43 10.2
43 31.8	43 50.3	44 19.2
59.6	44 18.9	51.2

2883	2892	3089
18 59 33.2	5 32.3	5 52.1
19 0 ~~6.4~~ 5.9	53.5	6 26.2
6 55.4	12 54.9	13 14.0
7 28.0	13 15.3	48.8

3089,	2892.	Δ
52.1	53.5	1.4
14.0	15.3	.3
0.1	1.3	.2
11.3	12.8	.5
21.1	22.4	.3
35.6	36.9	.3
42.6	43.9	.3
54.1	55.3	.2
1.2	2.3	.1
12.5	13.9	.4
19.9	21.1	.2
29.2	30.5	.3
36.9	38.2	.3
46.6	47.0	.4
		1.30

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1879phae.proj.481S

Reduction in R.A.

	3074	3075	(185)	(185) − 3074	(185) − 3075
18	35 33.05	35 52.35	36 22.70	49.65	30.35
	37 8.25	37 27.50	37 58.05	.80	.55
	39 3.20	39 22.35	39 53.10	.90	.75
	40 33.15	40 52.35	41 23.05	.90	.70
	42 4.35	42 23.65	42 54.25	.90	.60
	43 45.70	44 4.60	44 35.20	.50	.60

Reduction in Dec.

3074	3075	(185)	(185) − 3074	(185) + 3075
28.1	28.7	31.4	3.3	60.1
28.1	28.6	31.9	3.8	60.5
27.8	28.7	32.2	4.4	60.9
27.9	28.7	32.1	4.2	60.8
27.7	28.7	31.9	4.2	60.6
27.8	28.6	32.0	4.2	60.6

Star not the planet.

	2883	2892	3089	2892 − 2883	3089 − 2883
18	59 49.55	5 42.90	6 9.15	5 53.35	6 19.60
19	7 11.70	13 6.10	13 31.40	.40	.70
				5 53.38	6 19.65

2883	2892	3089	2883 − 2892	2883 + 3089
32.7	21.2	34.1	11.5	66.8
32.6	20.4	34.8	12.2	67.4
			11.85	67.1
			.985	.985
			11.67	661
			584	3305
			175.1	994.5
				495.8
				889.8
			21 2′ 55.1″	394.0 = 6 34.0
			1 27.6	

55.3
55.2
55.25
.285
54.42
27 21
816.3
889.8
73.55

408.2
889.8
481.6 = 8 1.6

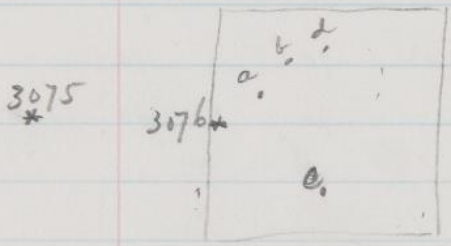
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1879phae.proj..481S

July 24, 1879

Cloudy till about ten o'clock.

10 0 H. observes Eunike (185)



4 sets 3075, 3075$_2$ b_1 a_1 d_1 a_2 b_2 d_2

4 sets 3075, 3075$_2$ a_1 c_1 a_2 c_2

false taps after d_1 in set 1

a_2 c_2 one tap in last set.

abcd of about same brightness.

There is a star in position of one observed last night for (185). It was at that time suspected double and it may be that this is the explanation, since no other star was even near enough to expected place of (185).

Star c is (185) Chron. Record

3075		(185)		3075		(185)	
18	29 10.2	30	14.4	18	32 52.9	33	57.1
	47.1		34.2		23.6		11.0
31	18.5	32	23.0	34	25.4	35	29.9
	49.6		37.1		56.0		43.1

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1879phae.proj..481S

July 24. 1879.

Swifts' Comet. O. C. W. Obs.

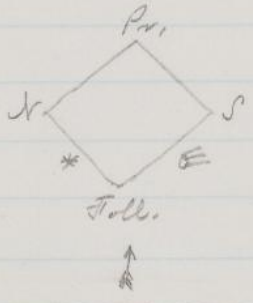
Comparison star D.M. +80°. #464. Mag. 9. 2

Comet in southern and star in northern half of square.

Pos. Circ. set at 311.5 = 266.5 + 45

Four complete sets.

Order * * ⊏ ⊏



---

(185) Ernike Reduction in R.A.

	3075	(185)	Δ				
18 29	28.65	30	24.30	55.65	1327 ⊏	18	33 8.7
31	34.05	32	30.05	56.00	Corr.		1 5.7
33	8.25	34	4.05	55.80	Sid. ⊏	18	32 3.0
34	40.70	35	36.50	55.80	Aroon	8	8 7.8
	18	33	8.7	55.81	Sid. Int	10	23 55.2
					Corr.	+	1 42.2
					Mean ⊏	10	22 18

Reduction in Dec.

3075	(185)	Δ
36.9	19.8	17.1
31.1	14.1	17.0
30.7	13.9	16.8
30.6	13.2	17.4
		17.08
		.987
		1686
		843

2)252.9 = 4′ 12″.9

126.4 2 6.4

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1879phae.proj..481S

Chronograph. observations. Swift's Comet.
Made July 29th 1879 h. 16s.

	Comet.		D.M. 80° 466.	
21	38	51.2	43	59.8
	40	56.3	48	26.2
	50	10.0	55	55.1 3
	53	59	59	55.8 0
22	1	4.0		
	2	32.3		
	5	50.7		
	6	43.2	12	42.8
	10	11.5	16	46.7
	17	49.2	23	55.6 ~~49.6~~
	21	39.0	28	50
	29	2.5	35	13.5
	33	7.4	39	29.0
	40	22.9	46	31.5
	44	45.4	51	1.7

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1879phae.proj.1481S

Reduction in R. A.

	Comet.		D.M. 80° 466.		E − 466
21	39	58.75	21 46	13.00	−6m 19.s25
	51	37.95	57	55.25	−6 17.20
22	8	27.95	22 14	44.75	−6 17.40
	19	44.1	26	0.30	−6 16.20
	31	4.95	37	21.25	−6 16.30
	42	34.15	48	49.60	−6 15.45
	22h 12m	13.s71			−6m 16.s97

Reduction in Declination.

Comet		D.M. 80° 466			Diff. − Col. 3.
2	51	4	26.4	47 3.6	416.2
2	55.9	3	59.7	503.0	386.8
3	28.3	4	3.9	547.7	342.1
3	49.8	4	9.4	580.6	309.2
4	4.9	4	13.5	606.5	283.3
4	22.5	4	24.2	638.7	251.1

6/19 8 8.7

+ 331".4

(Red. by rules)

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1879phae.proj..481S

Chronograph observations. Swift's Comet.
Made July 24th & 1879. p. 171.

D.M. 80°.464. Comet.

19	56	30.1 (6)		58	57.1 (4)
	58	38.8	20	2	17.0
20	3	37.1 (3)		6	13.6
	5	49.0		9	17.3
	10	26.2		13	8.4
	12	~~40.0~~ 39.9		15	56.8 (5)
	16	40.8 (5)		19	38.3 (4)
	18	57.4 (3)		22	8.4 (5)
	22	38.1		25	31.4
	24	50.9		27	59.1 (8)

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1879phae.proj.1.481S

Reduction in R.A.

	D.M. 80° 464.		Comet.			E − 464	
19	0.7	32.2	20	0	34.2	+ 3	2.00
20	4	43.1		7	45.	+ 3	2.30
	11	33.		14	32.	+ 2	59.40
	17	48.90		20	50.95	+ 3	2.05
	23	44.50		26	47.60	+ 3	1.10
	20h	14m			5.s73	+ 3m	1.s87

Reduction in Declination.

D.M. 80° 464.		Comet.		Col. 1. + Col. 2 / 2 × 15 cm. Dec.	Diff. − Col. 3.
2	3.7	3	25.	433.69	456.11
2	11.7	3	3.7	416.11	473.69
2	13.7	2	48.	398.27	491.53
2	16.8 −	2	35.1 −	385.26	504.54
2	12.8	2	28.	371.22	518.58
					5/2444.45
					− 488."9

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1879phae.proj..481S

July 27, 1879

B 394 $11^h\ 15^m\ 0^s$ } not needed in reduction;
B 236 19 36 $38\frac{1}{2}$ } times recorded by F. 1327 on chronograph.

Photometer H.

Jupiter I, III. S. obs.

Images at opposite edges of field.

11 42

	118,8	33.2
	152.0	
	282,4	69.6
	352.0	
	9052	1028
	4526	514
	226.30	25.70

11 45 S. obs.

	90.7	
	173.0	82.3
	293,4	54.6
	348,0	
	9051	1369
	226.28	6845
		34.22

11 48 S. obs.

	101,0	
	170.2	69.2
	284,9	
	347.0	62.1
	9031	1313
	4525	6565
	~~226.28~~	32.82
	225.78	

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1879phae.proj:1481S

July 27, 1879.

Jupiter I, III.

109.6	44.7	13	30.6	S. obs.		
154.3		13	53.0			
304.3	35.7	14	18.0			
340.0		14	41.1			
908.2	80.4					
454.1						
227.05	20.1					

					G. M. T.	
103.1	20h	15	32.4	S. obs.	11h 52m	31.4s
166.0			53.8		52	52.8
479		16	14.8		53	13.8
169.8			32.0			31.0
90.5			52.3			51.3
167.9		17	10.5		54	9.5
93.8			33.8			32.8
178.0			53.8			52.8
99.5		18	16.5		55	15.5
178.7			35.9			34.9
103.4		18	55.1			54.1
170.3		19m	18.9s		56	16.9

4 rattles.

					57	25.8
103.9		20	27.8	S. obs.		48.2
162.5			50.2		58	10.5
116.1		21	12.5			
156.0			28.5		58	26.5
118.1			44.9			42.9
154.0		22	0.3		58	58.3

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1879phae.proj..481S

July 27, 1879.

120.0	22m 22.4	S. obs.	22m 22.4	59m	20.4
145.4	40.0		40.0		38.0
	55.5				
146.1	23 13.2		55.5		53.5
143.0	38.6		23m 13.2	00m	11.2
	56.1				
130.2			38.6	00	36.6
138.0			23m 56.1	00	54.1
Sat. suspected		20h	24 22.3	1	20.3

One tap later just before rattle; Satellite suspected

Jupiter III

Limit of visibility.

131.1		R 26m 7.7	S. obs.
130.3		26 31.7	
146.1	15.8	26 58.1	
312.0		27 26.8	
320.2	8.2	27 48.0	
130.7	240		
9045	118		
4545	5.90		
227.25			

131.5	7.8	28m 16.6	S. obs.
139.3		28 38.9	
314.0	7.1	28 59.8	
321.1	9	29 20.0	
9059	745		
45295	3.72		
226.48			

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1879phae.proj.1481S

1327.

$20^h\ 15^m\ 32^s.4$ see page 177.

1 06.5

20 14 25.9

8 19 57.58

11 54 28.4

1 57.0

11 52 31.4 = C.M.T. corresp'ing to $20^h\ 15^m\ 32^s.4$ by 1327.

20 15 32.4

52 31.4

27 01.0 = dif.

23 01

23 02

12 32

15 32

18 32

24 32

$11^h\ 36^m\ 51^s$ M.W.T.

23 41

12 00 32

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1879phae.proj..481S

July 31, 1879.

8 10 η Draconis Phot. H.

Companion not seen with the photometer on account of poor definition. Seen with difficulty with an ordinary eyepiece magnifying 230. Photometer Q (Nebula Phot.) Ring Nebula a Lyrae G. C. 44447

Focus small telescope on a Lyrae

Sdrs.

9 08 14.2
12.3
11.8
12.8+

Focus repeated Sdrs

12.0
12.6
9 11 12.0
12.2+

Mean of two focus sets, 12.5 has been used in reduction by F. W.

Ring; a Lyrae Sdrs

9 13 28.3
28.0
28.3
28.2+

9 16 Contact parts Sdrs

No brighter than the sky around the nebula (moonlight).

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1879phae.proj.1.481S

July 31, 1879.

Focus readings small telescope

9 20 13.3 P. Obs.
13.0
13.2
13.2+

Field of small telescope darker than that of large tels.

Ring

9 23 26.2 P. Obs.
25.7
27.6
26.5+

Nebula G. C. 4244; star ι Herculis

9 45 16.1 P. Obs.
15.9
15.6
15.87 15.87+

9 43 14.7 S. Obs. ι Herculis
15.9
14.6
15.07
15.73

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1879phae.proj..481S

July 31, 1879

G. C. 42414 ; β Draconis

9 51 16.8 P. obs.
16.6
17.3
16.9+

9 55½ 16.5 S. obs.
16.0
16.6
16.4+

G. C. 42414 examined with Prism.

9 59 Spectrum continuous P. obs.
10 1 " " S. obs.

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1879phae..proj..481S

Aug. 1, 1879

γ Draconis. Companion seen with little difficulty with ordinary eye-piece, but with much difficulty, and uncertainly, with Phot. H.

8 30 γ Draconis Phot ht. S.obs.

134.7
148.0 13.3^ 270°, 5"

317.3

327.4 10.1^ +6.9^
23.4^
117^
585^

9274^
4637^
2318.5^

45°.7 5" Sdo

8 55

47.0 8.0^
55.0

227.2 7.8^
235.0 15.8^ +7.8^

5842^
2821^ 7.9^
1410.5^ 3.95^

9 5

53.4 4.6^ P. obs. 45°, 5"
48.8 { Very difficult & unsatisfactory.

227.7 8.0^
235.7 12.6^ +4.3^

5656^
2828^ 6.3^
1414.0^ 3.15^

Last setting thought (before reading circle) to be too large if anything.

9 13

326.4 P. obs. 240° 5".
319.2 7.2^ { Very difficult & unsatisfactory
136.6 7.0^
143.6 14.2^ +4.0^

9258^
4629^ 7.1^
2314.5^ 3.55^

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1879phae.proj..481S

Aug. 1. 1879

Nebulæ G. C. 4234,

Spectrum gaseous P. & S.
with faint continuous spectrum. seen by P
suspected by S

Photometer Q.

Cent. Obsn & Herschels. Nebula too bright
with 15 inches. Aperture reduced to 5"
12.7 cms.

	Altitude reading	Scale	
9 47	14.6	11.5	Field of
	14.2	11.9	prism much
	14.1	11.9	brighter than
	14.3+	11.8+	that of large
			telescope.
9 55	15.8	12.1	Pr obs.
	15.5	11.2	
	15.5	10.0	
	15.6+	11.1+	

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1879phae.proj..481S

Aug. 2 1879

8 15 Companion of γ Draconis conspicuous with ordinary eye-piece; estimated $p = 140°$ $s = 5''$. S. obs.

γ Draconis

Photometer H. Companion seen without difficulty.

S. obs. 270°, 5".

8 26

137.3
146.9 9.6
315.6
326.0 10.4

9258 20 0 7.3
4629
23145

8 33

48.0
56.6 8.6
225.7
234.0 8.3

S. obs. 45°, 5".
Companion less easily seen than in first set.

5643 16.9 7.7
2821.5
141.08

8 45

48.8
56.9 8.1

q. obs.

225.3
234.2 8.9 17.0 7.6
5655
2826
141.30

8 52

137.2
144.0 6.8
317.5
326.4 8.9

u. obs.

9251 16.7 7.8
4625.5 7.85
231.28 3.92

Seeing 7 4 8

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1879phae.proj..481S

Aug. 2. 1879. Descrip. IV. Compared with II.

Eclipses of Jupiter's Sat.

Boud 236.

17h ~~8~~m 40.0

59 40.0

Boud 394

9h 14m 0s.0

~~15~~ 0.0

G.M.T.

9 7 30.4

23 41

C.M.T = 9 31 11

Readings for Magnitudes.

P. 665.

Seeing 4. 6. 2.

~~18~~h 14h ~~5~~m S.V.

104.6 60.4

16V.0

287.6 60.9

348.V

9057

45 285 60.55

226.42 30.32

~~18~~ 7

18 7

114.6 50.5

16V.1

288.1 54.2

342.3

9101 1047

45505 5235

227.52 26.18

116.6 45.4 9h 23m 23s 18h 8m 20s

162.0 23h 59s V6

120.3 41.7 24 22 9 20

~~Suspected~~ 48.V

~~Seen~~ VV

123.4 25m 03s 10 1

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1879phae.proj..481S

Aug. 2, 1879.

~~4h 10m~~

Bond #236.

22h	10m	20s,5	
	11	21.0	

Bond #394.

13h	2s	0,0	
	26	0,0	

			M. M.S.
13h	27	38,5	
	23	42,	
13	51	20,8	
	26	0,0	
	2s	20.8	
22	11	21,0	
22	36	41,8	S. S. Reapp.

Reappearance of Jupiter IV (compared with II).

~~& Among Clouds.~~

Let at 84. Photometer H.

not seen,

Suspected,

			18h 47m 10s	22h 32m	2s,5 P. Obs.
84.0*		11.6	47 27	33	8.0
	9s,6	19.9	47 38	35	19,0
	7s,7	22.6	47 55		36.0
	98,3		48 09		= 0,0
	76,5		48 26	34	7.0

* This ought to be 76.0, and 84.0 the satellite wholly invisible, undoubtedly 76.0.

14h 2m S.C.

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1879phae.proj..481S

Aug.

~~Apr.~~ 2. 1879.

98.7		48m	38s	22h	34m 19s.0
73.3			49		30.0
99.3			59		40.0
70.8		49	09		50.0
100.7			17		58.5
72.8			26		35 7.0
101.3			41		22.0
70.3			53		34.5
101.4		50	05		46.5
67.2			21		36 2.0
104.8			33		14.5
64.9	41.4		43		24.0
106.3			53		34.5
65.4	40.4	51	08		49.5
105.8	41.4 / 40.9		25		37 6.0
64.8	43.5		41		22.0
108.3			50		31.5
62.8	42.6	52	02		43.0
111.4	46.0		15		56.5
60.8	51.0		30		38 12.0
111.8			46		28.0
57.9		53	00		42.0
111.8	53.9 / 104.9	52.4	17		59.5
57.6	53.4		29		39 11.0
111.0			46		28.0
56.7	56.9		59		41.0
113.6	110.3	56.2	54	16	58.5

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1879phae..proj..481S

Aug. 2. 1879.

		54m 28s			
53,0	61.3	22h	40m	10s,0	
114.3			41	23,5	
51,8			55 01	43,0	
116.7	64.9 126.2	63.1	14	56,5	
47,5	70.6		26	41	8,0
118,3			47	29,5	
50.8	67.8		56 02	44,0	
118.6	132.4	69.2	17	59,5	
51,4	69.9		29	42	11,5
121.3			43	25,0	
50.6	670		57	39,5	
117.6	136.9		57 09	51,0	
49,2	72.2		23	43	5,5
121,4			42	24,5	
50.6	69.4		55	37,0	
120,0	141.6		13 58 10	52,5	

3354 / 1677 / 83.85

3409 / 17045 / 85.22

3412 / 1706 / 85.3

1369 / 6845 / 34.22

2844 / 692 / 346

708 / 35.40

In all these settings clock carries Jupiter out of field.

Light of Jupiter IV.

48,5	75.2		
123.7			
48,9	72.3		
22h 49m 121.2		147.5	
51,3	70.3		
121.6			
50.6	69.0		
22 50 119,6		139 3	

3423 / 17115 / 85.58

3431 / 17155 / 85.78

6965 / 34.82

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1879phae.proj..481S

Aug. 2. 1879.

Limit of Visibility of IV. (Probably II)

22h 5m

76.3
97.0
79.4
94.0
347
17335
86.68

207

146
353
17.65
8.82

Seeing excellent 6, 8, 8 Pobs

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1879phae.proj.:481S

Aug. 2. 1879.

14	23	52			13	26	
	23	42		20 M.S.	14	23	52
14	47	34				23	41
13	26	0		G.M.T.	14	47	33
1	21	34					
22	11	21					
23	32	55					

Obs. II, (Compar.

Disappearance of Jupiter II. (Compared with IV).

Image of Sat II from IV 160° ± 7"

Photometer H.

23^h 27.5 Cloudy. S. Obs.

Following readings at intervals among clouds.

35,6		23^h	31^m	39,0
127,2	< IV disappears	45 50		
42,0		46 08		57,0
116,5		46 36	32	20,0
		47 32	33	22,5

Planet seem very well, but 49 45 35 35,0

Sat. II not seen.

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1879phae.proj..481S

Aug. 7, 1879.

Limit of Visibility, Satellite IV. went into clouds before corresponding Setting

~~23h 37m 6[illegible]~~

45.5

40 111.3

60.5

106.7

3240

81.00

65.8

46.2

1120

560

28.00

Jupiter about as much in clouds as when readings were taken on Sat II.

Bond 236

23	47	36.5
	48	36.5
	49	37
	50	37

Bond 394,

		0
		0
15	4	0
15	5	0

23 47 36.5 = 15 1 44.5

1 44.5

45 52.0

47 = 45 52

44 51

38 50

32 45 49

26

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1879phae..proj...481S

Aug. 3, 1879

Photometer F.

Dec. 9 Jupiter I Cent. Clocks

F. 3451 B 394

22 5 42.0 18 10 0.0

22 6 42.0 11 0.0

Con 13 31 25 W.M.T. m.n.T. 13 31 24.7

23 41 23 41

13 55 6 C.M.T. C.M.T. 13 55 0.1

4

22 51 C 51

C. M. T.

h	m	s				
13	49	46	45	50	3.33	
	50	43	46	47	3.24	
	51	09	46	13	3.43	
		31	47	35	3.26	1.28 / 3.256
		54		56	3.02	
	52	14	48	18	2.59	
		32		36	2.65	
		50				
		49		54	2.39	3.00
	53	03	49	8	2.66	2.60
		23		28 (20)	2.71	
		45		50 (22)	2.69	
	54	03	50	8 (18)	2.62	
		19	50	24 (16)	2.06	
		42		47 (23)	1.83	
		59	51	04 (17)	1.53	
	55	13		08 (14)	1.53	
		29		34 (6)	1.20	
		43		48 (14)	.95	
		55	52	0 (12)		Run not [illegible]
	56	15	52	28		

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1879phae.proj..481S

Aug 3 1879

55

94
92
97
111
105
499
.998

Comparison of brightness by naked eye.
Jupiter > Mars > α Aurigæ > Saturn

		γ 34 51				β 39 4	
23	3	51.5	+		14	8	0.0
	4	51.5	+			9	0.0
	5	52.0	−			10	0.0

Robt. Pace.

Aug. 4, 1879.
Cloudy.

Aug. 5, 1879.
Cloudy.

Aug. 6 1879.
Visitors all the evening. Exhibited Venus, α & ε Lyræ, ring nebula (H.6.4447), Jupiter, Moon.

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1879phae.proj.;4815

Aug. 7. 1879.

Apparatus for observing spectra recomposed after some search. Eye-piece not found; used No. 2 filar micrometer. O. obs.

Nebula G. C. 4045.

8 45 Spectrum mainly continuous. } G.C. 4042 not seen; sky somewhat hazy.
Suspicion of gaseous spectrum. }

Photometer Q.

Focus readings of small telescope, on ζ Serpentis.

8 54 13.3 S. obs. 17h 5m S.T.
13.0
13.3
13.2+

Eye-piece perhaps a very little too far out to be in the best focus on the edge of the prism, but nearly right.

Comparison of neb. with ζ Serpentis beyond focus.

8 55 17.0 S. obs.
17.2 17h 59m
17.6
17.3+

Same, within focus.

8 57 9.6 S. obs.
7.8
8.2
8.5+

Same, within focus.

9 5 6.4 U. obs.
6.2
7.2
6.6+

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1879phae.proj..481S

Aug. 7, 1879.

Same, beyond focus.

9 6 17.0 U. obs.
17.3
16.3
16.9+

9 10 Spectrum mainly continuous. U. obs.

9 15 U. examined region formerly observed with asteroid.
G. C. 4083.

9 20 Spectrum continuous U. obs.
No evidence of gaseous spectrum S. obs.
12.7 spectrum Photometer Q } Eye-piece readjusted. }
17.0 compared with ζ Serpentis.
17.6 S. obs.
17.6
17.4+

9 37 6.2 S. obs.
6.6
8.0
6.9+

9 41 6.2 U. obs.
5.2
~~7.2~~ 6.2+

9 43 17.3 U. obs.
16.1
19.2 18.2+

9 50 U. examined another region for identification of stars.

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1879phae.proj:1.481S

Aug. 10, 1879.

Constant of diopter. S. obs.

8h to 9h

	β Bootis	γ Urs. Maj.	α Cygni	β Urs. Min.
	26 3/4	20 1/2	24 1/16	9 7/8
	26 13/16	20 9/16	24 3/16	9 15/16
	26 13/16	20 5/8	24	9 3/4
	θ = 25.°22	18.°46	22.°35	8.°35
log cot θ	0.3270	0.4765	0.3860	0.8333
	1.1265	1.0107	1.0802	0.6937
	1.1274	1.0120	1.0825	0.6964
	1.1274	1.0132	1.0792	0.6884
	1.4535	1.4872	1.4662	1.5270
	1.4544	1.4885	1.4685	1.5297
	1.4544	1.4897	1.4652	1.5217
	28.41	30.70	29.25	33.65
	28.47	30.80	29.41	33.86
	28.47	30.88	29.18	33.24
	17.18	17.69	17.36	18.23
	17.17	17.68	17.35	18.22
	17.17	17.68	17.37	18.23
	12.93	15.46	14.16	17.79
	12.90	15.44	14.10	17.78
	12.90	15.42	14.18	17.80
	15.48	15.24	15.09	15.86
	15.57	15.36	15.31	16.08
	15.57	15.46	15.00	15.44
	16 2	106	40	238
	15.54	15.35	15.13	15.79

Observations of the stars reduced with constant 15.5: angles from α Urs. Min.

β Bootis
50.°5 −1
50.7 +1
50.7 +1
50.6 ±0.°1
Computed value 50.°4

γ Urs. Maj.
36.°7 −2
36.9 0
37.0 +3
36.9 ±0.°2
Computed value 36.°9

α Cygni
44.°8 0
44.6 +3
44.1 −2
44.3 ±0.°2
Computed value 44.°7.

β Urs. Min.
Reduction table not made for so small a distance; very little weight given this star in determining the constant, as the diopter was meant for measuring halos about 45° across.

79
486
175
91
831
415
38

~~log cos² θ~~

Tangent of half observed angle $= \frac{\frac{1}{2}a}{15.5 + \sqrt{h^2 - \frac{1}{4}(a - \frac{5}{8})^2}}$, in which a is the measured distance between the sights, and h the distance from sight to pivot.

15.4

Calculation repeated with more accurate value 15.5.

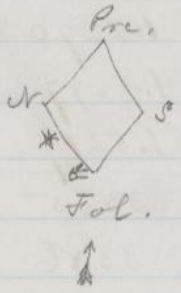
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1879phae.proj..481S

Aug. 10. 1879.

Swifts' Comet. O. C. Ir. Obs.

Comparison Star D. M. +63° 1194. Mag. 7.0
Transits at disappearance
Comet + Star both in Northern half of ~~field~~ square,
Pos. Circ. set at 5° = 320° + 45°
Six complete sets, — reject two partial sets after first set,
Order * ∈ * ∈



At 22h 4m S. T. Comet 40° fol. and 3' south of D. M. +63°. 1194

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1879phae.proj:1481S

Aug. 10, 1879

14 30 Looked at η Draconis; companion not seen with ordinary eyepiece.

15 0 Triple star near pole.
Photometer H.
DM. 89° 37, star a. S. obs. 340°, 7".

15 14 12.0
140.1 DM. 89° 37 disappears.
19 [illegible] 54.4 ✓
312.8 59.2 ✓ 113.6 ✓ 3.3 ✓
6594 ✓
3297 ✓
1644.85 ✓
~~2840~~

S. obs. 200°, 7"

15 20 50.8
102.3 51.5 ✓ DM. 89° 37 disappears
228.1
280.9 52.8 ✓
662.1 104.3 ✓ 3.6 ✓
33105 ✓
1651.2 ~~56.08~~

Observation barely possible.

Perseid meteors numerous and brilliant during the night.

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1879phae.proj..481S

Aug. 10, 1879.
Jupiter's Satellites.
Eclipse of Sat. I.

Bond 236			Bond 394.		
0h	47m	1.s0	15h	30m	0.s0
	49	1.0		31	0.0

15h	26m	5.5	Gr. S.
	23	41.11	
15	49	46.61	C. S.
15	31	0.0	
	18	46.61	
0	49	1.0	
1	7	47.61	Apps. Sid. S. of Eclipse.

~~Eclipse~~

Photometer H,
Images in opposite edges of field.
Seeing 7. 4. 5.

Comps. of Sat. I. with ~~Sat III~~, S. Obs.

33.4 ∠III dis.
107.0 73.6 0h 57m S. S.
223.2 73.0 XII
296.2 147.0 recorded some time later, from memory.

5598 133
2799
1399.5

Evidently 296.2, which should be used in the reduction.

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1879phae.proj.1.481S

Aug. 10. 1879.

Comps. of Sat. I with Sat III.

37.0
106.0 69.0
220.2
301.0 80.8
664.2 1498
3321 749
166.05 37.45

1h 1m S.V.

32.7
111.1 78.4
29.0
2818 80.0
1409 1584
70.45 109.0 792
30.0 3960
111.2 81.2
33.0
2869 797
14345 1609
71.72 112.7 40.22
39.9
110.3 70.4
31.3
2832 7.0.4
1416 101.7 35.2
70.80
31.5
109.5 78.3
2841
14205 29.5
71.02
113.3 83.8
1621
4052
36.2
104.4 68.2
38.0
107.0 69.0

15 44
1h 58 2m 13.0
44 14 29.0
20
27 25 42.0
41 56.5
54 3 9.0
45 5 21.0
16 10.5 32.5
27 43.0
44 √9.5
56 4 12.0
46 7 1 23.0
18 34.0
30 48.5
42 √ 0.5
48
54 12.0
15h 47m 06 24.5
20 34.5
31 41 √4.5
49 6 9.5
48 00 20.5

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1879phae.proj..481S

Aug. 10. 1879.

39.7		15h	48	18	1h	6m	37.5
96.1	56.4			28			48.0
49.1				38			58.0
93.3	44.2			48		7	7.5
49.5				58			17.5
91.3	41.8		49	12			31.5
57.0				24			43.5
85.0	28.0			41		8	1.0
67.0				59			19.0
Last seen at about			50m	02			22.0

(estimated 3s after last setting)

Limit of Visibility.

68.8			
76.5	7.7		1h 11m 5.5,
250.7			
258.3	7.6		
6543	7.65		
3271.5			
1633.58	3.82		

1	18	6.0	B 236
16	0	0	B 394

1	19	6.0	B 236
16	1	0	B 394

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1879phae.proj.r.4815

Aug. 11, 1879.

Triple star micr pole. Photometer H.

DM. 89° 37, star a.

8 55

14.9
141.2
189.1
321.3
166 5
3325
1666

47.9 DM. 89°37 disappears

53.6
101 5
~~5075~~
~~25.38~~

3.6

S. obs. 100°, 8".

9 8

50.0
102.1
232.1
279.0
663 2
3316
165.80

52.1 DM. 89°37 disappears

46.9
99.0
~~49.50~~
~~24.75~~

3.7 Observation just possible.

S. obs. 240°, 7"

Neb. G. C. 3964 not seen S. Obs. sky hazy.

Neb. G. C. 3967 not seen. S. Obs.

Neb. G. C. 4026 not seen S. Obs.

Saw Neb. G. C. 4045 but quite faint. although marked v B. by Herschel. - not measured because obs. previously found accidentally.

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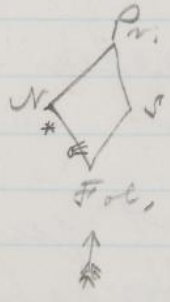
1879phae.proj..481S

Aug. 14. 1879.

Neb. G. C. 4234 not certainly seen. may be visible but not recognizable as a nebula.
Neb. G. C. 4234 not seen S. Obs.

10 10 Swift's comet. Spectrum faint, doubtful; but pretty certainly in part continuous, with probably also a weak monochromatic spectrum. (If the spectrum actually consists of bands not far apart, the series of images produced may imitate a continuous spectrum with this apparatus).

Swifts' Comet. O. C. Tr. Obs.
Compar. star. D. M. +62° 1414 mag. 6,7
Comet & star both in northern half of square.
Pos. Circ. set at 69° = 24 + 45
Six complete sets – reject partial sets.
Order ∈ ∈ * *
At 22h Comet precedes star 3m 6s and is 3' south.



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1879phae.proj.r.481S

Aug. 12. 1879.

Bond 236

19h 13m ↓30
14 ↓3.↓

Bond 394,

9h 49m 0↓
↓0 0

2.↓ ↓7,0
19.0 7,↓

9h ↓4m ↓0,↓
23 41.1

10 18 31,3
9 ↓0 0

28 31,3
19 14 ↓7,↓
19 43 24,8

Sat. I compared with IV which is nearer than II or III.
Clock carries Jupiter too fast.
Comparison made by holding Jupiter outside edge of field.

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1879phae.proj..481S

Aug. 12, 1879.

Phot. H. P. Obs.

19.7 19h 33m 43.√

118.9 +43.8 < (I disappears.) 34 7.√

137.6 34 33 29.√

114.6 16.4 30.57 √0.√

2335 131.0 15285 35√ 8.√

11675 16.7 76.42 24.0

58.38 112.6 129.3 2879 46.0

14395 36 36 21 35.√

115.13 13.3 71.98 √4.0

2279 126.6

11395

56.98

137.6 < (IV dis.) 19 37 2√.√

55.0 192.6 √2.√

137.3 38 19.2 3A √2.0

54.4 191.7 6592 39 7.0

94 3296 27.√

547 135.3 164.80

27.35 58.7 194.0 39 55 47.0

6608 40 4.√

58.1 136.7 3304

58.4 194.A 165.20 20.0

29.2 137.A 34.√

61.6 199.4 40 57.5 49.√

6642 41 3.√

133.2 3321

60.6 166.05 22.√

61.10 193.A

30.55 133.6 < 55.2 34.√

55.2 188.8 50.0 44.0

138.8 50.5 41 53.1 √9.0

50.5

10.57

5285

26.42

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1879phae.proj.481S

Aug. 12. 1879.

	189.3	57.5	19h 57m 42s		11,0
	131,8	56.4	10h 17m 08		22,√
650.5	188,2	53.4	24		34,0
325 25	134,8	51.5	36		49.√
162.62	186,3	41.1	46	43	0.√
	145,2	39.4	58		12.√
	184,6	31.8	18 10		23.√
	152,8	24,8	20		34.0
	177,6	19.8	35		49.0
	157,8		49 44		3.0
	suspected		18 58		12.0

Limit of visibility, Jupiter out of field, P. obs.

157.1	12.5	19h 45m
169.6		
150.2	11.6	
169.8	241	
6547	1205	
3275	6.02	
163.68		

B 394

10 30 0.0

31 0.0

B 236

19 55 0.0

56 0.0

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1879phae.proj..481S

Chronograph Observations on Swift's Comet.
Made Aug. 10. 1879. (see page 198.)

	D. M. + 63° 1194.		Comet.	
21	39	51.0	40	12.4
	40	44.3	41	41.9
	42	59.7	43	20.2
	43	55.7	44	13.4
	44	38.9	44	58.7
	45	32.9	46	33.1
	47	18.0	47	37.3
	47	55.7	48	56.8
	49	44.9	50	4.8
	50	22.2	51	24.3
	52	51.2	53	9.4
	53	27.6	54	30.9
	55	30.7	55	47.9
	56	6.8	57	10.4

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1879phae.proj.481S

Reduction in R. A.

D. M. +63° 1194.		Comet.		α − *
21h 40m	17.s65	40m	57.s15	+39.s50
45	5.90	45	45.90	+40.00
47	36.85	48	17.05	+40.20
50	3.55	50	44.55	+41.00
53	9.40	53	50.15	+40.75
55	48.75	56	29.15	+40.40
21h 48m	40.35	21h 49m	20.s66	+40.s31

Reduction in Declination.

D. M. +63° 1194.		Comet.		$\frac{\text{Col. 2} - \text{Col. 1}}{2}$ × 15 cm. Dec.
0m	53.s3	1m	29.s5	124.61
0	54.0	1	34.4	139.05
0	37.7	1	19.5	143.91
0	37.3	1	19.5	145.25
0	36.4	1	21.5	155.27
0	36.1	1	22.5	159.75
				6)867.90
				−144.″65

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1879phae.proj.481S

Chronograph Observations on Swift's Comet.
Made Aug. 11. 1879. (see page 204.)

	Comet.		D. M. + 62° 1414.	
21	18	40.7	21	56.0
	19	30.2	22	31.3
~~23~~	23	9.3	26	26.2
	24	1.7	27	0.0
	27	53.2		
	28	22.4	31	40.2
	29	16.2	32	12.4
	32	59.6		
	33	54.1		
	34	37.9		
	35	35.7		
	36	13.1	39	33.8
	37	10.0	40	4.4
	40	52.3	44	13.2
	41	50.9	44	42.4
	45	50.7		
	46	50.2		
	47	38.2	51	2.1
	48	39.2	51	28.8

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1879phae.proj.481S

Reduction in R. A.

Comet.	D. M. +62°. 1414.	$\alpha - *$
$21^h\ 19^m\ 5.45$	$22^m\ 13.^s65$	$-3^m\ 8.^s20$
23 35.50	26 43.10	−3 7.60
28 49.30	31 56.30	−3 7.00
36 41.55	39 49.10	−3 7.55
41 21.60	44 27.80	−3 6.20
48 8.70	51 15.45	−3 6.75
$21^h\ 32^m\ 57.^s02$	$36^m\ 4.23$	$-3^m\ 7.^s22$

Reduction in Declination.

Comet.	D. M. +62°. 1414.	$\frac{\text{Col. 1} - \text{Col. 2}}{2} \times$ N Co. dec.
$0^m\ 49.^s5$	$0^m\ 3\ 5.^s3$	47.45
0 52.4	0 33.8	62.16
0 53.8	0 32.2	72.19
0 56.9	0 30.6	87.91
0 58.6	0 29.2	98.27
1 1.0	0 26.7	114.66
		6)482.64
		−80."44

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Aug. 14, 1879

Swift's comet. O.C.W. obs.

Transits, time by watch of A. Searle

9h	13m	36s.5	star about 15h 25m +60°.2 7 mags.
	15	32	comet 8' south of star.
	1		The star is probably DM. +60° 1612

9	24	29	Star across 1st wire side of square
	25	49	" " 2d " " " "

Better position of star 3h 40m 60°.5

19 3

15 23

Identified as DM. +60° 1612 by means of DM. +61° 1501 which was found to precede it 47s. DM. +60° 1611 also seen in approximately correct place.

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1879phae.proj.481S

Aug. 19. 1879.

8 30 G. C. 3701 S. Obs.

Object supposed to be the N. about nebula.

Dec. circ. reads .3° too much. ($\frac{3}{10}$ of a degree).

Telescope about 1m west in time (of true place). No other near; this answers to description.

Spectrum continuous.

Photometer Q.

Nebula compared with star of the 4th mag. { α about 14h 40m (220°) δ " + 2°.2 109 Virginis (B.A.C. 4878)

14.6
14.3 } Beyond focus.
14.1
10
14.33+

Set within focus.

10.2
10.2
11.1
15
10.5+

Focus readings on star

12.4
12.2
13.3
19
12.63+

9 20 G. C. 4302. Spectrum gaseous. P. & S.

Professors Newcomb & Trowbridge also worked at the nebula, and at Photometric Q & J.

18.6
18.7 } Beyond focus.
19.1
24
18.8+

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Aug. 19, 1879.

Within focus. S. Obs.

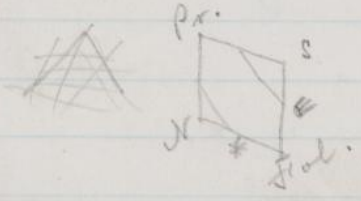
5.1
4.7
4.6
4.8+

Compared with ψ Ophiuchi.

Of Swifts Comet.

O.C.Tr. Obs.

Comparison star D.M. +5°6°. 1820. Mag. 7.5
Comet in southern and star in northern half of field.
Pos. circ. set at 332°.0 = 27.+45.
Six complete sets – reject partial sets.
Order ∈ ∈ * *
At 0ʰ R.A. ∈ = 15ʰ 30ᵐ
" " Dec. " = 56°.1 by circle.



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1879phae.proj.481S

Aug. 19. 1879.

Bond 236
21h 37 33,5
38 33,5

Bond 394.
11h 45 0,5
46 0,0

11h 49 40.7
23 42.
12 13 23
11 46 0.0
27 23.
21 34 33.
22 5 56 Asp. time of eclipse.

Jupiter I, II. Photometer H. S. Obs.
19.9 ∠I dis.
125.2
21h 52m 203,3 78.1
294.6
64 30
32 15
16 0.75

85.3
16 34
8 17
4 0.85

Jupiter I, II.
28.9 ∠I dis.
126,0
21h 54m 192.2 66.2
30 5.5
6 5 26
3.26 34
1 6 3.15

83,4
149 6
7 4 8
37.4

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Jupiter I, III (Disappearance of Jupiter I).

		124.6	78.1			21h √6m 30.0
			II disappears			
		202.7				41.0
3	6593	125.0		12 3 55	47.5	√3.√
	32965		82.0			
	16482	207.0	1601		√7	√.√
			8005			
		120.8	40.02			20.0
			78.5			
		199.3				32.√
4	6444				40.1	
	3222	119.3	85.7	12 4 47		46.√
	161.10		1642			
		205.0	41.05		√8	1.√
		120.0				16.√
			79.0			30.0
5	649.2	199.0				
	3246					
	16.23	129.2	71.8	12 5 44	37.4	46.0
		201.0	108			47.0
			754			
		124.8	37.70		√9	7.√
			76.2			19.√
6	6440	201.0				
	3220	120.7		12 6 31	24.2	30.√
	161.00		76.8			
		197.√	765			39.√
		130.8	38.25			√0.0
			66.9			
		197.7				√9.0
7	6520					
	3260	118.√		12) 12 22	0 5.0	10.√
	163.00		86.5			
		205.0	1534			20.√
			7670			
		120.3	38.35			30.0
			72.7			
						39.0
8	6500	203.0				
	3250					
	162.50	122.2	82.3	12 8 64	47.4	√√.0
			1550			
		204.√	775		1	√.√
			28.7√			2
		116.√				17.√
9			83.6			
		200.1		12 8 51	34	28.0

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6473
3 2 36.5
161.82

123.8 206.9 114.4 207.3 122.0 210.0 121.2 207.4 123.7 202.2 121.4 206.0 116.0 217.4 104.7 217.8 104.0 195.0 135.3 187.0 138.4 144.0 140.0 177.0 156.0

83.1 .7 83.35 41.68 88.9 88.0 88 45 44.22 86.6 78.5 165 1 82.55 41.28 84.2 101.8 1860 930 46.50 113.1 91.0 2041 1012.05 51.02

Suspected,

10657.7
3 2885
164.42

11 6549
3 27 45
163.72

12 6616
3308
165.40

13 6215
3107.5
155.38

22h 1m

12 9 37

12 10 22

12 11 2

11 7.5
11 25.0
11 36.0
11 51.0
12 10.5
12 25.5
36.0
48.5
57.0
13 8.5
20.0
31.
14 05.5

3 6.0

4 46.5

6 19.5

3 F.0 √2.0 1.0 14.5 26.√ 36.0 4F.0 √9.0 13.0 24.0 32.√ 41.√ √0.√ 1.√ 19.0 30.0 45.0 4.5 19.√ 30.0 42.5 √1.0 2.√ 14.0 25.0 √9.√

Images about $\frac{3}{4}$ of the field apart.

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Aug. 19. 1879.

Jupiter II. Limit of Visibility. 9. 6bo.

	159.9	8.1
	164.0	
22h 9m	336.2	12.0
	348.2	
	10 1 2 3	
	5 06,5	Seeing 7. 6. 6.
	253.08	

22	27	42	22	28	42	B 236
12	35	0	12	36	0	B 394

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