

KG
11365
156

Oct 1846 July 1847

St. I.

Vol. I 1-80

1846.
October to
1847
July.
Equatorial.

KG-11365.156

Height of Equatorial Pie
about 35 ft. of alluvium
Contains abt 500 or 600 tons of
granite.

~~without~~ With cupstone Cubic feet = 5555.
at 11 cubic feet to the ton = Tons = 505.

Equatorial Vol. 1

$$r \text{ of } 2 \times 5 = 31'' - 0.1 = 30.9$$

Eleven cubic feet of granite
to a ton. (Medford granite, as
nearly as they can easily determine)
The darker granite weight heaviest.
fifty cents a square foot for working.

Em. 86 Piscium Feb. 18.

Double envelope to Comet
March 6

October 24th P.M. 1846* 7th B. d. lat.

Observations on the New Planet

28.40
-12.40

21 38.00.5 * 7

Wing Micrometer

34
16'

39.21.1 Planet

* 21.58.21.4

Dif. of R. P follows

1.20.6

P 21.42.5

1.20.6 1/2 M.

21.44.00.9 *

1.21.1

1.21.1 } 1.20.8

22.00
14.11
7.50

45.22.0 P

22.00.35.4

1.20.5

1.21.1

01.56.6

1.21.1 }

21 45.53.4

1.21.2

1.21.2 } 1.21.1

47.12.9

02.34.2

1.20.9

1.20.5

03.55.1

1.21.4

22.05.14.8

1.20.9

1.21.2

76.2

Wings out of focus a little. Zero at coincidence

1.21.2

21.4

P 6.415 6.31 7.05 1.20.9 WCB

8.46.0

* 12.950 12.941 12.21 1.21.1

05.2

19.365 19.25 19.26

Mean diff. of R. 1.21.03

1.2

103.22.46.3

diff. of R. 9.53.3

11.01.9

Proc 1.07.7

WCB 9.44.2

23.1

WCB

103.23.54.0

9.39.4

4

7.27 7.42

13.23.54.0

9.53.4

12.53.4

12.04 11.83

9.53.4

P Dec -13.23.47.3

14.3

19.31 19.25

13.33.47.3

R 21.51.27.04

Dif. of Dec.

21.50.19.97

* is 7648 B. d. lat

19.36 WCB

12.96

R 21.50.06.01

19.25

mean 19.20

Dec -13.23.54.0

19.26

21.50.06.01

Dec -13.23.54.0

19.31

57.60

From Merid. Observations

mean 19.28

19.25 WCB

57.60

Prof. Challis finds the place

19.10

57.60

of this star R 21.50.09.94

19.10

57.60

Mean of six obs.

19.11

21.50.06.01

Dec 13.23.55.52

19.16

1.21.03

ap. diameter 3.87

19.13

21.51.27.04

ap. diameter 3.87

mean 19.12

19.13

2 1846: Oct = 24 $\pm$ 20 Fr. Spider line
 Dec - 424 up low
 22.35-- 7-17^a - 11-9^h J.P.B. det.
 9-91 - 10.19
 9-44 - 9.67
 9.57 - 9.59
 9.90 - 9.23

KG 11865.156



Oct 26th Alt alt 40 clock 424 marking 6^h 41^m 10^s Was turning round
 Roundabout and saw my shadow cast by a brilliant light. I looked
 up and saw a meteor just disappearing leaving a train for a few seconds
 by which its place was closely determined. At the beginning of the
 train 9^h 06^m Dec = 25° S of the End at 9^h 34^m Dec = 27° S. Being
 with my back to the object, I could not tell its magnitude at its commencement
 but from the intensity of the light it cast on the ground before me
 it ~~must have been~~ ^{it appeared} near that of the full moon but rather less probably, as
 its greatest brilliancy lasted only a half a second. & the contrast with the
 starlight must have ~~led~~ ^{led} to an over estimate. Then seen which
 was only for an instant it was about the size & brightness of Venus. Its
 light was white or bluish perhaps. It increased & decreased rapidly
 lasting about a second. The train was ~~rather~~ composed I suppose
 of sparks. Its course was to a point in the horizon one or two degrees
 East of S.

Oct 26 Adle



Jupiter's belts seen with the 5 ft power 75 at times with remarkable distinctness. If the same side is now presented to us as was on the last observation

The lower belt has ~~certainly~~ changed its aspect - it is now quite ragged, with two indentations of a brightness equal to that of the planet on the under side & one above; the latter with the corresponding snags at a. The belts both seem to fall away before reaching the sides of the Planet. The upper belt is smoother as far as I can see. The 75 power for some reason gives a very much better view than the 240. The lower belt looks very rough as though it was a rocky surface.

Oct 29		1846	New Planet	Red screen	21.20
1 st wire		2 nd wire	Comb above		14.30
* 21	09.22.6	- 49.9	11.53.6	12.20.9	
P	10.37.0	04.5	13.07.9	13.35.8	
	1.14.4	1.14.6	1.14.3	1.14.9	
21	14.16.3	14.43.5			
	15.30.7	58.3			
	1.14.4	1.14.8			

Position reading after 180° Comb below

21.25.14.3	25.28.5	27.18.5	27.32.8
28.8	26.42.9	38.0	47.1
1.14.5	1.14.4	1.14.5	1.14.3
30.18.1	30.32.5		
32.5	46.5		
1.14.4	1.14.0		

21.35	9.11	Comb to left zeros agree			21.50
A 11.26	11.32	11.47	11.54	11.61	
B 9.11	8.98	8.90	8.78	8.70	
20.37	20.30	20.37	20.32	20.31	
20.30					

20.37					Dif. of R
20.32					1.14.4 1.14.5
20.31					1.14.6 1.14.4
20.33					1.14.3 1.14.5
609.9					1.14.9 1.14.3
630.23					1.14.8 1.14.4
203					1.14.8 1.14.0
628.20	Star is same as on 26 th				1.14.57 1.14.35
10.28.2 = dif. Dec	Comb at 52 Oct 29. 6.48 ^{am}				Dif. R 1.14.46

24.43
23.10

3.50

Star is B.A. Cat. 7648

Mean Place *

1. 33

Planet follows Star

Planet S of Star

Jan 1st 1846 R 21.50.06.01

21. 9. 30.00

1. 26.66

Mean of two

~~9. 53.3~~

Dec 5 - 13. 23. 54.0

24. 7. 48

1. 21.03

9. 53.3 Mean of 10

21.

29. 6. 48

1. 14.46

10. 28.2 Mean of 9

21. 50. 06.01

- 13. 23. 54.0

21 R 21 51.32.67

24 21. 51. 27.04 - 13. 33. 47.3

29 21. 51. 20.47 13. 34. 22.2

Tuesday, Nov. 3rd, 184622.00
14.49
7.01

New Planet (Leveriers)

28. 51. 56.8	8. 18	21. 45. 05	A 8. 53	49. 04.8	8. 55 12. 72 too large
52. 08.1	12. 58	46. 16.2	B 12. 27	50. 15.9	
1. 11.3	20. 76	1. 11.2	20. 80	1. 11.1	

Telescope reversed, & crosses the meridian

x 59. 56.5	B 13.51	02. 41.0	13.71	06. 22.8	13. 56	finished at 5.15
P .07.8	A 7.22	02. 52.0	7.10	07. 34.1	8. 95	
1. 11.3	20. 73	1. 11.0	20. 81	1. 11.3	20. 81	

MSX 7.00

diff. Sec

20.76

80

73

81

81

20.78

31

20.78

6234

64418

208

642.10 = 10.42.1

Obsd. diff

R

rev. per.

1. 11.3

1. 11.3

1. 11.2

1. 11.0

1. 11.1

1. 11.3

1. 11.20

1. 11.20

10. 11. 26.8

Nov 5th 1846 New Planet.

Enter position

21.00
14.57
6.03

* 20.44	38.00	9.86	48.53.4	10.24	04.04.1	10.54
P - 45.49.00	10.87		50.04.3	10.87	5.14.5	10.37
1.11.0	20.73		1.10.9	21.11	1.10.4	20.91

57.16.8	10.41	00.07.8	H.S. 7.4	10.64	13.31.7	H.S. 31.6	10.06
58.27.0	10.56	11.18.3	8.0	10.27	41.7	41.2	10.88
1.10.2	20.97	1.10.5	0.6	20.81	10.10.0		20.94

07.52.9	42.00	11.03
08.03.3	02.5	9.91
1.10.4	10.5	20.94

20.73

21.11

20.91

97

81

94

20.91

31

20.91

6273

64821

209

646.12

10.46.1

diff R

1.10.4

1.10.2

HS

10.5 10.6

10.0 10.6

10.4 10.5

10.1 10.2

1.10.27 10.22

Obs'd diff. R

1.10.25

HCB

Nov 6th 1846

measures not very good on account of clouds or haze

* 21 48.12.4 A 8.88 above
P 49 23.0 B 11.93
20.81

1 10.6

* 21 51.27.4

P Clouds.

59 09.2 B 10.57 above
19.3 at 10.41

1 10.1 20.98

03 18.6 B 10.27

04 28.9 10.64

10.3 20.91

22 06.34.1

cont in it.

08 33.5 9.98

44.0 10.91

10.5 20.89

47 05.0 9.87

13 15.6 - 11.03
20.90

gPB Ch 424

Above - 9.67

Below 11.17

20.84

10 19.13 - 2
20 23.2

21 0.3 9.41

22 10.7 11.10

20.99

altitud & readjusted

10 26.46.3 9.24

27 56.8 11.69

10 28.45.2 20.93

19 55.3

Stars faint from haze
observations rather trying to be exact
Obs'd diff 1.10.38

20.90

Diff of R

1.10.6

1.10.1

HCB

20.90

10.3 1.10.42

20.81

10.5

20.98

10.6

20.91

10.2

20.89

20.90

20.84

20.91

20.93

20.90 = 10.45.8

1.10.30

10.4

10.5

10.1

gPB new position

10.36 02.8

37.12.5

9.7

10.36 17.0

37.27

10.0

38.39.2

48.8

9.6

10.38 53.0 ?

10.40 03.2

10.0

position turned 180°

43.24.2

34.8

10.6

10 43.39

48.9

9.9

45.52

1.9

9.9

10 46.06.4

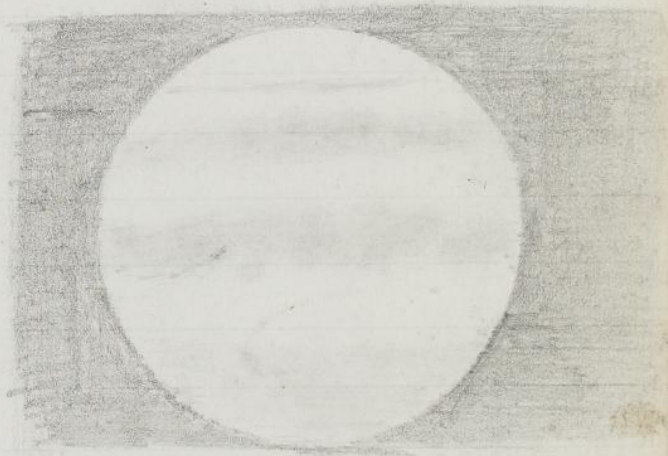
16.2

9.8

1846: Nov 7th at 11^h 21^m m.s.t.

a meteor was seen by H.C.B. in appearance much brighter, and double the diameter of Venus when at her brightest and nearest - the light of the meteor was white with the slightest tinge of yellow - in strong contrast to the ruddy light of a burning house which was on fire in the azimuth crossed by the meteor.

The meteor appeared round (☉) and during 10° of its path maintained a uniform size and light - it then rapidly decreased



5) 469/898

Nov 13 10 P.M. Saw Jupiter very perfectly. Its true North arc-

3/268/893

polar regions from Lat 60° are darker than the rest of the planet excepting the belts. remaining of nearly a uniform shading except two wisps of darker shade close together & just perceptible. The belts are very irregular, the middle which is the principal has a dark spot on it well situated for determining the rotation. The belts on not of a uniform surface in some parts curiously shaded but often seeming to be interspersed with lighter parts. The terminating abruptly. The middle belt has the appearance of being bent

Nov 18th 1846

Comb left

23^h 16^m 19.9 A 11^m 47 below
 ..17^m 39.4 B 7^m 66
 1^m 19.5 19 .13

20^h 17.0 B 7^m 58 above
 21^h 36.3 A 11.56
 1^m 19.3 19.14

23^h 23^m 09.4 7^m 47
 24^h 28.9 11^m 64
 1^m 19.5 19.11

23 24
 15.45
 7.40

comb right.

27^h 46.8 A 7^m 09 above
 ..09.0 B 11.47
 1^m 19.2 19.06

31^h 25.7 6.97 34^h 58.3 21
 32^h 45.0 12.10 .. 18.6 89
 1^m 19.3 19.07 1^m 19.3 19.10

Def A

new pos.

19.13	1 ^m 19.5	19.2
14	.3	.3
11	.5	.3
06	1 ^m 19.43	1 ^m 19.27
07		
10		
14.10		
14.10		
57.30	9 ^m 42.1	
592.10		

Nov 20th 21st Dec

424 9^m 23^m 30 D 48^m 00 N
 E h 4^m 01^m 20

New Plant Leverrier $\frac{7}{6}$
Nov 21st PM 1846

P

* 23..20..00.7 A 6..65 above

P 21..26.2 B 11.40

1..25.5 18.05

23..23..10.6 6..68

24..35.7 11.53

1..25.1 18.21

23..26..10.6 6..50

27..36.2 11.62

1..25.6 18.12

0..20..58.6 A below 9..18

22..24.0 B 8..88

1..25.4 18.06

24..45.4 B 8..83

26..10.7 A 9..23

1..25.3 18.06

0..27..57.23

30..55.7 B 8..82

0..29..22.0

32..21.0 A 9..40

.8 1..25.3 8.22

out in Position

0..34..13.0 8.66

0..35..38.6 9..49

1..25.6 8.15

18.05

21

1..25.5

25.6

12

.4

.8

06

.3

3

06

1..25.40

25.57

22

15

18.12

31

18.12

543.6

567.72

18.1

559.91

9..19.9

Nov 24th

H. Safford

$$\begin{array}{r} 23.50 \\ 16.12 \\ \hline 7.38 \end{array}$$

moved 180° in position.

164

3. 23. 49.0 49.0 B 8.76

20.5 20.0 at 8.18

1. 31.5 - 31.0 16.94

27 00.4 00.0 B 8.73

28. 32.2 31.6 8.30

1. 31.8 31.6 17.03

30. 35.0 35.0 8.38

32. 06.8 06.6 8.63

1. 31.8 31.6 17.01

34. 03.2 03.0 8.51

35.3 35.3 8.44

1. 32.1 32.0 16.95

41. 53.6 53.0 at 8.95

42. 25.2 24.4 B 8.04

31.6 - 1.4 16.99

44. 30.1 29.6 7.97

01.6 00.0 9.00

1. 31.5 2.4

~~48. 56.7~~ 56.4

50. 06.8 06.6 8.73

38.3 38.0 8.18

31.5 31.4 16.91

G.B.

H.S.

16.94

1. 31.5

1. 31.0

17.03

1. 31.8

31.6

17.01

31.8

31.6

16.95

32.1

32.0

99

31.6

31.4

97

31.5

32.4 ?

91

31.5

31.4

16.97

1. 31.69

1. 31.63

31

16.97

5091

52607

170

52437

8.44.4

Dec. 3rd 1846 New Planet Lum? Adams16.47
0.25
7.389th D-21.28 13
x x
x x

By 2557

* D. 13 01.8 B 8.50 18. 08.3 8.30 22. 03.7 8.22
 15 00.2 A 3.9.1 20. 06.8 4.04 24. 02.4 4.09
 1. 58.4 12.41 1. 58.5 12.34 8.7 12.31

8. 48.12
 wh 2. 29.41

alt. 18.0° in Position

O. 27. 34.8 A 7.74 31. 18.7 70 34. 32.1 70
 29. 33.9 B 4.55 33. 17.0 64 36. 30.4 64
 1. 59.1 12.25 58.3 12.34 1. 58.3 12.34 8.7

12.41 1. 58.4
 382.23 34
 123 31 8.5
 381.00 25
 6' 20.0 34 9.1
 12.33 34 8.3
 12.33 31 8.3
 382.23

Dec 9th 1846

424*0. 06. 12.7 A 3 13 09. 53.1 3.06 13. 30.3 2.95 1. 58.55
 P 08. 34.7 B 5.08 12. 14.9 5.14 52.2 5.19 0.20
 2. 22.0 8.21 2. 28.8 8.20 2. 21.9 8.14 17.11
 7.10

reversed in Position

O. 23. 22.7 B 3.01 27. 50.3 2.45 31. 24.1 2.80
 25. 44.3 A 5.28 30. 12.3 5.34 33. 46.0 5.38
 2. 21.6 8.29 2. 22.0 8.29 2. 21.9 8.18

8.21
 2. 22.0 21.6 20
 21.8 22.0 14
 21.9 21.9 29
 21.9 21.9 29
 2. 21.90 2. 21.83 18
 8.22
 246 6 31
 25482 1 11
 254.0 4.14.0

14

24.8 32.2 below A pretty object *
 59 37.2 59 46.5 38.2 D → 22.20
 47.2 46.2 R 19.50

* dumb-bell nebulae,
27 Messier, Vulpeculae.

00 below 8' x below 8' h 5.13.03 D
 1 02 06.8 39.8 D 22.13 30 01.6 30 33.7
 .T 96.7 19.7 02 48.9 12.8 42.6
 + 72.1 31.8 77.4 04 06.3 72.9 25.7 77.5 00.1
 03 43.5 14.8 31 36.6 09.8
 02 55.75 03 27.6 30 49.25 31 21.35
 02 55.75 30 49.25
 31.85 32.10

the large one is probably
not recorded in the Bedford Catalogue

60 40
17.31
7.09

Dec 14th 1846 RLC New Planet

15

* 25. 35.9	1. 45	30. 27.4	1. 38	34. 49.7	1. 26	39. 04.4	1. 21
P 28 21. 40.4	2. 84	33. 12.1	3. 03	37 34.7	3. 03	41. 49.4	3. 13
2. 45.5	4. 30	2. 44.7	4. 41	2. 45.0	4. 29	2. 45.0	4. 34

rev in position

47. 18.7	0. 67	51. 06.4	0. 63	55. 37.8	4. 55	59. 50.7	0. 41
50. 03.7	3. 54	53. 51.3	3. 71	58. 22.4	3. 73	02. 35.7	3. 87
2. 45.0	4. 26	1. 44.9	4. 33	2. 45.1	4. 28	2. 45.0	4. 28

Diff R

Diff Dec P S q 35

2. 45.5 4. 30

2. 44.7 4. 41

2. 45.0 4. 29

45.0 4. 34

45.0 4. 26

44.9 4. 33

45.1 4. 28

45.0 4. 28

2. 45.02 4. 31

31
4. 31
129 3

133 61

4 43

2. 18.2 = 133.18

Dec 15th

Found that the micrometer head
B reads 0.035 when in coincidence

25. 35.9

Observations of the New Planet.

Dif. R

Dif. Dec.

1846	Count alt. S.T.	P. follows * 7648 Bot. lat.	P. South of star.	N° of obs.	
Oct 21 st	9 ^h 30 ^m	1 ^h 26.66	0.00	ref	2
24	7 ^h 48	1 ^h 21.03	0.00	9 ^h 53.3 + 0.6 - 1.0 10 =	9 ^h 52.9
29	6 ^h 48	1 ^h 14.46	0.00	10 ^h 28.2 + 0.7 - 1.0 9 =	10 ^h 27.9
Nov 3	7 ^h 00	1 ^h 11.20	0.00	10 ^h 42.1 + 0.6 - 1.0 6 =	10 ^h 41.7
Star. 5	6 ^h 00	1 ^h 10.25	0.00	7 ^h 5. 10 ^h 46.1 + 0.7 - 1.0 6 =	10 ^h 45.8
Star. 6	7 ^h 10	1 ^h 10.38	0.00	9 ^h 10 ^h 45.8 + 0.6 - 1.0 9 =	10 ^h 45.4
18	7 ^h 40	1 ^h 19.35	0.00	9 ^h 52.1 + 0.7 - 1.0 6 =	9 ^h 51.8
21	7 ^h 30	1 ^h 25.48	0.00	9 ^h 19.9 + 0.7 - 1.0 6 =	9 ^h 19.6
24	7 ^h 14	1 ^h 31.66	0.00	7 ^h 5. 8 ^h 44.4 + 0.6 - 1.0 7 =	8 ^h 44.0
Dec 3	7 ^h 36	1 ^h 58.55	- 0.00	6 ^h 20.0 + 0.6 - 1.0 6 =	6 ^h 19.6
9	7 ^h 08	2 ^h 21.86	- 0.00	4 ^h 14.0 + 0.3 - 1.0 6 =	4 ^h 13.3
14	7 ^h 00	2 ^h 45.02	0.00	2 ^h 18.2 + 0.2 - 1.0 8 =	2 ^h 17.4

Sent up to Dec 14 to Schumacher

P.N. of Star

P.N. of Star

Dec 21	7 ^h 10	3 ^h 21.37 + 0.01	1 ^h 08.6 + 0.1 0.00	1 ^h 08.7
1847 Jan 5	6 ^h 56	4 ^h 56.82 + 0.18	9 ^h 30.7 + 2.9 0.00	9 ^h 33.6
" 12	6 ^h 53	5 ^h 48.30 + 0.57	14 ^h 03.0 + 4.3 0.00	14 ^h 12.3
" 19	6 ^h 45	(5 ^h 48.30 + 0.57) = 5 ^h 12.60 + 0.02	(18 ^h 16.8) 0 ^h 22.2 + 0.4	0 ^h 22.6
" 25	6 ^h 21	(7 ^h 31.24) = 4 ^h 23.83 - 0.26	(23 ^h 02.1) 4 ^h 35.6 + 3.7	4 ^h 39.3

+ Supposing the Dif. of the Stars Mean R Jan 1846

Mean R of Star 7648.	Jan 1 1846	21 ^h 50 ^m 05.94	- 13 ^h 23 ^m 55.5	d.R 11 ^h 54.67	from List latest
Sept 28	cor for Apr. R	+ 3.84	- 24.6	d.S 18 ^h 23.8	
Nov 6	"	+ 3.33	- 22.3		
Dec 14	"	+ 2.83	- 20.1		
Jan 25	"	+ 2.63	- 19.0		
Mean place of * 6 from Bepbel's Zones	Jan 1 1846				
Jan 1825	22 ^h 00 ^m 53.46	+ 1 ^h 07.79	22 ^h 02 ^m 01.25		
	- 13 ^h 11 ^m 27.94	- 6 ^h 05.4	- 13 ^h 05 ^m 22.5		

All these further reduced under Feb)

25.10
21.150
3.20

12^m 19'N
cup 5.00^a 17

Dec 21st 1846

Leverrier

Places of stars to observe with the

Planet 1850

8.9^k 22.02.20 -13.05'But let 7^m 22.05.30 -12.40* 1. 04. 44.7 0.80 PN of 8th

P 1. 08. 05.9 1.45

3. 21.2 2.25

1. 09. 34.0 67

1. 12. 55.6 1.56

3. 21.6 2.23

1. 04. 04.7

17. 26.0 0.51

3. 21.3 1.66

2.17

2.22
31
2.22
666
6882
22
68.60 = 1.08.6

1.09
21.56
3.19

17.59
28.10
7.11

Jan 3rd 1847

Emergence of 65 Lanius' 4.32'N

XCB by 2557 3.46.48.3 instantaneous

GPR 424 3.38.30.0-37

3. 57.00.0

14.8

0.54.31.5

2 557 3. 53.45.8 424 3. 38.15.2

3. 46. 48.3

3. 52.00.0

3. 39.6

4. 44.5

424 3. 40.11.9

3. 42.04.8

3. 42.03.8

18.49.56.87 2557 3. 56.0.0

Grill. S. Z. referred to the mean Eq. Jan 1846

18. 50. 43.6

4675 424 3. 47.25.4

328. 12.30.6 -13.26.39'

8. 51. 20.3

43.62

8. 34.15.44.5

27.8

38.7

1. 27.1

3. 15.00.0

24.4

40.8

Em. of 8. 49. 53.1 MS. Y. GPR

424 3. 03.11.5

Nov 5.26

07.1

36.6

65 Lanius 8. 49. 52.1 " GPR

Stationary from

03.8

46.1

Cumb. Am

Jan 3rd 1847

Dec 14. 11.44 328. 12.44.4

13. 26. 12.9

" "

18

34

17

5^m12
6.0

37

12
40

8

For Jan 5th 1847 P is by calculation 9^h 10^m N of star aily one 37^m
 4^m 48.2 follows star " = 5.90

Stellar

R 7 22^h 03^m

δ -13° 36'

18^m 57.50

47

18^m 58.37

25.55 39

6^m 57.005^m 59.01

56.50

148.75.56

1 43 53.2

Jan 5th 18471^m 46 55.2 A 9.191^m 49 52.4 B 9.254^m 57.2 18.441^m 52 30.5 8.87 1^m 59 51.8 18.351^m 57 27.4 9.75 2^m 04 48.0 10.154^m 56.4 18.62 large 4^m 56.2 18.50

1.45

21.50

8.55

4.07

4.15

4.20

2^m 06 45.7 7.872^m 11 42.7 10.54

9.297 8.060

9.560 8.362

3.6 0.23

18.44 4^m 57.0 18.46

2.0 0.11

3.6

Saw a meteor about

80 4^m 57.2

46 6.9

18.47 6.2

31 4.27 3

78.47 4.5 6.82

55.41

572.57

19.5

570.72 = 9^h 30.7

± 1.50^m Sid. bright as Jupiter
 it burst & two portions continued
 their course within 1/2 a degree of
 each other, faded gradually.

Course from Lygnae to head of Dra
 another of 1st magnitude in the
 same quarter. & 1 or 2 small ones.

Jan 5th
 Center 49.45 Center 2.50.50
 2.46 24.2 47 42.2 01.37.9
 T 84.3 46 33.3 T 70.1 53.5 46.3
 +65.6 +46.2
 47. 38.9 39.7
 48.5 48 52.3
 47. 06.35 48. 17.25
 06.10 48. 16.60
 47. 06.22 48. 16.90
 1.4
 Cent 262. 53. 42.50 + 11.34
 1W5. 27. 04.

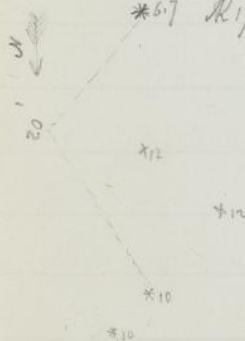
A very pretty nebula much like a comet

01. 37.9 02. 56.9 10. 41.0 12 00.0
 T 74.1 46.3 57.103. 14.9 T 77.0 10. 50.18 T 60.0 15.6
 +54.6 02. 40.9 +21.9 03. 36.8 +56.2 12. 47.0 12 45.0
 52.0 54.0 58.0 13 00.0
 02. 14.95 3. 25.45 11. 19.50 12. 30.00
 02. 13.60 2. 25.85 11. 18.90 30.30
 02. 14.25 3. 25.65 11. 19.20 12. 30.15
 2. 14.25 10.95
 1.40

Observed for Martians Jan 5th

*67 R 17.50 2+16.45

Jan 5th Emission of * 34 Sextantis
See Transit Book



Thursday Jan (12th) 1847

Not very accurate

$$2 \dots 16 \dots 01.5 \quad 14.78 \quad 2 \dots 23 \dots 46.8 \quad 13.62 \quad 2 \dots 32 \dots 04.9 \quad 14.84$$

$$2 \dots 21 \dots 49.7 \quad 12.35 \quad 2 \dots 24 \dots 35.7 \quad 13.60 \quad 2 \dots 37 \dots 52.7 \quad 15.64$$

$$\dots 11.8 \quad 27.13 \quad 5 \dots 48.9 \quad 27.22 \quad 5 \dots 47.8 \quad 27.48$$

$$5 \dots 48.2 \quad 27.22$$

$$5 \dots 48.9$$

$$47.8$$

$$5 \dots 48.90$$

$$2 \dots 16$$

$$21 \dots 50$$

$$2 \dots 24$$

$$21 \dots 50$$

$$14$$

$$47$$

$$1541$$

$$656$$

$$347$$

$$1001$$

$$8.446$$

$$452$$

$$8.688$$

$$124$$

$$8.566$$

$$27.13 \quad h = 4.26 \quad h = 4.34 \quad h = 4.41$$

$$27.22 \quad 9.656 \quad 8.464 \quad 9.75 \quad 8.56 \quad 9.92 \quad 8.74 \quad \text{reflow double star.}$$

$$27.48 \quad 14 \quad 1.146 \quad 1.146 \quad 1.46 \quad 1.146 \quad 1.146 \quad 1.146$$

$$83 \quad 0.802 \quad 9.610 \quad 0.896 \quad 9.706 \quad 1.066 \quad 9.896$$

$$27.28 \quad 6.3 \quad 0.41 \quad 7.9 \quad 0.51 \quad 11.6 \quad 0.79$$

$$27.28$$

$$8184$$

$$845.68$$

$$273$$

$$842.95 =$$

$$= 14' 03.0''$$

cor ref

drd clroR

$$6.3 \quad 0.41$$

$$7.9 \quad 0.51$$

$$11.6 \quad 0.79$$

$$3/278$$

$$9.3$$

$$3/171$$

$$57$$

$$2 \dots 20$$

$$19 \dots 26$$

$$6 \dots 54$$

Copies of Observations

A. S. Bauche x

Capt. Wilkes x

J. S. Graham x

Corrections for Refraction

(in arc h + 2.7)

$$m = \cos \delta \cos \alpha \quad \sin \text{alt} = m \sin h - n \quad \text{Diff of ref in } R = c d\delta, \text{ in seconds of time}$$

$$m = m \delta \sin \alpha \quad \sin \nu = \frac{\cos \delta \sin h}{\cos \alpha} \quad \text{" in } \delta = c' d\delta \text{ in minutes of arc}$$

$d\delta$ is used in minutes of arc

for declination -13°

variation of for a change of 10' in dec.

	alt	log c	log c'	log c	log c'
h 3 ^h 00 ^m	20.55	7.6152	8.9511		
		.130			
3.20	18.08	7.7453	9.0404		
		.153			
3.40	15.08	7.8986	9.1579		
		.195			
4.00	12.00	8.0931	9.3213	0.008	0.008
		.247			
4.20	8.44	8.3402	9.5469	0.011	0.010
		.347			
4.40	5.24	8.6878	9.8648	0.017	0.016
		.641			
5.00	1.57	9.2289	0.3856	0.026	0.025

22

supposed

12.14
2.40
5.34

from Star 8-9 follows Planet.

	dR	dS	dR	dS
Jan 29	4.08	5.30		
Jan 5	4.57	4.00		
" 12	5.48	4.30		
" 19	6.40	5.00		
Feb 26	7.37	24.00		
Feb 4	9.33	31.10		
January 19 1847 New Planet				
			5.68	0.22
			4.16	5.22
			2.50	12.30

26 12
22.57
3.15

~~2.22.04.4~~

Star apparently above Planet

2.26.46.2

Planet above center

Pretty N of Star

2.31.59.0

Star R 22.02 Dec-13.05 in 1850

5.12.8

Star 2.78 A

both same side above

P 2.01 B

P 2.78

2.37.09.2

0.77

S. 1.99

Planet preceds Star

2.42.21.6

S P 0.83

0.83

N of Star

5.12.4

P 0.15

.85

by differential of

center of Saturn

0.68

0.72

22.02.00.60

2.48.25.0 h

0.15 nearly N of K

3.1

0-13.05.05

2.37.09.2 L

0.17

21.6

31.5

11.15.8

0.22 h from K

22.32

22.2 = dS

31
22
6.6
6.8

M.S.7.6.45

28.40

19.54

6.46

By Saturn

Apparent R of K = 21.56.50.3

b = 13.04.51.1

By Star

56.50.40

04.47.6

Jan 25th 1847

23

14¹

17 9' N of P.

14th follows

P 5' N of Star

P 4th 22' preceds Star $\gamma \delta = 12^{\circ} 51'$

$$\begin{array}{r} 8.69 \\ 29 \\ \hline 8.97 \end{array}$$

$$\begin{array}{r} 26.35 \\ 22.02 \\ \hline 4.33 \end{array}$$

log c log c'

very low in the horizon & faint.

8.52 9.70 $h = 4.33$ 2, 35 17.5 Planet below 6-95 $d\delta 4.5$ 0.65 .65

L 2 39 41.7 Star above 2-00 d.R. 0.15 = 9.17 0.95 = 2.2 d.R.

4 24.8

8.95

8.70

9.89 $h = 4.41$

8.79

.65

.65

9.01

2 43 22.7 8.74

3/275 d.R. 0.22 = 9.35 0.54 = 3.5 d.R.

2 47 46.9 0.02

8.92

8.99

0.08 $h = 4.50$

4 24.2

8.76

8.92

.65

.65

2 51 09.7 7.87

27652

84 d.R.

0.42 = 9.62

0.73 = 5.5 d.R.

2 55 32.8 7.64

275.63

3/79

3/112

4 23.1

9.01

4.35.6

0.26

3.7

24.2

d.R.

3.7

24.2

 $d\delta = 4^{\circ} 39' 3$

3/115

4 23.83

cor. ref. - 26

d.R. 4.23 57

2.38

20.17

6.21

24

shall use 2557 just 5^m 11.5Though it is not easy to decide
that this is correct within 0.5January 25th 1847

2557 5.17.00.0 20.55.6.7

2419 5.11.04.2 15.00.0
5.55.8 5.55.65

Im. of 61 Tau 13'.02" South

Clear, calm & good seeing.

W.C.B. 2557 - 5.12.37.0 - 4
good. 2.0G.P.B. 2419 5.07.00.0 - 4.1 very good
20.5 thought not a

2557 - 5.12.35.0

2419 5.06.39.5 beat in error.

5.55.7

5.12.35.2

Em 5.58.03.0 - 80 very uncertain

40

The star seemed flattened, elongated & faint

5.57.23.0 it soon recovered its bright W.C.B. 2419 5.39.55.0 - 0.0
sup.

3.44.35.22

5.57.19.78

68 Tau 6'.27" N.

G.P.B. Im 6.37.24.8 - 30. good. very.
15.0 62419 6.37.09.8
5.56.0
6.43.05.8

2419 6.02.00.0

239 9.44.34.4

3.42.34.4

W.C.B. 6.43.08.2 - 2 double immersion interval 1/2 sec
1.0

6.43.07.2

2419 6.07.00.0

239 9.49.33.7

3.42.33.7

2557 6.54.00.0

Im 61 Tau W.C.B.

5.12.35.0

5.11.5

5.07.23.5

20.17.27.86

849.55.64

1.26.80

Em 61 Tau G.P.B.

5.57.23.0

5.11.5

5.52.11.5

20.17.27.86

9.34.43.64

1.34.14

Im 68 Tau

6.37.09.8

44.5

6.37.54.3

20.17.27.86

10.20.26.44

1.41.64

2419 6.48.03.9

5.56.1

00.0

56.1

5.56.05

5.11.60

44.4

MS 8.48.28.84

MS 9.33.09.50

MS 10.18.44.80

Feb 4

hR $\frac{22.14}{4.46} + 12.26$

Planet N of 7648 31' P N of 6 12.30" P South of h 27'
follows 9^m33' precedes 2^m50' precedes h 15^m

* 7th N of P 13' * 7 14' 5 of h
follows P 6^m 9^m precedes h

Jan 25th 1847

Im. 61 Tauri 8^h 48^m 28.8 W.C.B. good Calm clear & good seeing

" 8^h 48^m 29.0 G.P.B. thought to be not 0.5 in error

Em 61 Tauri 9^h 33^m 06.3 W.C.B. star elongated & faint

" 9^h 33^m 09.5 G.P.B. very uncertain

Im 68 Tauri 10^h 18^m 46.2 W.C.B. double Im. ^{in error 0.5} **Feb 28th RA 1847** **86 Piscium**

" 10^h 18^m 44.8 G.P.B. very bright line 2557 4^h 41^m 52^s - 4 least W.C.B.

Clouds. perhaps 5th in error the extreme

4^h 41^m 50

21 51.051.00.0

5^h 47.6

2557 5^h 01^m 23.7

4^h 36^m 02.4 Sid. time

21.51.18.41

21^h 52^m 05.2

46.75

6^h 43^m 57.2

21.52.05.16

1^h 06.7

Em 86 Piscium 6^h 42^m 51.1 M.S.G. W.C.B.

Feb. 18th

Observations on Neptune Oct 1846 to Jan 1847

	Greenwich	R	Reductions to	seconds of	Declination	Reductions
	M.S.T.	Mean Eq. of Jan 1846	App. R	App. R	Mean Eq. Jan 1. 1846	Apparent Dec.
1846	Oct 21 ^d 14 ^h 15 ^m	21 ^h 51 ^m 32 ^s .60 + 3.57		51 ^m 36 ^s .17	- ~~13^o 33' 48".4~~	- 23".1
	24 ^h 12 ^h 33	26.97 .52		30.49	- 13 ^h 33 ^h 48.4	23.0
	29 ^h 11 ^h 33	20.40 .45		23.85	34 ^h 23.4	22.6
Nov	3 ^h 11 ^h 45	17.14 .38		20.52	37.2	22.4
	5 ^h 10 ^h 45	16.19 .34		19.53	41.3	22.3
	6 ^h 11 ^h 55	16.32 .33		19.65	40.9	21.8
	18 ^h 12 ^h 25	25.29 .17		28.46	33 ^h 47.3	21.6
	21 ^h 12 ^h 15	31.42 .12		34.54	33 ^h 15.1	21.5
	24 ^h 11 ^h 59	37.60 .08		40.68	32 ^h 39.5	21.0
Dec	3 ^h 12 ^h 21	52 ^h 04.49 + 2.46		52 ^h 07.45	30 ^h 15.1	20.5
	9 ^h 11 ^h 53	27.80 .90		30.70	28 ^h 08.8	20.1
	14 ^h 11 ^h 45	50.96 .83		53.79	26 ^h 12.9	20.0
	21 ^h 11 ^h 54	53 ^h 27.32 .76		53 ^h 30.08	22 ^h 46.8	19.9
1847	Jan 5 ^h 11 ^h 41	55 ^h 02.84 .67		55 ^h 05.51	14 ^h 21.9	19.6
	12 ^h 11 ^h 38	54.81 .64		57.45	09 ^h 43.2	19.2
	19 ^h 11 ^h 30	56 ^h 48.67 .63		56 ^h 51.30	04 ^h 59.9	19.0
	25 ^h 11 ^h 06	57 ^h 37.68 .63		57 ^h 40.31	00 ^h 43.2	

The resulting Apparent places have been compared by means of differences, with the Observed differences of R & Dec. & found

Copies sent to Schumacher & Speersbanks Feb 29 March 1st

Time of Opposition Aug 19.706 - 0.166

$\alpha = 326^{\circ} 44' 31''$

From Cambridge Eng places Aug 4, 12th

$\delta = - 0^{\circ} 31' 47''$

Hamburg, Göttingen & Königsburg places of Sept 28th

probably not 3" in error.

Apparent		Circular Elements		To satisfy Leverrier's Mean Long		
Declination		No of Comp.	Ω 129.18'	1800 = 243°		
1	(not obs'd)	2	ϕ 1° 42' 26"	$e = 0.14$	at -77°	u 2-84°
0	13..33..25.3	10	r 30.0000	Line Per. 60°	$v - 92°$	
6	34..00.4	9	daily mov. 21.709			
4	14.6	6	The mean motions being near the that which $a = 30$ would give shows that its mean distance is near 30 I think a little more.			
3	18.9	6				
8	18.6	9				
6	33..25.5	6				
5	32..53.5	6				
0	32..18.0	7				
5	29..54.1	6				
1	27..48.3	6				
0	25..52.8	8				
7	22..26.8	3				
6	14..02.0	4				
2	09..23.6	3				
0	05..40.7	3				
	00..24.2	3	alt of Planet less than 5°			

March 4th 1847

About 10 o'clock detected a telescopic Comet in *Andromeda*

$$D = +50^{\circ}.06$$

First Instrumental place 424-6..28..20

Wh 6..58..22

at 23..30..00

err R 5..15

* 9

* above 23..35..15

1st out 6..38..19.0 -10 beats

2nd out 6..39..45.0 "

T 1..26.0

mean 6..39..02.00 -10 beats

$$T_0 55.7 = 620.7$$

To find the R from the time by

424 x h add 5..15

subtract 3' from D

6..39..02

6..39..31.3

24.3

7c 7..40..00

424 7..26..59.5

14.00

Comet below

6..38..42.0 -10 beats

T 1..39.0 39..05.0 "

+ 52.0 39..57.0 "

40..21.0 "

6..39..31.00

6..39..31.50 -10 beats

$$T_0 63.6 = 576.4$$

$$t_0 33.4 = 579.7$$

* above

6..57..52.0 -10 beats

58 11.0

+

* 620.7

R 576.4

$$dD = 1197.1$$

59..27.3

lost

Comet below

34.5 -10 beats

59..02.0 "

lost

7..00..05.0

Afternoon was muggy

It was cloudy through the day towards 3 P.M. the clouds broke a little but the atmosphere was thick & somewhat stormy & did not look favourable till towards sun set. when it cleared up somewhat, after a few sweeps at a low altitude had to desert from clouds, & took & commenced at a high altitude & soon came upon the comet which was nearly in a line with two bright stars in *Capricorn*.

March 4th

Comet below

*, above

(Observed by G. Johnson, all the times are roughly taken)

6..43..15 - 10 beats

6..42..52 - 10 beats' center

T 1..45 43..38 "

44.20 T = 1.28 center

+ 59 44..35 "

6..43..36.00

 $x_1 = 614.0$

45..00 "

 $T_n = 57.0 = 614.0$ $\mu = \frac{560.0}{1174.0}$

6..44..07.50 - 10 beats

 $\mu \delta = 1174.0$

6..44..06.50

6..43..36.6

6..44..07.0
30.4 $T_n = 67.5 = 550.8$ $t_n = 36.6 = 569.0$ * 5th or 6th mag (30' really) (18 Andromeda)

South of comet

*, above

center 6..48..19.5

6..51..07

out 49..15.5

T 2.21.2

Z1

 $T_n = 52.6 - 695.7 = 643.1$

T 56.0

+ 1.54.7

 $52.15.7 t_n = 34.3 - 577.5 = 647.2$

6..48..47.50

53.28.2

195

 $T_n = 36.2 = 697.2$

6..50..47.60

 $T_n = 91.3 = 301.4$

*, 300.1

6..52..48.35

 $t_n = 74.2 = 298.8$

* 2 697.2

6..52..47.97

* $\delta = 397.1$

6..48..47.50

 $*_1 - *_2 = 3.30.47$

It looked like a comet but there was a small star close to it which gave it in the Comet seeker an irregular appearance like a cluster. It was easily found in the Equatorial. & the small star near it which had given a doubtful look was separated from it by about one or two minutes. I took a little diagram of its place & waited for its motion but could not detect any in about 5^m. I then left & continued sweeping with the Comet Seeker for about 10^m or 15^m on coming back. I felt quite disappointed to find its distance from the little star unchanged. but I was not yet satisfied a nebula in

March 4th (continued)

W. & B. observes, G.P.B. marks time

*, above

*, below

7..07..56.7

7..08..39.6 $T_n 57.7 = 610.5$

T 1..51.1 08..13.2

T 1.29.1 08..55.7 $t_n 38.1 = 563.4$

+ 78.5 09..31.7

+ 59.3 09..55.0

 $\frac{511.1}{1074.5}$ 09..47.810..08.7

7..08..52.20

7..09..24.15

7..08..52.45

7..09..25.35

 $T_n 71.9 = 518.4$ $t_n 50.8 = \frac{503.9}{22.3}$
511.1*, 5.6th above

*, below

7..11..47.3

7..15..14.2

h 7..46..45

T 2..24.6 11..59.7

T 2.30.7 15..26.2

D 49..45

+ 2..01.6 14..01.3

+ 2..08.3 17..34.5

14..11.917..44.9 $T_n 97.5 = 157.5$

7..12..59.60

7..16..29.55

 $t_n 83.1 = 102.1$

7..13..00.50

7..16..30.35

60.1

 $T_n 93.6 = 258.6$

7..12..59.60

*, 130.0

 $t_n 78.7 = \frac{224.9}{83.5}$

7..13..00.50

*, 242.7

83.5

, -, 3..29.45

*, dS 3727

242.7

3..29.85

in that region I could not remember to have seen, & there was so much stray light about it. that I was on the point of getting a accurate difference when I noticed that although its distance from the star was not sensibly altered it had certainly moved in position for it was now in a line with the ^{two stars} side of a little triangle of stars ~~where~~ it was not a little before & on comparing with the diagram the change was evident. The first thing I did when it was first seen was to see if it was visible to the

$\# 5^h$ above truck $\# 1$ above Comet below
 $\# 8$ 12 33 $\# 8$ 12 15 $\# 8$ 15-57 $\# 8$ 16 59
 $T 2.20$ $16 13$ $T 1.43$ $17 22$
 13.58 9.16 ± 58 20
 $T_n 278$ $T 43$ $8.17 .06.50$ 18.42
 $\#_2 = 718.4$ $8.13 .36.5$ $T_n = 90.6 = 313.1$ $8.17 .50.50$
 $\#_1 313.1$ $8.17 .06.5$ $8.17 .51.00$
 $\times d\delta 405.3$ $22.30.5$ 23.4 $T_n 66.2 = 559.6$ 563.0
 $T_n 217$ $8.23 .04$ $8.25.7$ $t_n 37.3 = 566.4$ 513.1
 $\#_2 = 730.3$ $T 33.5$ $T 2.190$ $25 22.5$ $8.26.8$
 $\#_1 332.5$ $8.22 .47.25$ $t 1.41.5$ 27.12 $T 1.42$ 26.29
 $\times d\delta = 397.8$ $T_n 89.9 = 324.2$ $27 26$ ± 66.5 $27 35.5$
 $\# 5$ $\# 18 d\delta$ $8.26.16.50$ 27.56
 $\# 8 35.19$ 332.5 $8.26.17.25$ $8.26.59.00$
 $T 2.15$ 35.34 $8.22 .47.25$ $8.27.02.25$
 ± 1.45 37.19 544.0 $8.27.00.80$
 37.34 846.5 Comet $T_n 65.6 = 563.5$
 $8.36 .26.50$ $8.38 37.5$ $\#_1 - \#_2 = 3.30.00$ $t_n 42.7 = 544.5$
 $8.36 .26.50$ $T 3.000$ $38 51$ $8.27.00.6$ 109.6
 ± 2.31 $41 22$ $8.26.16.9$ $8.27.51 554.0$
 $41 37$ 43.7 $8.17.50.7$ $8.17.36$
 $8.40 07.00$ $8.17.06.5$ 4.15
 $8.40 .06.50$ 442 $8.27.00$
 $\# 5$ $8.22.47$
 4.13
 $\# R 23.31.44$
 4.14
 $23.35.58$
 $\# 5$ 49.38
 22
 50.00
 $\# R 23.36$
 50.00

unaked eye but I did not detect it.

March 4th Adell

* below

15.22
2423.36
15.25
8.1115 27.08.4 - 5 hrs 31. 31.0
22.3

424 Slow of 13.55

00.0

h 7.58.18 149.32

08.8

29 23.0

4th above05 01.7
13.5

48.5

56. 55.0

07. 15.6
29 bad(Adell)
(3607) unmarked
x 4.2 041.1659. 55.2 bad scan
1016. 44.55
6. 25.55
10. 19.00

16. 34. 50.4

35. 03.2

38 04.5

34.30 = * mid field

Adell

x 2nd 037.32

16. 47. 35

6. 33. 45

10. 47. 00

10. 13. 50

10. 19. 02

5. 12

day 0 37.32

h 0 = 37.29

10. 19. 00

10 24. 18

5. 18

day 0 41.16

h 0 41.13

Could see the comet this Adell but every attempt to get a comparison with 18 Andromedae was defeated by clouds. It was near the parallel of this star & followed it in R

$$d\delta \text{ Comet N of } *, \text{ cor ref } d\delta$$

$$6.30h-7.00 \quad 6.40 \quad 1197.1 \quad +1.0 \quad = 0.1198$$

$$6.45 \quad 1174.0 \quad +1.0 \quad = 1175$$

$$7.00 \quad \left\{ \begin{array}{l} 1121.6 \\ 1074.5 \end{array} \right. + 2.0 \quad = 1076$$

$$8.18 \quad 876.1 \quad 5.4 \quad = 882$$

$$8.27 \quad 886.5 + 5.6 \quad = 892$$

$$\begin{array}{r} 6/148 \\ 7.24.42 \end{array}$$

$$6/6346$$

$$d\delta \quad 6/1057.8 = 17.37.8$$

$$\begin{array}{rcl} d\delta & 397.0 & 397.0 \\ 372.9 & + & 372.0 \text{ near center} \\ 397.8 & + 2.0 & 400.0 \\ 405.0 & + 2.0 & 407.0 \end{array}$$

$$31/1504.0$$

$$394.0$$

$$*, - * \quad 401.3$$

$$14.00$$

$$24 \quad 9.50$$

$$424-4.10$$

$$22.46.30$$

$$47$$

$$22.47.17$$

$$7.28.52$$

$$8.41.35$$

$$1.26$$

$$8.40.09 = \text{alt. S. Z.} \quad \text{whence } *, R 23.35.14.67$$

$$*, \delta 49.44.08.3$$

$$*, 9^{\text{th}} \text{ August under}$$

$$d\delta R \text{ follows } *, \text{ cor ref } d\delta R$$

$$0.29.3 = 0.29.3$$

$$0.30.4 = 0.30.4$$

$$0.32.95 = 33.0$$

$$0.33.90 = + 0.10 \quad 0.34.0$$

$$0.44.2 + 0.24 \quad 0.44.4$$

$$0.43.7 + 0.36 \quad 0.44.1$$

$$6/215.2$$

$$d\delta R \quad 0.35.87$$

$$\text{hly min. R} + 8.3$$

$$3.30.47 \quad \text{hly min. Dec} - 3.20$$

$$3.29.95 + 0.05 \quad \text{d Dec daily } 1.20$$

$$3.29.85 \quad \text{d Dec } 3.20$$

$$3.30.00 + 10 \quad \text{d R } 3.20$$

$$3.30.00 + 0.20$$

$$27 + 40$$

$$23.$$

$$*, - * \quad 3.30.13$$

$$*, 18 \text{ Andromedae B. A. C.}$$

$$\text{March } 4^{\text{th}}$$

$$\text{At } 8.40.09 \quad \text{alt. S. Z. } 23.35.14.67 \quad R *,$$

$$\text{Comet follows } *, \quad d\delta R = 0.35.87$$

$$\text{Comet North of } *, \quad d\delta = 17.37.8$$

$$*, R 23.35.50.54 \quad \text{Mean of 6 Obs.}$$

Then positions are the clear of six sets of comparisons with the star $*$, including besides, the error of the relative positions of $*$, α , β from 4 sets

The observations were not

nearly made, at first from not being aware that it was a comet & afterwards from clouds. This is in part compensated by the number.

March 5th

1947

23.39
6.00

(* 4125 Gr. AR 23.33.59 B.R 23.39.10
 Approx 8 48.39.53 Approx 8 48.42)

* above 6.7th

6 .. 34 .. 00.6

34 .. 17.2

35 .. 18.2

cloudy

cloudy

39 .. 13.5

* above

6 .. 41 .. 22.4

41 40.4

424 5. 58 10 - 20 beats
 W h 6 .. 24 .. 48 D 49.02
 5 .. 35 .. 12 49.03

* 4th 6 .. 12 .. 13 D 55.22
 h 3 .. 38 .. 05 34.38
 3

Adaptation

* 3rd 6 .. 20 25-20

L 6 .. 25 .. 18 D 58.22

6 .. 24 37 31.38

26. 345-10

01.0

cloud

55.22

58.22

55.16

58.19

March 5th 1947
Comet below

traces of a tail

There is no nucleus & h

light is considerably diffused

* above
6.. 43..31.9
T1.37.0 43..50.7
+ 59.8 44..50.5
45..08.9

6.. 48..26.9
T2.06.8 38.2
t1.46.6 50..18.8
33.7

dR

6.. 44..20.45

6.. 49..30.30

5..09.85

5..08.87

6.. 44..20.60

6.. 49..28.50

5..07.90

dδ

T_r 64.0 = 573.9

T_r 83.2 412.7

5..08.87 = 986.6

t_r 39.6 = 557.5

t_r 66.0 392.4

ref + 0.6 = 949.9

dR

5..08.93

1365

968.2

ref + 0.6

dδ 968.8 = 16' 08".6

6.. 51..27.0

6.. 56..17.7

T1.34.2 51 46.7

T2.12.5 31.0

+ 55.2

t1.43.0 14.0

52 41.9

6.. 58..30.2

53..01.2

6.. 57 23.95

5..09.85

6.. 52..14.10

6.. 57..22.50

5..08.20

6.. 52..14.30

5..09.02

T_r 62.1 585.4

T_r 87.0 365.9

+ 0.7 951.3

t_r 36.4 569.7

t_r 67.6 376.7

dR 5..09.09 946.4

6.. 59..34.4

β_n 04..24.8

h 7..32 977

T1.30.9 59..54.8

T2.13.8 36.9

948.8

+ 50.6

+ 149.7 06..26.6

ref + 0.5

00 45.4

38.6

dδ 949.5 15' 49".3

01..05.3

β_n 05..31.70

5..11.85

7..00..19.85

β_n 05..31.75

5..11.65

7..00..20.10

5..11.75

60.1

T_r 60.0 547.7

T_r 87.8 - 355.0

ref + 0.9 952.7

930.0 dδ

t_r 33.4 579.7

t_r 72.0 - 327.7

dR 5..11.84

907.4

ref + 0.9 = 15' 30".3

March 5th

daily run in the 1st 00
 hourly run in the 150 = 21.30
 " " R =

out of focus

* 7..21..18.7 13.53
 7..26..33.6 14.54
 5..14.9 28.07
 31
 cr ref + 0.10 28.07
 dR 5..15.00 842.1
 14..27.4 870.17 14..27.4
 err ref + 1.0 2.8
 dS 14..28.4 867.4

7..30 07.7 good A 13.80
 35..22.7 13.75
 5..15.0 27.55
 31
 ref + 0.11 27.55
 dR 5..15.11 826.5
 14..11.3 854.05
 ref + 1.2 2.7
 dS 14..12.5 851.3

7..38..11.2- 14.02 h=8.10
 7..43 27.2 12.48
 5..16.0 26.50
 31
 ref 0.13 26.50
 5..16.13 795.0

821.50 13..38.9
 2.6 ref + 1.6
 818.9 13..40.5

By An. Microm.

Final Mean of dR

Andrie 5..09.90 15..49.4
 By Wire Micrometer
 dR 5..15.00 14..28.4
 5..15.11 14..12.5
 5..16.13 13..40.5
 824 21.4

5..15.41 14..07.1
 By giving a weight of $\frac{1}{3}$ to Andrie
 14 130.8

5..14.03 dS 14..32.7
 424 7..25..15

pN of * 16..08.6 5..08.93 6..50 4..17 22..50.26
 " 15..49.3 5..09.02 6..57 7..24.32 47
 " 15..30.3 5..11.75 7.05 22..51.13 22.51.13
 148.2 29.70 172 8..38..19

dS 15..49.4 dR 5..09.90 An. 6.57

By Annular Microm

Wire. 7..26 dS. 8..36.54 h=7.50

7..35
 7..43

101
 7..25..15

$\Sigma 20..46..00$
 $\times \text{ in } \text{Apr } 4125$
 $424 \ 20 \ 31..52$
 $1810 \ 23..32..12.38$
 $41..32..21.4$
 $14..08$
 $1..46.78$
 $12..16.3$
 $\Sigma 9..50$
 $\times R \ 23..33..59.16$
 $41..20..05.1$
 $424 - 4..18$
 $5..14.03$
 $48.39.54.9 \text{ dec } 1947 \text{ hr } 1$
 $2.886 \ 19.90$
 $23.39.13.19$
 $14..32.7$
 37
 37
 $48.54.27.6$
 $20202 \ 13930$
 $8658 \ 5970$
 $106.883 \ 736.30$
 $1..46.78 \ 12..16.3$
 $5^{\circ} \ 23..39..13.2$
 $4^{\circ} \ 29..35..50.5$
 $\text{daily } \text{mean} = 3..22.7$
 $5 \ 48..54.28$
 $4 \ 40..01.46$
 $\text{daily } \text{mean} = 1..07..18$
 $6 \ 47..45..43$
 $48..54.28$
 51.15
 $1.08..45$
 $\text{March } 5^{\text{th}} \ 8^{\text{th}} \ 36..54 \text{ M.S.T.}$
 $\text{p } R \ 23..39..13.19 \text{ Mean of } 6$
 $\delta \ 48.54.27.6$

Place probably a very good one
by 3 hr of practice & 3 hr of time.



March 6thapprox $\delta 47^{\circ} 47'$ " $\alpha R 23^{\circ} 42' 35''$ * 7^h 23.48.01 $\delta 47^{\circ} 22'$

* 7.8 23.49.33

 $\delta 47^{\circ} 25' 30''$ ~~5.47.30~~

45.47

~~5.48.55~~

34.83

5.12.10

23.18.35

6.07.25

5.31.0

0.36.25

0.29.48

8.38

23.46.14

23.52.51

6.17

6.24

55.45

32

34.30

55.30

42.50

47.10

15

47.25

Comet shows a tail of perhaps 20' very faint except at its commencement. There is no

concentration of light of consequence in the head. It is a bad

object to observe nicely the light being too much diffused. It bears

illumination without difficulty

I think it is brighter than when first seen

The head of the comet is very irregular, without any well defined nucleus, branching off in this manner. The tail stretching across the whole field of the telescope, the light is somewhat concentrated at the head, possibly there is a definite nucleus, but even telescope will not show it, it bears, about as much illumination as a star of the 10th magnitude

It appears brighter, to night bears more illumination, and the tail is more conspicuous. I thought at times I could make out a very much larger outline, a sort of double envelope

* 8th below

6 27 53.9	8 31	6 32 52.9	8.00	6 37 18.8	7.95
above 30 56.4	8.02	35 56.0	8.54	6 40 20.7	9.32
3 02.5	16 33	3 03.1	16.54	3 01.9	17.27

$$\begin{array}{r}
 31 \\
 16\ 33 \\
 \hline
 48\ 66 \\
 50\ 6\ 23 \\
 \hline
 1\ 6 \\
 \hline
 50\ 4.6
 \end{array}$$

h 6.59.00

* 6 42 52.0 7 70 047.55

6 45 54.7 9 78

1 02.7 17.48

Comet - 7.2

2 Stars - 7.5

3 Stars - 7.07

$$8 = 5 \frac{3}{2}$$

below 8th above

7.74

10.25

8.571 - 7.14

2 2.856

$$\begin{array}{r}
 17.99 \\
 31 \\
 \hline
 1799 \\
 5397 \\
 \hline
 557.69 \\
 = 9' 17.7
 \end{array}$$

Andromeda

* 6 52.00 wh

where the Center was

6 53 20.7 0 45 36

7 18 30

23 34 50.7

23 28 18

06 32

$$\begin{array}{r}
 44.34 \\
 45.26 \\
 \hline
 7.20 \\
 6.30 \\
 \hline
 7.13.30 \\
 23 46.14 \\
 \hline
 6 59.40 \\
 23 46.14 \\
 37 33.00 \\
 \hline
 7.46.46
 \end{array}$$

$$\begin{array}{r}
 42.50 \\
 47.10
 \end{array}$$

* 8^h below

6 ..27..53.9	8..31	6 ..32..52.9	8.00	6 ..37..18.8	7.95
above 30..56.4	8.02	35..56.0	8.54	6 ..40..20.7	9.32
3 ..02.5	16 33	3 ..03.1	16.54	3 ..01.9	17.27
	31				
	16 33				
	4899				
	50623				
	16				
	504.6				

h 6.59.00

* 6..42..52.0 7..70 047.55

6 ..45..54.7 9.78

1 ..02.7 17.48

Andromeda

* 6 ..52.00 wh

where the Center was

6 ..53..20.7 045.36

7 ..18..30

23 ..34..50.7

23 ..28..18

06 ..32

44.34

45.26

7..20

6.30

7..13.30

23 ..46.14

6 ..59.40

23 ..46.14

37 ..33.00

7..46.46

g p 13 below above

Comet - 7..2..58.7 - 7.74

2nd Star - 7..5..44.4 10.25

3rd Star - 7.07..18.2 - 7.14

2 ..45.7

17.49

31

1799

5347

557.64

= 9.17.7

1847. March 6th there are 3 stars in the same Declination, nearly
 G.P. B. obs as the Comet. mid, is *3 hour circle
 Below above h m s 3/37
 1st Star 7..8 ..49.3 - 6.81 1810 (4167) (4175)
 2nd Star 7..11 ..33.6 10.48 *4 R 23.46.14.66 APD 42..50..06.4
 3rd Star 7..13 ..07.8 - 6.88 2.9 1..50.33 12..20.3
2 ..44.3 17.29 29.982 23.48.04.99 42.37.41.1
31 89.946 23..47.46.99 47.22.18.9
17 29 60/1109.334 29.91 1..50.67 42..46..35.0
5 18 7 29.62 20 87 4 20 9 37 23..49.37.66 12..20.6
535.99 89.46 59.73 42..34..14.4
1 7 11 R.33 4 110667 47.25.45.6
533".3 = 8..53.3

*7th Groombridge
 *7th 7..30 ..51.5 3..3..39 47..38 Had much difficulty in
 *8th 7..32 ..23.5 3 3..59 ..0 47..26 finding the two stars of G.P.
6.98

*2 Compared with nearest brightest of Groombridge
 7 ..41..34.2 below 16.91 Diff. of R & Dec of Stars
 *1 of G.P. 44..29.9 above 13..37 30.28 *4 - *2 *2 N of *4 ref
 *2 of G.P. 46..02.7 above 6..53 30.28 2..55.7 - 0.17 15..35.6 + 2.7
2..55.7 23.44 938.68 2..55.5 - 0.19 15..35.6 + 3.0
23.44 935.6 2..55.42 15..35.4
703.2 23..48..04.99 47.28.18.0
726.64 23..45..09.57 47.37.57.3 = *2
724.3
 *2 7 ..48..51.5 16.70 30.28 *4 - *2 *2 N of *4
 *4 of G.P. 7 ..51..47.0 13..58 4.28.5 - 0.15 12..04.3 + 2.2
 7 ..53..20.3 6.77 4.28.8 - 0.16 12..05.2 + 2.4
23.47 4..28.50 12..07.0
31 23..49..37.66 47.25.45.6
23 47 23 ..45..09.16 47.37.52.6 = *2
704.1
727.57
2 3
725.2

Saturday March

early

purposely

late

β	8..00	02.6	4..40 below	8 03..52.2	3..82 below
x_2	8..02..39.7	8..43		8 06..26.9	8..45
	2..37.1	12.83		.08 " 34.7	12.27
		<u>31</u>			<u>31</u>
		12.83			12.27
		3849			3681
		39773			38037
		<u>13</u>			<u>1.2</u>
		396.4 = 6..36.4			379.2 = 6..19.2

Comet proceeds x_2 Comet N of x_2

δ	δ	δ	δ
2557-7..03	2..45.7 - .06	9..17.7 + 1.0	
7..08	2..44.3 - .06	8..53.3 + 1.0	
8..00	< 2..37.1 - .42 >	6..36.4 + 1.7	
8..03	> 2..34.7 - .42 <	6..19.2 + 1.8	
7..33..45	18	1866	
6..10	2..40.90	7..46.6	
7..27..35	- .09	+ 1.4	
22..52..10		7..48.0	N of x_2
8..32..25	2..40.81		
1..23.4			
8..31..01.6			
Mean R of x_2	23..45..09.36	47..37..55.0	
β R	23..42..28.55	δ = 47..45..43.0	Mean Eq 9m 1 st
Mean of 4 Sets.		MSZ March 6 th 8..31..01	

23..39..15	48..54
23..42..28	47..46
3..13	1..08
23..48	2..10
47..46	46..44
240	

March 4

March 4

5

6

Lon 20° 49' 59.1 Lat 46° 52' 51.6 R 9.99664000 343° 52' 59.5
" 20° 33' 12.4 " 45° 38' 50.2 R 9.99675530 344° 52' 52.0
" 20° 16' 37.9 " 44° 23' 43.7

Notice of Comet sent to

Prof A. W. Smith Middletown College Conn.

" O. M. Mitchell Cincinnati Observatory Ohio

" Caswell - Providence R. I.

Hon J. L. Adams - Washington D. C.

Lt Maury - Washington Observatory D. C.

Prof E. C. Herrick Yale College Conn.

" Rooney - Western Reserve College Ohio

Prof Snell - Amherst

Rev. James Burley - Georgetown College D. C. (*no copies left)

Capt Henry W. Bayfield R. N. Charlotte Town Prince Edwards Island N

March 8th

B R 23.. 48
 8 45.. 36
 44 .. 24

46.. 44 X 6.7 R 48.. 36 21.983
 43.. 46 ✓ 46.. 30' 20.881
 12 89.49
 43.. 28 23.. 46.. 00.51 110.371
 3.004
 37
 21.028
 90.12
 111.15
 20.022
 140.154
 600.66
 740.814 = 12.. 20.8

* 7.8^t

* 6 .. 20.. 36.8 below 3.. 05
 B 6 .. 21.. 18.4 above 5.. 57
 0.. 41.6 8.. 62

6 .. 22.. 53.2 5.78 h 6.. 29.. 24
 23 .. 36.3 3.02 D 45.. 37
 43.. 1 8.80

* 1 29

(4166) 6 .. 31.. 29.9 3.. 02 below
 32.. 12.4 6.63 above 9.63

* 1 6 .. 33.. 51.2 below 3.. 00

4166
 7 * 2 6 .. 34.. 35.7 9.. 33 below

34 .. 35.8 7.. 54
 * 2 36 .. 57.0 9.. 34 10.. 54

42.5 15.96 2.. 23.3
 2 .. 23.3 21.2
 3 .. 05.8 21.0
 - 25

0 .. 44.6
 2 .. 21.2
 3 .. 05.8 16.88

follows * 2 = 21.. 21.83 = 249

* 1 6 .. 43.. 22.5 2.. 93

6 .. 47.. 40.5 2.. 99

23.. 02.. 16.35
 46.7
 03.. 03

44 .. 07.4 7.. 95 10.88

6 .. 48 .. 26.7 8.. 30 11.29

* 2 46 .. 28.4 9.. 35

6 .. 50 .. 46.4 9.. 33 6.. 34.. 00

2 .. 21.0
 0 .. 44.9 6.. 43
 3 .. 05.9 17.30
 15.96

6.71
 2.31
 15.96
 17.30
 18.93

46.2 17.63
 3 .. 05.9

6.. 15

follows * 1 rep 16.53
 21.4

8.62 5.97 * 2557 6.. 21 7.. 24.. 42
 1.. 13

0.. 41.6 0.00 16.71
 21

8.80 9.94

23 * out 7 23.. 29 dis 8

43.1 16.71
 50.13

9.63 9.94

31 * out 7.. 26.. 29 dis 8

42.5 518.01
 17

10.54 29.82 6.37.00 32

44.6 516.3

10.88 308.14
 1.0

35

44.9 22.9

11.24 307.1

44

46.2

59.76 5.. 07.1 = d5

49

0.. 43.82 = dR

9.94

24

6.. 34.. 00

Times of passage of head of comet

429
Zero 69° 15'Tail points 20° N of Zenith
perhaps 1/2° long.

1st edge 24.9 25.00 across the edge of
center 11.16 25.15 the ring
2nd 32 25.35 axis of tail

77° 00' N

353.10

276.05 W

26.12 4
2.986 28
37
209.02 41
8958
110482

* 1810 23.46.09.19
1.51.15
1847 * R 23.51.00.34
2.21.83
23.48.38.55

44.38.40.3

12.20.8

44.26.19.5

45.33.40.5

8.36.3

45.25.04.2

8.37

4.70

4.67

light which

Gr 4166

26.12.5 X, 1810 23.46.04.34

1.50.48

1847 * R 23.47.54.82

0.43.82

by * 2 p. R 23.48.38.64

1.53.6

2.20.2

.33.4

0.26.6

5.07.1

R=5.19.5

 $\frac{A}{w}$

6 on

4 23.35.50

50.01.46

6 23.42.28

6.38.3

47.45.43

2.16

8 23.48.47

6.19.4

45.22.20

2.23

10 23.54.40

5.53

42.50.34

2.31

12 00.00.00

5.20

40.09.24

2.4

921

outline is ill defined

faintly but excepting near the head it is

* the first time with the naked eye

4159.7.23.30 R₁ X, 23.48.38.64 p X, 45.25.19.5

March

S 2.7.24.29

7.29.30 X, 38.64 p X, 19.5

7.26.30 X₂ 38.55 p X, 04.2

7.24.24 23.48.38.67 45.25.14.4

By 6 sets of Comp with * 4166 Gr

and 3 sets * 4181 Gr.

14 37.17.54 2.51.30

16 34.18.04 3.02.50

18 31.08.1 3.14

Times of passage of head of Comet

1st edge 24 9 25.00

center 11 16 25 18

2nd 32 25 35

across the edge of the ring

axis of tail

* 1810 23.48.09.19

26.12

4

1847 * 2 R

1. 51.15

23.51.00.34

2. 21.83

23.48.38.55

429

Zero 69.15'

352.15

77.00 N

44.38.40.3

12.20.8

44.26.19.5

45.33.40.5

8.36.3

45.25.04.2

Tail points 20° N of Zenith
perhaps 1/2° long

353.10

76.05 N

8. 87

4. 70

3. 67

diameter of all the light which bears ill,

hymo 3.0 in dia

observed dif of *₁ x *₂
R
3.05.85 3.09.13

26 25 X, 1810 23.46.04.34

1. 50.48

1847 * R 23.47.54.82

0. 43.82

by *₂ p R 23.48.38.64by *₂ p R 45.25

4 23.35.50

50.01.46

6 23.42.28

6.38 3

47.45.43

8 23.48.47

6.19 4

45.22.20

10 23.54.40

5.53

42.50.34

12 00.00.00

5.20

40.09.24

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

3.2

2.41.60

Clear & fine. Went 2

Comet tonight is col-
brighter & than ^{more} light it
exploded & the light ^{more} ground
and extends 4 or 5 itsin without much dif-
t was seen tonight for

ch 8 M.S.T. 7. 24.29

p R 23.48.38.61

p R 45.25.14.4

By 6 sets of Comp with * 4166 Gr
and 3 sets * 4181 Gr.

Series of passage of head of Comet

429
Zero 69° 15'Tail points 20° N of Zenith
percept 4° long.1st edge
center
2nd24 9 25.00
11 16 25 15
32 25 35across the edge of
the ring
axis of tail E

77° 00' N

353.10
E 76.05 W

* 1810 23.49.09.19

44.38.40.3

8.97

26.12

4

1847 * R

1.51.15

12.20.8

4.70

2.986

28

23.51.00.34

44.26.19.5

diameter 4.67

209.02

41

2.21.83

45.33.40.5

of all the light which
beats ill,

8958

110482

23.48.38.55

8.36.3

45.25.04.2

Gr 4166

26.12.5 X, 1810 23.46.04.34

44.41.53.6

hlymo 3.0 in dec

1.50.48

12.20.2

1847 * R 23.47.54.82

44.29.33.4

observed dip of * 1 x 2

0.43.82

45.30.26.6

3.05.85 3.09.3

4 * 2 p.R 23.48.38.64

5.07.1

45.25.19.5

4 23.35.50

50.01.46

Clear & fine. Not 2

6 23.42.28

6.38.3

47.45.43

2.16.03

8 23.48.47

6.19.4

45.22.20

2.23.23

10 23.54.40

5.53

42.50.36

2.37.46

12 00.00.00

5.20

40.09.24

2.41.60

The Comet tonight is col-
dently brighter & than light or
concentrated & the light ground
around the head extends 4 or 5 itsoutline is ill defined. The tail may be seen without much dif-
ficulty but excepting near the head it is very faint. It was seen tonight for
* the first time with the naked eye1557.7.23.30 R_p X, 23.48.38.64 p * δ 45.25.19.5March 8th M.S. 7^h 24.29

7.23.30

X₁

38.64

p *

19.5

p.R 23.48.38.61

7.26.30

X₂

38.55

p *

04.2

p δ 45.25.14.4

7.24.24

23.48.38.67

45.25.14.4

By 6 sets of Comp with * 4166 Gr

14 37.17.54

2.51.30

and Buts - - - * 4181 Gr

16 34.18.04

3.02.50

18 31.08

3.14

30 Apr
26 And.

$$\frac{5.27}{.31} = 17.03$$

$$\frac{158.1}{162.8} = 2.2258 \times 3'$$

47

$$6 \quad 34 \quad 47.3 \quad 3.40$$

$$6 \quad 35 \quad 36.8 \quad 8.50$$

$$0 \quad 49.5 \quad 11.90$$

$$x_1 - x_2 \quad 5.37$$

$$*_{27} 6 \quad 48 \quad 36.4 \quad \text{above } 13.87$$

$$*_{30} 6 \quad 50 \quad 55.0 \quad \text{below } 9.07$$

$$2 \quad 18.6 \quad 22.94$$

$$x_1 - x_2 \quad 17.57$$

$$\frac{22.94}{.31}$$

$$8882$$

$$711.14$$

$$\frac{711.14}{23} = 11.48.8$$

$$7 \quad 01 \quad 18.9 \quad 0.64$$

$$7 \quad 02 \quad 05.6 \quad 8.49$$

$$0 \quad 46.7 \quad 9.13$$

$$x_1 - x_2 \quad 5.45$$

$$5.41$$

$$\frac{5.41}{.31}$$

$$541$$

$$1623$$

$$16771$$

$$\frac{16771}{5}$$

$$x_1/x_2 \quad 2 \quad 47.2 = 167.2$$

$$42 \quad 44 \quad 44.3$$

$$47 \quad 47 \quad 31.5$$

$$12 \quad 59.50$$

$$0 \quad 08 \quad 19.86$$

$$23 \quad 55 \quad 20.36$$

$$1847 \quad x_1 \quad 23 \quad 55 \quad 20.47$$

$$0 \quad 49.34$$

$$23 \quad 54 \quad 31.43$$

$$*_{27} (30) \text{ Apr } 7 \quad 15 \quad 05.0 \quad 13.44$$

$$*_{26} (26) \text{ And } 7 \quad 17 \quad 24.0 \quad 8.48$$

$$2 \quad 19.0 \quad 22.92$$

$$x_1 - x_2 \quad 17.47$$

$$17.52$$

$$\frac{17.52}{.31}$$

$$17.52$$

$$5256$$

$$54312$$

$$\frac{54312}{1.8}$$

$$4 \quad 01.3 = 5431.3$$

$$42 \quad 56 \quad 28.5$$

$$47 \quad 47 \quad 27.3$$

$$15 \quad 18.50$$

$$0 \quad 10 \quad 38.66$$

$$23 \quad 55 \quad 20.16$$

$$42 \quad 47 \quad 29.4$$

$$6 \quad 04.4$$

$$42 \quad 53 \quad 34.3$$

Cloudy over the

Comet to night

Can be seen without difficulty

by the naked eye

March 10 MS. 2. 7. 18. 20

March 10 MS. 2. 7. 18. 20

March 10 MS. 2. 7. 18. 20

By 50x with a thin 4x mag which was differentiated with (30x & 2x) (red)

3
26
04
-1
-1

48

March 10th AdhCount S of α_2 at 17.40 Just a diameter of the outer ring4^h 34.004^h 46.50

12.50

4^h 27.00

49.0

12.00

4^h 38.004^h 51.00

13.00

There are no stars besides up to $R 1^h 57^m$ March 11thSpring $R 23^h 57^m 20^s$ $\delta 41^\circ 30'$

NPD 48.30

Gr 4199 6th $R 23^h 54.00^s$ $\delta 41^\circ 29.00'$ 12th AdhGr(4212) $23^h 55.57.6$
 $\delta 41^\circ 08'.20''$

Gr(4218)

8th $23^h 56.32$ 6.7 $23^h 56.50.1$ $41^h 42.08$

Gr(4219)

 $41^h 12.34$

March 11th very cloudy,
one just below ring

gr (4199)
* above

& one above very faint

8^h 01^m 35.6 8^h 05^m 21.0 1/4 424

T 1.49.4 01^m 50.4 T 1.31 46.0

+1.20.6 03^m 11.0 06^m 27.0

25.0 06^m 52

8^h 02^m 30.36 8^h 06^m 06.50

8^h 02^m 30.70 8^h 06^m 06.50

8^h 02^m 30.50

8^h 06^m 06.50

d.R 3^m 36.00

March 12th deli

4 P.B. obs alone till 16.34 when we reached.

X2 below 8^h - 4 beats

16^m 02^m 28.4 13^m 14 below

04^m 09.0 10^m 78 above

1^m 40.6 23.92

05^m 47.5 12.67

07^m 27.0 11.53

1^m 39.5 24.20

08^m 51.0 12.75

10^m 31.5 11.81

1^m 40.5 24.50

14^m 03.2 14.38

15^m 43.5 10.78

1^m 40.3 25.16

16^m 17^m 22.0 14.02

19^m 03.5 11.47

1^m 41.5 25.49

20^m 26.2 13.89

22^m 07.5 12.01

1^m 41.3 25.90

60

12 41

$$\begin{array}{r} 16.35 \\ 23.58 \\ \hline 7.23 \end{array}$$

$$\begin{array}{r} 24 \overline{) 80} \quad 3.33 \\ \underline{72} \\ 80 \end{array}$$

$$\begin{array}{r} 48 \overline{) 330} \quad 7.00 \\ \underline{336} \end{array}$$

$$\begin{array}{r} .88 \\ 49.8 \end{array}$$

20

11
March 12th Ark

26th 24.5 - 8.62 below x_2 8

27th 17.5 - 16.80 below x_7 x_2

26.68

29th 100.5 9.88

18.50

1 1.43.0 8.20

2 1.43.0 8.21

24.60

254.20

253.4 = 4.13.4

2.36.4

2.36.7

x_1 16th 34.25.0 7.83 below

38 27.9 7.61

16th 45.47.19

x_2 16th 35.18.4 16.00 below

39 20.8 15.74

37 1.01.4 11.71 above

41 1.04.6 12.28

1 1.43.0 27.71

1 1.43.8 28.02

by R 19.54

19.89

10.7.8

16.04

20.04

23.038

by R $\times \times$

07

37

37

2.36.0

18.50

35.7

16.35.45

16.20.49

15.00

11

14.029

21.266

36.4

19.54

16

60.12

91.14

36.7

19.89

19

74.148

112.406

2.36.40

43

22

12.21.5

1.52.41

2.36.52

19.31

29

3.043

20.04

2.36.52

19.31

37

21.294

140.20

57.31

41

9.126

60.12

59.61

11.2554

74.148

59.67

1 1.43.8 28.02

March $\frac{11}{12}$ Dec12.27
12.52.3
12.7
13.05.1

Ref. or	Corr	Ref. Declination	Corr
follows x_2 at 16.04	1.40.6 + 0.35	598 x_2 23.92	+ 4.8
2557. 08	1.39.5 0.32	24.20	4.6
11	40.5 0.28	24.56	4.0
16	40.3 0.27	25.16	3.9
19	41.5 0.25	25.49	3.7
22	41.3 0.23	25.90	3.3
29	43.0 0.21	26.68	2.6
37	43.0 0.17	27.71	2.1
41	43.8 0.15	28.02	2.0
187	135 $\frac{1}{2}$ 22.3	51.64	40

" 23.14.06 16.20.48 1.41.50 25.74 1510 x_2 23.54.52.94
 $\frac{47}{23.14.35}$ 6.2004 + 25 13.15.3 1.52.55

16.14.28 1.41.75 + 3.5 23.56.45.49

23.14.35 13.18.8 48.57.52.3

16.54.53 x_2 $\frac{1}{4}$ (4219) x_1 23.54.00.39 12.21.4

2.47 x_1 $\frac{1}{4}$ (4212) 1.52.41 48.45.30.9

dk.5.7. 16.57.06 x_2 1.41.75 23.55.52.80 dk. 1.41.75

49.02.06.2 dS 13.18.8

12.21.5 23.58.27.24

MSZ 17.12.06 x_1 2.36.52 48.49.44.7 48.01 10.3

MSZ 16.57.06 R 23.58.27.24 S 41.01.10.3 dk. 2.36.52 hlymo R + 7.0

16.57.06 23.58.27.24 41.01.10.3 dS 9.58.3 .. δ 3.33 = 200"

17.12.06 23.58.29.32 41.00.17.0 23.58.29.32

17. 618 2380 2.376 48.00.17.0

MSZ 17.02.06 R 23.58.27.93 S 41.00.52.5 March 11. MSZ 17.02.06

27.24 27.25 29.00 Considered a very good place dk. 23.58.27.93

Suffering 0.30 in R Mean of 9 sets with x_2 (4219) δ 41.00.52.5

" 3" in dec 3 sets with x_1 (4212)

March 12th 1847

The comet is plainly visible to the naked eye. In the comet ruler it shows a tail of 2° or perhaps 3° & is much brighter than on any preceding evening pole by that angle. I think it is curved

23 Androm. 12th Rln

above	7 ⁿ 38 ⁿ 59.5	3.06	7 ⁿ 45 ⁿ 36.7	3.58	7 ⁿ 52 ⁿ 42.2	3.99
x below	7 ⁿ 49 ⁿ 25.7	2.58	7 ⁿ 51 ⁿ 01.7	2.82	7 ⁿ 58 ⁿ 06.5	3.17
	5 ⁿ 26.2	5.64	5 ⁿ 25.0	6.40	5 ⁿ 24.3	7.16

3.100

23 Androm.

20.05
60.1

B.A.C.	0 ⁿ 05 ⁿ 44.44	49 ⁿ 47 ⁿ 31.7
	9.30	1 ⁿ 00.1
7 ⁿ 59	35.4 4.44	
8 ⁿ 04	59.7 3.63	x R 0 ⁿ 05 ⁿ 35.14
5 ⁿ 24.3	8.07	5 ⁿ 25.02
		x S 40.11 28.2
		3 ⁿ 18.8
		8 40 08.09.4

7 ⁿ 39	proceeds x	5 ⁿ 26.2	0.05	5.64	+1.7
7 ⁿ 46		5 ⁿ 25.0	0.06	6.40	+2.3
7 ⁿ 52		5 ⁿ 24.3	0.08	7.16	+2.9
7 ⁿ 59.5		5 ⁿ 24.3	0.09	8.07	+3.5
365		38		327	

7 ⁿ 49.10	5 ⁿ 24.95	6.54
2557 6.20	+07	6.54
7 ⁿ 42.50	5 ⁿ 25.02	1962
23 ⁿ 18 50		202.74
8 ⁿ 24.00		6.5
8 ⁿ 22 37		2.6
		3.188

March 12th 1847. 7ⁿ 58ⁿ 22.37
 R 0ⁿ 00ⁿ 10.12
 S 40ⁿ 08ⁿ 09.4
 4 Comp. with 23 Androm.
 A.D.C. (28)

March 15th 18473.115
9.34520.03
60.09D 36.00
h 7.0011.9
5.5
6.4
18.3

Rabouin * in Andromeda

7^h 32^m 06.3 14.03 7^h 38^m 13.9 14.52 41 55.0 14.73
 7^h 34^m 47.6 7^h 31^m 7^h 40^m 54.2 7^h 25^m 44^m 35.5 8^h 02^m
 2^h 41.3 21^h 34 2.40.3 22.27 2^h 40.5 22.75

31
21 38
64.02
661.58
21
6495

7^h 45^m 45.9 14.89 h 7^h 32^m 36.00
 48 25.5 8.29
 2^h 39.6 22.18

0^h 10^m 30.41 - 1850R^h 07h 7^h 30^m D=36°

ref

* R 0^h 10^m 21.077^h 32.1 2^h 41.3 + 0.19 21.34 + 2.67^h 38.2 2^h 40.3 0.22 22.27 2.97^h 41.9 2^h 40.5 0.23 22.75 3.37^h 45.8 2^h 39.6 0.25 23.18 3.7

380 19 15.4

7^h 39.30 2^h 40.42 22.386^h 35.00 + 0.22 317^h 32.55 2^h 40.64 22.3823^h 30.39 proceeds 67148^h 02.16 1^h 11 693781^h 19 11^h 31.6 = 6916457.8^h 00^m 57^s ref + 3.1p See 35^h 44^m 37.3March 15 M.S.Z. 8^h 00^m 57^sp R 0^h 07^m 40.43dec 35^h 44^m 37.3

p S of Star 11 34.7

or 5°

4 comp. * in Andromeda B.A.C. (58)

Tail is about 4^h long in the Comets taken. It has an intricate - unshaved
 look like some of the old Comets of Hevelius. The head is large & irregular.
 The tail commences narrow its brightness is inversely as its breadth. It is as
 bright as a Star of the 5th Mag.

54

R 0^h 12Z 390
45817^h dec 32° 40'17^h Count is 22 N of a Star in Ant. Cel. R 0^h 10^m 59^s 0 p 349 ZD 16.58.40

x Dec = 32° 40'

0^h 03^m 44.731^h 15^m 45.65^h 27.131^h 07^m 29.011^h 41.031^h 35^m 14.614^h 10.330^h 54^m 13.714^h 36.030^h 47^m 55.9(14^h 58.7(30^h 48^m 14.5)15^h 11.530^h 27^m 20.215^h 25.230^h 25^m 42.716^h 25.531^h 33^m 53.717^h 23.431^h 18^m 35.019^h R 0^h 1528 Andr. 1850 28^h 55^m 30

Z 385

S 29^m 20'R 0^h 22^m 13

X 390

March 19th 1847

Proceeds

HS

2557 R 54 49.4 - 48.6 below 8^h 127^h 59h = 6^h 37.30* 9^h 7^h 00 38.5 38.6 below = 5329^h 04^m 405 37.9 38.0 above 11^h 4829^h 00^m 0048^h 5

19.60

07^h about 00.3 7.730^h 17^m 05

1 20

48.0 48.0 5

6.35

$\begin{array}{r} 7.10 \quad 25.8 \quad 26.0 \quad 7.36 \text{ below} \quad 29 \text{ Andromeda} \quad 61.04 \quad 31.7 \\ \times 5 \quad 16 \quad 13.3 \quad 13.0 \quad 10.71 \quad 1850 \quad 0.22 \quad 13.00 \quad 59.9 \\ 5 \quad 47.5 \quad 18.07 \quad 9.43 \quad 61.05 \quad 31.6 \end{array}$

$\begin{array}{r} \text{below } 7.18 \quad 08.4 \quad 8.0 \quad 6.83 \quad *R \quad 0.22 \quad 03.57 \quad 28.54 \quad 28.4 \quad *S \\ 4 \times \text{above } 7.23 \quad 54.9 \quad 54.5 \quad 10.11 \quad 5.46.95 \quad 9.05.3 \\ 5 \quad 46.5 \quad 16.93 \quad \text{PR} \quad 0.16 \quad 16.62 \quad 29.03 \quad 33.7 = \delta \end{array}$

$\begin{array}{r} 7.26 \quad 09.7 \quad 9.0 \quad 6.46 \quad \text{Q } 29.08 \text{ h } 7.04 \\ 31 \quad 55.8 \quad 55.6 \quad 9.18 \\ 5 \quad 46.1 \quad 15.64 \end{array}$

March 19th 1915
 M.S.Z. 7^h 19^m 15^s
 PR 0^h 16^m 16.62
 S 29^h 03^m 33^s 7

$\begin{array}{r} 6.38 \quad \text{ref} \quad \text{ref} \\ 6.59.8 \quad 5.48.5 - 0.14 \quad 19.60 + 1.8 \\ 7.10.4 \quad 5.47.5 - 0.18 \quad 18.07 + 2.0 \\ 7.18.1 \quad 5.46.5 - 0.22 \quad 16.93 + 2.7 \\ 7.26.2 \quad 5.46.1 - 0.28 \quad 15.64 + 4.5 \\ 545 \quad 5.47.6 \quad 224 \quad 109 \\ 7.13.36 \quad 5.47.15 \quad 17.56 \quad 2.7 \\ 6.45 \quad - 20 \quad 526.8 \\ 7.06.54 \quad 5.46.95 \quad 544.36 \\ 23.46.24 \quad 542.6 \\ 7.20.27 \quad 9.02.6 \\ 1.12 \quad 2.7 \\ 7.19.15 = \text{M.S.Z.} \quad 9.05.3 \end{array}$

$\begin{array}{r} 7 \quad 46.30 \quad 5.00 \\ " \quad 41.30 \quad 6.00 \\ 15 \quad 35.45 \quad 6.40 \\ 19 \quad 24.04 \\ 23 \quad 21.00 \\ 10 \end{array}$

56
March 24th2.45
1.20

7.18.55-20 h 6.47.30 18.51 alt = 4.13

$$\begin{array}{r} 16.47.40 \\ 0.31.15 \\ \hline 16.16.25 \\ 0.24.30 \\ \hline 15.51.55 \end{array}$$

7.19.30

18.44.00

$$\begin{array}{r} 9.80 \\ 34.40 \\ \hline 44.20 \end{array}$$

7.21 33.5-20 h 6.50.05 18.51 3.53

$$\begin{array}{r} 16.50.05 \\ 0.31.30 \\ \hline 16.21.35 \\ 0.24.40 \\ \hline 15.56.55 \end{array}$$

$$\begin{array}{r} 14 \\ 18.36 \end{array}$$
March 24th M.S.Y.

29 06.0 -10

$$\begin{array}{r} 6.39.08 \\ 15.04 \\ \hline 0.24.04 \end{array}$$

29 18.0 -10

0.24.04

p Ap. R 0.24.40⁵ at 7.14^m sid. by instrument

Dec 18.36'

by sp. R 0.24.04 Dec 18.34.40

adriatic

8.53.03 D 22.55

h 6.47.50

2.05.13

1.58.33

Cr -6.40 -11

22.44

Comet below 7'

between two clouds

56.57.0

mid full

well taken 7.25.00-4 Beat

alt 3.00

$$\begin{array}{r} 61.0 \\ 82.5 \end{array}$$

6 10.5-4

59 P. R

Cloudy

$$\begin{array}{r} 7.41.45 \\ 6.39.08 \\ \hline 0.24.04 \end{array}$$

sign 27.11.5-4

22.5-4

a little more than twice
the breadth of the inner pole
the edge of the outer ring

+ 7.26.41.00

T 7.26.41.25

57.7 460.1 = 7.43"

78.0 466.2

93.1 266.6

79.5 247 4.17 3.26

8.21.00 mid

clouds

2nd Arctis below 5'

taken alone

8.46.35.5 h 6.55

T 98.5.4.03.5 late 1st phase

t 820 05

48.14.0 with

$$\begin{array}{r} 8.47.24.3 \\ 7.26.41.2 \\ \hline 1.20.43.1 \end{array}$$

T 8.47.24.75

disappeared in a cloud
as it left the field
$$\begin{array}{r} 7.40 \\ 12.24 \\ \hline 4.44 \end{array}$$
7th Arctis R 1.45.18.46

9.81

1.45.08.65

1.28.48.2

0.24.26.4

18.43

7.27.22.7

18.32.37.3

3.30

18.36.07

March 24 M.S.G. $7^h 13^m$

alt 3° $R 0^h 24^m 26.4$
 $\delta 18^\circ 36' 07''$

Mean of Comp by

First & Estimate with $R 0^h 24^m 22$
 59 Position & admits $\delta 18^\circ 35' 20''$

There is an inconsistency in the obs. of the star
 but I should be confident from ~~an~~ ^{the obs.} estimate of the distance of the two in Dec. that the
 position is not greatly in error, not 2' certainly—
 compared with γ^2 Arctis

* $R 1847 1^h 45^m 08.65$
 $\delta 0^\circ 24' 36.4$

April 21 ^{alt} δ for δ $12^\circ 20'$

April 20th Neptune up to this
 date has been so situated, just
 before sunrise, as not to admit of
 observations upon it from the
 5 foot Equatorial.

18 31.. 12-10 18.. 27.. 02-4
 3.. 33.. 00 L 3.. 37.. 06.

$R 16^\circ 48'$
 Alt 18.. 35.. 08-10
 L 3.. 05.. 05

18.. 14.. 39-20 Apr 26 ^{alt} δ looks like a comet.

Daylight

18 15.. 52.. -10 6.20.04 $E+40^\circ 20'$ *7^{te}

18.. 23.. 58.. -10 6.. 12.. 00 40.. 20

18.. 29 30 -10 6.. 06.. 29 40.. 20

16..

alt 18.. 41.. 19.0 6.21.. 61
 $58^\circ 12'$

In glancing at them, I made a mistake of one hour in R which
 made me think it a comet. It being too ~~near~~ ^{close} to sunrise to recognize
 it as the nebula in Andromeda

58

Neptune
 May 10th R 22.09^h Dec - 11° 54'
 " 14 22.10 - 11.53 - 11.49 - - 11.29
 " 18 22.10^h - 11.52 Stationary June 5th Op. Aug 21st

e' Aqu 7740
 22.03 22.02

There was a small star seen near e' Aquarii
 thought to be the planet it preceded the * e' by 30th ult.

* e'
 * Neptune?
 of planet

* 7740

18.47.20 - 10 - 12.02 x' 6' seen at R
3.31.24 x

probably Neptune

18.53.00 has a star above with following & 22' S. true
3.17.23 - 11° 57' 6' S of e' Aquarii

P 896 above

2.46 e' Aqu

11.42 P S of x e'

5.40
 4.28
 10.18

Planet is in Quadrature May 19^d 12^h fr. Wednesday.

First Observation of Neptune in Quadrature

Sat May $\frac{14}{15}$ 1847

Star is $\star$ Aquarii B.A.C. 7740

	4PB		4PB		4PB
2557 19 ⁿ 02 .. 43.5 = 4 beats	below 5 ⁿ 76	19 ⁿ 10 ⁿ 46.5	6 ⁿ 02	19 ⁿ 20 ⁿ 08.5	6 ⁿ 47
P 19 ⁿ 08 ⁿ 52.0 "	above 4 ⁿ 11	19 ⁿ 16 ⁿ 55.5	3 ⁿ 78	19 ⁿ 26 ⁿ 17.3	3 ⁿ 58
6 ⁿ 08.5	9.87	6 ⁿ 09.0	9 ⁿ 80	6 ⁿ 08.8	9 ⁿ 85

19 ⁿ 29 ⁿ 24.3	8 ⁿ 89	19 ⁿ 37 ⁿ 59.0	19 ⁿ 49 ⁿ 12.3
P 35 ⁿ 32.7	3 ⁿ 97	19 ⁿ 44 ⁿ 37.4	
6 ⁿ 08.4	9 ⁿ 86		

Stars are unsteady

Dif R. P. follows B.A.C. 7740

Dif Dec. P. S. B.A.C. 7740

6ⁿ 08.5

9ⁿ 87

09.0

80

08.8

85

08.4

86

6ⁿ 08.65 + .02

9ⁿ 85

31

4ⁿ 85

295 5

305.35

128 98

304.37

5ⁿ 04.4

P.S. of star.

ry +.5

19ⁿ 15ⁿ 30

3ⁿ 00

19ⁿ 13ⁿ

3ⁿ 27

15ⁿ 46

15ⁿ 48

Camb. U.S. &

May 14ⁿ 15ⁿ 42ⁿ

May $\frac{19}{20}$

16..51.4

17..16.5 8.64

19..11..17.9 above 5.04

x_1 19..24..16.7 4.23 part center x_2 is B.A.L. 7740
 x_2 24 58.6 9.06 below

 x_1 19..24..58.6 4.23 below

P ..31..17.9 4.10

6..19.3 8.33 257.4

$$\begin{array}{r} 8.33 \\ 249.9 \\ \hline 258.23 \end{array}$$

258.23

 x_2 19..33..42.4 1.33 above x_2 19..34..24.5 3.53 below

cloudy

d. dury light

2557..19..31..18

2557 + 3..06

Sid. 19..28..12

3..46.55

15..41..17

-2.34

May 19..15..38..43 M.S.?

May ²⁰/₂₁ 1947

Neptune near Squadrature

*₁ 19..10..67.2 below 2.76Bright *₂ 19..10..48.8 above 2.07

P 17..09.0 above 10..21
 6..20.2 8..14

*₂ 19..20..24.8 below 3.80
26..45.2 above 4..36
 6..20.4 8..16

P 19..45..51.2 below 5.03
11.9 3..11
 6..20.7 8..14

19..29..04.0 below 4..18

35..24.6 above 3..96
 6..20.6 8..14

19..37..18.8 4.61
19..43..39.7 3..61
 6..20.9 8..22

19..54..03.9 5..49
00..24.3 2..64
 6..20.4 8..13

8..14 19..17
 8..14 36

8..16 27
 8..22 44
 8..14 46
8..13

93 00
 8..15 23 0

31
 8..15 19..38..20"
2445
 252.65
8
 251.8 = 4..11.8

Diff. DR

Diff. Dec

6..20.2

4..11.8 Mean of 6

6..20.6

+ .4 ref

.4

9

.7

.4

Mean 6..20.53 + 0.02 ref

19..38..20

2557 + 3..08

19..35..12

3..50..51

15..44..21

- 2..35

May 20 M.S.Z. 15..41..46

Sat. May ^{28th} 29th 1847

$$\begin{array}{r} \times \text{barys } 19 \text{ .. } 48 \text{ .. } 58.7 \text{ } 3 \text{ } 70 \\ \text{P. above } 19 \text{ .. } 55 \text{ .. } 27.8 \text{ } 3 \text{ } 33 \\ \hline 6 \text{ .. } 29.1 \text{ } 7.03 \end{array}$$

$$\begin{array}{r} 19 \text{ .. } 57 \text{ .. } 07.7 \text{ } 4 \text{ .. } 23 \\ 20 \text{ } 03 \text{ } 36.7 \text{ } 2 \text{ .. } 78 \\ \hline 6 \text{ .. } 29.0 \text{ } 7.01 \end{array}$$

$$\begin{array}{r} 20 \text{ .. } 05 \text{ .. } 44.6 \text{ } 4 \text{ .. } 76 \\ \text{.. } 12 \text{ .. } 14.0 \text{ } 2 \text{ .. } 27 \\ \hline 6 \text{ .. } 29.4 \text{ } 7.03 \end{array}$$

$$\begin{array}{r} 19 \text{ .. } 55 \\ 20 \text{ .. } 04 \\ 12 \\ 21 \\ 29 \\ \hline 20 \text{ .. } 12 \text{ .. } 12 \end{array}$$

$$\begin{array}{r} 20 \text{ .. } 14 \text{ .. } 04.7 \text{ } 5 \text{ .. } 24 \\ 20 \text{ .. } 33.8 \text{ } 1 \text{ .. } 78 \\ \hline 6 \text{ .. } 29.1 \text{ } 7.02 \end{array}$$

$$\begin{array}{r} 20 \text{ .. } 23 \text{ .. } 38.7 \text{ } 5 \text{ .. } 77 \\ 29 \text{ .. } 07.9 \text{ } 1 \text{ } 23 \\ \hline 6 \text{ .. } 29.2 \text{ } 7.00 \end{array}$$

$$\begin{array}{r} 7 \text{ } 02 \\ 31 \\ \hline 7 \text{ } 02 \\ 210 \text{ } 6 \\ \hline 217 \text{ } 6 \\ 7 \\ \hline 216.9 = 3 \text{ .. } 36.9 \end{array}$$

$$\begin{array}{r} \text{Lif } R \\ 6 \text{ .. } 29.16 \\ + .01 \text{ ref} \end{array}$$

$$\begin{array}{r} \text{Lif } R \\ 3 \text{ .. } 36.9 \\ + .2 \end{array}$$

$$\begin{array}{r} 20 \text{ .. } 12 \text{ .. } 12 \\ 2557 + \text{.. } 3 \text{ .. } 20 \\ 20 \text{ .. } 08 \text{ .. } 52 \\ 4 \text{ .. } 22 \text{ .. } 24 \\ 15 \text{ .. } 46 \text{ .. } 28 \\ - 2 \text{ .. } 35 \end{array}$$

$$\begin{array}{r} 1855.7740 - 22 \text{ .. } 04 \text{ .. } 17.21 \text{ } - 11 \text{ .. } 48 \text{ .. } 11.8 \\ \text{prec.} \text{ } - 9.62 \text{ } + 52.6 \\ \text{prop. m.} \text{ } - .06 \text{ } 0.0 \end{array}$$

$$\begin{array}{r} \text{Jan } 1847 \text{ } 22 \text{ .. } 04 \text{ .. } 07.53 \text{ } - 11 \text{ .. } 49 \text{ .. } 04.4 \end{array}$$

$$*2 = 7740$$

$$\text{May } 28 \text{ } 15 \text{ .. } 43 \text{ .. } 53$$

Saturn's app^t South limb -

Saturn's center - apparently North but really South of star

20 39.42.8 0.00 starsth Sat. up. above star40.12.3 0.00 Saturn's N limb

29.5

Diff. R

up - min

41.21.7

0^m 29.5

29.9

19

11.5

51.4

29.7

28.7

13

25.5

29.7

29.0

29.0

12

14

29.1

12

29.4

14

20 42.43.4

29.3

1

14

13

14

12.4 Sat. South N sum

29.1

29.22

12

29.0

29.2

12

29.3

13

29.4

13

25

13

47.4

5.43

Star below

29.31

3.9

4.03

45 16.7

5.24

below Sat center

29.3

19

= 4.0

Saturn follows star 0^m 29.29

13.2

Q D B

47.36.3

5.78

.. South of star 0.04.7

54.33.3

5.95

48 05.4

5.65

55.3.2

4.82

29.1

13

29.9

13

20 49 09.7

5.62

55.43

5.03

38.9

5.50

11.7

4.89

29.2

12

29.7

14

20.50

42.4

5.725

20.57

7.8

5.07

51

11.7

5.60

36.8

4.94

29.3

.125

29.0

9

52.25.5

5.81

20.58

43.9

5.35

54.9

5.67

13

5.20

9.4

14

29.1

15

0.27.7 - 5.27.5

57.1 - 5.15

29.4

.122

June 6th - 7th 1847 ^{h.m.} 3.15 still

X, 20.08.36.8 2.55

20.17.00.9 3.05

20.26.03.5 3.67

P 20.15.06.9 4.88

20.23.30.4 4.48

33.6 3.85

6.30.1 7.43

6.29.5 7.53

6.30.1 7.52

20.34.11.4 - 3.31

20.42.26.1 2.74

P 40.40.0 4.22

20.48.55.9 4.79

28.6 7.53

6.29.8 6.53

June 12th
 Saw a Meteor at 8^h 10^m direction SE by S. alt when
 first seen 15° or 20° past beyond a cloud & reappeared very
 bright brighter than Venus. motion perpendicular
 to the horizon and very rapid lasted 1 or 2^s arc 40° or more

June 27th
 28th at One A.M.

First observations with the Great Refractor Night nearly calm
 & very hot - about 70. Looked at Saturn having an altitude of about
 15° or 20° it appeared very bright but not at all well defined. though some-
 thing was to be attributed to the unfavourable atmosphere fancied
 that some faint star or satellite was visible near the plane of & close to the ring
 was a little disappointed but was somewhat prepared for this result
 from previous trials of stars. we read off a place of Saturn & observed
 a star of the second mag. S.W. of Lyra. & Dubhe. Saw Mizar at 10° or 12°
 with a power supposed 200 or 300 no good definition to the stars. It
 is a mass of light not irregular, & without wings. ~~It~~ indeed remarkably free
 from them, some half dozen fine pointed rays close to the star so regular in appearance
 that it may be doubted whether they are a defect: but what looks serious is the
 striking want of concentration in a point of the light of a bright star & the entire
 absence of the pretty rings which we see in our transit & in the good glasses
 we have tried only the two lowest powers (or nearly so). The clock work
 not being yet adjusted. We left the dome to cool down
 with the shutters & windows down & tried the 5 ft. on the same objects
 the night was bad for seeing but we could still discern the small disc
 of Mizar under a power of 240. The light of the Moon low with a W.
 caused a beautiful ^{silver} luminosity or 'glory' to surround the shadows
 cast by our heads of the opening blades of the eads which were growing round

the building we ^{each} could only see that round his own head
it appeared to proceed from the heavy dew drops which had fallen.

On returning to the large instrument a very evident change for
the better had taken place. for though it was still unsteady very much
more so than in the small telescope. the view of Saturn was by far
the most magnificent we had ever enjoyed. whenever for a moment
it ceased jumping & splitting which effects cannot be fairly attributed to the
telescope (because they were the same when the planet was motionless in the field)
we had views of the ring now almost in the plane of vision, of the belt which
appears to be double, of the shadow of the ring? the rectangular pattern of the
band & of the little satellite close to the ring. & of two others which look
like stars of the first magnitude which I cannot tell how to
reconcile with those ragged stars. The edges of the ring & belt
appeared at glimpses perfectly sharp & free from haze. such as one
would think could not be given by any other than an excellent
glass. The little satellite too like a little point close to the ring
& yet when for a second the air was quiet perfectly distinct. - Why
won't those stars come up to the mark. There is but one hope
& that is that the largest telescopes require the best nights, in every
instance the stars have seemed in great turmoil. boiling & jumping
in a manner very aggravating while in the smaller instru-
ment the state of things was much better.

Great Refractor

h 424 19. 39. 19 260. 10'

Feb. 11. 19. 39. 19 260. 10'

Feb. 11. 19. 39. 19 260. 10'

Star of 2nd mag. S of Alpha A. 1846phae. 1847

424 20. 09. 57 275. 27'

Wh 2. 34. + 5. 27'

~~Little~~ & Area May.

η

Journal

424 20.. 31.. 10 328.. 10

21.. 55.. 28 260.. 56

22.. 03.. 42 239.. 06

h W 7.. 48.. 0 + 58.. 10

22.. 57.. - 9° 04'

23.. 18.. - 30.. 54

obs PD Ref. cor

Tab. PA

& Area May. h ^{117°} 7.. 48' m + 0.59

cos - 0.45

PD 31° 50' + 1'

33° 14' $\delta p = 83'$

Depth h ^{38° 30'} 2.. 34' m + 0.62

cos + 0.78

84.. 33 + 0

85.. 22 $\delta p = 49'$ a = + 34'

Journal h ^{349° 30'} 23.. 18' m - 0.18

cos + 0.98

120.. 54 + 3

120.. 25 $\delta p = 38'$ a' = + 115'

(h'' - h') 20.. 44' m - 0.75

cos + 0.66

(h' - h) - 5.. 14' m - 0.98

cos + 0.21

(h'' - h) 15.. 30' m - 0.79

cos - 0.61

m(h'' - m'h) = - 1.07

m(h' - m'h) = - 0.27

m(h'' - h') + m(h' - h) - m(h'' - h) = - 0.94

a = .34

a' 115'

$\frac{428}{321}$
a(m'h' - m'h) = - 36.38

$\frac{705}{230}$
a'(m'h' - m'h) = - 30.05

cos h' - cos h = + 1.23

cos h'' - cos h = + 1.43

$\frac{115}{615}$

$\frac{34}{572}$

$\frac{123}{141.45}$

$\frac{429}{48.62}$

$\frac{48.6}{820}$

- 0.94 + 92.8 (- 98.7)

$\frac{846}{752}$

$\frac{680}{680}$

- .94 - 6.3 (+ 6.7)

$\frac{564}{660}$

A.E.G.S. 2° 15'

Error of Elevation 0.. 07'

Instrument was then altered in elevation, till the screws came home.

Great Equatorial In 30^h 1847

2557 + 4.08

Darius

2557 22.47.00

424 14.51.40 h 5.13.28 - 197⁰.01.00^s

424 22.42.53.2

22.42.52

 γ Virg.15.03.10.25 h 2.40^m 180⁰.15.03"

Antares

15.19.43 h 23.06.26 153⁰.21.00"

Subha

21.38.44 h 10.59.20 243.00.24"

true h 10.44.30

Star α and α Phoenice

21.52.25.5 h 4.27.26 194.01.24

true h 4.24.33

Saturn

22.15.00 h 23.20.00 171.04.16

true h 0.45.00^s

	True h	True N.P.D.	Obs'd N.P.D.	δp
Jupiter	$h' 161.08'$	27.25	27.00	$\delta p + 26'$
α Cygni	$h' 66.08$	77.19	75.59	$\delta p' + 80 \quad a = +54$
Saturn	$h'' 11.15'$	98.27	98.56	$\delta p'' - 29 \quad a' = -55$

$$(h'' - h') - 77.23 - 0.976 \quad \text{with } +0.323 \quad \text{with } -0.946$$

$$(h' - h) - 95.00 - 0.996 \quad \text{with } +0.914 \quad \text{with } +0.405$$

$$(h'' - h) - 172.23 - 0.133 \quad \text{with } -0.195 \quad \text{with } 0.981$$

$$\frac{1.972}{1.839} \quad (h'' - h) = 0.515$$

$$(h' - h) = 0.591$$

$$(h' - h) = +1.351$$

$$(h'' - h) = +1.427$$

$$\begin{array}{r} 518 \\ 54 \\ \hline 2072 \\ 2592 \\ \hline 27.970 \end{array}$$

$$\begin{array}{r} 591 \\ 55 \\ \hline 2955 \\ 2955 \\ \hline 32505 \\ 27.97 \\ \hline 154 \overline{) 4.53} \\ 368 \\ \hline 850 \quad + 1927 \\ + 1.351 \quad + 54 \\ \hline - 55 \quad 7708 \\ \hline 6.755 \quad 9635 \\ \hline 67.55 \quad + 104.058 \\ \hline - 74.305 \quad 74.30 \\ \hline 1.84 \overline{) 178.36} \quad (97.00) \\ 1651 \\ \hline 1276 \\ 1288 \end{array}$$

$$\Delta E \text{ of } S = (97.0 \text{ sec Lat}) =$$

$$\Delta E \text{ of } 2^{\circ} 12' \text{ E of } S$$

Error of Elv. $2^{\circ} 27'$ too low

70

Antares.

July 3rd

424-15^h..01..00 153..47..30 424..15^h..13^m 194^o..04[']..36" a little low in R
 AR 16..20.03

Dances

(field

h 21..44..00 h 6 42 232^o..03[']..00" Sta 4th Wreck Major
 424 15^h..59..40 424 16..07

July 5th

Section

424 21..27..24 171^o..24[']

17

Asymmetri

21..46..05 hW 0^h..20^m 173^o..33[']22^h..58

173..32..12

424^h

Muxia

424 22..13..10 235^o..30[']..40"
 h 8..52

	Obsd N.P.D.	Calc N.P.D.	Corr	
h 22 ^h 41 ^m 340 ^s 15' ~ -0.338	116 ^h 12 ^m 30 ^s	116 ^h 05 ^m 38 ^s	+2 ^m 28 ^s	$\delta p + 9' 20''$
h 5 ^h 19 ^m 77 ^s 45' $\sim +0.984$	75 ^h 55 ^m 24 ^s	75 ^h 42 ^m 55 ^s	0	$\delta p + 12.29$ 13 ^m 09 ^s
h 6 ^h 44 ^m 108 ^s 00' $\sim +0.982$	37 ^h 57 ^m 00 ^s	37 ^h 38 ^m 33 ^s	0	$\delta p + 18.27$ 4 ^m 07 ^s
$(h'' - h')$ 21 ^h 15 ^m $\sim +0.362$	$(\sim h'' - \sim h) = 1.320$		1.32	
$(h'' - h)$ 99 ^h 30 ^m $\sim +0.986$	$(\sim h'' - \sim h) = 1.322$		7.92	
$(h'' - h)$ 120 ^h 45 ^m $\sim +0.859$				

For this set gives
 As West of S 16'
 Elevation too low 2' 45"

July $\frac{12}{13}$
 Capella & Lyra
 424 22..04..40 270° 231..20'
 h 4..11..32 38..40

Great Equatorial
 As Pappas
 22..31..20 207..03'
 h 23..35

Capella 6h
 22.. 50..35 270° 00' 214..03'
 45..57

Vernier III is used

Adraconis
 23..03..15 232..21 6h W 5h 36
 37..39

Saturn
 23..12..50 171..15'
 did Dec

Capella 6h E
 Saturn 0
 Adraconis 6h W

It takes 8.0 for Saturn to
 8.7 pass the field with
 the power we were
 did Dec to Apr diff.

Capella 6h E 45..57' 45..50'
 Saturn 0h 98..45 98..36

as x col. make a star on the E. horizon angle runs too small N.P.D. e + when axis is too low

Cup. $P = \theta + c + a$ $\theta = 44^{\circ}03'$ $P = 44..10'$ $\theta - P$ $P - \theta = +7' = c + a$
 True $P' = \theta' - c - a$ $\theta' = 37..39$ $P' = 37..35$ $\theta - P'$ $P - \theta' = -4' = -c - a$
 Sat $P'' = \theta'' - c - c$ $\theta'' = 98..45$ $P'' = 98..36$ $\theta - P''$ $P - \theta'' = -9' = -c - c$

III ~~Dec~~ ^{Dec} 47° 46' 12" ~~W~~ ^W | III ²⁷⁰ -221° 55' 54" ~~E~~
 II 137° 46' 00" ~~W~~ | II ¹⁸⁰ -131° 55' 40" ~~E~~ 48° 04' 20"

0

I 47° 46' 00" ~~W~~ | III 47° 46' 12" ~~W~~
 48° 04' 20" ~~E~~ | 48° 04' 06"
 18 20 | 17 54
 c = 9 10 | 8 57

When the Telescope is East. Vernier III reads N.P.D. too large.

Verniers afterwards adjusted to agreement

Yel W III 0° 00' 00"

II 89° 59' 44"

I 179° 59' 52"

III 270° 00' 00"

altered so as to read at 350°

III 330° 00' 00"

II 59° 59' 56"

I 150° 00' 00"

III 240° 00' 00"

III 300° 00' 00"

II 29° 59' 56"

July 13th

424 17^h 37^m 07^s h W 0^h 10^m 00^s 192[°] 38['] 00["] = 111 - Dec 12^h 38^m 00^s
 h. W 17 45^m 56^s h W 18^h 40^m 347[°] 21['] 18["] 12^h 38^m 40^s
 12^h 38^m 20^s obs Dec
 12^h 40^m 46^s true Dec
 17^h 58^m 06^s 2['] 26["]

Pole too low 2['] 26["] c = 21["]

Adjusted the verniers in collimation so as to agree to 4", adjusted the finder to parallelism.

Lat. July 10th

For the first time we directed the full aperture upon γ Corone the telescope being out of focus. The instant it was brought with a power of 700 or 1000 to distinct vision the stars were separated as certainly as though they had been 5" distant. They appeared as two very minute discs much smaller than I had ever seen in any telescope.  as plain as this diagram. Indeed the separation was so evident that it seemed hardly a test. The instrument was next turned on γ Corone which presented no difficulty though a better test than the preceding being closer & brighter. They are both more difficult than Antares which, last week, we saw double with the 5 ft. & a most excellent test it is too. When the seeing is tolerable the vision appears to improve with higher powers the reverse of course is the case in a bad atmosphere when large stars look worse with this telescope than I ever saw them before even with that foying power reflector.

July 15th We have this week seen the ring nebula in Lyra a most beautiful object not equally bright nor perfectly circular. There is a stem within $\frac{1}{2}$ of the diameter from it not mentioned by ~~any of the~~ ^{the} multitudinous of stars visible in its neighbourhood & in deed with a low power in any quarter of the heavens is truly astonishing. There seems scarcely any thing else besides double stars if we allowed the range sometimes used. also a round & very small disc to a Lyra. The telescope is very perfectly free from the primary colors, & more scarcely so than I anticipated from the secondary spectrum. The image when far out of focus is perfectly round with a brilliant purple spot in the center. I thought that with a Lyra the disc was not exactly concentric with the inner ring though it was so nearly so that it would be difficult to decide without steady air. The disc of a Lyra is decidedly smaller than that of our other telescopes.

Almost ever since the instrument was mounted we have had hot nights & days with much rain for the season & a good deal of partially clear weather but the sky & horizon obscured with the red haze & smoky atmosphere common to the season. We had Mr Wm. Dutchell's company to night & commenced with Venus in the twilight it looked well under the circumstances because I have never seen it to advantage except in the day time. we next looked at the moon very low in the S.W. & in a bank of haze it did not show well. Mr. Dutchell discerned the twilight we next looked at Arcturus & had the satisfaction of not being able to show the companion ^{opening} bands being divided (Mr Clark present) as to the side on which it appeared! We tried γ Cor. & it looked like any thing but a double star next we had γ Bootis - it could just separate it - matters were coming to a crisis, it was the test star which he uses for his telescope. He allowed that the separation was greater but the definition inferior. ~~we changed the power~~ we changed the power.

and observed the cluster in Hercules a splendid sight, & Lyra the light of which was beautifully pure & liquid & almost trying to the eyes. The annular nebula in Lyra. The Milky way about Cygnus, 61 Cygni & the dumb bell nebula which is evidently resolvable as we saw many stars in it & all the indication of resolution though the sky was clouded with haze.

July 20th Sun. of Andromedae triple for the first time we had not before examined it with tolerable weather. it was first seen with the field aperture, after wards to better advantage with 9" and even measured without difficulty when the Sun was shining full on the object glass. These were the first measures we have taken with the micrometer.

Spent 20th after Sun rise.

of Androm. dist 0.104.5 W.L.B	The position of the telescope (nearly vertical)			
A.C.	renders the measurements somewhat less			
5.0	accurate than they can be made			
3.0	G.P.B used the inner edges of the wires			
4.0	& placed them at a distance estimated to be			
5.0	near that of the stars			
5.0 G.P.B				
4.5	Position A.B.	Dist. B	Posit.	Levo
5.5	241.15	55.63	210.3	271.43
5.0	243.30	56.64	230.3	271.52
5.0	242.55	dist 1.06		271.47
Mean	0.46			

Comet

June 20th Small Equat

17^h 01^m 50^s 81° 02' 17.05.23 81.01
 Wh 17^h 02^m 23^s 3.06.20

Large Equatorum

Comet

17^h 51^m 36^s 80° 55' 12" 18^h 00^m 28^s 80° 55' 00"
 Wh 3.49.26 3.58.17
 14.02.10 14.02.11
 13.53.06
 .09.04

17^h 58^m

18^h 08^m 28^s 80° 42' 00" 18^h 15^m 48.5^s 80° 42' 20"
 4.15.22 4.22.42
 13.53.06 13.53.06.5

Diff R

Comet

18 22^m 17.5 80° 54' 28"
 4.20.24
 14.01.53.5

Comet follows x 9^m 04.0 Comet No. 12 13' 12"
 9.04.5 12.40
 8.47.0 12.08

Comet presents quite a bright starlike
 point of light

This Comet was first seen on July 14th at about 11^h 45^m. Station was in the round-about ~~to~~ watching some suspicious looking characters of which we had half a dozen to look after, I called out to him that I had found something very much like a comet. & we soon had it in the field of the G.S. Equatorial. we thought we saw traces of a tail. at first I tried to get rid of this impression (but without success) because I forgot for the moment that the telescope reversed. I was the more confident when it turned out to be in the proper position. We took a position & marked the stars but after watching a long time. could see no indications of motion. Being busy with the Great Equatorial we had ~~and~~ almost forgotten it so much so as to neglect several opportunities of reobserving it. However it had so much ^{over our head} the look

78

Star is to the right of the center of ring
Comet is to ap left.

July 20th

Star 437th really N of *
Comet ap left

T 9 00.2 18.44.07.8 18 52.31.9
+ 7.19.0 44.58.0 53.20.3 + 2^s
52 17.0 Tg.25.1
53 08.0 + 7.43.5 01 05.8

18.48.37.9 01.57.0 pm - 0.70
18.48.37.5 18 57.14.65
18.48.37.2 18 57.14.05
18.57.14.35
8.36.65
13.50.00 9.665
80.41.00 0.785
0.450
0.126
0.576

July 20th

2557 - 19.27.0 - 70
924 - 19.20.19.2

T₁ 540.2 2.7325 T₂ 565.1 2.7521
t₁ 439.0 2.6425 t₂ 463.5 2.6660
c.s. 9.2000 9.2000

383.05 85.61.9325 328.88 89.61.9521
355.6 69.61.8425 308.3 73.51.8660

378.8
308.3
711.8
663.4
66.0
3) 2036
678.0 = 11.18"

Diff. R
Comet follows x
9.04.0
9.04.5
8.47.0
8.36.6
212.1
8.53.02

Diff. Den
Comet N of Den
13.12"
12.40
12.08
11.18
78
12.19.5

Comet disappears sharply the-
hind the ring. almost with
as much certainty as a star

p. 385 13.49.24.7 + 32.04.06
+ 1.39.57 48.53.25.0
+ 8.36 1.4

13.51.12.68 80.57.32.4
+ 1.39.57 16.51.2

Star N of field

19.07.50 80.48.1

5.20.20
13.47.30

July 14
424 19.15.20 + 85.11.20
July 14
424 19.15.20 + 85.11.20
July 14
424 19.15.20 + 85.11.20

x is Hist. Cal. p. 385

This place of the star 1847 R 13.50.33.73
afterwards more ac-
is not reduced with
curately made up
much care.

July 20th 12.19"

p. R R 13.59.26.75

p. Den Den + 80.53.00.2

Com. N. 7. 16.26"

of a wanderer that on the morning of the 20th after looking a little while over the eastern horizon. I ~~thence~~ as the dawn was advancing I thought I would look for it. I soon got it in the Comet tube - not apparently in the same place but so near that I felt no confidence without an instrumental position. I searched some time for it but could not bring it into the field with the place we had before found. matters were looking better, but the day light was now so strong that it might still be doubtful whether I could have seen it if it had not moved. I marked its place by the stars & found its position by the globe. This gave a place so near its old position that I again ^{almost} gave it up. & it was not until late in the evening of the 20th that we looked for it. ~~It was~~ it was then found in the Comet tube. I could not recognise the stars by which I had marked it in the morning we began now to feel confidence by a single reading of the Declination circle. at last after an interval of six days we decided that it was a comet after all. we adjourned to the Dome & the Great Refractor with which we had a grand view of the stranger. There appears to be a decided nucleus or stellar point & a good deal of stray light.

x 7^h 28^m July 25th 88^h Observed to correct the place obs'd on the 14th with the Small Equatorial

20^h 05^m 55^s
21 41 37
17 24 18

5^h 2^m 40^s 2nd Uran Minoris

20^h 10^m 42^s 86^o 39^m 00^s
11 43 05 86 36 00

18 27 37 cor - 3 00
18 21 50 426 slow 3^m 07
- 5 47 = 8.56

747 = 2.5403

86.36 8.7731

248 85.14 1.685

248^s 2.398
4^m 08^s

6^m 20^s

May 4th Lent Silver compass needle
to Mr. Clarston to set a vane with
(near Swan Street) (Returned).

May 10th Lent L. P. Cooke (Junior) an
eyepiece apparently belonging to the Pea-
body Telescope. At the suggestion of Prof
Loomis. (Returned)

Edwin Lee

Elements of the Comet of March 4th 1847
 From Observations on March 5th, 12th, 19th Ephemeris

		Campbell S.T.		Dist from Earth	
Long N	21° 06' 46"	March 26 ^h 3 ^m 20 ^s 04	R 0 ^h 26 ^m 32 ^s	Dec N 13° 48' 25"	0.83
Long Per	275° 16' 22"	28 "	0 ^h 28 ^m 02 ^s	7 ^h 44' 16"	0.87
Q	48° 41' 49"	Per Pap. 30 "	0 ^h 31 ^m 29 ^s	1 ^h 24' 15"	1.01
Per. Dist.	0.0445986	April 1 "	0 ^h 47 ^m 35 ^s	5 ^h 45' 37"	1.14
1847 Per. Pap. March 30 ^h 33 ^m 69 ^s		3 "	1 ^h 00 ^m 17 ^s	10 ^h 03' 53"	1.21
Motion Direct.		7 "	Long 24° 51' 23"	Lat +7° 28' 57"	1.33
$\theta_0 - \theta_1 = +0.5$	$\theta'_0 - \theta'_1 = -44.5$	11 "	30 ^h 31 ^m 13 ^s	10 ^h 34' 19"	1.45
$\alpha_0 - \alpha_1 = +0.2$	$\alpha'_0 - \alpha'_1 = -3.6$	19 "	39 ^h 28 ^m 30 ^s	15 ^h 02' 17"	1.67

Observed by Hind Feb 6th

Feb 6 th on Gr. time		R	
9 ^h 16 ^m 58 ^s	21 ^h 09 ^m 11.2	71 ^h 25 ^m 44	
10 ^h 50 ^m 39 ^s	21 ^h 09 ^m 43.9	71 ^h 23 ^m 54	
7 ^h 6 ^m 55 ^s 55	21 ^h 16 ^m 58.8	71 ^h 56 ^m 42	
13 ^h 10 ^m 05 ^s	21 ^h 19 ^m 09.5	70 ^h 47 ^m 46	
8 ^h 11 ^m 22 ^s 24	21 ^h 26 ^m 59.9	70 ^h 15 ^m 43	

