

KG
11365
157

H.2

Vol. I 81-168

1847.
July to December.
Equatorial.

KG 11365.157

~~6~~

Adjustment of axis of equator Aug 19 p 98

Div. of Dynameter = $\frac{1}{5000}$ in.

Im. 7 Ophiuchi Aug 19th
 Im 29 " Sept 16th

$$\dot{a} - a = da$$

$$\ddot{a} - \dot{a} = da + d^2a \quad \text{where } d^2a = 2da \left(1 - \frac{d^2a}{2da}\right)$$

$$\ddot{a} - \dot{a} = 2da + d^2a$$

$$p = \frac{2da}{2da + 2d^2a} + B$$

$$p' = p - \frac{d^2a}{2da} p + \frac{d^2}{dt^2}$$

$$dp = -\frac{d^2a}{2da} p$$

$$\left(\frac{1}{n} - \frac{1}{k}\right) R = \frac{1}{n} p = p$$

1847

81.

Op. of Neptune about Aug 21st R 22^h 06^m 13^s
 Dec -12° 20' about

Lat. part of July R 22^h 08^m
 Neptune Dec -12° 06'

Comet of July 14th 1847

Great Equatorial Circle readings

Stn in yr. 2053

July 23rd Friday

Comet

18^h 24^m 31.0 78° 17' 52"
 1W 4^m 49^s 28.5
 13^m 35^s 02.5

Com.

18^h 34^m 33.6 78° 17' 40"
 4^m 59^s 36.5
 13^m 34^s 57.1

Stn 7th

18^h 41^m 29.8 78° 53.08
 4^m 58^s 31.0
 13^m 42^s 58.8

Stn

18^h 47^m 58.0 78° 53' 04"
 5^m 08^s 40.5 read 20th formula
 13^m 42^s 57.5

Comet 18^h 58^m 31.2 78° 17' 14"

Comet

5^m 23^s 43.0
 13^m 34^s 48.2

~~14^m 14^s 42.8~~

19^h 17^m 05.0 78° 17' 14"
 5^m 42^s 31
 14^m 34^s 34

Stn

19^h 05^m 09.0 78° 53.20
 5^m 22^s 15.5
 13^m 42^s 53.5

Stn 19^h 23^m 55.2 78° 53' 52"
 5^m 41^s 04
 13^m 42^s 46.2

for the 1st place of Comet * i int. R = 13^h 43^m 01.1 Dec 78° 17.52

pi .. = 13^h 35^m 02.5 78° 52.54
 7^m 58.6 35.02

3rd place of Comet * i int. R 13^h 42.52 Dec 78° 53.192nd

* .. R 13^h 42^m 58.6 78° 53.03
 13^h 34^m 57.1 78° 17' 40"
 8^m 01.5 35.23

13^h 34^m 48.2 78° 17' 14"
 8^m 04.5 36.05

13^h 42^m 45.4 78° 53.51
 14^h 34^m 54.0 78° 17' 14"
 8^m 11.4 36.37

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July 23rd

KG 11365.157

Comet proceeds * 2053 yr Comet S of * 2053 yr

424	18 ^h 25 ^m	7 ^m 58.6	35 ^s 02		2557 6.. 07.. 00
	18 ^h 34 ^m 9	8.. 01.5	35.. 23	37	424 5.. 59.. 09
	18 ^h 59 ^m 25	8.. 04.5	36.. 05	18.1	7.. 51
	19 ^h 17 ^m 18	8.. 11.4	36.. 37	37	4.. 44
	195	160	187	111	424 slow 3.. 07 24 del
	18 ^h 48 ^m 45	8.. 04.0	35 ^s 47	1267	
	3.07			32	
	18 ^h 51.52			481	
	8.. 03.12			543	
	10 ^h 48 ^m 40			86.97	
	1.. 46				

dis. 7 10^h 46^m 54

Star B. 4614 x 2053

Star 78° 49' 48.3

13^h 42^m 04.80

Star B. 4614 x 2053

1st 1947 x R 13^h 42^m 04.80

x S 78° 49' 50.0

Cambel S. 7.

July 23rd 10^h 46^m 54 x R 13^h 34^m 00.80

Dec 78° 14' 03.0

Sat. July 24th 1847

Observed with the Great Equatorial

Comet does not sensibly increase in brightness, bright
dawnlight - still point or nucleus visible

Comet

17.48.52	77.25.40	17.51.58.4	77.22.16	3.24
4.16.41.5		4.18.49.5		
13.32.10.5	3.58.4	13.36.08.4		424 Set forward
			3.24	3 ^m

Comet

17.59 56.0	77.25.52	18.03 59.1	77.22.10	3.42
4.27.53.5		4.27.53.5		
13.32.02.5	4.03.1	13.36.05.6	3.42	

18.10.25.5	77.25.28	18.16.10.0	77.22.33	2.45
4.38.30.0		4.40.02.0		
13.31.55.5	4.02.5	13.36.08.0	2.55	

18.30.30.5	77.25.08	18.34.48.0	77.22.44
58.39.5		4.58.48	2.24
17.31.51.0	4.09.00	13.36.00	

17.49

18.00

18.10

18.30

18.42

72

18.14.24

8.07.08

10.07.16

1.40

10.05.36.16.3

424

54

06 36

18.42.44.9	77.24.28	18.45.43.2	77.23.04
5.10.02		5.09.43.5	1.24 2.45.8
13.31.42.9	4.16.8	13.35.54.7	13.24 4.05.96

29.8	2.43.8	1842 Dec 13.32.40.25
Comet proceeds Sta 4.05.96		8 77.21.13.9

Comet M.S. 8.	1847 Dec 13.32.41.03
July 24 10.06.30	8 77.19.41.6

(* Arglander Zone 194.101)	13.28.35.07
	77.22.22.4

July 20th

Rev. J. H. Clinch with us -

the atmosphere clear but not steady - the moon near Quadrature and well seen we tried different powers on the great Telescope, with about 400 we could distinguish four different degrees of light near the boundary of illumination, at first our attention was attracted to near the central portion at a the light a  was very strong, at the it resembled  the moon when under a total Eclipse or  light copper colour, across that stretched the deep black shadows of the rugged mountain tops - a few minutes afterwards I noticed that the light was gradually ~~breaking~~ dawning upon a plain above, we could both distinguish four degrees of light - the bright silvery light of the fully illuminated portion the darker partially illuminated plain where the light appeared a light coppery hue - the more distant portions of the plain where it seemed evident the dawn was just coming on, and across the three last stretched the black shadows of the enormous rocky pinnacles, the last dark shadows helped us to trace the faint light of what seemed to be the dawn of the lunar day - If this faint illumination had proceeded from reflection, of light from the ~~sun~~ ~~mountains~~ ~~at~~ the sides of the plain, would not the light have streamed across with sharper outlines? - the gradual shading of the plain appeared to indicate atmospheric refraction -

1847

July 27⁺ Put forward H⁰ 424 one minute

2557 - 14..25..0

424 - 14..20..18.2

$$\begin{array}{r} 14..25..0 \\ 4..48.5 \\ \hline \end{array}$$

$$\begin{array}{r} 14..20..11.5 \\ 14..20..18.7 \\ \hline \end{array}$$

$$\begin{array}{r} 14..20..18.7 \\ 6.7 \\ \hline \end{array}$$

424 fast

17..03..00

3..46..40

13..16..20

74..52

16..09

73..51

cor + 3'

cor h + 51

$$\begin{array}{r} 13..11..11 \\ 74..40 \end{array}$$

$$\begin{array}{r} 1960 \\ 73..50 \\ 13..00 \end{array}$$

17..31..00

13..11..23

3..19..40

17..36..00

13..11..23

4..24..40

17..13..10

3..57

13..16..10

17..24..03

2..32

14..52..03

14..51..12

51

74..52

74..49

15..12

74..48

17..40

13..09..07

4..30..53

74..17

18..26

17..55 42.0

4 56..00

12..59..42

73..52

17..42

13..22

4..20

18..00

13..22

4..38

18..18

13..16

5

86

*4r 1960

Stu

July 27th

B's cm R

Coinet

18 .31 52.6 73° 54' 16"

51 .44

18 .47 30.2

74° 45' 0"

5 .28 .28.0

5 28 12.

13 .03 .24.6

15 .53 6

13 .19 .18.2

18 35 .50.7 73° 54' 34"

51 .26

18 .50 .38.5

74° 46' 0"

5 .32 .27

5 31 2.0

13 .03 .23.7

16 .12.8

13 .19 .36.5

18 .40 .19.0 73° 54' 36"

51 .20

18 .55 12.4 + 1.0

74° 45' 56"

5 36 56.0

5 35 52.0

13 .03 .23.0

15 .53.4

13 .19 .16.4

19 .07 33.2 73° 55' 24"

50 .04

19 .23 53.6

74° 45' 28"

6 4 14.0

6 4 49.0

13 3 19.2

15 .45.4

13 19 4.6

19 .12 55.8

73° 55' 30"

49 .54

19 .28 .41.7

74° 45' 21"

6 9 42.0

6 9 39.0

13 3 13.8

15 .48.4

13 19 2.7

19 .17 .14.7

73° 55' 32"

49 .48

19 .33 .20.4

74° 45' 20"

6 14. 0.0

6 14 .19.0

13 3 14.7

15 .46.7

13 .19 1.4

saw a meteor pass over the field while directed to the comet.

* 1960 $\text{Gr } \text{d} \quad 13^{\circ} 00' 05.37''$
 Jan 1947 $\text{d} \quad 73^{\circ} 50' 40.5''$

June 1947 to 73° 50' 40.5"

BR 13, 15, 55, 51

De 74" 41" 28.2

MS. 7 10⁴ 10⁵

July 27th

July 31st2557. $16^h 58^m 0^s$ 424. $16^h 52^m 40.2$ * apparent north
south of centre $17^h 0^m 48^s$ 17^h x a $7^m 35.2$ $9^m 23.$ $10^m 9.$ Ri apparent R.
south of centre $7^m 53^s$ $8^m 25.2$ $11^m 22.5$ 57.7 * apparent north.
south of centre $17^h 8^m 46.7$ x b $9^m 14.2$ $12^m 56.8$ $13^m 22.8$ R at centre of hill. $17^h 15^m 9.5$ horn circle $4^m 9^m 31.$ Declination $71^\circ 25'$ $17^h 24^m 00^s$ $17^h 24^m 37.7$

x 8th mag.

 36.0 x a.35 1.6 28.0 $40^m 50.4$ $41^m 59.0$ $27^m 46.0$ $39^m 23.2$ $41^m 15.0$ $42^m 22.2$ $28^m 14.5$ 46.3 $17^h 38^m 39.2$ $17^h 26^m 12.0$ 12.1 $18^h 8^m 8.8$ $5^m 11^m 52.$ $12^m 56^m 16.5$ $18^m 39^m 40$ $5^m 43^m 36$ $12^m 56^m 4$ $19^m 0^m 19$ $6^m 4^m 26$ $12^m 55^m 53$ $341^\circ 33' 20''$ probably 341° $341^\circ 34' 36''$ $341^\circ 34' 52''$ $341^\circ 34' 52''$

Ri

 $18^h 27^m 30^s$ $5^m 18^m 00$ $13^m 8^m 29$ $18^m 19^m 11.7$ $5^m 40^m 49.$ $13^m 8^m 22.2$ $19^m 10^m 24.0$ $6^m 2^m 14.$ $13^m 8^m 10$ $341^\circ 23' 46''$ $341^\circ 23' 16''$ $341^\circ 23' 4$

Diff R follows

Sta is in Mem. of the Academy 790^R 12.53.43.3
12.16.1

* 8th mag. Angel. zone 200 No. 44

12 ^m 12.5	Diff Dec.	12	51	9.76	71	35	29.6	
18.7	10' 26"			19.35		1	11.8	
17.0	11 20	~~* R 1142~~	~~12~~	~~51~~	~~29.11~~	~~Dec. 71~~	~~36~~	~~41.2~~
12 16.1	11 48			10.4		~~1~~	~~39.7~~	
	11' 11"	~~* R 417~~	~~12~~	~~51~~	~~39.5~~	~~Dec. 71~~	~~35~~	~~3.7~~
			12	16.1		11	11	
49.5								
* 4.3 31 ^d 10 ^h 13 ^m 2 ^s inst. Q's R		13	3	58.8	Dec	71	23	53
	* R	12	53.43.3			71	25.22	
			12	16.1			11.11	

Comets R 13. 05. 59.4 Ann. Dec 71. 14. 11

Note The erroneous place was sent
to the A.S. & Schumacher

Draconis 8th R

9th d Aug 3d 17h 32m 32s Dec 69° 54'

69°

Rh 4 30 55
13 1 37

R 17h 50m 31s
han 4 48 56
13 1 35

* (4-5) a 17h 56m 31s Dec 70° 48'
5DHk 5 29 55
12 26 36

70 38

x 18h 33m 44s
5 39 40
12 54 4

5 Dracons 18h 42m 6s.0 Dec 160° 47' 56"
6 12 12.0
12 29 55

SDraw. 18 51 44.4 Dec. 160° 47' 38"
6 21 56
12 28 48.4
R 19 15 59 Dec 158° 52' 52"
6 11 44
13 4 15

R 19h 26m 6s
6 21 57
13 4 9
Dec 158° 53' 18"

HAR

34 20

34 20.6

34 20.3

1850/12h 27m 2s.98
7.87

1850/12 26 55.11

34 20.3

R 13 1 15.4

Dir. Dec

1 55 4

1 54 20

1 54 42

Aug 310 22.8

19 2

70 36 55.9

59.8

70 37 55.7

1 54 42

R's Dec. 68° 43' 14"

Kapteyn 12° 12'S

22h 7m

Rate	20 ^h	55 ^m	55 ^s
	2	0	30
	29	59	24
	22	53	29
	12	55	20
		1	

99° 8'

102 19

9° 1'

7

10 39

91

28 8

21.5

21 12.46

72	8	46
----	---	----

21 ^h	44 ^m	21 ^s	Dec 262° 15' 20"
-----------------	-----------------	-----------------	------------------

11	39	40 ^s
----	----	-----------------

22	8	41
----	---	----

22

Salin

22	8	55
----	---	----

279 4 32

11	12	14
----	----	----

22	56	41
----	----	----

3rd m nll

22...49.0

4th m

22...5...4.0

424-22...43.342

424-4...58.32

78.6.13 observed G.P.B. read off & Prof. P. recorded & marked them

Aug. 10^h 9^m 40^s Cand. m.s. 4.
 Point of day 11^h 12^m 55^s 45^s
 Dec. + 63° 12' 11"

*a is probably

R	17 ^h	52 ^m	51.5	Dec 63° 22' 20"	*a	17 ^h	59 ^m	34 ^s	Dec 63° 11' 0"
h	4	56	5			4	54	42	
	12	56	46.5			13	4	52	
						*b	18	10	39.5 63° 00' 16"
						4392 O.A.E.	5	9	26
							13	1	13.5
R	18	15	58.5	Dec 63° 22' 2"	*b	18	21	12.0	63° 00' 56"
h	5	19	19.0			4392 O.A.E.	5	20	3
	12	56	39.5				13	1	10
R	18	26	32.0	63 21 56	*b	18	30	32.5	63° 01' 04"
h	5	29	56.0				5	29	24.
	12	56	36.0				13	1	8.5
R	18	34	25.0	63 21 52	*b	18	38	29.0	63 1 4
	5	37	50.0				5	37	22.
	12	56	35.0				13	1	2.0

M.S.T. Aug 10^h 9^m 11^s

Time by 424 18^h 25^m 38^s

True sid. time 18^h 26.6
 2 14.2
 9 12.4
 1.5
 9 10.9

4392 A.P. 1850 13^h 0^m 26.97
 7.09
 1847 13 0 19.88
 4 31.7
 R 12 55 48.2

Dec 1850

6 2 50 50.1

1847

57.2
 62 51 47.9
 20 55
 63 12 43

2.11 R

4 30.5

4 32.5

4 32.0

4 31.7

2.11 Dec

21' 06"

20 52

70 48

20 55

Aug 11. Inst. adjusted in az by Polaris.

Telescope east 13^h $26'$ 44^s

Dec 88° $29'$ $52''$ 12 24 58^s

$$\begin{array}{r} 63.12 \quad 3 \\ 67 \quad 10 \\ \hline 62.25 \quad 7 \end{array} \quad \begin{array}{r} 68.43 \\ 63.12 \\ \hline 5.30 \end{array} \quad \begin{array}{r} 7/330 \\ 47 \end{array}$$

Aug 11th Comet R 12^h 54^m
 " Dec 62° $25'$

Within a inch of δ ' diameter
 further we count 9 stars in the
 region of the ring nebula in Lyra

Aug 16th

Letter S. C. Walker to J. G. 601, 602, 603, & 604, Ast. Nachr. & Com. des Temps for 1849.

Observations on the Comet July 1847

95

Comb. m.s.t. of Observation			Comets		Star of Comp.		No. of Comp.	
			R	Dec N	R	Dec N		
1847 July	d h m							
	14.. 11.. 45		16 ^h 20 ^m 5 ^s	85° 14'	13.. 50.. 33.73	80.. 40.. 41.2	4	For Equatorial
	20.. 10.. 26		13.. 59.. 26.7	80.. 53.. 00	13.. 42.. 04.80	78.. 49.. 50.0	4	Star Cat p 385
"	23.. 10.. 46.. 54		13.. 34.. 00.8	78.. 14.. 03				B.A.C. 4614
"	24.. 10.. 06.. 30		13.. 28.. 35.6	77.. 22.. 27	13.. 32.. 46.23	77.. 19.. 41.6	5	Arg. Zone 194
"	27.. 10.. 49.. 10		13.. 15.. 55.5	74.. 41.. 23	13.. 00.. 05.37	73.. 50.. 40.5	6	1960 Gr.
"	31.. 10.. 13.. 12		05.. 59.4 13.. 03.. 99.6	71.. 14.. 11 ~~71.. 23.. 53~~	12.. 53.. 43.3 ~~12.. 51.. 39.50~~	71.. 25.. 22 ~~71.. 35.. 07.7~~	3	Arg. Zone 200
Aug	3.. 10.. 32.. 48		13.. 01.. 15.4	68.. 43.. 14	12.. 26.. 55.11	70.. 37.. 55.7	2	5 Draconis
"	10.. 19.. 11.. 00		12.. 55.. 48.2	63.. 12.. 43	13.. 00.. 19.88	62.. 51.. 47.9	3	B.A.C. 4392
Sept	6.. 9.. 15.. 01		12.. 57.. 09.7	46.. 18.. 24	12.. 58.. 58.44	43.. 54.. 44.6	7	B.A.C. 4389
Oct	11.. 7.. 07.. 30		13.. 09.. 46.2	32.. 35.. 45	13.. 11.. 02.75	32.. 26.. 23.1	3	Arg. Zone 408

6^c c' 22.02.31

11.33

a dy 21.58.04

e 1.03'

6^z 38 dy 22.02.36

12.18

7 22.04.17

11.48 ^{new}Neptune ~~not~~ opposite38 dy 18^cx 6^z 20.42.37.4

N. _____

x 6 20.49.26.4 5.25 below 20.55.50.8 5.63 x 21.10.42.7 3.04

N 20.52.38.2 4.08 20.59.02.3 0.69 N 21.13.54.3 3.24

3.11.8 6.33

3.11.5 6.32

3.11.6 6.28

$$\begin{array}{r} 31 \\ 633 \\ 1899 \\ 19623 \\ 63 \end{array}$$
Sun time 20.00^m

$$\begin{array}{r} 9.45 \\ 12.15 \end{array}$$

21.17.04.0 3.55 195.60 12.23.12.7

21.20.15.8 2.76

Dif. Dec

Dif. R

3.11.8 6.31

6.33

3.11.8

.32

11.5

.28

11.6

.31

11.8

6.31

dR 3.11.67

31

$$\begin{array}{r} 631 \\ 1893 \\ 19561 \\ 63 \end{array}$$

dS 194.98 = 3.15.0

Ap. R of 38 dy 22.02.30.08 Ap. Dec -12.18.27.9

3.11.67

3.15.0

Nep ap. R. 22.05.41.75

-12.21.42.4

d.S. 11.13^m

41.78

42.7

98. Aug 19th

Great Equatorial

Adjustment of Axis of Equatorial.

Tel. W Transit merid. mark III 227.33.08 III 137.33.48

I 47.33.44

~~47.40.44~~
317.34.20

N. Dec of point observed

Tel W

Tel E

Tel W I 47.33.44

Tel E I 132.26.00

I 47.33.44

47.34.00

II 317.34.20

II 42.25.16

II 47.34.20

47.34.44

III 227.33.08

III 312.24.04

III 47.33.08

47.35.56

IIII 137.33.48

IIII 222.26.00

IIII 47.33.48

47.34.00

Dernier III was then altered to 312.25.30

First Occultation observed with the Great Refractor

Occ. of

Apex M.S.V. 8^h 04^m

Immersion of

K.E.B 424 17.54.04.5 - 0 Aug 19th 21.6.15.2557-18.06.00

9.48.51.31

37.1

M.S.V. 8^h 04^m 44.0

424 18.01.10.5

9.49 38.06

17.53 27.4

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

9.49 38.06

9.49 38.06

9.03 49.3

Imm. of Ophiuchi observed with

4.49.5

5 26.6

37.1 424 fast

Aug. 20th 1847 Observations of Neptune near its Opposition

Planet really S. of star.

x²⁵⁵⁷ 19 47. 21.4 5.34 below 19 52. 31.8 5.63 57. 50.2 597
 N 19 50. 42.0 3.15 above 19 55. 31.2 2.87 00. 49.7 2.55
 3. 20.6 8.49 2.59.4 8.50 2.59.5 8.52

20. 03. 52.4 6.29 09. 03.5 6.63
 20. 06. 51.7 2.23 17. 02.8 1.99
 2. 59.3 8.52 2. 59.3 8.52

Sid. time 20^h 05^m
 9.53
 10.12

Angle of Position altered 180°

20. 15. 51.4 below 9.73 21. 04.7 ^{last obs'd this moon 05} 2.41 20. 26. 40.0 6.37 20. 31. 30.6 7.56
 18. 50.8 2.86 03.5 + 0.5 6.03 29. 39.12 2.19 34 29.4 1.19
 2. 59.4 8.59 2. 59.2 8.59 2. 59.2 8.56 2.58.8 8.55

Hij. Dec. Hij. LR

Mag comp = 8

8.50 2. 59.4 Ap R 38 Apr 22^h 02. 30. 10^s Dec -12. 18. 27.3
 .52 .5 2. 59.26 4. 23.9
 .52 .3 MS. 10^h 11^m Nip R 22. 05. 29.36 Dec -12. 22. 51.2
 52 .3 Adams Eph. 29.49 51.7
 59 .4
 59 .2
 56 .2
 55 58.8

8.54 2. 59.26

31
 854
 2562
 26474
 85
 26389 4. 23.9

Aug. 21st 1847. Observations on Neptune near the opposition

Count to right hand

* 20.13.21.7 4.88	20.17.51.8 4.53	22.13.8 5.51
20.16.14.7 4.81	20.44.4 5.21	25.06.0 4.22
2.53.0 9.69	2.52.6 9.74	2.52.2 9.73

moved 180° in position

20.28.35.7 5.76	20.33.52.5 61	38.28.4 6.36	44.25.4 6.79
31.28.7 3.95	36.45.2 12	41.21.3 3.30	18.4 2.91
2.53.0 9.71	2.52.7 9.73	2.52.9 9.86	2.53.0 9.70

180° in position

Dist. to 20.31

48.41.2 7.12	55.55.0 1.98	00.15.0 1.57
51.34.3 2.62	58.47.8 7.76	03.07.5 8.09
2.53.1 9.74	2.52.8 9.67	2.52.5 9.66

9.57
10.34

Dist. R

No. of comp. = 10

9.69	2.53.0	Apr. 22.02.30.11	Apr. 12.18.26.8
.74	2.6	2.52.78	4.59.7
.73	2.2	R 22.05.22.89	Dec. 12.23.26.5
.71	3.0		
.73	2.7	Adams's Eph. R 22.05.23.16	
.66	2.9	Dec. 12.23.27.2	
.70	3.0		
.74	3.1		
.67	2.8		
.66	2.5		

MS. 10^h 32^m
of Neptune

9.70
29.10
300.70
47
299.73 = 4.59.7

278
2.52.78

Probably Friday Aug 27th 1847

On (Friday Aug

about Aug 25th Saw the division of Saturn's ring near the extremities, on the evening when Dr Bachard, C. Walker were here. Neptune had a star near it of 12 or 13 mag.

Friday 3rd
Sept 3rd 1847

Comet of Feb'y 14

These do not look well at all.

19 ^h 17 ^m 58.4			
Star 7 th or 6 th			
19 19. 43.4	48. 01. 28	19. 29. 34.8	47. 52. 12
6. 24. 45.0		6. 26. 57.0	
12. 54. 58.4	± 40?	13. 02. 37.8	

Comet.

19. 35. 41.0	48. 01. 32	19. 43. 50.1	47. 52. 08
6. 41. 23		41. 12. 0	
12. 54. 18.0		6. 02. 38.1	
19. 39. 44.7	48. 01. 28	19. 50. 39.9	47. 52. 12
6. 45. 23.5		6. 48. 01	
12. 54. 21.2		13. 02. 38.9	

Comet lost in Cloud

or 12. 47. 01.5
+ 2nd mag.

20 00. 36.9	50. 04. 20
6. 12. 47.0	50. 04. 43
13. 47. 49.9	or + 23"
13. 41. 30.2	
or - 6. 19.7	

The comet still shows a star like point of light in the head. There is considerable irregular light scattered round the head & a faint tail visible in the Great Refractor some 6 or 8 in length. I think it appears longer though not quite so certainly in the Comet Seeker.

13. 49. 55.7
50. 04. 43

Monday

Sept 6th 1847

Comet

Seen through the Clouds

Star 5, 6th19^h 56 29.8 46^h 19^m 36^s6^h 52^m 51^s13^h 03^m 38.813^h 05^m 28.81^h 50.020^h 01^m 31.8 46^h 05^m 48^s6^h 56^m 03.013^h 05^m 28.813^h 48^m20^h 05^m 56.4 46^h 19^m 34^s02^m 10.013^h 03^m 46.413^h 05^m 34.91^h 48.509^h 10.9 46^h 06^m 00^s 13^h 34^m7^h 03^m 36^s05^m 34.920 14 23.4 46^h 19^m 24^s10^m 42^s13 03^m 41.405^m 29.41^h 48.020 17^m 48.4 46^h 06^m 20^s 13^h 04^m7^m 12^m 19^s13^h 05^m 29.420^h 22^m 30.7 46^h 19^m 12^s19^m 48.53^m 42.25^m 30.31^h 48.125^h 28.3 46^h 06^m 08^s 13^h 04^m19^m 58.005^m 30.320^h 30^m 25.7 46^h 19^m 12^s7^m 26^m 43.513^h 3^m 42.213^h 05^m 31.001^h 48.820^h 33^m 34.0 46^h 06^m 16^s 12^h 56^m28^m 03.013^h 05^m 31.0

Monday Sept 6th (Continued)
Using another version.
Comet

Great Refractor

Star 5.6th mag.

2557	20 42.57.7	46 19.16	20.45.22.8	46.06.36	12.40
	<u>55.0</u>		<u>39.51</u>		
	2.7		05.31.8		
	<u>31.8</u>				
	1.49.1				

48	57.5	46.19.28	52.22.5	46.06.30	12.58
44.34			<u>46.50</u>		
03.43.5			5.32.5		
<u>05.32.5</u>			27.17	19.39	
1.49.0			8.151	58.17	

Star is 438, Camera Denat.

19.58.40	1.50.0	13.48	Jan 1847 CR	12.59.06.59	43.55.42.8
20.06	48.5	13.34		8.15	58.2
20.14	48.0	13.04	CR	12.57.09.69	43.56.44.6
20.23	48.1	13.04	Dec		46.05.15.4
20.30	48.8	12.56			13.08.7
20.43	49.1	12.40			+46.18.24.4
20.49	49.0	12.58			
161	1.48.79	13.08			
20.23.06 ³ an ref	-0.4	+0.7			
11.00.36					

Sept 6th Camb. dt. S. Y. 9^h.15^m.01^s

CR 12^h.57^m.09^s.69
Dev +46.18.24

9.22.30
5.57
9.16.33
1.33
9.15.01

10.59.49
47
11.00.36

Tuesday 14th of Sept.

After a long Easterly storm it cleared off about 8 P.M.

We first looked at the Moon which was low rising very bad - the night was too cold. an expected occultation was made doubly sure by clouds.

Turned on the planetary nebula 1. H. IV. Azimutii Smyth p. 492

Its form is decidedly Elliptical yet it has not on all sides a sudden termination, although it differs remarkably from a common nebula. in the n.f. quadrant there seems to be a diffused light extending from the main body & gradually decreasing growing fainter as it does so. indeed the Southern (apparent) half (the true North) has a most faint trace of shading from the edge of the nebula. the other half is better defined. it is shaped like a peach stone.

We then turned to a remarkable cluster in Cygnus - Smyth p. 503. the stars are not apparently so large but perhaps even more numerous than in the cluster in Hercules.

We turned upon the Great nebula in Andromeda - it presented a new & wonderful feature.

We had before noticed that the portion of the Nebula in lower & right hand half (we suppose the object on the meridian & the observer facing South & the object as it appears in the Telescope, inverted) to be quickly terminated it now appeared that on this side of the nebula are two channels or canals like black bands extending perhaps 20' in the n.f. & s.p. quad. position 30° & 210° .

(Is not this a mistake?)
& nearly parallel to each other. rather is. Saw the coral cluster.

it has only a remote resemblance to Nichols plate though its striking feature can be traced. Sept. 16th Add by the light of

Sirius I could mark the hour, minute & second by 424. could also read the title ('Smyth's Celestial Cycle') in gilt on the back of that volume. This is done with ease. print of perhaps $\frac{1}{4}$ of that size could be read as was done with the chronometer.

2 Oct.

Frequently during the past & present month (Aug & Sept 1847) we have observed that the edge of the sun is without any doubt less bright than the center. The brilliancy diminishes more rapidly as we approach the edge. The tint seems brownish or buff. It is seen by projecting the image on a screen.

Oct 6th All. Saw Jupiter very beautifully in the morn. twilight set on Capella & watched to see what effect the rising of the sun would have on the state of the atmosphere. used first a power of about 800 next 2000 & lastly 400 as the sun rose the there was a marked improvement in the definition with 2000 the disc of the star was about as large as in the 5 foot with 500. but not so steady. With 400 the disc was beautifully small, round & bright, it was the best view of the stellar disc I have ever had. The whole aperture $1\frac{1}{2}$ " was used & the definition ^{was} much better than I had ever expected to see. With 400 I do not know that I could have suggested any improvement suggested it self.

1849. Sept 16th

Immersion at Dark Limb

107

$$\begin{array}{r} 2419 \\ 19^h \cdot 0^m \cdot 54.7 - \text{dur of } 8^{\text{th}} \text{ mag. quink - ab. 2 smth of } 29 \\ \hline 19 \cdot 0 \cdot 52.7 \end{array}$$

2419
W.C.B.

Immersion of 29 Ophiuchi

$$\begin{array}{r} 19 \cdot 13 \cdot 32.2 \text{ Lingard ab. } 2^{\text{nd}} \text{ sword} \\ \hline 19 \cdot 13 \cdot 30.2 \end{array}$$

$$\begin{array}{r} 2419 - 19 \cdot 18.0 \\ 1481 - 21 \cdot 55 \cdot 46.4 - 46.7 \end{array}$$

R.F.B. Immersion 29

$$\begin{array}{r} 21 \cdot 51 \cdot 22 - 10 \text{ beats} \\ \hline 21 \cdot 51 \cdot 18 \end{array}$$

$$\begin{array}{r} 2557 - 19 \cdot 28.0 \\ 2419 - 19 \cdot 23 \cdot 48.4 \\ \hline 4 \cdot 11.6 \end{array}$$

$$201481 \cdot 21 \cdot 51 \cdot 18$$

G.P.B. Immersion of 29 Ophiuchi

$$2557 - 19 \cdot 17 \cdot 56.5 - 30 \text{ beats}$$

$$\begin{array}{r} 2419 - 19 \cdot 28.0 \\ 1481 - 22 \cdot 05 \cdot 45 \\ \hline 2 \cdot 37 \cdot 45 \end{array}$$

$$2557 + 6 \cdot 18.3$$

$$\begin{array}{r} 19 \cdot 17 \cdot 41.5 \\ \hline 6 \cdot 18.3 \end{array}$$

$$\begin{array}{r} 11 \cdot 39 \cdot 14.78 \\ \hline 46.75 \\ 11 \cdot 40 \cdot 01.53 \end{array}$$

$$\begin{array}{r} 21 \cdot 51 \cdot 18.0 \\ \hline 2 \cdot 37 \cdot 47.3 \\ 19 \cdot 13 \cdot 30.7 \end{array}$$

$$\begin{array}{r} 19 \cdot 13 \cdot 30.2 \\ \hline 4 \cdot 11.6 \\ 19 \cdot 17 \cdot 41.8 \end{array}$$

$$\begin{array}{r} 19 \cdot 11 \cdot 23.2 \\ \hline 11 \cdot 40 \cdot 01.53 \end{array}$$

$$\begin{array}{r} 7 \cdot 31 \cdot 21.67 \\ \hline 6 \cdot 58 \cdot 51.19 \end{array}$$

$$30 \cdot 54.92$$

$$\begin{array}{r} 20.94 \\ \hline 7 \cdot 30 \cdot 07.72 \\ 08.0 \end{array}$$

$$\begin{array}{r} 12.37.5 \\ \hline 2.1 \\ 12.35.4 \\ \hline 30 \cdot 08.0 \\ 7 \cdot 17.32.6 \end{array}$$

Imm 29 Ophiuchi Camb. M.S.Y.

Sept 16th W.C.B. 7^h 30^m 08.0

G.P.B. 7^h 30^m 07.7

Imm * 8th mag 2nd S of 29 Ophiuchi

M.S.Y. 7^h 17^m 32.6 W.C.B.

108ⁿ
 Sun Oct. 7th 1847 Comet discovered by Maria Mitchell Oct. 1st
 Maria Mitchell's Comet

2557 20.29.56

2557 21.12.00

424 21.08.07.4

5.52.6

hw 3.17.00 250.10.04"

17.12.56
 5.52.6

17.18.48.6

* 2nd Very Cloudy - indist.

2557 20 51.37.6 245.53.54

3.35.52

17.15.45.6
 7.02

No other sure stars near

* R 1847 17.08.21.48 24.05.48.2

Comet

2557 21.01.51.0 250.02.40

W 3.43.25 4.08.46

17.18.26.0

* 2nd 2.40.4

21.06.39.8 245.53.50

23.50.54

17.15.45.8 25

Star in Draco

17.08.21.95 24.06.01.6

47

13.4

* Dec 5.54.11.8

17.08.21.48

4.07.06

2.34.70 p Dec 70.01.17.8

p R 17.10.56.18

October 7th 1847

M.S. 7.56.31

21.01.51

21.13.28

15.19

R 17.10.56.18

Dec 70.01.17.8

Comet

21.13.27.8 249.59.16

3.55.13 4.05.26

17.18.14.8

2.29.0

Comet follows star

2.40.4

2.29.0

Dec 2.34.7

Comet N of star

4.05.26

4.08.46

4.07.06

21.07.40

7.02

21.00.34

13.02.49

7.57.49

1.18

7.56.31 = M.S.

2557 + 7.02

Sect. Oct. 9th

Obsd. Metches Comet but were interrupted by visitors so that we could only get one place

Error of 424 = 0.0

424

9th 8^h

Dec + 55° 40' 16"

Comet Dec + 55° 31' 10"

diff. Dec
Comet & of Star
9".06"

19..54..23.4

424-20..00..01.2

Wh 3..09..48.0

3..14..58.0

Star is probably Arg. Zone 13

16..44..35.4

16..45..03.2

Zone 13 no 48

1

* 16..44..35.4

Comet follows + 27.8

Dec 55° 41' 29" * hmo 1842 R 16^h 43^m 38.9
 mag -32 +8.7

55.40..57

1847 R 16.43..46.6

9..06

27.8

Dec 55..31..51

R 16^h 44^m 14.4

Oct 9th M.S. 2. 6^h 48^m 11^s
 check Comet R 16^h 44^m 14.4
 Dec + 55° 31' 51"

20^h 00^m 00^s

13..10..42

6..49..18

1..07

6..48..11 = 1152

100

Mond Oct. 11th 1947

Star in Andromeda

may

1-4 may

x₁may position of 2.2 = 95° 05' 2 in 3rd2.3 130.00 3 in 3rd 42.4 126.40 4 in 2nd2.5 155.30 5 in 5th 6 in 1st 2nd

2.6 205.35 and 1/4 of the aperture

2.7 344.35 the 1/2 aperture

2.8 323.45 7 in 2nd 8 in 1st2.9 361.30 9 in 3rd2-10 376.30 10 in 3rd2-11 = 409.00 11 in 5th2-12 = 411.35 12 in 2ndx₁₂x₂x₆Zero of position
270° 37'x₁₀x₇x₉x₈Oct. 11th Star in Bepely Lane N. 40°

1925

R Lane 13^h 10^m 20^s 23 Dur 32^a 32' 39" 1

1925

- 19.31

+ 43.88

+ 0.01

+ 0.01

1925 13^h 10^m 00.9332^a 33' 23.5prods. 1^h 01.82

7.00.4

13^h 11^m 02.7532^a 26' 23.1 Star R 1947

19.11

2.81

22

22

3822

5 62

3822

5 6 2

420.42

6 1 82

7' 00.41

Comet of July ~~of 1847~~

Comet visible in Euter.

111

Oct 11th Monday

Comet is up left of star

2557 Comet

20..24..40.4 122..38'..04"

7..07..15

13..17..25.4

Jan 8th

20..29..16.7 122..28'..54"

7..10..36

13..18..40.7
7..76

Comet

20..34..45.8

7..17..20

13..17..25.8

*

38..28.8 122..29'..32

7..19..44

13..18..44.8

Comet

20..43..56.7 122..39'..28

7..26..26.0

13..17..30.7

*

20..48..31.9 122..30'..24

7..29..44.0

13..18..47.9

There is a star of the 9th mag.

S.p. Comet dist. of outwring

x R approx: 13^h 11^m 00^s Dec 32^d 23^h 26^m

Comet preceds star

1..15.3 - 0.57 = 1.14..56 ^{ref cor} _{data = 8 hand in v}

1..19.0 - 0.94 = 1.18..20 116

1..17.2 - 0.94 = 1.16..40

dR 1..16..52 Comet preceds x.

20..24
20..35
20..44
20..34..30
7..10Jan 8th

20..27..20

13..18..36

7..07..34

1..10

dR 7..07..34

Ref. Dec Comet N of star

9^h 10^m + 11 = 9^h 21^m Comet N of star9^h 16^m + 12 = 9^h 28^m9^h 04^m + 12 = 9^h 16^m cor dR for

alt v ref in alt ref in Dec ref in R

1st alt 1st 10^h 10^m 46 310 219 219 112nd 8^h 40 44 366 260 251 123rd 7^h 10 43 432 316 294 12

alt

1st alt 1st 10^h 46 294 208 208 0.872nd 9^h 07 344 248 239 0.943rd 7^h 28 416 304 282 0.94Star dR 13^h 11^m 02.75 Dec 32^d 26^m 23.1

- 1..16..52 + 9..22

Comets dR 13^h 09^m 46.23 Dec 32^d 35^m 45Camb. d. 5th Oct. 11th 7^h 07^m 30^s

112

ditchely Comet Oct 11¹⁵

21.. 08. 21.4 $36^{\circ} 49' 48''$
 257 4.. 19.. 55.0 $216^{\circ} 50' 00''$
 16 48 26.4

Comet

21.. 72 59.5 $215^{\circ} 43' 48''$
 4 43 32.
 16 39 27.5

Sta 7th

21.. 28 05.8 $216^{\circ} 48' 32''$
 4 43 4.
 16 45 1.8

Comet

21.. 31 42.7 $216^{\circ} 40' 36''$
 4 52 10.5
 16 39 32.2

sta 7th

21.. 36 02.7 $216^{\circ} 48' 28''$
 4 51 0
 16 45 2.7

Light of
 Comet nearly fills the ring
 of microns in the Comb
 taken it presents a very pretty
 appearance. Showing a tail of
 2° it had none on Saturday or
 only a trace of one.

Obs'd Diff. R

Obs'd Diff. Dec

25.7

4.44

5.34.3

4.44

5.30.5

7.52

5.39.7

12.74

5.40.3

15.08

24.8

39.58

Comet previously 5.. 36.2

9.59" Comet S of Sta

Sunset Aug 18

16.. 37.36.36

16.. 36.48.06

21.. 22.59 16.32.00.2

36.. 38.. 07"

21.. 36.43

21.. 40.58

21.. 48.43

144.23

Comet R 16.. 32.. 00.2

Dec +36.. 38.. 07"

dis. Oct 11.. 8.. 09.. 00

21.. 36.06 4 Comp

25.7+ 7.10

Sed. Time 21.. 28.. 56

13.. 18.. 36

8.. 10.. 20

1.. 20

dis. 8.. 09.. 00

Comet

21. 40. 57.8

5 1 34.0

16 39 23.8

Oct. 11 30) $\frac{8.3}{23} \frac{128}{61}$
 $\frac{224}{28}$
 $\frac{276}{53}$
 $\frac{380}{3.80}$

Star's App. R 16. 37. 36.5

Dec 36. 48. 02

$$\begin{array}{r} 7.05 \\ 22 \\ \hline 1410 \\ 1410 \\ \hline 15510 \end{array}$$

*

21. 45. 17.5

5. 00. 14.0

16 45 3.5

216° 48' 32"

~~16. 38. 22.97~~~~- 57.46~~~~- 1.13~~~~16. 37. 25.38~~~~36. 42. 43.0~~~~- 3.8~~~~- 1.3~~~~36. 42. 37.9~~

$$\begin{array}{r} 55 \\ 46 \\ \hline 1.41 \\ 16. 38. 40 \\ 36. 54 \\ \hline 48. 51 \end{array}$$

Comet

21. 48. 42.5

5 9 20

16 39 22.5

7. 26.3

16 31 56.2

Star

216° 33' 20"

36. 33. 20

36. 32. 54"

16. 54. * is Glit. Cel. p 78

16. 35. 23.28

+ 32.85

- 0.07

16. 35. 56.08

prec 1. 40. 30

16. 37. 36.36

11. 55. 16

48. 48. 53.7

- .8

48. 48. 53

36. 53. 37.0

prec 5. 31.3

x Dec 36° 48' 05.7

$$\begin{array}{r} 2.134 \\ 47 \\ \hline 14938 \\ 8536 \\ \hline 100298 \end{array}$$

$$\begin{array}{r} 7.05 \\ 47 \\ \hline 4935 \\ 2820 \\ \hline 33135 \end{array}$$

Boor of Mercuris

21. 56. 30.0

5 10 24.5

2557 16. 45. 5.5

16. 37. 39.16

7. 26.34

from Dec

from R

21. 41. 32

13. 18. 35

8. 23. 00

8. 21. 38

R 16. 31. 56.3 } last obs
Dec 36. 32. 54" }

The place of the Star taken from the
Circles of the Equatorial & corrected by of Mercuris
differs in from the true in R by 0.10 & Dec 4"

114

Oct. 14th 184719.22
6.27
$$\begin{array}{r} 8.03 \\ 53 \\ \hline 2409 \\ 4015 \\ \hline 60/425.6 \quad (7.06'' \\ 2120 \end{array}$$

Munich clatichules Comet

Comet

Star in Bepeli Zone 162

20.57 11.28.7 + 9.59.00"

40.14.5 9.47.04

4.29.76.5

5.07.57.5

16.28.12.2

16.32.17.0

Sun's Dist. Cal p(86)

Star 7th

21.05.24.0 + 9.47.00

Star 3rd mag.

16.50.34.36

4.38.70.0

21.46.23.3

16.32.14.0

4.48.20.0

16.58.03.3

80.22.58

Comet

α Cephei

9.37.02

21.12.08.0

21.49.36.4 9.39.14"

21.14.37.4 9.53.26

4.51.34.0

125² 4.46.25.5

16.58.02.4

16.28.12.0

16.50.25.8

Star

7.36.6

21.20.10.7 9.47.04

4.47.15.5

16.32.15.2

16.24.38.6

Comet

Dig. R. Comet previously Dig. Star. Comet N of Star

4.01.8

12.00 2.858

16.23.45.30

4.03.2

6.22 5716

-9.75

4.06.2

1.00

16.23.35.55

21.31.41.5 9.48.04 4.03.73

6.27

16.24.38.43

5.03.30.0

16.24.38.43

9.44.50

9.48.53.5

16.28.11.5

20.57.29 16.20.34.70

9.51.17

-1.02.4

Star

21.14.37

Comet. U.S. Oct 14th 1847 42.54

9.47.50.6

36.59.4

21.31.42

Comet. R. 16.20.34.70

3.00.2

5.04.41.0

21.14.36

Dec + 9.51.17

9.44.50.4

32.18.4

13.30.26

7.44.10

1.16

Oct 14

Comet is visible to naked eye in spite of the moon light. It is sailing along at a proper rate. With the Great Refractor it was quite interesting to see it move with a power of 300. When happened to be a small star near with in 1 or 2' of it. Father had just got up in his chair. I called to him to come up & see that the comet was in a line with these stars. He came directly but before he looked it had moved sensibly. I suppose that the interval was less than 30 seconds. The comet fills with its light nearly the whole field. All stellar matters, but very indistinct in its outline.

It is rather remarkable for its want of condensation.

$$\begin{array}{r}
 16..47..46.5 \quad "30.14" \\
 - 21..55.5 \quad 9.39 \\
 \hline
 25..49.0 \\
 25 \quad 48.9
 \end{array}$$

Oct 16th 1846

Saw Mars very finely with the Great Refractor. The surface much diversified at moments a great deal may be seen power 500 which it bears as well as the lowest. The polar spot of white is small. I fancy it is 'peaked' but not probable. Perhaps the edges of the planet are the brightest.

116

Friday Oct. 15th

Observed with the 5 foot. Equatorial. The dome being occupied with the frame &c of the new chair

Notwithstanding the comet is plainly visible to the naked eye, it is almost impossible to observe it with certainty with the field illuminated
9th 7th

Com 20. 49. 57.5 9th 51. 12. 8 1. 15. 3 Dec + 2° 39'
50. 09. 5 28. 4 1. 18. 4 h 4. 33

90. 53 Comet 3 dis South of 9th

21^h 05^m 7. 44
1. 87

9. 31 = Dif. Dec Comet & 9th pretty good.

279 3
288 61

21. 08. 11.0 288. 28 = 4. 48" Comet S of 9th

21. 09. 31.0
1. 20.0

The companion 9th
preceded by 40^s &
it was 7' nearly N.

21. 12. 37.5 5. 62

13. 55. 4 7. 06
12. 68

1. 17. 9 380 4
393. 08
391. 81 = 6. 32"

9th 21. 22. 24 + 2. 52
25. 51 X 5. 01. 00

16. 21. 24 2nd mag

Cloudy.

Brighter 9th 3rd + 2. 28

21. 33. 10 2. 29

7. 22. 50

16. 30. 20

R 16. 23. 12

7. 08

Observations are inaccurate
extremely differing from
defective illumination

* R 16. 14. 16

Dec 2° 52'

Oct. 15th

21^h 08^m 46^s Comet 5^h 42^m S of Star
 7^m 25^s " 1^m 19^s precedes Star

21^h 01^m 21^s
 13^h 34^m 22^s
 7^m 27^s 00

1^m 13^s
 7^m 25^s 47 = ch. S. 2.

Star is Repelli's Zone No 89

+ R 16^h 19^m 18^s some doubt as to Star

1^m 19^s + Star 2^h 41^m 55^s

Comets R 16^h 17^m 59^s 5^h 42^m

Comet's Dec 2^h 36^m 13^s

ch. S. 2. 7^h 27^m 27^s

21^h 08^m 11^s

21^h 12^m 37^s
 48

21^h 10^m 24^s

7^m 24^s

21 03^m 00^s

13^h 34^m 21^s

7^m 28^s 40

1^m 13^s

7^m 27^s 27

118

Monday Oct 15th

Oct. 8th mag. Dist. 15'

Station North of West. St. Comet above

20 ^h 21 ^m 06.4	T	60.0	20 ^h 22 ^m 52.	T	76.4	T _c	74.5
21 ^m 22.0	+	28.7	23 04.4	t	51.0	t _c	49.7
21 ^m 50.7	from T _c	58.5	606.0	23 ^m 55.4			497.6
22 06.4	t _c	27.9	598.7	24 ^m 08.4			540.0
21 36.3			23 29.9	diff dec outer			1103.6
36.4			30.2	inner			1106.7
21 36.2			23 30.0	mean			1105.1

Star

Water below

right hand star

Comet

24 ^m 46.4		24 ^m 53.0		24 ^m 26 ^m 39.4	T	72.2	T _c	70.4
24 ^m 56.4	T	64.1	25 ^m 11.9	T	83.7	26 ^m 50.4	t	48.0
33.8	t	37.4	26 ^m 08.2	t	46.3	27 ^m 38.4	-	530.0
25 50.5	t _c	65.8	26 ^m 17.1	T _c	85.9	27 ^m 51.6		525.2
24 45.1	t _c	98.6	25 22.0	t _c	59.8	27 14.4		
25 31.7			22.8			15.5	diff dec outer	876.6
32.2			25- 22.4			20 27 15.0	inner	887.3
32.0							mean	882.0

to compare to correct places

diff dec outer

24 46.4	T	90.7	24 53.4	T	57.1			1136.5
50.4	t	71.8	25 11.9	t	21.9			1143.8
26 8.2	T _c	88.6	33.8	T _c	55.6	621.2		
17.1	t _c	69.0	50.5	t _c	21.3	611.3		
25 32.3		346.6	25 22.8	diff dec				20 ^m 21.58
1.7		362.1	22.0					13 ^m 46.10
32.0			22.4					6.45 to 46
								1.04
								6.34 44

both below		above	
right hand star	left hand star	Comet	no nulling
28" 29.4	20 28" 37.5	20 30" 24.5	T 67.0
38.5 T 8.9.1	28 58.5	30 84.5	+ 65.0
70.5	54.5		
29" 49.0 T 86.8	29" 10.5	31 19.5	T 65.3
58.5 T 88.7	29" 31.5	31.5	T 43.8
29 13.7	368.6	30 57.0	565.6
9	4.5	58.0	539.8
365.3	4.3	30 57.5	
29 13.8	29 4.4		
diff. dec. base		a w R 1198.9	
936.2		1165.4	
905.1		1182.1	
919.6			

Star right	Star left first taken	Comet	
33" 02.5	20" 33" 11.5	20" 34" 57.8	4" 16" 56 - 12" 57
" 11.5	34 01.8	35" 12.8	7" 43" 04
34 19.8	33 36.6	35" 46.0	13" 12
29.4	T 86.9	36" 01.6	T 63.8
33 45.0	L 68.3	35 29.4	T 33.2
45.6		29.7	
45.8	T 84.7	20" 35" 29.6	T 62.2
	L 80.6	4" 16" 56.0	584.5
diff. dec. base	395.2	16" 18" 43.6	587.9
	980.0	7" 20	
	969.4	16" 11" 14	
	974.7		

2nd star
Star same hour angle to top 56

20" 53.08 - 10" 03'

4" 17.04

16" 36" 04
16" 29" 44
7" 20

nearby
Sun alt

21" 02" 30 - 10" 03'

4" 26" 26

16" 36" 04

20 23 30.0

27 15.0

30 57.5

35 29.6

20 29 18.0

7 20.0

20 21 58

1 53.6

52.6

53.1

53.0

1 53.07

78

1 53.35

4" 17" 04

10" 15

10" 03'

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

10" 15

Star 7th

20" 14" 50.5 - 20 - 40

45" 07.0 - 29 - 40

Star in Ref. 252 precedes Star

Star in Ref. 252 precedes Star

Star in Ref. 252 precedes Star

Star in Ref. 252 precedes Star

Star in Ref. 252 precedes Star

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Star in Ref. 252 precedes Star

Star in Ref. 252 precedes Star

Star in Ref. 252 precedes Star

Star in Ref. 252 precedes Star

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

another star follows 60" in R

120

Oct. 25th 21^h 30^m

* Star observed

Star of 13-15 with Neptune really S.p.

125^o 02

59.46

59.21

124^o 15

59.21

123^o 49

58.98

Y neutrals in ink
these were made up
Oct 25th

Supposed Satellite
The angle of position was altered from that
given below in pencil, because 59.22
in that the angle of the star was 51.58
taken for that of the sat. without
allowing for Neptune's motion. 7.64

Dist 15.4 Lat. is S.p 40° from the parallel
M.S. 7.45^m

Zero 51.58^d

As the measures were made after the
rising of the moon which is nearly full
they are not very good. Besides which we
were not at the time aware of its being the sat.

Zero of Pos. 270^o 20'P.B. Zero 51.52^d

57.57

57.57

110

Neptune & N. 14 mag

44^o 2044^o 0744^o 2144^o 0643^o 74

Sat 49.91

50.05

49.91

Position set as seen before
Clouds
147^o N.P. app.
132.

Satellite seen at all with much difficulty
any thing like accurate measures out of the question

At 22^h 42^m Sid. Time The position of the

Satellite (supposed) supposed Satellite was as follows

Dist 1.62

1.48

1.62

Mean 1.57

Position Same as above in a line.

At first say at 21^h Sid. Thought
to be up above 10° but at 22^h 30^m
Sid. Thought that the three were
Sep. then, above star, & the Sat. were

Star or 12^h 20^m possibly some degrees below

Zero 270.20

Position of Sat 146° from S.p. Neptune
or 34° from Equator.

Erased because allowance was not made for the
motion of Neptune

Moon bright
Star steady.

Oct. 26 * apparent
* -44 position on p

317.37

137.35

139.27

22.1

54.25

54.10

Zero 49.27

Env'g is cold with heavy cirrus

State of atmosphere very ununiform

Nothing can be seen of the Sup.

Satellite

Oct 26th 7th Nothing can be seen of the Sat. The star is visible
1st Ring not perfectly clear & unsteady & could not at
times see but one of the four brighter moons of Saturn

Summ

51.56

51.91

51.50

51.90

51.47

51.905

51.57

measured without
illumination by the
light of planet.

Oct. 27

Sat ap. S. fol.

151.25

53.37

Zero 51.86

152.30

53.29

Sat nearly n. of Wep.

Power 1000

53.10

Pos. 76. E. B. 61. 15'

L. P. B. 61. 45'

154

53.30

Dist

13.5

Power 1300

13.8

some time later

13.27

1.56

1.41

14.1

13.8

76. E. B.

diam of Jove

diam of Jove 7^h 30^m

diam of Jove

Nep. & Sup Sat Nep. appears above & to the left of Sat

power 1000

151.00

49.91 Zero 48.57

152.30

49.95

48.54

151.00

49.95

151.30

48.55

1.38

13.8

13.5

157.40

45.86

Zero 48.55

157.30

46.08

45.60

25.4

45.85

48.55

2.70

45.80

45.53

2.74

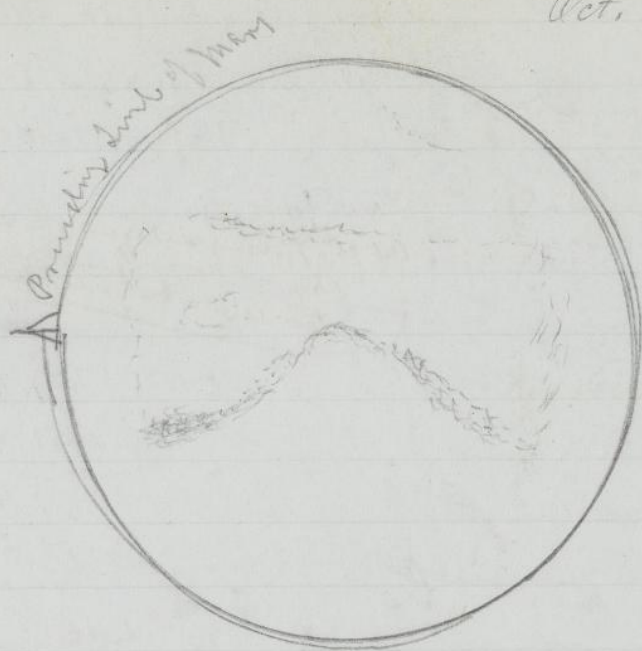
Summ

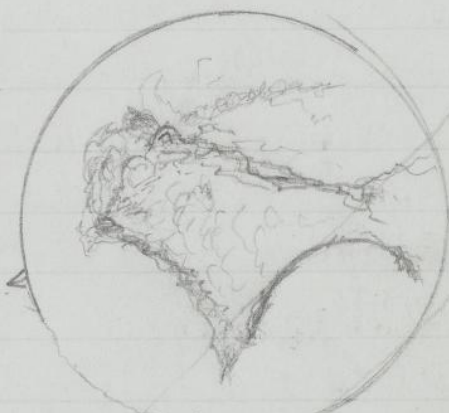
51.60

51.58

Not visible 12^h

Not visible 24^h

Oct. 27th 10^h 46^m

$$\begin{array}{r} 20.00 \\ 10.30 \\ \hline 9.30 \end{array}$$


diam of Mars

23^h 23^m

$$\begin{array}{r} 8.30 \\ \text{mid. S.} \end{array}$$

$$\begin{array}{r} 62.80 \\ 59.98 \\ \hline 2.32 \end{array}$$

$$\begin{array}{r} 60.02 \\ \times 62.32 \\ \hline 2.30 \end{array}$$

$$\begin{array}{r} 59.85 \\ 62.29 \\ \hline 2.44 \end{array}$$

$$\begin{array}{r} 59.94 \\ 62.29 \\ \hline 2.35 \end{array}$$

$$\begin{array}{r} 61.56 \\ 62.26 \\ \hline 70 \\ 61.55 \\ 62.27 \\ \hline 72 \\ 61.56 \\ 62.27 \\ \hline 71 \end{array}$$

$$\begin{array}{r} 23.74 \\ 14.56 \\ \hline 9.18 \end{array}$$

Oct. 28th

Lid time 21.5

Th. am 58.8) 123
58.50

Position Sat

✱

The star is much different

132.30

133.02

132.45

132.45 - .15 cor. for Zero

270.45

34.50

37.25

32.27

Zero

Distances

60.84

60.78

60.79

60.80

59.30

1.50

15.0

Coin 59.30

Position
Sat & Star

1.40

Dist X

61.46

61.18

61.15

61.09

61.21
59.30
1.89

Zero

59.31

59.38

59.30

den

21.40

9.30

34.75

The star is now of nearly the same
brightness as the Satellite, which shows
that the faintness of the Sat. is in some
measure owing to its proximity to the planet
Zero opposite 270.15

Power 1000

Set

132.30

60.79

134.45

60.71

135.35

60.59

133.30

60.72

136.30

60.77

133.30

60.75

Mean 134.00

Zero 60.72

62.27

1.55

Position

131.30

131.30

Zero

62.29

62.27

62.275

Mean at about 22.40 in Sat

These two are possible satellites
very faint not before noticed

Angle of position from the parallel.

Sat. really w. of Neptune.

pos. X.C.B. = 42.30

Dist " 14.7

G.R.B. 44.00

15.2

Mean of X.C.B.

M.S.T. 7.15

Mean of Six.

11.5.7 8.15

Star
Sat.

Night is clear & the Sat. seen without difficulty when the lights are put out. Some
stray light in the field of view is an inconvenience. Obs. are thought to be better
than on any previous night. Observations carried with 1000

Can see the Satellite with 1/2 of the area of the Object glass.

Observations on Lapeley Satellite of Neptune

Positions reckoned from the parallel of Declination

Oct. 25th 7^h 45^m Sat. is s.p. 40° Dist 15.4 dist. is mean of three Extrem dif 1.4

Observations were made after Moon rise. The angle of position is uncertain to the amount perhaps of three or four degrees possibly more.

power used 300

Oct 27th 7^h 30^m Sat. is n.f. 61° 30' Dist 13.7 Both means of six obs.

Extrem dif. of pos. 1° 30' do. of Dist 2.7 powers 300 & 1000

The power of 1000 shows the Sat. with greater distinctness than 300.

Oct 28th 7^h 45^m Sat. is n.f. 43° 15' Dist 15.0 Both means of nine obs.

Extrem dif. of pos 4° 00' do. of Dist. 1.4 powers 400 & 1000

Oct. Nov. 2nd Sat. is n.f. 55° 50' Dist 14.0 Means of six
obs. 7^h 15^m power 400 & 1000

126

1847. Oct. 29thPosition of * & 4th

h m
7.55

~~58.78~~
~~59.78~~
~~59.78~~

Position

255.25
253.00
257.45
253.23

8.15

dist^a

58.79
58.68
58.90
1237
58.79

62.26 ~~200~~
58.79
3.47

The Satellite cannot be seen
this evening. Though the star
is readily seen.

There is now a very
faint companion as shown
in the accompanying diagram
which there is reason to believe is
a new satellite. It could hardly have been
overlooked hitherto, if it had been there
Its distance was about ~~once~~
~~the~~ ~~Once~~ ~~of the~~ ~~fourth~~ of the

dist. of the star ~~dist~~ from Neptune
& its angle of position 125° ~~lep~~
or position s.p. 40° Dist. $45''$?

 $\sim 1 \frac{1}{4}$ dist of star

From the 30th of Oct. to the 8th of Nov Nep will move $5''$ in $R = 75''$

256 } ~~water~~
251 }
258 20
254 40
258 0
25
255 34

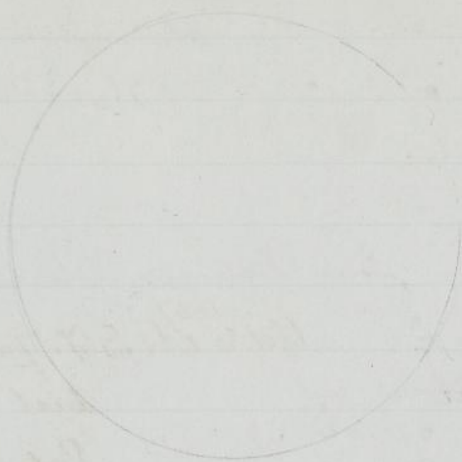
58.99 ~~Water~~

+ faint star on
edge of field 1' fr. edge.

power 400

* Sup new Sat
* studied.

$$\begin{array}{r} 66.76 \\ 68.88 \\ \hline 2.12 \end{array}$$



oct 29th
10 P.M.

10 rev

$$\begin{array}{r} 24.7 \\ 31.2 \\ \hline \end{array} \quad \begin{array}{r} 6.5 \\ 6.8 \end{array}$$

$$\begin{array}{r} 06.6 \\ 13.4 \\ \hline \end{array} \quad \begin{array}{r} 6.8 \\ 6.8 \end{array}$$

$$10 \quad \begin{array}{r} 6.5 \\ \hline \end{array}$$

$$10 \quad 6.5$$

$$\begin{array}{r} 41.2 \\ 47.7 \\ \hline \end{array} \quad \begin{array}{r} 6.5 \\ 6.5 \end{array}$$

$$\begin{array}{r} 00.4 \\ 06.8 \\ \hline \end{array} \quad \begin{array}{r} 6.4 \\ 6.4 \end{array}$$

$$\begin{array}{r} 17.0 \\ 23.4 \\ \hline \end{array}$$

$$\begin{array}{r} 0.65 \\ 1.5 \\ \hline 3.25 \\ 6.5 \\ \hline 9.75 \end{array}$$

$$\begin{array}{r} 38.4 \\ 44.7 \\ \hline \end{array} \quad \begin{array}{r} 6.3 \\ 6.3 \end{array}$$

$$\begin{array}{r} 6.3 \\ 1.5 \\ \hline 3.15 \\ 6.3 \\ \hline 9.45 \end{array}$$

20 rev

$$\begin{array}{r} 12.4 \\ 25.4 \\ \hline \end{array} \quad \begin{array}{r} 13.0 \\ 13.0 \end{array}$$

$$\begin{array}{r} 03.7 \\ 16.4 \\ \hline 7 \end{array} \quad \begin{array}{r} 53.4 \\ 06.0 \\ \hline 12.6 \end{array}$$

$$38.8$$

$$51.8$$

$$\begin{array}{r} 29.4 \\ 42.0 \\ \hline 6 \end{array} \quad \begin{array}{r} 18.4 \\ 31.1 \\ \hline 12.7 \end{array}$$

$$56.4$$

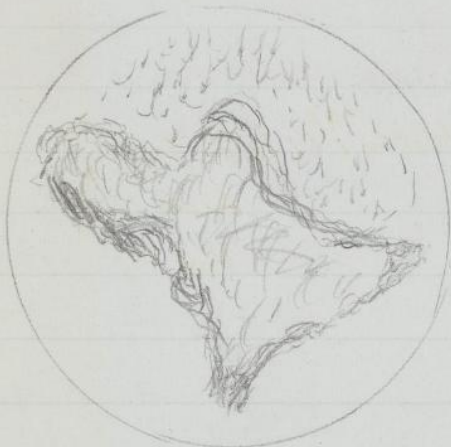
$$59.4$$

$$29.3$$

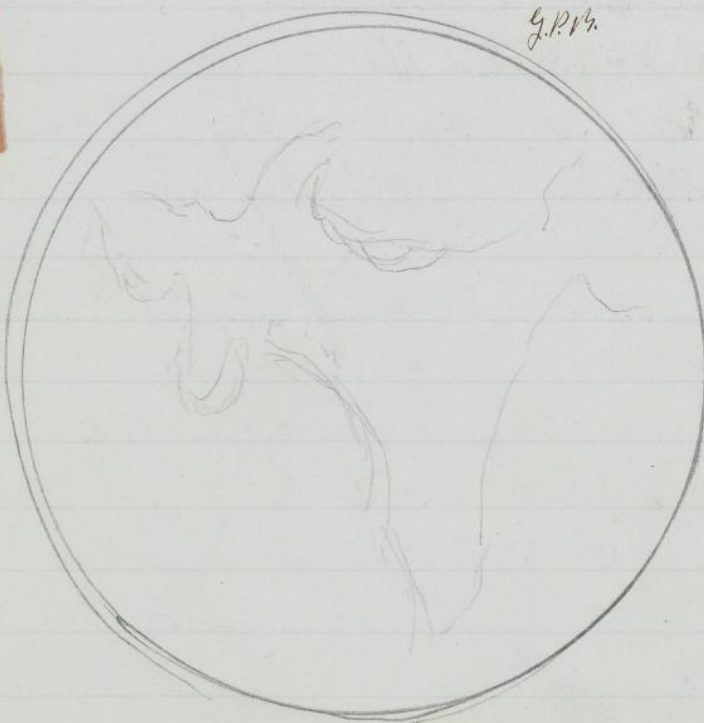
$$36.3$$

Vide Drawings of Prof Mitchell -

129

oct. 30th

G.P. 13.



130

Nov-20-

Pos -

146.25

146.23

145.37

18.25

146.28

Dist.
63.73
62.61
1.12

Coin

dense fog below, the planet
was but just above a heavy cloud
to the southward which extended from
S.W. to N.E. Sat faint

diam about

2^h.00

143.30

144.30

148.10

145.20

61.19

61.18

61.09

61.17

61.14

5.27

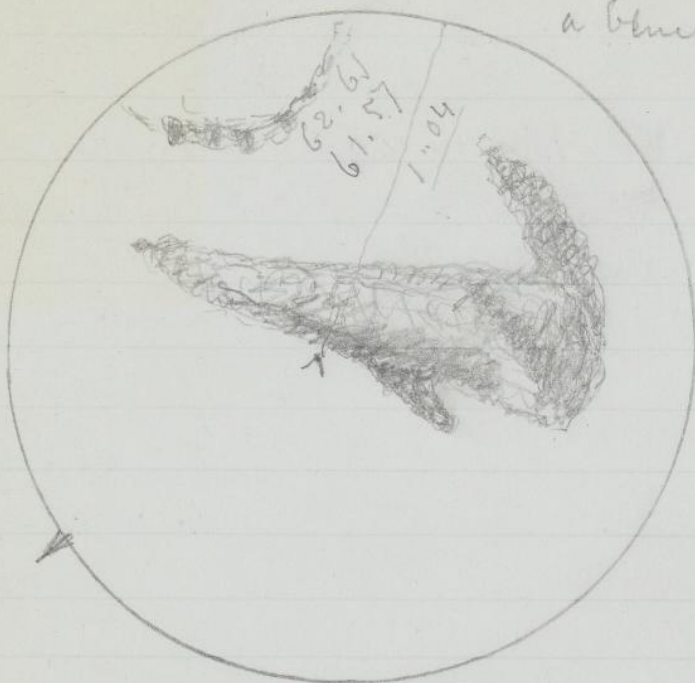
61.15

Zero 62.61
62.61
61.15
1.46

diam 145 55°.50' m.f. Dist. 14".0

M.S.Y. 7.15

Nov 2 Mars 8.15^{h m} The middle part has
a bluish tinge



atmosphere very unsteady.
When out of focus, the undulations
were violent, and directed apparently
towards the South. The direction of
motion was therefore really downwards.
It was a rapid but tolerably
steady evolution.

*

+



x x

x

x

Nov 2

Line with ap below α on nucleus

Zero 70.00

field is 146^s of R at Dec of Nov

$$146^{\circ} 40' = 112^{\circ} = 1^{\text{m}} 52^{\text{s}} = 28' ? \text{ group not}$$

x 5	pr $\frac{1}{5}$	68.31	above ap N
x 5	pr $\frac{4}{5}$	58.28	
x 4	pr $\frac{4}{5}$	55.79	
4	f 0.2	47.83	
2	f 0.8	42.84	
2	s.p. 0.6	33.45	
1	f 0.7	27.03	
4	sp 0.8	21.54	
2	sp 0.7	18.88	
3	s.f. 0.9	8.38	
1	s.f. 1.0	6.46	



Andromeda

133
There are three nebulae in the finder.

134

Nov 3 7.0. Land m. Solent

129.40	48.92	
128.45	48.65	win 50.03
128.30	48.73	50.06
129.10	48.74	50.05
<u>35.25</u>	<u>48.24</u>	
128.36	48.76	
	<u>50.05</u>	
	1.29	

Nov. 3. 7. A.S. 3

Dist = 12.6

per 38.36 m.f

17.1 2 *

Dist

61.26

61.38

61.33

61.37

61.47

50.03

50.09

49.99

Distance

99.16

101.08

100.10

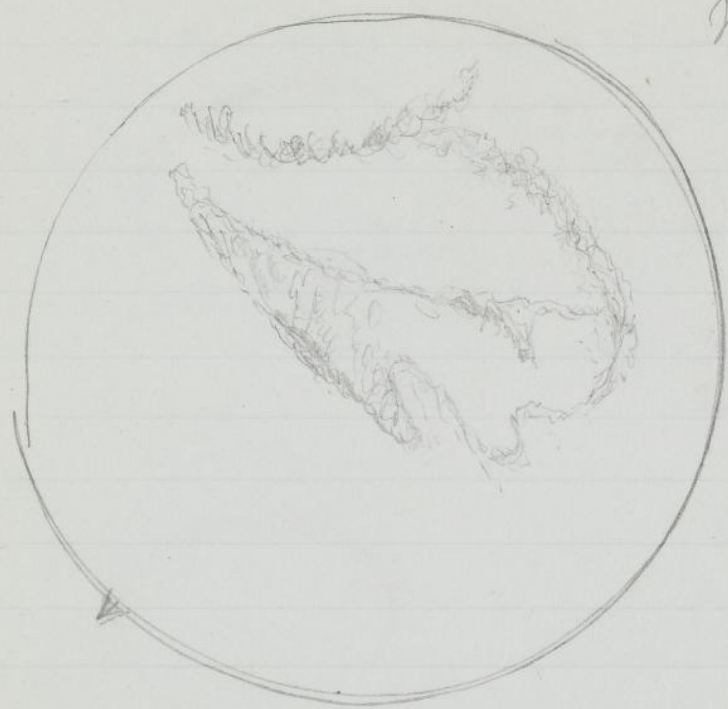
92.34

92.05

Star before end
New Sat.
Lupult.

Mars

Nov 3 - 8.30^h



¹³⁶
 (184) Nov. $\frac{4}{3}$ Am

Position of Cusps

161.10

161.45

161.35

Appulse of Venus
 pretty steady

v.s. illuminated portion

50.837

50.875

51.000

50.886

50.867

4465

50.893

49.844

49.844

49.847



a mounding point

Diameter of Venus ~~is~~ perpendicular to the line
 joining the Cusps. not very steady

54.365

54.292

54.363

54.343

54.363

51126

54.3752

49.8397

45.355

54.344

54.342

54.333

54.363

54.347

51229

54.374

49.839

45.350

54.363

54.377

54.365

54.320

54.383

51308

54.3616

49.8397

45.219

54.363

54.377

54.365

54.320

54.383

51308

54.3616

49.8397

45.219

54.363

54.377

54.365

54.320

54.383

51308

54.3616

49.8397

45.219

54.363

54.377

54.365

54.320

54.383

51308

54.3616

49.8397

45.219

more unsteady

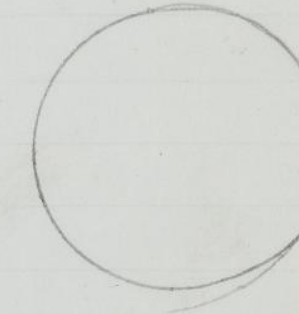
Coin 49.840

49.837

49.842

119

49.8397



21.2
 42.4

Before sun rise
 Nov 3-4th Venus as seen with the naked eye,

The light of Venus compared with the moon was much brighter with a bluish tinge - the moon light appeared sallow in comparison.

The division ^{line or twilight district} between light & darkness is irregular, the whole curve being cycloidale. The illuminative portion mottled.

I think the whole appearance, is such as the general surface of the Earth would present, without the excessive mountains such as Himalas range, the Andes & Alpes.

The apparent lower horn was rather sharper than the upper.

After sun rise.

The planet more unsteady, and the moon towards noon became too faint to compare colours with Venus when nearest, our lowest powers would not take in Venus and the moon into the same field, the upper limb of the moon was not visible when Venus passed. It was therefore impossible to make any measure either for difference of declination or R.

$$\begin{array}{r} 0.06 \\ 0.14 \\ 0.20 \\ 0.26 \\ 0.32 \\ 0.38 \\ 0.44 \\ 0.50 \\ 0.56 \\ 0.62 \\ 0.68 \\ 0.74 \\ 0.80 \\ 0.86 \\ 0.92 \\ 0.98 \\ 1.04 \\ 1.10 \\ 1.16 \\ 1.22 \\ 1.28 \\ 1.34 \\ 1.40 \\ 1.46 \\ 1.52 \\ 1.58 \\ 1.64 \\ 1.70 \\ 1.76 \\ 1.82 \\ 1.88 \\ 1.94 \\ 2.00 \\ 2.06 \\ 2.12 \\ 2.18 \\ 2.24 \\ 2.30 \\ 2.36 \\ 2.42 \\ 2.48 \\ 2.54 \\ 2.60 \\ 2.66 \\ 2.72 \\ 2.78 \\ 2.84 \\ 2.90 \\ 2.96 \\ 3.02 \\ 3.08 \\ 3.14 \\ 3.20 \\ 3.26 \\ 3.32 \\ 3.38 \\ 3.44 \\ 3.50 \\ 3.56 \\ 3.62 \\ 3.68 \\ 3.74 \\ 3.80 \\ 3.86 \\ 3.92 \\ 3.98 \\ 4.04 \\ 4.10 \\ 4.16 \\ 4.22 \\ 4.28 \\ 4.34 \\ 4.40 \\ 4.46 \\ 4.52 \\ 4.58 \\ 4.64 \\ 4.70 \\ 4.76 \\ 4.82 \\ 4.88 \\ 4.94 \\ 5.00 \end{array}$$

$$\begin{array}{r} 42.2 \\ 42.2 \end{array}$$

138.

Nov = 3 - 4⁺ Am. Diameter of venus in the direction perpendicular to the line joining the culps concerned near the meridian, position of the wires, nearly horizontal.

r - d

unsteady, or quiet only at intervals and for a short time

54. 362

54. 357

54. 343

54. 368

54. 358

1288

54. 3576

49. 8427

45.149

219

356

355

11073

45.268

(49.842
49.843
49.843
18
49.8427)

Nov 5^e 2557 + 8^m 00^s

(257)

Cur R - 8" 09"

139

N.p.

- (1) 22..52..00 - 59 bent Extrem of ap. upper left hand Canal (1)
 That which is furthest from the
 nucleus. It ends in a group of stars
 rather brighter than usual
- (1) h 10..10..50 40..10..00
 0..41..10
 0..40..55
 22..51..30
 10..10..50
 0..40..40
 - 5.08
 0..32..32 = R.
 40..08 = Dec.
- well
 (2-30 bent?)

- 2 23..01..00 - 65 Extrem of ap. p Canal (2) ends pretty abruptly
 10 18..74

- 3 23..13..28 - 30 319..46..24 Same as above, a better position
 10..32..02 40..13..36
 0..41..26
 23..13..13
 10..32..02
 0..41..11
 - 5.08
 0..33..03 = R.
 40..12 = Dec.
- Note No (2) that nearest the (N) is the
 most distinct & shortest

- 4 23..24..05.5 319..39..20 Place where no (1) either gets broader
 10..42..47.5 40..20..40
 0..41..18.0
 23..23..50
 10..42..42
 0..41..03
 - 5.08
 0..32..55 = R.
 40..19 = Dec.
- (1) proceeds (2) 65° (beats?) (2) proceeds (N) 60° (beats?)
 Both are here, plain (2) most so
 I think there is a possible trace of a third

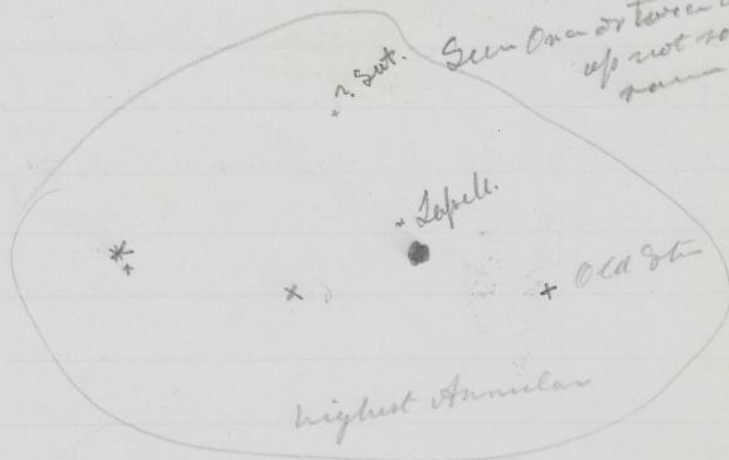
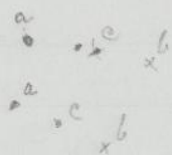
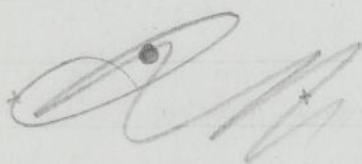
- 5 Parallel of (N) (N) nucleus (1) proceeds (2) 65° (beats?) (2) proceeds (N) 60° (beats?)
 Both are here, plain (2) most so
 I think there is a possible trace of a third
- (1) 23..41..50 - 34
 10..58..66 319..31..20
 0..42..46 40..28..40
 23..41..34
 10..58..06
 0..42..28
 - 5.08
 0..34..20 = R.
 40..27 = Dec.
- Thought to bend (2)

- 6 23..58..10 - 37 (2) is broader but very distinct They here
 11..14..91 I think make a bent to ap N In the same
 0..52..42 dec. as given (1) proceeds 64° (beats?)
 319..25..20
 40..34..40
 23..57..53
 11..15..31
 0..42..22
 - 5.08
 0..34..14 = R.
 40..33 = Dec.

140
1847

Nov. 5.

Lassall Sat above by too near to measure

a rep. by "the" star. C seen by glimpses
a little above the line joining a & b.Seen once or twice before
up not so near N
same pos.

Between Lap. & Old 9th
We have seen a very faint
star one two or three nights
Dist on 4th $\frac{2}{5}$ in a line
11 5² about same

Frater & Dr. P. think it
is above

Canaly.

Dec 40-26 27⁵
40-36 39 up regular
41-62 No. to this point

40-36.40
800
40-41.40

40-37 1847
1825
40-30

0.36.32
1.21
0.35.53
800

142
Nov 5³ FridayFor tracing the outline
up

(20) 2..58..54-30

End of spur or broad horn of light

19 h 2..12..11

221..22..32

ap. one extremity of Nebula

R 0..38..08
Dec 41..21

3..11..37

Light suddenly bright in the field with
dark cavities (dark shading is light)

(13) 3..17..52

20 h 2..36..53

219..51..20

R 0..32..26
Dec 39..50

0..41..00

(7 1/2 mag. by H&C) 181

very bright star P.A.C. 191

21 3..25..57.5-30 219..53..00

2..42..00

39..53..00 last Dec

39..51..00 * Dec

-2..00 Cor last Dec

h 2..25..42
8..00 2557+
3..17..42
2..42..00
0..34..02
0..33..43
-19

0..43..57.5

Vol. E. of Pier

for about the field pre-
ceding this star the neb. is much
brighter than anywhere else in the
vicinity. Nebular light extends
about the star.R 0..36..49
Dec 40..13

22 3..32..35 220..15'

h 2..52..12

Light ^{is} ~~very~~ ^{is} delicately diffused
shaded very gradually from
the Canals rather a feature

23 3..42..16 220..51..52

3..00..101

0..40..35

an oval Neb. in the faint
shading of the great (N) axis only
in the merid. circle. & appears
to be connected with the great N
with a horn or ridge.

R 0..32..00

Dec 40..50'

(17) R 0.36.30
Dec 40.58
24 3.53.21 221.00
3.08.17
0.45.04

Extremity of Great Neb. ? (swthg)
rather sudden termination light
is diversified with small curvatures
for the breadth of field

(18) R 0.37.05
Dec 40.24
25 4.00.10 220.26
3.14.30
0.45.40

Light may be said to end in
shading is exceedingly gradual

(19) 4.05.48 220.02.52
26 3.22.52
0.42.56

a very pretty ^{round} Nebula with a very
bright point like star

R 0.34.21
Dec 40.01

Com. Sk.
very round
25.7 5.09
12.08 319.42
-40.18

5.48.30
E 17.30
+47.58

144

Nov. 6. first sight of Neb

0 28 13 - 26 320 35

11 48 50

Clouded up.

Linda is 220 beats = 110° Dec 40°

$$\begin{array}{r} 28 \\ 4 \overline{) 82} \\ 20 \end{array}$$

Nov 10th

424 ± 10

I suppose that in this set the telescope was
clamped at the Nucleus. and

424 2 03 55 - 20 (1)

05 25 - 2 (2)

(3), (4) etc denote the brightness

29

2 11 02 - 20 (5) $AR 0^h 31^m 57^s$

Dec 40° 26'

1 38 22

0 32 40

30

2 15 35 - 20 (5 1/2) $AR 0^h 32^m 34^s$

Dec 40° 26'

1 42 18

0 33 37

2 18 20 - 20 (3) up to 1st canal

31

2 20 27 - 20 (4) $AR 0^h 33^m 09^s$

Dec 40° 26'

1 46 35

0 33 52

Brighter to 3 1/2 near canal

32

2 26 28 - 20 (6) Canal $AR 0^h 33^m 21^s$

Dec 40° 26'

1 52 24

0 34 04

2 29 15 - 20 (2) Mid. between canals shades off to them gradually at first
& then suddenly

1 54 50

0 34 25

 $AR 0^h 33^m 42^s$

Dec 40° 26'

R 0..33..49
 Dec 40..26

34 2..34..54 - 20 2nd canal Each is here as well as $\frac{1}{2}$ dist. between them

2..00..22
 0..34..32

R 0..34..24
 Dec 40..26

35 2..40..01 - 20

2..04..54
 0..35..07
 0..34..24 R. mel
 -43

2..51..44 - 20

(W) is nucleus

R of (W) from canal to N is nearly (2) & pretty uniform

(N) nearly 100% S. of center.

from Canal to N centre of field is near, in the limit of
 Dec. in which that bright light S.p. (N)

limit of (2) light shades of much sooner on the J. side

36 2..16..27
 0..35..17
 R 0..34..34
 Dec 40..26

Observations On a spot (dark) sun on Mars' southern hemisphere Nov. 17th P.M. 1947

power lowest	without ill.	
From following limb	From N limb trans	Zero
sideline	h m	
2..27 48.57	2..19 48.47	49.89
2..28 48.48	2..22 48.33	49.89
2..29 48.38	2..24 48.40	49.90 from N limb from spot
2..31 48.58		48 beats
		46 of 0.4

See for sun spot observed by Meißner.
 Ist. Nach. Vol 8 Fig. 18.

power
 400 48
 46
 47

Pos reading 274° 02'

Zero 270 154

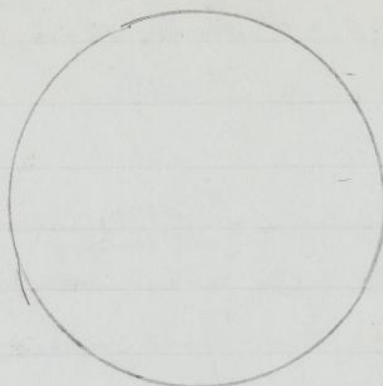
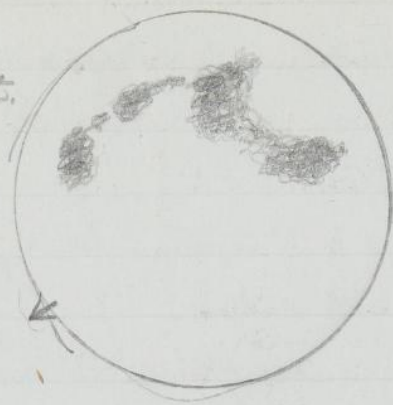
270 46

These were taken by

setting the position circle a few degrees from the parallel & 1 obs
 the times of contact of the ap. lower limb & the spot but
 the air is unsteady.

Very good Zero 270 50

1/16
Nov 12
h m
7.15
camb. m. t.



Estimates of the Apparent field of the Eye pieces of the Grand Refractor

Nov 25th

Micrometer Eye pieces

	N ^o 1	N ^o 2	N ^o 3	N ^o 4	N ^o 5	N ^o 6	N ^o 7	N ^o 8	N ^o 9
App. field.	27.2	30.5	36.0	27.0	35.8	32.0	36.9	30.5	32.5
	27.2	31.5	37.0	27.0	35.0	31.3	37.0	31.5	33.0
	27.0	30.8	36.2	27.0	35.5	31.5	37.3	30.3	32.7
Shutter									
Field	11.5	9.0	6.8	4.0	3.0	2.2	1.8	1.2	1.0

Nov. 26th In consequence of the warm & damp weather of the past week. Moisture condensed very abundantly on the machinery & Object Glass of the G.R. & insinuated itself between the lenses we separated them to day & cleaned them thoroughly. It does not seem easy to guard against such occurrence.

Found that the whole diameter of the polished part of the glass is ^{Hint lens (no real diff. between the two)} 15.37 English. The effective ⁱⁿ 14.95 English. whole diameter of glass about 15.5.

Diff. between the true, & effective, polished surface = to a gap of ^{in air} 3.8 about

We constantly see the diversion of the rings of Saturn under good seeing.

148

1867 Nov 26⁺

6.35 cm Y

49.80

49.60

49.59

49.74

49.60

 49.66

Zero

48.13.5

48.10.7

11.8

14.5

11.0

 48.12

 49.93
 48.11
 1.82

15.3

7.5 —

49.66

49.66

49.69

49.62

49.70

 49.68
 48.13
 1.55

48.12

48.14

48.11

48.14

48.13

 48.13

Paction

Zero

91.10

183.57

130.30

128.00

132.52

131.14

 1632

 End of
 obs. 7.35
 du. 5.2

 131.19
 191.10
 40.09

7.47 dec 87

power 1200

320.10 n. j

322.20

321.00

320.45

321.04 Dec 27.10

49.75

49.73

49.78

49.85

49.85

49.70

49.13

16.6

48.10 = zero.
 48.12 =
 15 =
 16 =
 48.13

End of obs 0.39 Sid.

Nov 29th Seeing very bad - very cold 4+6 cleared off about 9 o'clock
 looked at Neptune which was low & very unsteady we perhaps saw
 the Sat. S. p.

Nov 30 Seeing very good 4+16 looked at Neptune - beauti-
 fully defined no satellite visible. The supposed new satellite
 of Oct 29th appears to have been ^{comet} star now seen there. can be seen
 only in good weather.

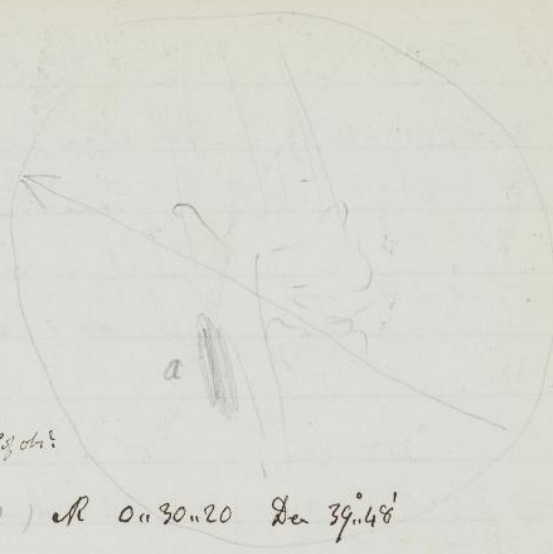
Sat. of Neptune Nov 26th 1847.

7.05^m Mean of W.C.B. 10 obs Dist 15.3 10 at Sat n. j pos. 49° 09' ^{dis. S. j 7.10^m}
 7.47^m G.P.B. 5 " " 16.6 5 obs 49.51
 7.05 W.C.B. Pos 49° 51' } from N Pole
 7.47 G.P.B. 40.06'

150

Neb. Andromeda

$$\begin{array}{r} 1^h 14^m 20 \\ 0^h 44^m 20 \\ \hline 0^h 30^m 20 \end{array}$$

$$\begin{array}{r} 1^h 17^m 21 \\ 1^h 17^m 11 \\ \hline 0^h 40^m 48 \\ 0^h 36^m 25 \end{array}$$


424 light?

- 6³⁷ 1. 14.20-30 Dec 39.50' (1) R 0.30.20 Dec 39.48'
 5³⁸ 15 19-3 1 for last 0.40.48^s (2) . 31.19
 4³⁷ 16.18-20 pretty suddenly (3) 32.24
 6⁴⁰ 17.21-25 (4) 33.13

In this group the Neb. is clamped in Dec & the times of occupying the centre of field is noted.

(1) is the commencement of the light. The axis of light is inclined 60° with the parallel the true S. proc.

On close examination all this is resolved

- 41 (5) 1. 23.58⁻²⁵ 39.50 here is the most conspicuous portion in this parallel the light is 4. in knots approaching to resolvability. a bright spot n.p. 5' in Dec & 30 beats in R
 h 0.48.59
 0.34.49
 R 0.31.49
 Dec 39.48

- 42 (6) 1. 41.55-25 faintest visible
 h 1. 07.14
 Dec 39.33
 R 0.31.31
 Dec 39.31

- 43 (7) 1. 51.18-25 39.56.00 position of (5) taken for part of nebula but considered as resolved.
 h 1. 16.18
 R 0.31.50
 Dec 39.54

Nov 30

(1)

very fine & clear night

44 0.. 46.. 59-25 39° 28' 30

H 0.. 12.. 19

R 0.. 31.. 30

Dec 39.. 27

End of Nebula it is difficult to trace the limit of nebulous light & the fine star dust & resolvable knots which fills the field the axis of the light is decided however

(2) 0.. 54.. 08.5-25

light here widens & brightens. between here & (1)

45 0.. 18.. 49

39.. 39.. 30

the light may be called 5' broad

R 0.. 32.. 09

Dec 39.. 38'

(1)

46 1.. 01.. 48 R 0.. 30.. 26

Dec 39.. 43'

other ^{ant} light (5) light of the neb R

47 1.. 02.. 32 31.. 10

2 - (4) - " - "

48 1.. 03.. 01 31.. 39

3 - (3) - " - "

49 30 32.. 08

4 (2 1/2) - " - "

50 47 32.. 25

5 mottled

51 1.. 04.. 55 32.. 33

6 (3) - "

52 15 32.. 53

7 (4) light

53 1.. 04.. 38 33.. 16

8 (5) - "

H 0.. 28.. 22

Dec 39.. 45

1 54 9.. 58 R 0.. 30.. 34

Dec 39.. 46'

light 5.

2 55 10.. 22 30.. 58

= 4

Field is full of small stars the light is in knots with darkish openings or muffs & appears resolvable

3 56 10.. 50 31.. 26

3

4 57 11.. 05 31.. 41

2

5 58 11.. 25 32.. 01

full of small stars

6 59 11.. 52 32.. 28

3

7 60 12.. 26 33.. 02

4

8 61 12.. 59 33.. 35

5

bright stars 3' north

H 0.. 36.. 24

39° 50'

The brightness of this last series was twice as bright as the brightness of the series preceding

152
1847, Nov. 30⁺ Dec 39^h 53^m Pub in Andromeda, Cent^d
Dec 39^h 55^m

1 62	1	21	41	Dec 0..29.53	Light = 5	indefinite
2 63	1	22	26	.. 30..38	4	mountain
3 64	1	22	52	31..04	3	
4 65		23	23	31..35	2	
5 66		23	55	32..07		Spot much brighter - 4' diam. resolved
6 67		24	20	32..32	3	
7 68		24	30	32..42	2	light generally about as bright as the last series
8 69		25	5	33..17	2	except the spot
9 70		25	20	33..32	3	Light in the brighter parts irregular
10 71		26	05	34..17	4	& in groups or knots & mostly resolved
11 72		26	35	34..47	4	so that it is difficult to distinguish between
12 73		26	52	35..04	5	not abrupt nebulosity & star dust

H 0..48.48

Dec 40^h 0Dec 39^h 58^m

1 74	1	37	57	Dec 0..29..14	Light = 5	
2 75	1	38	20	29..43	5	
3 76	1	38	38	30..01	5	fall of stars.
4 77	1	39	08	30..31	4	
5 78		39	22	30..45	3	
6 79		40	0	31..23	2	nearly & brighter a trifle
7 80		40	43	32..06	1	
8 81		41	60	32..23	1	
9 82		41	19	32..42	2	
10 83		41	32	32..55	2	light diffused, even,
11 84		42	42	34..05	3	even, gradual change
12 85		43	20	34..43	4	even lighter and fainter
13 86		44	5	35..28	5	more nebulous light fades very gradually, can hardly say where it ends

Character of light is more nebulous & generally brighter

H - 1..51.37^sDec 40^h 00

The general direction of the axis of the nebula is decidedly marked.

Nov 30^L

Dec 40° 04'

Dec 0° 30' 01"

Lyra = 5

87	1	1.57	37	
88	2	58	27	
89	4	59	20	
90	5	2.00	10	
91	6	0	55	
92	7	1	5	
93	8	2.1	47	
94	9	2	6	
95	10	03 ²	38	
96	11	2.03	7	

30° 51'

32° 04'

32° 34'

33° 19'

33° 29'

34° 11'

34° 30'

35° 02'

35° 31'

4

3

2

2

3

3 to 4

4

4 to 5

Dec 40° 05'

153

shooting star

increases from 4 to 3 pretty suddenly

doubtful all star

multitudes of stars very

small, faint, the whole

* neb with star like nucleus

4 diameters abt 2'

evenly diffused

4 to 5. fades very gradually

H 1. 24. 36

* this neb. 4 south of the center

Dec - 40° 6' (right) has been moved

Dec 40° 10'

40° 10'

97 1 — 2.08 . 56 R 0.30.00 Lyra = 5

98 2 — 2.09 . 29 30.33 — 4 — evenly diffused.

99 3 — 2.10 . 15 31.19 — 3 — inclining to knots.

100 4 — 2.10 . 55 31.59 — 3 — mottled, another shooting star.

101 5 — 2.11 . 40 32.44 * 2-1 as is of neb passed between

102 6 — 2.12 . 00 33.04 * 1 stream line

103 7 — 2.12 . 18 33.22 2

104 8 — 2.12 . 46 33.50 3 change pretty sudden, quicker

105 9 — 2.13 . 15 34.19 4 than on the other side

106 10 — 2.14 . 05 35.09 5 bright star, a little room

* This axis of the nebula passed between

1d 2. The light is growing decided

x the axis is pretty strongly marked.

H 1. 35. 56

Dec. 40° 11'

154
Nov. 30 * very clear & fine.
Dec 40.15

1 107	2..21..48	0..31..04	light = 5-6 faint & beginning
2 108	2..22..45	32..01	5
3 109	2..23..08	32..24	4
4 110	2..23..22	32..38	3
5 111	2..23..32	32..48	2 edge of canal, first:
6 112	2..23..55	33..11	Second canal
7 113	2..24..05	33..21	1
8 114	2..24..21	33..37	2
9 115	2..24..34	33..50	2
10 116	2..24..43	33..56	3-2 along the edge of the Neb
11 117	2..25..28	34..46	3 subulous light shade off very gradually towards
12 118			
13 119	2..25..58	35..14	4
14 120	2..26..47	36..03	5 H 1..47..44
15 121	2..32..06	36..21	40.16.20

Dec Andromeda

The foregoing were made with the telescope clamped in Dec & the times marked as the nebula passed the field. when the change is sudden the time given is the commencement of the brightness registered

In the column of Light the highest number is the minimum visible & the scale only answers for the series in which it occurs. That is No 1 in the last series is much brighter than No 1 in the 4th series &c

In order to compare the different scales that is No 1 in the last series with No 1 in the 4th series &c it is designed to run perpendiculars to these lines with similar scales of brilliancy & thus to connect the scales with each other which will give the lines of equal brilliancy.

For r Andromeda

2..32..06	40..16..20
h 1..47..44	40..15..00
0..44..22	1..20
Chocover 2..45 424+	
0..41..37	
Rx 0..41..24	
-13 Inst Cor. Feb. E of Pier	
Sum of cor. = -3 ^m 00 ^s in R in Dec -2'	

1847. Dec. 4 th		Clear & fine	Position of the Observer very dis- 155	
Chro no 424		Dec 40.17	trapping which affects the observations.	
122	1	17.14.00	30.19	Light = 6 - stars thinly scattered
123	2	17.55	31.00	5 - more abundant, pretty large stars in groups
124	3	19.07	32.12	4 - groups pass - now small stars full of points of light
125	4	19.49	32.54	3 - first canal
126	5	19.57	33.02	4 - first canal
127	6	20.09	33.14	2 - between the canals
128	7	20.23	33.28	other canal
129	8	20.29	33.32	2
130	9	20.31	33.36	1
131	10	20.46	33.51	2
132	11	21.00	34.05	3
133	12	21.24	34.29	4
134	13	21.56	35.01	5 stars medium
135	14	23.05	36.10	6 H 0.42.50
		Dec 40.19		
136	1	35.10	0.29.07	6 - 40.25
137	2	36.10	0.30.07	5 - stars small
138	3	37.19	0.31.16	4 - stars thick & large
139	4	38.05	32.02	3 - large stars pass - small comets
140	5	38.35	32.32	small stars very small
141	6	39.00	32.57	all resolved
142	7	39.18	33.15	1 st Canal.
143	8	39.46.5	33.43.0	2 - other canal
144	9	40.03	34.00	1
145	10	40.31	34.25	1
146	11	40.35	34.32	2 -
147	12	40.51	34.48	3 - plenty of stars, large & small
148	13	41.19	35.16	4
149	14	42.49	36.46	5 to 6 termination doubtful
		H 1.1.58		
		Dec 40.24		

156

1847. Dec 4*

Dec 40° 28'

1 ¹⁵²	1.48.55	R 0.29.50
2 ¹⁵³	1.50.30	0.31.25
3 ¹⁵⁴	1.50.53	31.48
4 ¹⁵⁵	1.51.46	32.41
5 ¹⁵⁶	1.52.22.5	33.17
6 ¹⁵⁷	1.52.42	33.37
7 ¹⁵⁸	1.53.16 ⁶³	34.11
8 ¹⁵⁹	1.53.21	34.16
9 ¹⁶⁰	1.53.35	34.30
10 ¹⁶¹	1.54.05	35.00
11 ¹⁶²	1.54.33	35.28
12 ¹⁶³	1.55.15	36.10
13 ¹⁶⁴	1.55.58	36.53
14 ¹⁶⁵	1.56.25	37.20

- 6 many small
fourth large stars
troupe of large stars. some
- 5 light small stars & many large
- 4 many, full of small &
- 3 very small
first canal
inter. layer
next canal
- 2
- 1
- 2 large stars & milky
- 3 milky
- 4 fine stars large & small
- 5 to 6 - mountain termination
H-1.15.0
Dec 40.29

2² Dec 40° 33'

1¹⁶⁶ 2.03.58 33.19 - 4

2¹⁶⁷ 2.03.25 33.46 - 1 canal

3¹⁶⁸ 2.03.40 34.01 - even light

4¹⁶⁹ 2.05.0 34.21 - 2° Canal

5¹⁷⁰ 2.05.10 34.31 - 1

6¹⁷¹ 2.05.35 34.56 - 2 sudden changes

7¹⁷² 2.06.10 35.31 - 3

8¹⁷³ 2.07.11 36.32 - 4 many stars all magnitudes

9¹⁷⁴ 2.08.8 37.29 - 5 full of stars in

10¹⁷⁵ 2.09.34 38.55 - 6 H-1.26.34

40° 35'

2.13.23

in andromeda

H-1.27.54

Dec 40° 17'

Though it is difficult to distinguish between the extreme of the Neb. star stars yet there is no doubt of the increase of light towards the nucleus. It is thought that the culture portions are not carried far enough from the nucleus.

The (x) indicates the preceding of the pair observed

Dec. 4th

Observations for Personal Equations with Prof. S. C. Walker

S.C.W.	S.C.W.		S.C.W.	W.C.H.	Hip.
64.7	28.7 - 4 beds	340 - 2 ⁵ -	51.3	14.8	3.5
56.8			~~41.0~~	40.6	0.4
77.3 [?]	56.8 - 4	0.5	31.5	55.2	3.7
10.2	33.5 - 4	23.3	36.3	15.5	0.8
57.0	7		67.2	31.4	4.2
77.3	57.0 [*]	20.3	1 ⁵ ? 33.3	13.4	9.9
25.3	49.2	23.9	41.0	25.0	4.0
103.5	13.3	0.2	65.0	45.2	9.8
67.6	31.2	3.6	38.7	54.5	3.8
83.3	03.8	19.5	36.9	16.4	0.5
40.1	08.3	8.2	58.6	22.0	3.4
54.8	35.0	9.8	71.8	51.8	9.8
2. 75.8 [?] 76.8	39.8	3.0 [?]	29.3	53.0	3.7
34.5	14.7	9.8	33.4	23.6	9.8
58.0	21.0	3.0	66.3	30.2	3.9
66.2	45.8	0.4	28.5	8.4	0.1
41.4	15.6	4.2	40.5	14.0	3.5
2. 61.4	5.2	0.2 [?]	20.1	0.3	9.8
10.0	34.0	4.0	66.1	30.0	3.9
79.4	00.0	9.4	not good 11.9	32.0	9.9
44.2	8.4	4.2	37.3	1.8	4.5
41	33.0	0.4 [?]	~~41.0~~	25.8	
27.2	51.0	3.8	30.0	11.1	41.1
37.8	17.5	0.3	65.8	30.0	4.2
2. 40.2	2. 22.4	2.2	78.0	58.3	9.7
24.4	5.0	9.4			

1987 Dec 6 ± *Nebula in Andromeda* Dec +40° 40'

176 11.56.43 Δ 0 31.24 Δ 40.37 light = 5 stars gal. series. down to points of light

2 177 58.9 32.50 4 - small stars thicker

3 178 58.53 33.34 3

4 179 59.15.5 33.56 edge of 1' canal

5 180 59.25 34.06 1-2 brighter. Canal appears to bend

6 181 11.59.57 34.38 next Canal

7 182 12.0.25 35.06 1. 60. then bet. ^{when} small stars

8 183 12.0.59 35.40 3 pretty sudden ^{sudden increase}

9 184 12.1.12 35.53 group or mottled

10 185 12.1.26 36.07 3

11 186 12.01.57 36.32 4 - spot

12 187 12.2.10 36.51 3

13 188 12.3.22 38.03 5 shooting star, near the end

14 189 12.4.00 38.41 6 about the end

Dec 40.43

190 1-0.10.15 Δ 0 31.55 4. ext of a light

191 2-0.10.48 32.28 5 - another neb. below the

192 3-0.11.48 33.28 4 southern part, follows

193 4-0.12.14 33.54 3 quick change. further dark

194 5-0.12.46 34.26 4 of field light

195 6-0.12.55 34.35 5 sup. canal

196 7-0.13.23 35.03 2 dark lanes

197 8-13.44 35.24 trace the ^{central} thro

198 9-13.54 35.34 second canal

199 10-14.43 36.23 3 bright star 1' north of center

200 11-15.35 37.15 4 light centres on this star

201 12-17.10 38.50 3 can't dis. the 3 stars so well

202 13-18.20 40.00 4 - pre. portion the stars very small. full. not so many

5 stars near the end - gradual end

Note It is doubtful whether the light can be traced all the way between the great & small nebulae. if at all, it is in the S.E. direction

Dec 40.45

Dec-6th Chro 424

Dec 40..48

Dec-40..50

157

203	1	12.28.48	R 0.34.58	L = 2.3	little neb oval
204	2	12.29.11	0.32.21	5	field 200 stars prob average
205	3	12.30.30	0.33.40	4	sum to trace the light go neb. all the way across
206	4	12.31.13	34.23		South pt of field brightens
207	5	12.31.38	34.48	3	
208	6	12.32.28	35.38		Canal sup ^o
209	7	12.32.34	35.44	2	
210	8	12.33.3	36.13		South pt of field bright points
211	9	12.33.25	36.35	3	to a gradual dimt.
212	10				all the field has abundance
213	11	12.34.45	37.55		2 br. stars - S of centre
214	12	12.35.42	38.52		5 small stars thicker brightens up
215	13	12.36.42	39.52		brighter reddish stars. pap. centre, End
					H = 11.52.20 - Dec. 40.50

Dec 40..53

40..55

216	12.42	4	R 0.32.02	8 -	small neb very small stars p than dark
217	42	27	32.25	10	dark vacant space
218	43	25	33.23	4	Gr. neb. - stars pluck
219	44		33.42		large & small stars
220	44	38	34.36	3 -	seems all small stars stars small & very plenty
221	12.46	4	36.02	2 -	like the milky way to the eye be stars
222	12.46	38	36.36		light nebulous - few small stars
223	47	25	37.23	3	can hardly tell, very gradual
224	47	50	37.48	4	very gradual, nothing to distinguish on this side the neb.
225	12.48	50	38.48	5 -	not so many stars about the end
	28		39.26		~~H~~ ^{hr} ^{hr} 11.5.32

424 0.55.23 - 40 hnts of Andromeda

0.55.07
0.55.14
0.55.24
0.55.30
0.55.36
0.55.42
0.55.48
0.55.54
0.56.00
0.56.06
0.56.12
0.56.18
0.56.24
0.56.30
0.56.36
0.56.42
0.56.48
0.56.54
0.57.00
0.57.06
0.57.12
0.57.18
0.57.24
0.57.30
0.57.36
0.57.42
0.57.48
0.57.54
0.58.00
0.58.06
0.58.12
0.58.18
0.58.24
0.58.30
0.58.36
0.58.42
0.58.48
0.58.54
0.59.00
0.59.06
0.59.12
0.59.18
0.59.24
0.59.30
0.59.36
0.59.42
0.59.48
0.59.54
0.60.00

wh 0.09.14 Feb. W

Dec 40..17.40

Feb. is on the same side of pier as when
the above were taken.

160

R 0^h 32^m 32^s
Dec 40^o 07'Dec 6th

226 1 19.29 - 50 beats

h 0^h 41.54 40^o 09' 00"0^h 37.15
- 4.43R 0^h 32.32 Dec 40^o 07'

End of 1st Canal ends pretty abruptly in a group of stars. The dist of the two apart here is 60 beats = 24^s. by 2 comp. but No 2 is hardly if at all visible so far as this

227 1 30.29 - 50 beats

h 0^h 52.36 40^o 15' 20"37.33
- 4.43R 0^h 32.50
Dec 40^o 14'

2nd Canal (begins about 3' N of the 1st & is not here quite so plain) though both are distinct. Dist apart 64 beats = 26^s

228 1 40 52-50 40^o 22' 12"

h 02.18

38.14

R 0^h 33.31Dec 40^o 20'

2nd. Dist here 65 to 70 beats both beautifully distinct. 2 the most so. The width of each is here nearly equal to $\frac{1}{2}$ the dist between the centres 1 is perhaps the widest

Note that the space between is in the same parallel nearly uniformly bright & equal in brightness to the inner side of No 2. The outer edge of no 1 is ~~very~~ ^{strikingly} not so bright as the space between & it is this which is

Dec 6^h - neb in Andromeda

41.00

Dec 40.97

1 229 - 2 .01 .33 R 0.33 .28

5 - light comes very gradually.

230 2 .45 34 .40

many large stars

231 3 .00 34 .49

not so many
some in patches -

232 3 .27 35 .22

4 more small stars

233 54 35 .49

3 - a ridge of light parallel to

234 4 .16 36 .21

2 axis of neb - sup. canal

235

ridge resolved into small stars
quite confident

236 2 .5 .14 37 .04

4.5

237 2 .6 .36 38 .31

5

238 2 .7 .19 39 .14

end of nebula

2 H - 1. 23. 22

Dec + 40.59

Dec 41.03

41.05

1 239 2 .11 .23 0.34 .43

5 Common + multitudes of small
stars & large intermedial.
no doubt of

2 240

3 241 57 0.35 .11

3 decided bright. knots, resolvable
like stars groups of thousands of
small stars, light between.

4 242

5 243 2 .14 .12 0.37 .32

4 - many, but not so many stars

6 244

bright 3 obs - 1. 32. 0 same Dec

7 245 2 .16 .5

3 obs. light cut 1. 32. 40 end of neb

1	"	32. 40	R 0.38 .42
4	3	.29	
41		.43	
38		.42	

Dec 41.03

Dec 41.05

Dec 41.10

1	246	Dec 41.09 R 0.35 .41	2 .20 .20	- beginning of neb - H 1. 39. 36	0. 40.24
2	247	R 0.37 .24	2 .21 .34	- axis of neb - " 1. 39. 27	42.07
3	248	R 0.38 .27	2 .24 .55	- end of light - 1. 41. 45	Dec 43.20
				41. 11	44.43
					0. 35.41
					0. 37.24
					0. 38.27

162

Dec 6th - neb L Andromeda

(256)

R 0.37.45
Dec 41.16

1 - 2 30.34

end of neb

H-1.48.06

0.42.28
4.43
0.37.45

Dec + 40.18

2 37.01

in Andromeda

H-1.50.54

h 1 50.54

Dec - 40.17

Initial errors
included

0 46.07

0 41.24 = R & Andr.

cor

- 4.43

40.15.40

Dec & Andr

cor - 2'

For Dec 6th Adopted for cor in R - 4.43 cor Dec - 2' Fel. East. of Rmhighly clouded
& mottledalong the under side at a
it is much brighter

On the Eve. of Dec 7th I think between 8 & 9²? Saw
a bright meteor, train & great velocity, being in the same at the
time I could only see about 10° of its path of which alt. 60° az. 20°

Saw also by Rev. Geo. Giles of Watertown

Dec 7th "Saw where about 8 o'clock saw in Watertown about 7000 feet East of U.S. Coast
Survey Station on Prospect Hill, a meteor of the 1st magnitude leaving a trail
the whole length of track from 7th Lovers to 93 Lovers; a haze or light cloud
prevented exactness in estimating its points of starting & stopping"
(may have been Monday or Wednesday)

Probably but not certainly Dec 7th

Direction as seen by G.P.B. to S.W. point of horizon

From appearance probably its distance did not exceed 10 miles, if not much less
& 5 miles from earth

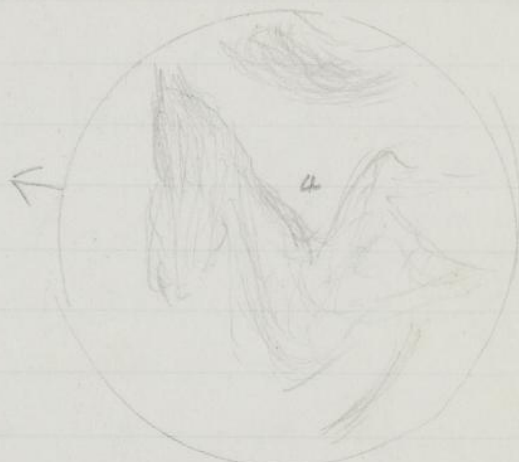
Dec 7th Sat. of NeptuneDec 7th class from 170

163

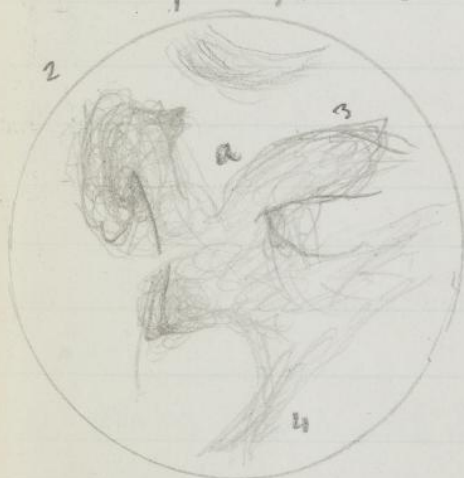
424
23^h 55^m
Zero Pos
50.96 50.05 142° 56' n/

50.93 50.04 142.15
51.06

No 1 Spole



9 Pole No 2



50.26 50.48
50.34 50.42

Spot a is a pretty well defined in let or corner

Spot a from / Spot a from
at 1^h 03^m Sill clear force. time of class N pole
6^h 53^m cl. 57.

50.33 50.51
50.34 50.42
50.35

Zero 49.47

424 East 6^h 10^m nearly.

The outline

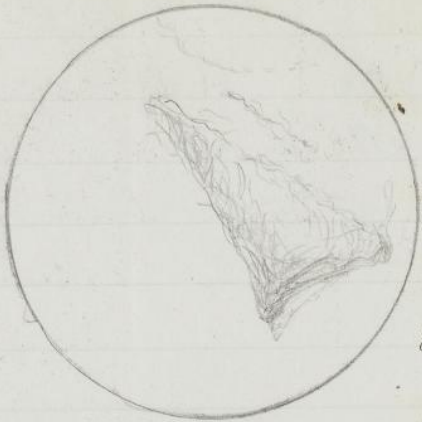
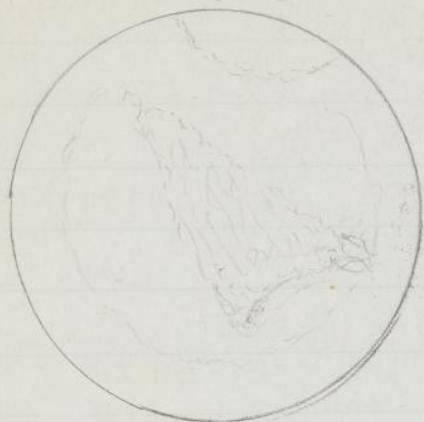
of No 2 is much better than that of No 1
See G.P.B Oct. 30th

feature a

50.25 50.43
50.16 50.40

The Figure as it appears on the planet to night is as I well remember just as it appeared on Oct 30th though so badly drawn (1, 2, 3 & 4 are strongly marked perhaps 4 is the most so.)
resembling to the figure of a man sitting ~~in a~~ having a grotesque Turk fashion with his arms akimbo.

164

Dec-11th
8.5h m
8.20

R of Nucleus of Gr. Vel

Bessel 1825 0.33.12

pre 1850

pre to 1850 1.21

Bessel 1850 0.34.33

Fur. Cel. 1850 0.34.33

Dec-11th observations on the canals.Nucleus R 0.34.24
" to 2nd Canal 34R 2nd Canal 0.33.50" to 2nd Canal 30R 1st Canal 0.33.20R of Nucleus
40.26'

first canal

second canal

1 266 3.45.33.7

2 267 4.0.40

3 268 3.46.37

1 269 3.47.16

2 270 3.47.45.3

3 271 3.48.20

nucleus

1st Canal2nd Canal

nucleus

both the canals are very strongly

light between the
the canals is abt 2/3
bright as on the sides
except the nucleus

1 272 3.50.56

2 273 3.51.18.5

1st Canal2nd Canalh m s
H-3.11.40 Dec-40.18.0
~~3.41.52
 3.11.40
 0.40.12
 6.12
 0.34.00 = R Nucleus~~

Mr Andron

274 4.10.36

H-3.23.0 - 40.16.30"

Tab. de. 40 14 40

1 50 40.40
40.45
$$\begin{array}{r}
 4.10.36 \\
 3.23.00 \\
 0.47.36 \\
 0.41.24 \\
 -6.12 \\
 \hline
 -2.1 = \text{Sum of Error in Dec}
 \end{array}$$

- 1847 Dec-11-
 Axis of Light.
 Neb. in Andromeda. obs on the brightest part of the nebulae 165
- 1 247 2..26..25 R.O. 38.13 Dec 41.19 Light 10-1 10-faint light H. 1..42.1
- 2 250 2..33..24 R.O. 37.08 Dec 41.08 9 pretty sudden Dec 41..20..40 Dec-41..9..30 H 1..50..05
- 3 251 2..36..22 R.O. 35.55 Dec 40.48 8 H-1..54..16 Dec. 40..49..20
- 4 252 2..40..24 R.O. 35.29 Dec 40.40 7 H 1..58..44 - " - 40..41..24 (near a 67 star full of small stars looks up if resolved)
- 5 253 2..44..06 R.O. 34.59 Dec 40.32 6 H-2..02..56 Dec 40..34..8
- 6 254 2..47..31 R.O. 34.30 Dec 40.30 5 " 2..06..50 Dec-40..31..56
- 7 - light increased up to the centre point, the brightest part runs in the direction in point "I fancy"
- 7 255 2..54..01 R.O. 34.24 Dec 40.26 1 - " 2..13..26 Dec-40..28..12 - nucleus (on looking again it is not so. whether this be the end of nucleus)
- 8 256 2..59..14 R.O. 34.54 Dec 39.39 10 H-2..21..9 Dec-39..41..0 (doubtful) goes off Kind of a hazy S.N. better
- 9 257 3..04..43 R.O. 30.42 Dec 39.17 10 - " 2..27..40 - " - 39..18..40
- 10 258 3..09..20 R.O. 31.32 Dec 39.39 9 - " 2..31..37 - " - 39..41..0 just the bending of the horn
- 11 259 3..13..11 R.O. 32.12 Dec 39.45 8 - " 2..34..48 - " - 39..46..40 - in bunches broken up.
- between these observations not so bright as at either
- 12 260 3..16..14 R.O. 32.08 Dec 39.55 6 - " 2..37..55 - " - 39..56..32 - Bright spot, this is resolved
- 13 261 3..22..47 R.O. 33.15 Dec 40.10 6 gradually less bright till near the spot where it suddenly brightens H..2..43..31 Dec-40..11..40
- 14 262 3..27..15 R.O. 33.34 Dec 40.16 5 - H-2..47..30 Dec-40..17..40
- 15 263 3..30..36 R.O. 33.53 Dec 40.21 4 - H-2..50..32 - " - 40..23..00
- 16 264 3..34..42 R.O. 34.11 Dec 40.24 3 - H-2..54..20 - " - 40..26..00
- 17 265 3..37..10 R.O. 34.29 Dec 40.26 3 - H-2..56..30 - " - 40..27..40

I fancy that near the nucleus the light is not brightest in the general axis. This will be shown perhaps in the above in the two points taken nearest the nucleus

1	31	61
2	32	62
3	33	63
4	34	64
5	35	65
6	36	66
7	37	67
8	38	68
9	39	69
10	40	70
11	41	71
12	42	72
13	43	73
14	44	74
15	45	75
16	46	76
17	47	77
18	48	78
19	49	79
20	50	80
21	51	81
22	52	82
23	53	83
24	54	84
25	55	85
26	56	86
27	57	87
28	58	88
29	59	89
30	60	90

91	121	151
92	122	152
93	123	153
94	124	154
95	125	155
96	126	156
97	127	157
98	128	158
99	129	159
100	130	160
101	131	161
102	132	162
103	133	163
104	134	164
105	135	165
106	136	166
107	137	167
108	138	168
109	139	169
110	140	170
111	141	171
112	142	172
113	143	173
114	144	174
115	145	175
116	146	176
117	147	177
118	148	178
119	149	179
120	150	180

168

Great Nebulae in Andromeda

181	211	241
182	212	242
183	213	243
184	214	244
185	215	245
186	216	246
187	217	247
188	218	248
189	219	249
190	220	250
191	221	251
192	222	252
193	223	253
194	224	254
195	225	255
196	226	256
197	227	257
198	228	258
199	229	259
200	230	260
201	231	261
202	232	262
203	233	263
204	234	264
205	235	265
206	236	* 266
207	237	* See Dec 6 th
208	238	
209	239	
210	240	

in norm. Gauss.		RT		Dec.		1911	
	h	L	m				
Oct	7	22	1	4.53	- 12°	47'	0.7"
	15	22	0	36.30		49	29.1
	23	22	0	15.45		51	18.4
	31	22	0	2.113		52	25.73
Nov.	8	21	59	56.86		52	48.97
		21	59	56.88			~~Cor. 21.19~~
	16		0	0.07		52	26.7
	24		0	11.72		52	12.3

~~Feb. 2nd 1948~~

