

Jan^y. 3rd 1845

H 6

Vol. I 433-516

1848.

May to November.

Prunella, recta

(No 4)

Jupiter KG 11365.161

Melina has seen the points on
San Delambre

Nebula p 498

Tail of
Encke's Comet
Nov $\frac{3}{4}$ 1848.

Cluster in Hercules

Sept 26th

Oct 28 Im

Transit Circle
Dimensions of - Sept

Aug 30
" 31
Sep 3
" 15
" 18
" 19
" 21
" 22
" 23
" 26
" 28
Oct 5
" 6
" 7
" 8
" 9
" 10
" 12
" 13
" 14
" 15
" 20
" 21
" 23
" 25
" 28
Nov 1
" 2
" 3

1848

Latitude of the Observatory.

433

Jan'y 3rd 1848 Latitude of Prime Vertical Transits, observed at Cambridge.

an δ of α Lyrae. Jan'y 1st 1845

From Naut^l Almanac. for 1845 ——— + 57°. 21'. 27". 43

... B.A. Catalogue, red to Jan'y 1 1845 ——— 28.90

Last vol. G^o Observations 1845-35 observations ——— 26.01

Naut^l Almanac. for 1847. red to 1845 ——— 27.44

Prof^r Pierce used, with correction ——— 26.36

The Lat. of the old station by former P.V. Transits ——— 42°. 22'. 48". 63

new station south of old - 20 feet ——— - 20

assumed Lat. of new station ——— 42°. 22'. 48". 43

Coast Survey Lat. of Centre of the Dome ——— 42°. 22'. 49". 493 } ^{approx.} _{Calc.}

" ——— " ——— of North Meridian Mark ——— 25°. 43'. 442

Dec. of α Lyrae, Mean place Jan'y 1st A.D. 1847 ——— 38°. 38'. 38.10 + 2.771

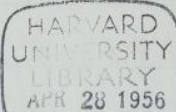
1848 ——— 38°. 38'. 42.35 + 3.070

434

KG 11365.161

Lat. from Prime Vertical Transits. assuming the lat.
of a Lyra to be, mean Place. Jan'y. 1st 1847 — $38^{\circ} 38' 38''.73$

1847. Dec. 27-29.	#	#	f	42.. 22.. 45.8		8	38.. 38'.. 57.75
	#			46.0			
	G			46.0			
	F			44.7			
	E			44.9			
	D			46.8			
	C			45.9			
	B			44.5			
	A			45.9	mean 45.61		
29-30	A			42.. 22.. 48.8		8	38.. 38'.. 50.7
	B			48.0			
	C			47.8			
	D			48.2			
	E			47.8			
	F			48.1			
	G			48.0			
	H			48.7	mean 48.2		
	I			48.4		8	38.. 38'.. 50.53
30-1/2 Jan'y. 3	I			46.4			
	H			46.1			
	G			46.2			
	F			44.8			
	E			45.6			
	D			46.2			
	C			45.9			
	B			46.2			
	A			46.3	mean 45.96		



1848

435

Jan'y. 3 + 6[±] A 42..22..47.4

8 - 38°. 38'..50".01

B 46.9

N.T. 1848

49.81

C 47.8

D 47.8

E 47.0

F 46.9

G 47.3

H 46.4

I 47.8 Mean 47.2

Jan'y. 6 + 7

8 - 38°. 38'..47".90

J last

K 44.3

L 44.7

M 45.1

N 45.0

O 45.7

P 44.4

Q 44.7

R 45.4 Mean 44.91

Jy 7 + 10 -

8 38..38..47.75

C 44.0

D 44.8

E 45.0

F 45.1

G 45.5

H 45.5 Mean 44.98

Jan'y. 10 + 11 -

E 44.8

8 38..38..47..45

D 44.6

C 44.8 mean

Lat. from Prime Vertical Transit of a Lyrae.

1888 Jan 7-12 + 19

 $\delta = 38^{\circ} 38' 45''.9$

I	42.22.43.8
H	44.2
G	43.5
F	43.6
E	43.7
D	43.2
C	44.1
B	43.6
A	43.6

Jan 7.22 & 24.1 42.22.44.7

 $\delta = 38^{\circ} 38' 43''.64$

H L	44.6
G	45.3
F	44.0
E	44.8
D	44.7
C	45.2
B	44.4
A	45.0

1848 May - 25th - North mer. mark $\frac{1}{4}$ in finished at Date.

Height from rock foundation 12.2

Top stone - length - 9.0

center of west dot to center of mid dot. 3.8 $\frac{1}{8}$

center of East dot to center of west dot - 7.4

center of mid dot to center of East dot - 3.7 $\frac{3}{4}$ full

Examination of Level on the Prime meridian piers,
Object Glap East

Object Glap E alt 30° ~~XN~~

	N	S	457
alt 30°	X 91.5	94.0	
	<u>90.0</u>	<u>96.5</u> X	

Illumination South

~~X S~~	alt 60°	89.7	95.7 X S
	0°	89.3	95.5 X S
	alt 32°	89.3	95.3 X S
	Depression 55°	89.7	94.7 X S
		<u>92.3</u>	<u>92.0</u> X S

Object West

	91.5	92.6	
alt 63°	93.0	90.3 X South	
	92.5	90.2 X S	

Object West

	93.3	90.0 X S
Level reversed XN	<u>91.5</u>	<u>90.7</u>

438

Illumination South

	N	S	
Object W X N	91.5	90.3	alt 60° WN + 0.6
Object E X W	90.5	91.5	E.S + 0.5

Object East

Prime Vertical Transit

Level with side moved towards the N

N	S
92.3	88.7

level ~~but~~ moved to S

N	S
89	92

Level with

X N	N	S
	90	90.5
Level wiped.		
X N	88.5	92.0

alt 60°

Sun shines on the pier

E.S. + 2.0

S + 2.0

The Sun

Object West

alt 60	N	S	
	90.0	89.5	WN + 0.2

alt 0	89.0	90.0
-------	------	------

	90	89
Mean	89.7	89.7

Object East

alt 60	N	S	
	88	91	
	87.7	90.7	E.S. + 1.5

Mean	87.3	90.7
	87.9	90.8

S + 1.5

Object West

N	S	
90	87.7	WN + 0.8

	89	88
Mean	89.3	87.7
	89.4	87.8

N + 0.8

Illumination North

Object East

N S

87.7 88.0 alt 60°

rev 88.0 87.7 X S

 $\Sigma N + 0.0$

alt 0° 88.0 87.7 X S

Object West

alt 60° ^N 92.0 ^S 88 X S $\Sigma N + 4.5$

alt 0° 92.0 82.3 X S

Sun does not shine on pin

Axis wiped

Object West

alt 0° ^N 92.0 ^S 82.2 alt 0~~S~~ $\Sigma N + 4.9$

alt 60° 92.0 82.2 alt 60

Object East

N S

89.0 85.2 $\Sigma N + 1.9$

Object W

92.0 81.5

 $\Sigma W 5.2$

May 26

Turned the Tel. a whole revolution

N. obj. W. alt 60° 92.5 - Least

" " dep. 10 - 94.5 greatest

" E dep 60 to alt 60 varied from 87 1/2 to 89

W alt 60 + 88.8 - 82 + W N + 3.4

E " 60 + 85.6 - 85.4 + E N + 0.1

W " 60 + 88.0 - 83 + W N + 2.5

E " 60 + 86.0 - 84.8 + E N + 0.6

E " 60 + 86.5 - 84.0 + *Level taken off the 51 level in same position* E N + 1.2

W " 60 - 88.8 - 81.3 + W N + 3.8

W. dep 60 - 89.1 - 80.1 + W N + 4.5

E " 60 - 85.9 - 84.0 + E N + 0.9

W " 60 - 85.8 - 83.9 + W N + 0.9

E " 60 - 85.8 - 83.0 + E N + 1.4

W " 60 - 88.0 - 80.0 + W N + 4.0

E " 60 - 85.8 - 82.0 + E N + 1.9

Reversed the axis

M-S - obj. E. dep. 60 - 89.7 - 77.2 + E N + 6.3

W " 60 - 88.0 - 78.5 + W N + 4.7

W alt 60 - 84.0 - 81.8 + W N + 1.1

E " 60 - 82.5 - 83.5 + E S + 0.5

W " 60 - 84.0 - 81.8 + W N + 1.1

E " 60 - 84.4 - 81.0 + *Level more south* E N + 1.7W " 60 - 84.0 - 81.0 + *do* W N + 1.5

alt. 60° *U.S. Object West.*

	N	S
	<u>83.3</u>	<u>81.8 X</u>
X	~~83.0~~	82.5
	82.2	83.0 X
X	<u>82.0</u>	<u>82.7</u>
	<u>83.0</u>	<u>82.5</u> X
clear	<u>82.5</u>	<u>82.7</u>

O.W. S + 0.1 N - 0.1

alt 60° *U.S. Object East.*

	N	S
	<u>81.3</u>	<u>83.8 X</u>
X	80.0	85.0
	81.3	83.3 X
X	79.7	84.7
	<u>80.0</u>	<u>84.5</u> X
clear	80.2	84.4

O.E. S + 2.1 N - 2.1

2) 2.2 / 1.1

Axis reversed

alt 60° *U.S. Object W*

	N	S
	<u>86.7</u>	<u>78.5</u>
	85.3	80.0
	84.7	80.7
	<u>85.2</u>	<u>80.0</u>
clear	85.5	79.8

O.E. N + 2.9

U.S. Object East

	N	S
	<u>82.0</u>	<u>82.7</u> X
X	81.5	83.0
	82.0	83.0
	<u>82.5</u>	<u>81.7</u>
	82.0	82.6

O.E. S + 0.3

2.6 + 1.3

Zero 50.005. 38.273
 19.980 38.297
19.985

B. Geminorum

$R 7^h 36^m 00.5^s$ $\Delta \alpha + 28.23.08$

$42.22.48 \cos = 0.0397740$

$28.23.08 \sin = 9.7526930 \cos 9.9443684$

$h 53.41.13 \cos 9.7724670 \sin 9.9062237$

$\Delta d. 45^{\circ} 08' 47'' \sin 9.8505921$

3.32

D. 46

$h 3^h 34^m 15^s$ 7.09.30

7.36.00

4.01.25 S

11.10.45 W

B. Geminorum cropped

The E.P.D at $4^h 01^m 25^s$ Sid. time

" W.P.D at 11.10.45

Smith Dist = $45^{\circ} 09'$

Pollux E.P. 2 June 14th Adc M.N

4 " 03 11.5 mid wire Sun through cirrus cloud.

41.4 next but one to the mid wire

04 11.0

4" 04 " 41.8 last wire & d. last wire = $44^{\circ} 57'$ Set in same way
as when d. wire
made.

N S

96 104

101 98

97 102

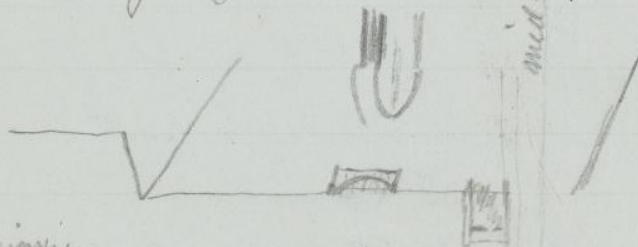
99 98

more 24th day The star is so faint that it is very difficult to follow it
 03^h 05^m from one wire to another
 03 35.3 mid

Clear but the star lost from its faintness
 The Sun being very near it.

S N

84 86.5

80 90.0

mid wire to chimney

145 0.71 } object glass west
 94N 0.88 }
 .83

145 1.60

14N 0.80

0.80

94S. 94N

0.675 55
 24
 0.74
 0.69 0.79

Col. = 0.41 Sg W. H. S.

Illumination East

Object glap moved from radial to S horizon			Object glap N of center to N horizon		
	E	W		E	W
$\Delta d = 0$			$\Delta d = 10^\circ$	76	76
$\Delta d = 0$	82	77.2	20	76	75
$\Delta d = 10^\circ$	76.3 ~~82.3~~	82.5	30	76	75
$\Delta d = 0$	75.2 73	83.2 77	40	75	76
" 10	75, 74	82, 76	50	75	76
" 20	76, 74	81, 75	60	75	76
" 30	77.5 73	78.5, 76.5	70	75	76
" 40	77.3	78	80	75	76
50	77	78	90	75	76
60	77	78			
70	77	77.5			
80	77.5	77.0			
90	77	77			

Object glap from N hor to radial

	E	W
$\Delta d = 80^\circ$	75	76
70	75	76
60	75	76
50	74	76
40	74	77
30	74	76.5
20	74	76
10	74	76
0	73	77

Object ad from S to limb

$\Delta d = 80^\circ$	78	76
70	78	76
60	77.5	76
50	77	76
40	76.5	76.5
30	77.5	75.5
20	77.0	75.0
10	76.5	76.0
0	77.0	75

Object glap at
limb

O. g. nader

78

77

E

W

77

71

75

73

70

78

See W. section

75

73

74

74

69

79

See W. section on the 43.

76

72

" ~~W~~

74

75

July 24 1848
 Quadruph
 Ste 16 H Delphin
 the close companion of
 the preceding ~~companion~~ 1480
 Comp S. p

50.07

Zero

149.30

50.08

50.02

150.30

50.07

03

150.30

50.06

03

150.30

02

150.10

16 H Delphin

B. b 1848.56

Dist 0.5

Pos 209.50' from 860°

26.27.50

22.11.00

4.16.50

22.15

4.15

2.30

Integrated looked at Saturn Neptune & for Encke & might
 as well have kept in bed.

Aug. 2nd Antares No 6

(Great Equatorial)

best & unsteady & blazing

49.673

50.011

Pos

85.50

623

.021

88.10

657

.034

85.40

650

.023

87.30

.035

674

124

87.05

1277

50.025

134.15

86.51

49.655

50.025

3.70

Antares 1848.58

Dist 3".6 Pos. 27° 10'

γ Coronae

50.115

Pos

below

334.10 - 154.10

108

332.30

MCB

107

330.00

100

331.20

103

335.00

33

13.00

50.107

50.025

0.82

332.36

very unsteady

γ Coronae 1848.58

Dist 0".8 Pos. 20° 20'

Power 140

May 15th 1848 Appulse of Jupiter & Mercury 447

4 & 5 nearest limbs

Dif of Dec

424

8.58.30 56.468

59.40 56.390

9.00.30 56.425

01.00 487

02.20 423

4 nearest & 5 farthest limbs

Dif Dec.

424

9.04.00 57.000

04.30 57.063

05.20 56.955

06.00 57.007

07.00 56.900

Two
See Jupiter's belts distinct

4 & 5 farthest limbs

424

9.09.50 59.377

9.10.20 322

11.15 312

12.30 433

13.00 420

4 farthest & 5 nearest limbs

424

9.13.30 58.532

9.14.30 496

9.14.50 460

15.30 437

9.17.00 360

9.17.20 413

424 9.19.00

Bow 11.42 03.2

Bow nearly m.s.t.

Dif R

Barochit. 1.

4 & 5 nearest limbs

4 farthest & 5 nearest

11.44.25

74.944

11.53.02

74.752

47.15

74.080

53.40

74.475

49.37

73.366

54.15

74.346

50.37

72.805

54.59

74.353

51.27

72.60

55.37

73.960

56.17

73.536

Mercury proceeds

4 x ♀ in R nearest limb

12. 47.30 52.443

49. 12 51.730

54. 1 0

Dist. of 2 nearest limbs from ♀ nearest limb.

12. 56.54 52.487

Dist. of nearest limbs.

1. 25.10

49.563

50.000

~~50.008~~

50.008

Dist. of nearest limbs

1. 32.00

50.208

♀ really not 2

As R 2 x Mercury's following limbs.

1. 35.10

38.213

Aug 15th 6^h 4^m 5.7. From N. Almanac

Mercury is more conspicuous

than Jupiter; its light is yellow

Jupiter looks slate coloured

or grey & faint like a thin cloud.

♀ R 8^h 37^m 00.00 4 R 8^h 36^m 54.81

Dec 19^o 04' 18".2 Dec 19^o 03' 33".1

Aug 15th 5^h 6.54 gr.

♀ R 8^h 36^m 54.08 4 R 8^h 36^m 54.08

Dec 19^o 04' 29".9 Dec 19^o 03' 35".7

The brightness of Mercury compared with Jupiter is like that of a glowing coal but not white hot compared with light coloured ashes.

nearest approach of limbs = 30"

♀ July mo. R+ 17.23 Dec- 33.33

4 " R+ 2.23 Dec- 7.92

R+ 15.00 Dec- 25.41

Aug 15th

38

$$\begin{array}{r} 27^{\circ} 19' 28'' \\ 0^{\circ} 11' 3.00'' \\ \hline 3^{\circ} 06' 24'' \end{array}$$

$$\begin{array}{r} 60) 636(10 \\ 60 \\ \hline 36 \end{array}$$

449

Grind new star

Dist	Pos
38.203	148 ⁰ .15 ¹
38.142	148 ⁰ .45 ¹
38.212	147 ⁰ .00 ¹
38.187	148 ⁰ .03 ¹
49.956	
11769	
235	
11534	

24/120(5)

New star 1848.62

Pos 212.57

Dist 115.4

30⁰.37¹3⁰.11.00
$$\begin{array}{r} 24 \\ 27^{\circ} 11.00 \\ 22.00 \\ \hline 5.11 \end{array}$$

$$\begin{array}{r} 3^{\circ} 26.00 \\ 27^{\circ} 19.07 \\ \hline 53.07 \end{array}$$

$$\begin{array}{r} 27.19 \\ 23.40 \\ \hline 3.39 \end{array}$$

$$\begin{array}{r} 27.26 \\ 23.24 \end{array}$$

Watched for motion perhaps 20^{min}. it clouded suddenly with dense fog. I think it might possibly have moved nearly a minute & are unnoticed!

First sight of Encke's Comet. 1848.

Encke

Aug 27th 17^h for R 3^h.19.07 + 31^h.54.54Aug 27th looked at field & found the comet gone.
$$\begin{array}{r} 27.19.07 \\ 23.05 \\ \hline 4.14 \end{array}$$

$$\begin{array}{r} 4.14 \\ 0.32.32 \\ 10.34.09 \\ \hline 0.28.11 \end{array}$$

$$\begin{array}{r} 14.04.02 \\ 2.18 \\ \hline 16.01.44 \end{array}$$

2557

$$\begin{array}{r} 0^{\circ} 32.47.5 - 30 \\ 15 \end{array}$$

$$\begin{array}{r} 0^{\circ} 32.32.5 \\ 19^{\circ} 08.48 \end{array}$$

$$\begin{array}{r} 3^{\circ} 23.44.5 \\ - 4^{\circ} 16.7 \end{array}$$

$$\begin{array}{r} 3^{\circ} 19.27 \end{array}$$
23^h.54.074^h.0723^h.50.0027^h.19.073^h.29.0731^h.59.00Cor - 1^h.5931^h.57.01

Encke's Comet

R

Aug 27th 14^h.01.44 M.S.T.Comet's { R 3^h.19.28^h } by 1st Comp.{ Dec 31^h.57.01^h } with 5 Persei

3 Persei

$$\begin{array}{r} 0^{\circ} 40.45.0 - 30 \\ 15 \end{array}$$

$$\begin{array}{r} 0^{\circ} 40.30.0 \\ 8^{\circ} 51.38 \end{array}$$

$$\begin{array}{r} 3^{\circ} 48.52.0 \\ 3^{\circ} 44.35.3 \end{array}$$
Cor 4^h.16.7

The object taken for

the Comet was a very faint misty

looking object 1 or 2 in diameter. it may very well have been

Encke but no motion was seen it clouded up with dense fog.

6^h. 3^h.25.40.57 58^h.29.147^h. 3^h.29.40.50 58^h.29.12.9
$$\begin{array}{r} 23.37.27 \\ 4.11.25 \end{array}$$

$$\begin{array}{r} 27.48.52 \\ 27.44.35 \end{array}$$

$$\begin{array}{r} 4.17 \\ 4.09 \end{array}$$

3 Persei

APP 58^h.34.20.0Pr. Cat. 31^h.25.40.0Cor - 7^h.59

There seemed to be some light round it possibly it was very small. The object taken for the Comet was a very faint misty looking object 1 or 2 in diameter. it may very well have been Encke but no motion was seen it clouded up with dense fog.

122 - 12.60
 3780
 2520
 289.80

0.67
 22
 134
 134
 1474

17
 22
 34
 27

3.23.31
 3.19.41
 4.00

25/240 (1.04)
 14/50 (35)
 39
 170

Encke from Eph.
 11^h 16^m C. m. s. (R) 3^h 23^m 14^s
 Aug 29th { Dec 32° 34' 41"

3.73
 23
 1119
 746
 8579

22^h 39^m 43^s
 4^h 48^m 15^s
 3^h 27^m 58^s
 4^h 20^m
 3^h 38^m

Not the Star
 Star of Comparison B2. 534
 3^h 23^m 33.30
 + 6.92
 - 0.08
 1825 3^h 23^m 40.14
 1^h 25^m 79^s
 3^h 25^m 05.93

32° 26' 26.3
 - 2^h 07.7
 + 0.4
 32^h 24^m 19.0
 4^h 49.8
 32^h 29^m 108.8

Star of the 10th Comet in a.p. Aug 29th
 30

Diff. Sec	Encke's Comet 2557	Com	Sec	Diff. R
23 ^h 01 ^m 35 ^s	23.38	23 ^h 19 ^m 45.5	19 ^h 54.8	93
04 ^m 05 ^s	19.82	04.2	20 ^h 15.3	11.1
06 ^m 30 ^s	18.86			
08 ^m 10 ^s	18.59			
09 ^m 20 ^s	18.75			
25 ^h 29 ^m 40 ^s	19.08			
25 ^h 05 ^m 56 ^s				

Calc 22^h 02.3
 15.3

27.8
 9.8
 25.7

7.5
 10.4

Com sun

23^h 22^m 43.4
 52.8
 9.4

24^h 08.5
 17.8
 9.3 58.0 23 08.5
 10.5

23.3 24.33.9 10.6

Mean Eq. Jan. 1st 1948.
 Star of Comp. R 3^h 23^m 40.54 Dec 32° 30' 54.3
 Comet preceds 4.33 Comet N 5^h 35.2

49.3 25^h 18.4 9.1
 23.4 34.4 11.0

25 - 56.4 05.6 9.2
 26 11.5 21.5 10.0

Star's place was determined on Dec 28th
 by comparison with 5 Persei with the
 Equatorial circles
 Cor. of Ephem add 1.8 in R subtract 13" in Dec

Aug 29-30th dell

467

2557	Com	Sta		
23	26. 51.0	00.4	9.4	
27	05.7	15.4	9.7	

Comet moved very sensibly among the stars

Zero 49.998

Dif. R

9.3

11.1

7.5

10.4

9.4

10.5

9.3

10.6

9.1

11.0

9.2

10.8

9.4

9.7

9.8

11.6

8.4

9.2

9.2

9.0

18) 175.5 (9.75 = Dif. R at 23. 24. 53

135

90

23. 20

22

23

24

25

26

27

28

29

23. 24. 53

27	40.2	50.0	9.8
	51.7	28. 06.3	11.6

28	34.0	42.4	8.4
	48.8	58.0	9.2

Dif. Dec

~~23. 39~~ ~~12. 74~~~~23. 44~~ ~~12. 33~~~~23. 45~~ ~~12. 36~~

23. 50 12. 63

23. 52 12. 37

23. 54 12. 60

23. 55.30 12. 49

23. 52.53 = 12. 52

23. 05.56 = 19. 08

58. 49 15. 80

Mean 23. 29. 25 50. 80

342.0 = Dif. Dec.

23. 24. 53 9.75 = Dif. R

23. 24. 53 9.75 = Dif. R

23. 24. 53 9.75 = Dif. R

23. 24. 53 9.75 = Dif. R

23. 24. 53 9.75 = Dif. R

23. 24. 53 9.75 = Dif. R

23. 24. 53 9.75 = Dif. R

23. 24. 53 9.75 = Dif. R

23. 24. 53 9.75 = Dif. R

Light put out & took a good view of it.

Star of comp

0. 01. 22.5

8. 33. 13.0

3. 28. 09.5

cor -4. 29. 2

3. 23. 40.3

S Persei 0. 07. 37.0

6. 18. 32.5

3. 49. 04.5

R 3. 44. 35.3

cor -4. 29. 2

cor +.16

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

57. 29. 0.6

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

57. 29. 22

S Persei

0. 07. 37.0

6. 18. 32.5

3. 49. 04.5

R 3. 44. 35.3

cor -4. 29. 2

cor +.16

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

Discrepancies in R 20" or so in Dec 10"

Discrepancies in R 20" or so in Dec 10"

Discrepancies in R 20" or so in Dec 10"

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Discrepancies in R 20" or so in Dec 10"

Encke's Comet

Aug 29. 12. 50. 53. Camb. M.S. Y

Comet preceded Star dR = 9.33

Comet North of Star dD = 5. 35.2

Comet North of Star dD = 5. 35.2

Comet North of Star dD = 5. 35.2

Comet North of Star dD = 5. 35.2

Comet North of Star dD = 5. 35.2

left off at about 1. 25^h

60) 4.5 (.08

0. 01. 22.5

8. 33. 13.0

3. 28. 09.5

cor -4. 29. 2

3. 23. 40.3

S Persei 0. 07. 37.0

6. 18. 32.5

3. 49. 04.5

R 3. 44. 35.3

cor -4. 29. 2

cor +.16

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

cor -4. 29. 2

Approx place of Star of Comp
R 3. 23. 40
Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Dec 32. 30. 40"

Owing to the want of concentration of the light & its faintness The places are not so accurate as the last places of Chauvart were.

2..10 20..40
3..23..14 32..34..41
3..25..24 3255..21

Encke from Eph.

Aug 30th 11^h 16^m

R 3^h 25^m 24^s

Dec +32° 55' 21"

August 30th continued

2557 0..15..53. Star of comparison with Comet

h 8^h 45..15.5

g 3..30..37.5 - 56° 57' 54"

In the field a star of 5th precedes the

56..58..14
*Dec. 33..01..46

star used by 1/2 the field

2557- 0..23..26.7

h 8..34..20.0

g 3..49..06.7
R 3..44..35.3
-4..31..4

S Persei

δ -58° 34' 00"
58..34..20
+20

The difficulty of observing the comet does not arise so much from its faintness as from its want of concentration. Though something of the kind begins to show itself.

Encke's Comet

Aug 30th 12^h 57^m 36^s

Stars R 3^h 26^m 06^s Dec 33° 01' 46"

Comet preceds star 10th mag.

d R 18.97

} 10 obs by

discrepancies 15" or 20" in R & Dec.

" is South of "

d δ 3^h 51.3

} G.P.B.

3..26..05.22

33..01..38.3

18.97

3..51.3

R = 3..25..46.25 δ = 32° 57' 47.0

Mean Eq Jan 1st 1848

August 30th513.41
2.37

Chro 2557

G.P. Beobacht.

463

Encke's Comet & * 10th mag. Comet south preceding &
 23.17.25 ~ 23.76 biff of Dec biff Dec after R's

20.00 ~ 24.51 " - "

23.50.15 ~ 29.47 too low

22.57 ~ 24.82 " - "

52.27 ~ 28.51

5738.08

24.00 ~ 25.24 " - "

55.10 ~ 28.00

18.7 27.1 37

28.02 ~ 24.79 " - "

57.33 ~ 27.89

18.6 27.1 37

23.22.37

312

24.0.30 ~ 28.01

18.5 27.1 37

24.62

2.28 ~ 28.54

18.4 27.1 37

50.00

23.57.40

28.19

18.0 27.1 37

25.38

50.00

18.0 27.1 37

24.87

21.81

18.0 27.1 37

21.38

21.38

18.0 27.1 37

dD 23.1.3 = 23.40.08 dR 18.91 + 0.06 = 18.97

18.0 27.1 37

biff R

1

dR

Comet

Star

at 23.40.50

23 36 32.5 23 36 57.2 18.7 23 41.52.0 23 42.12 200

42.4 rejected 5.5 23.1 4.0 23.7 19.7

23 38 2.2 38 21 18.8 23 42 46 23 43 5.3 19.3

38 14.7 38 33.3 18.6 57 17.2 19.5

10.35.13
47
16 35 59

23.40.08
4.25

23.35.43
10.35.59

12.59.44
2.08

12.57.36

39 2.0 39 20.7 18.7 23 43 55 23 44 13 18.0

13.5 33 19.5 6.2 44 25 18.8

39 55.6 40 14 18.4 23 45 12.3 30.3 18.0

40 4.7 40 25.3 20.6 23.4 45 41.6 18.2

The light of the Comet appears coarsely granulated. so that it might be mistaken for a very distant group of half a dozen stars of the 21st mag. In fact on Aug 27th this was thought an objection to its being the Comet. Lero

a slight elongation 50.060

small star 0.41.1
same declination
star obs with Comet = 54.7

was suspected but not towards the Sun. 50.000 ←

Comet 2 or more

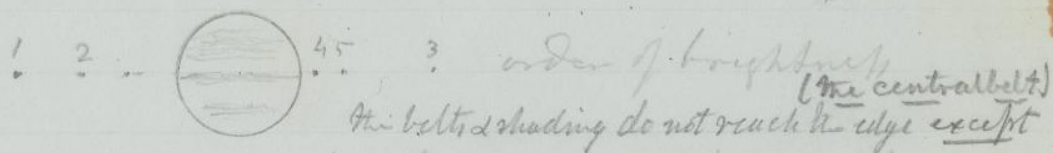
dR = 13.6
dD = 0

1848

August 30

at 1:50 AM pretty good seeing examined Saturn
 See the Ring steadily, on the right is seen two
 points of light, resembling satellites. The upper part

MGB



of Saturn is almost covered with belts, just below the
 middle belt it is very bright. on the left are seen
 bright beads a semidiameter from the limb, proceeding on
 Nov. 4 and 5 seem equally like beads, threading the ring

Aug 30 2^h etc

The spot on the ring a is certainly seen
 & while not sure of a ~~spot~~ ^{at c} on the ring

thought not continuous d & e are satellites

The ring shows best on the left. a was

thought to be seen about 11^h in much the same place but then more not quite
 distinct at an even dark shading the cap not so straight in its edge
 as on last night. The ring extending faint & thin not so thick

August 31st

Lidernal Dist

2557
20.58 { 48.240
 { 48.320

21.11 ~ 48.190 G.P.B.

13 ~ 48.365

17 ~ 48.180

18 ~ 48.220

21.01 ~ 48.270

20.57
0.40
10.27
Mem 48.254
50.000
17.460
3.49
17.111

Zep

{ 48.41

21.30^h

Sid

21.26

10.36

70.46

31

39

38

38

33

27

37

87284

48.355

50.000

1645

33

16.12

Sat. of Neptune will see on the
Pos. preceding side of the Planet

Mere

50.01

49.98

99

01

50.000

Power No 6

Pos 137.30

137.40

132.00

133.20

140.30

137.30

136.30

35

135.00

45.00

M.S.Y. 10^h 46^m

Power 860

Sat. of Neptune

Dist. 16.1 804.72 CB

Pos no obs

M.S.Y. 10^h 17^m 46^s

Dist 17.1 G.P.B.

Pos. 225.00 704.

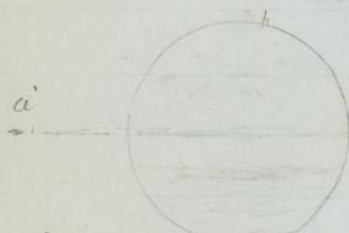
466

1848

August 31st 11..20 Solar time

Saturn is well seen, the ring steady, like a fine thread of light on the following side of the Planet, and on the right it is continuous for a short distance from the body of the Planet, then there is an interruption followed by several beads or points of light, exceedingly small but bright.

on the body of the planet there are many belts the darkest one is equidial, the lower, or northern portion is darker than the southern.



The spot a may have been a satellite as a new faint one was seen there at 2 P.M.

a is certain and b seen by glances also between b & the limb & a & the limb. There may be one or more spots especially at c. The ring is seen on both sides well.

11^h 30^m

Eye piece not centered

Dist of Comp		Dist of Comp	
0 ^h 01 ^m 47 ^s 0	23 ^h 49 ^m 00 ^s 0 - 10	56 ^h 36 ^m 04 ^s	
8 ^h 12 ^m 36 ^s	58 ^h 31 ^m 52 ^s	56 ^h 38 ^m 32 ^s	
3 ^h 49 ^m 11 ^s	59 ^h 34 ^m 20 ^s	33 ^h 21 ^m 28 ^s	
	2 ^h 28 ^m		
	3 ^h 33 ^m 55 ^s		

The central belt seems connected in some way with the ring though wider.

At 2^h A.M. Could see the ring steadily. 5 Satellites seen. I think the right hand one is easiest seen. 2 faint 3 very faint.

The same description of spots as at 11^h with unimpaired excepting that I discern more surely also the definition is better. The fact is that there is no doubt that the ring has inequalities though now fainter than heretofore [perhaps the seeing is not so good] I should say that the ring was visible quite up to the planet.

11.16 CR 3.27.38
Dec +33.10.30

Encke's Comet Aug 31st 32nd

22.43.30
4.30
22.39.00
27.27.38
4.48.38

4.46.00
27.27.38
22.41.38
4.30
22.46.08

4.49.11.0
3.44.35.3
4.35.7
3.33.55.5
3.29.19.8

Comet s.p. Star of 9th mag largest near.

23.07 33.90

09 33.79

12 35.19

14 34.20

15 35.19
23.11.24 34.45

The comet is close to a 7th mag star
interferes with obs.

23.39 37.13

41 36.67

42 36.97

44 36.48

23.41.30 = 36.81

23.41.24 = 34.45

35.63
50.00
14.37

23.26.27 140.8 = d0

23.24.48 1.20.20 = dR

Cur 1.39 15

23.26.27 1.20.05

4.27

23.22.00

10.39.54

12.42.06

2.05

12.40.01

Zero = 50.00
325

4.5.8
-0.3
1.74
15

2.47
73.26
3.17
12.00

Comet - 10.20

23.19 07.0

19. 73.0

Star 9th dR

280 21.0

440 21.0

Comet

28.5

22 49.51.21.0

21. 45.0

23. 06.0 1.21.0

Star of Compellian R 3.29.20^s

Dec 33.21.28"

Encke's Comet

Aug. 31st 12.40.01 Camb. M. 58

Comet precedes a star of 9th mag 1.20.05 } 10 obs. by

Comet South of " 2.20.8 } G. R. B.

2

3.29.18.99 33.21.23.7

1.20.05 2.20.8

3.27.58.94 = R 33.19.02.9 = Dec

Mean Eq. Jan 1st 1848

23 56.5 170 20.5
24. 13.0 25. 33.0 20.0
20.5 40.5 20.0
26. 37.0 27. 57.0 20.0
00.0 19.0 19.0
33. 16.3 34 35.0 185
23.24. 53 1.20.20
23.24. 48

Aug²⁹

3..23..40

32..30..40

Aug 30

3..26..06

33..01..46

9

5..35

-19- 3..51

3..23 31

32 36..15"

3..25..47

32..57..55

3..23..22

32..36..00

3..25..33

32..56..50

.29.14

Aug 31

3..29..20

33..21..28

- 1..20- 2..21

3..28..00

33 19..07

3..27..47

33..17..47

.13

Over father (the July?) thought he saw
the unilluminated part of the ring illuminated
by twilight or Saturn light.

Not very good seeing

Sept 3rd 2^h 30^m All Looked at Saturn and was
was instantly struck with the brightness of the ring
it is easier seen than hitherto this summer. I should not
both sides apparently equally bright. Think I can
see the ring crossing Saturn darker. There are
Satellites or bunches on the ring. The dark band
across the planet's Equator which we have noticed of late to be
losing its brightness Blackness. ~~has~~ now replaced by a
bright zone (of snow). We therefore conclude that this dark
belt was the unilluminated side of the ring crossing the planet
& its gradual diminution of darkness. The effect of the
Sun rising upon it perhaps of twilight ~~formation~~ which it seems
would account for the observed phenomena pretty well. especially
the effect so difficult to explain viz. its diminution of late in
blackness. The suddenness of the illumination by the Sun of
the upper (op) surface of the ring is very interesting. because
we should have expected the gradual effect of twilight but
we have not had so fine views of late as in July. The spots
two have been hard to see. The explanation of the bunches
on the ring is then possibly they are occasioned by the sun
shining through the ring divisions on to the inner edges of the
cannot be sure that the ring is seen close to the planet since it is too bright

55° 00.27

Sept 5-6th Dec
$$\begin{array}{r} 54^{\circ} 56.23 \\ 10.27 \\ \hline 55^{\circ} 06.50 \\ 3.40 \\ \hline 58.90 \end{array}$$

$$\begin{array}{r} 2.05.00 \\ 4.30 \\ \hline 2.00.30 \\ 3.40.22 \end{array}$$

$$\begin{array}{r} 2.15.00 \\ 4.30 \\ \hline 2.12.30 \\ 2.40.20 \\ \hline 27 \end{array}$$

$$\begin{array}{r} 0.083 \\ 1.3 \\ \hline 249 \\ 1.079 \end{array}$$

AR 3.40.22

Dec +35° 18'

$$\begin{array}{r} 5.10.20 \\ 6.31 \\ \hline 5.16.51 \end{array}$$

3.42.40

6^h 7^m

AR from Eph.

Dec from Eph.

$$\begin{array}{r} 3^h 40^m 27^s \\ 35^{\circ} 16' 51'' \end{array}$$

Encke's Comet

13 57 650

$$\begin{array}{r} 2.25.30 \\ 4.30 \\ \hline 2.21.00 \\ 3.42.40 \\ \hline 1.21.40 \end{array}$$
Sept 5^h 15^m 56^s 49^s Comet proceeds * = ~~5.70~~ 5.70Comet N of * 1^h 53^m 5
$$\begin{array}{l} \alpha = AR = 3^h 40^m 36.17 \\ \delta = Dec = 35^{\circ} 17' 12.7 \end{array} \left. \begin{array}{l} \text{Mean Eq.} \\ \text{Parallax 48} \end{array} \right\}$$

Comet m, n

$$\begin{array}{r} 61.58 \\ 50.00 \\ \hline 11.58 \\ 23 \end{array}$$
2^h 46^m 50^s

14 1/2 beats

2.59

61.07

$$\begin{array}{r} 3.03.42 \\ 113.5 = 1.53.5 \end{array}$$

48.00

14 1/3

3.00

61.67

Star of Comp AR 3.40 41.87

49.16

14.2

3.02

61.30

Comet proceeds 5.70

51.30

14.2

3.04

61.60

$$\begin{array}{r} 3.39.48.23 \\ 3.40.36.17 \\ \hline 3.40.15.19.2 \end{array}$$

53.00

14.0

3.05

61.93

Star of Comp + 35° 15' 19.2

55.00

14.0

3.07

61.77

$$\begin{array}{r} 61.58 \\ 50.00 \\ \hline 11.58 \\ 23 \end{array}$$

2.50.37

$$\begin{array}{r} 14.20 = 7.10 \\ 1.40 \\ \hline 12.80 \\ 5.70 \end{array}$$

3.09

61.74

$$\begin{array}{r} 3.03.42 \\ 61.58 \end{array}$$

(First Sat. of New Satellite of Saturn.)

35° 17' 12.7

Sept 15th P.M. Saturn looked at Int of Lat. in evening has been bad. six satellites, or stars

1. 2. 3. 4. 5. 6. 1 & 2 are bright all set down from morning

on 16th Sept 16th Saturn badly seen but could discern the dark part of ring it is thought, on the planet, and six stars or satellites

1. 2. 3. 4. 5. 6. 1. 2. 3.

are ~~phases~~ but one must be ~~in~~ ^{at} Sat α is very much less than usual Dist. from Sat. preclined about 4 diameters or a little further than 4 or about 4.5 from Saturn's centre. It does not appear to have moved since last night. 5 & 6 are very faint the both unilluminated side of ring lies in a bright belt between dusky regions above & below.

* meaning the brighter or Titan

Transit Circle

Dist between the graduated faces is 5.83 inches

Diameter of Circle inner edge of graduations $4\frac{1}{10}$ in

$$4\frac{1}{10} \pm 0.1 \pm 0.1$$

Diameter of pivots $2\frac{1}{2}$ in. Distance betweenthe ends of Pivots = 30.72 inches between shoulders 25.72 Length of each pivot 2.50 . $5\frac{1}{2}$ in from face of stone to theobject glass of micr. $4\frac{1}{4}$ in from object glass of micr to face of circle or focusfield of micr. = $0^{\circ}30'$ Diameter of groove for friction rollers = $6\frac{1}{8}$ in

Camb with Camb Old. obs.

app. hour

cor as. hour

s

1840 Feb 12	Don $4^h 44^m 28.8$	29.7	-0.9	-2.9
Mar 9	34.5		+4.8	+5.4
Apr 16	20.3		-9.4	-8.2
" 17	20.4		-9.3	-8.7
May 13	30.4		+0.7	-1.8
" 14	28.5		-1.2	+0.5
March 13	14.1		-15.6	-14.0
Apr 10	38.0		+8.3	+6.8
" 13	28.7		-1.0	-11.3
Oct 7	36.8		-2.9	-0.8
" 8	19.7		-10.0	-14.1
" 9	23.6		-6.1	-5.5
" 10	At 1st 21.9		-7.8	+3.9
" 10	At 2nd 31.3		+1.6	
" 12	12.2		-17.5	-27.0
Nov 2	34.7		+5.7	+4.2
Dec 2	32.1		+2.4	-7.3

Transit Circle

461

Distance from centre of axis to the top of the movable
frame of the friction rollers = $0.35 + 3.45 = 3.8$

Dist. from upper edge of plate of rollers to the top of frame
of rollers = 1.12 when the spring is in medium action

Dist from outer edge of pivots to the groove for the
friction rollers 8.33

Dist. from face of pin to plane of rollers 5.50

Dist of faces of Piers 25.00

Dist. of upper edge of plate of friction rollers to the tangent
to the lower edge of pivot 3.7 when the spring is in medium action

The upper edge of roller plate will then be exactly even with
the lower surface of the plate of the V.

Top of shutter above top of piers $7\text{ft } 6\text{in}$ top of piers to
ceiling $4\text{ft } 7\text{in}$

461

62 848

Sept 18th

Saturn is well seen, there is a very narrow dark line across the middle of the planet. the Ring is seen on each side, extremely delicate.

order of brightness of the satellites at 9^h. 20^m m.s.t.

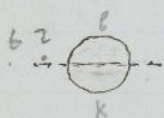


On the left or preceding side two points of light are seen which seem to me like two small satellites

at 10.40. the bright points are seen apparently with the same distance on the left, a very small satellite has come out, and precedes N^o 4

11.40 N^o 4 is on the ring — MC 13

Order of brightness double wags 7



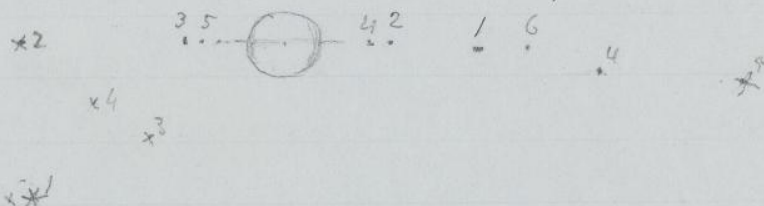
Sept 18th 11^h Pelt Looked at Saturn pretty good seeing ring seen at times with certainty. leaving no doubt on the mind of the existence of breaks in the ring or of spots more brightly illuminated than other parts on both sides. etc the earlier part of the evening there was a faint satellite behind the ring which might have had some effect on the appearance of the ring. But its motion was very rapid so much so that it moved from 2 to 6 in about an hour 2 moved to the right 6 is very faint & it is doubted whether 7 & 4 are not stars. 2 is drawn too much out of the plane of the ring in which it lies. I think the points on the left are seen after 1 & 2 have sensibly moved.

The lower Arctic circle to lat. 30° about is capped with a dusky or blueish screen pretty sharply terminated over K is a darker region as marked. The contrast with the upper region is strong as that seems to be diversified with dark & light regions but almost impossible to be exactly defined. The central belt is dark but not I think black.

Saturn has been before seen in July I think with a similar look on the same side presented.

Sept-19th

20 Am - 1 hr



The ring is certainly seen on both sides.

Thurs. Sept 21st

$$\begin{array}{r} 50.00 \\ 21.80 \\ \hline 28.20 \end{array}$$

New Satellite of Saturn

x & outer Sat.

G.P.B.

11^h 30^m 26.44

30 26.45

42 26.00

43 26.10

x & star

G.P.B.

21.97 11^h 32^m dir 32

21.72 11.37

169

218.4

5

9

4.30

W.C.B.

17.58 26.21

25.49 differ as much as we are liable to

25.89

Saturn nearest limb & x

$$\begin{array}{r} 12^h 25^m \\ 71.49 \\ 50.00 \\ \hline 21.49 \end{array}$$
~~12^h 25^m~~8~~1~~ 1212^h 80.41

12.35 79.79 Clouds

x & star G.P.B.

21.22

21.17

21.04

20.97

$$\begin{array}{r} 20.98 \\ 8 \end{array}$$
12^h 07^m

Zero 49.98

12^h 15^m

New Satellite of Saturn

Sept. 21st 12^h 30^m Dir = 220° Satellite follows

one measure

Satellites & star

x from little star

$$\begin{array}{r} 12^h 45^m \\ 79.80 \end{array}$$

Same other side of Zero { x from outer Sat.

$$\begin{array}{r} 12^h 45^m - x + lit \times 20.21 \text{ G.P.B. } 12^h 51^m - 26.20 \\ 49 \text{ " " " } 20.12 \\ 57 \text{ " " " } 19.84 \\ \hline 153 \quad 22 \\ 51 \quad 20.07 \end{array}$$

12.53 26.04

$$\begin{array}{r} 26.17 \\ 50.00 \\ \hline 23.88 \end{array}$$

X Little star

290

465

Time	Mean reading	Dist			
11.34.30	21.86	28.169	PRB	= 28.14 =	276
12.11.0	21.02	28.96	RCB	= 28.96	284
12.57.0	20.07	29.97	9 PRB	= 29.97	293

probable extremes
up thru 3"

Saturn's nearest limb

Zero 50.00

31.83 and brightest Satellite

31.96 which follows R

1.05² 31.84

bright Sat. preceds
(45.80) x
(50.00)
3 = 15.14
22.54

11.20²
- 0.4 1 x 2

one measure

Sept 19th x from Saturn's centre 255 x from outer Sat. 143

21.12.30

20

between the dates 21st & 22nd of Sept

[The following Note appears to have been entered in the record book]

15th and The new Satellite of Saturn was first noticed on Sept 16th it then being in the plane of the ring & between the brightest satellite and the outer Satellite (which was then thought to be a star, but has since on the 18th, 19th, 20th and 21st moved with Saturn)

The new satellite was again seen on the 18th, but still though suspected no ~~any~~ measurements were taken but on the 19th it was seen again & the fact of this being the third day when it had been noticed induced us to take accurate measurements from the outer Satellite & from the outer satellite to a star by which motion was speedily detected. And during 3 or 4 hours it was observed to keep in the plane of the ring, which it would not have done had it been a star. On the 20th through breaks in the clouds the brightest & the outer Satellites were discerned, showing the latter to be the satellite as we had supposed for on the 19th we

had examined the space towards which Saturn was moving in order not to be deceived as to the identity of the satellite. On the 21st after watching through lens in the clouds for an hour or two we again caught sight of the new satellite very nearly in the plane of the ring. And the clouds fortunately holding off from 11^h 30^m to 1 o'clock we were able to confirm to our entire satisfaction the suspected motion of the little satellite.

Sept 22nd New satellite of Saturn
 Power No 6
 x from great Sat.
 10^h 10^m { 54.47
 54.47
 54.25
 54.33
 54.15
 54.10
 54.33

10^h 25
 271.30 } x m. } great sat
 270.45 }
 Pos. of ring
 264.05 - 9. }
 261.35 +
262.40

Bad seeing
 Pos. N 40
 great Sat. from N's nearest limit
 64.30 }
 64.26 } 10^h 40^m
 64.35 }
 64.51 }
 64.41 }
 64.37 }
 4.38
 44.37
 1870
 3.7
1833

Sept 22nd New Satellite of Saturn

Sept 22nd 10^h 30^m Dist of satellite from N's centre = 192"
 satellite follows in N 5 measures

11^h 00^m 54.97

Sept 22

11^h 15^m

1848

Saturday Sept. 23rd
New Satellite of Saturn

x of Large Satellite		Large Satellite from Saturn's nearest limb	
8 ^h 55 ^m	55.38	9 ^h 06 ^m	58.57
	55.17		58.61
	55.44		58.56
	55.38	9 ^h 09 ^m	58.63
9 ^h 04 ^m	55.20		58.59
Mean 8 ^h 58 ^m	55.31		

Very bad seeing and
the measures difficultThe new satellite is now
farther from the great one
than last night

Zero 5:00

$$\begin{array}{r}
 8.59 \\
 5.31 \\
 \hline
 1390 \\
 8 \\
 \hline
 147
 \end{array}$$

$$\begin{array}{r}
 139.0 \\
 2.8 \\
 \hline
 136.2 \\
 8.5 \\
 \hline
 144.7
 \end{array}$$

h_{semi}

Sept 23 rd	9 ^h 08 ^m	dist of x from Saturn's centre	145"
22	10 ^h 40 ^m		192
21	12 ^h 30 ^m		220
19	13 ^h		255

New Satellite of Saturn

Sept 23rd 9^h 05^m Dist. from sp. centre 145" by 5 obs.

Sept 24th Sunday at 6^h 36^m PM a very bright meteor in the N.E. at twilight Cast a bright light on the wall of room through the window. alt. probably 45° descended from NE to N horizon.

Sept 25th 9^h 00^m ... ring seen perhaps in spots with breaks there is more of the bright equatorial zone seen below than above the dark belt.

268 Sept. 26 Cluster in Hercules

No	mag	dist from a.	Position		
18	2 nd	27.3	118.20 - s.p. - same as 21	41.53	47.25
19	3 rd	66.8	104.00 - s.p. - 80 202	49.98	49.98
				81.5	27.3
20	4 th	81.5	93.40 - s.p.	40.58	
21	5 th	94.7	98.30 - s.p.	94.7	49.98
22	5.6 th	114.5	112.30 - s.p.	49.98	43.30
				38.53	66.8
23	2 nd	235.8	109.30 - s.p.	114.5	49.98
				26.40	27.56
24	2 nd	224.3	105.40 - s.p.	235.8	224.3
25	1 st (11 mag)	434.5	140.14 - s.p. HCB	49.98	
				65.3	
				43.41	189.4
					49.98
26	3	310.4	112.15 - s.p.	22.26	19.92
27	4	300.6	116.05 - s.p.	277.2	49.98
28	3-4	277.2	92.30 - s.p.	49.98	300.6
29	2.3	158.1	79.30 - s.f.	34.87	49.98
				158.1	34.17
30	3	158.1	72.30 - s.f.	49.98	158.1
31	6.0	201.2	60.45 - s.f.	29.86	49.98
32	1-2	306.3	48.00 - s.f.	201.2	19.35
33	3	437.0	50.30 - s.f.	49.98	306.3
				62.5	
				437.0	

1848 Lept. 26th cluster in Herenlis Power. 140

469

a measured from ath upper star

18 double 2 nd	τ^d	47.25	118.20 S.p. lower series
19 3 rd		43.30	104.00 S.p. 103.40'
20 4 th		41.83	93.40 S.p.
21 5 th		40.51	98.30 S.p.
22 5 th 6 th		38.53	112.30 S.p.
23 2 nd		26.40	109.30 S.p.
24 2 nd		27.56	105.40 S.p.
Bright star 1 st [11 th]		6.53	140.14 S.p. Mc.B. outlier

Zero τ^d 49.98

clear +

469

Measured from a, upper

26 3 rd	τ^d	18.94	112.15 S.p.
27 4 th		19.92	116.05 S.p.
28 3-4		22.26	92.30 S.p.
29 2-3		34.87	79.30 S.f.
30 2-3		34.17	72.30 S.f.
31 6		29.86	60.45 S.f.
32 1 st 2 nd		19.35	48.00 S.f.
33 3		6.28	50.30 S.p.

q.p.b.

In the s.f. quadrant there are a much less number of stars than in the s.p.

239 - 9 - 1 - 7 - 23 herts. arcatures set behind the Mc Comb hills

Sept 26th
 gh 0^m 1 2 5 6 4

Encke
 Very bad seeing
 3 6 is faint

order of brightness

1 3 5 6 4

2-11-27 in line at 9^h.23

very Bad seeing, pitiful.

No 4 is probably one of the inner satellites

6 is very faint. at

* this is exactly a field
 distance from Saturn's centre

At 11^h set on Encke, it is plainly seen in the finder, in the gr. Tel with 140. it looks a diffused light, some six minutes broad, ill defined without nucleus.

ENCKE

Reduction of obs of Encke's Comet Sept 26th

Wly mo in Dec 100" 1^m = 1.67

23^h.53.57 25.4

54.08 25.4

55.13 25.6

55.23 25.3

56.07 24.6

56.16 25.8

56.37 25.0

57.07 25.4

57.50 24.6

58.01 24.3

Encke's Comet

Sept 26th 11^h 26^m 24^s * 8^h.9^m

Comet proceeds * 25^s.40

" South of * 3'.51.0

Star of Comp determined Jan 2 1849

* 5^h.08^m.14^s.79

25.40

AR 5^h.07^m.49^s.39

46° 27' 33.2

3 51.0

46° 23' 42.2 Dec

14

6 68

16 7

23 38

5^h.08^m.14^s

Dec 46° 27' 32"

11.28.24

5 38.05

17.04.30

15.05.01

1.59.30

526

76.44.38

8.46

76 53.24

5.04

63.33.6

5.07.33.6

200

46.20.13

3.28

46.23.33

23^h.56^m.06^s d.R 25.40

5.23

23.50.43 AR Ephem 5.07.34

12.22.26 Dec Ephem 46.23.33

11.28.17

1.53

11.26.24

Munitions of Encke

60 | 100 | 1.00 | 491
 60 | 100 | 1.00 | 491
 60 | 100 | 1.00 | 491

Sept 26 to 11^h PM
 77^h Comet star 8^h 9^h
 2557 53. 57.4 54. 22.8 25.4 23. 55. 12.8 55. 38.4 25.6
 54 08.0 33.4 25.4 23.4 48.7 25.3

Comet star
 23. 56. 06.8 56 31.4 24.6 56. 56.8 21.8 25.0
 16.6 42.4 25.8 07.4 57. 32.8 25.4

Comet star
 23 57. 50.2 58. 14.8 24.6 58. 47.8
 58 01.4 25.7 24.3 5 Comet 4 s p star

Comet 5 s p star

2557
 28.28 0^h 05^m 31^s
 28.25 0^h 07^m
 28.65 0^h 08^m

28.83 0^h 09^m
 28.89 0^h 10^m
 28.87 0^h 11^m

29.05 11.30

29.03 0^h 12^m

29.38 0^h 13^m

29.20 0^h 14^m
 8 03 1

28.80 0^h 10^m 06^s

49.98

21.48

42
 207.6

3. 27.6 Comet 5 s p star
 23.4 cor 148
 3. 51.0

Comet star
 0^h 17^m 01.4 19.5 18.1
 12.8 18. 30.2 17.4

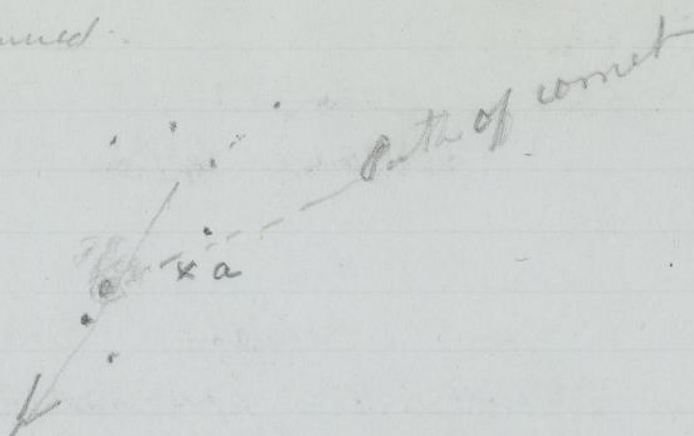
19 05.5 19. 23.8 18.3
 16.2 34.3 18.1

00.4 18.0 17.6

10.8 20. 28.2 17.4 Zero 49.98

56.2 14.5 18.3
 06.4 21. 24.4 18.0

0. 23. 48.0 04.8 16.8
 57.9 0. 24 14.8 16.9

Drake Sept 26th continued.Star of Comp 8th 9th

2557 0.. 34..51.8

E h 7.. 21..13.0

5..13..38.8

5..25.2

Star of Comp 5.. 08..13.6

43..32..12

46..27..48

16

46..27 32

Capella

0.. 41..36.8

7..30..43.5

5..10..53.3

5..05..28.1

5..25.2

44..09..32

45..50..28

45..80..12

-16

Sept 28thalt 8^h.00^m Sat peak 155"9^h.40 157

New Sat of Saturn

8^h.0

46.97

Follows Titan

46.58

46.78

50.00

3.22

Titan

8^h.5

30.89

limb of Sat from preceding limb of Saturn

31.85

31.65

31.80

50.00

18.20

14.98

30

146.8

45

8^h.14

46.58

Titan & new Sat.

8^h.17

31.72

Titan & nearest limb of Saturn

19

31.76

8^h.21.30 - 46.32

Titan & new satellite

8^h.23.30 - 46.19

Clouds interfere. at times

best measure on next page.

8^h.48 - 68.41 Titan to prec. limb of Saturn8^h.50 - 68.428^h.53 - 68.298^h.54.40 - 68.32

Sept. 28

Titan precedes Saturn

8.57

53.13

Titan & new Sat (The other side of Zero)

8.59.30

46.65

Titan & S.S.

Zero 50.00

9.01.0

46.54

9.20

68.46

Titan & Saturn's nearest line

9.21

68.33

9.26

46.57

Titan & new sat.

9.28.30

46.72

Titan & new sat.

9.32.0

46.70

9.33.30 - 31.69

9.53 - 46.98

9.55 - 46.83

new Sat. in plain of ring

18.37

3.7

180.0

8.7

188.7

32.6

156.1

46.67

50.00

3.33

32.6

183.3

3.7

187

Zero - 50.01

46.68

3.32

183

150

147.5

46.155

46.90

3.10

187.5

152.5

149.5

10 o'clock

Set down on next day have for
got ten except on the right hand

bisc.

in Titan & the new Satellite

Dark below

At 9.30 Dist of new Satellite from Saturn's centre 156" preceding

we now think we see breaks in the ring or rather brighter places

Sept 28th New satellite of Saturn at 9^h00^m Dist = 156" preceding Saturn's centre

5 measures.

(Cape of Good Hope obs. J. G. W. H.)

Taking for the mean dist. of Titan $177''.5$ Time of rev 15.945 days
 We find that at the distance of Saturn from the Earth
 Sept. 20th the daily circular motion of a satellite in degrees is
 $\log dv = 4.7954 - \log r^{\frac{3}{2}}$ r being in seconds of arc near Sept 20th
 assuming $r = 300''$ the obs. of the 19th, 21, 22, 23, 28 are thus rep.

resented	angle with sky	cal dist	10 ^h P.M. obs dist	
Sept 28	V 58.70	156.0	156	} obs. well made & reliable
23	118.75	144.3	144	
22	130.76	195.8	193	
21	142.77	239.0	222	} approximate places
19	166.79	292.1	257	

by changing r by $10''$ or $20''$ the approximate places are better satisfied but those on the 22nd & 23rd & 28th not so well. The time of revolution is about a month or twice that of Titan.

Daily motion $12''.01$

Obs. reduced to Sept 20th at 10 P.M.

Oct 14 th	147''
15	92

Taking a period of 21.04 days & a circular orbit we

find	Sept 19 th	+ 105.9	cal. dist.	Obs. dist.
$dv = 17''.00$ $r = 237''.0$	21	71.6	225	222
$\log k = 4.7925$	22	54.5	190	193
	23	37.4	144	144
	28	-48.1	176	156
	Oct 14	+38.1	146	147
	15	+21.0	85	92
	13	+55.2	194	201

76 2557 part of Sat. time 5^m 42^s
 cor 2557 part of M.S. time 13.04^m

Oct. 5th

Saturn

Zero 50.00
 50.00

1/2 Eq diam
 17.5 = 1.24804
 2 9.75762
 3 17.29 = 1.28542
 9.65 2/17.5
 8.75
 9.65

2557 E very faint

22.24 47.02 Saturn's nearest limb to (Enceladus?) which

22.26^m 47.21 follows η

22.28 47.16 η dist = 0.93730

22.30 47.13 Mean dist = 0.97968

22.27 47.13
 13.04 50.00
 M.S. 9.23 2 8.75
 28.12

Encel. Minus
 28.12 = 1.44902 17.74 1.24895
 26.26 = 1.41929 20.29 1.30728
 25.51 = 1.40664 16.09 = 1.20657
 23.82 = 1.37691 18.40 = 1.26490

25.51 16.09
 23.82 18.40
 2.65 9.65
 35.16 25.74
 33.47 28.05
 25.51 16.09
 23.82 18.40
 8.75 8.75
 34.26 24.84
 22.57 27.55

bright β nearest limb

22.48 55.18
 49 55.05
 50 55.19
 53 55.07
 55.12

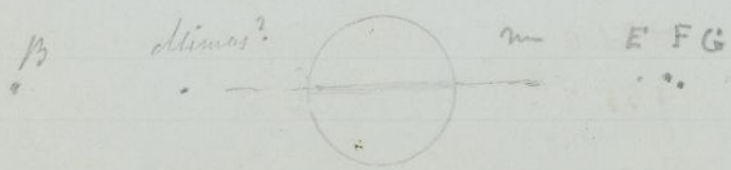
at 76.38 from β I fancy a faint (20)
 object preceding β in place of η
 after the moon set & was
 seen certainly. no motion
 was sensible among the stars

Mimas? pre Saturn E to Saturn nearest limb

23.21 51.73 23.31 = 52.75
 23 51.80 M.S. 23.32 13.04 52.62
 24 51.93 52 68.4
 26 51.88 26.26
 28 51.73
 23.24 51.81
 13.04 36
 M.S. 10.20 17.74

Ring seen distinctly both on & off the planet
 being at 9^h 30^m good & both

thought the ring broken or in parts brighter
 especially on the left. but a small satellite after
 words came out here which must have had
 some effect on the appearance of the ring



at the ring looks rough

at 9 o'clock E F & G were easy stars
 with a power of 140

$$\begin{array}{r}
 2557^{\circ} \\
 0^h 51^m = 74.44 \\
 \underline{74.04} \\
 74.24
 \end{array}$$

B to nearest limb

$$\begin{array}{r}
 1^h 05^m = 54.22 \\
 54.20
 \end{array}$$

$$\begin{array}{r}
 284 \\
 278 \\
 \hline
 286.5
 \end{array}$$

m to n

0^h 56

64.25

64.60

64.77

64.56

Comet sweep swept to

Cancer.

7.04

9.21

8.0

7.76

Zero 50.00

Mimas? This is a satellite as it remains in the plane of ring as does Enceladus

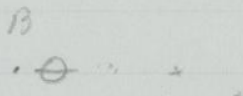
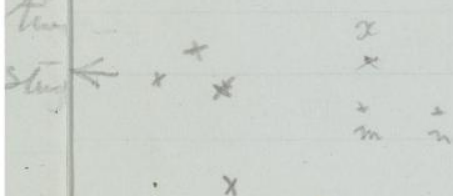
$$1^h 12^m = 52.03$$

$$52.10$$

$$\begin{array}{r}
 1^h 13^m \\
 13^m 04^s \\
 \hline
 12^m 09^s
 \end{array}$$

$$\begin{array}{r}
 52.07 \\
 50.610 \\
 \hline
 2.071 \\
 4.41 \\
 \hline
 20.29
 \end{array}$$

1/3 the measure at 23^h 15^m be correct there is reason to distrust α being a satellite



The object α though in the plane of the ring was thought too faint for the new satellite. Its distance from Saturn's centre at ~~4^h 50^m~~ at 11^h 50^m M.S.T. = 287" was thought too great. It was seen after moon-set best, though with difficulty & the wires could be brought only to an estimated place.

Note added Oct 6th

On calculating the place for Oct 5th from the elements before given we have cal = 270" obs 287" The obs. of the 22nd 23rd & 28th are a little better, satisfied by a little longer period than that corresponding to 300" which would diminish sensibly the discrepancy of 17" between the cal. & obs'd place on the 5th. There is reason to doubt whether α be not a star.

Enceladus fol. of centre reduced to Mean Dist.

$$\begin{array}{r}
 1848 - \text{Oct. } 5^{\text{th}} 9^h 23^m \text{ m.s.t.} \\
 24.26 \text{ or } 24.51 \\
 10.28 \text{ " } 22.47 \text{ " } 22.57 \text{ or } 32.62
 \end{array}$$

Red ink for Eq. diam = 18.0

Mimas forced. of centre red. to Mean dist

$$\begin{array}{r}
 \text{Oct } 5^{\text{th}} 10^h 20^m \text{ m.s.t.} \\
 24.74 \text{ or } 25.04 \\
 12.09 \text{ " } 27.15 \text{ or } 27.40
 \end{array}$$

measures exceeding difficult Bright clear light
faint object in plane of ring Oct 6th PM Admirable definition
and C C & Saturn's nearest edge

8^h 55^m 34.13
35.10
34.19
34.53
34.58

9^h 05^m 46.49
46.41
Mean 46.45

9^h 15^m 36.04 } x from Star (p. x)
36.39

1477
1832

15.5
3.5
19.0

Mean 34.51

x better seen

9^h 37^m 64.64
64.92
64.76
Mean 64.77

9^h 42^m 53.61
53.50
Mean 53.55

The belt across Saturn is not black but dusky though very distinct. The edge of the ring is well seen throughout but inclines to a beaded or broken appearance especially on the right hand side.
Zero 50.00

x Star

C

Minas



Saturn

Infinite

Minas

Saturn above is diversified & below hooded.

9^h 45^m 51.97

dist 0.93764
Mean dist 0.97968
9.95796
1.28012
19.06
17.30
1.23808
8.75
26.05

Oct 6th 9^h 46^m M.S. Minimal from 1/2 centre
by equal diam 17.5 on 18.0
Reduced to Mean dist by 26.05 or 26.30

1253
382
1635

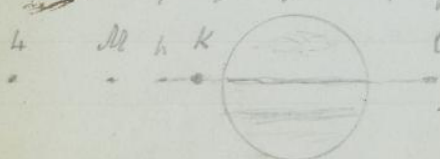
x to C

C to Saturn's near limb

11^h 50^m 37.55
37.35
Mean 37.47
46.10
46.17
Mean 46.10

From the obs. (x) appears to have been a star.

12^h 10^m Beautifully distinct



M in Minas K a satellite just appeared C a satellite or bead & h a point of light

Oct 7th Plu All the measures are to Saturn nearest limb 479

Magnimastodan

En to P

K BEM

C. D

8.39

48.02

8.43

47.28

47.325

49.980

47.325

49.980

47.325

49.980

47.325

49.980

47.325

49.980

47.325

49.980

47.325

49.980

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47.325

49.980

47.325

49.980

47.325

49.980

47.325

49.980

47.325

49.980

7. dist 0.93797
in air 0.97969
995829

47.96

47.94
49.93
19.60
2 02
14.70

47.37

47.325
49.97
26.71
26.71

an accidental star very red

B to P

E 26.11

8.46

46.01

19.60

46.00

1.41681
1.29226
9.95829
1.37510
1.25055

C to Saturn

= 23.72
= 17.80

8.50

46.28

Rad 8.75
32.47
26.52

D to Sat

8.56

42.93

43.00

Pite to Sat nearest limb

31.94

9.00

31.92

Zero 50.00

The satellites were watched for two hours & K soon showed it self to be a star & not the new satellite as at first suspected

9.10

47.03

47.13

47.08

49.99

291

47.63
49.93
236

inner bead on right hand ansa

outer bead on right hand ansa

List of Enceladus & Mimas from Saturn, centre reduced to Mean dist. log = 0.97968

1848 Oct 7th 8.40 m st Mimas from centre 26.52 2 St.

or 26.77

Set. 2g Diam 18.0

" 7th 8.44 " Enceladus " 32.47 2 St.

or 32.72

1 Oct = 7th 9^h 35^m Camb. mer Solar time

Saturn well seen, The Ring on each side like a fine thread of light, broken into globules towards the extremities most distinct on the right hand

order of brightness 5 6 7 a b c 3 4 1
of the satellites k⁺



seven satellites are seen distinctly

six of them nearly in the plane of the ring.

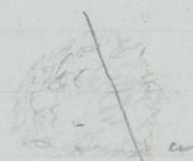
The 8th satellite was thought to have been seen at one time, but proved to be a small star, the moon light is too powerful to allow us to see the eighth sat.

↑ % Sun

Oct = 8/9th Snake, Comet

34.25

It is bright. I think that I saw it with the naked eye at 4.10. It is fan shaped the joint [towards the Sun] very nearly



it opens about 75° or 80°, and

occupies 4 or 5 minutes of the field in length. has no distinct nucleus. but concentrated near a.

Tail is fan-shaped & towards the Sun.

Light of the comet extends 10' each side of the brighter portion which is very ex-
centrically situated with respect to the general mass of light. & so indefinite that one place is about as good as many more.

Monday m. Oct (9th) *Comet von Pons*
(Encke)

6174
1543

481

2557

h m s
5.39.40Comet No. 7thdiff. Dec
34.25

Passage of Star of Comp.

2557 5.58.26

changed other side of zero

5.58.41.2 other star

Solar

x 239

4.25

to

4.30

mean

Solar

5.44.55

66.78

45.50 — 66.46

47.05 — 66.25

48.10 — 66.68

48.55 — 66.97

50.22 — 66.50

5.47.30

364

66.61

diff. Dec of
stars in field

Star 6.0.20 — 67.04

The other star is not given

so bright at the star of Comp.

There are other bright stars

in the neighbours hand

diff. Dec of star

2557 5.52.6.8 — Comet 1. mean

5.53.27.3 star

26.4 Comet 2. mean

5.53.46.2 —

1.20.5

1.21.8

5.54.07.8 Comet —

5.55.28.0 1.20.2

Zero 50.00

54.26.0 —

55.46.3 1.20.3

5.56.04.6 —

5.57.23.3 1.18.7

56.22.0 —

5.57.41.8 1.19.8

mean

5.54.15

1.3

1.20.22

* 7th

Star of Comparison

Star of Comp. R 7.27.05

Dec 53.01.02

6.14.46.5

H

2557

6.14.46.5

10.40.40

NPD - 86° 58' 40"

7.34.06.5

6.20.0.4

9.56.30

36.58.58

53.01.02

28.46.28

28.46.46

5.47.30 dd
6.45

$$\begin{array}{r} 66.61 \\ 50.00 \\ \hline 16.61 \\ 33 \\ \hline 162.8 \\ 1.8 \\ \hline \end{array}$$

$$164.6 = 2^h 44^m 6^s$$

60) 16 (27

$$\begin{array}{r} 0.27 \\ 67 \\ \hline 199 \\ 162 \\ \hline 1.8 \end{array}$$

5.54.15

5.50

5.48.25

13.09.44

16.38.41

2.44

16.35.57

Encke's Comet.

Oct 8th 16^h 35^m 57^sComet preceds * 7th 1^m 20^s 22 Star R 7^h 28^m 05^s" North of * 2^h 44^m 6^s Dec 53^o 01' 02"

R 7^h 26^m 35^s 88 } Mean Eyr.
Dec 53^o 03' 36".7 } Jan 1st 1848

Cor of Encke's Ephemeris

add to Eph Oct 7th 32.0 in R

Subtract 1.40 in Dec

16.35.57

5.37.05

22.13.02

15.03.36

7.09.26

$$7.157 = 0.8547 = 0.8547$$

$$617.4 = 2.7906 \quad 27.1 = 1.4330$$

$$4419 = 3.6453 \quad 195 = 2.2877$$

73.39

-3^h 15^m 20^s

10.13.39 + 35

53.02.06

110.17.26

53.05.01

111.31.40

7.24

Cor Eph 1.40

2.04

53 03.21 = Comet Dec

2.7

7.26 06.7

Cor Eph 32.0

7.26 .38.3

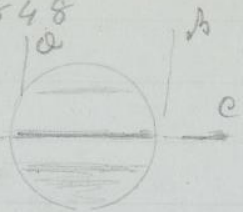
Ephemeris
Comet R

Measurements in Bright Moonlight

488

Oct. 9th 184820^h 30^m Sid

M B



Planet low & only tolerably seen

Titan

dist 0.93867

m .. 0.97968

9.95899

17.36 1.23555

18.66 1.27091

15.80 = 1.19854

16.98 = 1.22990

Eg. Paul Ser 8.75

24.55

25.73

Iapetus

x

to Minus 2557 20^h 36^m

51.84 m. s. t. 15

51.99

51.81

26.4

1.88

3.8

18.42 + 0.20 = 18.62

Q to B 20^h 42^m

51.19

51.15

Q to A 20^h 45^m

57.56

57.52

B to D 20^h 49^m

46.28

46.27

B to C 20^h 52^m

48.21

48.20

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

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48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

48.205

C is a satellite as it moves from the ring sensibly.

All seven of the satellites are again seen through the moon. is close by Saturn (10° prec) Minus is the most difficult but yet certainly seen

Order of brightness

Reduced to 1/2 Mean dist

Titan 1 = Star 8thA 2 " 9th 10thD 3 " 10th

B 4 16

Iapetus 5 11

C (Enceladus) 6 16

Minus 7 18

Excel follows 1/2 center at 7^h 31^m by 24.55 or 24.80Minus prec .. 7^h 15^m by 25.73 or 25.98

Eg. Diam 18.0

Oct 9th Saturn
W. E. B. Power 140
Equatorial Diameter Polar

Angle of 45° with Equator

47.75	48.05
79	47.89
77	47.97
73	48.00
70	47.96
<u>5/24</u>	<u>5/87</u>
47748	48174
50.000	50.000
22.52	18.26
<u>22.08</u>	<u>2.00</u>
1.34400	47.975
9.95402	48.980
1.30302 = 20.1	

48.05	Dir. ?	0.93870
47.95		0.97968
<u>.00</u>	Mean "	<u>9.44302</u>
48.00		9.95902
		<u>1.30108</u>
	Polar diam	14.6
	at Mean Dist = $\frac{14.6}{17.8}$	0.82022
	17.8	W. E. B. 9 th
	Equat 20.1	"

Oct. 10th

Star from Saturn's limb Upper

48.69	50.49
2557	51
23 ^h 10	52
.63	<u>50.507</u>
62	
<u>48.620</u>	
48.620	
18.5	

Zero	9.95940
96	18.5 1.26717
49.97	16.8 = 1.22657
.99	Polar diam - at Mean dist
<u>98</u>	
98	
49.976	

Dark band from Saturn's
Upper limb

50.83
49.13
50.82
<u>50.87</u>

The band to the eye is perceptibly
nearer to Saturn's Upper pole than
to the lower dif = 1.0 by mic.

Band from Lower
Limb

50.84
49.98
<u>8.6</u>
49.02
49.01
49.03
49.02
<u>49.98</u>
9.6

Oct-10-

Pomer 860 G.P.B

239-10-11-3 Contact of following limb of Saturn & 1st Limb of Titan

10:15-0 Contact, power 140 - H.G.B & G.P.B agree.
 The Sat Titan project from the disc, 2 or 3 tenths of
 an arc - compared with the thickness of the microscope wires.
 It enters on the disc of Saturn above the ring.

10^h 20^m } Satellite half on to the disc
 22 }

10-25-0 The sat is yet seen in contact or projected

10-27- yet seen - has a curious effect. Looks like
 a nose to Saturn

10-30 Last at time, begins to be doubtful whether it is
 here or no. G.P.B. is pretty sure he sees a projection

at 10-32 he nearly gives up, says:

10-33 - total immersion,

10-35 Perhaps a grain of light left on the limb.

The seeing became so exceptionally bad that
 the further observations could be made.

Oct 12th 1848. Saturn's satellites

Zero 49.97

E (enceladus) from η nearest limb (following limb)					
8 ^h .00	52.43	on the Right	(53.66)	η nearest limb & A on the Right	
	52.41		8 ^h .08	53.62	Red. to $\frac{1}{2}$ mean dist
	52.44			53.64	E fol. η , centre 30.69
	52.427				or 30.94
Zero	49.970				For Red. to $\frac{1}{2}$ E. diam. 18.00
	24.58				
	24.09				

η dist	0.93985
mean "	0.97968
	9.96017
24.05	1.38112
21.94	1.34129
	21.94
	30.69

Note B & C are measured from the furthest limb of Saturn

B on left hand C on left Titus on left from furthest

(following)

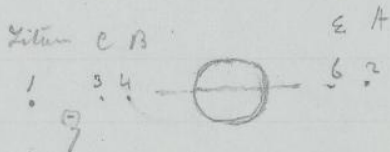
8 ^h .13	{ 45.19	8 ^h .17	{ 43.62	8 ^h .23	{ 3.6.02
	{ 45.32		{ 43.57		{ .00
	{ 45.31		{ 43.62		{ 35.95
	{ 45.31				

Ring is very plainly visible today

~~The last fortnight we have shown it to me~~

It is plain enough to be seen by our visitors who see it without being told in some instances. Though it is perhaps the star preceding η from Saturn's following limb.

8^h.29 40.09
40.10
40.04



New Sat.
very faint dist 4

moon bright
Titus 1-5 9 May

The ring is even very plain on each side of the planet - has somewhat broken appearance. at both extremities there are appearances of light points but not steadily seen, at times the atmosphere is very steady & clear.

2 - 10-11
3 & 4 - 11
5 - 11.2
6 - 15
7 - 16-15

A point of light on the right hand ansa was at first taken for Mimas but did not appear to move. There is perhaps a point of light on the left.

$8^h 46^m$ $251^{\circ} 40'$
 $251^{\circ} 00'$

Position of star Nov - 15 mag.

12th October

Ephemeris N^o 6 power 860

Sat of Neptune

10.8 - Dist 48.95

South preceding Zero - 49.97

G. P. B

10.10 - 48.98

Sat. could not be seen

49.97

10.12 - 49.04

are, or very near, the min

48.99

49.97

98

9.6

Pos 245° Sat G. P. B. doubtful. sat very faint.

Ball seeing & difficult.

Oct 12th Satellite of Neptune G. P. B.

M. S. T. 10^h 10^m Dist 9.6 3 obs visions

Pos. 245° very bad

Power 860

Oct 11th Satellite of Neptune

M. S. T. 7^h 50^m Dist. 16.4 Satellite very well

by 6.04. Pos. 220° seen. Power 860.

858 848 Oct. 13

2361
 380
 199.1
 195

Pos.

39-7.13 — 41.30 star n.p.
 41.16

Position circle probably not adjusted

Dist
 7.19.30 — 53.37^{ol}

20.30 — 53.54

22.00 — 53.77

25.00 — 53.32

26.30 — 53.48

53.50
 50.00
 350

Jupiter & new Satellite of Saturn
 new Sat. South proceeding

Dist of Jupiter from foll^r limb of Saturn
 7.28.20 — 71.92^{ol} worthl^r position not adjusted
 7.30.30 — 72.18

new Position ang of Pos of Ring 86°
 turned 90°

Dist of Jupiter & nearest (foll^r) limb
 7.39 — 73.54

73.65

7.40.30 — 73.60
 73.61

We again came to the conclusion that the object was a star

7.40 Dist 795.1

Dist
 7.43 — 53.68^{ol}

7.46 — 53.89

7.49 — 54.02

53.87

3.87

23.61

19.74

14.34

Jupiter & new Sat.

Oct. 13th Pos

8..5 — 42.05 Star n.p.

8..10 — 42.03

showing no motion or if any
in the wrong direction

Oct 14th The bright moon light rendered the observations very difficult & uncertain)

Titar

B
A
K

20^h 40^m

The line from K to x
passes much below m
* 9th mag

x taken for new Satellite

Jupiter

x from A

A from B

a to x

38.68
20^h 35^m 38.29

20^h 41^m 46.86
46.84

20^h 50^m 23.64

38.45

46.85

23.36

19 38.42

49.97

23.38

Zero
49.97

38.45

49.97

11.52

3.12

146.4

2.9

x from B = 143.5
152.6

x from A = a

23^h 15^m — 37.74

38.16

37.95

49.97

12.02

1.84

13.86

2.8

13.58

144.3

0^h 20^m

dist of new sat to A

A from B

23^h 22^m 48.16

48.10

48.13

49.97

1.84

Jap. from B 30.91

31.13

23.34 31.12

26 = 31.08
49.97

Jap from new sat

23^h 39^m 45.15

44.92

44.98

45.02

49.97

4.95

18.90
49.5
13.95
2.8
13.67
8.5
145.2

* 9th mag.

There can be no doubt that

x has moved as the line from K now
points very nearly to m

On the 15th K & m were seen but x was gone leaving no doubt of its being the Satellite

Oct 14th (Continued)

After several failures from mistaking stars for the new satellite. There is no reasonable doubt that we have seen it to night. When first seen it was before Moon rose & it was seen without difficulty but was very much obscured when the Moon rose.

Its distance from Saturn at 20^h 30^m Dist. = 152" pretty well

" 23^h 30^m = 145 difficult

The last measure are liable to uncertainty but still show strongly the motion of the new satellite which is further confirmed by its change of position referred to neighbouring stars.

From the first to the last measurement had the satellite been a star its distance from Saturn would have been 30" or 40" more than observed.

Oct 15th Sunday. New Satellite of Saturn239 15^h Dist8^h 37 - 44^m 20. nearest sat^l near lat8^h 39 - 44.348^h 41 44.32

44 - 29

Zero 49.98

5.69

233 0.8

8 71.5

8 5.48

8 5.46

s.d. 94.4

Dist sat^l Limb of Sat

46.92

8^h 43 - 46.92

Zero 49.98

3.06

Zero 49.98^aStar is of 14th mag.

Pos 0 10

new sat^l star above 1.308^h 47 5.30

6.00

new sat^l preceding

at 8^h the new satellite was nearly in the same R with a star of the 14th mag. at 11^h it preceded it very sensibly.

Oct. 15

~~39~~ 40.21 19° 0

new Sat and star above following

10.25^m

19.45

18.20

19.02

The satellite has moved with regard
to the star sensibly to the naked eye.
motion in position in 1^h 40^m = 13°

10.29

45.38^a disk of ~~X~~^a & new Sat

45.45

45.49

132

45.44

49.98

45.4

10.35

46.12 disk of a & limb of Saturn

46.21

46.19

152

46.17

Zero - 49.98

381

45.4

83.5

87.8

4.3

83.5

17

81.8

8.6

90.4

9

Two hour motion of X

New Satellite follows Saturn's centre

Oct. 15th at 8^h 40^m 94.4

10.30 90.4

(Oct. 17. This evening I received a letter from
Mr Wm Lassell, announcing his discovery of a
eighth satellite of Saturn. The letter was dated
September 30th.)

492. Oct. 20

235. Dist of α from
star south pole

Saturn

Pos. of Ring 87.50
56
177
7

7.9 - 58.32 perpendicular to plane of ring

13 - 58.38

16 - 58.41

18 - 58.27

20 - 58.55 doubtful

1193

583.9

50

83.9

26.62
847
1821
37
1784
8.5
18697.28. same star & preceding
line of Saturn

76.56

Zero
50.00

7.31 - 76.74

7.33 - 76.57

1181

76.60

 α & star south pole

7.39 41.46

42-41.16

50.41.55

117

41.39

50.41

86.1

7.13 - 58.37

7.58 - 76.21 star & on line of Saturn

 α & star S.P.

8.7 58.40 G.P.B

8.11 76.34 star & on line of Sat

76.48

G.P.B

8.14 76.37

94.24^m

Sat. to Stn

42.93

43.02

42.98

49.98

7.00

25.50

50

Star & Saturn

46.95

24.48

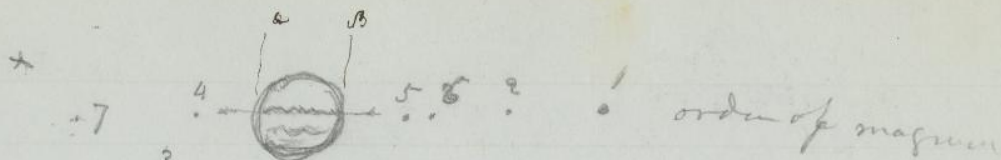
25.50

7.00

1850

The beads are seen on
the rings with out question
as in JulyNew satellite of Saturn precedes η 's centreOct. 20th 7^h 30^m 186.9

Oct 20



The ring is seen

distinctly on each side, has a ragged appearance across the body of the planet, it is a darkish band, nearly the thickness of one of the moons.

Are these measured from α or β ?

Measure of distances of satellites, as measured

No 1 Titan

8.30 — 65.875

32% — 65.805

34 — 65.793

No 5

54.027

8.45 54.267

54.265

639

54.213

54.213

49.980

4.233

41.485

21.93

20.15

41.48

10.66

30.82

1.48883

9.96385

1.45268

= 28.36

Equatorial of Saturn

8.35 — 59.055 No 2

58.900

37% — 59.098

52.213

52.160

52.107

52.116

52.187

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

52.157

Eg. diam calculated from
diam at m. dist = 17.5 would be
Oct 20th of diam = 18.9
near the moon

52.157
49.980
2.177
43.9
21.295

No 4 & farther limbs, providing

45.200

45.343

45.327

45.24

44.98

46.00

43.492

43.442

43.363

8.58%

2103

43.492

43.442

43.363

M.S.D. 8.41

2132

h. dist 0.94353
0.97968
9.96385

54.716

49.98

4.735

46.35

10.66

35.70 = 1.54267

9.96385

32.85 = 1.51652

46.35 = 1.66605

42.65 = 1.62990

8.25

33.90

Oct 20 at 8.41 m.s.t.

Red. to mean dist

Encl? for S₁ centre 32.85 by obsd. diam.

or 32.85

33.90 by cal. diam.

or 33.65

Eg. diam 17.0

9.4

Oct 20th Satellite of Neptune power 860

239 Dist. Pos. N. full

9.50 51.72

51.59

51.55 G.P.B.

51.42

51.65

9.59 - 51.57

9.54 51.583

49.984

1592

15.67

Tr.C.B.

48.48 Neptune low

48.31 } Can not see it

48.21 } near the wire

48.39 not good obs.

48.45

48.38

49.984

47.816

3.2

15.84

10.5 316.45 G.P.B.

321.00

320.00

317.00

318.40

Gene

49.985

975

992

49.984

frequently see neptune
with a sort of ray of
light in the plane of
the satellite something
s.p. & again n.f. To night
it is s.p. (Dr. inner sat?)

Oct 20th 9.54^{am} Sat of Neptune

Dist. 15.7 } obs. G.P.B.

Pot. 221.20 } Power 860

15.8 Tr.C.B. 5 obs not good obs. as the planet is low

Oct 21st

New Satellite of Saturn

not clear ~~not~~ and
Not good seeing.
Jupiter prec Saturns pre line

New Sat. prec. Jupiter
10^h 05^m

38.98
39.01
38.99
59.98
21.00
19.20
2020
40
198.0
85
2065

40.79
40.78 10^h 10^m

Dist = 204.5 Flyp prec??

New Satellite proceeds J's centre

Oct 21st 10^h 05^m 206.5

496

Oct 23rd 1848 Satellite of Neptune
 No6 Power 860.

W.C.B. Sat. in s.p. Pos W.C.B.

7^h 35
 48.40
 .49
 37
 35

 .32
 48.386
 49.982
 1596
 3.2

 15.64

138.30
 138.45
 141.35
 141.10
 142.08

 140.25

B

birt.

Pos

8.0

48.12

139.45

9 P.B.

8.10

48.26

135.30

48.28

Zero

49.98

136.15

48.30

49.98

135.20

48.28

49.99

138.00

48.250

49.40

137.00

49.982

49.982

1732

3.5

16.97

Sat of Neptune Power 860

Oct 23rd 7^h 35^m Dist 15.6 Pos 219° 30' W.C.B.

" 8^h 05 " 17.0 " 223° 00' S.G.P.B.

Oct. 23



All the eight satellites are well seen, and the Ring is plain on both sides. broken or in bunches. and dark away the centre.

7. Immas

4. dist 0.94513

0.97968

9.96545

39.56 1.59671

37.32 1.57194

36.49 = 1.56216

34.47 = 1.53734

8.75

27.74 or 27.49 } Eq diam

25.72 or 25.47 } 18.0

239

birt.

8.32-0 45.88 from further limb of Saturn

8.32..45 - 45.98

$$\begin{array}{r}
 - 45.98 \\
 45.95 \\
 \hline
 49.982 \\
 4.032 \\
 \hline
 81 \\
 \hline
 39.58
 \end{array}$$

7.6 Enceladas

8.37 - 53.82 from preceding limb of Sat

53.79

53.76

$$\begin{array}{r}
 53.79 \\
 49.982 \\
 \hline
 37.32
 \end{array}$$

8.40 - 52.96 Right hand bunch on the ring

52.92

498

New Nebula ? New Nebula

Oct 23rd

C is a nebulous body

30" n. following Saturn dist. just 12'
or a trifle more than a field.a is a star of the 9th mag 6.12
(no motion)

9 10 st	23 24	15.41	-6 25	47.3
4 44		-6 25		-34.7
13 54	23 24	9.16	-6 26	22.0
13.9	13.9	+1.60		+4.4
4.5	2.5		23 24	10.76
6.95				-6 26
5.56	34.75	48.30		17.6
6.255				+30.0
			23 24	59.09
				-6 25
				47.6

23 - Hyperion 2nd limb of Sat

dist 10.20"

30.872-

31.143

30.927

30.876

30.890

30.914

49.97

19 0.38

186.5

178.0

All eight of the satellites
of Saturn are visible to night
See the ring plane
and the bright places I think two
on each side.

New Satellite proceeds 1/2 centre

Oct 23rd 10^h 20^m 195.0 ?

178.0 ?

New Nebula (not in the new H. Annals)

By comp. with Saturn & app 23^h 24^m 59.06 -3.2 Comp with star a

8 " -6° 25' 47".6 -23"

cor to mean 99 1848.0

star a = 9th mag.

Ref prec x a Sa 0 18.19

Neb n. of " 48 12.7

ac ang. pos 255°

270°

15°

280.7 = 2.44824

+b 15° 9.41300

15° 9.98434

neba @ 48 72.7 = 1.86124

2.43318

ob 77.32 6.25 0.00273

77.58 neba @ 15 2.43591

4a 18.19 = 1.25982

ca 79.85 pos. altered

9.29

78.25 ac means

78.63

Mean

78.44

Zero

78.44

78.66

78.55

49.97

28.58

28.90

28.64

28.57

28.67

28.67

28.67

28.67

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28.67

28.67

1848phae.proj...161B

Jupiter

499

October 25th A.M. 5^h 53^m 1657 Jupiter at times well seen.



K to 4 following limb

48.83 6^h 00^m

48.75

K' to 4 following limb

48.46 6^h 03^m

48.55



The belt a is about as wide as $\frac{1}{3}$ from a to b plainly interrupted with the part towards a' not so distinct as that towards a. The connection between a a' & b b' is distinct. The connection has a darker place between a a' & b b'. b b' is darkest below & is suspected to have a streamer towards f but this is somewhat uncertain. c c' is the most prominent belt a very decided dark spot at k & apparent bright place to the right of it. The upper surface of c c' may be undulated. at d is a bright belt or else the space between dark belts. it is suspected that the darkening extends from d to c.

Satellites of Saturn

A in Titan

Oct. 25
 239 m
 10.21 — 49.60^a
 10.25 —
 10.26

10.28 49.61

49.62

10.30 — 49.60

10.32

Pas

332.0

333.45

332.30

Zero

~~49.963~~

326.45

332.30

334.25

331.50

No. 8

Power 1200

Jupiter

B smaller one below
 north following A

Both Right Hand. foll. Saturn

Zero

49.963

49.976

49.982

49.975

16

Zero 49.974

A
B

but
 10.47 — 56.176 Titan follows Saturn's mean limb

The Ring is seen steadily on both sides the planet
 it appears broken

The dark, middle belt on the planet does not seem straight
 it is irregular.

There are four other belts - & the northern part is darker
 than the middle or southern

Oct 27th

Measured the level of the Floor of the Observing Room
above the Marsh below J. E. Worcester = 65 feet.

Heights of the Inst. above

The stations

a 4^{ft} 8ⁱⁿ

b 4 " 4

c 4 " 9

d 4 " 9

Horizontal line from the Inst. at the preceding station

is above The Stations

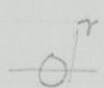
rod = 16 1/2 feet

b 1^{rod} 5^{ft} 8ⁱⁿ

c 1 " 4 " 8

d 1 " 7 " 6

Marsh 1 " 2 " 0

Oct 27th

New satellite of Saturn

a b

22^h 40^m
14^m 25^s
8.15

7a
53.87

a b 2 6 5 1 4 7 3 8
54.21
54.04

54.19

54.13

54.13
49.97
4.17

53.93

53.90

49.97

3.93

4.17

8.16

7.4

8.4

87.8

New Satellite of Saturn

follows N's centre

Oct 27th M.S.T. 8^h 15^m 87.8

502

2557 + 6^m 30^s

6/220

Sun

Encke's Comet Oct 27th 1862

From A. Nash 660

28 30

4. 45

The tail was prob.
ably the faintest part2557 7^h 56^m Comet prec * 8^h 19 beats7^h 57 18.5

57.30 18.5

58.20 17

58.50 17

59.30 16.5

7^h 58 14 = 17.508^h 11 30 = 18.008^h 04 52 = 16.388^h 01.40 Comet n of star 60^h 21^m8^h 03 59.138^h 04.10^s 58.648^h 05.30 58.038^h 06.30 57.46

07.40 56.71

8^h 07.45 58.35

50.00

8^h 07.45 58.35

Comet preceds star

8^h 10^m 9.5 beats8^h 10.40 8.0 Star R. 12.19.58.13

11.10 8.5

11.50 8.0

12.19.51.75

12.20 7.0 Star R. 25.04.07.1

13.00 7.0

8^h 11 30 = 80

25.05.28.9

8^h 23^m Comet same R as star & 20^h S of it8^h 30 Comet overpowered by day light17^h 55^m - 18^h 25^m17.30.39
5.38.05
23.08.448^h 04.45
1.16
6.10
5.54
5.58^h 04.45
6.347^h 58.11

14.24.39

17.33.32

2.53

17.30.39 16.5.7.

Star of Comp

2557 8^h 14^m 40^s - 10 beats7^h 48.02

12.26.33

12.19.55

64.55.00

66.55.18

25.04.42

Encke's Comet Star R 12^h 19^m 55^s 12.20Oct 27th 17^h 30^m 39^s Dec + 25^h 04^m 42^s 13.00Comet preceds * 8^h = 6^h 38^mNorth of * = 1^h 21^m 8^sR 12^h 19^m 51.75Dec + 25^h 05^m 28^s 9

Nov 3rd Dec

Oct 27 17.30.39

5.38.05

23.08.44

15.03.21

8.05.23

335.5

81

335.5

26840

2717.55

45.17

25.54.20

25.09.03

270

334.5

81

334.5

30792

311769

51.58

51.18

331.3

81

331.3

26566

268373

44.44

44.10

184.13.21

184.57.31

12.16

3.50

12.19.50

Nov 4th Dec

22.5

31.8

47.7

57.5

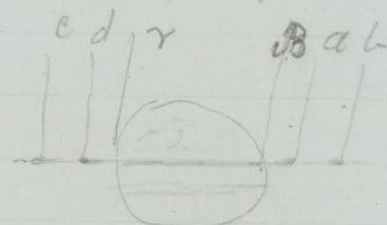
From Eph.

pdr 12.19.50

Dec +25° 09' 03"

Oct 28th

very beautiful view of Saturn.



Hyperion

I cannot perceive by the eye that γd & Ba are not equal
 The Southern Hemisphere is faintly diversified after Northern hooded

7. Pde

 γb γa Bd Bc

47.12

52.86

2) 5.74

2.87

52.29

52.32

.28

52.35

.43

.33

.28

52.88

52.82

52.85

49.97

2.88

It was difficult to measure the inner points

For an hour after dusk the air was in a remarkably fine state
 & the definition was admirable & the points seen as in July
 & seen better than since the disappearance of the ring the ring

0.326

519

Oct. 28

Hyperion from S.

$$\begin{array}{r}
 25.57 \\
 22.10^m \\
 14.29 \\
 \hline
 7.41 \\
 60.65 \\
 60.76 \\
 60.58 \\
 \hline
 60.68 \\
 49.97 \\
 \hline
 10.69 \\
 22.8 \\
 \hline
 12.97 \\
 25 \\
 \hline
 127.2 \\
 8.4 \\
 \hline
 135.6
 \end{array}$$

S to nearest limb

$$\begin{array}{r}
 53.28 \\
 53.20 \\
 53.26 \\
 \hline
 53.25 \\
 49.97 \\
 \hline
 228
 \end{array}$$

Hyperion & S follow Saturn. It is perhaps below the plane of ring

New Satellite of Saturn follows

Oct 28 M.S. 8 7^h 40^m 135°.6

Sat of Neptune Sat S.p

-49.00

48.76

48.74

48.83

49.97

$$\begin{array}{r}
 114 \\
 222 \\
 \hline
 172
 \end{array}$$

327° 15'

327° 30'

329° 45'

328° 10'

Power No 8

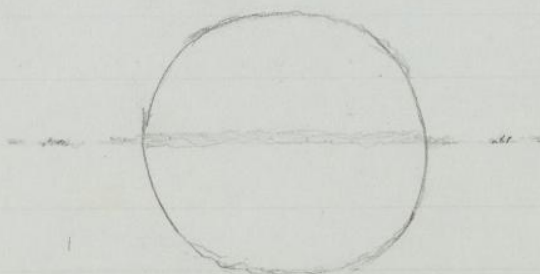
Observations

difficult. rays towards the satellite & perhaps pointing a little below it

Sat. of Neptune

Oct. 28th 8^h? Dist 11.2 Pos 211° 50'

Power 1500 Obs. difficult

Saturn October 28th

The Breaks in the Ring were distinctly seen. The dark ~~hole~~ across the body of the planet. did not appear even. The upper edge of the belt was above the light, on each side. Then

Oct. 28th

Obs. Immersion of

Star very unsteady.

2557 — 20^h 29^m 03.4 — 5 beats

η Librae

2557 — 20.. 32.. 6

239 — 5.. 56.. 36.3

2657 + 6.. 34.71

20.. 29.. 03.4

2.5

20.. 29.. 00.9

6.. 34.47

20.. 22.. 26.43

14.. 28.. 35.61

5.. 53.. 50.82

0.. 57.97

5.. 52.. 52.88

14.. 27.. 48.87

46.74

14.. 28.. 35.61

Imm. of η Librae

Imm. ~~5.. 52.. 42.75~~ M.S.P.W.C.P. 5^h 52^m 52.9 M.S.P.

Star very unsteady

Oct 30th Mr. Dawes

measured Enceladus 34.40

h. dist	0.94889	= 1.53656
	0.97968	9.96921
	9.96921	= 1.50577

Red to mean dist 32.04

E. fol. of center 32.04 at 2^h 32^m Camb. m. s. t.

" 19.85 " 6.. 46 "

506

1848

Nov 1st Lassel's Satellite of Nep.239-7^h - dist

48.223

Pos

140° 05'

W 13

135.07

135.20

138.30

Very Bad

Misty, no Definition

48.22

49.97

17.1

16.6

51.68

57.67

G.P.B. had seeing.

57.58

51.64

49.97

16.6

16.4

Hyperion following

dist from Saturn following limb.

239

7.33

74.37

74.38

74.41

74.44

74.40

49.97

24.43

49

23.94

8.4

2478

New Satellite from Pi centre

New 1st 7^h 33^m 247.8 following?

dist. Hyperion from new Sat follows

59.33

59.53

59.84

60.21

Pos

7.45

7.50

347.0'

347.45

new suspected sat star

from a star n.f.

7.40

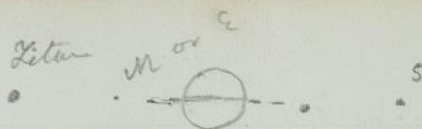
7.55

60.08

59.81

App & new star

+ Japetus



507

Nov 2nd

S to Saturn's fol. limb

Hyperion to S

45.72
 45.67
 45.76
 45.72
 49.92
 4.25
 18.12
 22.32
 4.5
 21.92
 8.4
 227.6

31.69
 31.86
 31.87
 31.93
 31.89
 31.85
 49.97
 18.12

New Satellite of Saturn

Nov. 2nd 7^h.10^m M.S.T.

Hyp. from Saturn's centre 227".6

Satellite follows.

Encl?
 Moon to N fol limb

Zero 49.95

7.20 48.35

48.21

7.23 48.29

48.283

49.97

1687

17.53

Bad seeing but the ring both on
 & off the Planet is distinctly seen

The dots are evidently below the dark
 stripes. The edge of the ring is not

an object requiring with the best atmosphere
 or favourable circumstances to see with the G.R.

h. dist 0.95098

0.97968

9.97130

1453 1.21827

15.47 = 1.18957

8.75

24.22

Red. to Mean dist

At 7.22 Encl. from N. centre 24".22

or 24.47 Eq. diam 18".0

Nov 3rd

Hyperion following Saturn

239
11.37

Dist

38.00

37.62

37.55

38.00

37.94

37.90

37.83

49.97

12.14

H from S - S pounds H

11.44

New Satellite of Saturn

2 to Saturn's nearest limit

7^h 50^m

42.75

42.66

42.72

42.71

37.83

80.54

92.94

19.40

29

42.71

49.97

7.26

12.14

194.0

3.9

190.1

4.4

198.5

Nov 3rd 1848 M.S.Y. 7^h 40^m

Hyperion follows Saturn's centre

198^h 5

The Moonlight begins to affect the
visibility of the new satellite.

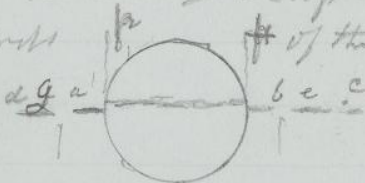
There seems to be no reason for
thinking its light variable.

Nov 3^d 1848

The Ring is exhibited in great beauty to night,

The divisions of the ring are so plainly seen that
no one could for a moment hesitate as to the cause,
viz. The light reflected from the inner edges of the rings

The dark Band stretching across the body of the planet
is - about the thickness of the band itself, above
the light



Power 140

or d

dist

49 61 = 49 59 = 49 615 = 49 605 = 49 605 following

limb of Saturn to b.

call foll. f - prev. p.

f to minos? 48.870 at 8.32.00

a to p — 49.564 h m

0.95196 48.778

0.97968 48.995

9.97228 121.7

1.07864 = 11.93

0.04892 = 11.19

48.800

48.700

48.743

48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

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48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

48.778

p. dist =

49.597 h m

49.672

49.605

49.630

49.616

49.616

49.616

49.616

49.616

49.616

49.616

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49.616

49.616

49.616

49.616

49.616

p to d — 49.325 h m

49.015

48.985

48.975

48.960

49.046

49.046

49.046

49.046

49.046

49.046

49.046

49.046

49.046

49.046

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49.046

49.046

49.046

49.046

49.046

49.046

49.046

49.046

49.046

49.046

49.046

Equatorial diameter of Saturn

Polar diam of Sat

Power 140 48.035

Power 140 48.035

9.97228 48.000

19.70 1.24447 47.980

1.26675 = 18.48 47.970

47.940

5.391925

47.985

47.995

20.10

48

19.70

48.115

48.125

48.085

48.060

48.125

48.125

48.125

48.125

48.125

48.125

48.125

48.125

48.125

48.125

48.125

Zero

49.998

49.995

49.992

49.993

49.995

49.995

49.995

49.995

49.995

49.995

49.995

49.995

Nov 3rd 1846

No. 6 Power 860

Polar diam of Saturn

48.150

48.130

48.160

48.155

48.153

48.155

126.3

48.153

48.153

48.153

Equatorial diam of Saturn

47.942

47.982

47.950

48.000

47.986

5.46260

47.9822

47.998

20.4620.46
41
20.05

Zero

50.003

49.996

49.995

3.149994

49.998

The light on the preceding side was not so broad as on the following, and tapered away preceding

210

81

210

1680

1701.0

21.41

+ 28.21.1 + 3"

16

196.29.11

196.57.06 + 3"

13.04

3.48

13.07.49.3

13.07.48.4

0.9

Eph

Oh

Cor. Eph

17.33.38

5.38.05

23.10.43

15.04.06

8.06.37

8.35.36

28

8.07.40

8.04.45

3.00

36

60

21.66

267.2

8.1

267.2

21376

2164.32

- 36.08.3

+ 18

35.55

11.44.53

11.08.58

11.06.18

2.42

Cor Eph

Encke
Nov 3

Comet

8. 20. 35.5
45.5

star 89th class

00.4 24.9
8.8

510

8. 21 44.4 22. 08.4
53.8 17.8

22. 33.8 22 57.5
42.8 07.5

23. 35.8 59.8
45.4 24 09.3

28.8 53.0
8. 24 38.7 8. 25 02.7
8. 22 40

Star of Comp.

Star A 13.0

2557 8. 39. 08.7

co. h 7. 26. 10
13. 14. 58.7
6. 48

* R 13 08 11
2 Virginis

8. 45. 21.4

co. h 7. 43. 56

13. 01. 25.4

12. 54. 37

06. 48

78° 57' 10"

1. 07

78 56. 03

11. 03. 57

78. 14. 25

78. 13. 18

1. 07

Mean Eq. Jan. 1. 1848. p. R

for x's place Dec. 30th

15) 206 (13.7

15
56
45
110

60) 206 (3.43 15

180
260
240
20

511

Comet condensed almost to a nu

8th/9th mag.

2557 Comet N of star 8.9

8. 33.54 = 69.08

14.54 68.83

35.50 = 68.57

36.27 = 68.34

36.54 68.16

8. 35.36 68.60

50.00

18.60

37

182.3 = 3.02.3

of Encke shows a tail
of 1° or 2° & is quite a respect-
able looking Comet. It has been
visible to the naked eye for
a week past. It has gone through
changes in throwing out its tail
similar to Halley's Comet of Feb 1847.
The amount of light in the tail is about
compensated by the
rush towards the sun.

Dec 11. 03. 57

Encke's Comet

Nov. 3. 17. 33. 38

Comet precedes * 8.9 = 0. 21. 10

North of * 3. 02. 3.

Star of Comp.

13. 08. 09.51

+ 11. 03. 15.7

0. 21. 10

3. 02. 3

13. 07. 48. 41 Dec 11. 06. 18. 0

Encke

Nov 3

Comet

8ⁿ 20ⁿ 35.5
45.5

star 8^g clear

00.4

8.8

8ⁿ 21 44.4
53.8

22ⁿ 08.4

17.8

22ⁿ 33.8
42.8

22ⁿ 57.5

07.5

23ⁿ 35.8
45.4

59.8

24 09.3

28.8

53.0

8ⁿ 24 38.7
8ⁿ 22 40

8ⁿ 25 02.7

24 21.10

Star of Comp.

2557 8ⁿ 39ⁿ 08.7co. h 7ⁿ 24ⁿ 1013ⁿ 14ⁿ 58.7* R 13ⁿ 08ⁿ 11

E Virginis

8ⁿ 45ⁿ 21.4co. h 7ⁿ 43ⁿ 5613ⁿ 01ⁿ 25.412ⁿ 54ⁿ 37

00.6 48

78ⁿ 14ⁿ 2578ⁿ 13ⁿ 18

1.07

Mean Eq. Jan 1st 1848for *'s place Dec 30thStar A 13ⁿ 08ⁿ 11ⁿ Dec +11ⁿ 03ⁿ 57ⁿ

Encke's Comet

Nov. 3ⁿ 17ⁿ 33ⁿ 38ⁿComet preceds * 8ⁿ 9ⁿ = 0ⁿ 21ⁿ 10ⁿNorth of * 3ⁿ 02ⁿ 3ⁿ

Star of Comp.

13ⁿ 08ⁿ 09.51+11ⁿ 03ⁿ 15ⁿ 70ⁿ 21ⁿ 103ⁿ 02ⁿ 313ⁿ 07ⁿ 48ⁿ 41Dec 11ⁿ 06ⁿ 18ⁿ 0

127
277
959
127
277
959
127
277
959

15) 206 (13.7
15
56
45
110

60) 206 (3.43 15
180
260
240
20

511
13
20
23
209

Comet condensed almost to a nu

8ⁿ 9ⁿ mag.2557 Comet N of star 8ⁿ 9ⁿ8ⁿ 33.54 = 69.088ⁿ 35ⁿ 366ⁿ 50

14.54 68.83

8ⁿ 28ⁿ 46

35.50 = 68.57

14ⁿ 52ⁿ 15

36.27 = 68.34

17ⁿ 36ⁿ 312ⁿ 53

36.54 68.16

17ⁿ 33ⁿ 38

9
4
2

8ⁿ 35.36 69.60
50.00
18.60
37
182.3 = 3ⁿ 02ⁿ 3

of Encke shows a tail
of 1° or 2° & is quite a respect-
able looking Comet. It has been
visible to the naked eye for
a week past. It has gone through
changes in throwing out its tail
similar to Halley's Comet of Feb 1847
a amount of light in the tail is about
21ⁿ 10ⁿ 21ⁿ 10ⁿ 21ⁿ 10ⁿ
operated by the
towards the sun.



Encke

Nov 3

Comet

8^h 20^m 35.5
45.5

star 8^h 9^m 24.9

00.4 24.9
8.8 23.3

2557 Comet N of star 8^h 9^m8^h 33.54 = 69.08

14.54 68.83

35.50 = 68.57

36.27 = 68.34

36.54 68.16

8^h 21 44.4
53.8

22^m 08.4 24.0
17.8 24.0

8^h 35.36 69.60
50.00
18.60
37
182.3 = 3^m 02^s 3

22^m 33.8
42.8

22 57.5 23.7
07.5 24.7

23^m 35.8
45.4

59.8 24.0
24 09.3 23.9

28.8

8^h 24 38.7
8^h 22 40

8^h 25.02.7 24.0 compensated by the
cor 13^m 24.07
21.10
2.97 brush towards the sun.

Star of Comp.

Star A 13^h 08^m 11^s Dec +16° 03' 57"2457 8^h 39^m 08.7

co. h 17^m 24^m 10^s
13^m 14^m 58^s
6^m 48^s

* A 13^m 08^m 11^s
2 Virginis

8^h 45^m 21.478^m 14.25

Star of Comp

13^h 08^m 09.51

+11° 03' 15.7

co. h 7^m 43^m 56^s78^m 13.180^m 21.103^m 02.313^m 01^m 25.412^m 54^m 37^s06^m 48^mMean by Jan 1st 1848. of Afor x's place Dec 30th13^h 07^m 48^m 41^s Dec 11° 06' 18.0

15) 206 (13.7

127

277

959

127

274

297

15) 206 (13.7

127

277

959

127

274

297

60) 206 (3.43 15)

180

260

240

200

511

127

277

959

127

274

297



Nov 6th Dec 1848

2557 + 6.54

Comet N of Star 8 double Encke's Comet that a prec. is used dist 10"

2557 8^h 37^m 10^s 62.29 1164
 39.10 61.77 1147 = 1.548
 40.27 61.41 15) 180 (12.00
 41.20 60.96 1.50 1.20 0.20
 Mean 8^h 39.30 61.61

8^h 43.7
 44.0
 45.4
 46.5
 46.1
 46.2
 50.8
 51.0
 53.7
 53.9
 56.3
 8^h 48.38

Comet proceeds

Star 8^h 43 47.8 58.2
 45^h 27.8^s 39.3 = 1.400
 8^h 46.05.2 15.7
 47.44.5 55.3

8^h 48.23.8 34.7
 8^h 50 03.7 = 1.399
 13.7^s 1.39.0
 8^h 50 49.8 51.00.8
 8^h 52 28.3 39.2 = 1.385

53 42.3 52.7
 55^h 20.2 = 1.379
 30.8 1.38.1
 7^h 44.45 1.54.3

Sif Dec.
 9^h 03.30 52.03

Lew 49.97

9^h 06.10 50.85

9^h 06.50
 9^h 07.07
 9^h 07.40

Star of Comp. lower right

8^h 57.03
 co. h 7^h 30.11
 13^h 26.52
 4^h 02.15 13.20.00

8^h 39.30
 6.56
 8^h 32.34
 19.00.08
 17.32.26
 2.52
 obs 17.29.34

Encke's Comet

Nov 5th 17^h 29^m 34^sComet proceeds * 8^h 1^m 41.06North of * 1^m 54.1R 13^h 18^m 14.68Dec + 7^h 43' 58.1Star R 13^h 20^m 00^sDec + 7^h 45' 30"at 9^h 07^m Comet same
Dec as Star

Star R 13^h 19.55.74
 1^m 41.06
 13.18.14.68
 Sif Dec 7^h 42.04.0
 1^m 54.1
 7^h 43.58.1

$$\begin{array}{r} 2.40 \\ 1.34 \\ \hline 4.34 \end{array}$$

$$17.29.34$$

$$41.44.30$$

$$53.35$$

$$23.07.40$$

$$15.04.22$$

$$8.03.18$$

$$8.05$$

$$190$$

$$72.450$$

$$8.05$$

$$152950$$

$$= 11$$

$$25.29.5$$

$$199.08.51.3$$

$$149.34.09$$

$$13.16.$$

$$2.16.7$$

$$13.18.16.7$$

$$247$$

$$505$$

$$1235$$

$$1976$$

$$198835$$

$$33.08.$$

$$32.56$$

$$8.19.19$$

$$7.46.23$$

$$2.40$$

$$7.43.43$$

$$1.54$$

$$7.41.49$$

error of Eph

From Eph

$$R 8.05.18 \quad 13.18.17$$

$$8.05.18 + 7.46.23$$

Reduction of the Obs. of Hyperion to the Dist of η on Sept 19th $\log = 0.9340$

	Obs'd Dist	Corrected
Camb. m.s.t	+ fol. - pre η centre	Dist
1848 Sept 19.56	+256"	+256.0
21.52	+220	+220.1
22.44	+192	+192.1
23.38	+145	+145.1
28.38	-156	-156.5
Oct. 13.32	+202	+204.8
14.29	+152	+154.3
15.40	+92.4	+93.8
20.31	-186.9	-191.0
21.42	-206.5	-211.2
23.42	-195.0 ^{178.0?}	-200.0 182.6?
27.34	+87.8	+90.5
28.31	+135.6	+140.1
Nov 1.31	+247.8	+257.2
3.31	+198.5	+206.6
2..30	+227.6	+236.6
1849 Jan 12.29	-131.6	-154.7

Sidereal Period 21.18 Mean solar days. Daily motion 17.00, at Mean dist of η , semiaxis = 214".3

Reduced to Sept 19th Mean semiaxis 238".0 $\log K$ 4.7950 $d\theta = K - \log a^{\frac{3}{2}}$

η 's Mean Dist. by 0.9795

eccentricity 0.115

Mean Long from Per. 97.0 Jan. 1st 1849

Perisaturnium 295°

The satellite passed the plane of the sky (on Sept 19th / 4
33.2 before it's perihelion

Does not satisfy the obs well

Phil Fr 17¹⁸/₁₇ Rev. James Pound Transit 4th Sat.
Hist d'Ac. 1707 Maraldi.

	Camb. M.S.T	Cor. for aberration	1 ^h 10 ^m to be applied
			Daily motion
1836	Feb 9 th 10 ^h 26 ^m	Long. of Rhea 270°	79.69033
	June 11. 5. 06	" Dione 90	131.53533
			190.69843
	July 12. 1. 41	" Jethys 90	~~124.92804~~
			262.73199 = 241952
	May 12. 3. 10	" Enceladus 270	~~137.17595~~ 2.55630 360°
			0.13678 1.3702 1 ^h 8 ^m 54 ^s

Ephemeris of Encke's Comet computed by Prof. P.
R

July 15	Mean Equinox Nov 26, 1848.	h ^h m ^m s ^s	h ^h m ^m s ^s	Declination	h ^h m ^m s ^s	♂	©
July 15	32° 02' 21".5	2 ^h 08 ^m 09 ^s .4	3.48	24° 07' 49".0	+29° 53'	2.1783	2.1713
16	23° 13.3	9 ^m 32.9		19° 37.8			
17	44° 10.4	10 ^m 56.7		31° 31.6			
18	33° 05.12.7	12 ^m 20.8		43° 30.5			
19	26° 20.0	13 ^m 45.3	3.53	55° 34.0	30.36	2.0886	2.1309
20	47° 32.9	15 ^m 10.2		22° 07' 42.8			
21	34° 08' 52.1	16 ^m 35.5		19° 57.4			
22	30° 17.6	18 ^m 01.2		32° 18.0			
23	51° 49.4	19 ^m 27.2	3.61	44° 44.7	31.36	1.9985	2.0898
24	35° 13.28.2	20 ^m 53.9		57° 17.3			
25	35° 13.8	22 ^m 20.9		23° 09' 56.2			
26	57° 06.2	23 ^m 48.4		22° 41.7			
27	36° 19' 05.5	25 ^m 16.4	3.68	35° 33.9	32.87	1.9082	2.0480
28	41° 12.2	26 ^m 44.8		48° 33.2			
29	37° 03' 27.0	28 ^m 13.8		24° 01' 39.5			
30	25° 49.7	29 ^m 43.2		14° 53.1			
July 31	48° 20.5	31 ^m 13.5	3.78	28° 14.1	33.70	1.8179	2.0054
Aug 1	38° 10' 59.5	32 ^m 43.9		41° 42.9			
2	33° 33.48.4	34 ^m 15.2		55° 20.1			
3	56° 46.5	35 ^m 45.1		25° 09' 06.2			
4	39° 19' 54.7	37 ^m 19.6	3.88	23° 01.5	35.18	1.7276	1.9619
5	43° 13.6	38 ^m 52.9		37° 05.9			
6	40° 06.43.8	40 ^m 26.9		51° 19.5			
7	30° 25.3	42 ^m 01.7		26° 05' 43.1			
8	34° 18.3	43 ^m 57.2	4.01	20° 17.0	36.85	1.6375	1.9177
9	41° 18' 23.7	45 ^m 13.7		35° 01.5			
10	42° 43.3	46 ^m 50.9		49° 57.1			
11	42° 07' 17.5	48 ^m 29.2		27° 05' 04.4			
12	32° 06.3	50 ^m 08.4		20° 23.8	38.83	1.5478	1.8725

$\frac{241.20}{13.47}$

hly no

Aug 13	42. 57. 10.0	2. 51. 48.7	27. 35. 55.8	~~1.4587~~	~~1.5253~~
14	43. 22. 29.9	53. 30.0	51. 40.8		
15	48. 08.1	55. 13.6	28. 07. 39.4		
16	44. 14. 06.4	56. 56.4	23. 52.0	+41.14	1.4587
17	40. 23.7	58. 41.6	40. 19.4		1.8263
18	45. 07. 01.5	3. 00. 28.1	57. 02.2		
19	33. 59.3	02. 15.9	29. 14. 01.0		
20	46. 01. 17.1	04. 05.1	31. 16.4	+43.87	1.3702
21	28. 58.0	05. 54.9	48. 49.2		1.7794
22	57. 05.2	07. 48.3	30. 06. 40.0		
23	47. 25. 41.8	09. 42.8	24. 49.3		
24	54. 51.0	11. 39.4	43. 17.9	+47.02	1.2825
25	48. 24. 29.9	13. 38.0	31. 02. 06.3		1.7319
26	54. 35.6	15. 38.4	21. 15.4		
27	49. 25. 05.2	17. 40.3	40. 46.0		
28	56. 00.0	3. 19. 44.5	32. 00. 38.7	1.1959	1.6826
29		3. 21. 50	32. 20. 54		
30	at 20.47 lamb.	3. 24. 00	32. 41. 33		
Aug 31		3. 27. 37	+33. 15. 44		
Sept 1	at 20. 47	3. 29. 56	33. 37. 38		
Sept 2	at 20. 47	3. 32. 18	34. 00. 02		

To mein Herr ich habe

1948phae.proj. 161B



Ear
Obs
Bo