

KG
11365
168

H. 14

Vol. III 1-98

Equatorial

From Dec. 4, 1851 To
May 18, 1852

KG-11365.168

Orion h star Feb 16 p 40

γ Virginis $12^h 33^m - 0^\circ 34'$

* Castor Time of rev 250 years

* Orionis

* Nebula in 8 $5^h 25^m + 21^\circ 54'$

H 1622 Spinal Nebula in Canes Venatici -

— $13^h 23^m + 48^\circ 04'$

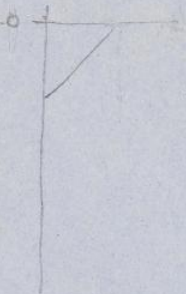
35 M. Cluster $5^h 59^m + 24^\circ 21'$

$6^h 47^m$ Close double 1" — $6^h 08^m + 59^\circ 26'$

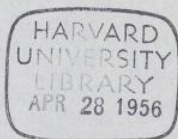
star near H. V No. 20 M $4^h 02^m 05^s + 8^\circ 59' 11''$

1952 Feb 26 Chemical focus shorter

than Optical by $1\frac{1}{8}$ inches.



KG 11365.168



1852

Jan. 8

Encke's Comet

Jan. 8 at 6^h 22^m Camb. m.s.t. Δ 23^h 01^m 01^s $\delta + 3^{\circ} 44' 21''$ $\left[\Delta 23^{\circ} 01' 03.33'' \delta + 3^{\circ} 52' 45.75'' \right]$
 9 23^h 02^m 06^s + 3^h 48^m 58^s another star same mag.
 precedes 31 and is with 11.30

Jan. 13

Encke's Comet

13 6^h 22^m Camb. m.s.t. Δ 23^h 06^m 36.2 $\delta + 4^{\circ} 09' 09''$
 14 — — — — 23^h 07^m 47.53 4^h 14^m 39^s

Weisser Horn 23 No. 111

* Δ 23^h 06^m 27^s $\delta + 4^{\circ} 11' 34''$

Δ 23^h 05^m 06.93 Δ 1825.0

prec 1^h 22.30see var 00.00 Δ 23^h 06^m 29.23 * Δ 1852.0d. Δ 8.85g Δ 23^h 06^m 38.08

cor for paral. + 23

 Δ 23^h 06^m 38.31

+ 4^h 02^m 48.6
 prec 8^h 45.96

* $\delta + 4^{\circ} 11' 34.55''$
 2^h 02.91

$\delta + 4^{\circ} 09' 31.65''$
 cor for paral. + 2

4^h 09^m 33.90 sec

~~sec~~ δ
 prec 3.048

27

21336

6096

82.296

1^h 22.296

19.49

-101

1948

27

13636

3896

525.96

8^h 45.96

$$(p + p + \frac{s}{100} \times 2y) \times y$$

Jan 13 Encke's Comet

3



Comet south pol. *

Comet very faint -
great deal of cirrus
flying about

Dy Dec

2..06..30	36.19
8..08	36.75-
9..30	36.01
10..30	37.30
13..38	37.36
14..50	37.20
2..10..31	41.81
chron. fast 3.6	36.97
2..10..274	4992
	129.5-
	9.8
	10360
	11655-
	126.910
	2..06.91 = dig Dec
	4 circ. per mut. in 27
	2..02.91 = dig in 8

Dy. R

* 2..19..233-	5
R 2..5-	9.0
x 19 57	8.0
R 2 20, 0570	
30.3	
20..88.5-	8.2
82	
2..21..4100	9.0
07	
2..22..16.5-	9.5-
alt { 16 15 8.0	
17.0 8.5	
17. 8.5	
18 9.0	
2..23..30	
38.3-	
2..24..47.4	8.9
04.0	
25 12.5-	8.5-
48	
2 25..57.5-	9.5-
294	
2..26..38.7	9.3
	88.4

Jan. 13 Encke's Comet

Dif. R

$$\begin{array}{r} 15 \\ 2, 32, 23.5 \end{array}$$

$$\begin{array}{r} 01 \\ 2, 33, 10.0 \end{array}$$

$$\begin{array}{r} 55 \\ 34, 01 \end{array}$$

$$\begin{array}{r} 275 \\ 2, 34, 36.9 \end{array}$$

$$\begin{array}{r} 16 \\ 17 \\ 17 \end{array}$$

$$\begin{array}{r} 15.5 \\ 2, 37, 24.8 \end{array}$$

$$\begin{array}{r} 57 \\ 2, 38, 06.5 \end{array}$$

$$\begin{array}{r} 9.5 \\ 17) 150.4 \\ 136 \\ 14.4 \\ 136 \\ 80 \\ 85 \end{array}$$

Comp. Star

$$2, 48, 19.5$$

$$\begin{array}{r} -2 \\ 2, 48, 17 \end{array}$$

$$2, 48, 13$$

$$H 3, 41, 16$$

$$2, 48, 13$$

$$53.03$$

$$\begin{array}{r} 1 \\ 2, 3, 06, 57 \end{array}$$

Dif. Dec

$$2, 43, 00 \quad 38^{\circ} 00' \text{ good}$$

Zero

$$49.91$$

$$93$$

$$93$$

$$7$$

$$49.92$$

$$\begin{array}{r} 23, 06, 29.23 \\ - 1.60 = \text{cor. to app. place 1852 Jan 13} \end{array}$$

$$23, 06, 27.63$$

$$+ 8.85$$

$$23, 06, 35.48$$

$$\text{cor. for paral.} + .23$$

$$A 23, 06, 35.71$$

$$23, 06, 37.74$$

App. place by Ephemeris

$$\delta + 4, 11, 34.81 \quad * \text{ mean } \delta \text{ 1852.0}$$

$$- 6.62 \quad \text{cor. to app. } \delta \text{ 1852 Jan. 13}$$

$$+ 4, 11, 28.19$$

$$- 2, 02.91 = \text{dis } * \text{ } \delta$$

$$4, 09, 25.28$$

$$+ 2.00 = \text{cor. for parallax}$$

$$\delta + 4, 09, 27.28$$

$$4, 09, 17.05$$

$$10.23$$

app. δ by Ephemeris

January 17

Eneke's Comet

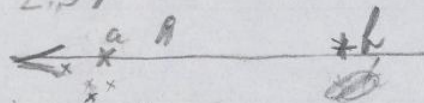
Place of Eneke's Comet

17 at 6^h 22^m Camb m.s.t. Ar 23.11.30.33 $\delta + 4.32.09$
 23.12.47.47 $\delta + 4.38.19$

Eles of comp.

6 mag. B.A.C. 8/27 Ar 23.12.48 $\delta + 4.34.27$

h
 2.10
 49
 2.59



a in Weiss Hra 23 No 229

a in B.A.C. No 6127

Diff in Dec. as a

2.24.30	27.66
26.30	27.30
28.25	27.65
30.00	27.39
32.00	27.41

2000
 49.93
 98
 49.93

3.03.15	28.41
04.50	29.01
06.10	28.98
08.00	29.05
09.20	29.13
	81.99
2.47.18.0	28.199
	49.93
	29.731
	9.8

173848

195579

2129638

3.32.96 = day 8

diff Dec. as h 4070

40.18

Diff in Ar as a

x	4033.3	14.5
A	2.40.47.8	
	24.5	
A	2.41.39.0	14.5

28
 4014
 49.93
 9.79
 9.8
 7832
 8811
 95942

x	42 17.0	
A	2 42 31.1	14.1

diff 8 and 1. 35.94
 as 3.32.96
 h 8 1.5702

	44.5	
I	2 43.59.5	15.0

	30.5	
A	2 44.45.0	14.5

	39.5	
A	45.54.9	15.4

	19.0	
A	2.46.34.0	15.0

	11.0	
A	2.47.25.5	14.5
	37.5	
	2.44.12.8	14.69

Jan. 17 Pm

Encke's Comet

7

Dij. in A2 cont.

x 9, 19.5 14.7
 A 2, 45, 34.2

07.0
 A 2, 50, 22.8 15.8

53.0
 A 51, 09.2 16.2


33.2
 A 2, 51, 48.6 15.4

18
 A 2, 52, 33.2 15.2

06.0
 A 2, 53, 21.3 15.3

*A 5 54.5 16.0
 A 54, 10.5
 L 2, 55, 24.5

A 5 56
 A 2 56, 11.2 15.2
 L 57, 26.0 43.8
 2, 52, 23.9 15.47
 2, 44, 12.8 14.69
 96, 46.7 10.16
 2, 48, 23.35 15.08 = dij. in R
 - 2
 2, 48, 21.35 2, 48, 29.35

There is either a nucleus
 or a small star of the 18 mag on
 the north pol. side of the comet
 as at a 

^{h m}
 3, 55 sid. Tim the little
 the little star (a) is much
 fainter, but is not yet
 centrally located.

^{h m}
 3, 43 The star is near the
 centre of the comet and
 is much fainter, though
 it sparkles as bright as
 usual at times.

19.44, 17.28
 46.94
 19.45 04.62

2, 48, 29.35
 19.45 04.02
 7, 203, 25.33
 19.45 04.02
 7, 3, 26.07
 1, 09.36
 7, 2, 16.71 M.S.G.
 7, 02, 16.71 M.S.G.

Jan 17

Encke's Comet

B.A.C. 8127 $\overset{h}{R} \overset{m}{23} \overset{s}{12} 42.09$ 1852.0

Am. prec. + 6.60

Sec. var. - .00

prop. mot. + .00

23.12.48

$\overset{h}{R} \overset{m}{23} \overset{s}{12} 48.19$ 1852.0

+ 3.049

2

6.098

"

- 19.63

2

39.26

N.P.D. $85^{\circ} 26' 12.8''$ 1850.0

Am. prec. - 39.26

Sec. var. - 0.00

prop. mot. + 0.00

$85^{\circ} 25' 33.54''$ 1852.0

$\delta + 4^{\circ} 34' 26.46''$

3.048

27

2133.6

6096

8229.6

1.22.30

XXIII
Weisse Hops No. 229

$\overset{h}{R} \overset{m}{23} \overset{s}{09} 55.40$ 1825.0

Am. prec. + 1.22.30

Sec. var. + 0.00

prop. mot. - 0.00

$23^{\circ} 11' 17.70''$ 1852.0

19.58

27

13706

3916

528.66

8.48.66

Dec. + $4^{\circ} 27' 19.8''$ 1825.0

Am. prec. + 8.48.66

Sec. var. + 0.02

prop. mot. 0.00

$4^{\circ} 36' 08.48''$ 1852.0

Obs'd dif. B.C. & Weiss

Obs'd dif. a & b

Jan 17 $1^{\circ} 35' 94''$ 204 2.71.9

17 $1^{\circ} 30' 00''$ 204

19 $1^{\circ} 37' 4''$ 306 3.112.2

19 $1^{\circ} 29' 75''$ 404

5.184.1

1.29.83

dif. a & b

1.36.8

dif. B.A.C. 8127 & star of Comp

B.A.C. 8127

$\overset{h}{R} \overset{m}{23} \overset{s}{12} 42.09$

Dec $4^{\circ} 34' 26.46''$

Obs'd $1^{\circ} 35' 94''$

+ $4^{\circ} 36' 02.40''$

Obs'd dif. of W 229

B.A.C. 8127 for 1852.0

$\overset{h}{R} \overset{m}{23} \overset{s}{12} 48.19$

Dec + $4^{\circ} 34' 26.46''$

Comp. * dif. $1^{\circ} 29.83$

+ $1^{\circ} 36.82$

Comp. * $\overset{h}{R} \overset{m}{23} \overset{s}{11} 18.36$ Comp. * $8^{\circ} 4.56-03.38$

Comet dif. $1^{\circ} 14.92$

3.32.26.96

15.08

+ $4^{\circ} 34' 06.1''$

$\overset{h}{R} \overset{m}{23} \overset{s}{11} 33.44$ δ $4^{\circ} 32' 30.32''$

Jan. 17 Encke's Comet

B.A.B. $\overset{h}{23}^{\circ} \overset{m}{12}' \overset{s}{48.19}$ 1852 B.A.C. Dec + $4^{\circ} 34' 26.46''$

$$\begin{aligned} & \text{dy. } A \times B \quad 1.14.92 \\ & A \times R = 23.11.33.27 \\ & \text{cor. for paral.} + .23 \\ & 23.11.33.50 \end{aligned}$$

$$\begin{aligned} & \text{dy } B \times B \quad 1.57.02 \\ & 4.32.29.44 \\ & \text{cor. for paral. } 7'' - 22 \\ & 4.32.29.22 \\ & \text{cor. for paral. } 2'' \\ & 4.32.31.22 \end{aligned}$$

Reduction of stars B.A.C. 8127 to app. place

$$\begin{aligned} & B.A.C. \text{ off} + 8.8160 - 8.1369 + 0.4641 + 7.7166 \text{ in } A \\ & - 0.9314 + 1.2595 - 9.4250 + 0.4610 \\ & - 9.7474 - 9.9964 - 9.9091 + 8.1776 \\ & - 0.5590 - 0.2491 - 0.8110 + 0.01509 \\ & - 0.2491 \\ & - 0.5590 \\ & - 1.6191 \\ & + 0.0150 \\ & - 1.6041 = \text{cor in } R \text{ for app. } A \end{aligned}$$

$$\begin{aligned} & \text{Dec} + 4.34.26.46 \\ & \text{cor. for app } 8 - 7.05 \\ & 4.34.19.41 \text{ 1852 Jan 17} \\ & \text{dy } B \times B \quad 1.57.02 \\ & 4.32.22.39 \\ & \text{cor. for paral.} + 2'' \\ & 4.32.24.39 \\ & \text{app. Ephem. } 4.32.19 \\ & 3.39 \end{aligned}$$

$$\begin{aligned} & \text{In Dec } \overset{a'}{-9.65.22} - \overset{b'}{8.89.14} - \overset{c'}{1.29.29} - \overset{d'}{9.31.16} \\ & - 0.9314 + 1.2595 - 9.4250 + 0.4610 \\ & + 0.5896 + 0.1509 + 0.7179 - 9.7726 \\ & + 9.892 - 1.416 + 3.224 + 0.5922 \\ & + 5.224 \\ & + 9.056 \\ & - 2.008 \\ & + 9.056 \\ & + 7.048 \\ & + 8.232 \end{aligned}$$

$$\text{Comp. } * A \overset{h}{23}^{\circ} \overset{m}{11}' \overset{s}{18.36} \delta + 4^{\circ} 36' 03.28''$$

$$\Delta \alpha + 15.08 \quad \Delta \delta - 3.32.96$$

$$\begin{aligned} & B.A.C. * A \overset{h}{23}^{\circ} \overset{m}{12}' \overset{s}{48.19} \\ & 8127 \text{ cor. to app. } A - 1.60 \quad 18 \\ & 23.12.46.59 \text{ 1852 Jan 17} \\ & \text{dy } A \times B \quad 1.14.92 \\ & 23.11.31.67 \\ & \text{cor. for paral.} + .23 \\ & 23.11.31.90 \text{ app. } A \\ & \text{Ephem. } 23.11.32.47 \\ & 0.57 \end{aligned}$$

Encke's Comet

$$\begin{aligned} & \text{Jan. 17 } \overset{h}{7}^{\circ} \overset{m}{02}' \overset{s}{16.77} \text{ M. 9.54} \\ & \text{Comets } A \overset{h}{23}^{\circ} \overset{m}{11}' \overset{s}{33.27} \text{ M. Equinox} \\ & \delta + 4^{\circ} 32' 30.32'' \text{ 1852.00} \end{aligned}$$

Comparison stars determined from B.A.C. 8127

Comparison of observed place with Encke's Ephemeris in
 Ast. Nach. No. 783 Calc. Obs.
 $A + 0.57$
 $\delta - 5.39$
 16 Comp. in R & 10 in Dec

Jan 19

Encke's Comet

At 6^h 22^m Cambridge

by Ephem.

19^h M

23.14.06.13

8 + 4.44.39

20

23.15.26.13

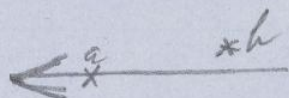
4.51.08

h m
2.40

45 54

3.18.54

3.26



Dif. in dec. stars a & h of the 17

Loon 38.98
49.97 40.06
93 40.00
94 40.01
95 49.95
14 9.84
95 97.4
1.37.4

Dif. in Δ as h
a 3.02.23 h 3.04 52.9 1.29.9
a 32.5 h 02.0 1.29.9
a 3.04.37.0 07.0 1.30.0
46.4 3.06 16.0 1.29.6
3.0 1.29.75

Jan. 19

Dif. in Dec h is B.A.C. 8127

h & c e comp. stars of tonight

93.90
94.12
94.16
94.22
16.40
94.10
49.94
44.16
9.8
353.28
997.44
492.768
7.12.77
an. for ref. 7.12.77

Dif. in Δ
1st wire = h 1 44.5 c 3 27.5 1.43.0
2nd - h 3.57.58.5 c 3.53 41.4 1.42.9
h 18.0 e 56.0 1.43.0
h 3.54.27.0 c 3 56 10.0 34 43.0
h 49.4 c 32.8 1.43.4
h 3.57.09.4 c 3 38 46.4 1.43.0
18.3

8127 B.A.C. M 23.12.48.19
Y.43.09

Dec + 4.34.26.46 d.h. 1.43.05
7.13.47
an. for ref. + 0.4
1.43.09

* of amp. h 23.14.31.28 = e^h M * 8 + 4.41.39.93 = e^h S

days 21.22
M 23.14.10.06

8 + 4.45.12.46

Jan. 19

Encke's Comet

11



Comet north ful. stars

Dij. in R e & A

A 14, 17.0
e 3, 14 38.5 21.5

A 15 08.3
e 3, 15, 29.8 21.5

15, 55
16 16.4 21.4

A 17, 28
e 3, 17 49 21.0

18, 26.8
3, 18 48.5 21.7

A 3, 19, 30.8
e 3, 19 32.0 21.2

A 20, 24.3
e 3, 20, 45.4 21.1

21, 28.4
3, 21 49.4 21.0

A 22, 11.8
e 3, 22 32.4 20.6

3, 18, 18.93 11.0
21.22 = dA

19, 52, 10.35
46.24
19 52 57.13

3, 18, 16.93 29

3, 18, 45.93

19, 52, 57.13

7, 25, 48.80 M.S.T.

1, 13, 04

7, 24, 35.76

Dij. in Dec

3, 27, 10 71.42

28, 40 71.75

29, 30 72.20

31, 30 72.25

33, 13 72.20

35, 13 72.13

3, 31, 00.8 11.97

71.995

49.95

22.045

647 9.8

7176380

198405

2160410

3, 36.04

cor. for mult. 13 3.51

d8 + 3, 32.58

Jan 19th (cont.)

Encke's Comet

Cor. for Refraction for dir of Star -

Preceding * is South

comp. star 10 mag

$$h = 4^{\circ} 40' \quad \text{Dir} = 4^{\circ} 40'$$

for $d\delta = 10'$ cor R 0.06. But Dir for $d\delta$ Dir 10' is 1.0

$$\begin{array}{r} \text{Dir An} \quad 7' \\ + 0.04 \\ \hline \end{array}$$

= Cor. obs. Dir R of *

$$\begin{array}{r} 7 \\ + 0.7 \\ \hline \end{array}$$

= Cor $d\delta$ Dir *

Place as star of comp. determined from B.A.C. 8127

$$\begin{array}{r} \text{star of comp} \\ R \quad 23.14.31.28 \end{array}$$

$$dR_{*} \quad -21.22$$

$$R \quad 23.14.10.06$$

$$\text{cor. for parall.} \quad + .22$$

$$R \quad 23.14.10.28$$

$$\text{cor. to app. } R \quad -1.60$$

$$23.14.08.68 \quad \text{app. } R$$

$$\text{Ephem. } 23.14.09.61$$

$$\text{calc-obs} = +0.93$$

$$\text{star of comp } \delta + 4.41.39.93$$

$$d\delta \quad + 3.92.53$$

$$4.45.12.46$$

$$\text{cor. for parall.} \quad + 2$$

$$\delta + 4.45.14.46$$

$$\text{cor. to app. } \delta \quad - 7.02$$

$$4.45.07.41$$

$$\text{Ephem. } 4.44.56.28$$

$$\text{calc-obs} = -11.13$$

$$\text{Comp. star } R \quad 23.14.31.28 \quad \delta + 4.41.39.93$$

$$\begin{array}{r} R - * \\ 4\alpha - 21.22 \quad \delta + 3.32.53 \end{array}$$

Encke's Comet



The observations of Encke's Comet thus far have been corrected for parallax and refraction. The obs. of 13.17.8.19 have been expunged and places substituted uncorrected for parallax.

$$\begin{array}{r} \text{Jan. 19} \quad 7.24.35.76 \quad \text{M. Time Camb.} \\ R \quad 23.14.10.28 \quad \text{M. Equinox} \\ \delta + 4.45.14.46 \quad 1852.00 \end{array}$$

Comparison star determined from B.A.C. 8127

Comparison of observed place with Encke's Ephemeris in Ast. Nach. No. 783

$$\text{Calc. - Obs.}$$

$$R + 0.93$$

$$\delta - 11.13$$

Jan. 20_{xc}

Est. Therm. -1°

Encke's Comet

2., 38
 $\frac{45}{8, 23}$

Dif. in Ar

$\begin{matrix} P \\ * \end{matrix} \begin{matrix} 47, 41 \\ 2 \end{matrix} 47, 47.5$ 6.5

49, 57.5
 2, 49, 57.5 6.0

49 36.5
 2 49, 49.5 7.0

50 21.5
 2 50, 28.5 7.0

51 22.5
 51, 29.5 7.0

$\begin{matrix} P \\ * \end{matrix} \begin{matrix} 51 53.0 \\ 2 \end{matrix} 51, 58.9$ 6.9

52 39.5
 52, 40.4 6.9

53 16.5
 2, 53, 23.2 6.7

53 54.5
 54 01.0 6.5

54 41.2
 $\frac{48.0}{2, 54, 48.0}$ 6.8
 $\frac{16, 67.3}{2, 51, 31.17}$ 6.73 = diff

Dif. in Dec

$\begin{matrix} 3, 00.00 \\ 3, 27.00 \\ 28.40 \\ 30.30 \\ 32.00 \\ 35.00 \\ 36.40 \end{matrix} \begin{matrix} 71.00 \\ 72.94 \\ 72.98 \\ 72.77 \\ 73.18 \\ 72.90 \\ 72.80 \end{matrix}$ *part*
 3, 31.38 18.07
 73.01
 49.93
 23.08

9.8
 184.64
 207.72
 226.184
 3, 46.18 = d8

as for motion on 10.80.
 18 x 5 p 3, 35.38

2, 51, 31.17

$\frac{-2}{2, 51, 29.17}$ 19.56, 06.95-
 $\frac{38}{2, 52, 07.17}$ 46.74
 19, 56, 53.69 19 5-6 53.69
 $\frac{1, 080.2}{6, 54, 05.46}$ 19.57

Jan. 20

Enckes Comet

$$H 4.35 \quad \delta + 4.48$$

h m s

$$c A 23.14.31.28 \quad c \delta + 4.41.39.93$$

$$dM a e \quad 1.03.47$$

$$a A 23.15.34.75 \quad a \delta + 4.47.57.40$$

$$dA a e g \quad 6.73 \quad 3.35.38$$

$$p A 23.15.28.02 \quad p \delta + 4.51.32.78$$

$$as to app. 1.6$$

$$23.15.26.42 \quad app \delta + 4.51.25.78$$

$$C Ephem 23.15.27.63 \quad Ephem 4.51.16.64$$

$$1.21 \quad 9.14$$

$$Dy. Decca$$

$$a is useful$$

$$3.46 \quad 88.67$$

$$8.41$$

$$8.30$$

$$8.20$$

$$Zero \quad 8.30$$

$$49.93 \quad 18.8$$

$$48.376$$

$$49.93$$

$$34.446$$

$$9.8$$

$$307568$$

$$346014$$

$$376.7708$$

$$6.16.77$$

$$+ .7$$

$$Dy. A 6.17.47 = ds \times c a$$

$$c \quad 3 \quad 26.5 \quad a \quad 4 \quad 30.0 \quad 1.03.5$$

$$c \quad 3 \quad 53.43.0 \quad a \quad 3 \quad 54.46.5 \quad 1.03.5$$

$$c \quad 5.17.8 \quad 1 \quad a \quad 21.0 \quad 1.03.2$$

$$c \quad 3 \quad 55.34.0 \quad a \quad 3 \quad 56.37.9 \quad 1.03.9$$

$$12.0 \quad 15.0 \quad 1.03.0$$

$$57.28.5 \quad 3.58.32.0 \quad 1.03.5$$

$$26$$

$$1.03.43$$

$$as. for ref. + .04$$

$$dA \times c a a \times 1.03.47$$

Enckes Comet

$$a * \text{ of comp. } A 23.15.34.75 \quad 1852.00$$

$$a * \quad \delta + 4.47.57.40 \quad 1852.00$$

$$dA - 6.73 \quad d\delta + 3.35.38$$

h m s

$$Jan. 20 \quad 6.54.05.46 \quad M. I. Line Camb.$$

$$p A 23.15.28.02 \quad M. Equinox$$

$$p \delta + 4.51.32.78 \quad 1852.00$$

Comparison with Enckes Ephemeris

Calc. — Obs.

$$A + 1.21$$

$$\delta - 9.14$$

Jan. 23.

Encke's Comet

Place of Com.
 at 6^h 22^m 22^s $23^{\circ} 18' 10.6''$ $8 + 5^{\circ} 04' 36''$
 23 $23^{\circ} 19' 35.00$ $5^{\circ} 11' 34''$

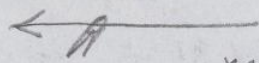
49.96

94

Weisse Hora 23 No. 413 414

3^h 11^m 00^sNo 413 No 23, 20, 42 $8 + 5^{\circ} 14' 58''$

Def. Dec.



xa comet south pole Comet is much brighter
 x a comp. stars

3^h 11.00 22^h 01

13.30 27.33

16.00 27.50

18.30 27.30

21.00 27.22

3^h 16.00 136

27.27

49.52

22.65

9.8

18120

20385

221970

3^h 41.97

cor. for met. in 13

-3.9

3^h 38.07

cor Ref

+0.2

3^h 38.27Cor for Ref. diff. = 3^h 30^m

h for the for R

H 3^h 56^m 00^s H 4^h 10^mDec + 5^h 13'

Cor in R for diff Dec 10'

0.03

diff Dec 3^h 0.01 = Cor in R

diff in Dec

0.6

+0.2 = Cor in Dec

Def. in R

26.32.0 x 3^h 27.37.5 1^h 05.53^h 26.49.0 x 3^h 27.54.0 1^h 05.03^h 25.0 x 3^h 29.30.5 1^h 05.53^h 28.41.4 x 3^h 29.47.3 1^h 05.93^h 30.16.8 x 3^h 31.39.0 1^h 05.73^h 30.39.0 x 3^h 31.39.0 1^h 06.03^h 20.0 x 3^h 25.0 1^h 05.03^h 32.36.5 x 3^h 33.41.2 1^h 04.73^h 29.31.71 43.3-2 1^h 05.41 = 1^h 05.423^h 29.29.711^h 01.603^h 30.31.31 cor. sid. time20^h 08.43.367^h 21.47.951^h 12.387^h 20.35.57 M.G.

26

Jan. 23 Encke's Comet

Star of comp. Weiss Hora 23 No. 413

Am. p. 15.74	Am. p. 3.048
sec. p. + .00	sec. p. 0.000
15.74	3.048
27	27
13878	21336
3948	60960
53358	82296
8.53.98	1.22.30

$\begin{matrix} h & m & s \\ * R & 23.19.21.72 & 1825.0 \\ & + 1.22.30 & \end{matrix}$

$\begin{matrix} * & 23.20.44.02 & 1852.0 \\ & + 5.15.39.58 & 1852.0 \end{matrix}$

$\begin{matrix} dR & 8x & 1.05.42 \end{matrix}$

$R, 23.19.38.60$

$\begin{matrix} dS & 8x & 3.38.27 \end{matrix}$

$\delta + 5.12.01.36$

Encke's Comet

Star of comp. Weiss Hora 23 No. 413

$\begin{matrix} * & \text{of comp. } R & 23.20.44.02 & 1852.0 \\ & \delta + 5.15.39.58 & 1852.0 \end{matrix}$

$\begin{matrix} \delta - * \\ dA - 1.05.42 & dS - 3.38.27 \end{matrix}$

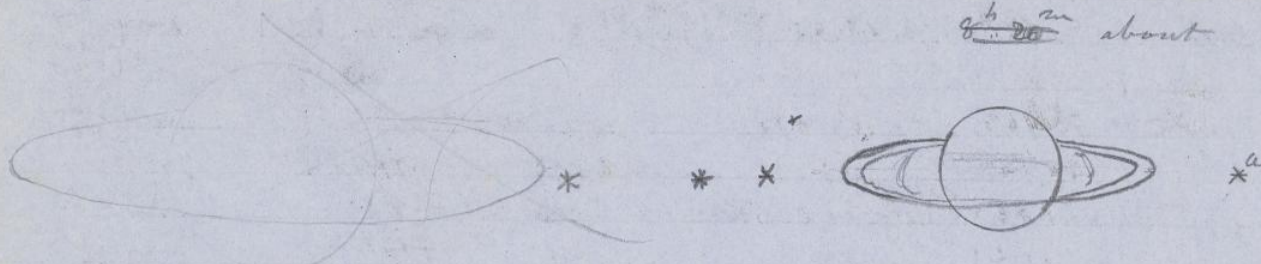
Jan. 23 $\begin{matrix} h & m & s \\ 7.20.35.57 & M. G. Line Camb. \\ R & 23.19.38.60 & M. Equinox \\ \delta + 5.12.01.36 & 1852.00 \end{matrix}$

Jan. 24th 1852

Saturn

Very bad vision

17

 $\frac{8.5}{20}$ about

Enceladus

is ~~Mimas~~ ^{Enceladus} At 8^h 10^m it was in the axis of ring (prolonged) & at its greatest elongation Distance of Mimas on fol. side from nearest limb of Saturn just equal to dist. of outer edge of ring from twice the dist. of outer ring edge of outer ring from nearest limb of ball

Enceladus

On Following side dist. of Mimas from center of ball = S.d. of ring + S.d. of ring - S.d. of ball
= 2. S.d. Ring - S.d. ball

At 8^h 10^m M.S.P. - Reduced to Mean dist.

= Diameter of ring - Semidiam of ball

Enceladus fol. Saturn's center 31" good estimate

= 40" - 9" = 31" at mean dist.

The above estimate must be very close - as the estimate was made repeatedly & the edge of ring was found central between Mimas & edge of ball. & it was precisely in the axis of ring.

At 9^h 5^m Mimas was in the following position sensibly below the prolongation of axis but still at the above distance



Enceladus

Had it been a star Saturn would have approached it by 9" in R & the axis of ring would have appeared below M by 4"

Jan 26th 1852

Enceladus!

	forward	backward
prec. the prec.	50.98	48.85
ansa, outer edge	50.95	48.90
measured in the	50.963	48.875
direction of the	49.930	49.930
axis of ring	1033	1055
	1055	
	2088	
	10.44	
	21	

Σ. prec. ansa

10".23 at 2^h 24^m Sid.

$$h. \text{ dist} = 0.96912$$

$$0.97968$$

$$9.98944$$

$$10".23 \quad 1.00988$$

$$9.99 = 9.99932$$

$$20.04 = \text{S.d. Ring}$$

$$30.03$$

At --- 6^h 02^m M.S.D.

G.P.B.

Enceladus prec 1/2 centre by 30".03

Red to Mean dist

Sat. ap. below ring.

S.d. Ring 20".045

Agrees with cal. place

By C.W. Fritter - 6^h 30^m Σ prec 1/2 29".46

8".22 " 32.63

h m
2.52 sid

$$49.03$$

$$48.86$$

$$49.00$$

$$48.997$$

$$48.997$$

$$50.960$$

$$50.960$$

$$1967 \quad 2/99957$$

$$9.83 \quad 49.978$$

$$20$$

$$9.63 \text{ at mean dist} = 963 - 0.21 = \frac{9.42}{20.04} = \frac{29.46}{29.46}$$

h m
4 45 sid h m
4.55

$$51.19$$

$$48.75$$

$$51.25$$

$$68$$

$$51.21$$

$$60$$

$$18$$

$$57$$

$$51.25$$

$$48.58$$

$$57.108$$

$$31.8$$

$$51.216$$

$$48.636$$

$$48.636$$

$$2580$$

$$12.90$$

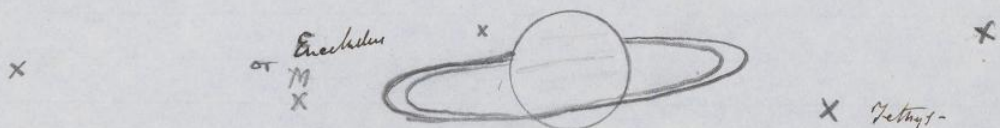
$$1.11059$$

$$9.98944$$

$$1.10003 =$$

$$\frac{12.59}{20.04} = \frac{32.63}{32.63}$$

Measured from prec. ansa -



Jan. 26

Encke's Comet

Comet's place at 6^h 22^m Jan. 26. 26. Alt 23. 23. 56. 67 $\delta + 5^{\circ} 33' 20''$
 27. Alt 23. 25. 26. 73 $\delta + 5^{\circ} 40' 52''$

star of comp. Weism Horn 23. 26. 45. 8
 x Alt 23. 22. 50. $\delta + 5^{\circ} 26' 37''$

Jan 27th 1852

Setheus
Enceladus? (If not too bright for it)

The Moon is close to Saturn & possibly this may be one of the other near satellites

The seeing is only tolerable

4

Jan. 27th P.M. 1852.*Setheus*

Enceladus follows - measures in direction of major axis of ring -

Sid time 124 free limb.

fol. limb

3^h.22^m 47.61
47.66
47.63
47.633

3^h.28^m 49.56
.61
.61
49.593
49.997

Encel.

3^h.35^m 47.76
47.77
47.85

3.22 47.793

3.35 47.633

3.28 47.713

Zero 49.937

2.224

44

21.80

Setheus
At 3^h.28^m Sid. time Enceladus followed in the direction of axis

Saturn's free limb 21".80 6 obs } measures
fol " 2.75 } pretty good

0.969 66 3.28
0.979 68 20.26
9.990 18 7.02 22".28
22.28 1.34793
1.33810 = 21".78 one half = 10".89

The smallest distance best observed

The new ring does not fill half the space between inner edge of old ring & the ball. Not so wide as outer ring

Not good seeing but the shadow of the ring below on the ball & the dark line (N.R.) above are easily distinguished
projection of new ring on ball = $\frac{1}{2}$ width of shadow

Two hours later air greatly disturbed so that ^{nothing of Enceladus} no satellites could be seen

Setheus

At 7^h.02^m M.D.D. Red to 1/2 mean dist

Enceladus follows 1/2 centre 21".78

Set below ring ap. I think.

By calculation from 29th 10".89

Dist of *Setheus* = 10".9 fol. & below (apparently)

Zero 29th

49.91

93

94

93

49.93

19997
50210
0277
49960

Date must have been 29th as it was cloudy on 30th

Was not the object taken for Christmas Encl.

Watch fast 9^m Jan. 29th 1852

Enceladus? & Mithras? Zero 49.93

watch = 6.17

Drime

6.22

Drime

6.22

Prigee Moon light

6^h 09^m { 49.04 } 8. fol. 7^m
m.s.t. { -14 } fol. limb
Sun 49.09
49.93
847
8.23

6^h 13^m { 47.31 } Drime
m.s.t. { .34 }
47.325
49.930
26.052
25.53
7.60
27.53 13
16.56

Encel. follows Saturn's prec. limb

At 6^h 15^m m.s.t. Excl. follows Saturn's centre = +16".56
7.08 = +13.07



Setty x
x Enceladus
x Saturn's
Drime?

At 6.25 49.22 } 8 fol 7^m
m.s.t 6.18 22 } fol limb
49.22
49.93
7.14
6.96
8.23

At 6^h 13^m Drime
Encel. follows 7^m centre +16".56
7.08 & follows 7^m's fol. limb 3.07
9.28 & follows 7^m centre 0 D.N. of 7^m's centre by 15".01

Mean 7.60 9.99166
17.79 1.25018
16.56 1.21906
17.45 1.24184
16.24 1.21072

6.27 Mithras fol 7^m centre } Good obs.
33
6.39
9

Not probably 5^m in error
M.S.D. 6^h 21^m in conjunction with Saturn
The eye judges very closely by the chord & arc cut off by a.c. or centre.
MST 6.33 " prec. Saturn's centre by 17".79

backward forward
7.15 - 20 m.s.t.
7^h 06^m 49.60 7^h 08^m = 50.21
m.s.t. 49.62
7.08 49.61 7.08 50.21
49.93 Sun 49.93
32
28
3.07

At 6^h 21^m Mithras is dist from true N limb by dist of outer edge of ring in side of N limb This latter dist is = $\frac{1}{2}$ [diam - b']
edge of ring is inside N limb by 8".01 - 5".45 = 2".56 at Mean dist

at Mean dist Polar diam = 17.99 - 1.96 = 16".03 . minor semi axis of ring = 5".45
Polar S.C. = 8".01

Drime
Excl. from 7^m's & from 7^m's
m.s.t. Prec. limb. fol. limb
9.29 50.85 9^h 29 50.81

Encel. follows Mithras from
prec limb fol limb.
9^h 30^m 50.78
31. 50.82
50.80
49.93
877
5.53
2
9

Satellite N of Saturn's centre
by 8".01 + 2".56 = 10".57
Part of Polar Ed = 8".5 = 11.5
Setty from 4th on 2nd disc 11".5
Drime = 11 from Mithras Pole
upper 52.40 } 9^h 42^m
lower 52.33 }
52.365
49.930
2835
26.95
23.86
6.17 lower 50.60 } 9.46
30.03 50.52 }
15.01
50.56
49.935
0.635
6.17

To the eye at the above off. 9^h 25^m m.s.t.
Excl. from 7^m's was in conjunction with Saturn's centre - The eye better than the micrometer

At Saturn's mean dist
Sun 29th 9^h 33^m Setty prec 7^m 17".45
29th 6.18 Drime fol 7^m 16.24



Setty x
x Enceladus
x Saturn's
Drime

Jan. 29

Encke's Comet

Weisse Hora 23 No. 594

29 ^{h m s} ^{1 1 1} ^{1 1 1}
 29 ^{h m s} ^{1 1 1} ^{1 1 1}
 30 ^{h m s} ^{1 1 1} ^{1 1 1}

* Ar 23..28..41 8+6..02..12

← ^P
 *a

Comet very faint- ^{Ter}
 49.92
 91
 92

Dip in Dew

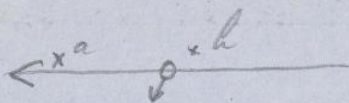
4..00 8363
 1.20 8412
 2.40 8498
 3.20 8430
 5..00 8472

Dip in Ar
 10..25 dip 13 ^{bb}

Blotch prevent getting
 Dip in Ar

Jan. 29

Mars

4-50
24-50
20

The measures of Mars were taken from
the nearest limb

a 9-10 mag
b " "

Dif in Dec \downarrow north pol. a b north pol. a

a & b

Dif in Dec
a & b

Dif. Δ Δ & a

h m
4, 45.0 47.45
47 7.36
37
4, 49 47.28

4, 50 47.94
1 97
2 95
4, 53 95

* 5, 19.0
2 4, 55, 33.4
1 04.5
x
2 4 51, 19.0

01.5
2 4 57 16.0

51.5
4 54 05.9

30
4, 58, 44.5

10.5
4 59, 25.0

* 49.0
2 5, 00, 03.5

Dif Δ a & b

a 5, 00, 56.8

b 1, 15.0

32

5, 01, 50

15.0

5, 02 32.5

02.0

5, 03, 20.0

Feb. 2nd

Encke's Comet

2 AR 23.34.56.46 8 + 6.28.35-
 3 AR 23.36.36.26 + 6.36.53

← * +

* subtr. free

Dig. in Dec.

h

3.52.00 31.57

34 31.08

35.30 31.10

37. 30.98

40 30.94

3.58.00 30.95

55 30.52

56 30.63

57.20 30.44

59.00 30.38

3.45.53 8.79

30.879

49.94

19.061

9.8

152.488

171.549

186.7978

3.06.80 = d8

Comp. star Weiss Har 23 No. 710
 * AR 23.34.23 * 8 + 6.26.53

Dig. in AR

x 1.29.5- 42.09.4 33.9

x 3.41.39.0 3 42.13.4 34.4

x 52.4 43 27.5 35.1

x 3.43.02.0 3.43.37.4 35.4

x 3.44.20.0 44 54.8 34.8

x 3.44.29.5 3 45.05.2 35.7

x 46.8 46 21.0 34.2

* 3.45.56.1 3 46.31.8 35.7

x 18.5- 47 52.5 34.0

x 3.47.28.0 3.48.09.4 35.4

x 36.5- 49 12.5 36.0

* 3 48.46.0 3 49 21.9 35.9

3.45.43.73 60.5

3.45.41.73 35.04 = dAR

1.59.37

3.47.41.10 Sid. Tim

20.48.08.91

6.59.32.19

1.08.73

M.B. 6.58.23.46

20.47.22.17

46.74

20 48.08.51

Feb. 2nd

Enckes Comet

Star of comp. Weisse Hora XXIII No 710

* AR 23.33.02.00	1825.00	* $\delta + 6.16.56.8$	1825.0 sec. var	price 3.053	price 19.92
AR price 1.22.43		AR price +8.58.11		0.00	sec. var +.01
AR 23.34.24.43	1852.00	$\delta + 6.25.54.91$	1852.00	3.053	19.93
$dAR \times 89$ 35.04		3.06.80		27	27
AR 23.34.59.47		$\delta + 6.29.01.71$		21371	13951
				5106	3986
				82.431	538.11
					8.58.11

Correction to App. place

BA C. coordinates	a	b	c	d
For R	+8.8244	-7.8244	+0.4851	+7.8689
	-1.1094	+1.1715	-9.3404	+0.3928
	-9.9338	-8.9959	-9.8255	+8.2617
	-0.8578	-0.0990	-0.6683	+0.182
	-0.099			
	-0.666			
	-1.622			
	+0.018			
	-1.604			
	= cor. in AR			

For Dec	a'	b'	c'	d'
	-9.6457	-9.0923	-1.3001	-8.5578
	-1.1094	+1.1715	-9.3404	+0.3928
	+0.7551	-0.2138	+0.6405	-9.3506
	+3.690	-1.635	+4.370	-0.245
		5.690	1.635	
		+10.060	-1.880	
		1.880		
		+8.180		
	= in N.P.D.			

* Mean AR 23.34.24.43	
cor. to app.	-1.60
* App. AR 23.34.22.83	
	35.04
AR 23.34.57.57	
Ephem. 23.34.58.99	
	1.12

* Mean $\delta + 6.25.54.91$	
cor. to app.	-8.18
* App $\delta + 6.25.46.73$	
	3.06.80
App $\delta + 6.28.53.53$	
	6.28.49.24
	6.29

Enckes Comet

Star of comp. Weisse

Hora XXIII No 710

* AR 23.34.24.43	1852.00
* $\delta + 6.25.54.91$	

$dAR + 35.04$	$d\delta + 3.06.80$
---------------	---------------------

February 2 nd	6.58.23.46	M.T. Line Camb.
AR 23.34.59.47		Mean Equinox
$\delta + 6.29.01.71$		1852.00

Compared with Ephem. Calc. — Ch.

 $AR + 1.12$

Feb. 2nd 1852

Inner satellites of Saturn.

202 is 2nd 2nd
* Enceladus
Mimas. prec 17th

$$202 = 24.58^m$$

$$= 34.02^m$$

prec limb

fol limb

$$0.97437$$

$$47.37$$

$$45.55$$

$$0.97468$$

$$47.31$$

$$45.47$$

$$9.99469$$

$$47.34$$

$$45.51$$

$$34.45 \quad 1.53719$$

$$49.94$$

$$49.94$$

$$34.03 = 1.53188$$

$$2.602$$

$$4.43$$

$$25.48$$

$$43.41$$

$$43.41$$

$$68.89$$

$$34.45$$

Not a favourable night

Enceladus? prec 17th

$$= 31.11$$

$$31.15$$

Zero

prec limb

fol limb

$$49.94$$

$$47.83$$

$$45.99$$

$$.95$$

$$.80$$

$$46.02$$

$$935$$

$$47.815$$

$$46.005$$

$$933$$

$$48.840$$

$$49.940$$

$$158$$

$$2.125$$

$$3.935$$

$$49.940$$

$$= 29.33$$

$$21.25$$

$$60.60$$

$$30.30$$

$$29.69$$

Possibly the object observed for Mimas was Encel. a that obsd for E was a brighter satellite. As the atmosphere was much disturbed so that the observations were made with difficulty & Moon bright

$$4.28$$

$$4.34$$

$$4.25$$

$$4.21^m$$

$$47.55$$

$$45.74$$

$$47.39$$

$$45.60$$

$$53$$

$$53$$

$$37$$

$$45.50$$

$$47.54$$

$$45.785$$

$$47.38$$

$$45.55$$

$$49.940$$

$$49.940$$

$$49.94$$

$$49.94$$

$$2.40$$

$$4.155$$

$$2.96$$

$$4.39$$

$$48$$

$$83$$

$$2.96$$

$$6.95$$

$$23.52$$

$$40.72$$

$$34.75$$

$$34.06$$

$$40.72$$

$$64.24$$

$$34.06$$

$$-0.41$$

$$32.12$$

$$33.65$$

$$33.65$$

$$33.65$$

$$3.00$$

Red to mean dist.

$$3.13$$

$$con 202. 3.11$$

$$3.11$$

$$M.S.D. 6.11$$

Encel. prec 1/2 centre

$$34.03 - 4.06$$

$$M.S.D. 6.24$$

Settyr prec 1/2 centre

$$29.33 - 4.06$$

$$4.31$$

$$4.23$$

$$3.11$$

$$3.11$$

$$M.S.D. 7.42$$

Encel "

$$34.72 - 4.06$$

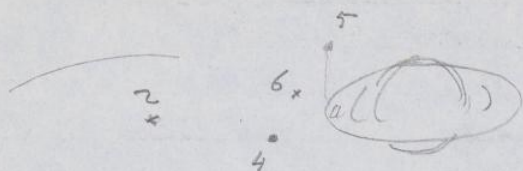
$$M.S.D. 7.34$$

Settyr "

$$33.65 - 4.06$$

After the above observations the zero was altered

Feb 2nd continued



At $4^h 40^m$ of 202 - 5 was just above
the ansa at a (on line perp to axis of ring)
Titan

The satellites 5 & 4 were of nearly equal
brightness - 4 although observed for Enceladus seemed too bright for
it 6 was much smaller & either Mimas or Encel.

9^h 50^m 11.53. ^{Setting} 2 for 4, p. time & is but little below the axis

	46.92
	46.78
	46.74
	46.78
New York	50.02
	3.24
	6.5
	32.75
cor	- 40 to mean dist.
	32.35
sd	9.00
	41.35

Tuesday Feb 3rd 1852 - P.M.

Watch Slow 3^m

Obs of Saturn's Satellite -

α in Jethys

α too bright for Enceladus?

α follows β & appears above

Distance of α

from Jol limit

MSR 6^h 29^m + 3^m

47.38	25.28
46	43.66
	<u>769.74</u>
47.42	34.47
50.00	
2 58	
52	
<u>25.28</u>	

from limit

6^h 33^m +

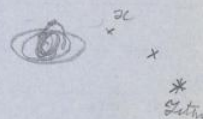
45.55	0.97510
54	0.97968
	<u>9.99542</u>
45.545	1.53744 = 34.47
50.000	<u>1.53286</u> = 34.11
44.55	
89	
<u>43.66</u>	

α above β 's centre (apparently)

6^h 34^m +

49.32
<u>.43</u>
49.375
50.000
<u>625</u>
12
6.18
<u>-.06</u>
6.07

cur to m.d



* Saturn

Notwithstanding the images are tranquil I cannot see Mimas nor Enceladus unless α is it. It is near full moon however

9 P.M. saw α in α Enceladus immediately - good definition at 9^h 15^m dist = diam. of ring from centre below axis 7^h 2

α from

α seems too bright for Encel. in Jethys.

from limit

9^h 22^m 53.31

33	9.99542
53.32	
50.00	
<u>3 32</u>	44.21 1.61500
32.54	
<u>40.78</u>	40.78 = 1.61042
242	
<u>47.21</u>	

MSR

Red to mean dist

Feb 3rd 9^h 24^m - Jethys follows β 's centre 40^h 78

9^h 11^m m.s.t. α still above axis

49.67

71
<u>49.68</u>
50.00
<u>31</u>

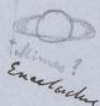
3.166

3.04

= 3.01 at mean dist

Not very exact motion not evident at 9^h 10^m to 20^m

Mimas & Encel. perp to Jethys ansa



Mimas?
Enceladus

* Saturn

Double dist app below axis

51.44

.50

51.47

50.00

147

735

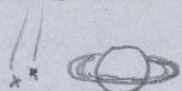
712

Feb 3rd Cont

New ring always easily seen - not so wide as outer ring. Where it crosses ball it is about $\frac{1}{2}$ as wide as the shadow of ring on ball seen below. - New ring evidently widens at edges of globe as it should do by the laws of perspective.

During the present apparition of Saturn we notice that the new ring is more conspicuous than it was last year probably owing to the more favourable position of its plane at the present time.

Though not quite as broad as the outer ring it fills up nearly half of the interval between the old ring & the ball.

Feb 4th6^h 50^m $\alpha = \text{Peltor?}$ 

Encl. or Minus

* Zulu

Enceladus follows
following ansa-Double dist from
following ansa6^h 18^m

6.14 52.58

22 -67

23 54

25 74

26 58

311

52.62

50.01

2 61.52

2/25.58

12.79

47.58

18

6.40 15

16

.03

23

133

47 27

50.01

2 74

58

2/26.85

13.42

6.23 12.79 0.97584

6.40 13.42 0.97968

21 284

6.32 -13.10 - 9.99616

13.10 1.11727

12.99 1.11343

20.04

33.03

Enceladus Bright Moonlight

6.30 Minus? is precisely in the line of the axis
perhaps 0.5 up aboveSeeing not good & a high S. by wind
shakes the telescope & makes all the obs
very difficultAt 10 PM Looked again but Saturn was
too low to see Encel.My rough cal. from obs on 2nd Encel was at elong. at 7^h 0^m

Zero 50.00

 α prec. 1/2 centre
6.46

46.02

50.014

3 994

80

1.99262 = 39.14

9.99616

1.58878 = 38.80

Feb 5th P.M. 1852

Satellites of Saturn

0.97856

M. pre. ansa

M.S.T.

0.97968

At 6^h 05 49.68 ± 16^h 50^mpos = 6^o 10'

9.99688

Ext diam of Ring

6^h 55

pos = 90°

41.18 1.61469

40.89 = 1.61157

54.17 } thought

54.22 } too large

54.22 } perhaps

54.203 1"

50.0

42.02

41.18

Probably Mimas

At 6^h 05 Mimas preceded pre. ansa by 3" & about as much above (apparently) the axis of ring

At 6^h 55 ill. on line 90° from axis = dist Rad of ring.

At encl. dist 42.9

Tethys 7^h 22^m M.S.T.

52.24

50.014

22.26

45

21.81

1.33866

9.99688

21.65

20.04

41.69

At 6^h 50 the line from Mimas a tangent to curve of ansa - made an angle of 6° with perp to axis Mimas pre. ansa. It was perhaps 4^h 05 above ansa.

follows following ansa in axis. It may be not to Enceladus in dist from Saturn.

Seeing not good & Full moon Enceladus not seen probably in conjunction (above) with Saturn



The five old satellites were again as the object observed is either Mimas or Encel.

By rough cal Encel. was near sup. conj. about 7^h 45^m. The above was probably an observation of Mimas -

6^h 05^m 15^s
 from 50.61
 mount 50.014
 time 5.96
 12
 5.84
 2
 5.82
 4
 14.82

from Aug
 6^h 08^m

50.249
 50.014
 47.6
 4.66
 2
 4.64
 20.00
 15.34

Sat. Feb 7th 1952
 Enceladus. J. L. - J. L. - J. L.

from

M.S.P.

50.98 Double dist at 6^h 10^m
 51.10 0.97800 6^h 20^m
 51.04 0.97964 1/2 mean dist
 9.99872
 50.014 0.70157
 2/1026 0.69989
 5.13
 10
 5.03

20.04 2.d. Ring.

15.03

Red to Mean Dist of Saturn

At 6^h 15^m Encel J. L. centre 15.03

Zero

50.005
 025
 010
 015

Time 50.014

All the old statistics recognized -
 No doubt of the identity of Enceladus as it keeps with Saturn
 rather approaching the centre - abt 8" ap - below axis

Wind blowing half a gale - but vision pretty good !! Ther 35°

The inner edge of new ring is nearer the ball than the width of the
 outer ring -

Feb 7th Continued Satellite of SaturnPethys fol. fol. Area. at Elongation $\leq 1''.0$ up below axisAt 6^h.30^m A.S.S.

Measured in margin

52.35

Rhea

*

Dione*

*Titan



Pethys

6.25

36

34

Jupiter

0.97800

52.35

0.97968

50.014

9.99872

2.336

1.35965

= 22.89

47

22.82 = 1.35837

22.89

20.04

42.86

wind very annoying.

Chord cut by ring
on n 51.12

6.34

53.58 Dione prec. prec. Area

53.59

at elongation 1.5 up below axis

53.585

50.014

3.571

35.00

11

34.89

34.89

20.04

54.93

cor to n dist

m s t

At 6.25

Pethys fol. fol. Area 42.86

6.34

Dione prec. centre 54.93 very little before elongation

Feb. 9th 1852

7^h - 40^m

Satellites of Saturn

Clouds & bad seeing

perhaps E & M. present. Price. ansa.

Jupiter beyond

Saturn 9^h 10^m



ϕ x

x

x

Feb. 14

Encke's Comet Chron. 194

35

14 p.m. ^{h m} 23.56.18.87 8+8.10.25"
 15 23.58.13.00 8.18.36

Comp. star
 Weisse XXIII No. 1132

Zero

49.93

50.04

50.01

50.03

200.01

50.00

Stars with pre

Dy. in Dec

^h
 5.00.00 67.02
 03.15 67.13
 05.40 67.00
 19.40 67.45
 22.22 67.58
 27.00 67.92
 77.47 210
 5.12.58 67.35
 50.00
 17.36
 9.8
 138.80
 1561.5
 1700.30
 2.50.03



Dy. in AR

* 5-07.58 A

x 5.08.10. A

* 0.15.5 A

x 5.10.27.0 A

x 12.27.0 A

x 5.12.39.0 A

* 14.41.5 A

* 5-14.52.7 A

h m s

5. 9.325

5. 09.44.7

11 49.0

5. 12.01.3

5. 14.02.0

5. 14.14.0

5 16.16.0

5 16.28.3

5. 13.00.98

40.17

5. 12.20.81

21.35.27.57

7.36.53.24

1.14.85

7.35.38.39 M.G.P.

d.A

1.34.5

1.34.7

1.33.5

1.34.3

1.35.0

1.35.0

1.34.5

1.34.6

36.1

1.34.51 mean

Feb. 14 Continued Encke's Comet

Not good seeing Ext. Therm. $+18^{\circ}$

Comet pretty bright - full 5 times brighter than when first seen. Although it is near the horizon, yet there appears to be an ill defined nucleus on the north following side of the centre. The nucleus is clearly seen and is decidedly a little one side of the centre, not much however -

Star of comp. Weisse XXIII No. 1132

* $R\ 23^{\circ}.53'.26.90\ \delta + 7^{\circ}.58'.55.9\ 1852.0$
 $+ 1^{\circ}.22.75\ + 9^{\circ}.01.35$
 * $R\ 23^{\circ}.54'.49.65\ \delta + 8^{\circ}.07'.57.25\ 1852.00$
 $dR \times \alpha p\ 1^{\circ}.34.51\ d\delta \times \alpha p\ 2^{\circ}.50.03$
 $R\ 23^{\circ}.56'.24.16\ \delta + 8^{\circ}.10'.47.28$

M_s	δ
$An. pre + 3.065$	$An. pre 20.05$
$var. sec. \underline{00}$	$var. sec. \underline{00}$
3.065	20.05
$\underline{27}$	$\underline{27}$
21455	14085
$\underline{6180}$	$\underline{4010}$
82735	54135
$\underline{1^{\circ}.22.75}$	$\underline{9^{\circ}.01.35}$

Encke's Comet

Star of Comparison

Weisse Hora XXIII No. 1132

* $R\ 23^{\circ}.54'.49.65\ } 1852.00$
 * $\delta + 8^{\circ}.07'.57.25$

$dR + 1^{\circ}.34.51\ d\delta + 2^{\circ}.50.03$

February 14 - $h m s$
 $7^{\circ}.35'.38.39\ M. 9^{th} time Camb.$
 $R\ 23^{\circ}.56'.24.16\ } M. Eq.$
 $\delta + 8^{\circ}.10'.47.28\ } 1852.0$

By 6 comp. in δ and 8 in R

Sat. Feb 14th 1852

Dione? follows fol. ansa

O | . |

Ans. 6.33

46.85
47.17
46.98
47.00
49.990
299

6.33
37
13
74

Direct meas

46.77
46.90
46.87
46.847
49.990
31.43
31.43
29.90
276
30.99
62
30.37

At 7.05

Saturn
XDione
X Rhea

Dione fol. fol limit of Saturn

6.41 -

45.75
76
45.755
43.875
963
44.815

44.815
49.990
51.75
50.72

6.34 50.64

6.43 51.10

6.38 50.87

Dione fol. free limb

6.44

43.87
88
43.875

30.37 1.48244

50.72 1.70518

39.49 1.59649

0.98287

0.97968

0.00319

1.48244

1.70518

1.59649

1.48563 = 30.60

1.70837 = 51.10

1.59968 = 39.78

20.04

59.82

Rhea? fol. fol ansa

6.47

45.96
49.99
403
81
39.49

6.52 49.41

54 49.24

56 49.16

6.54 49.27

49.99

72

36

7

3.53

3.54

9.00

Settys? fol. free limb

Double Dist

Settys free 1/2 centre 5.46

Zero

49.99

98

50.00

Except when obsd -

Always have a pencil

Diam Ring 40.09

" Bulb 18.0

Feb 14th 6.38^m in sb. Reduced to m. dist.

Dione fol. fol 1/2 centre 50.87 good.

Feb 14th 6.47^m

Rhea fol 1/2 centre 59.82 106

Feb 14th 6.54^{am}

Settys free 1/2 centre 5.46.

Feb 16th 1852

Eq diam

$$\begin{array}{r}
 1670 \cdot 1.22772 \\
 0.00452 \\
 16.97 = 1.22724
 \end{array}$$

48.33

48.26

27

48.287

49.991

17.04

32

16.70

Polar diam

48.28

Jethys? ap. above upper limb

$$\begin{array}{r}
 49.81 \\
 6.48 \\
 \hline
 80
 \end{array}$$

49.805

49.825

190

38

18.62 = 1.86

Dione ap above u.l.

$$\begin{array}{r}
 49.40 \\
 6.51 \\
 \hline
 40
 \end{array}$$

Rhea ap. above axis

$$\begin{array}{r}
 49.50 \\
 6.54 \\
 \hline
 43.59
 \end{array}$$

R. proc. fr. limb

$$\begin{array}{r}
 43.59 \\
 6.58 \\
 \hline
 43.59
 \end{array}$$

Jethys fol. fol. limb

$$\begin{array}{r}
 49.73 \\
 7.02 \\
 \hline
 .76 \\
 49.745 \\
 49.995 \\
 25.9 \\
 \hline
 2.45
 \end{array}$$

Dione? fol. fol. limb

$$\begin{array}{r}
 49.66 \\
 7.04 \\
 \hline
 49.997 \\
 33.8 \\
 7 \\
 3.28 \\
 3.32 \\
 9.06 \\
 9.44 \\
 12.72 \\
 11.76
 \end{array}$$

17.06

Spice D.
Angle of S & D with
axis

$$\begin{array}{r}
 181.40 \\
 7.13
 \end{array}$$

$$\begin{array}{r}
 181.05 \\
 .16
 \end{array}$$

$$\begin{array}{r}
 180.00 \\
 .18
 \end{array}$$

$$\begin{array}{r}
 180.55 \\
 180.55
 \end{array}$$

$$\begin{array}{r}
 176.00 \\
 90^\circ + \text{Kurofarsi}
 \end{array}$$

$$\begin{array}{r}
 4.55 \\
 \text{angle}
 \end{array}$$

$$\begin{array}{r}
 88.05 \\
 \text{with axis}
 \end{array}$$

$$\begin{array}{r}
 0.98420 \\
 0.97968
 \end{array}$$

$$\begin{array}{r}
 0.00452 \\
 0.98917
 \end{array}$$

$$\begin{array}{r}
 0.38917 \\
 2.45
 \end{array}$$

$$\begin{array}{r}
 0.39369 \\
 2.48
 \end{array}$$

$$\begin{array}{r}
 2.48 \\
 9.00 \\
 11.48
 \end{array}$$

$$\begin{array}{r}
 2.48 \\
 8.44 \\
 10.92
 \end{array}$$

Feb 16th 7^h 02^m M39

Jethys fol. to centre 11.48 by comp. diam.

" 10.92 by obsd. "

Feb 16th 7^h 04^m Dione fol. to centre 12.32 comp. diam.

11.76 obsd. "

$$\begin{array}{r}
 177.30 \\
 7.30
 \end{array}$$

$$\begin{array}{r}
 179.50 \\
 32
 \end{array}$$

$$\begin{array}{r}
 178.40 \\
 178.40
 \end{array}$$

$$\begin{array}{r}
 176.00 \\
 176.00
 \end{array}$$

$$\begin{array}{r}
 2.40 \\
 2.40
 \end{array}$$

Angle with axis 87.20



Feb 16th cont1859 7^h.23 Distance S. of Pethys in dir perp. to axis

50.43

49.995

43.5

4.263

= 4.26

7.25 Pethys apalone a.l. 50.12

1.09

50.105

49.995


11.5

2

1.08

Rhea

Dione
Pethys

Feb. 16 Encke's Comet continues to grow brighter. There is decidedly a pretty bright nucleus on the north following side of the centre thus:  as seen in the telescope.
- There is no comp. star

Note Apr. 1859. Tail of. ☉?

Orion OrionFeb 16th P.M. 9^hLooked at Orion nebula - Saw 6 stars 14^h 19^m away in place of 2

Kaperium

Saw 2nd variable star?

← * * * *

47.14
286
143

Enceel free free Ansa at elongation-
Double Dist-

48.29
51
52
48
48.450
49.591
1.541
1.447
2.988
14.94
14.64

7.02
47.14
47.08
47.07
47.097
48.991
2.12894
14.47

Feb 17th P.M.
Orion Ring

45.74
14.64
20.06
34.70

54.06
46.00
45.87
49.591
4.121
40.69
1.90
40.95
40.13

54.06
49.991
40.69

7^h 15^m Rhea fol. fol. limit
50.26 up. above
49.99
27
2.65
30
2.95
9.00
11.95

0.98486
0.97968
0.00518
1.16554
14.64
14.81
20.05
34.86

1.17072



Rhea?

50.073
910
983

50.073
49.990
983

Zero 49.991 49.991

Feb 17th 6^h 59^m in 30
Enceel free 4th centre 34.86

Feb 17th 7^h 19^mRhea fol. 1st centre 11.95

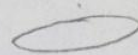
The new Ring is seen to advantage to night - When it crosses the ball it is as broad as the part of the shadow of the ring on the ball seen below. Evidently wider near the limit. A division near the inner edge of the broad ring is always suspected when the air is steady. Have seen it on a dozen different nights. But whether it is a division or a dark marking do not feel decided.

Feb 18th P.M.Dione?
Peltus?Peltus?
Dione?

Rhea?

Peltus

*

Peltus? free-
free hand

fol hand

45.27

43.58

6
6.54

45

57

44

6.57

57

36

45.38

43.577

49.99149.991

46.11

64.14

421.28

45.19

62.86

62.86

17.67

8.83

54.02

0.00584

54.02 1.73255

65.96 1.81928

54.75 = 1.73834

66.85 = 1.82512

9.00

75.85

Rhea? fol fol hand

7.00 43.21

02 31

43.26

49.991

6731

1.35

65.96

Dione fol fol hand

7.05 49.68

49.99

31.6

3.04

20.04

23.08

Feb 18th 6^h 55^m M.S.P.

Red to mean dist

Peltus? free 1/2 centre

54.75

Feb 18th 7^h 01^m

Rhea? fol. 1/2 centre 66.8 79.85

18^h 7.05 Dione fol 1/2 centre 23.08 18.4

Feb. 19

Very brilliant Aurora all over the heavens - streams up beautifully - some of the streams are permanent for a few minutes, while the major part of them are lambent ^{diffuse} and directed to the Zenith. Looked at Encke's Comet - Owing to the Aurora it was quite faint. No stars to compare it with - More particulars of the Aurora.

About 20 minutes after sunset there appeared in E.N.E. a dark red stream of the Aurora stretching from the horizon quite up to the Zenith.

This was the only appearance of an aurora at that time.

Shortly afterward there were several white streams southward of this at an alt. of about 40° , whose bases were ^{not} well defined, seen rushing up to the Zenith. Before twilight had ended, a broad stream was seen rising immediately from the horizon in the W.N.W. and continuing unbroken, but gradually diminishing in brightness to within 8 or $8\frac{1}{2}^\circ$ of the Zenith. Full 15° degrees of the base was in twilight, nevertheless it was distinctly seen. Its color was slightly red at this time, but at $7:15$ when the whole heavens appeared in commotion and the auroral display at its maximum (that is, maximum between six and ten o'clock) it was of a most beautiful crimson. It was also, the most permanent stream of all, it continued ⁱⁿ its position, with only the change of color which has just been mentioned above one hour.

At $7:15$ P.M. no part of the heavens seemed free of the aurora. In the south there was less display or flickering of the aurora, than at any other place - the aurora there was collected together in heaps, resembling luminous clouds and towering one above another to the Zenith. The intervals between these luminous heaps, were of ~~the~~ ^{only} "blackest darkness," and stars of the first magnitude shone ^{only} very faintly through them. North of the prime vertical the display was magnificent. None of the streams were permanent for above a minute, except that which has been mentioned above. Two black arches ~~towering~~ ^{tracing} one above the other, the largest having an alt. of 30 or 35° at the highest point, the lesser about 10 less stretched across the north. From the summits ^{of} these the aurora blazed incessantly for 5 or 10 min. The most active portions of the aurora were pure white, and that which ^{lay} ~~formed~~, of a reddish cast. At this moment there were four streams coming from the four points of the compass almost exactly intersecting each other near the star β Tauri. The Zenith, however, was the point where the most of the rays seemed to meet.

1852

Feb. 19

43

Determination of comp. star of DeArrest Comet
 Comet observed on the morn. of Oct. 2/3 1851
 Inst. place of star $R\ 4^h\ 29^m\ 07^s\ 8 + 4^h\ 00^m\ 00^s$

On the morning of the 20th (after the Aurora) the Thermometer
 of Capt. Geo Lewis of West Newton was at 16° below zero while
 that of his neighbours on the hills above his house were 3°

Capt. L's Thermometer compared with our standard
 stood -4° for -3° of Standard.

Feb 19th 1852

Aurora of most remarkable beauty & activity
first visible in the evening twilight extending over all quarters of the sky

Between 10 & 11 o'clock The display was beautiful beyond description
& for activity has never to my recollection been equalled for the last
twenty years We have had auroras in which the deep red
colour was more prevalent. But none which have surpassed
this in other beautiful features. The streamers shot up to
a corona most perfectly defined (rather point of convergence)
which remained in the Dec. of stars. or $0^{\circ} 30'$ to 2° N of it &
as nearly as possible in the meridian - if any thing a little E of S
but not far enough from the true meridian to be in the magnetic
At least this appeared so to me. & that the place of the point of con-
vergence was so well defined that the above position was not
more than 1° or 2° in error for the interval between 10. & 11 P.M.

The white streamers from 3° to 15° alt were strongly
tinged with prismatic colours the red being lowest.
This fact shows that the streamers were above or very high in the
atmosphere

The streamers converged to the corona from
all directions S as well as N. of extreme beauty - at times
glowing with deepest red to the very center of the Corona.

I first saw the streamers long before dark while riding in
Brighton. The most red was then in the NW. At $10^h 15^m$ P.M. immense
sheets of light flashed over the whole sky - especially brilliant
in the Southern quarter of the heavens - where the suddenness
& brightness of the flashes could be compared only to heat light-
ning on a summer night. At this period the rapidity
& brilliancy of the successive changes exceeded anything of the kind
I had ever witnessed

After a partial subsidence of this feature
the whole sky S & N was E & W - was arched with streamers of
exquisite beauty all converging to within an area of two or three
degrees in the place above indicated. At times glowing with
the deepest blood-red to the very zenith - & again pulsating &
throbbing with sheets of light darting upwards from the horizon

It seemed as if certain parts of the sky were in
a state of momentary inaction - & instantaneously illuminated as if by
the passage of an electric discharge - Possibly very thin clouds as
the form reappearing moved from the NW slowly & with a cloud-
like motion.

Feb. 23

Encke's Comet

Orion

23 R 00. 13. 36.80 δ + 9. 12. 35" comp. star Wain No. 21924 R 00. 15. 29.33 δ + 9. 16. 44* R 00. 11. 28.60 1823.10 3.0811. 23.19 27 R 00. 12. 51.79 1852.6162

1. 23.19

* δ + 8. 57. 53.1 1823.109. 00. 81

+ 9. 06. 53.91 1852.0 20.03

00

20.03

27

14021

4006

54081

9.00.81

Feb 25th 1852

Looked at Orion to see if the H star was visible but the air was too much disturbed for observation -
 Cleared off at 9 P.M. Wind N.W. - 3

Feb. 26 P.M. should have observed Encke's Comet this evening if the Microm. had not been off for dagueratyping
 There has not been a single clear night since the

Feb 26th 1852

47

Recommenced daguerreotyping - Mr Whipple came up at 6 P.M. We removed the Micrometer and adjusted the frame for the plates. The Chemical Focus is 1 inch $\frac{1}{8}$ th shorter than the optical.

Time of exposure to image of the Moon 15^s. The air was pretty good - but some cirrus gathered before the trials were completed. Which we feared might interfere with the process - 6 plates used. For the two first the rate of the clock was not quite adjusted.

The irregularities of the clock work motion are among the greatest difficulties encountered. The edge of the moon at the N & S points being freer from haziness indicates a good focus - the blur being then the effect of irregularity in the clock.

Feb 27th 1852

Mr Whipple came before dark - We first looked at Venus but the view was unpromising for any attempt upon it - so we returned to the Moon - fine definition but most unfortunately a thin haze commenced gathering - which though it scarcely affected vision the view to the eye. Yet it most required double the time for a picture. It is remarkable how soon even so thin a haze affects the photographic action.

The clock worked better than usual - Seem to go best when the telescope is a little out of balance so as to favour it.

It grew so cloudy that we gave up at 8^h 15^m -

See March 2nd & 3rd

Feb. 27 Pm

Chron. 194 Jan. 68 Lauri Great Egg Observer C.M.D.
 4. 23. 20.3 - 465 good; instantly

Feb 27th

Mr Burr came from the Telegraph (Bain's) Office to readjust the wires of the telegraph connections with the observatory. Found in several of the switches that the connecting wires were unsoldered. Probably by the many discharges of lightning last summer. On one occasion the charge burnt up our Call-coil. The changes effected promise to make the matter simpler than hitherto.

March 2nd 1852

Daguerreotyping.

Mr Whipple came after 7 P.M. Night cold very clear & very unfavorable owing to the commotion in the air 6 plates were used notwithstanding.

March 3rd P.M.

Mr Whipple commenced daguerreotyping after dusk sky very clear but it is too cold both for the plates (on which there is an effect) and for the clock to work well. The seeing is also very bad. The time for exposure was only 6" or 8" whereas when the night is clear so slightly hazy the time must be prolonged two or three times.

A high altitude of the moon is requisite as well as a clear sky. A full moon takes but 5" while a new moon takes 20" or 30". Whether it is that the ^(straight?) edge of the moon is kept strongly illuminated or whether there is some sympathy over in the action over the whole plate which makes it possible to take a picture quicker when the whole of it is exposed to a strong light than when only a small part of its surface is.

In taking the sun a great difficulty is experienced from the inflections of light when the screen is suddenly flashed before the picture.

Mem Paid \$65 to Mr W. for compensation in last years Daguerreotyping.

March 11th Mr Whipple came this eve to say that he was going to come in the morning to take the Moon - Charles staid up till 5 A.M. but it got cloudy.

April 24th Mr Whipple came at dusk. proceeded to take 4 plates exposure 20" alt of Moon 30" Tolerably steady.

The shortest successful exposure was on one occasion to the Moon nearly full for which 5" to 6" was sufficient.

March 3rd 1852 P.M. Power 103- J.P.B.
 Im. of 83 Cancri 8..32..25 - 20 beats 20 9..03..00
 10 194 9..03..12.7
 194 = 8..32..15.0

Vision is not good. Observation not very good.

March 8th Mr Clark brought up his 7 1/2 inch achromatic made for Williamstown College to be tested. Night was cloudy

March 9th Cleared suddenly after dark. Got up the telescope on Polaris - atmosphere very bad. The image was slightly tinged with red on the upper right hand side & blueish on the opposite { Eye not in centre } { Eye piece ? } { apparent upper blue sp. right }
 This was noticed in the same position with Prof. Keely's new achromatic by W & S. It was [probably atmospheric therefore] - We looked through the transit opening of West wing - the day previous had been the warmest for two or three months past - as the sky cleared it grew cold rapidly rendering the state of the atmosphere very unfit for a delicate trial.

With Mr. C. I noticed that if the eyepiece was put out of focus too far from the object glass so that the violet-blue appeared in the centre of the disc or nearly so (the brightest part is a little eccentric) There appeared a slight vacancy in the light half way between the centre & circumference.

On moving the object glass 90° (rotating it) & 180° this vacancy also described the same angle showing that it was not atmospheric. On mentioning this to Mr. C. he ascribed it to a slight want of homogeneity in the material of the crown lens which he had laboured to remove but not with entire success.

Bringing the eyepiece now on the other side of the focus (the violet blue rays dispersing in the circumference) The vacancy changed place 180° but was less evident.

The blue-violet predominates showing Mr C says a trifling over correction.

With the Waterville glass. There was a more evenness of light in the ultra focal images - but the outside of the image for the eyepiece too. The object glass was brighten. Spherical aberration? It not quite perfect.

March 10th 1851

Cleared off cold from NW - Wind boisterous - Not good vision

Mr. Clark came up early in the eve - Put the Waterville telescope & our small Equatorial side by side on the stand. - our is 3 or 4ⁱⁿ longer.


Both show the violet-blue in the centre when the eyepiece is too far from the object glass. Since the focus of the violet rays is thrown further out they are less refracted therefore the chromatism is a trifle overcorrected which appears in all Munich glasses which I have seen & seems to be advantageous.

The Cambridge small Equatorial shows a very symmetrical disc on either side of focus. The light is not uniformly diffused. But on the side the focus forms two rings or halos & a collection in centre

The reason why - when the eyepiece is pushed in - the blue central light is diffused in the circumference is because the focus of the blue violet is further from the object-glass & when the eyepiece is pushed in - the blue-violet will be most out of focus & consequently appear diffused in a misty circle outside of the rest of disc & more diffused & fainter than the rest

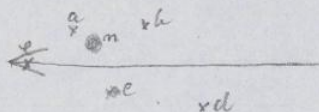
March 11th Mr. Clarke came at dusk but at the same time arrived Judge Rodgers - & a party - his brother Mr. Mason - & ladies. Went with them to the Dome - looked at Saturn - Venus - Nebula in Orion - Cassiopeia.

At 9 P.M. we went to the West Wing - opened the shutters & directed at Polaris - Prof. Keely's Telescope & our small Eq. being side by side on the same stand. The air was much better than we have before had an opportunity to try it in. There was evidently a defect in the image by the new telescope. The image out of focus had left light - was thinner on one side than the other quite perceptibly which Mr. P. ascribed at first to defective centring - but on moving the telescope so as to bring it opposite the centre of the opening. The appearance was effectually removed & the disc shown symmetrical & exceedingly well defined. Showing that the edge of the building being probably of a different temperature from the outside air. obstructed the vision.

We therefore as the night was calm removed the stand to the open air outside the South Entrance. I Upon γ Leonis dist = — The images were beautifully defined - round & free from wings & concentric - the light of a yellowish cast - as belong to the star. Next set on the triple star of Cancri - with a power marked 295 (which perhaps is 290 on this telescope) the close pair dist = 1.2" about was inspected the appearance of the discs showed them  almost in contact. Mr. C thought them separated. I could not be sure of a dark line between. But from the appearance have no doubt that the instrument is equal to separating stars distant 1" - with a favourable atmosphere. This dist 1" would be near the limit of its separating power.

See next leaf

March 10 1852

Spiral Nebula in Canes Venatici $RA 13^h 23^m$ Dec $48^{\circ} 04'$ 

d m. f. c.
 b s. f. c.
 a s. p. c.
 e s. p. c.

n is principal neb.
 c is cluster on sec. neb. m, b
 small stars - order of bright.

e

d

u

b

by line.
 Dif. 8 m & e

24⁷⁸

87

35

60

24⁵⁰

35

e & d

45⁷⁸

63

71

70

e & e

39⁷⁸

40 22

40 01

39 85

e & b

83⁷⁸

84 05

4 06

84 10

e & a

82.01

2.13

1 96

81 92

Sum

50.07

05

07

05

March 11th 1852 Trial of Telescopes (continued)

It would probably elongate a star of 0.7 under the best circumstances

Upon ω Leonis dist = 0.5 no elongation could be made out a suspected one was tested by trial on other stars which showed (by trying a bright star) that the eye piece at the time of trial was a very little out of focus causing a minute distortion of the disc of stars which became perfectly round on readjustment.

We conclude that the trial shows an object glass of excellent character and equals in all respects to the best work that lies within the range of telescopes of ^{like} equal size by the first European artists

We afterwards set Mr. Clark's Object Glass on the stand in the open air Examined ζ Cancri with powers to 400 - The division of the close pair was an easy matter - so much so that I should judge it capable of dividing one of similar magnitudes of 0.5 distance - This must be regarded as a very satisfactory performance - The discs were small & clearly separated by a dark space - indeed it was not close enough for the instrument - We set on Procyon & the small 8th mag. double star near it which was readily separated - The seeing was not so good as we could have desired & the wind shook the stand although we took as sheltered a spot as we could command for the purpose the night was pretty still - With 400 the central disc was concentric in the light - no well formed rings - About the same amount of over correction of colour as occurs with the Munich glasses - giving a purplish or violet centre when the eye piece is too far out. Noticed a false image at a distance from the disc of bright stars which rotated with the object glass

March 15th 1852 - The sky cleared suddenly after a shower - Mr. C got out his telescope - directing it upon the Nebula in Orion air disturbed - With a low power saw the 5th star easily The 6th star of the trapezium was difficult to make out but I satisfied myself that it could be seen & probably without much effort when the air is quiet. ζ Orionis dist 5"? easy. γ Orionis dist 1" saw it at once double the pair nearly in a parallel - upon ω Leonis dist. 0.5 I thought there was an elongation of which the impression remained in the direction N & S nearly. As this is nearly the true direction - which at the time I did not know - It would seem that the telescope did effect a decided separation elongation. They were not separated but the atmosphere was unfavourable - Perhaps the colour is too much overcorrected.

With regard to the image of false light we tried several experiments by covering up portions of the aperture - This had an effect but only partial - showing that it was not probably a knot or cord in the glass or

For two or three days on.

March 10th

Nebula (new?) in h 1236

a
x

194

x h 1236

9^h 43

79.28

10^h 07^m 79.09x
x
x
x

Nebula taken for a comet

11^h PM -

194 10^h 14^m 30.0 9^h 57^m 40^s
 2 02^m 20

12^h 16^m 50

194 Slow 20

12 17 10

APD 81⁰ 50'10^h 17^m 158⁰ 10' 0"H 10^h 00^m 3012^h 16^m 45

20

12^h 17^m 05

h 1236 1830.0

1855.0

a 12 16 14 + 1 16 = 12 17 30

APD x 81 36 53 + 8 20 = 81 45 13

Two or three others near.

x 50 ft -

9^h 45

62.80

63.00

x follows b = 66.45

21 beats

9^h 53^m

22

21.5

x follows b

50.07

37.50

72.50

37.50

37.15

37.10

37.15

50.07

12.92

10^h 11^m

62.62

62.81

x 50 ft

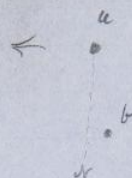
62.71

March 11th 1852

Spiral Nebula in Can. Ven.

Smaller nucleus is N. of the larger
P. & Dist of Analein

Pos	dist	
343..25	23.10	12 ^h Pol. -
342..37	22.80	
342..37	<u>22.92</u>	
343..80		
Zero	<u>1..28</u>	
344..28		



Zero of Pos
88° 30'
88.35

Note added Feb 18 1860
Orion & Cluster
in Hercules I think
are spiral

March 15

Victoria

*a a comp. star 10 mag. dif. M h & a $7\frac{1}{2}$ by 6 means
 p Victore 8 mag. h precedes
 b *8-9 mag. a 9. 62. 29
 starful 9 03. 55
 4 04

Gen
 50.08
 08
 06
 22
 50.07

Dif. Dec a & p

Dif. Dec p & h

Dif. M p & a

8.37.30 68.90
 9.20 68.88
 40.30 68.97
 41.40 68.96
 42.30 68.98

h m
 8.45.00 42.00
 5.50 41.99
 6.50 41.88
 8.50 41.88
 50.10 41.95

h 4 05
 a 8 54. 11.4 6.4
 h 55.9 6.1
 a. 8. 56. 02.0

42.4
 56 48.5 6.1

18.5
 8. 57. 25.0 6.5

03.8
 8. 58. 10.4 6.6

58.5
 8. 58. 45.0 6.5

20.4
 8. 59 27.0 6.6

March 16 The star measured last night
 for Victoria has not moved

9. 27. 21 H 2. 18. 09 Dec + 12. 36. 20

March 15

Victoria

57

March 15th Trial of Mr Clark's Telescope (continued)

it would have been more affected. It was remarked that the image which when the true disc is in focus - is dispersed into a wedge-shaped figure its point towards the star & its sides formed like a caustic curve when the eyepiece was pulled out of focus - by $\frac{1}{2}$ inch perhaps - the light almost entirely was united into a point like a star - This fact of the light coming to a focus - & its regularly formed edges - & the small effect of moving a body before the object glass made us conclude that it must be in some way occasioned by reflection. It strikes the eye only with 1st & 2nd magnitude stars & in no respect interferes with the definition of stars & planets but might affect a view of the Moon.

March 16th The weather promised better for definition tonight but we were to a great degree disappointed. Though there was no annoyance from wind - there was a haze of cirrus over the sky & what was worse an undulation in the atmosphere of small extent but very rapid making the images of the stars look fuzzy - diffusing the discs of the stars too much for a fair trial upon any objects closer than 1" -

During the day Mr C. had separated the object glass & removed the tin foil between them. This did not alter the definition - but had a sensible effect on the false light before alluded to. Taking more the form and the impression I received was that it was less plain than on the previous evening. This it was suggested might be because there was more diffused light in the sky - Last evening most of this stray light was in the Triangle - To night more distributed over the whole length.

The object lenses are now in contact without foil between them

Looked at Orion nebula. The 6th star of the Trapezium is seen well & Orion's small companion well shown. With this star the ray of light is visible when looked for but does not strike the eye unless attention is directed to it.

Orion's was seen but scarcely so well as on last night owing to the furriness of the images by quick atmospheric tremor. We examined also Procyon & the close double star near it. and were satisfied that the figure of the wing of light had altered since last night by removing the tin foil.

Later in the evening we set the Great Refractor upon ϵ Cancri the atmosphere in a state not favourable for separating close stars - could see the close pair separated with 600 - but the tremor sometimes diffused the discs so as to fill up the interval.

Set Mr C upon the same object with a power of 400. The separation was equally distinct & showed the same character - proving that atmospheric trouble occasioned the indistinctness

we notice this evening

March 16th 1852

S. Orionis

For Personal Equation -

G.P.B. leads

C.W.D.

C.W.D.

G.P.B.

5	37.1	26.0	33.0	7.0	39.1	25.4	32.0	6.6
		53.0	59.8	6.8		49.9	56.6	6.7
		16.8	23.5	6.7		10.0	16.5	6.5
		43.8	50.4	6.6		36.5	42.9	6.4
	39.1	05.8	12.5	<u>6.7</u>		57.0	03.5	<u>6.5</u>
				6.72				6.54

					17.4	23.8		
	39.0	45.5	6.5	46.1	25.8	17.4	6.4	
	01.9	8.5	6.6		37.0	43.6	6.6	
	07.5	14.0	6.5		55.9	02.4	6.5	
	33.2	39.7	6.5		18.0	24.5	6.5	
	45.1	54.5	01.1	<u>6.6</u>	35.0	41.6	<u>6.6</u>	
				6.54			6.52	

C.W.D. marks later than G.P.B.

0.09

1st act. obs. discrepant

11

0.012nd "

11

0.05

$$G.P.B. - C.W.D. = -0.04$$

$$G.P.B. - C.W.D. = -0.050$$

$$10'' = 6.58 \quad 658$$

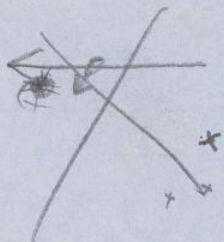
$$1'' = 0.658 \quad 329$$

$$1'' = 9.87 \quad 904$$

$$\begin{array}{r} 656 \\ 328 \\ \hline 984 \end{array} \quad \begin{array}{r} 658 \\ 329 \\ \hline 987 \end{array}$$

4
4
5
2
7

March. 16 P.m. Mars



At 7.30^m sid Lim

Mr Clarke's double Star AR

$a = 5^k \text{ mag.}$
 Companion 7^k

←

is np 258° pos
 Dist = $0''.8$

347.4	2) 271.8
173.7	135.90
2..53.7	2..15.90

Air unsteady
 power 800

H.C. 13173-4

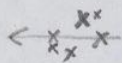
194-7^h 56.39
 1.. 14.34
 6.. 42.05
 Dec -14° 56'

6.. 39.. 53.71	104.. 55.45.4
2.. 15.90	0.. 2 53.7
6.. 42.09.61	104.58.39.1

194 32
 R 6.. 42.37
 Dec -14.56

March 16 Pm.

Net. in Orion



March 20

Determination of place of comp star of
 D'Arrest Comet. Comet comp. with star Oct. 23, 1851
 See preceding Eq. Book

Dif. Dec.

Dif. R

5 min south

*h

*c10

96.16

a 2.17.0

124.3

4.073

a comp * Oct. 2/3

96.02

a 8. 37.30.0

8 41. 38.

4.08.0

h star from

96.13

which a is det.

.31

38.0

15.3

4.07.3

a 9-10

96.103

8. 42. 51.5

8. 46. 58.5

4.07.5

h 6 mag duplex

50.06

29.6

h north pol a

46.049

4.07.4

9.8

4.07.5

368344

4.07.45

414387

cor for ref +.04

451.2214

7. 31.22

4.07.49

*b is B.A.B. 1427

Winn 4- 629

March 23

cor for ref +.80
7. 31.22

Dif. Dec

Dif. R

The dif. in R below are worthless owing to the wires

a b h

a b h

not being set perpendicular to the parallel of Dec.

562

59.5

502.0

4.02.5

539

8. 51. 09.1

55. 11.5

4.02.4

5.15

45.0

47.0

4.02.0

116

45.0

47.0

4.02.1

5.387

8. 55 54.4

8. 59 56.5

4.02.25

50.012

44.625

7.8

357000

401625

4373250

7. 17.32

21.22

43.22

7. 17.32

21.22

43.22

7. 17.32

21.22

43.22

7. 17.32

21.22

H 4. 37. 01

Dec. South 3. 52. 00

Zero

50.016

49.99

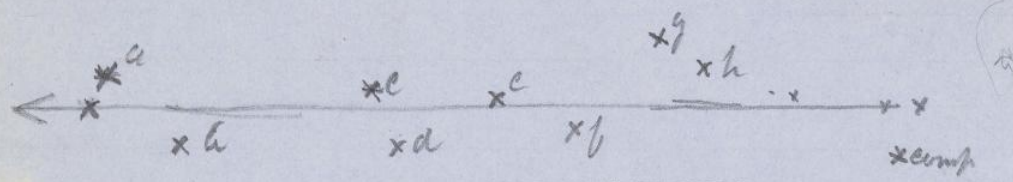
50.03

150.035

50.012

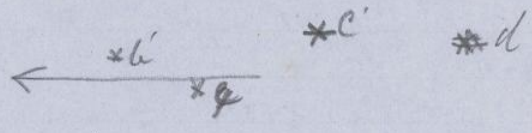
March 20

Determination of place of comp. star of Brorsen's Comet -
Comet comp. with star Sept. 1, 1851 See proc. 2. Book



Dy. M

com a	2 50	
com h	9,, 43,, 12,5	-22.5
e	40	
d	47 52	9
e	9,, 05	
f	49 28	
g	51,, 22	
h	51,, 35	
	9,, 55,, 13.4	



a*		
b	1135, 54.4	
c	1140, 21.3	4,, 26.9

Dy. M

b & c		
b	19 58	c 4,, 24.5
b 10	20,, 10.5	c 10,, 24, 37.2
b	39	c 0 06.0
b 10,, 25,, 53		c 10, 30,, 20.0

Zero
50.04
07
07
16
50.06
in comp. star of comet
c' New comp x = 86.6.29992

Dy. Dec. b & c

20 38
20 45
83
20.41
50.06
29.65
9.8
23720
26685
290,570

Dy. A

a & b	
11 33,, 21.5	4.50.57 = da b & c
33,, 53.4	31.9
34,, 29.0	32.0
11, 35,, 01.0	32.5
	32.0
	6.4
	32.1 = da a & b

dec

25,, 03.
15,, 10
15,, 15
30
15.10
56.06
34.96
20.44
55.40
9.8
443.20
49860
542,920

b & c

29.63
29.61
29.63
30
29.62
50.06
20.44
50.06

9.02.52 = da a & b
4.50.57
15, 53.49 = da a & c

4, 26.5
4, 26.7
4, 27.0
4, 27.0
4, 26.9
39.1
4, 26.82 = da b & c

1852

March 20

Continued from preceding page

H.C. No. 27992

An. prec. 2.030 Rsec. var. $.000$ 2.030 51 2.030 10150 103530 1.4353 * R $15.11.28.67$ 1851.0 prec. $1.43.53$ $15.13.12.20$ 1851.0 dabge $4.26.82$ $15.08.45.38$ dabge 32.1 * a R $15.08.13.28$

c is H.C. No. 27992

c R $15.13.12.20$ 1851.00 c Dec. + $46.09.21.29$ a R $15.08.13.28$ 1851.0 a Dec. + $46.23.14.78$

a is comp. star of Brorssen's Comet on Sept. 1, 1851 - Its place
has been determined from H.C. No. 27992

An. prec. + $13.45X$ sec. var. $-.050$ 13.406 51 13406 N.P.D. $43.39.15.0$ prec. + $11.23.71$ N.P.D. $43.50.38.71$ * a Dec. $46.09.21.29$ 1851.0 67030 dabge $4.50.57$ 683706 a Dec $46.14.11.86$ $19.23.71$ dabge $9.02.92$ comp a Dec. $46.23.14.78$

$30^2 \quad 10^2$ $900 \quad 100$

8

March 23 Spiral Nebulae in Comae Venatici Observer C. W. S.

Zero

50,03

02

07

03

9

50,045-

new	acc	cred	dr b	dr b
14 ^r 34	44 ^r 74	46 ^r 82	71 ^r 23	85 ^r 38
14 10	4 52	47.00	1 22	85 59
14 20	4 46	6.99	1 40	85 03
13 75	44 20	6.97	1 33	84 80
13 93	4 23	6.85-	1 50	84 90
<u>13 75</u>	<u>44 38</u>	<u>46 94</u>	<u>71 35</u>	<u>84.60</u>
24.03	253	41.57	203	30.30
14.005-	44.42	46.93	71.34	85.03-
50.045-	<u>50.04</u>	<u>50.04</u>	<u>50.04</u>	<u>50.04</u>
36 040	5.62	3.11	21.30	35.01

March 24th 1852.

Daguerreotyping

Mr. Runkle & brothers came to look through
the telescope.1st plate

Carton

1st 45 counts = 25^s2nd40^s

last but one

2^m

last

3^m2nd Plate

Time of Exposure

1 st	52 ^s
2 nd	45
3 rd	30
4 th	25
5 th	20
6 th	15
7 th	10
8 th	5
= 9 th	1 ^m 30 ^s
10 th	1 " 15
11 th	0 " 45
12 th	0 " 30
13 th	0 " 10

March 25th 1852

Daguerreotyping -

71
Clear Ther + 35° Calm
Ground covered with snow

Mr W. came at 6^h 45^{min}

1st plate exposed 18 counts = 24^s

Found not long enough
Not mercury enough either
Not long enough

2nd " " 23 " = 30

3rd " 29 " = 39

Not long enough

4th " 45 " = 60

The Moon 5 or 6 days old Night not good -
we tried Castor with power of 350? But an exposure of 5^m gave no trace of action

March 25-

Dif. Dec a & h

11.06.20	1715
8.40	118
10.30	106
12.80	6.80
14.40	140
17.00	125
11.50.00	127
52.30	125

Dif. Dec a & e

11 58.45	8.21
12.02.20	3.17
4.30	323

Dif. March

a 6.50.4	h 52.5	1.021
a 11.27.05.0	h 11.28.06.8	
8.37.0	38.9	
11.28.51.5	11.29.53.1	
18.5	20.0	
11.30.32.8	11 31.34.5	

02.5	04.5
11.34.17.1	11.35.19.0

Dif. March

a 46.0	c 38.4
a 12.10.00.5	c 12.11.53.0

27.5	20	29.4
12.12.42.4	13.	44.4

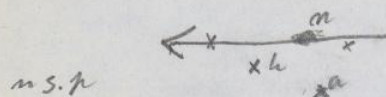
Pos. Circle
 $\begin{array}{r} 102.12 \\ 90 \\ \hline 152 \end{array}$

← xa

a g mag
 h 10-11 mag

a comp. star S. J
 a is Waine H. 7 10387

March 25-



Dif. M
 m & a
 12.40 4.5
 4.2
 4.3
 0^m 26.25 = Δα (6)

m & h
 26.0
 26.5

Dif. Dec m & h
 12.45.0 89.13
 47.00 4.04
 48.00 4.44 8.94?
 Mean 39.04

Mean
 39.04
 50.04
 11 00
 22
 117.8 = 1' 57".8 = Δδ (6)

Place of Nebula or Comet??
 13.12.07 H 4.12.28 Dec +60° 38'

4.12.28

8.59.39

Faint in Comet seeker.

Chim. Slow 1 00

R 9.00.39

Dec +60° 38'

} Elongated in altitude
 or R.

Found in H. 1 catalogue.

Arg. Sternverzeichnis +60 1175
 1855.0 8 59 52.3 +60° 39.5
 14.2 10.7
 1852.0 8 59 38.1 +60 40.2
 Δα +26.25 Δδ -2.0
 Obsd α 9 00 4.35 δ 60 38.2

4.74

3

14.22

4.74

22

9.48

9.48

104.28

-14.2

3

-42.6

14.2

22

28.4

28.4

51.24

h 555

8 58 19.3

pre 1 44.3

1852.0 9 00 03.6

29 16 31

60 43 29

5 12

1852.0 60 38 17

Nebula h 555

Compared with star of 9.5 mag. Arg. St. vr. +60° 1175

Rel. s.f. star Δα +0^m 26.25
 Δδ -1' 57".8

April 1st Pan.

2nd

$$\begin{array}{r} 102.15 \\ 90 \\ \hline 152.15 \end{array}$$

a 51.8 b 59.6 07.7
 28. 36.00.0 29. 07.5 4.075

Scale A used only in Zones 1 & 2.

April 13th - Observations for value of Mica Scale used for Zone
 Observations - N.B. The atmosphere was very much disturbed - 5 in. snow on ground

Mean of passages of Polaris and its companion over the minute wires of declination
 of the scale

		Value of scale
-1' to 0'	2 ^m 35.1	1 ^m 00.2
0' to 1	32.4	0 ^m 59.2
1 - 2	35.8	1 ^m 00.5
2 - 3	33.6	0 ^m 59.3
3 - 4	35.0	1 ^m 00.4
4 - 5	33.6	0 ^m 59.3
5 - 6	32.5	0 ^m 59.2
6 - 7	36.2	1 ^m 00.7
7 - 8	37.5	1 ^m 01.2
8 - 9	32.5	0 ^m 59.2
9 - 10	33.8	0 ^m 59.7
11 div of scale		= 10 ^m 58.9

88.31.08

 $\frac{1}{2}$ dist comp 8

88° 31'

58.7

cos 8.41307

8.41307

1' = 4^s 0.60206

156.52 1.6 = 2.19456

154.52 2.18899

4.0516 = 0.60763

2^m 34.5= 1^m 00.781^s = 0.39

The divisions of the scale
 are therefore as nearly exact
 as can be determined without
 further observations.

Note added April 29th.

As this scale was graduated under
 circumstances the same with those
 at the time of graduating Scale B of
 which an accurate determination was
 made on April 28th I shall
 therefore use for the value of

One div. of Scale A = 0^m 59.85
 10 div = 9^m 58.50

April 13.

Observations for d.R. PolA 3540 & 3597

Temp = 35°²

	3540	3597	d.R.	dif. ap. R	8.13.95
	10.5	09.0	8.14.1	com. mean	-0.03
	19.8	17.0	14.0		8.13.92
	20.8	25.0	13.9	3597	10.1.22.43.50
11.36.34.5	11.38.19.0	11.46.32.8	13.8		10.1.14.29.58
			8.13.95		

Polaris comp.

Polaris

had seeing

-9	12.01.59.7	2.31.5	12.02.20.9	2.38.8	comp is 16" S. of Polaris
0	4.31.2		12.04.59.7	5.07.3	
		2.36.2		2.28.5	
1	12.07.07.4	2.35.6	12.07.28.2	2.36.0	12.04.31.2
2	9.43.0		10.04.2		12.27.39.5
		2.32.2		2.31.5.0	12.28.09.5
3	12.15.2	2.36.8	12.39.2	2.33.2	23.08.3
4	14.52.0		15.12.4		23.04.8
		2.30.5		2.36.6	23.09.1
5	16.50		17.49.0	2.34.5	12.02.31.2
	climb	2.30.5	26.23.5	2.35.7	12.30.13.3
6	14.53.0				25.42.1
		2.36.8			25.43.5
7	12.22.29.8	2.41.0	12.22.59.2	2.34.0	25.42.8
8	25.10.8		12.25.33.2		25.45.0
		2.28.7		2.36.3	2.2
9	27.39.5	2.33.8	12.28.09.5	2.33.7	
10	12.30.13.3		12.30.43.2		
	28.13.6		28.22.3		

The scale was used in the same position relative to the axis of the eyepiece as when observing the zones so that these observations show that errors of division parallel a effect of oblique vision at edge of the field are nearly insensible

May 6 Pm

a	is	5.55	1.40	41,09.3	26.9
P	"	7.35	4.43	36.2	3.8
b		2.52		41 40.0	
a		6.38	1.42	42,37.5	27.3
P		8.15	4.45	41.4	3.2
b		3.30		43,08.0	
a		5.23	1.40	44 28.6	27.4
P		7.08	4.45	44,50.6	3.8
b		2.21		44,53.8	

a	5.31	1.44	58,12.8	27.2
P	7.15		40.0	3.8
b	2.23	4.52	38,43.8	
a	5.02	1.43	00,05.6	27.0
P	6.45		32.6	
b	1.58	4.47	36.6	40

$$24) 3.5 \quad 0.21$$

$$\begin{array}{r} 21 \\ 21 \\ 42 \\ 441 \end{array}$$

$$\frac{15}{250} \quad \frac{3}{50}$$

$$24) 64.5 \quad (2.70) \quad 24) 66 \quad (2.75)$$

$$165 \quad 1.35 \quad 270$$

$$2.6$$

$$56.7$$

$$9.57.593$$

$$9.55.25.1$$

$$2.342$$

$$5a + 25b = 2.34.2 = 154.2$$

$$21a + 441b = 7.24.0 = 444.0$$

$$62$$

$$24) 66 \quad (2.75)$$

$$180$$

$$168$$

$$120$$

$$5.50$$

$$9.57$$

$$9.57.56.7$$

$$5.5$$

$$9.58.02.2$$

$$9.55.25.1$$

$$2.371$$

$$20a + 100b = 616.8$$

$$\begin{array}{r} 1 \quad 5 \quad 30.5 \\ \hline \end{array}$$

$$21a + 105b = 647.6$$

$$21a + 441b = 444.0$$

$$336b = -203.6$$

$$b = -\frac{203.6}{336.0}$$

$$2.30878$$

$$2.52634$$

$$9.78244$$

$$t^2 \quad 3.11742$$

$$3.16412$$

$$2.94656$$

$$-884.2$$

$$t = 17.2$$

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

$$38.2 = 1.55877$$

$$3.11742$$

$$5a + 25b = 17.1$$

$$21a + 441b = 51.5$$

$$21a + 105b = 17.9$$

$$336b = +33.6$$

$$21a + 105b = 71.8$$

$$21a + 441b = 51.7$$

$$336b = -20.1$$

$$20.1 = 1.30320$$

$$336 \quad 2.52634$$

$$b \quad 8.77686$$

$$25 - 1.39794$$

$$0.17480$$

$$-1.5$$

$$17.1$$

$$5/18.6$$

$$a = 3.72$$

$$17.18$$

$$b = +0.100$$

$$a = +2.92$$

$$a = \frac{17.1}{17.1} = 0.342 - 0.50 = +2.92$$

$$t \quad 1.58206$$

$$a \quad 0.46528$$

$$+ 111.5 = 2.04744$$

$$146.0$$

$$257.5 \quad 1.58206$$

$$a \quad 0.57054$$

$$+ 142.1 = 2.15260$$

$$-87.3$$

$$54.8$$

$$87.3 - = 1.94098$$

$$20a = 616.8 + 60.6 = 677.4$$

$$a = 33.87 = 1.52982$$

$$38.2 \quad t \quad 1.55877$$

$$1.58206$$

$$3.11188$$

$$+ 1293.7$$

$$884.2$$

$$409.5 = 6.49.5$$

$$12.51.08$$

$$13.8.16$$

$$17.8$$

$$9.57.59.3$$

$$9.51.09.8$$

$$13.42.37$$

$$12.51.08$$

$$51.30$$

$$12.51.08$$

$$54.48$$

$$13.45.56$$

Place of New Planet of Gasparis of March 17thApril 24th 7^h 15^m Camb. mst

514 S.

42 m. N. m.

28th α 9^h 51^m 10^s9^h 50^m 54^s9^h 51^m 54^s

GP13.

 δ +13° 46'

-13° 40'

+13° 40'

3.24

1.6

13.44

3.24

51.84

Runkin 3044 6th mag.

17.05

1.6

102.30

17.05

212.80

4.32.8

7.8 mag

5.6

9^h 53^m 16.58

+13° 41' 12.9

51.84

4^h 32.89^h 54^m 08.42

13° 36.40.1

BAC-3361-

76° 14' 39.9

9^h 43^m 02.42

+13° 45' 20.1

76° 51' 03.7

9^h 50^m 15.49

+13° 08' 56.3

13° 11' 32

37.

45.32

13.46

13.09

37

10^h 40^m 00^s

2 13

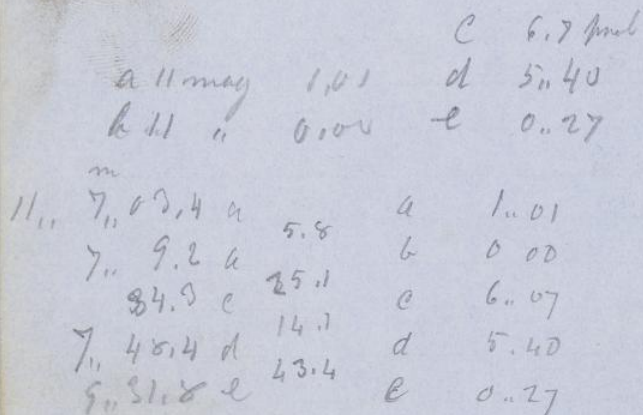
10^h 42^m 13^s9^h 50^m 15.551^m 57.513^h 14^m 57^s

2 13

13 17.10

3^h 26.369^h 50^m 34^s9^h 50^m 16^s

inter -18



Two fields & $\frac{1}{4}$ folg

mag.	Dec	time	
10.11	a 1.01	13.11.83	6.5
10.11	b 0.00	13.11.83	6.0
11	c 6.07	14.11.84	25.
10.11	d 5.39	14.11.84	14.1
9.10	e 0.27	15.11.84	43.7

Q	1.01	9.6	5.6
h	0.00	5.6, 15.2	24.9
e	6.06	49.1	14.2
d	5.39	54.3	43.7
p	0.28	58, 38.0	

a	1.01	45.4	6.0
b	0.00	51.4	24.9
c	6.09	16.3	13.9
d	5.44	30.2	43.6
e	0.28	51.13.6	

Correct price. h m
 h m
 Cornet price. h m s d c at 12, 15 and.
 5. 25 n of h

$\theta = 10^\circ$
 # fol. G 516.85 4.50
 # fol. H 14 1/2 15.5 8.32

+ Kq mag.	3.47	11.36.56.2		gmk	3.47	11.42.55	
+ l 11 "	7.00	57.42.4		l	7.02	43.41.2	
a	9.58	12.5		a	10.00	44 11.7	
b	8.58	38 18.3		b	9.00	17.4	
m 10	0.43	39.24.7	31.3	10 m	.43	45.23.8	30.9
m 12	1.13	9.56.0	45.2	m	1.16	5.54.7	45.5
p 9	9.28	40.41.2		p	9.27	11.46.40.2	

K	3.46	12.21.35.8		m	12.31.46.0	0.43	9.5
l	7.00	2.22.2		n	32 16.8	1.18	
a	10.00	52.6					
b	10.59	58.4		m	12.36.35.5	0.42	3.4
m	0.40	5.3	31.0		37.06.8	1.16	
n	1.17	24.58.3	45.5				
h	9.26	25.21.8			38.10.2	0.39	3.3
					8.41.3	1.12	

K	3.47	57.45.7	6.5
l	6.59	12.56.30.2	
a	9.59	60.3	
b	8.58	9.06.0	
m	0.41	12.4	
n	1.13	43.6	
p	9.26	1.01.29.0	45.4

Value of Scale (13)

April 28th

Polaris

Definition good.

comparative Pol.			Polaris			No. 0	marks	
0	13., 26.06.8	2., 34.2	26., 29.7	2., 33.9				22.9
1	28 41.0	2., 34.7	29., 03.6	2., 35.5	1			22.6
2	31., 15.7	2., 32.0	31., 39.1		2			23.4
3	33., 48.7	2., 34.5	34., 10.2	2., 31.1	3			22.5
4	6., 22.2		36 46.0	2., 35.5	4			23.8
5	38., 57.5	2., 35.3	39., 19.0	2., 38.0	5			21.8
6	41., 31.7	2., 34.2	41., 54.8	2., 35.8	6			22.7
7	44., 4.6	2., 32.9	44., 28.3	2., 33.5	7			23.1
8	46., 36.3	2., 31.7	47., 02.5	2., 34.9	8			23.9
9	49., 13.5	2., 37.2	49., 38.5	2., 35.5	9			26.2
10	51., 43.0	2., 29.5	52., 10.7	2., 32.2	10			24.5

0 to 1	2., 34.2	2., 33.9
0 2	5., 08.9	5., 09.4
" 3	7., 40.4	7., 40.5
4	10., 15.4	10., 16.3
5	12., 50.7	12., 49.3
6	15., 24.9	15., 25.1
7	17., 57.8	17., 58.6
8	20., 24.5	20., 33.3
9	23., 06.7	23., 08.8
10	25., 38.2	25., 41.0

One Polaris 88.31.04
 8
 88.30.56

comp	Polaris
0 13.56 45.0	13 57.06.8
1 9.18.5 - 2.33.5	59.41.2
2 14.01.53.0 2.34.5	2.16.1
3 04.26.8 2.33.8	4.50.7
4 07.01.0 2.34.2	7.25.3
5 09.35.0 2.34.0	9.58.8
6 12.09.4 2.34.4	12.33.6
7 14.42.4 2.33.0	15.07.0
8 17.15.8 2.33.4	17.41.3
9 19.49.0 2.33.2	20.14.9
10 22.23.2 2.34.2	22.48.2

No	0
1	0.25.39.2
2	6.24.48
3	3.12.24
4	8.74.77.0 44
5	0.30.10.3 03
6	9.04.87.3 47
7	on 5 8.41.33.9 27
8	7.46.21.2 74
9	2.1 4.68.55.7 49
10	2.77.65.5 25
	597.8
	= 9.57.8

0 to 1	2.33.5	2.34.4	1500
2	5.08.0	5.09.3	1539.2
3	7.41.8	7.43.9	3.18730
4	10.16.0	10.18.5	8.41339
5	12.50.0	12.52.0	1.60069
6	15.24.4	15.26.8	17609
7	17.57.4	18.00.2	1.77678
8	20.30.8	20.34.5	598.1
9	23.04.0	23.08.1	9.58.1
10	25.38.2	25.41.4	

In making the above observations the focus was adjusted by the test that there should not be any relative parallax of the lines on the scale and the images of the stars - This source of error is thus eliminated. & as the transits were taken with each line in precisely the same position which it occupies when declinations are read from it the resulting value of the divisions is identical with that used for declinations

April 28th PM 1852

Ext. Bar - 39.4

Observations of Transits of Polaris & its companion 16" S.p. it
over the Scale (B) of Mica used in Zones 3, 4, 5
For the values of its divisions -

Page over the
Time for minutes -

Minute	Companion	Polaris
0	11. 43. 12.9	11. 43. 33.7
1	45. 46. 4	46. 7. 7
2	48. 19. 9	48. 40. 8
3	50. 53. 8	50. 14. 8
4	53. 27. 1	53. 48. 9
5	56. 0. 2	56. 24. 5
6	58. 35. 9	59. 01. 2
7	12. 1. 7.0	1. 32. 7
8	3. 41. 6	4. 07. 2
9	6. 16. 4	6. 42. 1
10	8. 46. 3	8. 16. 0

Obs. made at about 13^h Sid. Tim?
or was it at 11^h & 12^h Sid.

0 to 1	2. 33. 5	2. 34. 0
0 to 2	5. 07. 0	5. 07. 1
0 to 3	7. 40. 9	7. 41. 1
0 to 4	10. 14. 2	10. 15. 2
0 to 5	12. 47. 3	12. 50. 8
0 to 6	15. 23. 0	15. 27. 5
0 to 7	17. 54. 1	17. 59. 0
0 to 8	20. 28. 7	20. 33. 5
0 to 9	23. 03. 5	23. 08. 4
0 to 10	25. 33. 4	25. 42. 3

Value of Mica scale (B)

Times of transit from the zero line to each minute. By a star in Dec $88^{\circ} 30' 56''$
 Each by Mean of eight passages

	$h_0 - h_n$		$h_0 + h_n$	$\frac{h_0 + h_n}{2}$
$d_0 - d_n = 0$ to 1	2.. 38.9	= 1x	0.. 59.71	0.. 11.. 32
0 to 2	5.. 08.3	= 2x	0.. 59.72	10.. 16
0 to 3	7.. 41.5	= 3x	0.. 59.73	9.. 00
0 to 4	10.. 15.9	= 4x		7.. 42
0 to 5	12.. 50.0	= 5x		6.. 25
0 to 6	15.. 25.3	= 6x		5.. 08
0 to 7	17.. 57.8	= 7x		3.. 50
0 to 8	20.. 31.7	= 8x		2.. 34
0 to 9	23.. 6.6	= 9x		1.. 17
0 to 10	25.. 38.8	= 10x		0.. 00
	141.. 09.8	= 55x	$\frac{10(10+1)}{2}x + \sum (arc - m) = \frac{1}{2}x$	

$$d_0 - d_n = \sin d_0 - \sin d_n = 2 \sin \frac{h_0 - h_n}{2} \cos \frac{h_0 + h_n}{2} \cos \delta$$

$\frac{1}{2} h_0 - h_n$	\sin	$\sin d_0 - \sin d_n$	$d_0 - d_n$	$\cos \delta$
1.. 17.0 = 0.. 19.. 14	7.74778	8.71387	6.46165	0.. 59.. 71 = 1x
2.. 34.2 = 0.. 38.. 33	8.04974	71399	.76373	1.. 59.. 72 = 2x
3.. 50.7 = 0.. 57.. 41	8.22476	71409	6.93885	2.. 59.. 18 = 3x
5.. 8.0 = 1.. 17.. 00	8.35018	71418	7.06436	3.. 59.. 22 = 4x
6.. 25.0 = 1.. 36.. 15	8.44707	71429	.16132	4.. 59.. 06 = 5x
7.. 42.6 = 1.. 55.. 39	8.52679	71432	.24111	5.. 59.. 37 = 6x
8.. 58.9 = 2.. 14.. 43	8.59304	71436	.30740	6.. 58.. 63 = 7x
10.. 15.9 = 2.. 33.. 59	8.65105	71439	.36544	7.. 58.. 48 = 8x
11.. 33.3 = 2.. 53.. 20	8.70242	71441	.41683	8.. 58.. 58 = 9x
12.. 49.4 = 3.. 12.. 21	8.74759	8.71442	7.46201	9.. 57.. 64 = 10x
				54.. 49.. 59 = 55x
				0.. 59.. 81 = x

Mean, giving each a weight proportional to its
 Distance from zero (i.e. by least squares. ?)

Final value of one division of the mica scale B

is $0.. 59.. 81$ at the temperature 39.4

The probable error of dividing is $0.. 18 0.. 17$ for any

division

(See July 7th 1852)

By obs in July combined with those 10 div = $10.. 00.. 00 + 0.. 072 (t - 69.8)$

$$10 \text{ div} = 9.. 58.. 10 - 0.. 05 = 9.. 58.. 05$$

This value was tested in reducing Lane 4 - 6 Catalogue Stars

gave the zero correction $\delta = -1.. 10.. 2$ By Value of Scale A B $-1.. 09.. 7$

April 28th 1852Adopted value of one div. $0''.59''.81$ Scale B.

	obs'd values	comp values	$o-c$	$(o-c)^2$	
0 to 1	$0''.59''.71$	$0''.59''.81$	$-0''.11$	121	Probable error of one division of the scale $0''.15$ $0''.18$
" 2	$1''.59''.72$	$1''.59''.62$	$+0''.10$	100	
" 3	$2''.59''.18$	$2''.59''.43$	$-.25$	625	
" 4	$3''.59''.22$	$3''.59''.24$	$-.02$	4	
" 5	$4''.59''.06$	$4''.59''.05$	$+0''.01$	1	
" 6	$5''.59''.37$	$5''.58''.86$	$+0''.51$	2601	
" 7	$6''.58''.63$	$6''.58''.67$	$-.04$	16	
" 8	$7''.58''.48$	$7''.58''.48$	$.00$	0	
" 9	$8''.58''.58$	$8''.58''.29$	$+0''.29$	841	
" 10	$9''.57''.64$	$9''.58''.10$	$-.46$	2116	
				9) 179	9) 6425
				0.20	714
				.85	0.27
				90	67
				144	189
				0.170	162
				Prob error	0.1809

See July 7th 1852-

May 10 Pm.

2.8 9^h 10 14 13^h

3
2
4 + 10^h
8 + 3 10^h 11^h

0
3
4

group { 4
4 + 12^h

0
6
10 + 2 12^h

0
3
4
9 + 9^h
2
0

6^h - 3^h 15^h R

In Milky way
R 1830 + 12

6	4	6	16x	14
3	3	3	9	5
4	6	8	16x	8
0	0	5	10x	7
4	2	1	8	6
4	3	4	12	5
3	2	3	6	5
1	1	3	7	8
0	3	4	8	7
4	5	5	9	5
3	5	4	20x	3
5	4	2	13	5
3	0	1	6	9
8	3	3	7	3
4	2	3	3	5
0	2	0	8	4
9x	1	1	7	6
2	1	8x	8	1
2	9x	2	9	10
3	7	3	6	4
3	4	5	14x	5
8x	1	0	7	6
0	3	0	7	6
7	2	3	8	7
0	7	2	12	5
4	1	1	11	5
0	4	2	5	3
5	3	4	8	5
0	3	2	9	4
3	4	5	3	2
1	8x	4	7	2
5	4	7	2	5
5	5x	0	3	1
3	1	2	10	7
4	11x	3	15x	5

$R 11^4 + 30^\circ \text{hr}$

4	2
3	0
4	2
4	3
5	2
4	4
3	6
4	7
0	4
3	6
4	6
6	3
4	1
3	1
3	2
1	4
2	2
5	3
3	3
4	0
3	0
3	2
3	2
5	4
0	3
1	0
0	2
7	0
2	1
5	1
3	0
7	1
0	2
3	2
8	2
0	2
3	

The preceding are the numbers of stars above the 14^{th} mag. in a field of $10'$

They are taken with a design to show the tendency of the stars to form groups with intermediate vacancies. This is more striking in the number of vacancies than of groups. Neither are to be so easily detected in the Milky way as elsewhere.

90

May 18th 1852 -

R. for all above pole 12^h 30^m

-28°	-10	+10°	+30°	+50	+70
7	2	2	2	1	2
4	3	0	4	2	4
6	6	2	2	1	1
3	1	0	0	4	2
7	4	4	1	0	2
5	2	2	4	5	4
1	4	1	x 4	4	3
3	5	2	2	2	4
8	7	1	0	2	5
4	1	5	0	1	2
5	0	1	1	3	0
7	1	3	1	4 1	4
2	2	0	x 7	2	6
6	3	1	0	5	2
3	4	5	0	2	3
6	4	0	1	3	0

-18	0°	+20	+40	+60	+80
4	4	4	4	2	7
4	2	0	4	2	6
2	0	2	3	0	3
3	5	0	0	1	4
5	0	1	2	2	2
0	2	0	3	4	2
6	0	0	1	0	5
5	2	x 8	3	0	4
6	1	1	0	5	8
2	2	0	4	4	4
2	0	4	4	1	2
0	1	0	2	1	2
2	0	0	4	0	0
0	2	2	1	1	1
3	3	2	2	2	2
7	1	0	3	0	3
	4	4	2	5	0

In this region unusual uniformity groups by no means a striking feature -

Sub pole $\alpha R 0^{\text{h}} 30^{\text{m}}$

+90

20 Sub pole

6

7

4

6

2

7

3

6

3

5

2

6

4

6

1

6

2

4

3

4

5

4

2

5

5

4

3

3

5

4

4

4

The foregoing are the numbers of stars above the 13th mag. in fields of 10' taken at random in the region apogonized.

The section is nearly perpendicular to the milky way its pole being in $+25^{\circ}$ Dec.

The Design was to see if there is a tendency of the stars to arrange in groups.

10⁰ S pole

6

4

5

2

8

2

4

5

3

5

7

4

4

5

7

7

5

13	14	7	5
12	13	6	5
17	12	6	7
6	10	8	4
5	12	8	5
12	9	3	5
13	12	5	7
9	15	8	6
12	15	7	5
18	12	9	3
7	12	10	5
10	8	9	6
12	11	9	6
10	12	4	3
16	6	12	3
10	9	4	4
—	—	—	—
15	10	8	—
11	8	5	—
14	8	5	—
8	12	8	—
8	4	7	—
10	10	4	—
11	7	6	—
12	3	8	—
8	9	7	—
10	9	7	—
5	9	6	—
6	13	6	—
11	13	8	—
12	10	7	—
11	13	7	—

109

109

38

190

73

170

580

580 fields
+ 18
were compared

598

New Cornet

$$\begin{array}{r}
 \begin{array}{cccc}
 a' & b' & c' & d' \\
 -9.6709 & -9.9528 & -1.2709 & -9.5642 \\
 -0.9953 & -1.2391 & +8.2348 & +0.2529 \\
 \hline
 +0.6662 & +1.1919 & -9.5057 & -9.8171 \\
 +4.637 & +15.56 & -0.820 & -0.656 \\
 +15.56 & & \frac{.656}{-.976} & \\
 +20.20 & & & \\
 -0.98 & & & \\
 \hline
 +19.22 = \text{even in N.P.D.}
 \end{array}
 \end{array}$$

+ 19.22 = evr in N.P.D.

$f + 0.79$ $g + 1.83$ $g + 1.10$ $h + 19.96$ $H + 209.42$ $i - 4.29$
 $H + 209.42$ $\sin H + a$ 9.08692 $\log 2.063246$
 $a + 337.19$ $\sec 8$ 0.57594 $\cos 8$ 9.42416
 $H + e + 167.01$ $\log h$ 1.30016 $0.05662 - H + 39$
 0.96292 -9.182 $\cos H + a$ 9.99674
 $g + a = 56.29$ $\sin 8$ 9.98412
 $\sin g + a$ 9.92102 $\log h$ 1.30016
 $\tan 8$ 0.55996 $1.24102 + 19.10$
 $\log g$ 0.26245 $\cos g + a$ 9.99674

$$\begin{array}{rcl} \sin 9 & 9.92102 & \log h \quad \underline{1.30016} \\ \tan 8 & 0.55996 & 1.24102 + 19.10 \\ \log 9 & \underline{0.26245} & \cos 9 + 9.74208 \\ 0.74343 + 5.539 & \log g. & \underline{0.26245 + 1.01} \\ & & \underline{0.20458 + 14.10} \\ f + \underline{0.79} & & \\ & - 2.858 & \text{ds} = \underline{20.39} \\ & - \frac{1}{2} \quad 9.5f & - 19.10 \\ & & \frac{1}{2} \quad 0.13 \\ dx - .1902 & & - 19.23 \end{array}$$

* c mean place
cor to app R.
app. place

Mar 2y 1852.0

94

May 18th 192 1852 New Comet

Comet

start 10 may.

$\beta 16.30.54.5$ * 2.58
 $\times 31.19.3$ 22.8
 $\beta 16.33.17.5$ 21.3
 $\times 38.38.8$

$12.44.38$ in R in Dec.
 $14.02.22$ change
 $1.17.44 - 8.93 + 8.46.3$

$\beta 35.41.8$ 20.2 $\beta 3.30$ 38
 $\times 36.02.0$ * 4.08

9.6
 1.1
 9.6
 9.6
 1.804
 $22.28.56.7$
 $22.28.55.6$

480
 $77.7) 526.3$ (6.773 = move Dec. in
 466.4 one minute
 60.10
 54.39
 57.10
 54.39
 27.10
 $13.10.33$
 $13.00.58$

$\beta 38.50.0$ 22.0 3.90
 $\times 39.12.0$ 4.30
 $16.16.58$ 6.3
 21.57

$2.28 = 1.48$
 $0.45.5$ $0.37.0$
 $0.37.0$ $0.36.4$

$777) 843$ (0.115
 777
 1160
 777
 3830
 6.77
 9.6
 4062
 6093
 64.99
 $140.5.0$
 $35.19.0$

$16.34.41.4$
 $194 \quad 7.1.54.3$
 $16.32.47.1$
 $3.46.03.6$
 $12.46.43.5$
 $2.5.6$

Comet moves north +6.773 in 1st Sid.
 " Dec to R 0.115 "

$12.44.37.9 = M.S.P.$ Comet $\text{Dec} \times 6$ $0.21.57$ North of Star 6 $0.36.4$ - 4 obs

$14.02.22.0$ " " $0.30.50$ " $9.23.2$ - 2

$12.44.37.9$ $0.21.57$ $0.36.4$
 $31.37.8$ 4 4 $9.96.0$

$13.10.32.6$ M.S.P. Comet $\text{Dec} \times 6$ $0.24.55$ North of Star 6 $3.32.0$ Mean of 6 obs.

May 18th $\text{cor for motion between Dec. \& R. Sid}$ $+1.5$

B.A.C. 7907

1.292
 2
 2.584

$Q 22.33.58.39$ 1850.0 N.P.D. $15.24.30.9$

2.58 -37.52

$Q 22.34.00.97$ 1852.0 $15.23.53.58$ 1852.0

$4.44.45$ $8+74.36.06.42$ 1852.0

$22.29.16.52$ $0.15.7$

19.72 $74.36.25.1$

$22.28.56.80$ $1.06.9$

$74.35.18.3 + 0.7$

0.1 "

$Q 22.33.54.0$ N.P.D. $15.26.02.9$

9.64 $2.10.45$

$Q 22.33.59.04$ $15.23.52.22$

$74.36.07.76$ 1852.0

$74.36.06.42$

Adopted mean place

of B.A.C. 7907 for 1852.0

R 22.34.00.97

Dec. + 74.36.07.10

The dec. is obtained from a mean
 between B.A.C. and Radcliffe Obs.

distance gives R 22.34.00.99 Dec. 74.36.10.09

18.66
 2
 37.32

1.292
 7

9.044

18.64

7

130.46

12.10

Comet south proc.
star a 9 mag.

a

$$\begin{array}{r} 16.46.39.5 \\ * 16.46.59.6 \end{array} \begin{array}{r} 3.30 \\ 2.54 \end{array} \begin{array}{r} 1.36 \\ 1.36 \end{array}$$

4.

$$\begin{array}{r} 48.30.6 \\ 16.48.49.7 \end{array} \begin{array}{r} 5.30 \\ 4.06 \end{array} \begin{array}{r} 1.24 \\ 1.24 \end{array}$$

$$\begin{array}{r} 51.13.3 \\ * 16.51.32.3 \end{array} \begin{array}{r} 6.30 \\ 5.24 \end{array} \begin{array}{r} 1.06 \\ 1.06 \end{array}$$

$$\begin{array}{r} 53.00.4 \\ * 16.53.19.8 \end{array} \begin{array}{r} 5.30 \\ 4.35 \end{array} \begin{array}{r} 5.5 \\ 5.5 \end{array}$$

$$\begin{array}{r} 16.55.53.8 \\ * 56.14.8 \end{array} \begin{array}{r} 5.30 \\ 4.58 \end{array} \begin{array}{r} 3.4 \\ 3.4 \end{array}$$

$$\begin{array}{r} 16.58.27.5 \\ 16.51.03.5 \end{array} \begin{array}{r} 19.72 \\ 27.6 \end{array} \begin{array}{r} da ag \\ Scale \end{array} \begin{array}{r} 1.07.0 \\ -0.2 \end{array}$$

$$\begin{array}{r} 3.46.03.6 \\ 13.04.59.9 \end{array} \begin{array}{r} 1.06.8 \\ 2.08.6 \end{array}$$

$$\begin{array}{r} 3.46.16.87 \\ 46.74 \\ 3.46.03.61 \end{array}$$

$$13.02.51.3 \text{ Add Comet proc. Star a } 0.19.72 \text{ Comet South of a } 1.06.8 + 1.5 = 5.6 \text{ } \begin{array}{r} 1.06.8 \\ + 1.5 \\ \hline 2.05.3 \end{array}$$

$$13.00.57.0$$

$$16.51.03.5$$

$$\text{com. from end } 1.54.0$$

$$16.49.09.5$$

$$3.46.03.61$$

$$13.03.05.9$$

$$2.08.3$$

$$13.00.57.6 \text{ M.G.S.}$$

Star of comp. 9 mag. Position derived from

B.A.C. 7907 and Radcliffe vol. VI No. 2063

Adopted mean place of star of comp.

$$\begin{array}{r} a 22.29.16.42 \\ \delta + 74.36.28.77 \end{array} \left. \begin{array}{l} 5.8 \\ 5.8 \end{array} \right\} 1852.0$$

$$* a R 22.29.16.42$$

$$da ag 19.72$$

$$g R 22.28.56.70$$

$$* a Dec. + 74.36.28.77$$

$$da ag 1.06.8$$

$$* \delta + 74.36.28.77$$

by 5 comp.

Star of comp. 9 mag. Position derived from

May 18. 13.00.57.6

$$\begin{array}{r} 13.00.57.6 \\ \delta + 74.36.28.77 \end{array}$$

$$\begin{array}{r} da \\ \delta \\ -0.19.72 \end{array} \begin{array}{r} \delta \\ -1.06.8 \end{array}$$

Star placed on next leaf

May 18. 13.00.57.6 M.G.S. Comb.

$$\begin{array}{r} a R 22.28.56.70 \\ \delta + 74.36.28.77 \end{array} \left. \begin{array}{l} 5.8 \\ 5.8 \end{array} \right\} 1852.0$$

96

a	3.45	5.01	2.6	5.01	23.2	exp. p. h	not set parallel
h	7.20	12.3		27.2		e	to see circle
	s	s	264	0194	da	de	ds
a	3.58	3.57	5.3	49	4.04	abc	hac
h	7.32	7.31	3.52	3.0	04.65	4.45.0	4.42
c	4.16	4.17	08.34	4.420	17.16.48.6	4.42.6	4.42.1
				4.42.1			0.20
							3.14

a	2.38	2.39	15.41.5	15.56.	2.882.5	660		
h	6.14	6.13	13.43.5	15.58.5	4.44.1	42.1	0.19	3.15
c	2.57	2.58	20.25.6	17.20.40.3	4.44.3	4.41.8	19	3.15
a	4.46	4.15	24.01.	4.15.5	5.002.7	hcc		
h	7.50	7.49	17.24.03	24.18.2	4.44.0	4.42.0	0.18	3.16
c	4.34	4.33	17.28.45	17.29.00.2	4.44.7	4.42	1.4	3.16
					26.7	12.0	11.2	3.2
					de 4.44.45	4.42.00	18.7	3.15.3

a	0.27	17.51.48.8	30.0
h x	9.45	17.52.18.8	0.51.12

a	0.25	53.28.0	31.0
h +	9.57	17.53.59.0	30.5
	50	6.8	

ann. scal	9.25	17.52.38.4
	-1.8	1.54.4
	9.23.2	17.50.44.0
		3.46.03.6
		14.64.40.4
		2.18.4

Assd 14 02.22.0 Comet free. x 8 0.30.5 Comet n of b 9.23.2

C of 6.7th mag. B. d. C. 7907-

194	17.50.00	CH	6.53.27	16.24.30
Fast	2.55	EH	5.06.33	C Dec +74.35.30
	17.28.05		17.28.05	
	C R		22.34.38	

Comparison stars with BAC. 7907 = c

of Cephei

$$\begin{array}{rcl}
 *a \text{ prec. } *c & 4^m 45.0 & a \text{ n of } c = 0^s 18.0 \\
 & 44.6 & 20.0 \\
 & 44.1 & 19.0 \\
 & 44.3 & 19.0 \\
 & 44.0 & 18.0 \\
 & 44.7 & 18.0 \\
 & 27 & \\
 *a \text{ prec. } *c \text{ by } 4^m 44.45 & & *a \text{ n of } c = 0^s 18.7
 \end{array}$$

$$\begin{array}{rcl}
 a * b \text{ prec. } *c & 4^m 42.0 & b \text{ s of } c \quad 3^s 16.0 - ds \\
 & 42.1 & 14.0 \\
 & 42.1 & 15.0 \\
 & 41.8 & 15.0 \\
 & 42.0 & 16.0 \\
 & 42.0 & 16.0
 \end{array}$$

$$\begin{array}{rcl}
 b \text{ prec. } c & 4^m 42.00 & 3^s 15.3 \\
 O R 1852.0 & 22^m 34^s 00.97 & ds - 0.6 \\
 & 22^m 29^s 18.97 & b \text{ s of } c \quad 3^s 14.7 \\
 Red. from sp. to mean & -0.10 & c Dec 74^m 36^s 07.1 \\
 & 22^m 29^s 18.87 & 74^m 32^s 52.4 \\
 p \text{ prec. } b \text{ to } d & 0^m 24.55 & -0.6 \\
 1852.0 R p & 22^m 28^s 54.32 & 74^m 32^s 52.4 \\
 & & 3^s 32.0 \\
 & & Dec. p = 74^m 36^s 24.4
 \end{array}$$

$$\begin{array}{l}
 \text{Motion in R in } 1^m = -0.115 \\
 \text{Dec} \quad +6.775
 \end{array}$$

Stars by comparison with Greenwich BAC 7907 & Radcliffe Sp.

$$\text{By Star } a \quad 1852.0 R \quad 22^m 29^s 16.42 \quad \text{Dec } 74^m 36^s 25.8$$

$$\text{May } 18^{\text{th}} \quad 13^h 00^m 57.6 \quad \text{Comet } R \quad 22^m 28^s 56.70 \quad \text{Dec } 74^m 35^s 19.0 + 1.5 \quad \text{cor. for mo. of p}$$

$$\text{May } 18^{\text{th}} \quad 13^h 10^m 32.6 \quad \text{Dec } 74^m 36^s 24.4 + 1.5 \quad \text{6"}$$

$$\text{Adopted place May } 18^{\text{th}} \quad 13^h 05^m 45.1 \quad \text{Comet } R \quad 22^m 28^s 55.51 \quad \text{Dec } 74^m 35^s 20.7 + 1.5 \quad \text{Eq } 1862.0$$

The places were obtained on the mica scale B- which is left for the illuminated wires for comet observations especially for right ascensions. The two above places agree to 0.6 in Dec but differ $1.3 \times \cos d = 0.30$ in R.

Comet is rather faint - round - & has not much concentration of light.

98

Reduction to App't Equinox for * 6

a 22.29.18.9

δ 74.33

337.20

g +0.80 i -4.32

79.11

g +1.83

H 209.42

h +19.97

g+a 56.31

sin 9.92119 cos 9.74170

h+a 187.02

sin 9.08795 cos 9.99672

δ sin 0.55849

sin 9.98402

2 sin 0.57447

1.32180
6.30038
0.02122

g 0.26245

g 0.26245

h 1.30038

h 1.30038

+5.52 = 0.74213

0.00415 = +1.01

-9.18 = 0.96280

1.28112 = -19.19

i = 0.63246 -

j +0.80 i cos +1.14

cos = 9.42553

+5.52

+1.01

0.05799

-9.18

-19.44

= +1.14

+6.32

+1.15

-9.18

-19.44

-2.88

-19.44

0.95

-20.25

da -0.191

-1.01

dδ -19.24

19.24

* a 22.29.16.42

74.36.25.8

* b 22.29.18.87

74.32.52.4

-0.19

-19.2

-0.24.55

+3.53.5

App't place 22.29.16.23

74.36.06.6

-0.30.50

+9.23.2

Δa -0.19.72

-1.5.3

App't { 22.28.54.32

74.36.45.9

App't R 22.28.56.51

74.35.01.3

R { 22.28.48.37

74.42.15.6

