

KG
11365
183

H.29

Equatorial Vol. VII.

1858 - 1859

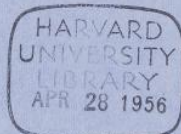
Nov. 11 to May 4

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KG 11365.183

KG-11365.183



Comet VII. 1858

Nov. 11. Berlin 12^h AR = 20^h 0^m 47^s Dec = -19° 32.5'
(Clouds)

Nov 19. 1858 Occultation of μ Arietis.

obs by C. W. P. with Great Refractor. All recorded

EL = 22 22 00 before obs
236 = 22 28 1.4

EL = 22 56 00
236 = 23 2 1.5

Imm of μ Arietis			236 = 22	48	16.0	mean d.l.
			236 fast of EL	6	1.45	
			22	42	14.55	
			EL slow		57.27	
Sid Time			22	43	11.82	
			15	53	40.62	
15	52	53.88	6	49	31.20	
				1	7.09	
46.74			6	48	24.11	comb. m.2.
15	53	40.62				

Occultation of Pleiades Nov. 20 1858.

Moon very nearly full and observations doubtful.

A. B. obs.

Observed with the Great Refractor.

236 =	22 ^h	38 ^m	42.0 - 10 ^s	beats	Imm of * of 7 ^h mag
	22	41	20.0 - 10	"	* of 8 ^h "
	23	6	12.0 - 10	"	* of 7 "

236 fact of Sid Time 5^m 06.7^s

236 =	22	38	37.0
	22	41	15.0
	23	6	7.0

15	56	50.43
		46.74
15	57	37.17

Sid Time	22	33	28.3
	22	36	6.3
	23	0	58.3

			Red. to mean solar time
6	35	51.13	1 04.85
6	38	29.13	1 05.28
7	3	21.13	1 09.36

			Camb. m.s. 2.
6	34 ^m	46.28 ^s	
6	37	23.85	
7	2	11.77	



Comet VII (Luthe's of Sept 5)

$302^{\circ} 6'$
 $20^{\circ} 8' 24''$
 $-24^{\circ} 39'$

hly mo in $AR = 0$

Dec 28, 1858

Search for Aglaja

hymn in R - 2.5 sec - 6"

24) 60 125
48
120Planet R 6^h 4^m 52.^s Dec + 30° 43.5'

513

Bepel

* 8/9

6

2

14.9

1.5

30' 41' 45" 1 09"

6

2

16.4

30 42 54 5 30

b

8/9

6

3

30.6

74.2

30 48 24 5 30

236 in

2 40 32.7
41 46.4 1 13.7

43 40.4

2 C	2	12	00
236	2	24	04.3
2 C	~~from~~ slow = 1		32
	2	13	32
236		+ 7	32.5

a 12	16.4	33.5	1 20
b 11	23.0	39.0	6 40
c 12	58.9	35.9	10 20
d 12	510	6.1	6 40
e 13	12.0	7.0	6 10
f 13	17.4		6 40

a	13.0
b	19.6
c	39.0 19.4
d	45.2 6.2
e	52.0 6.8
f	57.8 11.5
g	9.8

a	45.0
b	51.6 6.6
c	11.4 19.8
d	17.6 5.2
e	25.6 8.0
f	30.0 6.4
g	41.3 11.3

5 00

g	39.2	11.8
h	46.0 6.0	18.1 6.3
c	5.5 19.5	22.0 19.7
d	11.7 6.2	44.0 6.2
e	18.0 6.3	50.2 6.2
f	22.8 5.8	56.2 6.0
g	35.6 11.8	8.0 11.8

little b' follows a in same sec by 13.5

Dec 28, 1858

a	41.2	6.8	d	31.3	6.0	23.5
b	46.0		e	37.3	<u>11.6</u>	<u>29.2</u>
c	7.8	19.8			5.6	5.7
d	140	6.2	e	44.6	11.0	
e	19.8	5.8	d	<u>50.6</u>	<u>2.6</u>	
f	260	6.2		6.0	6.6	
g	37.6	11.4				

planet	d	21.8	
	e	27.2	5.4
	f	44.0	6.8

Aglaja was found to be
 the small star e of only the 13th/14th magnitude. Its
 motion after an hours interval was very
 plain to the eye

e = Aglaja
 * f

Dec 28. 1858

Agleja

G. P. Bobs

Duro of scale 269° 30'

chrom 236

8.2 — 9 35
 39.0 9 36
 38 43.2
 39 50.0 3 29
 54.8

86 2 12 00
 236 2 21 4.3
 9 4.3
 8 below 1 31.7
 236 fast 7 32.6
 6 7"
 1^m 11.0 11.6

Scale Diff. Sec
 6 3 40 44.0 — 4.85 9' 39"
 p(13 or 14 mg) 41 58.0 59.8 3 22 6' 9"

Diff. Alt
 1 11.0 11.3

6 43 00.0 — 4.6 9 41
 p 11.0 15.7 3 29 6 12

1 11.0 10.9

6 46 13.0 17.6 8 48 6 7
 p 23.8 29.0 2 41

1 10.8 11.4

6 49 4.0 8.6 7 31 6 7
 p 14.6 19.3 1 24
 1 10.6 10.7
 1 10.88 11.78
 11.18 ~~11.78~~

Star lines are erroneously
 at $\Delta \delta = 6' 8.4''$

$\Delta \alpha = 1^m 11.03$

236 = 3 38 41.1 39 52.4 bamb sid. time 3 36 1.68
 40 46.3 etc 18 27 26.86
 43 2.4 9 8 34.82
 46 15.3 11.4
 49 6.3 bamb m.s.t. 9 7 4.95
 236 = 3 43 34.28 44 45.
 236 fast 7 32.60
 sid time 3 36 1.68

*6 = B2. 513. & Lalonde 11726 & 11727

$$\begin{array}{r} \text{Tab. AR} = 6 \quad 2 \quad 25.60 \\ \quad \quad \quad - \quad 1 \quad 06.50 \\ \hline \quad \quad \quad \quad \quad 0.18 \\ \hline 6 \quad 1 \quad 18.92 \end{array}$$

$$\begin{array}{r} \text{Sun} + 30^{\circ} \ 48' \ 54.4 \\ d \quad \quad \quad - \quad \quad \quad 23.2 \\ \hline 2d' \quad \quad \quad + \quad \quad \quad 0.8 \\ \hline 100 \quad \quad \quad + 30 \ 48 \ 32.0 \end{array}$$

$$\begin{array}{r}
 \text{Proc} + 3,867 \\
 \underline{\hspace{1cm} 33 \hspace{1cm}} \\
 11601 \\
 \underline{11601} \\
 127,611
 \end{array}$$

$$\begin{array}{r} -0.208 \\ \underline{33} \\ 624 \\ \underline{624} \\ -6864 \end{array}$$

$$\begin{array}{r} 6 \quad 1 \quad 18.92 \\ + 2 \quad 7.61 \\ \hline 6 \quad 3 \quad 26.53 \end{array}$$

$$\begin{array}{r} + 30 \quad 48 \quad 82.0 \\ \hline + 6.9 \\ + 30 \quad 48 \quad 25.1 \end{array}$$

1800.0 Salonde 5 59 42.47

59 11 24,8

$$\begin{array}{r} + 3,867 \\ \underline{58} \\ 30936 \\ 19335 \\ \hline 224,286 = +3^{m}44^{s},29 \end{array}$$

$$\begin{array}{r} + 0.140 \\ 58 \\ \hline 1120 \\ 700 \\ \hline + 8.120 \end{array}$$

5	59	42, 47
	3	44, 29

$$\begin{array}{r} 59 \quad 11 \quad 24,8 \\ \hline 8,1 \end{array}$$

Salanda mean } 1558.0 6 3 2876

$$\begin{array}{r} 59 \quad 11 \quad 32.9 \\ + 30 \quad 48 \quad 27.1 \\ \hline \end{array}$$

Bd double weights B. wt = 1 Lalande wt = 2

$$1858.0 \text{ AA} = 6^{\text{h}} 3^{\text{m}} 26.68^{\text{s}} + 30^{\circ} 48' 26.5''$$

$$\delta = +53.09$$

$$G = 341^{\circ} 51'$$

$$H = 353 \ 20$$

$$\alpha = 90 \ 52$$

$$\alpha = 90 \ 52$$

$$G+\alpha = 72 \ 43$$

$$H+\alpha = 84 \ 12$$

$$\begin{array}{r} \log g \quad 1.38640 \\ \sin(G+\alpha) \quad 9.97993 \\ \log p \quad 9.77546 \\ \hline 1.14179 \end{array}$$

$$\begin{array}{r} 1.38640 \\ \cos \quad 9.47290 \\ 0.85930 \quad +7.238 \\ \hline +1.056 \\ +8.289 \\ \hline -0.856 \\ \hline +7.433 \end{array}$$

$$\begin{array}{r} \log h \quad 1.31000 \\ \sin(H+\alpha) \quad 9.99777 \\ \sin p \quad 0.06606 \\ \hline 1.37383 \end{array}$$

$$\begin{array}{r} 1.31000 \\ \cos \quad 9.00456 \\ \sin \quad 9.70940 \\ \hline 0.02396 \end{array}$$

$$\begin{array}{r} +53,090 \\ +13,860 \\ +23,650 \\ \hline 15) 90,600 \quad 46.04 \end{array}$$

$$\begin{array}{r} \cos \delta \quad 9.93394 \\ i \quad 9.99870_n \\ \hline 9.93264_n \end{array}$$

	6	3	26.68		30	48	26.5
			+ 6.04				+ 7.4
	6	3	32.72		30	48	33.9
$\Delta \alpha$	=	+1	11.03	$\Delta \delta$	=	-6	8.4
Aglaja planet	AR=6	4	43.75	der=+30	42	25.5	
Dec 28	Cant m 51-		9 ^h 7 ^m 4.9 ^s				

Sent to Dr. C. A. F. Peterson
for April 4 1859

Revised

1730
1859. Jan. 19 (7th 26° 2')Orion Good vision.
with haze.

G.P.B. obs.

Scalem -0.254x5

Dev of Position of Scale
88 25

W. 787

5	29	10
5	7	45
21	25	

First two stars obs. are D & F

Scale

D	7'	12"
F	3	04
	4	41

} not recoded by G.P.B.

Cor. of δ aff. +32' 56"

D	7'	12"	Eb = 4 ^h 11 ^m 50.3 ^s	54.4	Red. to 1 st wire 4 ^h 11 ^m 50.35
F	3	06		58.5	11 58.55
10 mag. = 2	6	33	12	34.2	38.2 12 34.20
7/8 W. 787 B.D.	8	27	15	43.0	47.0 15 43.00
9 th W. 824	7	37	17	0.0	3.8 16 59.90
					+3 9.5 -
					+4 26.4 -

Repeated

10 mag.

D	8'	10"	4	18	0.7	4.7	4	18	0.70
F	4	02			8.9	12.8		18	8.85
7	7	30			44.5	48.5		18	44.50
W. 787	9	23	21	53.3	57.3		21	53.30	
W. 824	8	35	23	10.2	14.2		23	10.20	

a star put in by accident

21 6.0-10.1

1.03" = Properly adj. Dec 787 and 824

J.H.S. Station in 1862 & 1905

Jan 19.

Orion

All stars of Trap. easily seen

"h" Star ?

a small star in this place

597 236 = 4 54 / 6.2

*
*
*

	Scale	arc				Red. to 1 st wire
W 597 = $9/10$	-0' 20"	-3 ^m 56.4"	$\epsilon\delta = 4^h$	43 ^m	32.4 - 36.5	4 ^h 43 ^m 32.45
76 ^m	-0' 20"			46	47.4 51.5	46 47.45
8 ^m	0' 58"				48.8 52.8	46 48.80
M ^m	9' 28"			47	5.7 9.6	47 5.65
O ^m ? (yes)	3' 29"				29.9 34.0	47 29.95
7 ^{te} * = 8 ^m	5' 08"			48	7.9 12.0	48 7.95
W 863 = 9^{te} or $9/10$	10' 08"			53	6.1 10.1	53 6.10

W 597 is a little smaller than H^m" 863 same mag as I^m not quite as bright as H^m" 824 is ^{but} a little brighter than I^m not quite as bright as H^m" 787 is about as bright as the brightest but one of the Trap. - ^{By 2nd set} ~~second~~, not quite as bright as the brightest but one of the Trap.

787 is more than a magnitude brighter than 824

* There are two of these very bright within say 4' of each other.

1859. Jan 20.

Thetia

$$EB = 3 \quad 4 \quad 00$$

$$3 \quad 14 \quad 50.2$$

$$10 \quad 50.2$$

Salade 13818 g mag.

$$1800 \quad AR \quad 6 \quad 57 \quad 28.64$$

$$+ 3 \quad 27.68$$

$$7 \quad 0 \quad 56.32$$

$$NPD \quad 70^{\circ} 38' 58.9$$

$$+ 4 \quad 35.0$$

$$70 \quad 43 \quad 53.9$$

$$Dec +19 \quad 16 \quad 6.1$$

$$3.52 \quad 59$$

$$59$$

$$31.68 \quad 295$$

$$1260$$

$$207.68$$

Salade 13847 8 mag follows 43.8 and $11' 53''$ south

$$AR = 7^h \quad 0^{\circ} 3' \quad +19^{\circ} 19'$$

Mr Hall has computed the reductions from
 up to mean Equinox for the Trifid stars com-
 pared with the stars in zones Jan. 19th. They differ
 by 0.03 only in R & 0.1 in Dec. So that we may
 deduce the differences of Mean R & Dec at once from the obs
 after correcting for refraction & temp. coef. of scale.

Apparent Places of $\delta, \epsilon, \zeta, \eta, \theta$ for Jan 19, 1859

δ	AR =	5 ^h 27 ^m 39.70	Dec = -	5° 8' 56.2
ϵ		5 27 47.87		5 13 3.2
* 10 mag		5 28 23.52		5 9 35.7
ζ		5 27 40.27		5 48 46.3
η		5 27 41.12		5 47 28.3
θ		5 27 58.47		5 38 58.4
ϕ		5 28 ²² ~~23~~ 77		5 44 57.3
* 7 mag		5 29 0.77		5 43 18.3

By Orion Zones

By Orion Zones

$$\gamma - \delta = +1. 21.67$$

$$- 34. 22.1$$

$$\phi - \delta = 0. 43. 07$$

$$+0. 43. 83$$

$$- 36. 01.1$$

$$- 36. 6.2$$

$$\eta - \epsilon = -0. 10.60$$

$$+0. 11.36$$

$$- 25. 55.2$$

$$- 25. 58.8$$

$$\eta - 10^{\text{th}} = -0. 41.90$$

$$- 37. 52.6$$

Feb. 4, 1859.

Pandora.

$$AR = 1^h 16^m 43.86 \quad \text{Dec} + 12^\circ 3' 17.4''$$

$$\text{Hourly mv. in } AR = + 3.65 \\ \text{in Dec} = + 23.5''$$

Lalande 2449. 7 mag.

$$\begin{array}{r} + 3.153 \\ + 0.003 \\ + 3.156 \\ \hline 59 \\ 28394 \\ 15780 \\ + 186.194 \end{array} \quad \begin{array}{r} - 19.094 \\ + 0.035 \\ - 19.059 \\ \hline 59 \\ 171531 \\ 95295 \\ - 1124481 \end{array}$$

$$\begin{array}{r} 1800. \quad 1^h 11^m 24.57 \quad 78^\circ 26' 47.0 \\ \quad \quad \quad + 3 \quad 6.19 \quad \quad \quad - 18 \quad 44.5 \\ 1859. \quad 1 \quad 14 \quad 30.76 \quad 78 \quad 8 \quad 2.5 \quad \text{Dec} = + 11^\circ 51' 57.5'' \end{array}$$

A star of 9 mag. follows 15.75 and is $3' 27.1''$ north of 2449

Hestia

B2. 346

$$\begin{array}{r} * 8.9 \text{ mag.} \quad \begin{array}{r} h \quad m \quad s \\ 6 \quad 46 \quad 10.81 \\ + 30.39 \\ + 0.01 \\ \hline 6 \quad 46 \quad 41.21 \\ + 1 \quad 55.6 \\ \hline 6 \quad 48 \quad 36.8 \end{array} \quad \begin{array}{r} + 19^\circ 42' 5.8 \\ d \quad - 30.0 \\ d' \quad - 0.4 \\ \hline 19 \quad 41 \quad 35.4 \\ \quad \quad 2 \quad 16.6 \\ \hline 19 \quad 39 \quad 19.4 \end{array} \end{array}$$

* X

A star of 8.9 mag follows 17.40 and is $1' 30''$ north
 a star of 8 mag follows 32.12 and is $15' 38''$ north

$$\begin{array}{r} 8 \quad 54 \\ 6 \quad 44 \end{array}$$

$$\begin{array}{r} 29 \quad 27.8 \\ \quad \quad 2.3 \\ \hline 39.5 \end{array}$$

38

1859²
Feb. 4. 1858

Hestia

110

Daily mo in AR - 34.96
" " + 1' 50.0

66 3 49 00.0
236 3 49 33.5

4 8 55.4

	a	b	inerts
14 mag a	a	from c	4.5
13 mag b	b	c	1.0
12 mag c	c	d	8.4
13 mag d			
	a	b	c
	b	c	1.0
	c	d	8.4

236 = 4 12
cb from is perpendicular to bd

236 = 4 16

B2. A	4	18	55.2	59.6	10.28
c		20	16.0	20.0	0.7

A	21	5.2	13.6	10 18
c	22	30.2	34.3	- 0 2

a is 35" south of c. b is 11" north of c. d is 38" north of c

Feb. 4

Hestia

* 6

$$236 = 4 \quad 28 \quad \underline{54.6}$$

11. 6. 4 30 49.7
 f d 31 22.8
 d

No 1 pre d 22 ^{hours} and 15" south d
 2 pre d 12 15 south d
 3 pre d 6 1' 40 north d
 5 followed d 3 1 20 south d
 6 followed d 6 2 00 north d
 7 follows 19 2 00 south d

This was Hestia

clouded up.

The star d is near the place of Hestia after applying
 Mr. Watson's correction.

33.3

11.0

44.3 pre d

1' 48

15

1' 33

1859 Feb 5 Hestia

Daily mo in R - 33.3

$$R \ 6^h 48^m 28^s$$

$$+ 19^\circ 50' 44''$$

" Dec + 1' 48"

Hestia by last evgt sh should

$$Noj \ \frac{p}{d} \ \frac{d}{d} \ \text{by} \ 44.3$$

$$1' 33''$$

$$Eb = 5 \ 10 \ 00$$

$$236 = 5 \ 10 \ 38.5$$

$$38.5$$

$$Eb \text{ fast} \ 9 \ 18.0$$

$$236 \text{ fast} \ 9 \ 56.5$$

$$\text{hents}$$

$$3.5$$

$$p? \ 236 = 4 \ 14 \ 2.6$$

$$d \ 14 \ 46.8$$

$$p \ 236 = 4^h \ 17^m \ 48.0$$

$$* = X.B.2. \ 17^m \ 52.3 \ 4.3$$

$$\text{Scale} \ 1' 33''$$

$$7 \ 03 \ 5 \ 24 \ p \ \text{moved } 1'' \ \text{during observation}$$

$$4 \ 17 \ 48.0$$

$$18 \ 3.0$$

$$18 \ 7.5 \ 4.5 \ 1 \ 53 \ 5 \ 19$$

$$7 \ 12$$

$$19 \ 10.8 \ 15.0 \ 4.2 \ 1 \ 47 \ 5 \ 18$$

$$7 \ 05$$

$$20 \ 59.0$$

$$21 \ 03.4 \ 4.4 \ 3 \ 28 \ 5 \ 20$$

$$8 \ 47$$

$$22 \ 44.4 \ 2 \ 56 \ 5 \ 18$$

$$8 \ 14$$

$$22 \ 48.7 \ 4.3$$

$$25 \ 07.0 \ 11.3 \ 4.3 \ 3 \ 26 \ \text{Calc. m.l.} = 7 \ 8 \ 39.23$$

$$42 = -4.33 \ 46 = -5 \ 19.5$$

$$236 = 4 \ 20 \ 58.30$$

$$236 \text{ fast} \ 9 \ 56.30$$

$$\text{Lid Lin} \ 4 \ 11 \ 1.80$$

$$21 \ 1 \ 12.15$$

$$7 \ 9 \ 49.65$$

$$1 \ 10.42$$

Observation of Feb. 5

$$\begin{array}{rcl}
 *X \text{ Tab. AR} & = & 6^h 46^m 42.93 \\
 k & = & + 30.38 \\
 \frac{\delta - \delta'}{101}, k' & = & 0.00 \\
 1825 \text{ AR} & = & 6 \cdot 47 \quad 13.31
 \end{array}
 \qquad
 \begin{array}{rcl}
 Dec & = & +19^\circ 57' 43.7'' \\
 d & = & - 29.9 \\
 \frac{\delta - \delta'}{101}, d' & = & 0.0 \\
 Dec & = & +19 \quad 57 \quad 13.8
 \end{array}$$

m & n for 1842.

$$\begin{array}{r}
 \log 92 = 1.96379 \\
 6.48946 \\
 \hline
 8.45325
 \end{array}
 \qquad
 \begin{array}{r}
 1.96379 \\
 5.98686 \\
 \hline
 7.95065
 \end{array}$$

$$\begin{array}{r}
 + 0.02839 \\
 46.02824 \\
 \hline
 m = 46.05663
 \end{array}
 \qquad
 \begin{array}{r}
 - 0.00893 \\
 + 20.06442 \\
 \hline
 n = 20.05549
 \end{array}$$

$$\begin{array}{r}
 \log n = 1.30222 \\
 \sin \alpha \quad 9.99070 \\
 \tan \delta \quad 9.55989 \\
 \hline
 0.85281
 \end{array}
 \qquad
 \begin{array}{r}
 1.30222 \\
 \text{and } 9.37129 n \\
 0.61351 n
 \end{array}$$

$$\begin{array}{r}
 + 7.1267 \\
 + 46.0566 \\
 \hline
 p = 53.1833 = + 3.546 \\
 \quad \quad \quad 34 \\
 \quad \quad 14184 \\
 \quad \quad \underline{10638} \\
 \quad 120564
 \end{array}
 \qquad
 \begin{array}{r}
 p' = -4.107 \\
 \quad \quad \quad 34 \\
 \quad \quad 16428 \\
 \quad \quad \underline{12321} \\
 \quad 139638
 \end{array}$$

$$\begin{array}{rcl}
 1859.0 & & 6 \quad 47 \quad 13.31 \\
 \text{Red to app place} & & \quad \quad + 2 \quad 0.56 \\
 \text{AR} & 6 & 49 \quad 13.87 \\
 & & \quad \quad + 2.25 \\
 & 6 & 49 \quad 16.12 \\
 \Delta \alpha & & \quad \quad - 4.33 \\
 \text{planet's app AR} & 6 & 49 \quad 11.79
 \end{array}
 \qquad
 \begin{array}{rcl}
 & 19 & 57 \quad 13.8 \\
 & \quad \quad - 2 \quad 19.6 \\
 Dec + 19 & 54 & 54.2 \\
 & \quad \quad + 4.6 \\
 & 19 & 54 \quad 58.8 \\
 \Delta \delta & & \quad \quad - 5 \quad 19.5 \\
 Dec + 19 & 49 & 39.3
 \end{array}$$

1859. Feb. 5 $\gamma^h \delta^m 39.2$ Camb. m. 2.

* X to apparent Place

$$\begin{aligned} G &= 306^{\circ} 6' \\ \alpha &= 102 \quad 18 \\ G + \alpha &= 48 \quad 24 \end{aligned}$$

$$\begin{aligned} H &= 315^{\circ} 32' \\ \alpha &= 102 \quad 18 \\ H + \alpha &= 57 \quad 50 \end{aligned}$$

$$\begin{aligned} \log g &= 0.99530 \\ \sin(G + \alpha) &= 9.87378 \\ \tan \delta &= 9.55910 \\ &0.42818 \end{aligned}$$

$$\begin{aligned} &0.99530 \\ \cos(G + \alpha) &= 9.82212 \\ &0.81742 \end{aligned}$$

$$\begin{aligned} \log h &= 1.29140 \\ \sin(H + \alpha) &= 9.92763 \\ \sec \delta &= 0.02678 \\ &1.24581 \end{aligned}$$

$$\begin{aligned} &1.29140 \\ \cos(H + \alpha) &= 9.72622 \\ \sin \rho &= 9.53231 \\ &0.54993 \end{aligned}$$

$$\begin{aligned} &+ 2.680 & + 6.568 \\ &+ 17.612 & + 3.548 \\ f &+ 13.390 & + 10.116 \\ 15 &33.682 & - 5.591 \\ &+ 2.246 & + 4.525 \end{aligned}$$

$$\begin{aligned} \cos \delta &= 9.97322 \\ i &= 0.77430n \\ &0.74752n \end{aligned}$$

Feb. 10. 1859.

Occultation of γ TauriInstrument, Five feet Equatorial, $E.L. = 7 \ 39 \ 00$

$$A.H. \text{ obs. Imm. } 236 = \begin{array}{r} 7^h \ 35^m \ 49.0 - 10^{\text{hats}} \\ = 7 \ 35 \ 44.0 \\ \hline 19 \ 16.5 \end{array}$$

$$\text{Sid Time} = \begin{array}{r} 7 \ 25 \ 27.50 \\ 21 \ 20 \ 54.93 \\ \hline 10 \ 4 \ 32.57 \end{array}$$

$$\text{Camb. m. t.} \begin{array}{r} \hline 1 \ 39.04 \\ 10 \ 2 \ 53.53 \end{array}$$

$$236 = \begin{array}{r} 7 \ 39 \ 00 \\ \hline 236 = 7 \ 39 \ 28.5 \\ 58.5 \end{array}$$

$$\begin{array}{r} E.L. \text{ fast} \quad 9 \ 18.0 \\ 236 \text{ fast} \quad 10 \ 16.5 \end{array}$$

$$\begin{array}{r} 21 \ 20 \ 8.99 \\ \hline 46.74 \end{array}$$

$$\begin{array}{r} 21 \ 20 \ 54.93 \end{array}$$

Same Occultation obs. by H. P. J.
with the "Fraunhofer," recorded by Spring Gov.

$$\begin{array}{r} \text{Imm. } E.L. = 7 \ 34 \ 46.0 \\ E.L. \text{ fast} \quad \hline 9 \ 18.0 \\ 7 \ 25 \ 28.00 \\ 21 \ 20 \ 54.93 \\ \hline 10 \ 4 \ 33.07 \end{array}$$

$$\begin{array}{r} \hline 1 \ 39.04 \\ \text{Camb. m. t.} \quad 10^h \ 2^m \ 54.03 \end{array}$$

The above observations are good ones.

A. H.

Feb. 14, 1859.

Occultation of κ Geminor.

obs. by H. P. T. with the "Fraunhofer." recorded by Spr. Gov.

Imm.

$$C. b. = 3^h 31^m 39.8^s$$

$$C. b. \text{ fast } \underline{\quad 9 \quad} 20.50$$

$$\text{Sid. Time} = 3 \quad 22 \quad 19.30$$

$$\underline{21 \quad 36 \quad 41.15}$$

$$5 \quad 45 \quad 38.15$$

$$\underline{\quad 0 \quad} 56.62$$

Camb. m. t.

$$5 \quad 44 \quad 41.53$$

$$21^h 35^m 54.41$$

$$\underline{\quad \quad \quad} 46.74$$

$$21 \quad 36 \quad 41.15$$

Emission obs. by A. H. with Five feet Equatorial

$$236 = 4^h 33^m 2.0 - 10^{\text{beats}}$$

$$= 4 \quad 32 \quad 57.0$$

$$236 \text{ fast } \underline{\quad 10 \quad} 24.50$$

$$\text{Sid. Time} = 4 \quad 22 \quad 32.50$$

$$\underline{21 \quad 36 \quad 41.15}$$

$$6 \quad 45 \quad 51.35$$

$$\underline{\quad 1 \quad} 6.49$$

Camb. m. t.

$$6^h 44^m 44.86$$

$$C. b. = 4 \quad 43 \quad 00$$

$$236 = \underline{4 \quad 44 \quad 4.0}$$

$$1 \quad 4.0$$

$$\underline{\quad 9 \quad} 20.50$$

$$236 \text{ fast } 10^m 24.50$$

The observation of the emission is 2 or 3 seconds uncertain.

A. H.

Feb. 16/17. 1859.

Eclipse of the Moon.

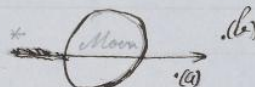
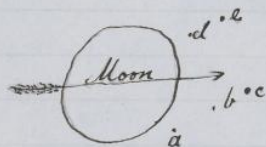
The earth's shadow was so badly defined that its contact with the Moon's limb and with spots on the Moon's surface could not be observed with any accuracy. The following occultations of stars were observed by A.H. (with Great Refractor.)

(1)	Imon.	*	of 8-9 mag.	236	=	14 ^h	43 ^m	46.0	recorded by H.P.I.
(2)	"	*	10	"	=	14	58	46.5-10 ^{beats}	" " A.H.
(3)	"	*	11	"	=	15	4	5.5-10 "	" " "
(4) (good)	"	*	9	"	=	15	9	52.5-10 "	" " "
(5)	"	*	9	"	=	15	29	37.0-10 "	" " "
(6)	"	*	9	"	=	15	59	51.0-10 "	" " "
(7)	"	*	9	"	=	16	5	1.5-10 "	" " "

236 fast 10^m 34.60
Sid. Time at Mean Noon 21^h 44^m 34.26

Camb. m. t. of Immersions.

(1)		16 ^h	45 ^m	51.90
(2)	* a	17	0	44.96
(3)	* d	17	6	3.09
(4)	* o	17	11	49.14
(5)		17	31	30.40
(6)	(a)	18	1	39.45
(7)	(b)	18	6	49.10



* mag not occulted

The first star occulted was about 8 or 10 degrees south of the Moon's center.

A.H.

* The arrows show the direction of the moon's motion.

1859.

Feb. 21.

A Nebulosity attached to a star of 9-10 mag
which follows its center six seconds and is two minutes
north of it.

236

	^h	^m	^s
236 =	7	33	59.5
236 fast		10	52.4
Sid Lim =	7	23	7.1
h =	4	2	14.0
AR =	3	20	53.1

Hour Ang. west $4^h 2^m 14^s$

Dec + $30^{\circ} 55'$

This is not in Deneb's Catalogue
It is visible in the Comet Seeker & in
the 4ft finder but barely

Was discovered by H P Guthrie
on February 5. 1859.

By Schonfeld in 1858
Vide Answer

New Nebula.

Orion -

Chart I

Feb 21st 1859. 8 PM Clear. but only tolerably good vision
Commenced drawing the nebula in
chalk on the Charts prepared by Mr Hall. of all the stars
on a black ground.

The charts have a cloth surface on
pasteboard & were made by the Book binder

There are 4 Charts 17" by 14½ in each
and a 5th of same size for the Trapezium & vi-
cinity on a larger scale.

There is a remarkable dark region
extending from $R_2 - 0^m.35'$ Dec +11°.20" rel. to δ' to the
Dec. +26' about - at which point bright nebulosity again
appears.

I propose to indicate dark regions
by red chalk. This is necessary to prevent a
danger of misconstruction so that parts accidentally
not whitened in drawing with chalk may not be
mistaken for /dark space/-

I have not, thus far since 1855 com-
mencing in 1857 made any attempt to com-
pare our results with previous observa-
tions

Feb 22

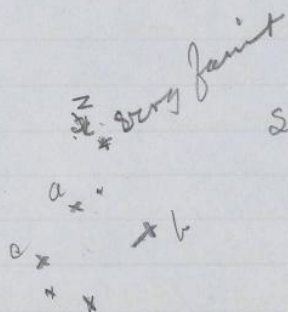
Orion

7 P.M.

Drawing Nch. Ch.

Very fine definition for 20^m then clouded.

Star ϵ^2 is quite plain in the pos given below
relatively to a and c



Sun also on 23rd

52.5
3' 42.5"

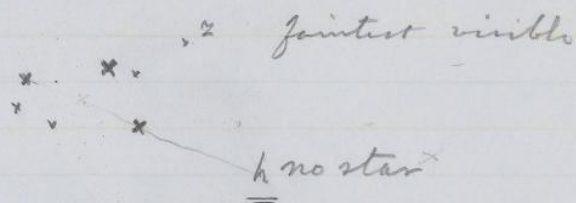
Found a star of 13th mag. in $R-0^h 15^m 5^s$ Dec $+0^{\circ} 24''$

rel. to θ^1 It was not on the chart, & not observed March 10th 1857.

The region about γ^1 , H^1 & ϵ^1 has an appearance of resolvibility

Orion 1859 Feb 23

Drew again the star ϵ - Hazy but fine definition



At the time when ϵ was visible though faint no trace of a star could be discerned at h where on March 10th 1858 was a star brighter than ϵ . Seen also in Feb 1897 by Mr Coolidge.

Drew again on chart I

There is a very large area north of the nebula in which there is but little if any nebulosity. I have marked in red on the chart the boundary beyond which scarcely any light can be detected.

Under the best definition no star is to be seen within the trapezium.

Orion 1859 Feb 23rd

Under tolerable, though not good definition, completed the Chart I of the nebula. leaving a few corrections in minutiae to be made near the trapezium on the first very fine night.

N.B. to determine a few prominent features by angles of position & distances & lay them off on the Chart V. which will be a duplicate of the region about the trapezium.

The edge a b c seems to be just perceptible (more strongly seen Mar. 4th).
brighter than the region within it

w is the brightest part of the nebula
x is very black

y bright. There is a curved

bright outline as at p q -



Orion March 1st 1859. Bell definition
 Commenced on Chart II Found the star R
 of Catalogue was 10^{th} mag. 7^{h} $9^{\text{m}}/10^{\text{s}}$

March 2nd Completed Chart II and
 worked a little on V. I think that there is
 often a disposition of the nebulae to shrink from
 the immediate contact or neighbourhood of some stars
 and as evident a tendency to condense about others

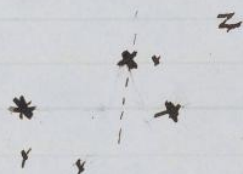
I am disposed to think that in general where
 the stars are most numerous there is also an
 increase of nebulae

Tolerably good definition quite clear.

Orion March 4th

Worked on Chart V but the
moisture condensed on object glass.

The nebulosity preceding the trapezium
at W. & towards a point half way from a to g of Feb. 23
distant ray 1" is the brightest of all - The edge a b
of Feb Feb 23 evidently in outline as then given -
Star K = 16th z not seen. h not seen

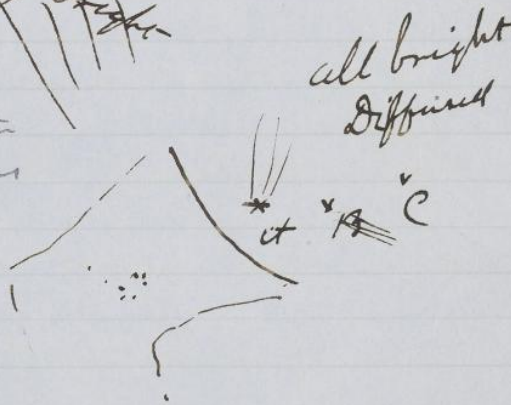


h not seen

It has nebulosity connected
with it a N a v. little ^{indicated} in direction as
very bright

vide an obs of
W C B, in 1848? with
sketch showing same
nebulosity connected
with it & B

Jan 4 1848 p 305.

all bright
Diffuse

Several stars about the nebula trapezium as A, &c are
decidedly nebulous or have nebulous attachments. This would
be highly important to verify (subsequently verified vide
March 10th)

Saturn

5th March 1859

powers 316 . 401

Good definition but thick haze. from 6.30 to 7 sid. time
(from $7\frac{1}{2}$ to 8 M.C.F.)

Ring A. The "pencil line" is easily seen, extending
from about 30° round the southern half and 20 round
the northern half.

Division of rings Can be traced further round the
southern hemisphere than the northern. It also appeared
darkest in the south following a north preceding quadrants
and this deeper shade extends further in the S.E than
in the other. Haze is too thick to decide much

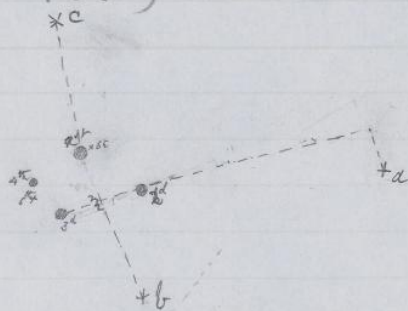
Ring C is easily seen

Ball I suspect there are two or more belts near the
north pole & antarctic circle. Haze was however
too thick to make sure of them, and I at times
I could not discern any vestige of them. The equatorial
dark belt fades gradually from the bright zone: to
the south, at first slowly then more rapidly. The polar
regions also fade gradually from the pole to the

Orion.

March 5th

1859

9 $\frac{1}{2}$ M.C.T.

The definition is indifferent

There are 3 stars near the trapezium. a is at $2\frac{2}{3}$ the distance $3-2$ ^{east} and at $\frac{2}{3}$ the distance north of it. ~~1st~~ m is twice the distance $1^{th}-m$. It has a reddish tinge. c was seen once, its distance from 1^{th} is not quite twice the distance $1^{th}-2^{d}$.

The 5th star is of a whitish color

Saturn (cont. from last page)

Turned the telescope on Saturn after ~~seeing~~ examining Orion. Mr Ch. W. Tuttle had just ~~time~~ ^{time} to see ~~the~~ the curvature on the two rings  when it clouded up suddenly before observations could be made. J.C.

Comparison of 236 with Cb. by A.H.

1859.	March 10	Cb.	22 ^h	54 ^m	00 ^s
		236.	22	56	28.0
	" 11	Cb.	2	4	00
		236	2	6	32.4

Orion: March 10 1859

Admirable definition. A 6 days old in neighbourhood

See also another diagram on pricked chart

* on chart

* on chart

* new

* faint

new * m

m is easily seen

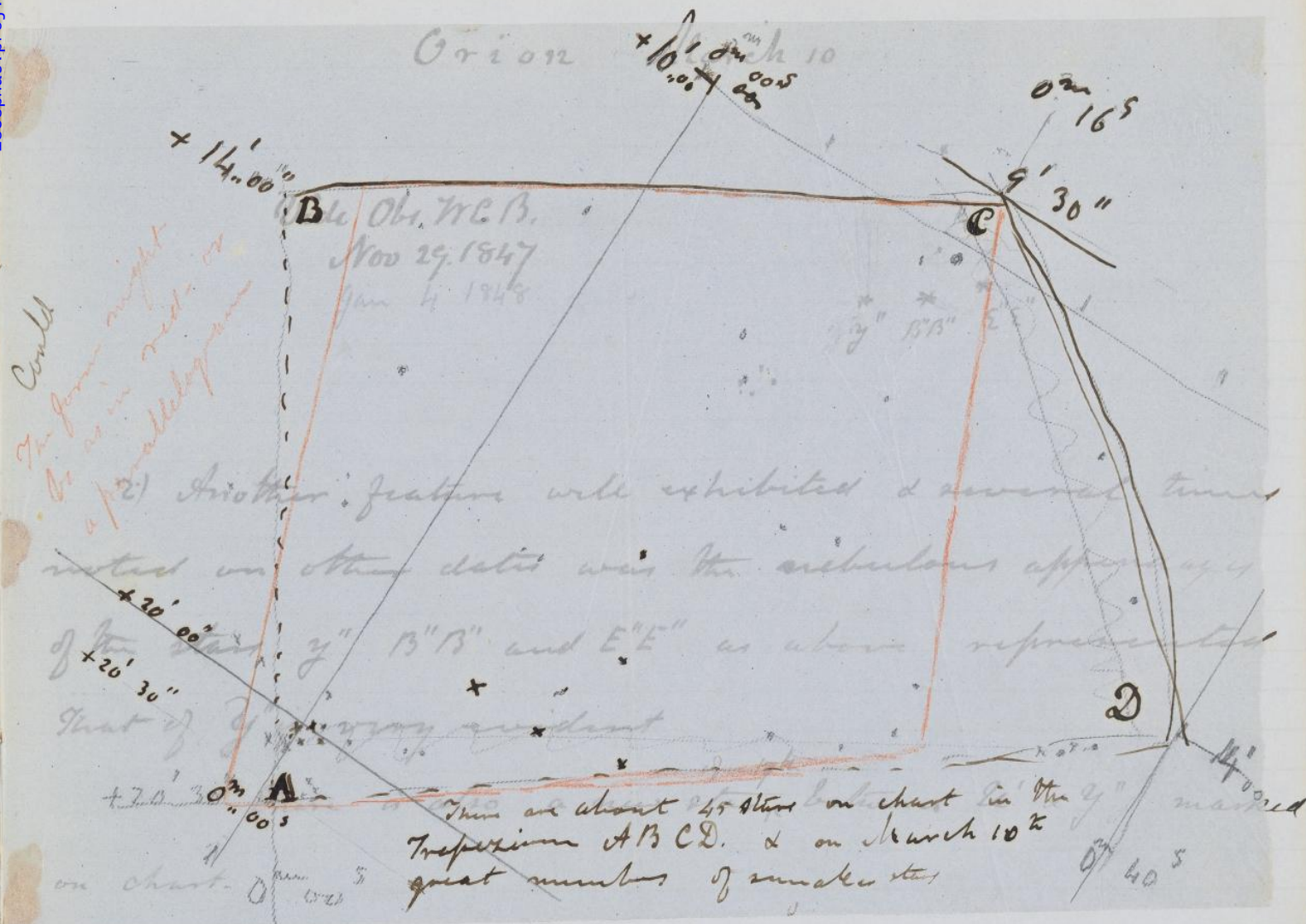
* k about γ^2 * γ^2 easily seenNew star "may fainter than γ^2 certain"(Vide Eq Book
March 1850
Jan 23 1851
Feb 3 "* * about as bright as γ^2

Though slightly hazy & with the moon near the vision was admirable. In the brighter part of the nebula near the trapezium by glimpses many new stars were suggested. γ was certainly seen & located it is much fainter than γ^2 . Of k not a trace. Though its vicinity was often explored. it must be nearly 1 mag. or more γ^2 .

Innumerable stars of the last degree of faintness & many new ones easily seen appear in the regions outside of the brighter nebulosity of the trapezium.

Two features were very noticeable

1st) The great number (probably at least 20 could have been located) of very small stars in the region south of the three bright stars γ ", β " β " and ϵ " ϵ " as far as ρ " & f " f " & h " h_2 " and between this and the great proboscis



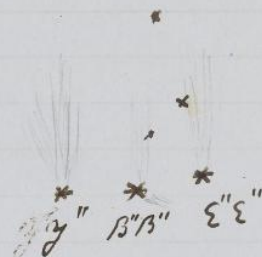
On a scrap of thin paper I have indicated the region
which has most bright stars. & it is remarkable that
it is just where the small stars appeared in the greatest
number on the 10th. That is in the region of θ , and pre-
ceding the great 'Procyon' and there is occupied with a pretty
bright diffuse nebulosity mostly very evenly graduated
In the black regions near α & η of θ , but a single
~~new star~~ ^{very} faint star could be seen. Showing that the nebulosity consists of stars.

Orion March 10

Vide Obs WCB.

Nov 29. 1847

Jan 4. 1848



.
 .
 .

2) Another feature well exhibited & several times noted on other dates was the nebulous appendages of the stars γ'' $\beta''\beta''$ and $\epsilon''\epsilon''$ as above represented. That of γ'' is very evident.

There is also a new star ^{of 17th} between δ' & γ'' marked on chart.

On a scrap of this paper I have indicated the region which has most bright stars. & it is remarkable that it is just where the small stars appeared in the greatest number on the 10th. That is in the region s.f. θ , and preceding the great 'Procyon' and there is occupied with a pretty bright diffuse nebula mostly very evenly graduated.

In the black regions near & n.f. θ , but a single ^{very} faint star could be seen. Showing that the nebula consists of stars.

March 10. 1859. about 9 o'clock m.t.

Saturn

Looked at Saturn through the Great Refractor. It was the finest sight I ever saw through a telescope. The seeing was excellent, and with a power of 401 I could easily and steadily see the division of the rings. The division appeared like a clear, well defined, black line, having the form of an ellipse similar to that of the rings and running around on either side to the shadow of the ball. Towards the extremities of the outer ring I thought that I could see by glimpses a dark line indicating a division of this ring. Just above the line where the plane of the rings intersected the ball a dark belt was visible on the ball and above this belt another fainter one.

A.H.

Saw Saturn under very beautiful definition. The outer ring, A. was divided - the dark line being one third of the breadth of the ring distant from the inner edge of the latter. There seemed to be a bright rim on the inner edge of A.

The shadow was very dark on the right hand of the ball. & on the left it could be

seen without difficulty

as it were adhering to the ball.

The shadow could be seen on B.



1858phae.proj...1838

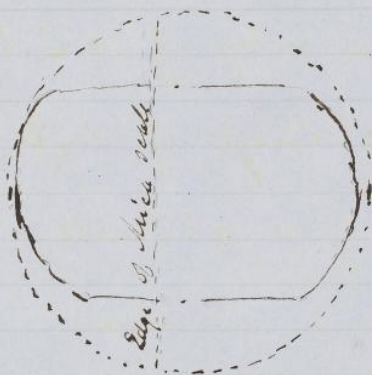
I did not carefully note the position of the ^{left hand} shadow:-
as to ~~its~~ position relatively to the outer edge of the ring.

Orion March 16th 1859

Marked on a copy of W.C.B.'s drawing of
 Orion, ^{bound with pamphlet "Nebulae" to Mem. Am. Acad.} the relative brightness of different regions
 or rather their sequence of brightness. 1 indicating
 the brightest region 2 the next and so on. The Moon
 was nearly full and the atmosphere slightly disturbed

Mica Scale B.

by eye 785
 by compass 786
 by drawing 788



by eye 672
 by compass 674

The outer circle is the exact size of the edge
 within which the Mica scale sets $\frac{5}{100}$ of an inch below
 the face of the plate

Orion. March 23 1859 G.P.B.

236 = $6^h 57^m$. A patch of light just visible $40''$ preceding the centre of Trapezium and a little south of the centre.

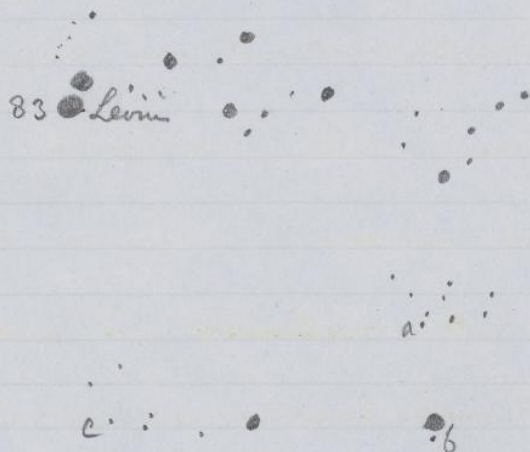
236 = $7^h 00^m$. A patch of light $1' 30''$ south of centre of Trap and following $1'$.

Looked at the nebula in early twilight and found that the bright part surrounding the Trapezium is outlined as in my water color drawing and as described Feb. 23rd. Compared the drawing & with a few corrections found it very satisfactory. Took color & brush and set in corrections and found the relative intensities

Vision not good

Stars in the neighbourhood of δ^3 Leonis

Saturday: March 27



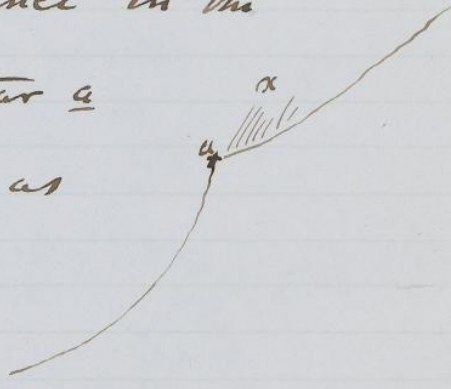
a and c are sufficiently bright to find a place
on Chacornac's map when they are missing
b is a fine star with a companion north
of it about 7 seconds.

S.C.

Orion March 28th 1859

Have completed a drawing of the nebula in water colors and compared it on several evenings with the nebula correcting with color & india ink wherever there was occasion. I am satisfied that it is a very correct representation. The stars however have not been revised especially as to magnitude.

The season since the beginning of Feb. has been very unfavourable. For this reason in some of the more delicate details. For instance in the great proboscis. The outlines S. of the star α are not as certainly ascertained as I should have wished. The seems to be an indeterminateness between α and π (This was cleared up March 20th)



Tonight the atmosphere was hazy & disturbed & as this has been much the case for weeks past there has been no opportunity of studying the small stars.

G. P. B.

41

+

2

1

2

1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

7

Biele's Comet

March 30 1859

$$\begin{array}{r}
 3.19 \\
 \underline{34} \\
 1276 \\
 \underline{957} \\
 108.46 \\
 \end{array}
 \quad
 \begin{array}{r}
 186 \\
 \underline{34} \\
 744 \\
 \underline{558} \\
 632.4 \\
 \underline{1032}
 \end{array}$$

$$\begin{array}{r}
 76 \quad 25 \quad 48 \\
 \underline{13 \quad 34 \quad 12} \\
 32 \\
 \underline{32} \\
 258
 \end{array}$$

$$\begin{array}{r}
 185 \\
 \underline{18} \\
 167 = 2 \quad 47
 \end{array}$$

$$\begin{array}{r}
 8/13.2 \\
 \underline{1.65}
 \end{array}$$

From Prof Hubbard's

$$\begin{array}{r}
 8 \\
 \underline{13 \quad 13} \\
 13.05
 \end{array}$$

I R

$$\begin{array}{r}
 1 \quad 36 \quad 9
 \end{array}$$

Ephemeris

$$\begin{array}{r}
 4 \\
 \underline{13 \quad 9}
 \end{array}$$

II

$$\begin{array}{r}
 2 \quad 15
 \end{array}$$

III

$$\begin{array}{r}
 1 \quad 36 \quad 45
 \end{array}$$

B.A.C. 496

$$\begin{array}{r}
 R \quad 1 \quad 31 \quad 42.4 \\
 Du + 13^{\circ} \quad 34' \quad 12''
 \end{array}$$

Start from Winter

$$\begin{array}{r}
 1 \quad 28 \quad 18.0 \\
 1 \quad 29 \quad 7.9 \\
 1 \quad 29 \quad 53.9 \\
 \underline{1 \quad 48.5}
 \end{array}
 \quad
 \begin{array}{r}
 13 \quad 15 \quad 55 \\
 13 \quad 2 \quad 6 \\
 13 \quad 13 \quad 38 \\
 \underline{+10 \quad 32}
 \end{array}$$

$$\begin{array}{r}
 g^h \quad 1 \quad 30 \quad 06 \quad 5 \\
 g^h \quad 1 \quad 30 \quad 56 \quad 4 \\
 g^h \quad 1 \quad 31 \quad 42 \quad 4
 \end{array}
 \quad
 \begin{array}{r}
 49.9 \\
 46.0 \\
 +13^{\circ} \quad 26' \quad 27'' \\
 13 \quad 12 \quad 38 \\
 13 \quad 24 \quad 10
 \end{array}
 \quad
 \begin{array}{r}
 27'' \\
 -13.49 \\
 +11.32
 \end{array}$$

Virginia April 1 1859

R $9^h 45^m 30^s$
Dec $12^\circ 27'.1$

hly mo. $-\frac{17}{24} = -0.7$
 $+ \frac{5}{6}$

BAC 3360 $7\frac{1}{2}$

$77^\circ 27' 32''$

R $9^h 42^m 44.9$

$+2 \quad 29$

~~Dec~~ $+ 29.1$
 $9 \quad 43 \quad 14.0$

$77 \quad 30 \quad 01$

$+12 \quad 29 \quad 59$

$-4 \quad 26.7$

$-2 \quad 31$

BAC 6th

BAC 3337

$4 \quad 40.7$
 $9 \quad 38 \quad 47.3$

$+12 \quad 27 \quad 28$

Zero of Scale $79 \quad 59$

A correction is to be applied to the ephemeris of

-41^s in AR and of $-3'.0$ in Dec.

Apr. 5

Planet's AR = $9 \quad 44 \quad 33 - 41 = 9^h 43^m 52^s$

Dec = $12 \quad 35.5 - 3'.0 = 12^\circ 32'.5$

April 1. 1859

Virginia

chron 236.

a 14
x

* b 12-13

* c 13

* d 14

B*	8 ^h	45 ^m	47.8	9.0	Scale "
b		48	13.6	34.8	5 03
d		48	20.0		6 40
			~~24~~		

b*	48	58.2	19.7	5 54
----	----	------	------	------

a 14 mag.	g beats prec b 8.7	236 = 8 ^h 54.0 ^m
b 12-13	b " c 13.5	55.5
c 13	c " d 13.5	56.0
d 14		

a	a to b 8.5	8 ^h 57.0 ^m
b	b " c 13.5	57.5
c	c " d 13.5	57.7
d		

B*	9 ^h	0 ^m	24.0	-	28.0	2' 57"
b		3	49.6	-	53.7	4 32
b*		4	34.2		38.3	3 47

Miss Coolidge & Tuttle
Recommended Lines

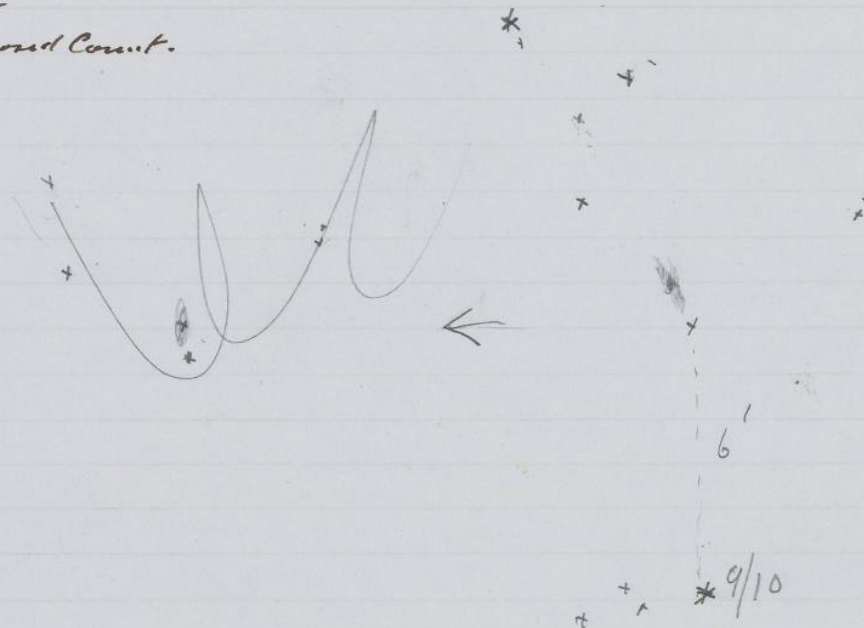
Place

New Nebula

Found in Looking for supposed Comet reported by
(Parkhurst.)

G.P.B. and H.P.T.

Search for supposed Comet.



236 16 57 20

W 6 47 56

13 50

16 43 30

9 55 34

Dec +79° 48'

* 9th

Place Examined Aug. 14 1863 and not found

New Nebula

Search for Parkhurst Comet sat. April 8/9 1859

Angle pos. inner 88 58

 $A = 7/8^{\text{th}}$ S.p Comet $B = 8/9$
 Scale

Scale

4 8

236

A-16	28	21.5	4' 8"	Neb. fol. A.	Neb. fol. B
	28	41.5		5 01.0	2 58.0
				1.0	58.0
				0.2	57.5
p 16	33	22.5	8 23	1.3	57.5
		42.5		4a + 5" 00.88	- 2" 57.75

5 01.0

5 1.0

2 58.0

2 58.0

B 16	36	20.5	4' 7	Neb. n. of A	Neb. n. of B
	36	40.5		4' 15.0	4' 16.0
				4 16.0	4 15.0
				4b + 4' 15.5	+ 4' 15.5

Neb. n. of A

Neb. n. of B

4' 15.0

4' 16.0

4 16.0

4 15.0

4b + 4' 15.5

+ 4' 15.5

A	16	40	00.5
			20.2

5 00.2

5 01.3

p 16	45	00.7
		21.5

2 57.5

2 57.5

B 16	47	58.2
	48	19.0

2 14

6 30

2 15

Approximate place 1859.0

A 8" 31' 52.8 78° 40' 25"

B 8 39 50.8 78 40 24

4a + 5 00.9 4b + 4 15

- 2 57.8 + 4 15

8 36 53.7 78 44 40

8 36 53.0 78 44 39

Place of New Nebula

1859.0 α 8" 36.53 δ + 78° 44' 40"

Compared with * at 7/8 Oct. 1853

B 8/9 " 9305

Neb. n. of A 4a + 5" 00.88

4b + 4' 15.5

Neb. n. of B 4a - 2" 57.75

4b + 4' 15.5

Parkhurst Comet. = (a Nebula)

Comet	236	16	51	52	+ 78° 46'		16	51	52
HW	7	59	38		<u>78</u> <u>44.7</u>	236 feet	<u>13</u>	<u>36</u>	
					Unit. cor. - 1.3		16	37	56
							<u>7</u>	<u>59</u>	<u>38</u>
						AR =	8	38	18
							<u>8</u>	<u>36</u>	<u>53</u>
						Unit cor	- 1	25	

	236				
A	17	9	42.5	4	8
	16		2.5		

17	14	43.0	8	23
	15	4.0		

The star A = Arg. Outrun ^{1/8 mag} H & 9183 18420 8° 29' 30.22 78° 43' 53.6									
B " ^{1/8} 9305 8° 37' 30.72 78° 44' 1.9									
1854.4862.0	a	1850	127° 38.6	sin	9.89863	cos	9.78587		
1855.1859.0			129 38.4	sin	9.88653	cos	9.80479		
Mean 1850.5	1855	"	78° 44.0	tan	0.70068	n	1.30222		
m = 46.0591					0.59931		- 1.08809		= 12.25
n = 20.055					0.58721		1.10701		= 12.79
31.2 3.071					1.30222				
52.29 5.314					1.90153				= 79.713
40.2823 5.188					1.88943				= 77.523
60.5549 18.385					1.17609	46.054	1.17609	15	
8.239			5.314		= 0.72544	125.772	= 2.09959		
			5.168		= 0.71334	123.582	= 2.09196		
8 29 30.22			78° 43' 53.6				0.92350		= 8.385
8 37 30.72			78 44 1.9				0.91587		= 8.239
+2 22.54			-3 28.2				17 1.23045		
+2 20.05			-3 37.5				142.54		= 2.15395
A 1859.0 8 31 52.76			78 40 25.4				140.05		= 2.14632
B " 8 39 50.77			78 40 24.4						2.31854 = 208.2
									2.33746 = 217.5

1859 Apr. 11. Appointed,
for the visit of the first division of the
Senior Class.

A new Comet. by H. P. Tuttle. Apr. 27. 1859
obs. by E. P. B. T. H. S. rec.

Zen of Position $88^{\circ} 05'$

Bar. 30.084 Alt. 60°
Ex. Th. 42.5

Comet foll. star

Chron. 231 $10^h 17^m 30^s$
 $19 35$

$\theta - *$ yellow 7170

Comet north foll. star a. 10 mag. (same as above)

Three sets.

comet and star obs. over 2 wires on Spr. Gov. with breaks between each set.

$\theta - *$ in Dec.

$\theta - *$

Star 67.09
 θ 64.58

$\theta - = 11^h 51^m 25.0 + 2.51$

Star 66.72
 θ 65.14

$53 22.9 + 1.58$

Star 66.65
 θ 66.26

$55 49.2 + 0.39$

Star 66.17
 θ 67.00

$58 10.9 - 0.83$

Star 67.15
 θ 69.17

$\theta - = 12 \quad 0 \quad 40.4 \quad - 2.02$
 $\theta - = 11 \quad 55 \quad 53.68 + 1.63 = 20$
 $\theta - \text{fast} \quad 10.72 \quad 0.326 = 48$
 $11 \quad 55 \quad 42.96 \quad 3.20 = 48$

2 19 46.31
46.74

2 20 33.05
9 35 9.91
1 34.2

Sid. J. Mon 2 20 33.05

$9^h 38^m 35.7$ band m.s.t.

Bornet Apr 27. 1839

Right Ascensions recorded on Spr. Gov

		First Set.		$\delta - \star$	
Star	EC = 11	43	36.70 - 48.40	+ 55.05 - 55.40	
δ		44	31.75 - 43.80		
Star	11	45	14.55 - 26.40	+ 55.40 - 55.60	
δ		46	09.95 - 21.00		
Star	11	46	52.65 - 4.45	+ 54.75 - 54.45	
δ		47	47.40 - 58.90	1.20 2.45	
		17	89.15 - 123.70	55.07 54.82	
11	45	9.72 - 21.23	Mean + 54.94		

Second Set.

				$\delta - \star$	
Star	EC = 12	3	51.25 - 63.10	+ 51.25 - 51.00	
δ		4	42.50 - 54.10		
Star		5	11.70 - 23.25	+ 50.70 - 51.25	
δ		6	2.40 - 14.40		
Star		6	44.75 - 56.40	+ 50.65 - 50.60	
δ		7	35.40 - 47.00	2.60 2.75	
		17	80.30 - 115.50	50.87 50.92	
12	6	06.77 - 18.50	Mean + 50.89		
			54.95		
12	6	12.63	10 5.84		
11	46	15.47	52.92		
EC = 11	56	14.05 -			
11	55	53.68	motion in AR in 1" = 0.25		
	0	20.37	53.92		
			0.08		
		AR = +03.20	AR = -53.00		

Comet Apr. 27, 1859

Star of Comparison (Arg. Jones) Collum. 7170.

$$1842.0 \quad AR = 6^h \quad 33^m \quad 1.53 \quad \text{Dec} + 53^\circ \quad 48' \quad 11.4''$$

$$1850.0 \quad AR = 6 \quad 33 \quad 43.00 = A \quad \text{Dec} + 53 \quad 47.8 = D$$

$$\log 17 = 1.23045$$

$$\log \sin A = 9.99528$$

$$\log \cos A = 9.93580$$

$$\log \frac{m}{15} = \frac{0.12611}{0.25689}$$

$$\text{num} = +1.8071$$

$$\frac{m}{15} = \frac{+3.0707}{4.8778}$$

$$\log = 0.68822$$

$$\log 17 = 1.23045$$

$$1.91867$$

$$\text{Proc} = +82.92$$

$$\log \cos A = 9.16603n$$

$$\log n = 1.30221$$

$$\log 17 = \frac{1.23045}{1.69869n}$$

$$\text{Proc} = -49.97$$

$$AR \quad 6 \quad 33 \quad 1.53$$

$$+1 \quad 22.92$$

$$1859.0 \quad 6 \quad 34 \quad 24.45$$

$$\text{Dec} + 53^\circ \quad 48' \quad 11.4''$$

$$-50.0$$

$$53 \quad 47 \quad 21.4$$

$$f = +22.32 \quad g = 12.43 \quad G = 321^\circ 24' \quad h = 19.39 \quad H = 230^\circ 24' \quad i = 6.48$$

$$\alpha = 98 \quad 33$$

$$59 \quad 57$$

$$98 \quad 33$$

$$328 \quad 57$$

$$\log g = 1.09447$$

$$\sin(G+\alpha) = 9.93731 + 22.32$$

$$\tan \delta = 0.13537 + 14.69$$

$$4.16715 + 37.01$$

$$\log h = 1.28758 - 16.93$$

$$\sin(H+\alpha) = 9.71247n + 15)20.08$$

$$\sec \delta = 0.22838 + 1.34$$

$$1.22863n$$

$$1.09447$$

$$\cos = 9.69563$$

$$-0.79410$$

$$\log h = 1.28758$$

$$\cos = 9.93284$$

$$\sin \delta = 9.90679$$

$$0.12721$$

$$+6.224$$

$$13.40$$

$$19.624$$

$$3.83$$

$$+15.79$$

$$\log i = 0.81158n$$

$$\log \delta = 9.77192$$

$$0.58305n$$

Comet Apr. 27, 1859.

Star, 1859.0	AR =	6 ^h 34 ^m 24.45 ^s	Dec = +53° 47' 21".4
App Eq.		<u>+ 1.34</u>	<u>+ 15.8</u>
		6 34 25.79	53 47 37.2
S - *		<u>+ 53.00</u>	<u>+ 3.2</u>
S's	AR =	6 ^h 35 ^m 18.79 ^s	Dec + 53° 47' 40".4

At 9^h 33^m 35.7^s Camb. m.s.t.

The above results fully tested by duplicate computations
by J. W. S.

10
11
5
6
10
11
6

33
20
4
25
10
11
6

58
26
14
46
28
35
20
56
20
25
6

42
19
32
27

1859. Apr. 29.

Comet I 1859.

Oblen 7013 9 mag

$$\text{Tab. AR} = 6^h 23^m 48.56 \text{ sec} + 49^\circ 45' 51.5''$$

$$\begin{array}{r} 3.09 \\ 1.56 \\ \hline 4.63 \\ 8.5 \\ \hline 2315 \\ 3704 \\ \hline 39355 \end{array}$$

$$\begin{array}{r} -2.10 \\ 8.5 \\ \hline 10.5 \\ 16.8 \\ \hline 17.85 \end{array}$$

$$\begin{array}{r} 6 \quad 23 \quad 48.56 \quad +49 \quad 45' \quad 51.5'' \\ +39.36 \quad -178 \\ \hline A = 6 \quad 24 \quad 27.92 \quad \odot = 49 \quad 45' \quad 33.7'' \end{array}$$

$$\begin{array}{r} \log A \quad 9.99752 \\ \log \odot \quad 9.07248 \\ \frac{n}{15} \quad 0.12612 \\ \hline 0.19612 \\ \text{num} \quad 1.571 \\ 3.0707 \\ + 4.6417 \\ \hline 12 \\ 324919 \\ 46417 \\ \hline 78.9089 \end{array}$$

$$\begin{array}{r} \log A \quad 9.02756 \\ 1.30222 \\ 0.32978 \\ \log 17 \quad 1.23041 \\ \hline 1.56023 \\ \text{num} \quad -36.3 \end{array}$$

$$\begin{array}{r} 6 \quad 23 \quad 48.56 \quad 49^\circ \quad 45' \quad 51.5'' \\ 1 \quad 1891 \quad 36.3 \\ \hline 1859.0 \quad 6^h \quad 25^m \quad 7.47 \quad 49^\circ \quad 45' \quad 15.2'' \end{array}$$

Reduced and tested by duplicate (M.S.)

A star	10"	32.1	pos - 25.4	north	9 mag.
	7	31	fol.	13.1	south 8 mag
	2	10	fol	34.3	north 8-9

Comet

April 27 1859

The sky was too hazy to admit of a good view of the Comet a tail of 10' in the direction indicated in the diagram

was plainly seen.

Diameter of nebulousity of Head 3' but there was too much haze

to allow

of

seeing

the

whole extent

of the nebulousity

I thought once or twice that there was a point of concentration like a nucleus but could not ascertain this.

The tail was about one half as broad as the head or perhaps more.



For pos of Tail

112° 28'

115

112

113 9

Zero

88 5

25 4

90 0

Angle of pos.

115 4

G.P.B.

Comet, Apr. 29. 1859.
G. P. Bobs. A. U. rec.

Elb 10 49 00
231 9 28 13.2

Ex. Ther } 4 pages ahead
Bar.
Alt Ther }

Dir of Pos. 88° or

Beginning with Long S

Comet south pole star of 9-10 mag. (Star of comp.)

AR on Spr. Gov. on two wires
Elb = 11^h 8 7.0 17.4
* 8 28.8 39.0

Break

8 59.8 70.3
* 9 21.9 32.0

Break

9 56.4 6.3
* 10 18.2 28.4

Break, Solis

Comet. Apr 29. 1859

See

231 = 9^h 51^m 21.8
 53 19.4
 54 50. about
 57 2.0
 58 29.0

Mr. Ridd-

69.04
 70.05
 70.83
 71.60
 72.20

86 = 11^h 12^m 8.6
 14 6.1
 15 43.6
 17 48.5
 19 15.3

Sum of wires

50.65

50.60

50.67

AR again

86 = 11^h 21 51.2 58.1
 * 22 15.4 22.2

Break

22 42.0 48.9
 23 6.5 13.4

*

Break

23 34.0 40.4
 * 23 58.3 65.2

Break

Comet Apr. 29. 1859.

Hor of comp in center of field

231	= 10 ^h	10 ^m	36.0	H	5 ^h	4 ^m	03	140°	13' circle no
	1	20	36		11	31	12	90	
	11	31	12	AR	6	27	9	Sec + 50	13

2

Star of comp not in Catalogue.

Angle of Pos of Tail

125° 28'

Tail north fol. comet.

A circle of a minute and a half in diameter includes nine tenths of the light of the comet, but it can be barely traced a distance of two minutes from the head, besides the tail, which can be traced 6 minutes but is very feeble owing to a strong atmosphere.

Hand - 1859.

Box

Box

Box

Comet I 1839. Apr. 29. 1839

G. P. B. obs.

Ex. Ther 48°
 Bar 30.034
 Alt. Ther 60.00

Comet north fol. star 7009 Oeltgen's Arg.

AR got on Spr. Goo. on two wires.

Long Sets

* 12 26 59.4 6.3
 28 14.1 21.6 + 1 14.7 15.3

Break

* 12 28 50.7 57.6
 30 5.4 12.5 1 14.7 14.9

Dots Break

Dec	Mic. R	E. C.
231 = 11 ^h 13 ^m 31 ^s	26.47	12 ^h 34 ^m 17.6
15 40	27.54	36 26.2
17 41	28.68	38 27.4
15 37.3	27.56	36 23.7
	50.64	
	+23.08	
	46	
	3 36.2	

Comet I 1859 Apr. 29 1859

AR again
S. B. D.

*	12	40	18.7	26.4		
	41	31.8	39.4		+1	13.1 13.0

Break

*	12	42	1.0	8.4		
	43	13.6	20.7		1	12.6 12.3

B. B. D.

El.	12	29	9		+1	14.90		
		36	24			+3'	46"2	
		42	18		1	12.75		

789°: 215° 11 435°: 1.19

12	36	24
	+10'	

+1 13.71 +3 56.2 not cor. for Temp. and Refr.

S. T.	12	36	14
	-2	4	

S. T. M. 12 34 10

A. F. S. N. 21 31 58

10 ~~58~~ 6 8

Revised by A. H.

Comet I. 1859. Apr. 29. 1859.

Star of Comp. = 7009 Delphinus Aug.

Tab. AK = $6^h 23^m 35.56$

Dec = $+49^\circ 59' 50.3$

$$A = 6 \quad 24 \quad 15.0$$

$$D = 49 \quad 59 \quad 33$$

$$\begin{array}{r} \sin A \quad 9.99756 \\ \text{tang } D \quad 0.07607 \\ \hline \frac{n}{15} \quad 0.12612 \\ \hline 0.19975 \end{array}$$

+ 1.584

3.0707

4.6547

$$\frac{17}{325829}$$

46547

79.1299

$\cos A \quad 9.02873n$

n 1.30222

17 1.23045

$1.55638n$

- 36.01

$$\begin{array}{r} 6 \quad 23 \quad 35.56 \\ + 1 \quad 19.13 \\ \hline 1859.0 \quad 6 \quad 24 \quad 54.69 \end{array}$$

$\alpha \quad 96 \quad 14$

$$\begin{array}{r} 49 \quad 59 \quad 50.3 \\ - 36.0 \\ \hline 49 \quad 59 \quad 14.3 \end{array}$$

$\alpha \quad 96 \quad 14$

$$f = +22.70 \quad g = +12.49 \quad G = 325.50 \quad h = 19.44 \quad H = 228.32 \quad i = 6.30$$

$G_{12} \quad 58.06$

$H_{12} \quad 324.46$

$\log g = 1.09686$

1.09656

$\sin(G + \alpha) \quad 9.92890$

$\cos$

9.72299

$\text{tang } D \quad 0.07599$

0.81955

1.10145

+ 22.58

$\log h = 1.28870$

- 19.15

1.28870

$n(H + \alpha) \quad 9.96141n$

+ 2.705.13

9.98212

- 4.057

$\text{sec } D \quad 0.19181$

12.63

9.88418

+ 6.600

$1.24162n$

+ 16.06 17.76

1.08500

2.543

+ 1.18

12.16

$\log i \quad 0.80003n$

+ 14.70

$\cos d \quad 9.80819$

$0.60822n$

Comet I 1859. Apr. 29. 1859.

Star 1839.0	6 ^h 24 ^m 54.69	+ 49° 59' 14.3
app Eq.	<u> + 1.18</u>	<u> + 14.7</u>
	6 24 55.87	49 59 29.0
A - *	<u> + 1 13.71</u>	<u> + 3 46.2</u>
AR 6	26 9.58	Sun + 50 3 15.2

At 10^h 6^m 8^s Camb. m. s. t

not corrected for refraction &c.

Tested by duplicate computation. M.S.

1859
May 2. Stars for Comparison with Comet,

At 8^h Cambr. Comp. α 6^h 15^m
 δ 44° 43'.

Bessel's Zone 511 (vol XVII p. 78) - 9th mag.

	$6^h 8^m 53.97$	$44^\circ 48' 21''$	1842.0	$6^h 9^m 9.7$	$44^\circ 48' 02''$	9.99965
	-59.036	-4.87		+44.48102	9	9.99697
	-0.268	+0.71		1.3267		0.12276
Winkler's correction	+0.253			3.0704		
1855.0	6 7 54.92	44 48 16.9	Ann. Photo	4.3971	α	-4.60167
Pro. 34 years	2 26.50	-27.2	" " δ	0.8015		-99.390
1859.0	6 10 24.42	44 47 49.7 (Pl.)				
		(revised A.21.)				

A star precedes, 3^m 7^s 67 (about), and is 6' 10" 9 north of, the star of comparison given above. (uncorrected for Precession)

$$f = 22''.97 \quad g = +12''.58 \quad G = 322^\circ 37' \quad h = +19''.53 \quad H = 225^\circ 32' \quad i = -6''.04$$

$$\alpha = \frac{92 \ 36}{55 \ 11} \quad \alpha = \frac{92 \ 36}{318 \ 8}$$

$$\begin{array}{ll} \log g = 1.09968 & 1.09968 \\ \sin(G+\alpha) & 9.91433 \quad \cos & 9.75660 \\ \log \delta & 9.99693 & 0.85628 \\ & 1.01094 \end{array}$$

$$\begin{array}{ll} \log h = 1.29070 & 1.29070 \\ \sin(H-\alpha) & 9.82439 \quad \cos & 9.87198 \\ \sec \delta & 0.14898 \quad \sin & 9.84794 \\ & 1.26307 \quad & 1.01062 \end{array}$$

$$\begin{array}{lll} +22.97 & \cos \delta & 9.85102 \\ +10.25 & \log i & 0.78104 \quad n \\ +33.22 & & 0.63206 \quad n \\ -18.33 & & +7.18 \\ +14''.89 & & +10.25 \\ +0.99 & & +17.43 \\ & & -4.29 \\ & & +13''.14 \end{array}$$

Red. to app. Place

Micrometer May - 2nd 1859.

9 ⑧

At Sunset commenced observing
parages of Polaris over $\frac{1}{4}$ Revolutions of
the screw beginning at $90''$ for the first set
and at $55''$ for the 2nd for which the com-
panion was used. Vision very bad
& the observations uncertain. but those
of the companion more reliable.

Comet I 1859. May 2. 1859.

G. P. B. obs.

Ex. Ther. 51.5°
 Bar. 30.232
 Alt. Ther. 66.0

Observation reduced to mean of declination times.

New Zero of Pos. = $90^{\circ} 32'$ Comet compared with star γ of 12 mag. (south fol. * γ)

AR on Spr. Gov. over 2 wires

γ . * $\epsilon b =$ 11 36 7.5 17.1
 36 47.6 57.0 + 0 40.1 39.9

B.

* 37 14.2 23.9
 37 54.0 3.7 39.8 39.8

B.

* 38 19.1 28.7
 38 58.6 68.2 39.5 39.5
 160.2 188.9 39.80 39.73

D. B. $\epsilon b =$ 11 37 58.1 Mean 39.77
 11 55 0.0 37.33
 11 46 29.0 38.55
 + 0.03 $\Delta \alpha = 38.58$

Dec

 γ . *

~~45.082~~ time not observed.
~~63.015~~

$\epsilon b =$ 11 44 10.0 69.47 Time by ϵb .
 46 8.0 70.55
 48 29.0 71.38

Zero of Wires
 50.48
 50.47
 50.49
 50.48

$\epsilon b =$ 11 46 15.0 70.47
 cor. of ϵb - 8.0 50.48

Id γ . 11 46 17.8 19.99
 2 40 51.2 40

Comb m. l. 9 51.2 $\Delta \alpha = 19.5.9 = -3' 15.9$

Comet May 2. 1859.

AR again
D. B. D.

γ^*	$\epsilon b = 11$	53	10.9	17.4
		53	49.0	55.0

- *

+	0	38.1	37.6
---	---	------	------

B.

*	54	24.6	30.8
	55	1.7	8.0

37.1	37.2
------	------

B.

*	55	23.0	29.2
	56	0.0	6.3
$\epsilon b = 11$	54	56.9	63.1
11	55	0.0	

37.0	37.1
1.2	.9
37.37	37.30
Mean	37.33

Reading for Distance of wires for AR transits 57.34

B. D. B.

* γ compared with the Bessel * of 9-10 mag.

Bessel *	(2)	$\epsilon b = 11$	58	40.9 - 47.2	"	73.9 - 79.3	8' 31"	AR on 4 wires
γ no sig. 2 wire	12	2	last	43.1	"	69.4 75.0	2 31	AR. 2 wires on scale.
		3		55.9	"	55.5 - 55.7	6' 00	

D. D.

Bessel *	(2)	12	4	22.7 - 28.9	"	55.4 - 61.0	8' 20	B. B. D. after transit
γ			8	18.6 - 24.8	"	51.7 - 56.4	2 20	
			3	55.9 - 55.9	"	55.7 - 55.4	6' 00	

Diff AR = 3" 55.68
cor. refr. - 0.00

Diff sec + 6' 00.0
cor. for temp. - 0.6
5' 59.4
cor. refr. + 0.2
5' 59.6

Comet I 1839 May 2

L. B. B.

Bessel * (1) north. proc. Bessel * (2).

Bessel * (1) E.C. = 12	10	14.6 - 20.9	47.3 - 53.0	Scale 7' 49"	(* (1) of 9 mag)
Bessel * (2)	13	22.0 - 28.1	54.9 - 60.4	1 29	
	3	7.4 - 7.2	7.6 - 7.4	6' 20"	

Long B.

Cor. for Refraction $\tau = + 5^{\circ} 35' 42''$

Bessel * (2) and γ $\Delta = +44^{\circ} 51' \psi = +6^{\circ} 38'$
 $2\Delta = 89$ $42 \log \cot \gamma = 0.03439$
 $\psi + \Delta = 51^{\circ} 29' \sin 9.89344$
 $\psi + 2\Delta = 96$ $20 \cos 9.04262$

$\log k = 1.7560$
 $\log \sin(\rho' - \rho) = 6.9779$ for * 78
 8.7538
 9.7869
 9.2110 8.9469
 $\log \cot \gamma$ 0.0344
 $\cos(\psi + 2\Delta)$ 9.0426
 9.1227
 7.1466
 7.4107

$\cos \Delta = 9.8506$
 2
 9.7012
 $+ 0.16 * 28 B.2.$ 6.1761
 $\cos. \sin + 0.09 * 8$ 0.8773
 $- 0.003 * 28 B.2$
 $\cos \sin AR - 0.0016 * 8$

Bessel * (2) 1859.0 $6^h 10^m 24.42$ $\sin + 44^{\circ} 47' 49.7$
 app. eq. $+0.99$ $+ 13.1$
 app. $6 10 25.41$ $44 48 02.8$
 $3 55.68$ $5 59.6$
 $* 7$ $6 14 21.09$ $44 42 03.2$
 $* 2$ $+ 38.58$ $- 3 16.0$
 $\text{app. AR} = 6^h 14^m 59.67$ $\sin + 44^{\circ} 38' 47.2$

Revised J.W.S.

May 2. $9^h 4^m 22'$ Camb. m.t.

(Watson) Comet May 2 1859

Good definition.

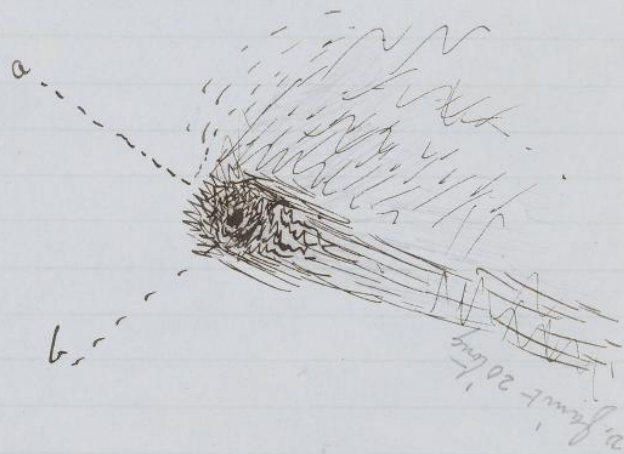
Angle pos. of tail

	120° 00'
Zero	180 32
	60 32

diam. Bright part of head perp. to
axis of tail & through nucleus

39" 14
Zero

beyond above diameter light
is faint in any direction



The tail is conical
near nucleus & not

at all bright beyond 2' It can however
be discerned as far as 20' The preceding quad-
rant between a & b has appeared to me on
previous nights deficient in light at a slight
distance beyond 1' from nucleus & I have found
to night by repeated trials in moving upon

1059phao-proj-1938
The Comet May 2

The Comet from different directions that
the ^{5 to 5.5} ~~5.5~~ quadrant contains light at a dis-
tance of 6' while the pre-quadrant shows
no trace beyond 3'

The light is pretty well concentrated but
no stellar point can be detected

The increase of light in approaching the
centre is far greater than would be the case if
the form were spherical & the distribution uniform

St

Stars for Comet, May 3^d

Nimocks correction,
which is included in K.

Star 1. 8th May. B.Z. 511

6 8 39.95 + 42 51 44.3
- 58.78 - 5.0
+ 0.38 - 1.0

+ 0.253

1825.0

6 7 41.55 42 51 38.3

B.Z. 516

6 9 0.04 42 51 42.7
- 1 18.16 - 9.7
- 0.28 + 0.8

+ 0.236

6 7 41.61 42 51 33.8

B.Z. 532

6 9 18.47 42 51 44.8
- 1 36.74 - 9.3
- 0.26 + 0.7

+ 0.236

6 7 41.47 42 51 36.2

Adopted 1825.0

6 7 41.54 42 51 36.1

Star 2. 8th May. B.Z. 511

6 11 19.20 + 42 58 34.3
- 58.79 - 3.3
+ 0.34 - 0.9

+ 0.253

6 10 20.75 42 58 30.1

B.Z. 516

6 11 39.20 42 58 31.9
- 1 18.17 - 8.2
- 0.30 + 0.9

+ 0.236

6 10 20.73 42 58 24.6

B.Z. 532

6 11 57.40 42 58 36.5
- 1 36.74 - 7.6
- 0.30 + 0.8

+ 0.236

6 10 20.36 42 58 29.7

Adopted 1825.0

6 10 20.61 42 58 28.1

	α	δ		
Pr.	6 ^h 7 ^m 41 ^s 54	+42° 51' 36"	1841.5	
	2 26.54	- 26.4	α 6 ^h 8 ^m 52 ^s 8	6 ^h 11 ^m 32 ^s
			δ +42 51.40	42 58.25

1859.0	6 10 8.08	42 51 9.7	h ₀ 9.99968	9.99945
	6 10 20.61	+42 58 28.1	h ₀ 9.96746	9.96921
Pr.	2 26.69	- 34.3	δ 1.62478	1.62628

1859.0	6 12 47.30	42 57 53.8	α 6.58812	- 8.70158
	6 12 48.28	42 58 6.3	- 1.42183	- 1.53529

Comet's computed place at 8^h Cambr.

	α	δ		
Baily 11956	6 ^h 11 ^m 7	42° 55'	α 6 ^h 8 ^m 1.0	
Pr. 59y	4 14.30	- 41.4	δ 42 51.57	
	6 5 53.99	42 51 57.2		
1859.0	6 10 8.29	42 51 15.8	9.99974	- 8.54372

1859.0	6 10 8.13	42 51 11.2 (1 Cal = 1 Bus)		
	6 10 9.09	42 51 23.7		

App. Place May 3.

$f = +23.00$	$G = 322^{\circ} 53'$	$H = 224^{\circ} 18'$	$G = 322^{\circ} 57'$	$H = 224^{\circ} 18'$
	$\alpha = 92^{\circ} 34'$	$92^{\circ} 34'$	$93^{\circ} 12'$	$93^{\circ} 12'$
	$G + \alpha$ 55 27	$H + \alpha$ 31 6 52	56 5	31 7 30
$\log 1.1015$	1.1015	1.1015	1.1015	
$\sim (G + \alpha)$ 9.9157	$\sim$ 9.7537	9.9190	9.7466	
$G \delta$ 9.9674	0.8552	9.9691	0.8481	
0.9846		0.9896		
$\log h$ 1.2914	1.2914	1.2914	1.2914	
$\sim (H + \alpha)$ 9.8349n	$\sim$ 9.8632	9.8297n	9.8676	
$\sim \delta$ 0.1348	$\sim \delta$ 9.8326	0.1356	9.8335	
1.2611n	0.9872	1.2567n	0.9925	
+23.00	+7.16	+23.00	+7.05	
+9.65	+9.71	-18.06	+9.83	
-18.25	-4.34	+9.76	-4.33	
+14.90		+14.70	+12.55	
+0.96	+12.53	+0.98		
	0.7727n		0.7727n	
	9.8652		9.8643	
	0.6379n		0.6370n	

Red. to app. dupl.
J.H.V.

New Nebula: (3rd May 59)

In R $12^h 53^m$ and decl. $0^\circ 45' \pm$ north there is a faint nebula about $50''$ in diameter showing a very slight condensation of light towards a point north preceeding the centre of figure. The south and south following quadrants may be perceptibly less bright and less defined than the north and north preceeding ones; if such a thing be possible. The nebula was noticed for the first time on the night of the 30th April 1859 while zoning.



{ at ~~a~~ an angle
in the outline
was suspected }

J.C.

Micrometer May 3 1859

Transits companion of Polaris

1st Set $70''$ to 67.25 Power 140

2nd Set $60''$? to 40.75 " "

3rd Set from $60''$ to $40''$ followed by
B. D. B. D. Companion power 401

Each obs. was transit over movable
wire altered by $0''.25$ commencing always
with even revolution

4th Set preceded by long dots - $60''$ to $37''.00$
Companions power 401

Removed the Mica Scale for the purpose of
thoroughly cleaning it. It has hitherto been so placed
that the zero of pos. of its R wires read $1^\circ 0'$ more than
that of the Micrometer wires. In replacing, it was
adjusted to parallelism as nearly as possible.

Micrometer. May 3 1839

First Set.

Second Set

$\epsilon b = 10^h$ 19 22.7 5.7^x
 28.4 6.7
 35.1 5.8
 40.9 7.6
 48.5 6.3^x
 54.8 6.9
 20 1.7 5.5
 7.2 5.9
 13.1 7.5^x
 20.6 8.8
 29.4 5.1
 34.5

0 to .25 .25 to .50 .50 to .75 .75 to 1.00
 5.7 6.7 5.8 7.6
 6.3 6.9 5.5 5.9
 7.5 8.8 5.1
 19.5 22.4 16.4 13.5
 6.50 7.47 5.47 6.75

$\epsilon b = 10^h$ 25 47.9 6.2^x
 54.1 6.2
 26 0.3 7.2
 7.5 4.9
 12.4 5.7^x
 18.1 8.1
 26.2 6.7
 32.9 4.8
 37.7 6.5^x
 44.2 6.6
 50.8 6.6
 57.4 6.1
 27 3.5 6.4^x
 9.9 5.9
 15.8 7.3
 23.1 7.9
 31.0 4.3^x
 35.2 6.9
 42.1 7.0
 49.1 7.1
 56.2 6.4^x
 28 2.6 5.8
 8.4 6.5
 14.9 6.1
 21.0 8.0^x
 29.0 6.1
 35.1 5.8
 40.9 6.7
 47.6 6.4^x
 54.0 6.5
 29 0.5 7.1
 7.6 7.1
 14.7 4.9^x
 19.6 6.7
 26.3 6.5
 32.8 5.7
 10 29 38.5

Micrometer May 3. 1859.

Second Set.

Eb = 10^h 29^m 38.5

45.8 7.3 x
51.4 5.6
59.7 8.3
30 6.3 6.6
11.4 5.1 x
16.8 5.4
24.2 7.4

30.9 6.7

37.9 7.0 x

43.2 5.3

50.3 7.1

55.7 5.4

60.3 4.6 x

31 8.7 8.4

13.3 6.6

21.7 6.4

29.7 6.0 x

35.5 5.8

41.7 6.2

47.8 6.1

54.3 6.5 x

32 2.0 7.7

7.3 5.3

15.0 7.7

21.6 6.6 x

27.0 5.4

35.0 8.0

40.3 5.3

47.4 7.1 x

54.1 6.7

60.3 6.2

33 7.5 7.2

13.7 6.2 x

20.1 6.4

26.3 6.2

Eb = 10^h 33^m 26.3

31.5 5.2
38.4 6.9 x
44.1 5.7
52.1 8.0
59.2 7.1
34 4.1 4.9 x

0 to 25 25 to 50 50 to 75 75 to 100

7.3	5.6	8.3	6.6
5.1	5.4	7.4	6.7
7.0	5.3	7.1	5.4
4.6	8.4	6.6	6.4
8.0	5.8	6.2	6.1
6.5	7.7	5.3	7.7
6.6	5.4	8.0	5.3
7.1	6.7	6.2	7.2
6.2	6.4	6.2	5.2
6.9	5.7	8.0	7.1
4.9			

70.2 62.4 69.3 63.7
6.38 6.24 6.93 6.37

Micrometer May 3, 1859.

Third Set	
$Eb = 10^h$	39^m
35.6	
40.4	4.8x
46.9	6.5
53.4	6.5
59.9	6.5
40	6.2x
6.1	4.8
10.9	6.2
17.1	7.8
24.9	6.4x
31.3	4.9
36.2	5.9
42.1	7.9
50.0	7.1x
57.1	5.8
41	7.4
2.9	6.0
10.3	5.8x
16.3	7.3
22.1	6.5
29.4	6.6
35.9	5.6x
42.5	7.1
48.1	5.1
55.2	7.1
60.3	6.9x
42	8.4
7.4	6.4
14.3	4.9
22.7	6.9x
29.1	7.3
34.0	6.6
40.9	5.5
48.2	5.7x
54.8	7.1
60.3	
43	
6.0	
13.1	

Third Set	
$Eb = 10$	43
13.1	7.7
20.8	5.3
26.1	6.2x
32.3	5.8
37.6	6.8
44.4	7.5
51.9	5.5x
57.4	6.7
44	7.0
46.1	7.2
11.1	6.1x
18.3	6.9
24.4	5.2
31.3	7.5
36.5	6.2x
44.0	4.7
50.2	9.2
54.9	5.5
45	6.8x
4.1	6.5
9.6	7.3
15.9	5.2
22.4	5.8x
29.7	7.7
34.9	5.3
40.7	8.3
46.4	7.57
53.7	7.6
46	5.4
2.0	4.5
9.5	7.0x
17.1	5.5
22.5	7.6
27.0	6.0
34.0	
39.5	
47.1	
53.1	

Micrometer

May 3. 1859.

Third Set
 $Eb = 10^h$
 46 53.1 7.2 x
 60.3 6.6
 47 6.9 6.8
 13.7 8.0
 22.0 5.8 x
 27.8 5.7
 33.5 5.5
 39.0 5.0
 44.3 8.6 x
 52.9 5.0
 57.9 7.1
 48 5.0 8.2
 13.2

Fourth Set.
 $Eb = 11^h$
 3 12.8 8.2 x
 21.0 5.0
 26.0 5.4
 31.4 6.0
 37.4 8.5 x
 45.9 4.0
 49.9 7.2
 57.1 7.8
 4 4.9 6.3 x
 11.2 6.1
 17.3 7.6
 24.9 5.2
 30.1 5.6 x
 35.7 8.1
 43.8 5.1
 48.9 8.5
 57.4 4.6 x
 5 2.0 7.4
 9.4 6.0
 15.4 5.2
 20.6 6.8 x
 27.4 6.4
 33.8 7.0
 40.8 6.8
 47.6 7.6 x
 55.2 6.6
 6 1.8 6.1
 7.9 6.1
 14.0 5.8 x
 19.8 6.6
 26.4 5.2
 31.6 9.2
 40.8 6.9 x
 47.7 7.0
 54.7

0.625 2.5650 50.675 75.6100

4.8	6.5	6.5	6.5
6.2	4.8	6.2	7.8
6.4	4.9	5.9	7.9
7.1	5.8	7.4	6.0
5.8	7.3	6.5	6.6
5.6	7.1	5.1	7.1
6.9	8.4	6.4	4.9
6.9	7.3	6.6	5.5
5.7	7.1	7.7	5.3
6.2	5.3	6.8	7.5
5.5	6.7	7.0	7.2
6.1	6.9	5.2	7.5
6.2	4.7	9.2	5.5
6.3	6.5	7.3	5.2
5.8	7.7	5.3	8.3
7.5	7.6	5.4	4.5
7.0	5.5	7.6	6.0
7.2	6.6	6.8	8.3
5.8	5.7	5.5	5.3
5.6	5.0	7.1	8.2

20/127.6 129.4 131.5 131.1
 6.380 6.370 6.575 6.555

Micrometer May 3. 1859

Fourth Set
 El 11^h 6^m 54.7 6.0

Fourth Set
 El = 11^h 10^m 24.3 6.6^x

Rejct

		0 to 25	25 to 50	50 to 75	75 to 100
7	5.0 8.3 ^x	8.2	5.0	5.4	6.0
	13.3 5.7	8.5	4.0	7.2	7.8
	19.0 6.7	6.3	6.1	7.6	5.2
	25.7 6.3	5.6	8.1	5.1	8.5
	32.0 7.1 ^x	4.6	7.4	6.0	5.2
	39.1	6.8	6.4	7.0	6.8
	44.0 3	7.6	6.6	6.1	6.1
	45.3 6.4	5.8	6.6	5.2	9.2
	51.7 5.6 ^x	6.9	7.0	6.0	4.3
	57.3 5.7	8.3	5.7	6.7	6.3
	3.0 6.1	7.1	5.2	6.4	6.4
	9.1 6.1	5.6	5.7	6.1	6.1
	15.2 7.7 ^x	7.7	7.0	6.0	7.1
	22.9 7.0	5.3	6.6	7.0	5.7
	29.9 6.0	7.2	6.2	6.3	5.3
	35.9 7.1	6.5	6.4	6.1	7.6
	43.0 5.3 ^x	7.8	5.9	5.3	6.1
	48.3 6.6	6.6	6.2	7.7	6.6
	54.9 7.0	6.5	5.2	5.5	8.1
	1.9 5.7	5.1	4.3	9.1	7.7
	7.6 7.2 ^x	5.2	4.6	8.1	5.6
	14.8 6.2	9.6	3.2	4.9	10.1
	21.0 6.3	5.7	6.3	3.7	6.2
	27.3 5.3	154.5	133.5	138.1	154.0
	32.6 6.5 ^x	6.717	6.068	6.277	6.691
	39.1 6.4				
	45.5 6.1				
	51.6 7.6				
	59.2 7.8 ^x				
	7.0 5.9				
	12.9 5.3				
	18.2 6.1				
	24.3				

30.9 6.2
37.1 7.7
44.8 6.6
51.4 6.5 ^x
57.9 8.2
6.1 5.5
11.6 8.1
19.7 5.1 ^x
24.8 4.3
29.6 9.1
38.2 7.7
45.9 5.2 ^x
51.1 4.6
55.7 8.1
3.8 5.6
9.4 9.6 ^x
19.0 3.2
22.2 4.9
27.1 10.1
37.2 5.7 ^x
42.9 6.3
49.2 3.7
52.9 6.2
59.1

1859 May 3 Comet 15 1859 (Watson)

Comet compared with Stars A & B. on the
Scale & with Spring Gun.

For places of Stars with 8 pages back

A = 8^h 13^m 51.1 516 522

B = 8^h " 51.1 516 522

B 8 13 * A 1.38 V 2.24 * B 8.23

B

1.40

Angle of position

* A 26 11 29 20.3 - 26.8 " 58.6 - 63.9

30 51.8 - 58.0 " 89.9 - 95.5

* B 31 59.7 - 65.9 " 97.8 - 43.2

* A + 1 31.5 31.2 31.3 31.6

* B - 1 7.9 7.9 7.9 7.7

9 C = 11 33 8.3 - 14.9 " 46.7 - 52.1

34 39.8 - 45.9 " 77.4 - 22.3

35 47.7 54.0 " 85.9 - 31.2

B 8 13

* A 1.38 + 0' 46"

V 2.24 - 5 59

* B 8.23

B

* A 1.40 + 0 34

V 2.14 - 6 10

* B 8.24

D.B.

Angle of position of tail 119° 15'

Position angle 180° 31'

Angle of Pos.

61 16.

Tail is north following head of comet

* A + 1 31.5 31.0 30.7 30.2

* B - 1 7.9 8.1 8.5 8.9

7

Comet

The Comet was n.f. * A. Under very fine definition it was still doubtful whether there was a stellar nucleus

The brightest part of the tail is * conical
apex 2' from nucleus rest of



tail very faint - margin of cone

not as decided as represented. Can discern

the light to 5' on fol. side of head & 3' on free side

$$\begin{aligned} \text{---} * A &= +1^m & 31.40 \\ \text{---} * B &= -1 & 7.85 \end{aligned}$$

$$Eb = 11^h 31^m 13.8$$

$$\begin{aligned} \text{---} * A &= +1 & 30.85 \\ \text{---} * B &= -1 & 8.35 \end{aligned}$$

$$El = 11^h 35^m 1.4$$

$$\begin{aligned} \text{---} * A &= +1^m & 31.12 \\ \text{---} * B &= -1 & 8.10 \end{aligned} \quad \left. \begin{array}{l} \\ \end{array} \right\} AR$$

$$Eb = 11^h 33^m 7.6$$

$$\begin{aligned} \text{---} * A &= +0' & 40.0 \\ \text{---} * B &= -6 & 4.5 \end{aligned} \quad \left. \begin{array}{l} \\ \end{array} \right\} su$$

$$-7.0$$

$$11^h 33^m 1.$$

$$2^h 44^m 13.$$

$$8^h 48^m 48.$$

$$8^h 47^m 27.$$

$$21 \text{ comb. m. r.}$$

$$\begin{aligned} * B, \text{ cor for Temp} &= -0.5 \\ \text{cor for refr. } +0.2 & -6 & 4.0 \\ & +0 & 39.9 \end{aligned}$$

Comet May 3. 1859.

Cor. for Refraction

* A & $\left\{ \begin{array}{l} \text{Sid Time} = 11^h 33^m 1^s \\ \quad \quad \quad 6 \quad 10 \quad 54.6 \\ \tau = 5 \quad 22 \quad 6.4 \\ \lambda = 57^\circ \end{array} \right.$

$$\log \eta = 0.0267$$

$$\psi = 10^\circ 14'$$

$$\Delta = +42^\circ 51', \psi + \Delta = 53^\circ 5'$$

$$2\Delta = 85^\circ 42', \psi + 2\Delta = 95^\circ 56'$$

$$\log k = 1.7562$$

$$\delta' - \delta = 40''$$

For * A & the cor. is zero.

$$\begin{array}{r} 11 \quad 33 \quad 1 \\ 6 \quad 12 \quad 12 \\ \hline \tau = 5 \quad 20 \quad 49 \\ \lambda = 56.5^\circ \end{array}$$

$$\log \eta = 0.0254$$

$$\psi = 10^\circ 46'$$

$$\Delta = +42^\circ 55', \psi + \Delta = 53^\circ 41'$$

$$2\Delta = +85^\circ 50', \psi + 2\Delta = 96^\circ 36'$$

$$\begin{array}{l} \log k = 1.7567 \\ \sin(\delta' - \delta) \quad 7.2472 \\ \cos^2(\psi + \delta) \quad 0.1876 \\ 9.1915 \text{ cor in } \delta = 0.16 \\ \eta \quad 0.0267 \\ \sin^2 \Delta \quad 0.2706 \\ \cos(\psi + 2\Delta) \quad 9.0605n \\ \text{amp } 15^\circ \quad 8.8239 \\ 7.3732 \text{ in } \cot \alpha = 0.002 \end{array}$$

$$\begin{array}{l} \delta' - \delta = 6' 4.5'' \\ \sin(\psi + \delta) \quad 9.9062 \\ \quad \quad \quad 9.8124 \end{array}$$

$$\begin{array}{l} \sin \Delta \quad 0.1353 \\ \quad \quad \quad 0.2706 \end{array}$$

Comet May 3. 1859.

$$\begin{array}{rcl}
 \text{app. Eq.} * A & 6^h & 10^m & 9.09 & + & 42^\circ & 51' & 23.7 \\
 & & + 1 & 31.12 & & & + 0 & 39.9 \\
 \text{AR.} & 6 & 11 & 40.21 & \text{Dec} & + & 42 & 52 & 3.6
 \end{array}$$

$$\begin{array}{rcl}
 \text{app. Eq.} * B & 6 & 12 & 48.28 & + & 42 & 58 & 6.3 \\
 & & - 1 & 8.10 & & & - 6 & 4.2 \\
 & 6 & 11 & 40.18 & + & 42 & 52 & 2.1
 \end{array}$$

$$At \quad 8^h \quad 47^m \quad 21^s \quad \text{Camb. m. 2.}$$

Eclipse of July 18th 1860

computed by Rev. C. M. Bristow

At Cambridge Eclipse Begins July 17 19^h. 28^m. 01^s
Ends " 21 13 54

10 1/2 hrs of ☉ eclipsed.

Washington mean time	α	Hour. Min.	δ	Hour. Min.	$\log \Delta$	$\log r$
May 12	5 46 36	-7.4	+27 24.4	-3.87	9.9123	9.7620
13	41 36	7.6	25 51.5	3.79		
14	38 32	8.0	24 20.5	3.71	9.239	9.7210
15	35 21	8.3	22 51.5	3.62		
16	32 1	8.7	21 24.6	3.52	9.363	.6748
17	28 31	9.3	20 0.0	3.42		
18	24 48	9.9	18 38.0	3.30	9.494	.6221
19	20 52	10.6	17 18.9	3.15		
20	16 37	11.4	16 3.3	2.98	9.632	.5620
21	12 3	12.4	14 51.7	2.78		
22	7 6	13.5	13 45.0	2.52	9.778	.4937
23	5 1 42	-14.8	12 44.5	-2.18		
24	4 55 48		+11 52.2		9.9930	9.4190
25	+20		+3 4			
26	+16		5.2			

Elements of the comet;

T. 1859 May 29.0030 Washington mean time.

$\log q$ 9.30403

ω 281° 59.66

Ω 357 41.77

i 94 52.78

Mean Equinox, April 27th.

From observations made at New York, April 23^d, and at Cambridge April 27th and 29th.

April 27th

C - O.

$\Delta \alpha \cos \delta$ + 0.03

$\Delta \delta$ + 0.22

Magnetic Declinations at Cambridge
 Copied from Mr Schott's letter Dec Jan 1859.
 (Obs of 1840-59 by W.C.B.)

Year	Obs ^d D	Comp ^d D	diff.	Year	Obs ^d D	Comp ^d D	diff.
1708	+9.00	+9.60	-0.60	1840.4	+9.30	9.42	-0.12
1742	8.00	7.88	+0.12	1842.2	9.57	9.57	0.00
1757	7.33	7.31	+0.02	1844.5	9.65	9.76	-0.11
1761	7.23	7.19	+0.04	1845.4	9.53	9.84	-0.31
1763	7.00	7.14	-0.14	1852.5	10.13	10.42	-0.29
1780	7.03	6.87	+0.16	1852.5	10.65	10.57	+0.08
1782	6.75	6.86	-0.11	1853.4	10.91	10.64	+0.27
1783	6.87	6.87	0.00	1856.4	10.84	10.72	+0.12
1788	6.63	6.89	-0.26	1857.7	11.29	10.83	+0.46
1810	7.50	7.45	+0.05	1858.9	11.52	10.92	+0.62
1835	+8.85	9.07	-0.16				
1837	9.15	9.15	0.00				

Phenomena of the Comet 1859 II.

	Wash.		Hor. mot.		h. D	
	α	δ	α	δ		
1859. May 0	6 ^h 23 ^m .6	+48° 57'	47.1	-4.6	9.8600	9.9449
1	19.6	37 7	9	4.6		
2	16.2	45 17	9	4.5		
3	12.6	43 29	6	4.5	8687	9094
4	9.5	41 41	6	4.4		
5	6.4	39 55	6	4.4		
6	3.3	38.10	7	4.3	8801	8695
7	0.4	36 26	7	4.3		
8	5 57.5	34 44	7	4.3		
9	54.7	33 3	7	4.2	8936	8241
10	51.9	31 24	7	4.1		
11	49.0	29 47	7	4.0		
12	5 46.1	28 11	7	4.0	99094	9.771

The comet will probably be visible till about the 10th of May, and again after its perihelion on the 9th of May, with perhaps ~~be~~ be seen in June. From the 12th perhaps till July 5th.

M.S.

Comet I. 1859

Apr	M. S. Wash.			α - δ			α		δ
	α	δ		α	δ		α	δ	
28.	9. 30			1. 24. 58	+ 8. 57. 97		6. 30. 4	+ 57. 58	
29	8 35. 9. 4	3.	AZ. 76 107	1. 13 36	+ 3 36 55		6. 26. 21. 33	+ 52. 8. 2	
29	9. 44 11. 9	10	"				6. 26 10. 76	+ 50 3 7	

Mean place 1860.0 of AZ. 76. 107

6. 24. 59. 68 + 49. 59. 11. 96

The first place is with the comet sector -

