

KG  
11365  
127

H.43

*Equatorial.*

*July 13<sup>th</sup> 1861.*  
*16*

*Sept. 12<sup>th</sup> 1861.*

Sold by THOMAS GROOM & Co., Stationers, India Building, 82 State Street, Boston.



KG 11365.197

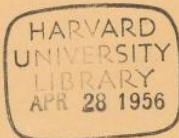
1861phae.proj..197B







KG 11365.197







(63). Ansonia?

July 15, 1861.

J. H. S. obs.

Edge of ScaleAngle of Pos.  $35^{\circ} 33'$ 

236 \* 16 27 23.2  
 p 16 28 8.2 45.0 p 5' south of \*

\* 16 34 41.6  
 p 35 26.8

\* 36 15.3  
 p 37 0.5

Spr. Son.

\* 16 38 50.8  
 39 19.6  
 p 40 7.8

\* 40 54.6  
 p

\* 42 2.2  
 p 15.6

\*  
 p

\* 43 17.1  
 p 30.2

236 \* 43 54.5  
 \* 44 26.4  
 p 44 39.9

Spr. Son.

Circle reads  $116^{\circ} 53'$ 

\* 34.2  
 p 41.8

x 1.8  
 b 9.9

7' 46"  
 1 42  
 2 6



(63)

July 15, 1861

Spr. low.

\*

p

\*

p





## Comet 1861. II

1861 July 15<sup>th</sup>7<sup>th</sup>

El.

*	9 24	9 24		20	23	14.0	20.9	
8	3 14.5	3 14.5	-6' 9.5		25	20.5	27.3 + 2	6.45
*	9 24	9 25		20	28	6.8	13.6	
8	3 4.5	3 5	-6 19.8		30	13.9	20.5 + 2	7.00
*	8 8	8 9.5		20	31	45.3	52.0	
8	1 40	1 42	-6 27.8		33	52.8	59.6 + 2	7.55
*	10 24	10 24.5		20	34	55.3	61.8	
8	3 54	3 54.5	-6 30.0		37	3.4	10.2 + 2	8.25
*	10 22.5	10 23.5		20	37	58.2	64.9	
8	3 46.	3 47.5	-6 36.2		40	7.0	13.8 + 2	8.85

Star 48.9 mag. = R. 4722.

Star. Mot. in AR  $10^{\circ} 52'$  in Dec. -  $1^{\circ} 75'$  Motion

El.	20	25	24	+ 2	6.45	+ 1.44	- 6	9.5	- 14.0	23.9
		30	17		7.00	+ 0.56		19.8	- 5.4	28.2
		33	56		7.55	- 0.10		27.8	+ 0.0	26.8
		37	7		8.25	- 0.67		30.0	6.5	23.5
		40	10		8.85	- 1.22		6 36.2	11.9	26.3

Verified

Pr. Error.

20	33	23	2	7.62 $\pm 0.05$	- 6	24.7 $\pm 0.41$
Refr.				+ 0.01	-	6.2
Temp.				- 0.1	+	0.3
			+ 2	7.63	- 6	24.6

Comet 1861. II.

1861 July 15.

R. 4722. 1836.0 14 21 57.935  
19.39954° 39' 44.90  
- 6.47.8220 14 22 16.6  
0° 21 36.35

1861.0. 14 22 41.334 + 0.019 + 54° 32' 57.08 - 0.55  
 Res. to app. + 2.45" + 2.3"  
 Comet - Star. 2 7.63 - 6 24.6

Comet's A.R. Sta. 14 21 57.414  
Per. + 1.51+ 54° 26' 34.3  
+ 7.1

790° 0.11843  
 9.76469  
 1.52107  
 2.70016  
 9.91031

76.764  
 - 27.365

Com. per. sec. var. by 330.49

El 20 33 23  
 pred. 5 48.  
 Int. 20 27 35  
 - 7 34 3.4  
 - 2 6.7  
 12. 51 25

Comet. m.s.

Schub. Int.

C. 216 5 54 30  
 O. 216 13 54 26.6  
 O-C + 8' - 3.4

0.719 482  
 0.211

12 51 25  
 1. 48 40  
 - 4 6  
 12 31 49  
 58090  
 936531  
 936531  
 8.948  
 9.41951  
 39.12  
 2.44 87.3  
 4.10 82.1  
 1.27  
 4.10 82.1  
 2.44 87.3  
 36 17.7  
 1.76.56 0.2965  
 1.74761  
 1.516  
 57.62  
 3.14

h - 8.9708 + 9.8613  
 B - 8.8264 - 9.8206  
 C + 0.2956 - 1.2116  
 D - 8.8810 - 9.7157  
 Aa - 0.695 + 5.41  
 Ab + 1.257 + 12.64  
 Cc + 1.755 - 11.46  
 St. + 0.136 - 1.04

C 14 24 49.51 + 54 26 42.4  
 O-C + 7.44 - 1.0  
 Red. + 4.26



June 11, 1881

1861phae

Dear Mr. Brewster

I have just received your letter of the 10th inst. and am  
glad to hear that you are interested in the  
study of the life history of the American  
Ostrich. I have a few specimens of the same  
which I will send you by mail.

Very respectfully,  
John G. Wolbach

Comet II 1861

1861phae.proj..197B

1861 July 15

Saw the Comet at 9 PM - clear.

Appearance of nucleus & neighborhood through the great Refractor presents a remarkable sameness with increasing haze & indistinctness notwithstanding the size of new envelope.

Envelope is probably (9)

nucleus 1"

1' 25"

good

330°

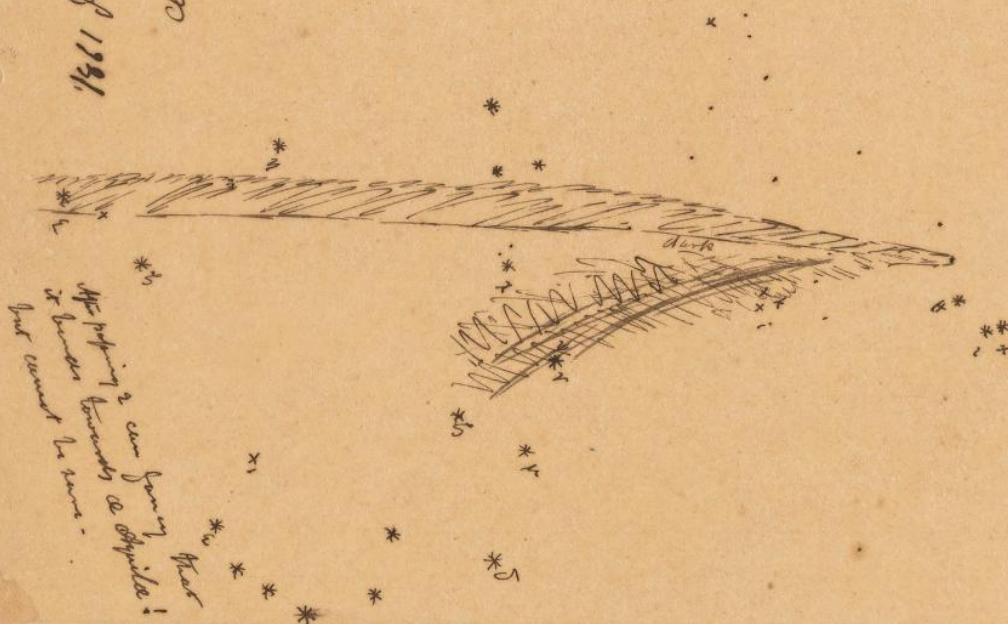
All the rest chaos -

To the naked eye the nucleus is as bright as  $\gamma$  Urs. Minoris

The 14<sup>th</sup> was the only cloudy evg. since comet was first seen July 2<sup>nd</sup>



1861 July 15 19<sup>h</sup> 10<sup>m</sup> am Sid.  
 Ep. P. B. Aug. Mr. Moore.  
 Clear. Moon set & sky dark.



Cannot take after Moon set. Traced with entire certainty  
 as above. Is getting very much fainter than it was before.





Comet It 1861

1861 July 16 17<sup>h</sup> Sid

New envelope 10 10' 10"

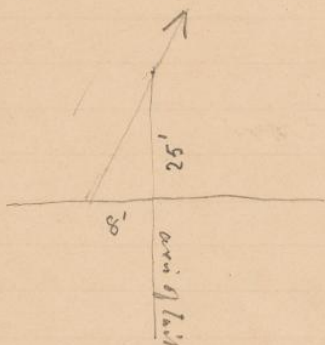
To apex 14"

287°

168°

Direction of brightest  
'envelope'

258° 50'

Envelope is prob-  
ably (10)No outline can be made out for entire  
envelope

Clouded suddenly

## Comet II, 1861

July 17, 1861

Moon lighter bright  
EC 17<sup>h</sup> 20<sup>m</sup>

Prof. Bond obs

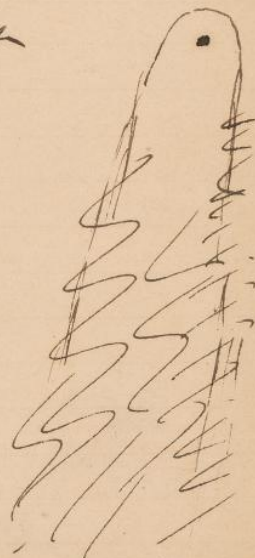
The luminous sector extends from  $169^\circ$  to  $277^\circ$ , distance  $35''$  about, very indistinct. Tail is  $15'$  wide at  $50'$  from nucleus, in Finder. Angle of Pos. of Tail. tangent is  $\frac{12}{25}$

Envelope is probably (10)



Moonlight too bright to admit of tracing tail.

Note that throughout the apparition the nucleus has been placed in sensibly same position relatively to outline of head & i.e. not at focus of parabola but rather catenary - as in Comet of Donati in finder





## Comet II 1861

July 17. 1861

J.H.S. 565

Arg of Pos set  $353^{\circ} 32'$   
g.t.

236									
$\odot$ 18	29	25.6	18 32	50.4	57.2	4'	19"	4'	20"
*	34	10.7	37	25.6	42.3	4	50	4	53½
$\odot$	35	6.7	18 38	31.6	38.3	4	9½		
*	39	51.1	43	16.1	22.8	4	50	4	53
$\odot$	40	55.5	18 44	21.4	28.2	6	2	6	3
*	45	39.9	49	4.9	11.6	6	49½	6	51

M.H.  $+6.67 - 1'39''$ 

M H	18 32 54	- 4 45.15	+ 0.64	- 0 32.2
	38 35	4 44.50	+ 0.07	0 40.5
	44 25	4 43.45	- 0.60	0 47.8
Virgin	18 38 38	- 4 44.37		- 0 40.1

Probably M. 26865. Brighter than 9.10 (mag) 8.9

Orbit 1861 II.

July 17

1800.0 14 34 51.85 +53 30 26.3  
+1 58.28 -15 57.3

1861.0 14 36 50.13 +0.30 53 14 35.0 +0.2

f.c. +2.47 +2.6  
Orbit - Hm +4 44.37 -0 40.1

Orbit<sup>1</sup> A.R. Star 14 32 8.43 53 13 57.7

J. Par 0.612 + 0.9  
Par. 1.14 + 1.7

14 38 38  
Jan. 5 119.5  
18 32 18.5  
7 41 56.5  
1 47

10 47 5 Cambr. m.s.

Schub. Spt.

C. 217 54.5 53 17.5

O 219 2.1 53 14.0

Orbit +2.6 -2.5

Abh. -1.27

(p. 304.)

f. 1861

d<sup>o</sup> 14 35 57.0

d<sup>o</sup> 53 22.01

g<sup>o</sup> 0.11881

h<sup>o</sup> 9.79852

1.91150

3.08759

9.69073

1.83883

-69.002

0.12672

9.80088

2.12610

1.30219

9.88918

0.05370

-1.1316

+1.9392

15.507

1.9391

15.594.5

G 354.17

α 219.13

H 156.34

g<sup>o</sup> 0.127

g<sup>o</sup> 9.7412

g<sup>o</sup> 1.256

g<sup>o</sup> 9.921

g<sup>o</sup> 9.921

g<sup>o</sup> 0.123

g<sup>o</sup> 9.435

g<sup>o</sup> 1.304

g<sup>o</sup> 9.983

g<sup>o</sup> 9.904

f + 41.35

g<sup>o</sup> -13.35

h<sup>o</sup> +9.7

g<sup>o</sup> -15.04

h<sup>o</sup> +15.53

i<sup>o</sup> +2.08



2  
8-  
9  
8.4

7  
6  
2

5

# Multistation of $\alpha$ Scorpii

1861 July 12<sup>th</sup>

El 19 5 42.47

Chr. 736 19 2 33.2 # 1st. with Const. Secker

Chr. Sun of El. 2 8.8

19 5 42.0 Reduced to El.



Obsd 1861. II.

1861 July 18.

G. P. V. 17<sup>h</sup> 30<sup>m</sup> Probably a new envelope

from 190<sup>h</sup> 30<sup>m</sup> to 273<sup>h</sup> opening of sector.

15" from Nucleus.

envelopes -

Cannot discern outlines of preceding  
Envelope is probably (II)

Orbit 1861. IV.

1861 July 18.  
H.S.Position  $17^{\circ} 3' 21''$  $14.4 \text{ in } \alpha + 1.87$   
 $+ 0.125$  in  $\delta - 1.32$ Comet  $1^{\circ} 4''$   
Star.  $8^{\circ} 56'$  $1^{\circ} 5''$   
 $8^{\circ} 58.5'$  $-7^{\circ} 52.8' - 7.4 \text{ a. } 17$  34 16.3 22.7 - 1 23.25 - 0.70  
35 39.5 46.0 - 1Comet  $1^{\circ} 6.5'$   
Star.  $9^{\circ} 41.5'$  $1^{\circ} 8.5'$   
 $9^{\circ} 6.5'$  $-7^{\circ} 58.0' - 3.0 \text{ a. } 17$  37 31.6 38.1 - 1 22.15 - 0.29  
38 54.0 60.6Comet  $2^{\circ} 2'$   
Star.  $10^{\circ} 4'$  $2^{\circ} 4.5'$   
 $10^{\circ} 6'$  $-8^{\circ} 1.8' + 0.3 \text{ a. } 17$  40 7.1 13.8 - 1 22.15 - 0.03  
41 29.3 35.9Comet  $2^{\circ} 1'$   
Star.  $10^{\circ} 5'$  $2^{\circ} 3.5'$   
 $10^{\circ} 7'$  $-8^{\circ} 3.8' + 3.4 \text{ a. } 17$  42 23.5 30.1 - 1 22.10 - 0.31  
43 48.6 52.2Comet  $2^{\circ} 16'$   
Star.  $10^{\circ} 24.5'$  $2^{\circ} 18.5'$   
 $10^{\circ} 26'$  $-8^{\circ} 8.0' + 6.7 \text{ a. } 17$  44 56.8 63.3 - 1 21.55 - 0.14  
46 18.3 24.7Eb. 17 34 20  
37 35  
40 10  
42 27  
45 0

17 39 54.4

Ref.

Temp. (unknown)

 $-1^{\circ} 22.30'$ Verified  
~~note~~ $-8^{\circ} 0.9' \pm 0.16$



Amel 1861 II.

1861 July 18.

The star is Altz 14785 = R. 4800 = P. III. 164. = Pol. 3803 = J.

		1836.	1861
Pi.	14 34 30.90 1 59.43	53 5 56.0 -15 52.5	$\alpha$ 14 35 41.6 $\delta$ 52° 56' 32"
J.	14 35 39.71 50.91	52 56 50.08 6 49.11	$\gamma$ 0.12198 $\alpha$ 9.79815 0.12615 1.30225
R. (1838)	14 35 41.615 48.950	+52 56 34.91 -6 29.5	$\alpha$ 9.89097 9.88972
Rob. $\frac{1843}{1861}$	14 35 49.31 41.12	52 55 31.26 -5 27.1	(2.015 0-0.72?) 0.04628 -1.1124
Arg. 1842	14 35 53.39 37.20	52 55 0.2 -6 56.0	$\frac{\delta}{\delta t}$ 1.9579 1.9580
			$\frac{\delta \delta}{\delta t}$ -15.604 -15.556

Pi.	14. 36 30.33 + 0.35	52 50 5.5 + 0.5	1830.9
J.	30.62 - 0.04	5.0 + 0.5	38.0
R.	30.565 + 0.023	5.4 - 0.5	48.5
Rob.	30.51 + 0.045	4.2 - 0.1	50.5
Arg.	30.59 + 0.04	4.2 0.0	51.5

Ad. (grn)	14 36 30.59	52 50 4.7
Red to app.	+ 2.45	+ 2.5
	- 1 22.30	- 8 0.9

Amel. M. Dec.	14 35 10.74	52 42 63
---------------	-------------	----------

17 39 54.4
for 1 5 50.
17 34 4.
17 45 53
1 36

Q 46 35	Amel. M. J.
C. (Ch)	216 40 52 45.5
0-C	+ 7.7

a	8.9323	9.8838
2	8.8427	9.7902
i	0.2916	1.1918
Q	-8.8327	9.8003
	-0.3710	+ 6.35
	+ 1.276	+ 11.31
	+ 1.759	- 13.98
	+ 0.122	- 1.14
	+ 2.447	+ 2.54





Comet 15 1861

July 19

Viewed the Comet through openings in a hazy sky

The outline of latest envelope barely suspected at about 30" dist -  
with no noticeable change of shape -

Envelope is probably (11)

Sector opening ~~between~~ ~~from~~  $100^{\circ}$  to  $110^{\circ}$

I think from  $177^{\circ}$  to  $279^{\circ}$

Comet 1F 1861

1861 July 20  
at 16<sup>h</sup> 45<sup>m</sup>

Clear

No envelope can be discerned but

most of light issues from nucleus in pos  $256^{\circ}$ 

Nucleus about 1" to 2"





# Phet 1861 II

1861 July 26<sup>th</sup>  
1861

Camp: with star x, 9<sup>th</sup> ang. (rather bright)

Alt. +1.53 - 1.13  
0.102

Comet	1 36	1 32.5	16 53	31.1	37.2		
Star x	7 49	7 52.5	56	50.3	56.6	-3	19.30 - 6 14.0
							+ 0.94 - 10.4
Comet	3 17.5	3 19.5	16 58	10.1	16.6		
Star x	9 56	9 38	16 1	28.9	30.6	-3	18.90 - 6 18.2
							+ 0.46 - 5.1
Comet	0 58.5	1 0	17 2	50.7	57.2		
Star x	7 24	7 25	6	8.9	18.5	-3	18.25 - 6 25.2
							- 0.02 + 0.2
Comet	3 25	3 26.5	17 7	19.1	28.4		
Star x	9 54.5	9 55.5	10 37.1	42.5		-3	18.05 - 6 29.2
							- 0.97 + 15.2
Comet	3 20	3 22.5	17 11	36.8	43.2		
Star x	9 55	9 56	16 54.0	60.5		-3	17.25 - 6 34.2
							- 0.91 + 10.0

Also tel at 353 20.5

Posit. angle "3" 22 - 0

0.002 Verified

-3 18.35 - 6 26.2

Star x comp: with a. Same angle

0.04  
App. Disposition

- 0.04 - 0.1

x	0 54.5	0 56		17 16 27.7	34.1		
a	7 37	7 39.5	-6 42.5	17 43.7	50.1	-1	16.00
x	1 38	1 40		18 58.4	54.9		
a	8 19	8 2-	6 41.	20 4.3	10.8		15.90
x	3 0	3 1.5		21 5.2	11.4		
a	9 41.5	9 44.	6 42.	22 20.9	27.5		15.90
x	3 19	3 21		23 28.9	39.4		
a	10 2	10 3.5	6 42.8	24 48.1	51.5		16.15
x	2 39.5	2 42.5		25 38.8	48.2		
a	9 22	9 23.5	6 41.8	26 54.8	61.2		16.00

-1 15.99

a = R 4839 G 2557 Str 1668. Ptol 3273. Ed 1528

x-a -3 18.39 - 6 24.2 -4 34.34 -13 6.2

-1 16.43 - 6 41.1 App.

Temp. unit



## Comet 1861 II.

1861 July 20

1790.0	14 42 43.19	52 14 55.9
1790.1	+ 2 18.02	17 55.2

1810.0	14 43 22.22	+52 9 56.2
1812.4	1 39.15	12 51.4

1830.0	44 1.43	52 4 52.7
1836.4	1 0.27	7 58.3

1836.0	44 12.696	52 3 23.08
1838.	48.605	6 17.5

1845.0	44 30.57	52 1 6.4
1846.7	31.11	4 1.5

S.C.

S.C.

1790.1	14 45	1.21 + 0.02	52 57 07	0.0
1812.4		1.37 + 0.20	57 14.8	+ 0.6
1836.4		1.70 0.00	57 4.4	0.0
1838.		1.30 + 0.02	57 5.6	- 0.5
1846.7		1.68 - 0.01	57 4.9	(+ 0.3)

3x	- 1.1264
2x	+ 1.9444

an	15.176
----	--------

dx	dx
----	----

dx	dx
----	----

Proper motion Coma Sarah: so that S.I.R. = J = 1 with demand.

Res. to app.	+ 2.44	+ 2.8
St.	14 45 1.61	+ 57 57 4.9
	- 4 34.34	- 13 6.2

H. A.R. S.	14 40 29.71	+ 51 44 51.5
------------	-------------	--------------

El.	17 2 44.6
fast.	5 52
	16 56 52.6
	7 53 16.2
	1 29.0
	9 1 37. WT. Camb.

C. (Gals.)	210	0	+ 51 48.
0	220	74	44.0

0-C	+ 7.4	- 4.0
-----	-------	-------

a.	8.9110	9.8960
b.	8.8535	9.7774
c.	0.2885	1.1781
d.	8.8060	9.8196

- 0.730	+ 6.97
+ 1.205	+ 10.67
+ 1.759	- 13.64
+ 0.116	- 1.20

+ 2.44	+ 2.8
--------	-------

Comet I 1861

July 21 11<sup>h</sup> 45<sup>m</sup> MST

Outline of even inner envelope no longer to be distinguished. The light material is still projected from the nucleus towards Sun mostly in ang pos -  $255^\circ$

Is hidden by strong moonlight  
tail measured with difficulty in pos ang  $\phi$ .

$$\tan \phi = \frac{15}{26}$$





1861 July 24

Comet	4' 2"	4' 3"	19	4	14.6	20.5	- 2	55.35
Star	8 3	8 4.5		7	9.7	16.1		
Comet	2 39	2 41.5	19	8	38.2	44.3	- 2	55.25
Star	6 46.5	6 49.5		11	33.4	39.6		
Comet	2 39	2 40.	19	12	33.3	39.4	- 2	55.05
Star	6 48	6 50.5		15	28.3	34.5		
Comet	2 36	2 36.5	19	16	28.3	34.4	- 2	55.00
Star	6 47.5	6 50		19	23.2	29.5		
Comet	2 30	2 32.5	19	20	23.0	28.9	- 2	54.55
Star	6 48.5	6 51.		23	17.4	23.6		
Comet	2 36	2 38	19	24	44.4	50.6	- 2	54.20
Star	6 55	6 57		27	38.6	44.8		
Comet	2 31	2 32.5	19	28	43.1	49.0	- 2	54.05
Star	6 56	6 57		31	37.0	43.2		

Hazy. Comet rather faint

The star = Feb = P. IX. 235 = Gr. 2171 = J 7891 = Arg 14984

= Redd. 3193 = B.M. 4937 = Rec. 3146 = Joh. 1857 = Ar (12y) 1208

		11.4 + 1.09 + 0.073	- 0.84			Reduced	
El.	19	4 18	- 2	55.35	- 4	1.2	± 2 54.45 - 10.4 - 4 11.6
		8 41		55.25		7.8	54.68 ± 6.6 54 14.4
		12 36		55.05		9.4	54.76 - 3.3 13.1
		16 31		55.00		12.5	55.00 0.0 12.5
		20 26		54.55		18.5	54.83 + 3.2 15.3
		24 48		54.20		19.0	54.80 + 6.9 12.1
		28 46		54.05		24.6	54.94 + 10.2 14.6

Verified.

- 19 16 34 - 2 54.79 - 4 13.4



9.19  
8.54

20.41  
22.60  
27.118

Feb. (2) $\rightarrow$	14	49	25.40	} verified	+ 50	29	43.35	} verified	1840	1850
		+ 2	20.34			- 17	27.41		0.06257	0.07993
Pi.	14	49	44.30		50	27	6.5		9.82985	9.83259
		2	0.60			- 14	59.3		0.12621	0.12612
Gr.	14	50	4.92		50	24	36.7		1.30230	1.30222
		+ 1	40.84			- 12	31.3		9.86749	9.86516
J.	14	50	54.76		50	18	19.24			
			51.42			- 6	22.36		0.03857	0.03864
Ai.	14	51	4.23		50	17	8.99		1.9769	1.9776
			41.53			- 5	8.7		14.784	- 14.702
Rob.	14	51	4.4		50	17	7.35			
			41.53			- 5	8.7			
Arg.	14	51	9.28		50	14	36.5		1825.5	1.9766
			37.57			- 4	39.3		1833.5	1.9773
Ai.	14	51	14.43		50	15	53.30		1848.0	1.9776
			31.64			- 3	55.1		1850.5	1.9776
Radd.	14	51	14.53		50	15	52.0		1851.5	1.9776
			31.64			- 3	55.1		1853.0	1.9777

Feb. 1790.1	14	51	45.74	-0.02	50	12	16.0	-0.4		
Pi. 1810.5			44.96	+0.33			7.2	+0.5		
Gr. 1835			45.76	+0.19			5.4	+0.5		
Ai. 1843/1844			46.18	-0.04	11	56.9	+0.5	a	8.8822	9.9037
Rob. 1841.5 1842			45.95	+0.01			58.8	+0.1	b	8.8510
Arg. 1842			45.95	+0.04			58.6	+0.1	c	0.2961
Radd. 1844.5			46.85	+0.04			57.2	0.0	d	8.7676
			46.17	-0.01			56.9	+0.2		9.8333

Mean 1800	14	51	45.84		50	12	10.9		- 0.757	- 7.96
Arg (w)	1841		46.15			11	57.8		+ 1.231	- 9.75
AR									+ 1.816	+ 13.48
AD. 1861	14	51	46.30		+ 50	11	51.2		+ 0.108	+ 1.26
			+ 2.40				+ 3.0		+ 2.398	- 2.97
8-x		- 2	54.78			- 4	13.4			for AD.
Conuli AR. Dec.	14	48	53.92		+ 50	7	40.8			
19 10 40 15.7									c. 222.6	+ 50 11
8 9 32.5									+ 7	- 3.3
1 48.3										
10 59 19 Cambr. m. t.										





Comet II 1866

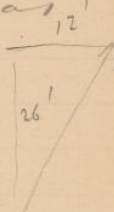
July 25

17<sup>h</sup> 10<sup>m</sup> Sid.

Comet much diminished in brightness  
nucleus 1" stellar - with light jutting from it  
mostly in direction pos reading 265° much as usual

Avg pos of Tail in field

$$\tan. \varphi = \frac{12}{26}$$

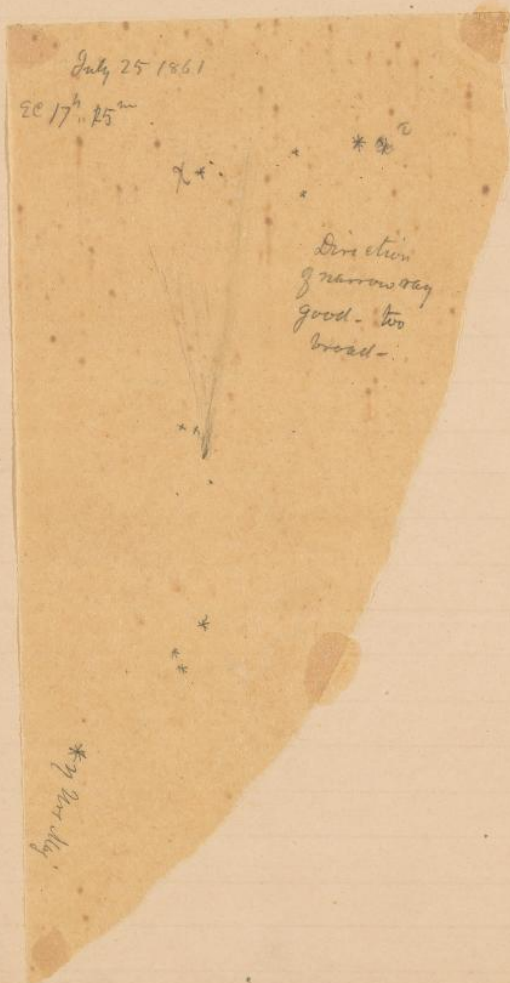


No Envelope can be distinguished

from haze.

Comet to naked eye as bright as

♂ Urs. Maj.



G.P.B.

It was difficult to avoid the impression that there was nebulosity stretching in a curve towards  $\alpha$  Bootis

Comet 5F 1861

July 26

Annoyed by clouds but have strong suspicion  
that ray 2° broad tends faintly to cluster in Hercules







## Comet 1861 II

July 25<sup>th</sup> 1861  
 H.S.  $\checkmark$  Ang. ref. at 353°33' Recorded on Zone sheet.  
 Compared with  $\alpha$  = Ang. Olth. 14971 = R. 14678.

Comet	9 51	9 53.5	El. 20	3 39.6	40.7	A.H. +1.0	-0.79
a	1 26	1 30		3 56.2	62.3	-16.60	+5 23.2
						-16.41	
Comet	10 16	10 18		5 1.5	7.8		
a	1 52	1 56		5 16.0	24.0	-16.35	+5 22.0
						-16.29	
Comet	7 23	7 25.5		6 32.6	38.9		
a	2 2	2 3.5		6 49.0	55.0	-16.25	+5 21.5
						-16.25	
Comet	6 21	6 24		7 59.1	65.2		
a	1 3.5	1 4		8 15.3	21.3	-16.15	+5 18.8
						-16.25	
Comet	9 18	9 20.5		9 20.9	27.1		
a	1 1	1 3.5		9 36.9	43.1	-16.00	+5 17.0
						-16.19	

a	5 10	5 13	20 11	26.6	32.8		
b	—	2 5		51.8	57.9	-25.05	+3 8.0
a	5 10	5 14	12	51.0	57.3		
b	2 4	2 6	13	16.2	22.2	-25.15	3 7.0
a	7 5.5	7 8.5	14	19.4	25.3		
b	3 59	4 1		44.3	50.3	-24.95	3 7.0
a	6 53.5	6 56	15	37.9	43.8		
b	2 46	2 49.5	16	2.7	9.0	-25.00	3 7.0

Star  $\alpha$  = Ang. Olth. 14975.

-25.04 +3 7.2  
 +0.1  
 -0.1

Refr. and Temp. precisely counteract each other.

Refr.  
 Temp.



Comet 1861. II.

1861 July 25.

Reduction of Star = Places

Star B = Arg. Alt. 14975.

1861.00 14 50 40.05 + 49" 43' 22.9  
+ 38.02 + 4 39.8  
a - B. - 25.04 + 3 7.2

Star a A. Alt. 14971 = R. 1878.

1836.00 14 50 2.804 + 49 47 56.44  
50.032 - 6 8.95  
1842.00 14 50 15.18 + 49 46 27.8  
38.03 - 4 40.3  
+ 66.00 + 4 5

R. 4. 14 50 52.84 + 0.03 49 49 41' 47.5 - 0.4  
A. 53.21 + 0.04 41 47.5 0.0 verified  
Comp with (b) 53.03 + 0.04 41 50.3 0.0

1861.00 14 50 53.06 + 49 41' 48.3  
Red to ap. + 2.38 + 2.9  
Comet - Star - 16.28 + 5 20.5 Verified

20 3 43 ~~Comet's Alt.~~  
5 5  
6 36  
8 2  
9 24

Comet's Alt.

Sec.

20 6 34 Cl. 14 50 39.17 + 49 47' 11.7

5 54 (5 54.43 at 7:15)  
20 0 40 (not moving)

8 13 29  
1 56  
11 45 15 Cambr. Mean Time

	3	2.	a
$\delta^\circ$	49 44' 05"	49 44' 13"	
$\alpha^\circ$	14 50 59.0	14 50 36.2	
log $\delta$	0.07133	0.07211	
sin $\delta$	9.83171	9.83086	
	1.40487	1.40487	
	2.58097	2.58097	
cos $\delta$	9.86592	9.86666	
	58.342		
	-20.320	20.316	
		a	
		14 50 28.2	
		+ 49 44.86	
log $\delta$		0.07230	
sin $\delta$		9.83066	
		1.52407	
		2.70016	
		9.86681	
		76.764	
		-26.732	
Ha	8.8792	9.9070	
gB	8.8445	9.7483	
gC	0.3010	1.1679	
gD	8.7616	9.8314	
	-0.772	+ 8.14	
	+ 1.200	+ 9.61	
	+ 1.842	- 13.56	
	+ 0.107	- 1.26	
	2.377		



Comet 15 1861

July 30

1<sup>st</sup> opportunity of seeing tail to advantage since Moon left

The reflection of northern right hand side very evident  
 This edge is barely halfway between  $\epsilon$  and  $\kappa$  trace -  $\epsilon$  being just in boundary -  
 Tail  $1^\circ$  broad in Cometrack at  $3^\circ 30'$  from sun,

Drawn with care as in margin at  $10^h 5^m$

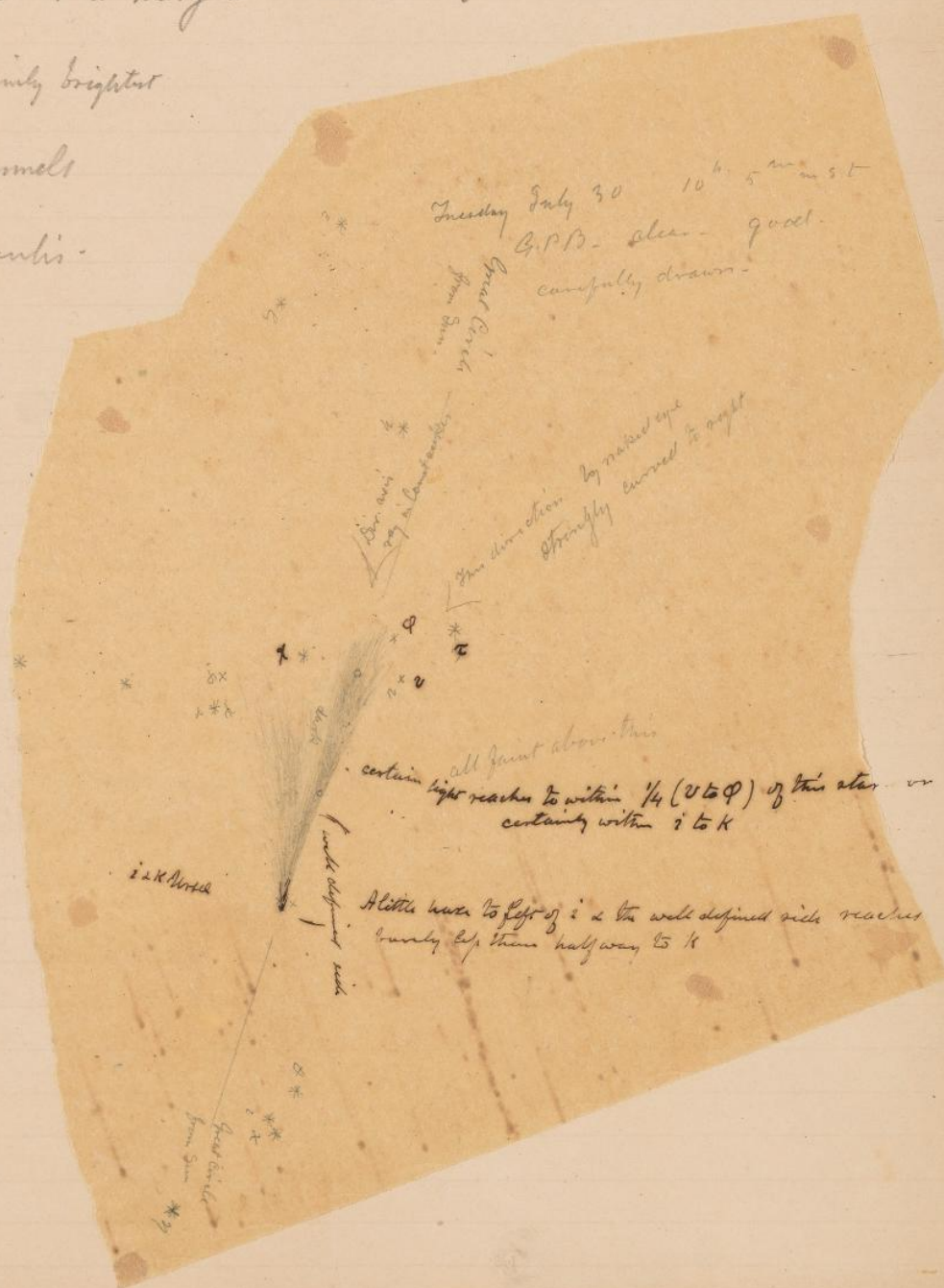
The right hand side plainly brightest

for ~~see~~ traces of dark channels

almost to  $\kappa$  &  $\nu$ . Herenhis.

To naked eye right hand branch manifestly curves to right towards  $\nu$  &  $\phi$  say half way between them. But it is doubt full whether light reaches so far.

In comet seeker a narrow ray is discerned with dark channels as sides reaching as indicated in diagram.





Comet II 1861

July 30

Smith clear -

Comet nucleus = star of  $9/10^2$  mag.

Can discern still a predominance of light in direction  
from nucleus reading  $244^\circ$

Ang pos  $\varphi$   $\tan \varphi = \frac{9}{26}$

Tail in field is 12' broad at 50' from nucleus

Light barely discernible in Great  
Refractor at 8' towards Sun and  
17' on side



Cambridge 1861 July 30<sup>th</sup> 10<sup>h</sup> 5<sup>m</sup>  
M.L. ~~18~~

Comet's Tail Great Circle from  
Sun

1840.0

Nucleus	224 17	+ 48 <sup>o</sup> 29'
5 <sup>o</sup> from "	231 20	46 57
10 " "	237 57	44 59

For several days past I have  
been almost certain that the  
right hand side of the tail curved  
to right towards the group.  
 $\varphi \approx 2$  The moon light &  
haze has interfered with good  
views until to night I now feel  
still more sure the the tail is actu-  
ally curved to right.





## Comet 1861 II

Feb July 30<sup>th</sup>  
1861

Comet compared with star = R. 4930 Aug 353° 33'

Comet	9 4	9 5.5	10 11	17.6	23.7	-34.70	+7' 40.0
a	1 24	1 25.5	11	52.3	58.4		
Comet	9 3	9 5	13	24.6	30.6	-34.50	7 39.0
a	—	1 26	13	59.1	65.1		
Comet	10 6	11 8	15	25.9	31.8	-34.35	7 39.0
a	2 26.5	2 29.5	16	0.3	6.1		
Comet	10 5.5	10 8	16	52.9	61.0	-34.40	7 36.5
a	2 27	2 29.5	17	29.4	35.3		
Comet	8 43	8 45	18	37.7	43.6	-34.05	7 36.8
a	1 6	1 8.5	19	11.8	17.6		
			Verified			-34.40	+7 38.7

B. Lgr. Rimmer.

B	6 57	6 59	B. after 1 <sup>st</sup>	20	20.4	26.3		
a	6 10	6 13.5			52.7	58.7	-46.2	+32.35
B	9 2.5	9 5		22	16.6	22.5		
a	8 15				49.0	55.0	67.5	32.45
B	2 59.5	3 2		23	52.6	58.4		
a	2 14	2 15			24.8	30.8	46.2	32.30

St.	19	11	21
	13	28	
	15	29	
	16	58	
	18	41	

18 15 11

Mean - 46.5 + 32.37  
Red to 1900.0 0.0 0.00

Comet 1861 II.

1861 July 30.

Star's Pos.

 $b = R. 4922.$ 

1836.00	14	58	57.988	48	23	21.10
			50.504 s.c.		-5	58.8 s.c.
1561.00	14	57	48.49 + 0.03	48	17	22.6 - 0.4
b-a			+ 32.37			- 46.5

 $a = R. 4930$ 

1836.00	14	57	30.260	48	22	38.87
			58.453		-5	57.72

1861.00	14	58	20.713 + 0.03	48	16	38.2 - 0.4
---------	----	----	---------------	----	----	------------

Compu with b	14		20.89			38.7
--------------	----	--	-------	--	--	------

Alpha	14	58	20.91	+ 1.8	16	36.8
			+ 2.30			+ 3.2

Comet - Star.			- 34.48	+ 7		38.7
---------------	--	--	---------	-----	--	------

14	57	48.63	- 1.8	24	18.7
----	----	-------	-------	----	------

El. 18 15 11.

fast. 41

18 14 30 Sid. Time

8 33 12

9 1 35

9 39 43

Camber. M. T.

Sub. 224 20 48 29

H. 224 27 48 29

p. 10 5 224 27 48 29

20	14 57 23.2	14 57 55.3
0	48 26.37	48 19.62

tg 0	0.05074	0.05058
sin 0	0.84448	0.84551
	1.52407	

a. 20	9.65438	9.62339
-------	---------	---------

	1.41929	1.42013
	-26.260	-26.311

b-a		a
-----	--	---

a	6.26	8.8534
---	------	--------

b	6.21	8.8460
---	------	--------

c	7.31	0.3046
---	------	--------

d	6.17	8.7265
---	------	--------

a'	7.12	9.9100
----	------	--------

b'	7.13	9.7256
----	------	--------

a'	8.56	1.1545
----	------	--------

d'	8.28	9.6463
----	------	--------

	-0.02	-0.919
--	-------	--------

	-0.03	+1.134
--	-------	--------

	+0.02	+1.889
--	-------	--------

	.000	+0.101
--	------	--------

	-0.01	+9.33
--	-------	-------

	+0.02	+8.60
--	-------	-------

	-0.03	-13.37
--	-------	--------

	+0.03	-1.33
--	-------	-------





## Comet II 1861

1861 Aug. 1

In a tolerably clear sky can trace the tail with  
comet seeker nearly to star  $\phi$  of the group of  $\alpha$  &  $\epsilon$   
much as on 30<sup>th</sup> but less certainly.

At 1 field of <sup>from nucleus =  $3^{\circ} 30'$</sup>  Comet seeking  $\wedge$  Tail is  $1^{\circ} 15'$  broad.

The ray though plainly seen in comet seeker is not visible to  
the naked eye. & the comet loses the appearance of  
tail so evident to naked eye of having its two sides  
curved in opposite directions.

G.P.B.



Comet 11 1861

1861 Aug 3

It is noticeable in the great refractor that the  
as far as  
tail at 30' from the head is quite narrow compared  
with the head only 1' broad - but in finder  
probably from its lower power its breadth is 8'.  
and at 50' distance it is 10'.

No doubt an inner ray only is discernible  
in Cyr. Refractor - The aspect is Tadpole-oidal decidedly

## Comet II. 1861

Aug 3, 1861

114 rec.

Ang. of Pos. set at  $35^{\circ}3'35''$ 

J.H.S. obs.

Chron 236 (3<sup>m</sup> 15<sup>s</sup> fast)
$$\begin{array}{r} +2.93 \\ -31.2 \end{array}$$

17	55	28.2	—	8 4	8 5	—	26.40	+4 48.0
*	55	54.6	60.2	3 16	3 17			
56	37.4	43.2		7 3	7 4	26.15	4 48.2	
*	57	3.6	9.3	2 14	2 16.5			
57	57.0	62.5		9 20	9 22.5	26.01	4 46.8	
*	58	23.0	28.9	4 34	4 35			
17	59	52.1	58.6	8 4	8 5	25.55	4 47.8	
*	18	0	18.0	3 15	3 18.5			
1	14.2	20.0		6.50.5	6 52	25.79	4 46.0	
*		40.0	46.0	2 4	2 6.5			
18	2	40.2	46.0	7 52	7 54	25.55	+4 46.0	
*	3	5.7	11.3	2 6	2 8	47.25		

Last Comp.

N.H. Ang. 2 55 20

Sec. +47<sup>m</sup> 28<sup>s</sup>

Cloudy at times.

Star = probably Ang (Ölitz) 15129 89<sup>m</sup>

Chr. J. 17 55 28  
 56 40  
 56 0  
 59 55  
 15 1 17  
 2 43

mean 17 59 0  
 3 15  
 17 55



## Comet 1861. II

Aug 3.

1842.00

 $15^h 2^m 28.05$   $47^\circ 28' 47.0''$   
 $+ 38.54$   $- 4 26.1$ 

1861.00

Rising  
Rev. to app.

Comet - star

 $15^h 3^m 6.59 + 0.04$   $47^\circ 24' 24.9''^*$   $0.10$   
 $+ 2.25$   $+ 3.4$   
 $- 25.87$   $+ 4 47.1$  *Verified.*
Comet's place  $15^h 2^m 43.01 + 47^\circ 29' 15.4''$ 

for Par.

 $+ 0.429$  $+ 0.48$ 

17 59 0 (236)

3 15 fast

 $17 55 45$  *Initial*  
 $- 8 48 58$ 

9 6 47

1 30

9 5 17 M.J. Cambridge

\* According to Leverrier this must be corrected by  $+ 46.2$   
 (Also in Rümker)

Par.  $15 2 43.8$   $47 30.0$ 
 $Ob$   $2 43.4$   $29 16$   
 $+ 0.61$   $+ 44''$ 

The reduction from Aug. agrees with L.V.

Corrected

 $C. 0$   
 $+ 0.54$ 
 $- 2.0''$ 

Rümker

 $20 15^h 2^m 47.3$   
 $47^\circ 26.163$ 
 $lg \delta^0$   $0.03709$   
 $sin \delta^0$   $9.85471w$ 
 $1.40467$  $2.58097$  $cos \delta^0$   $9.84414$  $1.29667$  $- 19.800$  $+ 58.342$  $G$   $354 11$  $\delta$   $225 47$  $H$   $140 53$  $lg \delta$   $0.036$  $ln(G+g)$   $9.808m$  $g$   $1.282$  $ln(G+g)$   $9.884m$  $l$   $43.71$  $g''$   $- 13.80$  $h''$   $+ 3.32$  $33.68$  $ln \delta$   $0.169$  $sin(H+g)$   $9.065$  $h$   $1.295$  $ln(H+g)$   $9.997$  $ln \delta$   $9.867$  $g'$   $- 14.67$  $h'$   $+ 14.43$  $h''$   $+ 3.66$

Orbit 1861 II,

1861 Aug. 5.  
1861 obs.Orbit compared with (probably) Aug-Orb.  $15138-39-40$   
= P. 15. (1)

(Copy)

Star	El.	20	48	45.0	50.6	Dev.	2' 26"	2' 29"
Comet			49	50.5	56.3		6 13	6 15
Star			51	8.9	14.8		4 45	4 46
Comet			52	15.0	20.6		8 31	8 32
Star			53	19.6	25.4		6 15.5	6 16
Comet			54	25.9	31.2		10 1.	10 2.5
Star			55	56.3	62.3		2 43	2 44.5
Comet			57	2.4	8.2		6 26	6 26
Star			58	20.6	26.3		3 25	3 26
Comet			59	26.6	32.4		7 7	7 9

H. 16 + 2.95 - 29"

Reduced

El	20	49	53	+ 1	5.60	+ 3	46.5	15.83	34.2	Temperature	68°
		52	18		5.95		46.0	6.06	44.8	Obs = 0.	
		54	29		6.05		45.0	6.06	44.9		
		57	5		6.00		42.25	5.89	43.4		
		59	30		6.05		42.8	5.82	44.9		
								+ 1	5.93	+ 3	44.4

The angle was set  $353^{\circ} 34'$ ; so zone this evening.Mean  
Refs.+ 1 5.93 + 3 44.5  
6.00 + 0.1



Comet 1861. II.

1861 Aug 5.

1836.00 15 3 10.20 + 47° 6' 26."05  
50.97 -5 48.91  
1842.00 3 22.59 5 2.47  
38.74 -1 19.05

A-R + 0.37 + 0.23

R. 15 4 1.17 + 0.03 47° 0' 37.1 - 0."4  
A (3m) rect. div. 1.53 + 0.04 37.4 0.0

Ad. 15 4 1.29 47° 0' 37.1  
Rw to app. + 2.21 + 3.4  
Comet - Star. + 1 5.93 + 3 44.6

Print SPR Dec. 15 5 9.43 + 47° 4' 25.1  
+ 0.622 + 3.69

R. A.  
L<sup>o</sup> 15 3 35.7 15 3 42.0  
D<sup>o</sup> 47° 3' 53 47° 2' 53

sin L<sup>o</sup> 9.85619 9.85638  
lg D<sup>o</sup> 0.03124 0.03106  
1.52107 1.40487  
2.70016 2.58097  
m x<sup>o</sup> 9.84256 9.84236

-25.793 -19.602  
76.764 56.344

Cor. for Sec. by 344 Aug.  
Δa -24 +9  
Δb +7 -22  
Δc +1 -16  
Δd -30 +16

El. 20 54 39  
fast. 43.7  
20 53 56  
8 56 51  
11 57 5  
1 57.1  
11 55 8

Cambridge M.T.

The reduction from Aug. agrees with L.

Reduction Completed.

Pr. 15 5 10.6 47° 25.  
10.0 29  
C-o + 0.76 -4."

8.9320 9.9149  
8.8471 9.7061  
0.3091 1.1437  
8.6963 9.8570

-0.976 +10.60  
+1.044 +7.54  
+1.915 -13.29  
+0.097 -1.41

Δx +2.21  
Δd +3.64  
Pre + Incl.  
+2.04 -14.7

Comet II 1861

1861 Aug 6

Comet = star  $5^{\text{th}}$  mag with faint brush  
 to naked eye of which axis at origin is directed towards  
 $\chi$  (near  $\tau$  v  $\lambda$ ) say  $2^\circ$  long





Comet 1861. II

1861 Aug. 6.  
1851.

Compared with (Chro. 236) Aug. 15/61.

	Chro. Time.							
Comet Star	17 32 59.8	65.7	5 34	5 35				
		38.5	4 21	4 24	+ 32.80	+ 112.0		
Comet Star	17 34 45.0	50.8	5 51	5 56				
	35 27.6	73.4	4 44	4 46	42.60	1 8.5		
Comet Star	17 36 39.6	45.5	5 54	5 55				
	37 22.3	28.2	4 45	4 46	42.70	1 9.0		
Comet Star	17 38 48.8	54.8	7 2	7 8				
	39 31.0	37.0	5 54	5 56	42.20	1 8.0		
Comet Star	17 41 7.6	13.3	7 2	7 2				
	41 50.0	55.6	5 53	5 55	42.35	1 8.0		
Comet Star	17 43 5.8	11.5	5 10	5 13.5				
	43 47.9	53.8	4 6.5	4 8	42.20	1 4.5		
Comet Star	17 45 14.9	20.8	5 11	5 13.				
	45 57.3	63.1	4 6.	4 9	42.35	1 4.5		
Comet Star	17 47 40.5	46.5	5 38	5 39				
	48 22.8	28.5	4 28	4 37.5	42.15	1 2.2		
Comet Star	17 49 36.2	42.1	5 36	5 39				
	50 18.4	24.2	4 35	4 37.5	42.15	1 1.3		
Comet Star	17 51 39.4	45.4	6 44	6 45				
	52 21.2	26.9	5 40	5 44	- 41.65	1 2.5		

Circle at 353.75'

+ Rounded 41.35?

- 42.315 + 1 6.05

Single observations not so good as usual.



## Comet 1861. II.

1861 Aug. 6

1861.00 15<sup>h</sup> 6<sup>m</sup> 9.72 46° 57' 46."1  
 Obs. 26. +38.59 -4 21.7

Lo 15<sup>h</sup> 6<sup>m</sup> 29.0  
 do 46° 55' 35.2

15 6 48.31 <sup>S.C.</sup> +0.04 46° 53' 26.4 <sup>S.C.</sup> 0.0  
 Res to app. +2.20 +3.6  
 Comet - Star. -42.31 +1 6.0

0.02923  
 9.80143  
 1.40487  
 258097  
 9.83684

Comet's AR. Dec.

15<sup>h</sup> 6<sup>m</sup> 8.24 +46° 54' 34.0  
 for Par. +0.389 +0.34  
 NM in AR. +2.8 in Dec. -27.9

1.29553  
 -19.75

17 33 6 +7.7	+0.43	-42.07 06 -4.2	1.79
34 48 +7.5	0.35	42.25 06 -3.5	5.0
36 42 +5.31	0.26	42.44 13 -2.6	6.4
38 52 +3.21	0.16	42.04 27 -1.6	6.4
41 11 +1.2	+0.05	42.30 01 -0.5	7.5
43 9 -0.58	-0.04	42.26 17 +0.4	4.9
45 18 -3.5	0.14	42.47 18 +1.3	5.8
47 43 -5.30	0.26	42.41 10 +2.6	4.8
49 39 -7.26	0.35	42.50 19 +3.5	4.8
51 42 -9.29	-0.44	42.09 22 +4.4	6.9

G 354° 8'  
 α 226 42  
 H 138 2

log 0.029 f+44.11  
 log 9.815 90-13.47  
 log 1.285 10+2.27  
 log 9.879 +33.0

310 11.55  
 417 16 ±0.84  
 17 42 13 Chr. Time ±0.026  
 16 feet ±0.77  
 17 42 0 Sid. Time ±0.25  
 9 0 48  
 8 41 12  
 1 25

log 0.165 8-14.60  
 log 8.917 1+43.0  
 log 1.293 1+39.0  
 log 9.919  
 log 9.815

8 39 47 Cambridge N.Y.

Reduction Completed

Pr. 15 6 9.1 46 54 32  
 O. 9.6 34  
 +0.50 -2"

Cluster

Aug 10. 1861

Five Foot Equatorial

J.H.S.

$$\odot \quad 236 = \begin{array}{r} 18 \ 21 \ 59 \\ 0 \ 38 \ 10 \end{array}$$

$$\text{Dec} - 34^{\circ} 32'$$

$$\odot \quad \begin{array}{r} 18 \ 24 \ 49 \\ 0 \ 40 \ 8 \end{array}$$

$$- \ 34 \ 35$$

$$\ast \quad \begin{array}{r} 18 \ 27 \ 6 \\ 1 \ 5 \ 45 \end{array}$$

$$- \ 36 \ 59$$

$$\odot \quad \begin{array}{r} 18 \ 30 \ 9 \\ 0 \ 45 \ 57 \end{array}$$

$$- \ 18$$

$$4N \quad \begin{array}{r} 18 \ 32 \ 34 \\ 0 \ 48 \ 0 \end{array}$$

$$- \ 34 \ 35$$



Comet III, 1861.

Aug 10, 1861

cl.

J.H.S obs

\* 236 = 19 39 1.2  
 40 29.6

19 39 23.3 29.0  
 40 51.6 57.4

5' 35" 5' 37½"  
 4 50 4 53

\* 41 28.8  
 41 57.6

19 41 51.2 56.8  
 43 19.6 28.2

6 44 6 45½  
 5 56 5 59

\* 45 30.6  
 46 59.2

19 45 52.6 58.4  
 47 21.2 27.0

6 44 6 46  
 5 55 5 56

\* 48 22.8  
 49 51.6

19 48 44.9 50.6  
 50 13.6 19.4

5 5  
 4 16 4 18½

\* 51 8.1  
 37. ?

19 51 30.2 36.0  
 52 59.4 65.0

6 2½ 6 4  
 5 8½ 5 10

Comet - Star.

N.H. +2.70 -16.6

cl 19 40 54  
 43 22  
 47 24  
 50 16  
 53 2

+1° 28.35 -0° 44.6  
 28.40 47.2  
 28.60 49.5  
 28.75 49.0  
 28.90 0 54.0

+1 28.62 -0 47.1  
 28.56 48.7  
 28.58 49.3  
 28.60 47.7  
 28.63 51.5

Mean 19 47 0

+1 28.60 -0 48.9

Comet by Brinman 15 10 38 46 11 40

Star " 15 9 9 46 12.5

\* in center of field

236 = 19 54 21  
 HC 4 44 30

Dec. +46 13

Star for (Aug 10<sup>th</sup>) Comet.

Received Aug 31. 1861.

17 26? 6 35.5 6 37.5

22 6 36 6 41

30 13.5 Star Jan 5 47 5 50  
Star a 1 13 1 6 + 4 44.0Star x 7 12 7 14.5  
Star a 2 25 2 27.5 L 47.0Star x 9 8.5 9 11.5  
Star a 4 22.5 4 23.5 L 46.0Star x 9 52.5 9 54.5  
Star a 5 5 5 7.5 L 47.2Star x 7 40 7 44  
Star a 2 53.5 2 58 L 45.2Temp  
Ref.+ 4' 45.9  
- 0.2  
+ 0.2  
+ 4 45.821 30 52.4 58.4  
35 19.6 25.3 L 27.0536 56.7 62.6  
41 23.8 29.3 L 26.9042 43.2 49.4  
47 10.4 16.2 L 26.7548 41.5 47.2  
53 8.0 13.7 L 26.5054 56.5 62.3  
59 22.6 28.3 (L 26.05 !)- L 26.80  
+ 0.01  
- 4 26.79  
10.01

+ Rejected

C 15 10 37.4 46 11 41  
a 36.9 42



Comet 1861 IV

1861 Aug. 10<sup>th</sup>

$$\text{Star } a \text{ (preceding page)} = 15760 \text{ Argelander (Deltan)} - 27992 \text{ (Baily)} = 5030 \text{ R.}$$

	1861	1861		1861	1861
1800.0 L	15 11 28.62	+ 46" 20' 15.0"			
	2 3.86	- 13 36.7			
1836.0 R	15 12 41.635	46 13 13.55			
	50.77	- 5 33.65			
1842.0 A (app)	15 12 53.89	46 11 52.0			
	38.59	- 4 10.5			
	s.c.	s.c.			
1861.0 L	15 13 32.53 + 0.16	+ 46 7 (8.3) - 0.6			
R (1839 606)	32.405 + 0.035	7 39.9 - 0.4			
A	32.48 + 0.04	7 38.5 + 0.1			
Adopted (R.D.I.)	15 13 32.47	+ 46 7 39.1			
Red. to app (Aug 10)	+ 2.14	+ 3.9			
$x - a^+$	- 4 26.79	+ 4 45.8			
$x$ app. (Aug 10)	15 9 7.62	+ 46 12 28.8			
Comet - $x$	+ 1 28.60	- 0 48.9			
Comet's app. place	15 10 36.42	+ 46 11 39.9			
from Bessel's	+ 0.579	+ 2.60			
El 19 47 0					
fast 45					
19 46 15 - 11.7					
19 46 34					
10 29 41					
1 43					
10 27 58 Comb. m.					
(of 91. m. - 0.01)					
+ The assumption at first will be that this declination is in error					
30."					
+ The apparent difference ( $x - a$ ) is supposed to be the same					
for Aug. 10 <sup>th</sup> as for Aug. 31 <sup>st</sup>					

## Comet 1861 II

1861 Aug. 15<sup>th</sup>  
THU.

4 9.5 4 13

Star of the 8<sup>th</sup> mag. = Olsen 15272 7.8 R 5033 BZ 419  
Comet 5.7. High set at 353° 35'

Star	7 26	7 29	19	7 52.2	58.0		
Comet	2 13	2 17		9 57.5	56.9	+ 1 59.10	- 5 12.5

Star	8 0	8 2.5
Comet	2 46	2 49.5

Star	8 20	8 23
Comet	3 6.5	3 10

Star	8 50	8 54	19	20 29.9	35.6		
Comet	3 36	3 38		22 29.6	35.0	+ 1 59.55	- 5 15.0

Star	9 4	9 5		23 58.0	63.7		
Comet	3 7	3 48		25 57.7	63.2	+ 1 59.60	- 5 17.0

Star	9 18.5	9 20.5		27 23.7	29.3		
Comet	4 0.5	4 3		29 23.4	29.0	+ 1 59.70	- 5 17.2

Star	10 42.5	10 44		30 51.4	57.1		
Comet	5 24	5 26		32 51.3	57.1	+ 1 59.95	- 5 18.2

Star	6 43.5	6 48.5		40 10.0	15.8		
Comet	1 20	1 21.5		42 10.7	16.3	+ 2 0.60	- 5 23.2

Star	9 23	9 25.5		43 22.0	27.7		
Comet	3 49	3 51.5		45 22.5	28.2	+ 2 0.50	- 5 23.8 ?
Assumed star (B)	4 9.5	4 13	19	44 31.2	37.0		2

Dols.

BBB Star in centre of field Nord 41 32 25 45° 33' N

Temp. cont. 59°

El. 19 47 44



Comet 1861 II.

1861 Aug. 15<sup>th</sup>

BZ 419 15 13 35.30 + 45 38 58.5  
 - 54.68 + 24.55  
 + 0.07 + 0.57

(1828 June 13)

1425.0 15<sup>h</sup> 12<sup>m</sup> 40.69 + 45<sup>s</sup> 39' 23".6  
 Red. to 1861 + 1 13.84 - 8 11.1

Punkt 1836.0 15 13 3.393 45 36 58.42 1838  
 Red. to 1861 + 51.278 + 5 33.07  
 Arg (Oct 2) 15 13 19.74 45 35 38.8  
 + 136.97 - 4 13.0

Bessel 15 13 54.53 + 0.04 45 31 23.5 + 0.4  
 Riinder 54.67 + 0.03 25.35 - 0.95  
 Argelande note 20 54.71 + 0.04 25.8 - 0.1

Adopter 1861.0 15<sup>h</sup> 13<sup>m</sup> 54.67 45° 31' 24".8  
 Red. to app. + 2.03 + 3.4  
 Comet - Star + 1 59.26 - 5 14.3

Comet's App. Dec. 15 15 56.56 + 45° 26' 10".3  
 + 0.938 + 2.01

Hdr + 2.68 - 11.3 Reduced to 0.0

19 7 54 + 0.29 - 7.1 1 59.99 - 5 19.6

22 32 + 0.32 - 2.6 .87 17.6

26 0 + 0.7 - 1.3 .77 18.3

29 26 + 0.02 - 0.1 .71 17.9

32 54 - 0.14 + 1.1 .81 17.1

42 13 - 0.55 + 4.4 2 0.05 19.4

45 26 - 0.70 + 5.5 1 59.20 18.3

298 25 1 59.26 - 5 14.3

19 29 48. E.6

48 fast

19 29 0

9 36 17.

9 52 43.

1 37

9 51 6 Lamb. N.T.

Brounner

15 15 58.4 45 26 10

1843.0 1848.5 1851.5  
 15 13 17.8 15 13 29.0 15 13 35.2  
 45° 30' 42" 45° 34' 20" 45° 33' 54"

to 15 0.00895 0.00864 0.00847  
 Jan 20 9.87328 9.87359 9.87377

1.66244 1.52407 1.40487

2.85853 2.70016 2.58097

9.82277 9.82237 9.82215

1.56467 1.40630 1.28711

110.538 76.764 58.342

-36.700 -25.486 -19.369

La 8.79992 9.9236

L 8 8.85282 9.67512

L 5 0.3116 1.12352

L 8 8.65342 9.8745

-0.946 + 12.157

+ 0.876 + 5.81

+ 2.011 - 13.04

+ 0.093 - 1.54

C-0

Δα + 1.54

Δδ - 2"

Oct 1861 II.

1861 Aug 17<sup>th</sup>

\* 9B.

5	11.5	5	14	19	45	23.9	18.6	-18."2	+ 41.500
*	5	29	5	33	46	4.0	9.6		
6	26	6	29	47	2.1	7.9		-19.2	41.10
*	6	45	6	48.5	43	33	118.9		
4	6	4	9	49	7.8	13.4		-19.8	40.80
*	4	28.5	4	29	48.6	54.2			

B.D.

0	4 6	4 9	51	5.4	10.8	- 20.0	40.55
*	4 26	4 29		45.8	57.5		
0	1 37	1 41	52	57.8	57.7	- 22.2	40.40
*	2 0	2 2.5	53	32.3	38.0		

D.D.D.

2	34.5	2	36.5	55	5.2	10.7	-22.2	40.70
*	2	56.	2	59.5	48.9	57.4		
3	32	3	35	56	40.6	46.2	-22.8	40.50
*	3	55.5	3	58	57	21.1	26.7	

-20."6  $\bar{40.72}$ Star's place about  $\frac{1862.0}{15 \ 17 \ 55} + 45^{\circ} 13.4$ 

			Ap. in * + 2. <sup>s</sup> 69	-20."0	Reduced	
19	45	26	+0.25	-1."7	-40.75	-20."1
	47	5	+0.14	1.3	40.92	20.5
	49	11	+0.49	0.6	40.71	20.4
	51	8	0.00	0.0	40.55	20.0
	52	55	-0.09	+0.6	40.49	21.6
	55	8	-0.18	1.4	40.84	20.8
	56	43	-0.35	+1.9	-40.75	40.9
	51	5			-40.72	-20.6



El. 19 51 4  
 fact 48  
 19 50 16

Comet by Brünnow 15 18 1 + 45° 10' 19"  
 Nov 15 18 41 45° 10' 7"

Combs. 7 14 35  
 - 23 42  
 - 11 40  
 8 39 53  
 3.20.1  
 9.26 8.05  
 1.26 1.35

Comet Comp. 15 18 5.1 15 9 49  
 4.1 7 53

## Comet 1861. II

1861 Aug 20

7<sup>11</sup> A.M.Comet very near (S.P.) comparison star = *Redd.* 3365.

Comet - Star - 40"	18	22	0	- 40.
42.		22	49	
38		23	✓6	
39.5		24	21	
42.		25	8	

Comet on 1<sup>st</sup> wire Star on 2<sup>d</sup> Fine transits

Lost by fault of battery

B. B.

Comet - Star - 46"	Lost.
43	
42	
42.5	
45	

Comet on 2<sup>d</sup> wire star on 1<sup>st</sup> Fine (2) transits

Lost.



## Comet 1861 II

1861 Aug 20.

Comet - Star - 47.5 Lost.  
 45.  
 46.  
 45.  
 45.5

Comet on 1<sup>st</sup> W. Star on 2<sup>d</sup> Wire Transit

Comet - Star.

48 38 18.8 24.0  
 38 38.0 40.1  
 38 54.2 59.2  
 39 14.6 19.5  
 48 39 39.0 43.8

5) 18 38 56  
 1<sup>st</sup> sec d  
 sec d

- 5.00 + 4.00 sec d

Comet - Star

(40 2) - 47.5 No time ca. 1' before fall.  
 18 41 9 48  
 (41 48) 45" No time  
 42 14 48  
 18 42 56 47

? Comet on 2<sup>d</sup> wire star on 1<sup>st</sup> 41 transits [Comet now followed]  
 ? Comet on 1<sup>st</sup> wire star on 2<sup>d</sup> 2 transits

Star - Comet 48 44 19.8 26.5 6.7 4) 18 44 51 + 6.58 - 4.00 sec d  
 44 36.7 43.3 6.6  
 44 53.4 59.8 6.4  
 45 9.0 15.6 6.6  
 Comet - Star. 45 27.5 32.0 4.5  
 45 47.2 51.8 4.6

Battery weak. Comet rather too faint to observe well in culmination





$$\begin{array}{r} \text{by sec. } \delta \quad 0.1489 \\ \quad \quad \quad 0.6011 \\ 5.635 \quad \quad 0.7509 \end{array}$$

$$\begin{array}{rcl} \begin{array}{ccc} h & m & s \\ 18 & 38 & 56 \end{array} & + 0.635 & 5 \\ \begin{array}{ccc} & h & m \\ & 44 & 51 \end{array} & 0.945 & 4 \\ \begin{array}{ccc} & h & m \\ & 45 & 37 \end{array} & + 1.085 & 2 \end{array}$$

Reduce to 18 41 38

$$\text{Provisional} + 0.577 - 47.0$$

Reduced to 18 41 38

$$\begin{array}{rcl} \Delta x & + 0.755 & 5 \quad \text{Correct on } 1^{\text{st}} \text{ W.} \\ & 0.001 & 4 \quad \text{Correct on } 2^{\text{nd}} \text{ W.} \\ & 0.904 & 2 \quad \text{Correct on } 1^{\text{st}} \text{ W.} \\ \hline & 0.659 & 6 \end{array}$$

$$\begin{array}{rcl} \text{Mean} & + 0.797 & 1^{\text{st}} \text{ W.} \\ & 0.401 & 2^{\text{nd}} \text{ W.} \\ \hline & 0.80 & \end{array}$$

Hor. Motion after Breianow. + 2.71 - 18.5

Motion

$$\begin{array}{rcl} \Delta \alpha & \begin{array}{ccc} h & m & s \\ 18 & 23 & 29 \end{array} & - 40.3 - 5.6 \\ & \begin{array}{ccc} & h & m \\ & 41 & 38 \end{array} & - 47.0 \end{array}$$

## Comet 1861 II.

1861 Aug 21.  
M.S.Comet comp with  $\alpha = 1000$ 

Comet North Proceeding difficult to observe

Comet	9 4	9 7.5	19	0	11	40.0
Star $\alpha$	3 23	3 25.5		2	16.9	22.2

Comet	<del>9 22</del>	9 26	Int Star
		+ 5 41.5	

Comet	8 59	9 2
Star.	3 19	3 21.5
		+ 5 40.2

Comet	8 1.5	8 1	Int failed
Star	2 21.	2 24.	
		+ 5 38.8	

Comet	7 59	8 3	19	21	30.7	44.6
Star	2 24	2 26		23	55.9	61.8
		+ 5 36.0				

Comet	9 19	9 22.5	25	7.4	12.8
Star	3 45	3 48.5	27	24.3	29.9
		+ 5 34.0			

Comet	7 49	7 51.5	28	41.1	46.7
Star	2 16.5	2 19.5	30	58.2	63.9
		+ 5 32.2			

Comet.	7 8	7 10.5	32	21.1	29.7
Star.	1 37.5	1 39.5	34	40.9	46.6
		+ 5 30.8			

Comet	7 42	7 44	38	9.8	15.3
Star	2 12	2 16	40	26.3	32.1
		+ 5 29.0			

Comet	6 57	6 58	41	25.7	31.2
Star	1 24.5	1 27.5	43	42.3	47.8
		+ 5 37.0			



## Star for Comet 1861 II

1861 Aug 21

Star &amp; comp: with star a. &amp; north following.

a	1 38	1 41.5	19 54	54.6	64.3	
x	5 36.5	5 36	57	58.6	64.0	+2 59.75 + 3 58.6
a	3 16	3 19	19 59	4.1	13.7	
x	7 14	7 16	20 2	7.9	13.5	2 59.80 3 57.5
a	5 6	5 9.5	20 3	2.7	8.3	
x	9 4	9 5.5	6	2.5	8.2	2 59.65 3 57.0
a	2 45.5	2 48	Higher power 20	9	9.0	16.4
x	6 42	6 44.5	12	16.7	16.2	2 59.75 3 56.5

Star C = Radcl. 3387

Mean  
 HM +2.72 -18" Correction Ref. Temp = 6.00 0.0  
 2" 59.79 + 3' 56.6

El.	Comet - x	Reduct.
19 0 1	- 2 16.20	+5 41.5 +1.22 -8.0 - 2 16.98 +5 33.5
21 42	2 17.20	5 36.0 0.23 1.5 16.97 34.5
25 10	2 17.00	5 34.0 +0.07 -0.5 16.93 33.5
28 44	2 17.15	5 32.2 -0.09 +0.6 17.24 32.8
32 27	2 16.85	5 30.8 0.25 1.7 17.10 32.8
38 13	2 16.65	5 29.0 0.47 3.4 17.12 32.4
41 28	2 16.60	+5 27.0 -0.66 4.4 17.26 31.4

Reduct	19 26 49	- 2" 17.09	+5' 33.0
Ref.		0.00	+ 0.1
Temp (62)			- 0.2
Comet - Star		- 2 17.09	+ 5 32.9



# Comet 1861 II

1861 Aug. 21

$\alpha$  = Daily 28230 -  $\beta$  1423 = Radcl. 3387

Radcl.

Daily 1880.0

$\beta$  1423

1825.0

to 1861

Radcl. 3387

Runk 5895. u

Reddick to 1861.0 m.

Lal. 1793.3

Bessel 1829.4

Runk 1862.

Radcliffe 1860.7.8

Compared with C. (annual date)

- Adopted pro tem:

Rad. to app.

Star x - Star a

Star x app place

Comet - x

Comet's app. place

in Par. 50

El 19 26 49

fact 59.5

19 26 0, 1st J.

9 59 56

9 26 4

1 33

9 24 31 M.T. Canbr.

Proimnos

15 22 25.4

+ 14 39 5.1

0.0

+ 1.57

- 5.11

1800.0

1843.00

$\alpha$  15 19 32.4  $\delta$  15 21 1.4

$\alpha$  9.99559  $\delta$  9.99329

$\alpha$  9.88352  $\delta$  9.88586

$\alpha$  0.12623  $\delta$  0.12614

$\alpha$  7.30232  $\delta$  1.30223

$\alpha$  9.80910  $\delta$  9.80574

$\alpha$  0.00534  $\delta$  0.00531

$\alpha$  +2.0572  $\delta$  +2.0582

$\alpha$  -12.925  $\delta$  -12.822

$\alpha$  183.5  $\delta$  184.5

$\alpha$  2.0583  $\delta$  12.809

$\alpha$  1853.0  $\delta$  2.0584

$\alpha$  8.7750  $\delta$  9.9199

$\alpha$  8.8578  $\delta$  9.6496

$\alpha$  0.3132  $\delta$  1.1062

$\alpha$  8.6204  $\delta$  9.8879

$\alpha$  -0.956  $\delta$  +13.63

$\alpha$  +0.763  $\delta$  +4.72

$\alpha$  +2.050  $\delta$  -12.73

$\alpha$  +0.088  $\delta$  -1.63

$\alpha$  +1.945  $\delta$  +3.99





# Comet 1861. II

1861phae.proj...197B

1861 Aug 23.  
1. Compared with star a of Aug. 21<sup>st</sup>

Star a	7 45	7 46.5	18 55	15.5	21.1		
Comet	3 9	3 10.5	58	7.2	12.9	+2 51.75	-4 36.0
Star a	9 17.5	9 21	18 59	40.2	46.7		
Comet	4 42	4 44	19 2	32.3	38.0	2 52.20	4 36.2
Star a	10 24	10 26	19 3	57.2	62.6		
Comet	5 46	5 49	6	49.7	55.1	2 52.50	4 37.5
Star a	8 30	8 32.5	19 8	0.8	6.4		
Comet	3 47	3 51.5	10	53.1	58.8	2 52.35	4 41.0
Star a	6 59.5	7 3	19 12	5.2	10.7		
Comet	2 20.5	2 21.5	14	57.9	63.4	+2 52.70	4 40.2

Star a	9 49	9 52	19 16	25.2	30.8	-18.70	+ 8 7.8
Star b	1 41.5	1 44		43.9	49.5		

Star a	10 16.5	10 19.5	17 37.4	42.9	-18.95	+ 8 7.2
Star b	2 9	2 12.5	56.3	1.9		

See next day also

Alt.	Hor. Dist. (Br.)	Motion	Reduced	Motion in $\delta$
18 58 10	275 - 16.9	+ 0.39	52.14	-2.4 $\Delta$ - 4 38.4
19 2 35		+ 0.19	52.39	-1.2 37.4
6 52		- 0.01	52.49	0.0 37.5
10 56		0.19	52.16	+ 1.2 39.8
15 1		0.38	52.32	+ 2.3 37.9
19 6 43			2 52.30	4 38.2



Count 1861 II

1861  
Aug 23  
Star 6.

B7 473 15 29 75.08 + 44° 28' 33.7  
+ 18.44 + 38.6  
+ 0.06 + 0.5

1825.0 15 20 43.58 + 44 29 12.8  
+ 1 14.23 - 7 42.3

1861.0 15 21 57.61 + 44 21 30.5 + 0.8  
- 18.80 + 8 80

a (from this comp) 15. 21 39.05 44 29 39.3

Position of a adopted yesterday.

1861.0 15 21 38.66 + 44 29 36.0  
Red 4 app. + 1.89 + 3.9

B-4 + 2 57.30 - 4 38.2

15 24 32.85 + 44 25 1.7

21. 19 6 43  
fact. 50

19 5 52 lid. Time

10 7 47

50 58 34

- 1 28

8 56 35 Camb. m. v.

Pos. 15 21 35.2 + 44 25 1  
+ 2.0 - 2"

1861.0

α° 15 21 20.5

δ° 44 25.37

log° 9.9922

sec° 9.885602

1.66264

2.65853

air° 9.80642

1.56006

-36.712

m x 2

Aa -0.975 + 13.90

Bb +0.720 + 4.66

Cc +2.059 - 12.78

Dd +0.069 - 1.64

+ 1.89 + 3.9

-18.80 + 8 8.0  
+ 0.01

## Comet 1861-II

1861 Aug 24.

Comet compared with star c from BZ 473

Star c	5 39	5 43	18	44	56.3	64.8
Comet	4 15	4 17		46	48.2	50.7

Star c.	6 45	6 49		50	6.1	11.8
Comet	5 17	5 20.5		53	55.4	60.7

Star c.	4 37	4 40.5		55	5.3	10.7
Comet	3 17	3 9.5		58	54.4	54.8

Star c	3 10	3 14	18	59	58.6	64.1
Star b	4 30	4 32.5	(see last night)	0	9.2	14.7
Comet	2 8.5	2 11.5		3	48.2	53.7

+ 10.60 1 49.3

Star c	6 51	6 54	19	4	54.3	63.9
Star b	8 39	8 42.5		5	8.4	14.3
Comet	5 18.5	5 23		46	48.3	53.9

+ 10.45 1 48.2

Star a	9 16		10	22.5	28.0	
" b	1 7	-8' 9"		41.1	46.6	18.60
Star a	10 16		18	18.7	24.3	
" b	2 8	-8' 9"		37.8	43.1	18.95

El. Comet - c. 14.11 +2.576 -16.98

Rel. to mean

18 42 42	+ 3	48.90	- 1	25.0
53 58	3	49.10	1	28.2
58 57	3	49.10	1	30.5
69 3 50	3	49.60	1	32.0
8 51	3	50.00	1	31.8

3	49.36	- 1	27.8
	49.33		29.6
	49.10		30.5
	49.37		30.5
	49.54		29.0

18 58 53	+ 3	49.34	- 1	29.5
----------	-----	-------	-----	------



# Comet. 1861. II.

1861 Aug. 24.

Star c.  $P_1$  1173. See also 419 473

15 20 14.39 + 44 26 43.9  
+ 15.44 + 38.7  
+ 0.06 + 0.4

1875.00 15 20 32.89 + 44 27 23.0  
+ 1 14.29 - 7 41.3

Comp. with 8. 15 21 47.14 + 0.065 44 19 41.7 + 0.8  
47.20 + 0.065 41.7 + 0.8

Adopted 15 21 47.26 44 19 42.5  
Red. to app. + 1.84 + 3.8  
Comet- Star + 3 47.34 - 1 29.5

in Per. 15 25 38.50 44 18 16.8  
+ 0.472 + 1.46

El. 18 58 53  
Prod 52

18 58 1 in Trin.

10 11 46

8 46 15

1 26

8 44 49 Cambr. Mt.

B. 15 25 40.7 44 18 12

Oh. 36.8 18

$L^o$  15 21 10.0  
 $S^o$  44 23.53

$T_0$  9.99078  
 $Sin x^o$  9.88610  
1.68244  
2.85853  
 $Q^o$  9.80542

1.55932  
+ 110.536  
- 36.257

$Q$  300 57  
 $x$  230 27  
 $H$  120 23

$T_0$  9.990  $f$  + 46.24  
 $Sin x^o$  9.886  $g^o$  - 13.84  
 $S$  1.306  $h^o$  - 4.27  
 $all. x^o$  9.854

$Sec$  0.146  $g$  - 14.47  
 $in (H^o)$  9.202  $N$  + 13.19  
 $x$  1.282  $i^o$  + 5.13  
 $all. H^o$  9.994  
 $Sin d$  9.844

$g_i$  9.856

Comet 1861 II.

1861 Aug. 27.

Comet 2 10 2 12	18 35 43.6 49.4	- 4 44.65	- 4 49.5
Star 6 59.5 7 1.5	40 28.4 33.9		
Comet 4 38 4 39.5	41 27.0 33.0	- 4 44.80	- 4 48.5
Star 9 26 9 28.5	46 22.0 17.6		
Comet 6 40 6 45	47 30.8 36.5	- 4 44.30	- 4 53.5
Star 8 35 8 38	52 15.2 20.7		
Comet 1 20 1 22	53 44.9 50.4	- 4 43.95	- 4 53.5
Star 6 13 6 16	58 28.8 34.4		
Comet 5 2 5 4.5	18 59 41.1 46.5	- 4 43.85	- 4 58.0
Star 9 56.5 10 0.	19 4 24.7 30.4		
		- 4 44.31	- 4 52.0

Dist. betw Comet and Star = 1 field of finder

Comet seems brighter than lately. This is owing to the fineness of the night in all probability. Aug 26<sup>th</sup>  $M_V = 10.8$  Aug 27<sup>th</sup> 10.5 according to my visual  $\mu$  scale. J. W. S.

$M_V + 2.81 - 15.5$

El	18 35 47	+ 0.56	- 3.1	- 4 44.09	- 4 52.6
	41 30	+ 0.29	- 1.6	44.51	57.1
	47 34	+ 0.01	0.0	44.29	53.5
	53 48	- 0.29	+ 1.6	44.24	57.9
	59 44	- 0.56	+ 3.1	44.41	51.9
	18 47 41			- 4 44.31	- 4 52.0



## Cond 1861. II

1861 Aug 27

Star = Gr 2258 = Phil. 3423 = Bst. <sup>5475</sup>~~2258~~

Alp 8. (1800)	15	31	36.11	45	44	13.2
		+2	3.86		-12	13.6
Gr. (1810.0)	15	31	56.37	45	46	15.2
		+1	43.56		-10	12.7
BZ 419	15	33	21.61	44	10	22.0
		-	54.56		+19.9	
		-	0.10		-0.7	
BZ 420	15	33	23.31	44	10	23.7
		-	56.20		+19.0	
		+0.02			+0.2	
BZ 423	15	32	8.30	44	10	6.5
		+18.59			+35.6	
		+0.02			+0.2	
(1825.8)	15	32	26.95	44	10	41.2
			27.13			42.9
			26.91			42.3
Mean 1825.0	15	32	27.00	44	10	42.1
		+1	13.12		-7	11.9
Phil. 1845.0	15	33	7.69	45	53	16.5
		+32.49			-3	11.5
Jacob 1850.0	15	33	17.40	45	54	16.63
		+22.34			-2	11.61

Baily	15	33	39.97	+0.15	44	0	3' 33.2	-0.19
Gr.			39.93	0.16		3	32.1	+0.2
Bepul			40.10	+0.04		3	30.2	+0.8
Radst.			40.18	-0.01		3	32.0	0.0
Pa. (half wt in AR)			39.74			3	31.8	0.0

No Bepul Radst Pa

1861.00 15 33 40.07 +44. 3 31.6

2.030  
12.100

1845.00 1810.0

$\alpha$  15 33 77 15 31 26.1  
 $\delta$  +44" 6.72 44 15.78

$\log$  9.98654 9.98833  
 $\sin$  9.90895 9.90178

$\delta$  12614 0.12623  
 130223 1.30232

9.77661 9.78047

0.01663 0.01664  
 -1.0390 -1.0395

$\frac{d\alpha}{dt}$   $\frac{d\delta}{dt}$

1800.0 +2.0301 -12" 400  
 1845.0 2.0310 14.994  
 Ver. +0.0032 -0.244

1830.5 2.0305 -12.026  
 35.5 .0307 12.014  
 43.0 .0309 11.996  
 53.0 .0313 11.974  
 55.5 .0313 11.965

34.985  
 52.995

30204  
 +1 3.393  
 3.89

1861 Aug 27

1861.00      15 33 40.97 + 44 3 31.6  
+ 1.85 + 4.6  
- 4 44.31 - 4 52.0

Comet's app. pl 15 28 57.61 + 43 58 44.2  
for Par. + 0.1148 + 1.28

El 18 47 41  
 fast 53  
 Rev. Tonic 18 46 48  
10 23 35  
 8 23 13  
1 23  
 8 21 50 Camb. m. s.

Br. 15 29 0.1 +43 58 42  
 Ch. 57.9 45

$\Delta a$	-13	+2
$\Delta b$	+2	-13
$\Delta c$	+1	-11
$\Delta d$	-16	+5

a	8.7426	9.9396
b	8.8721	9.6174
c	0.3079	9.0773
d	8.5848	9.9047

- 0.937	+ 14.75
+ 0.653	+ 3.63
+ 2.053	- 12.07
+ 0.083	- 1.73
+ 1.852	+ 4.58



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

## Comet 1861 II.

1861 Aug. 29<sup>th</sup>

Comet	6 40	6 43	20 19	20.3	25.7	- 36.70	+ 3 6.4
Star 8	3 44	3 45.5		56.4	51.8		

Comet	7 1	7 2	20 21	54.4	60.0	- 35.85	3 6.5
Star 8	3 43.5	3 56.5	22	30.3	30.8		

Comet	9 38	9 40	20 24	18.1	13.6	- 35.55	3 6.0
Star 8	6 32	6 34		53.7	59.1		

Comet	5 38.5	5 41	20 26	15.4	20.8	- 35.55	3 4.8
Star 8	2 34	2 36	26	50.9	56.4		

Comet	5 25	29	20 33	59.1	60.5	- 35.60	3 1.0
Star 8	2 26.5	27.5	34	30.7	36.1		

Comet	6 15.5	20.5	35	49.8	55.6	- 34.90	3 2.0
Star 8	3 14.	16.	36	24.8	30.4		

Comet	4 58	5 0	37	45.3	50.7	- 34.95	3 2.5
Star 8	1 54	1 59	38	20.2	25.7	- 35.50	+ 3 4.2

Star a	3 22	<del>4 33</del>	29 41	28.0	33.4		
" b	8 33		42	55.2	64.7		

Star a	2 57	2 58.5					
" b	8 8.5	8 11.5					

Star a	3 36	3 39.5					
" b	8 46	8 49.5					

The comet grows more faint and ill-defined; though not so much fainter as I should expect. Mag. 11.0



## Comet 1861 II

1861 Aug 29.

Star 8 = BZ. 419. 420. 423.

419 15 31 31.70  
 - 56.57  
 - 0.14

420 15 31 33.90  
 - 56.21  
 - 0.02

43 49 49.3  
 + 20.4  
 - 1.1

43 49 50.3  
 + 19.5  
 - 0.2

15 30 34.99  
 37.27

43 50 48.6  
 9.6

Mean 1628.0 15 30 37.13  
 +1 13.80

+43" 50' 9.1  
 - 7 16.4

1861.0 15 31 50.93 + 0.04 + 43" 42' 52.7 + 0.08

Red. to app. + 1.01  
 Comet - Star - 35.50

+ 4.3  
 + 3 4.2

Comet's ARG. 15 31 17.28 + 43 46 20  
 + 0.664 + 2.94

Reduced to 40

20 19 23 + 0.43 - 2.3 - 35.67 + 3 4.5

21 57 + 0.34 - 1.6 54 4.9

24 21 + 0.20 - 1.0 35 0.0

26 14 + 0.11 - 0.6 44 4.2

33 58 - 0.26 + 1.3 86 2.3

35 53 - 0.35 + 1.8 28 3.8

37 48 - 0.44 + 2.3 39 4.8

20 28 33.56 - 35.50 + 3 4.2

post. 55

20 27 34

10 31 26

9 56 10

1 38

Q 54 32 M.T. Cambridge

B. 15 31 19.8 + 43 46 3  
 Ob. 17.6 46 4

$\delta^a$  43 46.52

$\alpha^a$  15 31 14.2

$t_{90}^a$  9.98143

9.90126

1.69244

2.85853

9.79138

1.56513

G 353 56

a 232 58

H 115 18

$t_{90}$  9.981  $\delta^a$  46.77

10 (true) 9.863  $\delta^a$  - 14.30

g 1.311  $\delta^a$  - 5.36

a (true) 9.835  $\delta^a$  27.11

sec d 0.141  $\delta^a$  - 14.00

10 (true) 9.308  $\delta^a$  + 12.91

N 1.280  $\delta^a$  + 5.41

a (true) 9.991

sec d 9.864

Comet 1361. II.

86/ Sept. 5<sup>th</sup>  
1861.

Zero 1<sup>st</sup> trial 261° 9' for wires

Coincidence

17.64  
17.66  
17.65

17.565

Other Side

17.47  
17.46  
17.51

Comet South preceding

At 19 19 54 8.12 - 9.445

~~19 20 42.5~~ 26.69 9.125

19 25 20.5 27.26 9.695

Wire Comet. Time

I 27 52.7 57.0

- 4.70

II 28 8.4 12.5

I 29 20.6 24.9

- 4.50

II 29 42.3 46.8

I 30 61.2 65.7

- 4.50

II 31 2.3 6.5



I 19 31 58.4 02.6 -4.25

II 32 19.9 23.3

I 19 33 32.4 36.2 -4.40

II 52.6 56.6

S.G. one pair

Found led at  $181^{\circ} 25'$

Led to  $171^{\circ} 9'$

$M + 3^{\circ} 0 - 12^{\circ} 3$

			$\Delta\alpha$	Motion	Reduced	$\Delta\alpha$
Chro. 236.	19 19 54	-	1' 32".6	-2".2	-1 34.8	
	22 42		29.4	1.6	1 31.0	
	25 20		35.0	1.4	1 36.1	
	28 0			+0.14		-4.06
Mean of times	29 31			0.07		4.93
	19 30 52					4.35
	32 9			-0.06		4.31
	33 42			-0.14		4.34
	44 49	-	1 36.5	+2".9	1 33.6	
	45 49	1	36.6	3.7	1 32.9	
	50 51	1	38.6	4.1	1 31.5	
					-1' 33.3 = 0.34	-4.30

Comet 1861. II.

1861 Sept. 5.

19. 44 49	7.715	- 9.55
48 49	7.71	9.555
50 51	7.732	9.755

$p = 10^{\circ} 16'$	$\log$	9.2580
$\frac{1}{15} \Delta - \Delta$		0.7938
$\Delta$ sec.		<u>0.1363</u>
$\overline{\Delta\alpha}$	1.54	0.1886
$\Delta\alpha$	<u>4.30</u>	
$\Delta\alpha$	2.76	



## Star for April 1861. IV.

1861 M. 5

B2 620

15 39 6.71 +43° 16' 8.3

-56.17 + 17.7

-0.08 -0.7

1628.0

15 38 10.46

+43 16 25.3 = Daily 28754 0.0

1 13.63 - 6 57.3

1400.0

15 37 18.56

+43 21 23.7

+2 4.73 -11 48.9

1661.0 L.

15 39 23.29 +0.15 +43 9 34.8 -1.0

39 24.09 +0.05 -43 28.8 +0.8

+1.7

J.M.!

Can be compared with Berl. 3430. 3.31

Adopted.

15 39 24.14 43 9 28.8

Red. to app.

+ 1.68 + 4.3

Comet - Star

- 2.76 - 1 33.3

Comet's place.

15 39 23.06 +43 7 59.8

+0.49 + 1.89

Chr. 19 30 52  
fast 22

19 30 31 L. 10 June

10 59 4

8 31 27

- 1 24

8 30 3 Camb. m.d.

- 55.1

Brünnow 15 39 24.8 43 7 59

Obs'd 23.4 8.1

The star's place needs revision.

1861.5	1861.0
15 38 21.7	15 38 46.9
43 19.35	43 13.00

43 0	9.97054	9.97295
------	---------	---------

43 0	9.91118	9.91134
------	---------	---------

1.91150	1.68166
---------	---------

3.08757	2.85853
---------	---------

0.971299	9.76187
----------	---------

1.79612	1.56713
---------	---------

- 62.55	- 36.91
---------	---------

187.28	110.54
--------	--------

2.85056	2.62040
---------	---------

G	350 57
---	--------

L	234 51
---	--------

H	108 3
---	-------

43 0	9.972	4746
------	-------	------

43 0	9.876	- 14.63
------	-------	---------

1.377	- 7.60
-------	--------

9.819	
-------	--

Red	0.137	- 13.69
-----	-------	---------

n(H+O)	9.468	+ 12.34
--------	-------	---------

L	1.276	+ 5.69
---	-------	--------

g(H+O)	9.980	
--------	-------	--

m	9.835	
---	-------	--





Comet II. 1861

Sept. 2

July 13<sup>th</sup> 9 PM

Looked at Comet with great refractor Diameter of head

is 3' to 4' nucleus very minute  $\alpha$  with surrounding nebulosity within  
1" of it is = star of 13<sup>th</sup> mag. The tail 2' broad at 20' from nucleus  
and 1' at 10' dist. is faintly seen for say 30' but in  
Comet stick for say 10'. In the latter it seems best defined  
on the right side. Though quite faint.

Comet 1861 II

Comet ref. star a (at angle  $351^{\circ} 3'$ )  $\Delta a = \text{Paral. Sec.}$ 

Star	19	52	14.2	19.4			
Comet		52	31.3	36.5	+17.10	+0.99	18.09

Star		53	18.7	24.1			
Comet			36.3	41.4	17.45	0.94	18.39

Star		53	58.5	63.8			
Comet		54	15.9	20.9	17.25	0.91	18.16

Star		54	48.1	53.3			
Comet		55	5.0	10.2	+16.90	0.87	17.77

Star  
Comet

NM - 11.6

Chron. el.

20 1.3	20.58	Comet	16.76
		Star 2	11.97

Comet n. of ?	20	1 58	+ 46.9 - 2.0
		3 42	

20 4.5	20.58	Comet	16.85
			12.67 ?

20 5.3

20 9.3	20.58	Comet	16.63
		Star 2	12.37

20 9 56	+ 41.7 - 0.5
11 33	

20 12.7	Comet	16.87
	Star 2	12.40

20 13 15	+ 43.87 + 0.2
14 56	

20 16.0	Comet	16.82
	Star 2	12.78

20 16 28	+ 39.6 + 0.8
18 11	

20 19.2	Comet	16.85
	Star 2	12.77

20 19 48	+ 40.0 + 1.5
21 26	

21.4
6.0
0.5
1.5



## Comet 1861 II

Sept. 7.

351 3 again. 5 transits

Red. to 20 12 17

Star	20	24	22.9	37.2			
Comet		24	40.8	55.6	+18.15	-0.63	17.52
Star	25	20.2	30.0				
Comet		38.8	48.5	18.55	0.68		17.97
Star	26	23.8	26.0				
Comet		42.7	45.0	18.95	0.73		18.22
Star	27	8.5	13.8				
Comet		27.4	32.6	18.85	0.77		18.08
Star	27	46.1	51.2				
Comet	28	4.6	10.1	18.70	-0.80		17.90

Star	a	Σ 22	2	24	20	32	27.4	33.0	
?	(10.11)	Σ 42.5	5	45	34	22.6	28.1	+3	20.8
a		3	54	3	56				
?		7	14.5	7	17			+3	20.8
a		4	8	4	10				
?		7	30.5	7	33			+3	22.8

+3 21.5

Temp. 65°  
Apr.

Zhr (true meridian) 260° 54' also

- Return?  
19 53 54 17.75 4 +0.93

U. 20 12 17 +14.00 +4' 3".9  
 Apr. Comet - ?  
 b-a

+42.44  
 +3 21.5

20 26 33 18.64 5 -0.33  
 18.103  
 17.960

The comet was compared in R.A. with a, and in declination with b, which latter way  
 com: with a.

## Comet 1861. II.

						1843.0	1853.0
BZ. 120	15 41 11.33	+43" 0'35.6	Q"	15 40 52.1	15 41 12.6		
	- 56.16	+ 17.1	D"	+42 57.50	+42 56.59		
	- 0.12	- 0.9					
1825.0	15 40 15.05	+43 0 51.8	Star α"	9.91452	9.91496		
	1 13.72	- 6 51.9	γ d"	9.96902	9.96854		
Radl. 1845.0 (851.9)	15 40 56.18	42 57 6.7		1.08244	1.33024		
	72.77	- 3 2.7		2.85853	2.50633		
See next date.			γ α"	9.75623	9.75530		
Adopted BZ. 120	15 41 28.77 +0.04	42 53 59.9 +0.8		1.56598	1.21376		
Radl.	41 28.95 +0.00	54 4.0 0.0		-36.811	-16.358		
Adopted	15 41 28.77	+42 54 4.0		140.538	49.131		
Comet - Sun	+18.00	+ 4 3.9		2.61476	2.26163		
Rad. to app.	+ 1.65	+ 4.4					
Comet's a. d.	15 41 48.49	+42 58 14.8					
	+0.536	+ 2.55					
EL			Q	353 98			
20 12 16			α	235 22			
fast 1 6			γ	105 58			
20 11 16			γ d	9.964	+47.65		
11 6 57			Star	9.880	-14.70		
9 4 19			γ	1.319	- 8.23		
1 29			α	9.814			
9 2 50	Comet met.		Star d	0.135	-13.59		
- 22.41			Star	9.505	+12.20		
- 14.5			h	1.276	+ 5.77		
8 26.3			α	9.977			
			Star d	9.833			
C. 15 41 50.4	42 58 9						
0 42.8	13						





## Comet 1861 II

1861 Sept. 8  
7.45Comet S. f. Radcl. 34486 *Streaking very small; hardly discernible.*  
In A.R. at Angle  $351^{\circ} 2'$  *Reduce to  $\alpha$  20 39 17*  
 $+3^{\circ} 05' - 11'' 4$  *Reduced in motion*

Star	El	20	15	8.7	15.2			
Comet			16	39.5	46.0	+ 1	30.80	+ 1.14

Star			17	16.2	23.1			
Comet			18	48.0	54.4	1	31.55	+ 1.04

Star			19	16.8	21.2			
Comet			20	45.9	52.2	1	31.05	+ 0.94

Star			21	11.2	17.4			
Comet			22	42.5	48.7	1	31.30	+ 0.84

Star  
Comet

Changed Power to 200 circa - Angle  $261^{\circ} 2'$  *Reduced*

Star	21 <sup>n</sup> 23	<del>24</del> 29 El	20	29	23			
Comet	26.88			30	59	- 1.58	+ 35.77	- 37.35

Star	29.10		20	32	9			
Comet	32.94			33	44	- 1.05	- 38.02	39.07

Star	26.55		20	34	58			
Comet	28.51			34	35	- 0.51	- 38.81	39.32

Star	21.32		20	38	12			
Comet	25.25			39	48	+ 0.10	- 38.51	38.61

Star	13.72		20	41	18			
Comet	17.54			42	57	+ 0.70	- 37.44	36.74

Star	13.65		20	50	6			
Comet	17.47			51	41	+ 2.36	- 37.44	35.08

*Per. time long*  
 $- 37^{\circ} 66' \pm 0^{\circ} 53'$   
 $\pm 1^{\circ} 16'$



## Comet 1861 II.

1861 Sept. 4

I am inclined to think the higher power useful for the declinations.

Back to  $351^{\circ} 2'$ Reduced

Star	2057	33.3	37.9			
Comet	56	6.2	10.3	+ 1	32.65	- 0.85
						1 31.80
Star	2057	31.4	36.0			
Comet	59	4.4	9.5	1	33.25	- 1.01
						1 32.24
Star	2059	58.8	63.1			
Comet	21	1	32.2	1	33.50	- 1.13
						1 32.37
Star	21	1	59.5			
Comet	3	33.2	37.4	1	33.55	- 1.24
						1 32.31
	21	3	56.4			
	5	29.7	34.1	1	33.25	- 1.33
						1 31.92

B.B. Angle changed to  $352^{\circ} 51'$ Mean  $\bar{I}$   $32^{\circ} 14.4 \pm 0^{\circ} 058$   
1 amp  $\pm 0^{\circ} 173$ Star a precedes star  $7^{\circ}$  South

a	3' 10" 5			21	8	26.0	31.4	- 12.60	- 225.5
$7^{\circ}$	5 36	5 39				36.7	43.9		
a	2 1			9	55.4	60.8	- 12.60	2 26.5	
$7^{\circ}$	4 27.5			10	8.0	13.4			
a	Sw. 62			11	7.5	12.9	- 12.70		
$7^{\circ}$	"				20.1	25.7			
a	7 17.5	to AR							- 2 28.5
$7^{\circ}$	9 46								
a	7 17.5	"							- 2 28.0
$7^{\circ}$	9 45.5							- 12.63	- 2 27.1

Oct 1861. II

1861 Sept. 8

B<sub>7</sub> 120. 15 41 23.70 +43 3 2.2  
 - 56.16 +17.1  
 + 0.11 - 0.9

1875.0 15 40 27.43 43 3 18.4  
 +1 13.65 - 6 51.35

b° 1861.0 15 41 41.08 +0.04 42 56 27.05 +0.8  
 -12.13 -2 27.1

a (comp. with 2°) 15 41 28.49 42 54 0.7

a D. 2. 4. 20 28.77 +0.04 53 54.9

Mean 15 41 28.65 42 54 0.3

Parall. 28.95 - 0.01 4.0 0.0

Ad. 15 41 28.84 42 54 2.8

Red to ap. +1.62 +4.3

+1 32.14 - 37.7

Comet's place 15 43 2.60 42 53 29.4  
 from Par. +0.555 +3.01

Transit El 20 39 17 22  
 20.9 11 10 54

13.4 20 38 22.5

16.9 11 10 54

20.4 9 27 28.5

23.5 1 33

26.9 9 25 56

9 25 56 Lamb. M.T.

- 52.6

4 36 20.22  
 El fact 54.55

C 15 43 4.5 42 53 27  
 O 2.9 31  
 1.6 - 4

15 41 4.3

+ 42° 59' 87

40 9.96962

sin 2 9.91478

1.68244

1.65853

9.76566

1.56684

-36.886

2.61421

G 253 58

a 235 22

st 106 53

40 9.9681 f +47.75

sin 6.19 9.8800 - 9° - 14.73

9 1.3201 10° - 8.69

m 6.19 9.8140

2nd 0.1352 9° - 13.61

sin (H+2) 9.5281 11° + 12.09

1.2756 11° + 5.79

a (H+2) 9.7738

sin 9.8330



Comet II. 1861

Sept 12. 1861

J.H.S. obs.

236 = 19 19 44  
 20 53  
 22 10  
 24 23

Angle of Pos =  $335^{\circ}.10$  side a  
 $334.90$  " b  
 $334.87$  b  
 $335.90$  a

Coincidence  $23.565$  23.652  
 On the other side  $23.740$

19 32 31  
 35 3  
 37 20

Distance =  $33.58$   
 $33.52$   
 $33.49$  } Angle of obs =  $66^{\circ}.5 = 194.5$  T-W

19 40 51  
 42 32  
 44 25  
~~45 28~~ 46 2

Angle of Pos  $342.4$  side b  
 $340.9$  a  
 $341.5$  a  
 $342.5$  b

Coincidence  $23.570$  The coincidence was changed  
 $23.555$  between the dist. and the last  
 $23.520$  angle of Pos  
 $23.548$

19 51 51  
 53 17  
 55 32

dist =  $33.49$   
 $33.69$   
 $33.77$  } Angle of obs =  $74.1$  186.9  
 $33.65$

19 59 57  
 20 1 6  
 24 20  
 3 36

$347.3$  side a  
 $348.8$  b  
 $349.9$  b  
 $349.9$  a

Method of reduction in. AT no 266. (Struve)

Cont 1861 II.

1861 pha. 12.

Reduction of Previous Observation

$$P = 90^\circ + T - W$$

Here assumed  $T = 81.0'$  (could be sensibly wrong)Chro. time  $P = W$ 

19 21 48 \* 335° 16'

19 34 58

19 43 28

19 53 34

20 1 45

341 49

346 56

9.878 =

10.102

195° 48'

189 11

182 52

3  
Dist

96° 80' or 2° 3' = 96° 89'

99.00 or 1° 2' = 99.02

for 19 43 28 Assumed Pos. 189° 11' Dist 96° 00'

Hence  $m = -96.8$   $n = -15.7$  $x = 2.45$   $y = 2.45$ Assumed  $x = T$   $x = m$   $y = n$ 

$$dx = \text{Hourly motion in } d = -10.1 \checkmark$$

$$dy = \text{Hourly motion in } d \times \cos d = +34.6 \checkmark$$

$$dd = 3.13 \text{ by } 0.496$$

$$15 \text{ by } 1.176$$

$$1.672$$

$$\text{on } d \text{ at } 42.56' \quad 9.867$$

$$1.539$$

$$m' = m + (T' - T) dd$$

$$n' = n + (T' - T) dy$$

 $T' - T$ Computed  $m'$  $n'$ 

log

by  $z'$ 

Computed Distances

 $v'$ O-C  $22.5 - z'$  $d' = \eta - v'$  $z''$ 

19 21 48	19 34 58	19 43 28	19 53 34	20 1 45
-0.361	-0.162	+0.168	+0.305	
-93.16	-95.37	-96.80	-96.49	-99.88
-28.14	-20.61	-15.70	-9.89	-5.15
1.9692	1.9794	1.9859	1.9936	1.9995
1.4570	1.3141	1.1959	0.9952	0.7116
1.9882	1.9893	1.9965	1.9956	2.0001
	97.57		96.99	
196° 50'	192° 12'	189° 13'	185° 44'	182° 57'
	-0° 68'		+0° 03'	
-1° 6'		-0° 2'		-0° 55'
-1.87		-0° 06'		-1.60

\* Substituted for motion in 1 minute in the original formula.



Amol 1861 II.

1861, Apr. 12

Equations of Condition

①  $dx = \cos \varphi' d\alpha + \sin \varphi' d\alpha$

$$D) \quad Z' dv = \sin v' dm + \cos v' dn$$

$$\odot \quad -1.87 = +0.29 \, dm - 0.96 \, dn - 0.67$$

$$\textcircled{c} \quad -0.68 = -0.98 \Delta u - 0.21 \Delta u = -1.19$$

$$-0.06 = +0.16 \partial u + 0.99 \partial v - 0.83$$

$$+ 0.03 = - 0.99 \partial_m - 0.10 \partial_n - 1.09$$

$$-1.60 = +0.05 \Delta u - 1.00 \Delta u = -0.95$$

	sn	mn	
cast	+2.05	-0.19	+1.87
2y	0.312	9.255	0.272
86 etc	+2.98	+2.77	+3.60
	-0.016	+0.164	+0.001
	2.934		3.601
	0.467		0.556
dn			0.089x
	8.344	+0.23	mn.2

m	-an		-bu		-su	
	+	-	+	-	+	-
3.50		0.54	1.80		1.25	
0.47	0.67		0.14		0.81	0.7
0.00		0.01	0.06		0.05	
0.00		0.03		0.04		0.03
2.56		0.08	1.60		1.52	
6.53	+0.01		+3.60		+3.60	
a	ab		as		bs	bs
	+	-	+	-		+
0.08		0.28		0.19	0.92	0.64
0.96	0.20		1.17		0.04	0.25
0.03		0.16		0.13	0.98	0.82
0.98	0.10		1.08		0.01	0.11
0.00		0.05		0.05	1.00	0.95
2.05		-0.19	+1.28		2.95	2.75

$\Delta m \quad +0."11$        $\rho_{\text{c. Error 16h}} (4 \text{ or } 3) \quad \pm 0."57$

$$\partial n \quad + 1.23$$

$m = -96^h 69^m \pm 0.40$   $\Delta$   $\delta$  Comet - Star At  $19^s 43^m 28^s$  Chr. time

$n = -14.97 \pm 0.34$   $\Delta$  a Comet-Star

Refraction - correction entirely = 0.

Wg n 1.160 n

$$2\pi \cdot 15 \cos \delta \quad \underline{1.063}$$

$$0.117_n = -1.31 \pm 0.031 \text{ } \kappa' - A^2$$

It is very evidently more work to reduce a series of angles of position and distances than an ordinary observation; although the chronograph sheets do not have to be read off.

## Comet 1861. II.

561 Sept. 12.

Star's Place.

$15^h 47^m 35.40$      $42^\circ 44' 16.0''$   
 $-54.07$      $+13.7$   
 $+0.08$      $+0.7$

$1825.00$      $15^h 46^m 41.41$      $42^\circ 44' 30.4''$   
 $+13.38$      $-4$      $35.1$

$1861.00$      $15^h 47^m 55.79$      $+42^\circ 37' 55.3''$   
 $+0.04$      $+0.4$   
 $+1.35$      $+4.4$   
 $-1.31$      $-1$      $36.7$

$15^h 47^m 55.07$      $+42^\circ 36' 23.8''$   
 $+0.492$      $+2.01$

$19^h 43^m 28$   
 $30$  (cor)  
 $19^h 42^m 58$      $19^h 42^m 58$   
 $11^h 26^m 40$   
 $8^h 16^m 18$   
 $-1^h 21^m$   
 $8^h 14^m 57$      $19^h 42^m 58$

$7^h 35^m 3$      $19^h 42^m 58$   
 $0.3165$

$15^h 47^m 56.9$      $42^\circ 36' 25''$   
 $55.3$      $26$      $25$

$1843.0$   
 $15^h 47^m 18.0$   
 $42^\circ 41.21$   
 $C$   
 $9.96589$   
 $9.92273$   
 $1.52107$      $68244$   
 $2.70416$      $65850$   
 $9.73814$

$57096$   
 $1.41169$   
 $-55.614$      $37.158$   
 $74.764$      $110.538$

$354$      $1$   
 $G$      $1.24$   
 $A$      $236.53$   
 $H$      $100.42$

$9.965$      $+46.12$   
 $9.890$      $90 - 13.07$   
 $1.323$      $100 - 9.75$   
 $9.801$      $+23.30$

$0.134$      $91 - 13.38$   
 $9.581$      $1' + 11.78$   
 $1.274$      $1' + 5.89$   
 $9.966$   
 $9.031$



12  
07  
175  
30

# Rough Comparison of Some Comet Observations with Brinnow's Ephemeris (Notices Aug 26)

		$\Delta x$	$\Delta y$
0.99	Aug 3	+0.54	-2"
1.04	5	0.6	-4
1.06	6	0.5	-2
1.16	10	0.8	-1
1.28	15	1.4	-2
1.39	20	1.6	-3
1.42	21	1.7	-5
1.46	23	2.0	-2
1.48	24	2.4	-6
1.56	27	2.2	-3
1.59	29	2.2	-1

The residuals Aug 3-27  
are thus represented

$$\Delta x = +1.5367 + 0.5759 (t - \text{Aug. 16})$$

$$\Delta y = -3.22 - 0.060 (t - \text{Aug. 16})$$

$$\text{Error of 1 AR} \pm 0.5067$$

$$\text{1 Sec.} \pm 0.499$$

$$\frac{0.01}{0.09} \\ \frac{0.12}{0.22}$$

This is of course exceptional.

1.74	Sept 5	1.4	-2
1.78	7	1.6	-4
1.80	8	1.6	-4
	12	1.6	0
	16	1.3	0
	18	0.6	-5
	19	+0.7	-4

Filar-micrometer-transits -

"

"

Position and Distance

Filar-micrometer Standard

Observation made at last, rather low power, etc.

Differences of AR and Angles of Position - Star from  
Historic Clock

I find for the obs. in September (to the 19<sup>th</sup>) the prob. error in medio of

Inight's work =  $\pm 0.5056 \pm 0.49$  from the agreement inter to of the comparisons

Sept 28	-0.4	-1"
Long Aug 11	2.2	-2"
21	1.9	





Reduction from 1836.00 to 1861.00

$$\alpha' - \alpha = 76.5764 + [1.52497] \sin \alpha'' \tan \delta''$$

$$\delta' - \delta = [2.70016] \cos \alpha''$$

where  $\alpha'' \delta'' = \frac{1}{2}(\alpha' + \alpha) \quad \frac{1}{2}(\delta' + \delta)$  or hold good for 1848.5

Reduction from 1842.00 to 1861.00

$$\alpha' - \alpha = 58.5342 + [1.40487] \sin \alpha'' \tan \delta''$$

$$[2.58097] \cos \alpha''$$

where  $\alpha'' \delta''$  hold good for 1851.5

Reduction from 1800.0 to 1861.0

$$187.202 + [1.91150] \sin \alpha'' \tan \delta''$$

$$[3.06759] \cos \alpha''$$

$\alpha'' \delta''$  here hold good for 1830.5

for July 18

$$\text{Gr. 12y Cal - Radcl.} = -0.5038 + 0.5032 \sin(\alpha + 5^h 32^m)$$

$$\text{Mass - Gr. 12y lat.} = +0.052$$

$$\text{Mass - Radcl.} = +0.024 + 0.032 \sin(\alpha + 5^h 32^m)$$

20.17  
304.  
50  
-08

Reduction from 1825.00 to 1861.00

$$119.538 + (1.60244) \sin \alpha'' \tan \delta''$$

$$2.85253 \cos \alpha''$$

from 1845:

$$49.731 + [1.33024] \sin \alpha'' \tan \delta''$$

$$2.50633 \cos \alpha''$$



Radcliffe Dist.

Arg. Rad.  
from ArgelH<sub>2</sub>O<sub>2</sub> for  
100-60°Jewers  
TRad - Radcl.

Rad. Argel for Jordan

45 + 0."33

+ 0."1

50 0.38

for 50°  
40 - 1.69 - 0.26

+ 0.19

+ 0."1

55 0.44

50 1.04 + 0.30

w. 7/8

60 - 0.40 + 0.88

+ 0.69

60 0.58

+ 0."2 from

65 0.73

70 0.95

75 1.20

80 + 1.23

A-J + 1."3

Change of  $m$  and  $n$  in 100 years

$$100 \frac{dm}{dt} = 0."03086 \quad \text{mag}$$

$$100 \frac{dn}{dt} = -0.00970$$

$$\text{Hence } \Delta p = \text{act} + [0.053 - 0.0048 p]$$

$$= \text{act} + [0.0035 - 0.0048 p] \quad 3, 5 - 0.48 p$$

$$\Delta p' = \text{act} - 0.0048 p'$$

$$- 0.48 p'$$

$$u - \text{act} (30^\circ - 60^\circ) + 0."2$$

$$u - \text{act} - 0.2$$

$$\text{Tabb. Rad in Dec} = \text{act}$$

✓ 1847 near 1/2 Books



Lens  
58.28

$\gamma$   
59.60  
59.36

Scale 262.55  
Comp 263.00  

---

1.05



1861 Aug 20<sup>th</sup>

$\Delta$  1861.0    15 21 13  
 + 45° 48' 41"

1862.0  
~~443.4 + 50.4 = 493.8~~  
 488.2  
 22





1861phae,proj.,1978