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11365
196

H.42

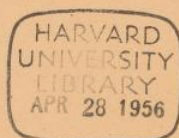
Equatorial
June 22^d 1861
July 13th 1861

Sold by T. Groom & Co., Stationers, India Building, 82 State St., Boston.

KG 11365, 196



KG 11365.196



Comet 1861 II

1861 July 2.

G.P. Obs. J. H. Green.

C

Star	1	12.5	15	8	26.4	33.3	0.2
Comet	4	49.0	10	40.7	49.0		

Star	2	6	15	12	1.8	10.5	0.3
Comet	6	25	14	28.9	37.9		

Star	9	29	15	16	38.3	47.2	0.4
Comet	5	45	19	19.8	29.1		

Star. 236

15	20	44
6	42	20
6	2	48

Probably N.L. 183.99.

Time for Sec. ^{observed} about 28. ^{refr.} that for A.R. J.H.S.

15	10	45	+2	16.40	-28°	+3	36.5	
	14	33	2	27.75	-28°	4	19	
	19	25	2	41.70	-28°	5	17	
15	14	54	+2	28.45		+4	24.2	Verified
			-0.02				+ 5.4	
					North (28°)		+ 0.1	
					Ref.		- 0.1	
					Comp.			

April 1861. II. (Great Comet)

1861 July 2.

Ad. 183, 99 - Ad. 915. 8 33 53.06 62 50 25.2 7.8 mag.
 - 18.72 + 17.2
 = Fed. 1369 = Runka 2619. - 0.31 + 1.1

Runka Comets

1861.0 (~~Ad. 915~~)

8 33 36.03

62 50 43.3

- 0.2

8 33 36.03

62 50 43.3

+ 1 36.99

- 3 57.7

Angel.

Fed.

1861.0

8 35 13.02

62 46 45.6

L^o

8 34 24.5

8 32 11.5

S^o

62 48.74

62 34.22

Runka 2619

8 33 5.16

62 42 1.95

19 50

0.189 33

0.29102

2 7.69

- 5 12.37

19 50

9.892 93

9.896 25

8 35 12.85

62 46 49.6

as 2^o

0.226 12

0.128 13

8 29 8.92

63 1 28.0

0.309 75

0.313 45

+ 6 4.10

- 14 37.7

2.034 1

2.058 0

8 35 13.02

62 46 50.3

18 51.5

3.070 6

3.070 1

5.101 7

5.128 1

1.097 33

1.092 03

2.376 03

2.923 34

S.L.

S.L.

Fedorenko

8 35 13.02

+ 0.01

62 46 50.3

0.70

Runka

12.85

0.00

49.6

- 0.7

L^o

Angelanton

13.02

+ 0.04

25.6

+ 0.1

8 34 9.1

62 49 20

Adopted (Point 1. Aug. 1.) 8 35 12.95

62 46 47.3

19 50

0.289 03

9.893 31

0.126 13

1.302 22

9.794 51

0.306 97

3.070 6

5.101 7

1.096 23

2.494 69

18 48.5

Comet 1861 IV (Great Comet)

1861 July 2.

1861.0 *
Rev. to app.

8 35 12.95
+ 1.54

+ 62° 46' 47.3
+ 0.2

G 354 4
L 128 48
H 169 54

+2 28.43

+ 4 29.6

Comet's App. Sec.

8^m 37^m 43.22

+ 62° 51' 17.1
+ 3.48

log 0.289
sin 9.924
g 1.230
in 9.735

f + 38.84
g° + 27.78
n° - 39.05
+ 27.57

Log. pr. Par.

Pro 236. 15 14 54

fast. 2 4

Sidereal J. 15 12 50
6 42 48
8 30
- 1 24

8 28 38 Ambidg m. t.

dist 0.340
sin 9.943
h 1.309
a 9.681
dist 9.949
i 0.190

g' - 9.24
N + 8.70
i' + 0.71

0.8024
9.9949
0.2647
1.1277
9.9666
9.195

1861 July 2nd9^h m 3^s +

Clouded

A remarkable dark triangular spot in
principal envelope

Zen. of Per 353° 30'

Principal inner envelope

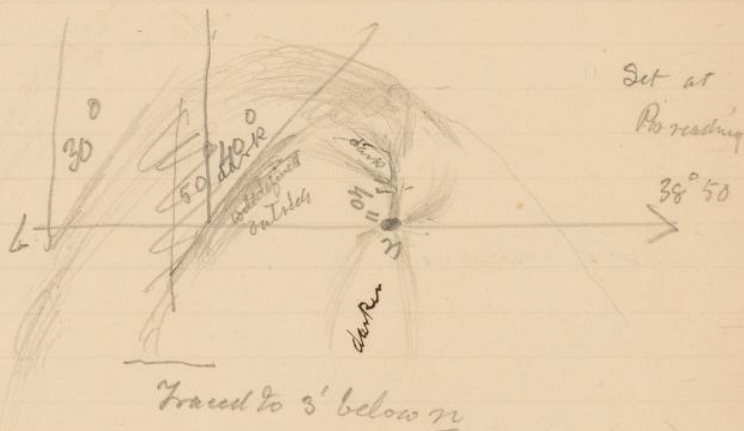
Height $n_1' = 2' 25'' = n_3'$ Breadth a_1'' 7.30 33"

Next outer

 $n_2 = 6' = n_2$

Nucleus 4" rather diffused at edge.

Inner envelope left edge

40" from n to point of dark
triangle above nucleus

No dark hollow can be seen in the axis excepting within less than 1' from nucleus.
The outer edges of envelopes however extend a few minutes towards
A great diffusion of haze fills whole field & obscures details
of all but inner envelope

July 2 1964 continued

Pointing finder by naked eye. 236 is 2nd just.
 Points in edge of tail Obs with 5 ft eq Long Ray -
 Dr.

236 = 16 31 +28.5 By VHS.
 h 11 8

236 16 34 +4.8 By G.P.B. (edge of tail, center)
 East h 1 9

Obs of prec. edge is edge towards S.W

236 16 35.9 +40.2
 East h 0 4.5

236 16 39.3 +59.7
 W 0 58.0

16 49.9 +70.7
 W 3 51.1

head of Comet

16 47 4.5 Dr. + 63.5'

16 43.8 +70.4
 W 5 51.0

Comet II, 1861

July 2, 1861

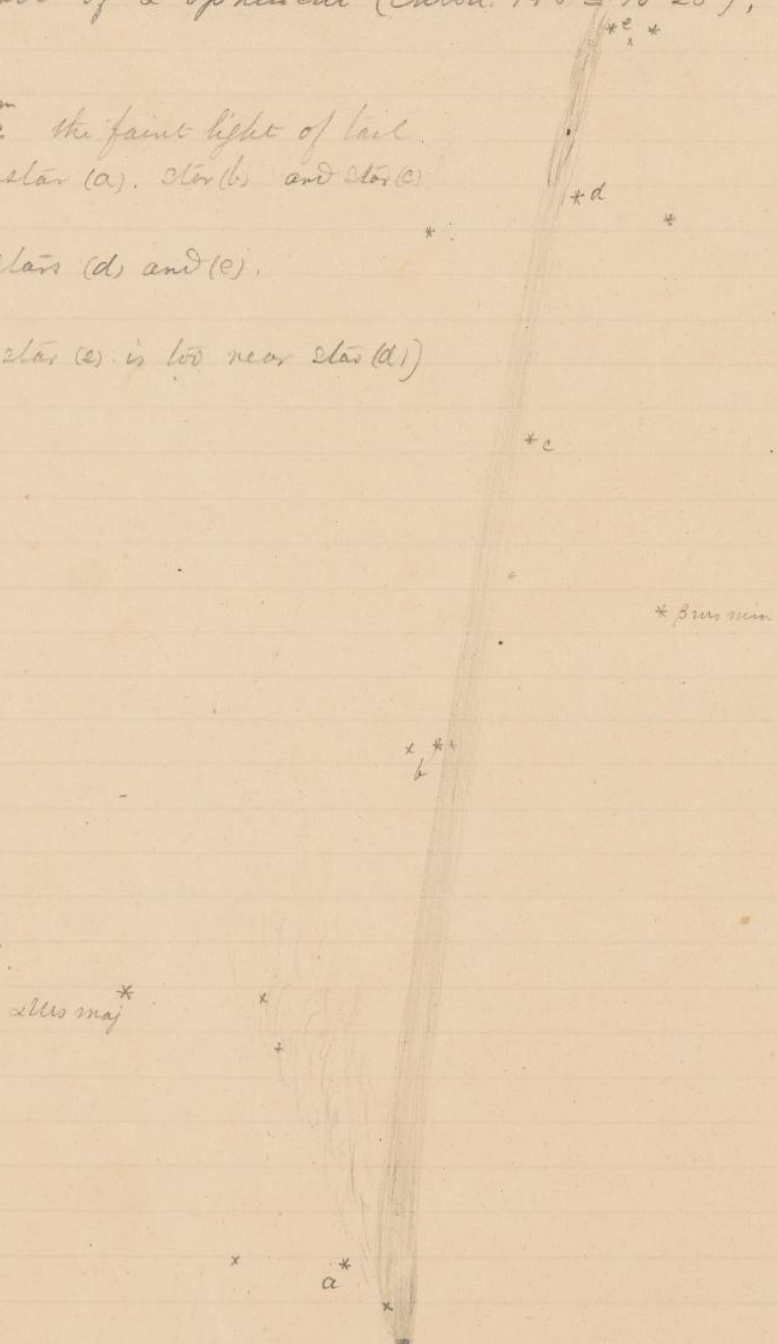
A.H.

On the left hand side just above the nucleus, six or seven degrees the tail seems to run off towards α Urs Maj. On the other side much straighter. The tail can be traced beyond the zenith to α Ophiuchi. It passes to the east of α Ophiuchi (Chron. 196 = $16^h 28^m$), ($19^h 34^m$ fact).

Chron 196 = $16^h 32^m$ the faint light of tail barely touches star (a). star (b) and star (c)

also very near stars (d) and (e).

(In the drawing star (e) is too near star (d))



α Urs Maj

β Urs min

Distance 8'

Left is brightest rich

~~Extends~~ ^{15'} ~~20~~ towards Sun } in further
 35' perp. to axis } carefully
 estimated

July 3. Good daily motion in 4. 139" by 2.6 observation good
 shape perfect. Dark spots - fine streamers very decided.

1961 July 2nd	(1) 1=8	(2) 6	(3) 2.75	(4)	(5)	(6)
- 3		6	3.50 " = 1' 10"	2 10	2 10	112" 0 45
4			4 20	2 10	2 35	1 26
- 5					2 10	2 10
6						
7						
- 7	6	7	8	9	10	11
8	(7)	(8)	(9)	(10)	(11)	(12)
- 9	0 32					
10	1 2					
- 11		15				
12		34				
- 13		60	25			
15			60			
- 16				40		
- 17					14	
18					35	
19						15
						30

Identification of Envelopes.

Star into trail
 in back

Comet II, 1861

July 2, 1861

A.H.

On the left hand side just above the nucleus, six or seven degrees the tail seems to run off towards α Ues Maj. On the other side much straighter. The tail can be traced beyond the zenith to α Ophiuchi. It passes to the east of α Ophiuchi (Chron. 196 = $16^h 28^m$), ($196^{\circ} 34'$ fact).

Chron 196 = $16^h 32^m$ the faint light of tail barely touches star (a). star (b) and star (c)

also very near stars (d) and (e).

(In the drawing star (e) is too near star (d))

1550.0					
A. 13957	8.9	mg	14 41 16	-18 18.9	
	*	8.9	+ 1 ^m 28.5	+ 1 ^m 17"	
A. 13956	8.	—	14 35' 9	-19 18.65	
A. 13944	2-3	8.	14 35 26	-18 14.3	
A. 13961	6.9	6.9	14 28 58	-17 40.49	
	6.2	9	28 52	40.74	
13725	9	9	14 25 25	-17 21.86	
13738	8	8	25 57	17 23.23	

2
10!
1/4 Piazzi

Distance 8'

Left in brightest rich

Flaccidus ^{15'} ~~to~~ towards Sun } in field
35' perpendicular to axis } carefully
estimated

Ang pos Lat reads 150° 'dark strips up to middle
145.50

Long of Proj. $353^{\circ} 30'$

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X

Branch
 of milky way

adys
 *

*

*

*

* a Her wide as dirt
 * a Ophi at 9^h 40^m m: f
 attor. to a Oph.

end of this
 branch
 of milky way

3/4th mag

4.5

5th
 5th 5th

Chinensis
 preceding
 slightly to
 is perhaps best defined. h. 5

July 2nd

Left hand
I thought the stars
of the two one of which is
x Draconis = x was the
brightest -

They were within
10' of each other & the
edges grazed between

Clouded suddenly

Great Comet

July 2 continued

Looking at the Comet with a good
opera glass saw a very remarkable
appearance - The long ray is clearly traced
far within its junction with principal tail
but on each side of it is a very narrow
dark channel & outside of these
two fainter rays.

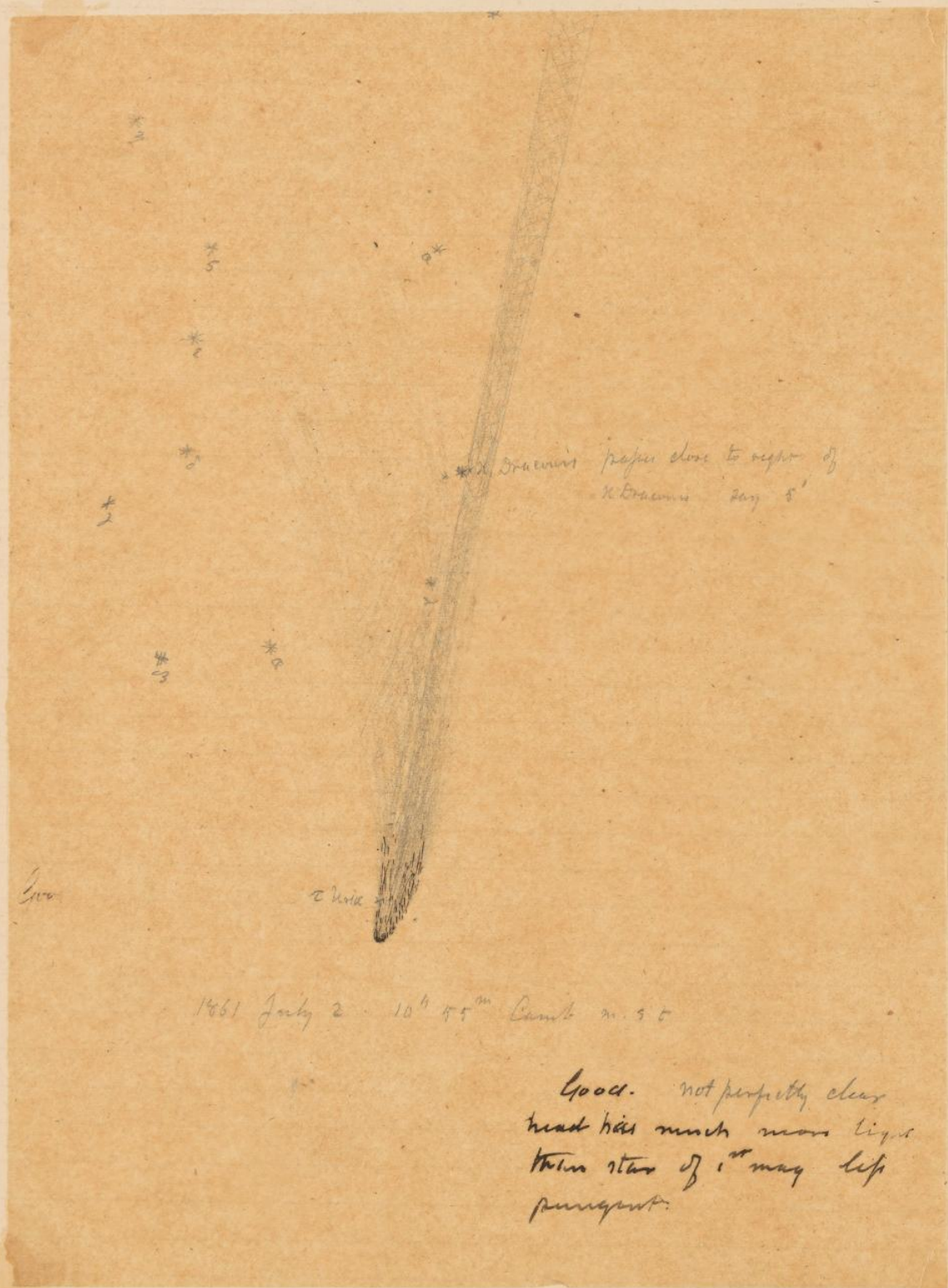
I reckon three rays then
besides original curved brush-like
tail - broom-like. Between them
are the finely marked grooves traced
 10° or 15° at least from π

The long ray is over 106° long. 10° beyond α Ophiuchi

114

Sedge paper
5. N of α Draconprecisely on edge $4/5 \pi^*$
at $10^h 55^m$

Orion M41 II.



Comet. 1961. II.

1961 July 3.
G.P. B. etc.R₂

Star 7.8 mag. No other near.

E. G.

Star	1	38	15	7	37.8	(46.6.?)
Comet	7	34	8		8.8	

15 11 10.3 20.1

11 31.3 41.5

D.B.

Star	0	47	8	52.7	2.3
Comet	6	48	9	17.4	27.8

15 12 28.2 34.9

12 50.2 60.4

B. A. B.

Star	1	23	10	9.6	18.8
Comet	7	31	10	38.2	48.6

15 13 42.0 57.5

14 10.8 21.3

B. B. B

Star	0	13	11	44.8	54.6
Comet	6	29	12	18.6	29.1

15 15 17.5 27.1

15 51.3 61.8

Star	0	13	13	12.6	22.2
Comet	6	37	13	57.0	61.3

15 16 48.0 54.7

17 23.7* 33.9

Star	-	0	22	15	24.2	34.8
Comet	6	8	16	9.4	19.6	

15 18 56.9 66.6

19 41.9 52.2

* 15 17 1 for 8m
+ 19 19

Oct 1861 II.

July 3

At Obs. 236 15 19 33

Obs. 236. 15 20 9 . 66° 1' Star

5 28 0

Motion 3.045 in 1" assumed.

section 4.5 in 1" assumed

El.	15	11	36	+21.30	+2.33	+5'56"	+6.8 + 18.9	6	14.9
	12	55		25.25	.39	6 1	+ 13.0		14.0
	14	16		29.30	.45	6 8	+ 6.9		14.9
	15	56		34.25	.48	6 16	- 0.6		13.4
	17	29		38.95	.60	6 24	- 7.6		16.4
	19	47		43.30	<u>3.15</u>	6 30	- 17.9		12.1
					3.				47.7

Time for Star 28^s preceding A.R. (mean of two)

Mean 15 15 20 + 32^s 49 + 6' 12.5 } Verified
 Motion in 26.^s + 2.1 }

Temp. Ref. correction for the present.

Orbit 1861. II,

July 3

$$A.L. 176.26 - 1063.10374 = R. 3005$$

R. 3115	$Q \begin{smallmatrix} h & m & s \\ 46 & 43.705 \\ 1 & 17.845 \end{smallmatrix}$	$+ 66^{\circ} 7' 2.27''$	$\begin{smallmatrix} 2^{\circ} \\ 8^{\circ} \end{smallmatrix}$	$Q \begin{smallmatrix} h & m & s \\ 47 & 42.8 \\ 1 & 3.54 \end{smallmatrix}$	$Q \begin{smallmatrix} h & m & s \\ 47 & 56.8 \\ 66 & 2.67 \end{smallmatrix}$
1861.0	$Q \begin{smallmatrix} h & m & s \\ 48 & 41.55 \\ 1 & 29.49 \end{smallmatrix}$	$66 \quad 0 \quad 2.1$	48°	0.35262	0.35203
R. 10374	$Q \begin{smallmatrix} h & m & s \\ 47 & 12.06 \\ 1 & 29.49 \end{smallmatrix}$	$+ 66^{\circ} 5' 18.6''$	48°	9.73694	9.73626
		$- 5 \quad 19.5$		0.12613	0.12612
	$Q \begin{smallmatrix} h & m & s \\ 48 & 41.55 \\ 1 & 29.49 \end{smallmatrix}$	$+ 65 \quad 59 \quad 59.1$		1.30222	1.30221
				9.923241	9.92303
				0.21569	0.21471
				0.67337	0.67304
				1.39794	1.39795
				1.22546	1.22571
Remainder	$Q \begin{smallmatrix} h & m & s \\ 48 & 41.55 \\ 1 & 29.49 \end{smallmatrix}$	0.00	$66 \quad 0 \quad 2.1$	$- 1.3$	
Arg. d.	$Q \begin{smallmatrix} h & m & s \\ 48 & 41.55 \\ 1 & 29.49 \end{smallmatrix}$	$+ 0.04$	$65 \quad 59 \quad 59.1$	$+ 0.0$	
1861.0 (Ad)	$Q \begin{smallmatrix} h & m & s \\ 48 & 41.57 \\ 1 & 29.49 \end{smallmatrix}$	$66 \quad 0 \quad 0.0$	6	$304 \quad 5$	$f \quad + 39.01$
Red. to app.	$+ 1.66 \quad 89$	$+ 0.8$	2	$417 \quad 10$	$g^0 \quad + 24.01$
Comet - Star	$+ 32.39$	$+ 6 \quad 14.5$	54	$169 \quad 44$	$h^0 \quad - 34.69$
Orbit's AR. Sun	$Q \begin{smallmatrix} h & m & s \\ 49 & 15.85 \\ 1 & 22 \end{smallmatrix}$	$66 \quad 6 \quad 15.3$	66	0.35147	$g' \quad - 13.31$
El. 15 15 20				9.737	$h' \quad + 13.54$
1 - 5 48				1.232	$i' \quad + 0.66$
15 9 40				9.8922	
6 46 45				0.391	
8 22 55				9.640	
1 22				1.309	
8 21 33				9.808	
				9.901	
				0.225	

W. I. Cambridge

Comet II, 1861

July 3 fine darkness clear & calm.
nucleus perfectly seen. & all the details of envelope

Prof. Bond obs.

A new envelope 4 has been thrown off since last evg. strikingly like those of Donati's Comet of 1858. on a magnified scale.

~~This time 44" is imaginary as~~ 4 is left hand intersection of line perp to axis.
4" .. imaginary

8^h 34^m n4' = 1' 10" good { began obs at 8^h 34^m m.s.l.
at 11 10 n4' = 1 25 .. } strong twilight

Edge of 4 well defined on free. and left hand side.

n4 = 1' 12" Fine rays in all directions from nucleus

nx = 0 50

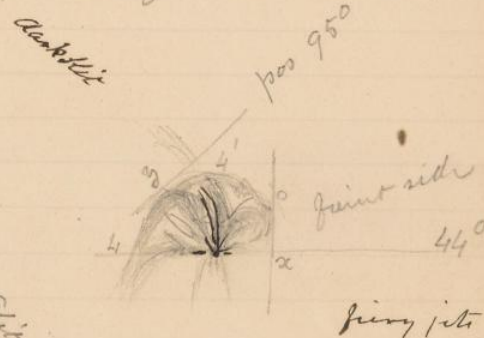
nz = 1 10

Nucleus 2" very decided

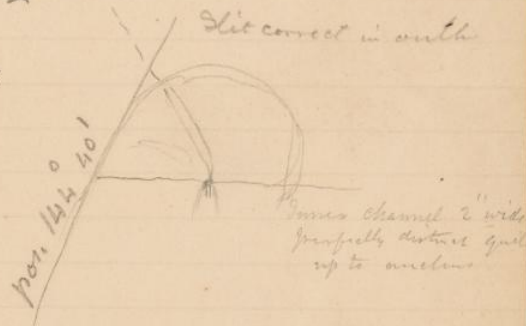
8 58 20 Small star 40th in axis 1' from nucleus

Interior rays branch out precisely like fronting in window pane

Dark slit 102° 30' does not point exactly to 22 but curves to it as shown quite remarkable nucleus quite to nucleus as fine branch perfectly well seen



at a narrow dark slit



watch = 9 3 50 Entrance of ^{another} star of 10th mag into Envelope
= 4 37 Star in axis direction

n3' 3' 45" Same as na' of July 2nd different

The change of inner envelope at 11^h 10^m was very striking Slit no longer extends to nucleus & has expanded as in margin definitely very good.

At 11^h 10^m slit changed to dark

$n 3 = 3' 50''$ Same as $n a$ of July 2nd.

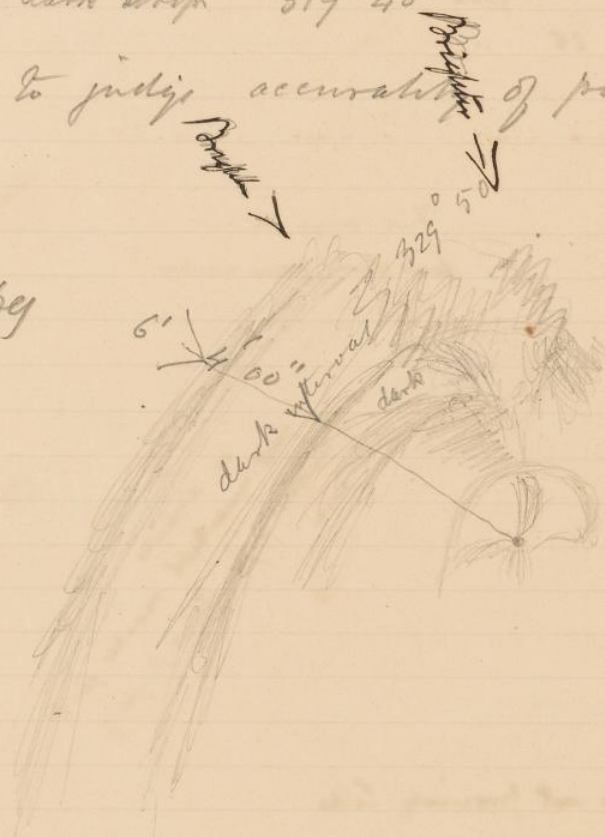
$n 2 = 6 00$ " $n b$ 2nd

Any pos axis? dark strip $319^{\circ} 40'$

It is impossible to judge accuracy of pos of axis

About 9^h m.s.t.

• Dim outer envelope



On this 2nd
No distinct callous
excepting inner envelope
which also is very new

July 3 cont

In finches

N to apex 15'

at N breadth

35 perp to axis

No defined outline but above is line of equal
light

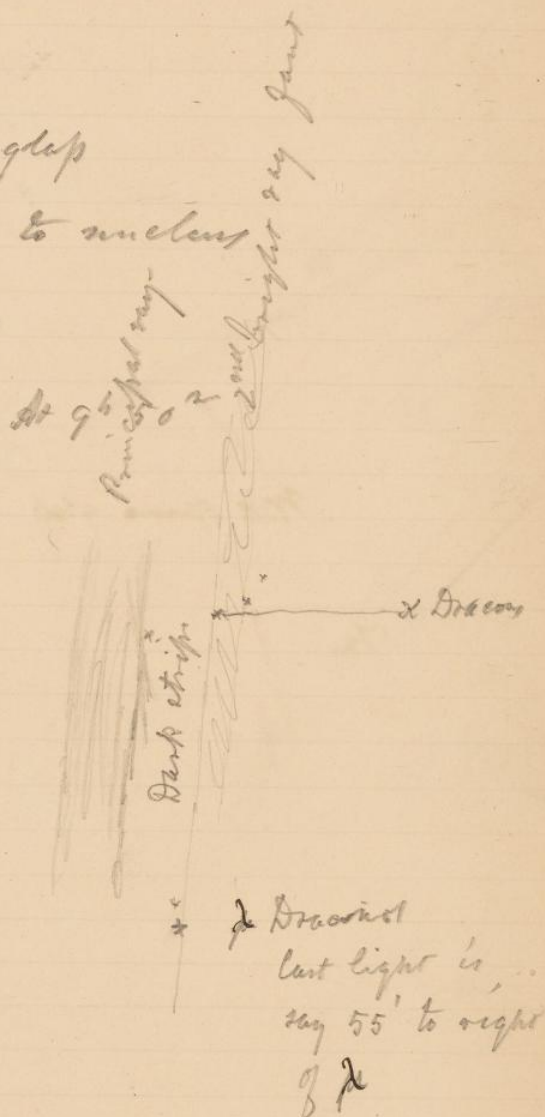
With open gap To apex 18' to 20'

The

dark stripes extend 40° with Opera glass

& with bright streaks are traced quite up to nucleus

The alternations of ~~bright~~ streaks with dark grooves is plain in some places than at others nearer the nucleus. but for $20''$ they can easily be seen with Opera glass some 5 or 6 alternations



Group
 extends to $\theta = 2^\circ$ from center
 extends to 10° to right or in J. full
 Extends 20'
 Opera glass

faint edge
 $2\frac{1}{2}$ from θ

Comet II. 1861

July 3. 1861

The west edge of tail passes very near γ , δ , η , ϵ , δ
Mercurii and α ophiuchi. The tail can be traced to Taurus
Poniatowski, or the cluster of stars south end of β ophiuchi
 α Draconis is a little inside of the east edge of tail.
West edge of tail passes near α Draconis. A.U.

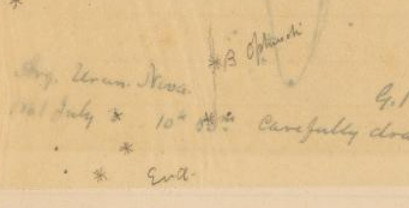
1861 July 3rd G.P.B.

Arg Uran. Nova V

Edge of Long Ray 10^h 25^m inst.

Carefully drawn

Draco



Arg. Uran. Nova

1861 July * 10^h 25^m

Carefully drawn

G.P.B.

1861 July 3 G.P.B.
Carefully drawn on
Arg Uran. Nova I.
edge of rays.

α Dra in dark streak

Glenn Mij.

1861 July 3 G.P.B.
Carefully drawn on
Arg. Ur. Nova I.
edge of rays.



IV. Arg. Ur. Nova.
1861 July 3 10^h 50^m G.P.B.
Carefully drawn

Cont. 11. 18. 17.

18. 17. 16.

Plan. 18. 17. 16.

7. 11. 10.

236 * 18 31 17

18 33 17

B

21 25 17

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* 18 31 17

18 33 17

* 18 31 17

number 18 31 17

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* 18 31 17

* 18 31 17

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.

6 54 6 57

2 36 2 39

6 54 6 57

2 36 2 39

7 30 7 32

3 36 3 39

8 36 8 39

2 46 2 49

4 46 4 49

7 30 7 32

3 36 3 39

4 46 4 49

Cont. 11. 18. 17.

236 * 18 31 17

18 33 17

107 6

18 31 17

18 33 17

18 31 17

Panel II 1861

Neoph. a. 1861

16 25 6.0 5 7
38 8.5 1 36½

29 47
37 12.2 9 28

31 14.2 7 48
41 16.1 1 16½

Comet 1861. II.

1861 July 3.

| | | | | | |
|---------------------|----|----|------|-------|-------|
| Star | 17 | 30 | 43.2 | 53.0 | |
| Comet Star + 52" | | 30 | 45.0 | 55.3 | 2.05 |
| Star | | 32 | 15.2 | 24.8 | |
| Comet Star + 57" 5 | | 32 | 21.8 | 31.8 | 6.60 |
| Star | | 33 | 37.2 | 46.8 | |
| Comet Star + 1 4.5 | | 33 | 47.9 | 58.2 | 11.05 |
| Star | | 35 | 15.7 | 25.6 | |
| Comet Star + 1 11.5 | | 35 | 31.6 | 42.5* | 16.40 |
| Star | | 36 | 54.0 | 4.1 | |
| Comet Star + 1 18.2 | | 37 | 15.9 | 25.8 | 21.40 |

Time for Declination Same as for NR. Observed in both scales.

The star is Olks. 10476. found in no other catalogue.

| Comet - Star | | El. | | Comet - Star | | in 1 minute of time | |
|--------------|----|-----|--------|--------------|--------|---------------------|----|
| | | | | | | 3" | 4" |
| 17 | 30 | 50 | +2.05 | +0' 52" | 11.65 | +1' 4.8 | |
| 32 | 32 | 27 | 6.60 | 57.8 | 14.55 | 3.9 | |
| | 33 | 53 | 11.05 | 1 4.5 | +6.50 | 5.1 | |
| | 35 | 37 | 16.40 | 1 11.5 | +1.65 | 5.3 | |
| | 37 | 21 | 21.40 | 1 18.2 | 14.45 | 4.9 | |
| 17 | 34 | 2 | +11.54 | +1 4.7 | +11.56 | +1' 4.8 | |

Mean 2 months
Rise 2 months
Temp

+ Project this a first reduction.

Comet 1861. II.

1861 July 3.

Allen 10476

$$\begin{array}{r} 9^h 54^m 26.82^s \\ + 1 \quad 28.92 \end{array}$$

$$\begin{array}{r} +66^\circ 20' 25.6'' \\ - \quad 5 \quad 25.9 \end{array}$$

$$\begin{array}{r} 2'' \quad 9 \quad 55 \quad 9.1 \\ 2'' \quad 66 \quad 17.71 \end{array}$$

1861.0

9 55 53.14

66 14 59.7

S. C.

+0.04 +0.04

00.00 145°

0.05742

Res. to app.

+1.86

+0.7

145°

971657

0.12612

Comet - Star.

+11.54

+ 1 4.7

9.93209

Comet's A.R. Dist.

9 56 6.58

+66° 16' 5.1"

Assumed.

0.19810

$$\begin{array}{r} \text{El. } 17 \quad 34 \quad 2 \quad 4 \\ \text{part } \quad \quad 5 \quad 48 \quad 2 \end{array}$$

$$\begin{array}{r} 17 \quad 28 \quad 22 \\ - \quad 6 \quad 46 \quad 45 \end{array}$$

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

10 39 52 Cambridge m.t.

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

0.66732

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

1.27675

1.23430

Hourly Motion between this and former obs. this evening

$$\begin{array}{r} \text{Right Asc. } 2^h 58^m 2.2^s \\ \text{Decl. } 41^\circ 15' 9'' \end{array}$$

1861

1861

1861

By former obs.

this

this

Comet II 1861

July 4, 1861

J. H. S. obs

comp with 26288 2629 Radcliffe

El.

Scale

| | | | | | | | | | | |
|---------------|----|------|-----------------|-----------------|-------------------|-------------------|----|------------------|---------|------|
| $\frac{1}{2}$ | | | ^h 17 | ^m 34 | ^s 25.0 | ^s 35.6 | 8' | 10" | | |
| * | | | | 35 | 9.6 | 19.4 | 1 | 0 | - 44.20 | |
| * | | | | 35 | 14.9 | 25.2 | 1 | 44 | - 49.75 | 5.55 |
| $\frac{1}{2}$ | 32 | 45.6 | 17 | 36 | 15.9 | 26.5 | 9 | 8 | | |
| * | 33 | 25.4 | | | 56.0 | 66.1 | 1 | 58 $\frac{1}{2}$ | - 39.85 | |
| * | | | 37 | 1.5 | 11.4 | | 2 | 42 $\frac{1}{2}$ | 48.25 | 5.49 |
| $\frac{1}{2}$ | | | 17 | 38 | 29.6 | 40.4 | 9 | 27 | | |
| * | | | | 39 | 4.2 | 14.3 | 2 | 19 | - 34.15 | |
| * | | | | | 6.6 | 19.4 | 3 | 3 | - 39.40 | 5.55 |
| $\frac{1}{2}$ | | | 17 | 40 | 12.0 | 27.4 | 10 | 19 $\frac{1}{2}$ | | |
| * | | | | 40 | 42.4 | 52.3 | 3 | 16 | - 30.45 | |
| * | | | | 40 | 47.5 | 57.5 | 3 | 59 | - 35.30 | 5.15 |
| | | | | | | | | | | 5.34 |
| $\frac{1}{2}$ | | | | | | | 8 | 48 | | |
| * | | | | | | | 1 | 44 | | |
| * | | | | | | | 2 | 27 | | |

Time for Rad. same as for AR.

There is something wrong with the AR of Radcliffe 2629. (Not of)
 R. 2629 has a considerable P.M.

17 36 30
 36 21
 38 35
 40 17

Verified

17 37 26 El.

- 37.5⁰⁹ + 7' 7.8
 12.42 6 21.0

Temp. Ref. omitted. Small.

Stars for Comet 1861 II.

July 4. 1861.

2628 Ravel = Feb. 1822.7 = Oct. 11505
 2629 " = " 1823 = " 11507 = Str. 1284.

Feb. 1822 A.R. 1825.5 3.2761 3.2776 -19.383
 Radt. 2628 1823.0 3.2695 19.420
 Oct. 11505 1851.5 3.2510 19.419

Feb. 1790.0 10.50 11.31 67 9 18.1
 4 35.35 -22 56.2
 Oct. 1842.0 11 1 30.20 66 52 26.1
 1 13.17 -6 8.9
 Radt. 1845.0 11 1 41.76 66 51 28.9
 1 1.59 -5 10.7
 11 2 46.

Feb. 1823 A.R. 1825.5 3.2776 -19.384
 Str. 1284 1823.0 3.2567 19.411
 Oct. 11507 1851.5 3.2505 19.419
 Radt. 2629 1853.0 3.2490 19.521

28 1790.0 10 58 12.30 67 9 58.1
 4 35.31 -22 56.3
 Str. 1830.0 11 0 48.12 66 57 2.4
 1 59.56 -10 1.7
 Oct. 11507 11 1 35.07 66 53 9.9
 1 13.46 -6 9.0
 Radt. 2629 11 1 46.02 66 52 11.8
 1 1.58 -5 10.7

Per. 1830
 2 11 0 48.2
 8 66 56.33 66 57.05

50 0.3709
 52 9.110782 9.4073
 1.20216
 62 9.98530

1830 3.8724 3.8729
 -19.389 -19.390

Per. 1860
 11 2 39.6 11 2 44.3
 66 46.63 66 47.35

0.36747 0.36772
 9.39374 9.39316
 0.12610 0.12610
 1.30228 1.30220
 9.98627 9.98620

3.8422 3.8417
 -19.400 -19.431

Comet 1861 II.

1861 July 4.

| | | | | | | | | |
|--------|-----------|----|---|--------------|----|----|------|-----|
| 1861.0 | Feb. 1790 | 11 | 2 | 46.66 + 0.01 | 66 | 46 | 21.9 | 0.0 |
| | Oct. 1842 | | | 43.37 + 0.04 | | | 17.2 | 0.0 |
| | Nov. 1852 | | | 43.35 - 0.04 | | | 18.2 | 0.0 |

| | | | | | | | | |
|----|--------------------|----|---|-------|----|----|------|--|
| a. | 1861 (Nov. 2 1841) | 11 | 2 | 42.68 | 66 | 46 | 17.1 | |
|----|--------------------|----|---|-------|----|----|------|--|

| | | | | | | | | |
|--------|------|----|---|--------------|----|----|-----|--|
| 1861.9 | Feb. | 11 | 2 | 47.61 | 66 | 47 | 1.8 | |
| | 8th. | | | 47.68 | | | 0.7 | |
| | Oct. | | | 48.23 + 0.04 | | | 0.9 | |
| | Nov. | | | 47.68 - 0.04 | | | 1.1 | |

Ad. (Feb 0 8th 2 0.1 R. 2)

| | | | | | |
|----|---|-------|----|----|-----|
| 11 | 2 | 47.75 | 66 | 47 | 0.9 |
|----|---|-------|----|----|-----|

Res

| | | | | | | | | |
|--------------|----|---|---------|------|----|---------|-------------|--------------------------|
| Star a | 11 | 2 | 42.68 | 66 | 46 | 17.1 | Q | 354 7 |
| Res. to app. | | | 2.02 | | | + 1.5 | x | 165 48 |
| Comet - Star | | | - 37.09 | | | + 7 7.8 | ✓ | ~~165 48~~
8 9 |
| Star 2 | 11 | 2 | 47.75 | 66 | 47 | 0.9 | log | 0.368 f 39" 18 |
| Res. to app. | | | 2.02 | | | + 1.5 | in log | 9.534 9° 13.81 |
| Comet - Star | | | - 42.42 | | | 6 21.0 | g | 1.234 15° - 22.68 |
| | | | | | | | alt. log | 9.972 |
| Comet from a | 11 | 2 | 7.61 | 66 | 53 | 26.4 | sec | 0.401 g' - 16.07 |
| " 2 | | | 7.35 | | 53 | 26.4 | alt. log | 9.614 n' + 16.88 |
| | | | | | | | n | 1.309 i' + 1.71 |
| Mean | 11 | 2 | 7.48 | + 66 | 53 | 26.4 | alt. (H.V.) | 9.737 |
| | | | | | | | alt. n | 9.963 |

17 37 26 El.

15 41.5

17 31 44.5

6 50 41.5

10 41 3.

- 1 45

10 39 14

Pawling Mean Time

1961 July 4 L.P.B.

Clear & fine

Probably a new envelope ~~to~~ ~~NE~~11^h 5^m m.s.t.

Comet in field

Tail 40' broad at
25' from nucleus

All the details more confused & indistinct
than heretofore. There seems to
be a dense mass of nebulosity
interposed between us & Envelope

Although a great fading away
since the ^{last} ~~last~~

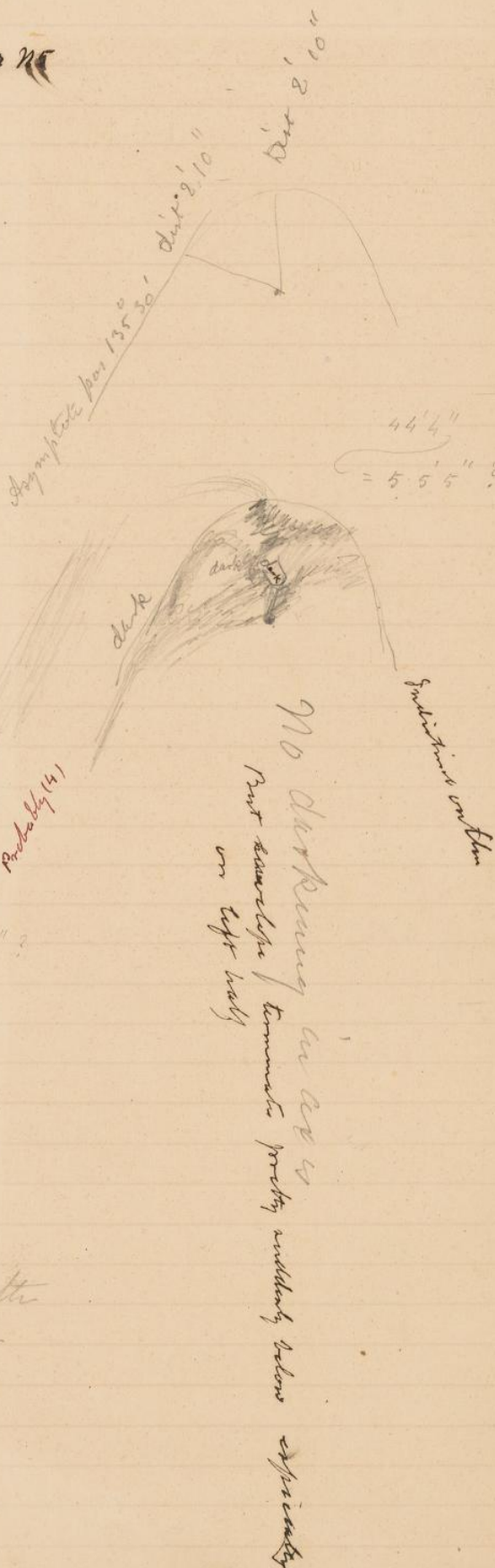
Nucleus about 3"

Outer envelope lost in haze of head.

Are much impressed with
almost perfect resemblance
of curved inner envelopes
to our engravings of Donati
just finished

Only the fiery streams from
Nucleus are more decided in
the present Comet.

I see that the Cometary character is better
preserved in our engravings than in
any other representations



Comet II. 1861.

1861 July 4

T.H.S. 028.

Star North prec. Comet.

0°49'1"

| | | | | E. b. | l-x | $2\frac{1}{2}$ in 1" assumed | Scale | other side. | l-x | |
|-------------|----|----|----|------------|------|------------------------------|-----------|-----------------|---------------------------|----------|
| 236 * | 15 | 31 | 51 | 15 | 35 | 21.5 | 31.5 | 6' 54" - 6' 57" | | |
| ♂ | | 33 | 9 | 36 | 39.5 | 50.1 | + 1 18.20 | 34.83 | 2 36 2 38 - 4' 18.5 - 2.8 | |
| | | B | | | | | | | | |
| * | | 34 | 35 | 38 | 3.2 | 10.1 | | 6 55 | 6 57 | |
| ♂ | | 36 | 0 | 39 | 30.5 | 40.9 | + 1 20.55 | 34.96 | 2 35 2 38 - 4 19.5 - 1.5 | |
| | | | | | | | | | | |
| * | | 38 | 19 | 41 | 49.0 | 59.0 | | 7 30 | 7 32 | |
| ♂ | | 39 | 53 | 43 | 20.9 | 34.5 | + 1 35.20 | 34.88 | 3 8½ 3 11 - 4 21.2 0.0 | |
| | | | | | | | | | | |
| * | | 41 | 26 | 44 | 57.2 | 7.0 | | 8 36½ | 8 39 | |
| new star * | | 42 | 28 | 45 | 56.9 | 7.0 | | 2 46 | 2 48 | |
| ♂ | | 43 | 10 | 46 | 40.5 | 51.0 | + 1 43.50 | 34.99 | 4 14 4 16 - 4 22.8 + 1.4 | |
| | | | | | | | | | | |
| * | | 44 | 44 | 48 | 14.3 | 24.2 | | 9 10 | 9 13 | |
| * long sig. | | 45 | 43 | 49 | 13.9 | 23.7 | | 3 19 | 3 21 | |
| ♂ | | 46 | 36 | 50 | 6.2 | 16.4 | + 1 52.05 | 34.97 | 4 46 4 49 - 4 24.0 + 2.9 | |
| | | | | | | | | | | |
| | | | | Mean E. b. | 15 | 43 | 21.5 | + 1 34.92 | 34.91 | - 4 21.2 |

Comps * in centre of field

236 = 15 47 44

4 49 15

157° 0'

20 44.5 8' 50" 26 36.8 8' 10"

21 37.5 7 16 27 27.0 6 24

23 4.5 4 18

Star for Comet II. 1861.

July 4

$x = \text{Comp. star}$ $a = 11371$ Ocltyen

El.

$x - a$

$x - a$

| | | | | | | | | | | |
|----------|----|------|----|----|------|------|---|------------------|--------|----------|
| $a * 16$ | 38 | 6.0 | 16 | 41 | 36.4 | 46.7 | 8 | 7 | | |
| $x *$ | 38 | 8.5 | | 41 | 39.1 | 49.1 | 1 | 36 $\frac{1}{2}$ | + 2.55 | -6' 30.5 |
| a | 39 | 47. | | 43 | 17.0 | 27.3 | 9 | 28 | | |
| x | 39 | 49.5 | | | 19.0 | 29.7 | 2 | 57 | 2.20 | 6 31. |
| a | 41 | 14.2 | | 44 | 44.7 | 54.7 | 7 | 48 | | |
| x | 41 | 16.6 | | | 47.0 | 57.4 | 1 | 16 $\frac{1}{2}$ | 2.50 | -6 31.5 |

+ 2.42

- 6 31.0

Res. to mean

+ 0.1

Comet 1861 II.

1861 July 4.

Obs. 11370.71 10 54 27.12 +67° 11' 27.9
 +1 15.18 - 6 5.8

1861.0 10 55 42.30 67 5 22.0 2° 67 8.51
 Red. to app. +2.00 +1.4
 Comet - Star A. +1 37.34 - 10 52.2 10 0.37911
 HA mid 9.44637
 Comet's app. place. 10 57 21.64 +66 54 31.2 1.40487
 2.54096
 9.96234

15 43 21.5 El.
 5 41.5

15 37 40
 6 50 42
 1 26

8 45 32 Cambridge M. T.

G 351° 7'
 x 163 56
 14 168 21

40 0.374 f 39" 18
 100 9.473 9" +15.19
 9 1.234 1" -24.39
 100 9.9674
 1 0.410 9' -15.89
 100 9.6644 1' +16.62
 1 1.309 1' +0.71
 100 9.947
 100 9.914

This observation had better be revised.
 Needs a rather careful examination

Comet II. 1861

July 5

Prof. Bond obs

1 minute to be subtracted
from the time here given
on two wires Spr. Gov. * of 9 mag

* 16 46 29.8 40.1 - 3.95 4' 28" + 1' 21"

46 34.0 43.8 3 7

* 17 28.0 37.9 - 2.20 3 56 + 1 19

30.3 40.0 2 37

* 48 37.0 47.3 - 0.10 3 11 + 1 14

37.3 47.2 1 57

2 comet fol. #
at Sec wire 0.1

* 50 4.9 14.7 3 59

7.7 17.9 + 3.00 5 11 + 1 12

46 35
47 32
48 30
50 10
"

+ 5.81

+ 1' 16.5

~~16 47 9~~
~~16 47 2~~

276 16 46 42
HC 4 50 40

CL
236
fact

16 48 15.

5 42

16 42 33

6 54 37.7

9 47 58.3

1 36.3

65° 11'

J W Watts July 5^m 10^h



Comet II 1861

1861 July 5

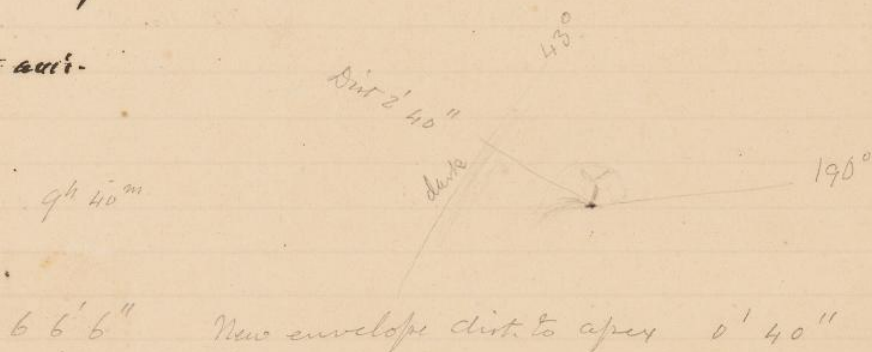
L.P.B

Comet again under fine definition & clear sky

There is a striking resemblance in the successive envelopes
they are in fact more nearly alike than I can easily draw the

There is always a jet of brighter light upward from nucleus branch
to left & right - mostly to left hand. and another for-
ming the lower left hand boundary = All like a furc.

A new envelope tonight nucleus

2" rather elongated perp. to axis.

Outer envelope very diffuse

At 236 18h 50m
Apex New envelop 926' = 0' 50"



July 5 continued
Took passages in A

Motion in R in 1^m = 1^h 80

Correction for
motion of Comet in
interval

| Transit edge | 55'5" near apex | E.C. 18 ^h 49.42.1 | | | | diff. R |
|--------------|-----------------|------------------------------|------|--------|---|---------|
| 66'6" | " | 50 3.7 | 31.5 | - 0.94 | = | 30.56 |
| nucleus | . | 50 13.6 | 9.9 | - 0.31 | = | 9.59 |

18 50 38.8

9.18 94.48 cos 65° = 3.88 = 0.97 = 58"

29.04

59.3

29.6 - 0.89 = 28.71

51 8.4

9.1 - 0.30 = 8.80

51 45.9

52 5.2

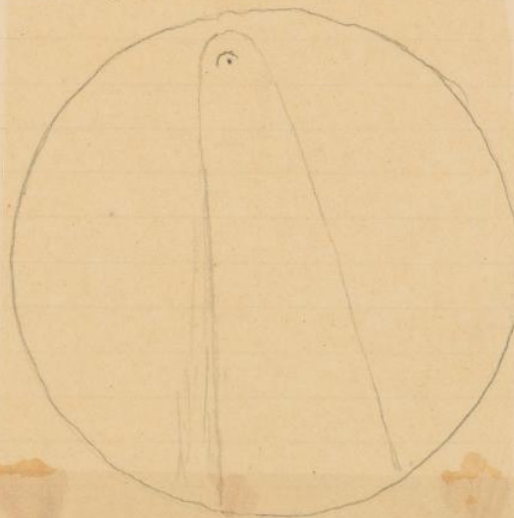
28.7 - 0.86 = 27.84

52 14.6

9.4 - 0.30 = 9.10

In ~~front~~ Comet ~~area~~

Field = 2° 48'



Comet 1861.II.

July 5.
1861

Star b comp. with a. = Helix. 12283 = Bailey 22657.

B. 1 7 El. 19 5 16.0
a. 9 11 6 21.8

Star a precedes Comet n.f.

Δ - x
 Δ x

Δ x

a 3 3 El. 19 7 4.6 14.2
B 7 56 7 25.4 35.5 + 21.05 + 4' 58"

a 1 29 19 9 5.4 15.1
B 6 16 9 29.9 39.9 24.65 4 47

a 3 10.5 19 11 8.9 18.7
B 7 33 11 37.7 47.7 28.90 4 42.5

a 4 24 19 13 20.8 30.2
B 8 52.5 13 53.2 63.2 32.90 4 38.5

a 4 21 19 15 22.7 32.1
B 8 46.5 15 59.0 69.0 36.60 4 28.5

St

19 11 46 *ripes.*

Mean

Ref. Temp. am

+ 28.78 + 4' 39.3

Comet's MR. and Dec. 11 57 9.67 + 66° 3' 22.0

El. 19 11 46
for 5 42
19 6 4 Sidereal
16 54 38
12 11 26
2 0
12 9 26

Comet 1861. II,

1861. July 5.

Star's place.

Traced from Arg. Mr. Nova
 The crosses in circles indicate points in great circle drawn
 from Sun through nucleus July 5, 1861.
 at 18h 4m Sid. = 11h 24m 55

Chart V

Chart IV

Path of comet's great circle from sun through nucleus at 18h 4m Sid.

Dist from nucleus Computed by T.H.S. June 4, 1860.

| | | | | |
|----|----------|----------|-------|------|
| 0° | 178° 59' | +66° 06' | -16.2 | +7.0 |
| 10 | 203 11 | 65 2 | | |
| 20 | 222 58 | 60 78 | | |
| 30 | 237 4 | 54 04 | | |
| 60 | 260 17 | 29 14 | | |

Opposite Sun 117° 14 285 13 -12 43

Reynolds
Compt.!

2 *2*

5^h 11^m P.M.

Path of ~~Earth's~~ great circle from sun through nucleus at $19^h 8^m$ Sid
 = $11^h 24^m$ m.s.t.

| Dist from nucleus | α | δ | Computed by T.H.S. | procc to 1840 | α | δ |
|-------------------|-----------------|-----------------|--------------------|---------------|----------|----------|
| 0° | $178^\circ 59'$ | $+66^\circ 06'$ | | -16.2 | | $+7.0$ |
| 10 | 203 11 | 65 2 | | | | |
| 20 | 222 58 | 60 38 | | | | |
| 30 | 237 4 | 54 04 | | | | |
| 60 | 260 17 | 29 14 | | | | |

Opposite Sun $117^\circ 14$ 285 13 -22 43

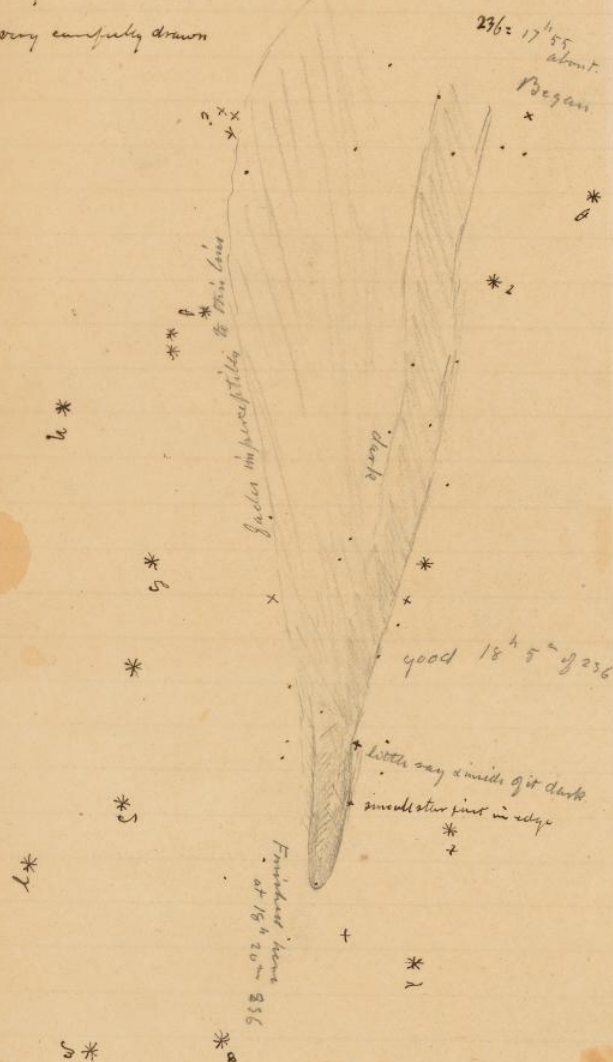
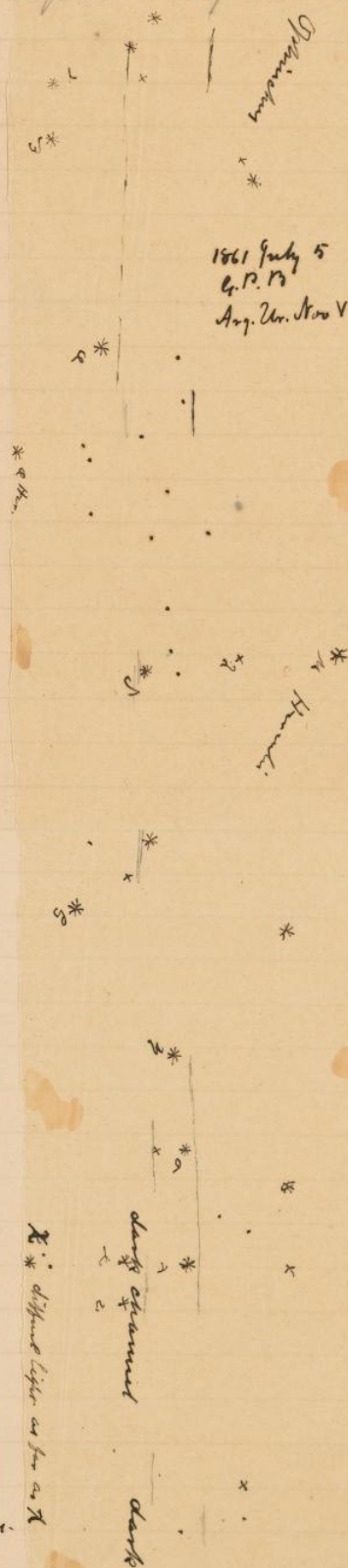
Comet II 1867

1861 July 5 cont.

Drawings of tail & principal Ray about Aug. Ur. Nova.

Finished 10^h 50^m a.m.1861 July 5 G.P.B.
Arg. Nova Uran. IV.

very carefully drawn

1861 July 5
G.P.B.
Arg. Ur. Nova V

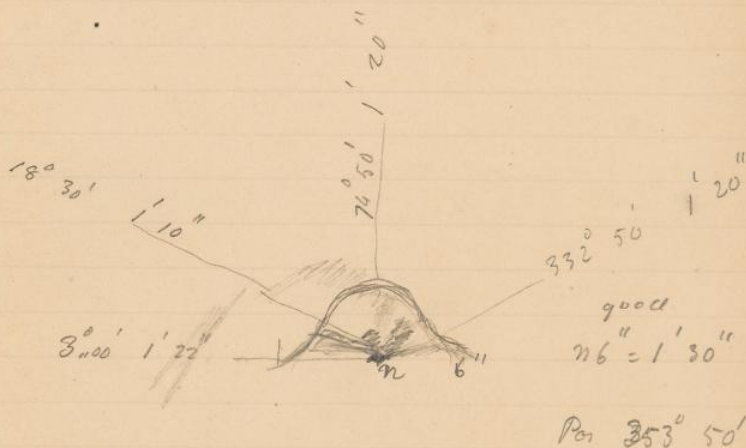
Edge of light from γ Draconis past a to north side near nucleus has two or more points of contrary flexure. & I have no doubt that the ray is tortuous. On revision by comparison with others I can not alter the course of edge by any means to a great circle. Indeed a straight edge held in the hand against the sky shows the irregularities plainly.

The comet is surely fainter. In Comet seen the dark channels below. In tracings of path of ray I take the pretty sudden after abrupt termination of brighter light but I am convinced that faint irregularity is diffused perhaps 2° on either side. The dark channel on S. side is still discernible from below & Draconis almost to α Spiculi.

1861 July 6

Good definition

Nucleus 3"

EC 15^h 30^m

Outer envelope a compressed haze -

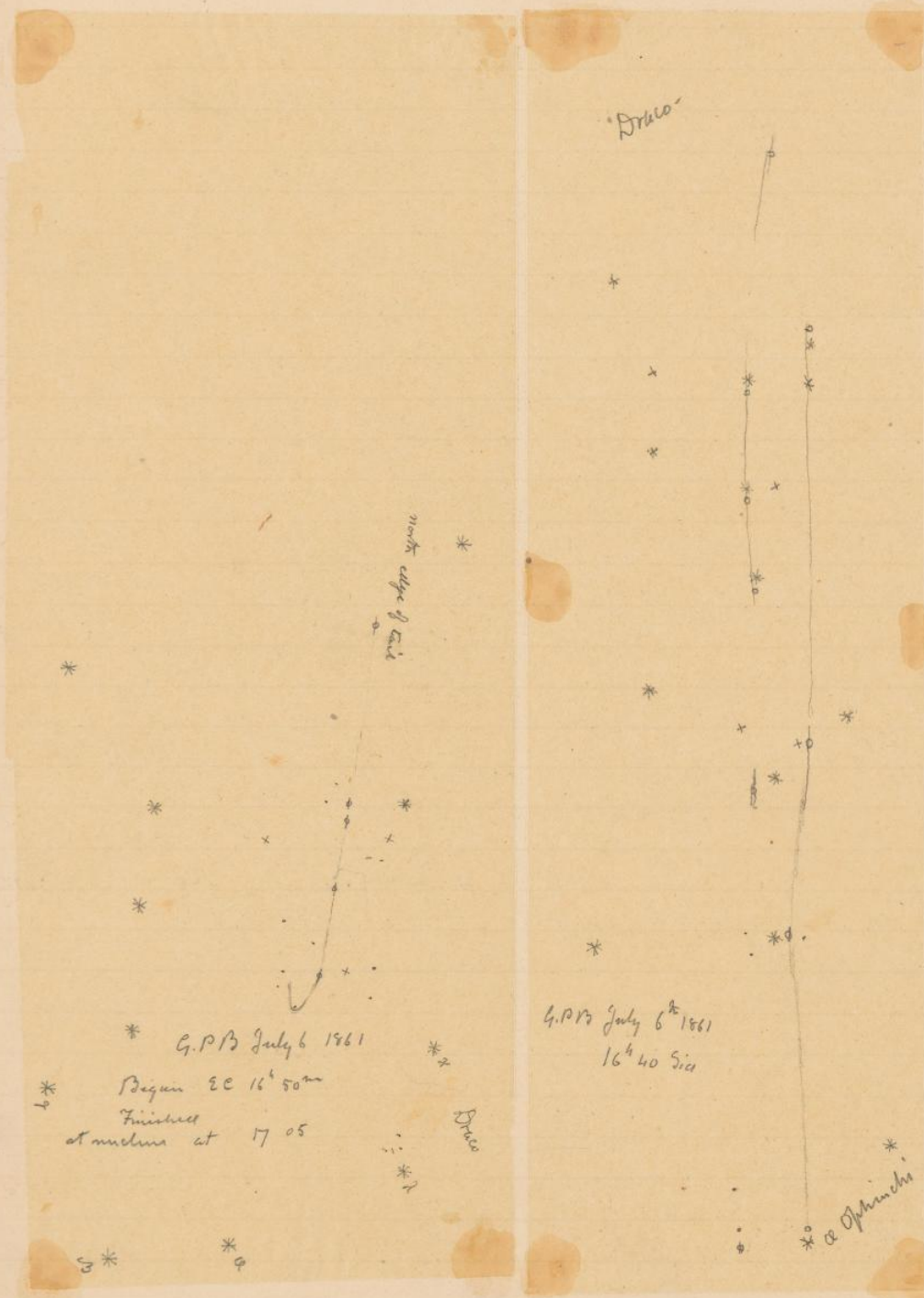
Inner envel. probably (5) not (6)

Precisely like a military chaparran.

DDD followed by signals
 of Transit of Aps 55' 5"
 and Aps 55' 5"
 and nucleus



Envelopes always rather best
 defined on left side
 a inner one close to nucleus is
 sharply defined on lower side



Comet II 1961.

1961 July 6

S.P.B.

Comet prec star

16 2 9.8 19.4
43.6 54.1

Comet 4' 31"
Star 8/9 2 1

North?
Another star is 3' South of Star
of Comp & follows at 15°

J.H.S.
Angle inside 303° 34'

Comet North Prec Star

 Δd Δx

| | | | | | | | | | | |
|---|----|----|------|----|------|------|------|----------|----------|---------|
| | | | | 16 | 20 | 23.5 | 32.8 | Scale | + 1' 19" | - 10.80 |
| * | | | | | 20 | 34.3 | 43.6 | 5' 12" | | |
| | | | | | | | | 3 53 | | |
| | 16 | 18 | 34.2 | 16 | 22 | 0.4 | 10.1 | 5 54 | 1 15 | - 8.65 |
| * | | | 43.8 | | 22 | 9.0 | 18.4 | 3 39 | | |
| | | | | 16 | 23 | 14.4 | 24.1 | 6 18 | 1 8 | - 6.70 |
| * | | | | | 23 | 21.3 | 30.6 | 5 10 | | |
| | | | | 16 | 24 | 51.9 | 61.5 | 6 41 1/2 | 1 3.5 | - 4.65 |
| * | | | | | | 56.5 | 65.8 | 5 38 | | |
| | | | | 26 | 23.1 | 32.4 | | 4 49 | 0 58 | - 2.45 |
| * | | | | | | 25.6 | 32.8 | 3 51 | | |

Ee. 16 20 28

22 5

23 19

24 57

26 28

(Time for Dec. same
as for AR)

236 = 16 24 51
HC 3 50 33

16 23 27.4 - 6.57 + 1' 8".7
Refr. Temp. omitted

Dec 64° 51'

Probably Olsen 128ⁱⁿ/₁₃

Chad 1861. II.

July 6.

Altzen 128^m/₂ = no other authority.

1842.0 12 30 15.795 + 64° 56' 40.2"

51.105 - 6 17.6
1841.0 12 31 8.90 + 0.04 64 50 22.6

R. to app. + 2.23 + 2.0

J-* - 6.57 + 1 8.7

J.A.R. 12 31 2.50? (2.60) + 64 51 33.3
Dev.

16 23 27.4

5 12

16 17 45

6 38 34

9 19 10

9 17 32

9 17 39 H. J. Canting

L⁰ 12 30 41.4

S⁰ 64 53.52

B⁰ 0.32919

sin² 9.99609 12551.

1.40487

2.55096

9.99609

0.85987

8 167 47

6 354 10

14 166 23

h₀ 0.328 f + 37.50

v. (h₀) 0.5522 g⁰ - 1.25

g 1.237 h⁰ - 4.26

c (h₀) 0.000

h₀ 0.371 g' - 17.26

sin(h₀) 9.007 h' + 18.33

h 1.008 i' + 0.89

sin(h₀) 9.998

sin² 9.997

Comet II

1861 July 7

New envelope 77'7" Good definition

n6 = 2' 10" very faintly outlined - seen only on left hand

In find nucleus is 8' from apex
at nucleus perp to axis 16' = Breadth

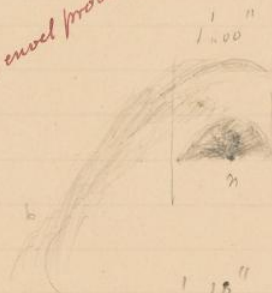


There is a similarity among
successive envelopes.

Inner envelope sharply cut
on lower side close to nucleus
but no dark hollow in tail.

a good deal
brighter 8' 4 times
as below

Inner envel probably (6) not (7)



n7' = 0.32"

n6 = 2' 10"



No dark axis - all a mist.

$\phi = 10^\circ$
 $\delta = 137^\circ$
 $\delta + 4^\circ$

Ray divides but by a clearly marked line
 when viewed + is probably a new open
 protell on the edge of the

$7^{\text{th}} 11.40^{\text{th}} 1864$

H. P. Y. has two good drawings.

Very Rather hazy

1861 July 7 10^h 40^m

G. P. North

very hazy July 7

very hazy

a. B. C. P. North

1861 July 7 11^h 30^m m.s.t.

G. P. B.

Very Mr. North

* a. P. North

1

Comet SE 1861

July 8 1861

G. R. B.

Good definition

Finished at 236 = 16° 35'

Nucleus 2.5
brilliant > 5 Mr. Min. nearly = ∞
to naked eye -

$$\eta\gamma = 1'.00''$$

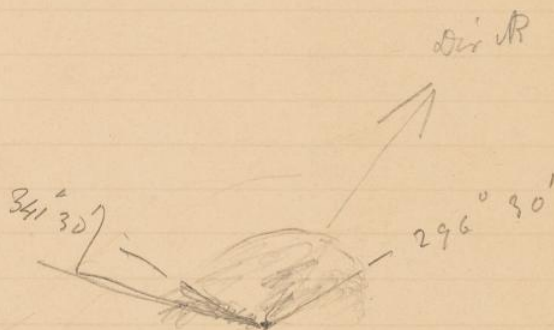
$$\eta\gamma'' = 0.40$$

Inner envel. probably (b)

$$\text{Apex } 1' 2'' = \eta\gamma'$$



On the left hand the envelope next to the innermost has frequently appeared almost as though having the double outline on that side as below.



- 2 I imagine that the outer envelope seen to right may have for its outline only the innermost edge

1861 July 8th GPR

Diffuse tail extends
its left hand
edge through
2nd Herules (7. 7₂)
to 5th Cor. Por.

Some haze in sky-

With Opera glass I
strongly suspect
two or three alternating
dark channels & bright
ray

GPR

1861 July 8
Arg. Mr. Nova

20 17^h 15^m

finished-

haze 2° on either
side of narrow
ray-

17^h 10^m

2nd Herules

Narrow bright ray
to middle

2nd Herules

5th Cor. Por.

Ray well marked

Haze faint

Prod 1861 II.

1861 July 8.
1861

| | | | | | | | |
|------|----|----|------|------|--------|--------|--------|
| II. | 17 | 10 | 53.3 | 61.4 | Star x | 2 33 | 2 35 |
| | | 11 | 26.4 | 34.9 | Comet | 6 7 | 6 7 |
| I. | 17 | 14 | 54.7 | 62.9 | Star a | 6 22 | 6 25 |
| | | 18 | 33.6 | 42.0 | Star x | — | 1 41 |
| | | 20 | 12.4 | 20.8 | Comet | 4 44 | 4 45 |
| II. | 17 | 21 | 30.7 | 38.9 | Star a | 7 32 | 7 34.5 |
| | | 26 | 52.9 | 61.5 | Comet. | 5 26 | 5 26.5 |
| III. | 17 | 28 | 22.0 | 30.4 | Star a | 6 51 | 6 54 |
| | | 33 | 49.8 | 58.2 | Comet | 4 23 | 4 23 |
| IV. | 17 | 35 | 10.0 | 18.2 | Star a | 6 54 | 6 56 |
| | | 40 | 42.5 | 57.3 | Comet | 4 59.5 | 5 0 |
| V. | 17 | 42 | 11.6 | 19.8 | Star a | 7 42 | 7 45.5 |
| | | 47 | 49.4 | 57.9 | Comet | 4 13 | 4 12 |

obs'd at angle 353° 34'.

At last obs. Hor. Ang. 44 18 30 Sec. + 61° 47'

Alt in Decl.

Star a is prob. Oclt 13571. - Alt. 203.59.

| | | | | | | | | | | |
|-----|---|----|----|------|-----|-------|------|-------|---------|--------|
| Elb | C | 17 | 20 | 16.6 | + 5 | 17.80 | - 1' | 39".0 | - 50".0 | 20.0 |
| | | | 26 | 57.2 | | 22.40 | 2 | 07.0 | 25.6 | 21.6 |
| | | | 33 | 54.0 | | 27.80 | 2 | 29.5 | - 0.2 | 29.7 |
| | | | 40 | 46.9 | | 32.80 | 2 | 54.8 | + 24.9 | 29.9 |
| | | | 47 | 53.5 | | 37.95 | 3 | 31.2 | 50.4 | (40.4) |
| | | 17 | 33 | 57.6 | + 5 | 27.75 | + 2 | 32.5 | + 2" | 30.3 |

Cinet 1861. II.

1861 July 8.

S.B.

| | | | | | | | |
|---------------|----|----|-------------|-----------|-------|--|---------------|
| 1612.0 | 13 | 15 | 22.99 | + 61° 54' | 42.2 | 2° | 13 15 44.5 |
| | | | + 42.93 | - 6 | 0.4 | 2° | 61 51.70 |
| 1861.0 | 13 | 16 | 5.92 + 0.04 | 61 | 48 | 41.8 | 80 |
| Pm. to app. | | | + 2.34 | | + 2.2 | | 140° 0.27 79 |
| S - * | | | + 5 27.75 | - 2 | 32.8 | 30.3 | 140° 9.91 121 |
| | | | | | | | 1.60682 |
| S. app. place | 13 | 21 | 36.05 | 61 | 46 | ~~11.7~~ ^{13.7} ~~2.0~~ | 258097 |
| | | | | | | | 9.97556 |

| | | | |
|--------|----|------------------|--------------|
| 91. 17 | 33 | 57.6 | |
| | 5 | ~~41.2~~ | 43.5 |
| 17 | 26 | ~~13.2~~ | 14.1 |
| 17 | 6 | 27.5 | |
| 10 | 21 | ~~110.8~~ | 46.6 |
| | 1 | 41.9 | |
| 10 | 20 | 5 | Cambing N.T. |

C 354° 12'
 L 149 1
 H 164 36

40 0.271 + 39.63
 140 9.399 9° - 7.44
 9 1.241 10° + 2.77
 140 9.988
 140 0.326 9° - 16.94
 140 8.500 11° + 17.86
 140 1.308 12° + 1.26
 140 9.999
 140 9.945

Comet II 1861

1861 July 10 9^h

Saw the Comet with great Refractor at

10 P.M. Bright nucleus in a

map of haze. No outline envelope

clearly seen but there seems to

be a new one 88'8" forming

$$n 8' = 15''$$

Inner env. probably 17'

Next outside is a dim map suggesting 1'30" to 2'00" for its distance

There is no possibility of measuring the ang of pos of axis of tail.

(July 9)

Place of Comet (inter-related)

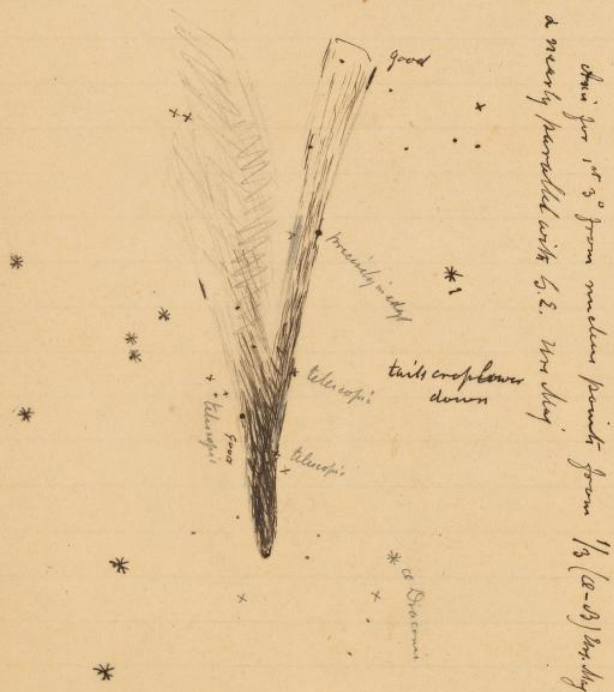
| | | |
|--------------------|-----------------------|-------|
| At 9 55 | 204° 18' = 204.3 | |
| | 60 24 | 60.4 |
| ⊙ 109 15- | Angle of Pos. of Tail | |
| + 22 17 | at Comet 105° 38' | |
| Distance from Head | Comp. at 6. Dec. | |
| 0 | 204° 18' + 60° 24' | |
| 5 | 213 36 | 58 42 |
| 10 | 221 54 | 56 26 |
| 20 | 235 28 | 50 30 |
| 30 | 245 46 | 43 21 |
| 40 | 253 47 + 35 29 | |
| 90 | 280 37 - 7 39 | |
| 70 | 271 2 + 9 55- | |

1861 July 9

Remarkable change of aspect in tail

10^h

1st 3° of Tail axis directed from point between α & β Nov. day $\frac{1}{3}$ (2 to 3)



9^h 55^m m.s.t. 1861 July 9 G.P.B. Uran. Nova

Very remarkable - Principal Ray strongly curved. The two tails seem to proceed the Ray from left hand side of head & the clippers one from the right hand side, cropping each other lower down than above indicated say 4° to 5° from nucleus.

The ray is well defined for say 25° to 30° & can generally be defined within $\pm 10'$

often within ± 2

1861 July 9 G.P.B. 10^h 10^m Uran. Nova
Principal ray well seen to S.E.
Remarkable change position to 2 & 4 v.
recognition instantly.

* Draw



Comet 1861 II.

1861phae.proj..1968

1861 July 9th
H.S.

| | | | | | |
|---|------|------|-----------------------------------|---------|------|
| 8 | 0 48 | 0 49 | 21. 17 43 | 11.3 | 19.0 |
| a | 9 42 | 9 45 | (1 st last) (Not good) | 44 38.8 | 46.6 |
| 6 | | 1 31 | | 45 — | 67.1 |

| | | | | | |
|---|-------|--------|---------|-----|------|
| 8 | 4 11 | 4 11.5 | 17 48 | 2.6 | 10.6 |
| 8 | 5 7.5 | 5 10 | 50 48.2 | | 56.3 |

| | | | | | | |
|---|------|--------|----------|-------|------|------|
| 8 | 4 58 | 4 58.5 | B. in ny | 17 52 | 24.4 | 32.7 |
| 6 | 6 10 | 6 13.5 | | 55 | 8.0 | 15.8 |

| | | | | | |
|---|------|--------|-------|------|------|
| 8 | 4 43 | 4 43.5 | 17 56 | 59.7 | 67.9 |
| 6 | 6 10 | 6 14 | 59 | 39.9 | 48.1 |

D.B

| | | | | | |
|---|-------------------|--------|----|--------|------|
| 8 | 4 29.5 | 4 29.5 | 16 | 1 10.1 | 18.3 |
| | Star lost. Cloud. | | | lost. | |

| | | | | | |
|---|--------|--------|----|--------|------|
| 8 | 4 14.5 | 4 15 | 18 | 5 46.6 | 54.5 |
| x | 6 11 | 6 15.5 | 8 | 22.1 | 30.0 |

| | | | | | |
|---|-------|-------|----|--------|------|
| 8 | 4 3.5 | 4 4.5 | 16 | 9 48.2 | 56.0 |
| x | 6 12 | 6 17 | 12 | 21.5 | 29.3 |

Obs'd at angle 353° 34' as before
A = Oct 13 9 38 B = Oct 13 9 65

| | | | | | | | | | | | | |
|-----|----|----|------|---|---|-------|---|----------|--------|-------|--------|----------|
| El. | 17 | 48 | 6.6 | — | 2 | 45.65 | — | 0' 57.5" | + 6.12 | 39.93 | - 34.9 | - 1 32.4 |
| | | 52 | 28.6 | | 2 | 43.35 | | 1 13.5 | 3.60 | 35 | - 20.5 | 34.0 |
| | | 57 | 3.8 | | 2 | 40.20 | | 1 28.8 | + 0.93 | 37 | - 5.3 | 34.1 |
| | 18 | 5 | 50.5 | | 2 | 35.50 | | 1 58.5 | - 4.16 | 66 | + 23.7 | 34.6 |
| | | 9 | 52.1 | | 2 | 33.30 | | 2 10.5 | 6.50 | 40 | 37.0 | 33.5 |

Mean 17 58 40.3 — 2 39.60 — 1 33.8 Verified

Star for Comet 1861 II

1861 July 9th
JWS

1862.00 13 39 35.61 + 60° 29' 2.3
+ 39.43 - 5 45.4

1861.00 13 40 15.04 + 0.04 + 60 23 16.9
Red to app. +2.40 + 2.1
S - + - 2 39.60 - 1 33.8

1861.00 13 37 37.88 + 60 21 45.2

α 13 39 55.3
 δ 60° 26' 16

$\log$ 0.24623

$\sin$ 9.62563

1.40187

2.55097

α 9.95735

1.27693

2.53832

-18.912
56.342

G 356° 13'

α 205 4

δ 163 40

$\log$ 0.245 39.99

9.519 -10.17

1.243 + 6.23

9.975

$\log$ 0.306 -16.54

9.184 +17.43

1.307 +1.22

9.995

9.939

17 58 40.3
5 44.3

17 52 56

7 10 24

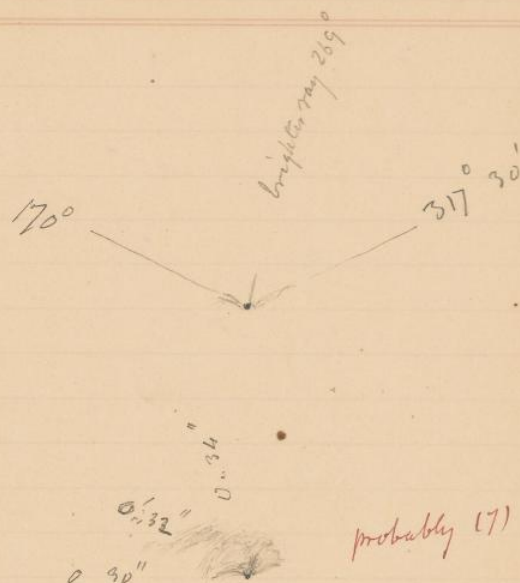
- 1 45

10 40 46 *Comet. sm. t.*
47

Comet II 1861

1861 July 10

Clear & good definition



Probably 8' 8"

At 16" dist

probably (7)

No outer envelopes visible but the haze is brightest on left hand side - shooting off beyond margin of field

In twilight I think in the finder that the axis of the tail appears rather brighter

than the sides - Cator saw this was very as below

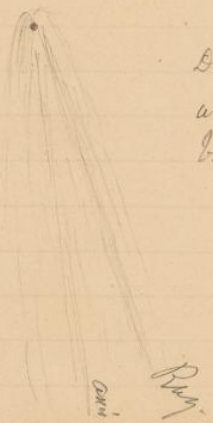
In finder very distinct

In twilight at 25' from nucleus breadth = 20' difficult

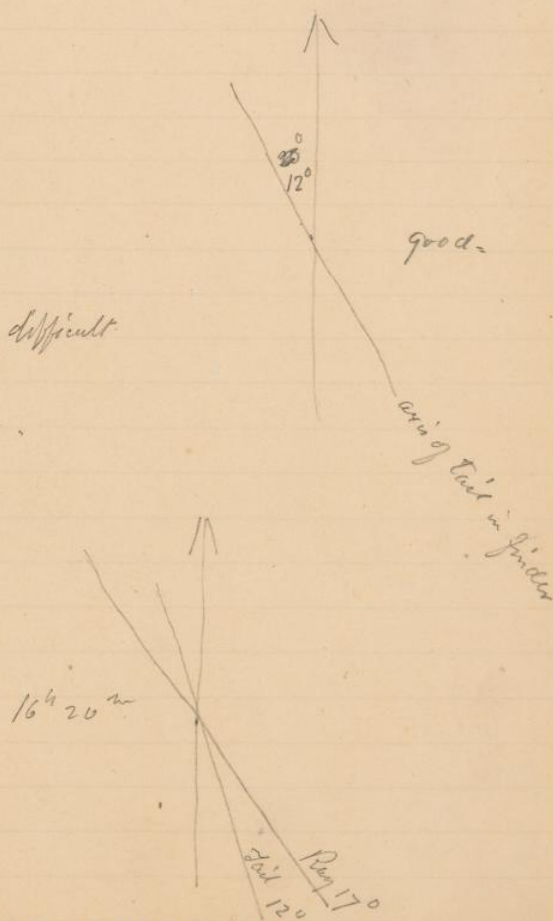
0 " " 12

a

16" 25"



Dark
at 50' from n
breadth = 25'



1861 G.P.B. July 10^c.

Sid. time 16^h 45^m

Comet neck

Length of principal ray diminishes

Nucleus to naked eye = Star 2-3 mag

Very singular
More than 3°
In Opus of star seen as
beginning of ray.

stronger ray

2 1/2° above

1861 July 10
G.P.B. Mr. Norton
17^h 00^m Sid.

1861 G.P.B.
July 10
18^h 50^m Sid.

Heavy lower edge
Left hand side
to the right

Seems still to
keep as before relative
to a Opheus but
diffuse & uncertain

* 3 Hercules

Comet 1861. II.

July 10.

Comet comp: with Peltzen 141.17

| | | | | |
|----------|------|--------|------------|------|
| Comet | 5 32 | 5 33.5 | 16 58 39.3 | 67.1 |
| Star | 6 42 | 6 46 | 17 1 22.2 | 29.5 |
| Comet B. | 5 22 | 5 22 | 17 2 39.2 | 47.2 |
| Star. | 6 44 | 6 47 | 5 0.7 | 8.6 |

~~Star.~~
Comet.

B.D.

Comet 4 49 4 49

Interrupted by clouds.

M.C. +26.0 - 2.98

| | | | | | |
|------|-----------|------------|-----------------|------------|----------------|
| El. | 16 59 3.2 | Δd | - 2 22.65 +0.49 | Δd | - 1 11.2 - 5.5 |
| | 17 2 43.2 | | 2 21.45 -0.44 | | 1 23.5 +2.5 |
| Mean | 17 0 53.2 | | - 2 22.05 | | - 1 17.4 |

Rep. Temp. on.

Cinet 1861. II.

1861 July 10.

| | | | |
|-------------------|-------------|----------------------|---------------|
| 13 51 8.01 | 59 16' 26.2 | 109.70 | mg. |
| +38.41 | -5 36.9 | | 9 |
| 13 51 46.42 +0.04 | 59 10 49.3 | ~~59 0 49.3~~ | |
| +2.43 | +2.2 | | 20 13 51 27.2 |
| -2 22.05 | -1 17.4 | | 20 59 12.63 |

1861.0
Red to app.
8-*

| | | | |
|-------------|------------|--------------------|---------|
| 13 49 26.80 | +59 9 34.1 | ~~59 34.1~~ | 024510 |
| | | | 9.66968 |
| | | | 1.40657 |
| | | | 2.58097 |
| | | | 9.94668 |

81. 17 0 53.2
5 44.9

16 55 8.3 *L. daniel*
-7 14 20.7
-1 35.1

9 39 12 *Cambria m.d.*

1.29965
-19.926
58.322

G 354.14
N 207.57
H 162.50

tg 0.224 $\delta + 10.15$
ml 9.977 $\delta - 11.10$
J 1.2614 $\delta + 7.40$
a(two) 9.967

td 0.291 $\delta - 16.23$
di(two) 9.972 $\delta + 17.10$
N 1.307 $\delta + 1.30$
a(two) 9.992
di 9.934

Comet II 1861.

1861 July 11

One Envelope only $88'8''^2$ probably (71)

In Comet sketch

16^h 25 Sid.

Taking outline of equal faint light. The
breadth of nebulosity perp. to axis on line
through the nucleus is $2\frac{1}{2}$ times dist n to
apex-

double stars brighter 7^h ? $\frac{6}{10}$ of field

Comet II

1861 July 11

Clear - bright

1961 July 11^h 16 30 miles
to 16 45 did. time

There is a dark channel on either
side of narrow way which is
shady defined by it.

dark bendy in

dark stream clearly seen
to χ & perhaps beyond

28/

Faint left hand tail. linear 2500

Linnaea 1119. 2

1861 July 11. G.P.B.

Mr. Novae. 16th 45 Sid

65 17 20

Have on pre side seems
even to expand out as far
as the center of
Cereus Poracali.

In Opera glass the sharply cut narrow ray contrasts clearly with the dark channels on either side and note that these channels prove the existence of hazy light on both sides of ray outside of Channels

1861 July 12

Finch
 Sid. $16^h 45^m$

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

$$" \quad \frac{11}{26}$$

At dist 50'
 breadth tail = 24'

dist 15'
 br = 17

Beam at nucleus 15'
 to apex 6

Left side of head
 is slightly brightest

Seems to
 curve

The dark channels still recognized with opera, lens & Comstock

have noticed that the upper edge

of diffused tail is pretty decidedly marked
 & tonight when very clear reaches even
 beyond centre of Com. Nov. ^{diffuse light} almost to the
 group. Big Serpens M & Hercules over greatest

With a sky perfectly clear I was
 pretty confident that an extremely diffused
 nebula still lingers near a Opheus. The
 was rather on the following side of it. 25° broad.



Tail has aspect
 of two contrary curves

1861 Jan 12

GPB

New envelope 99'9" ²

$$m_9 = 0'25''$$

new envelope better defined
than its late predecessor

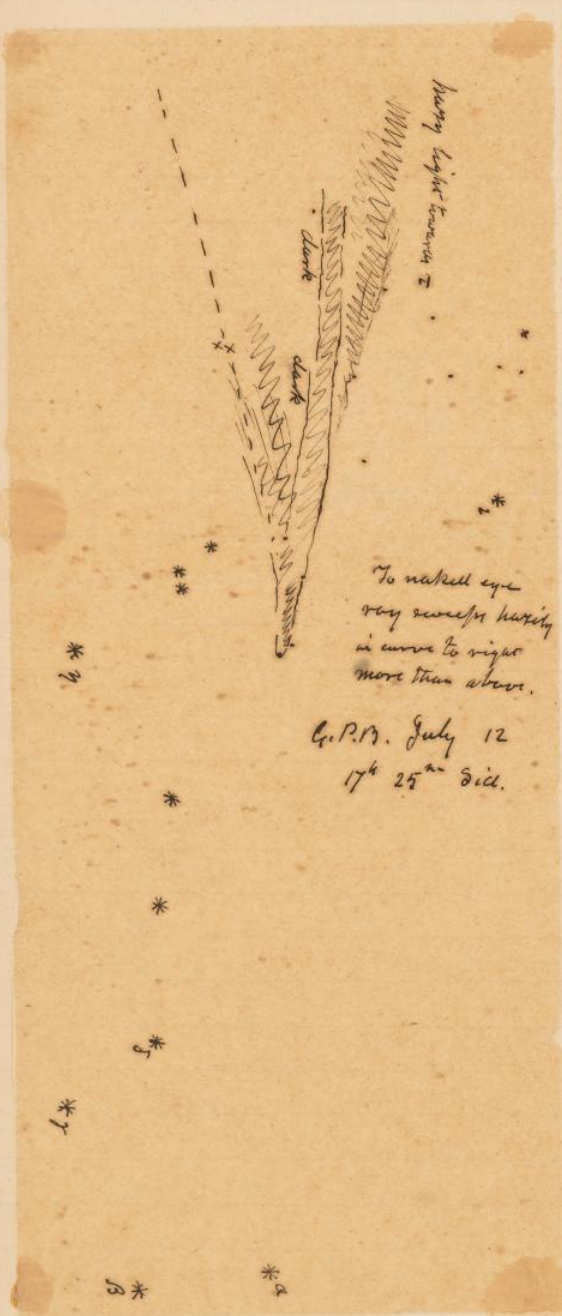
measures 3"

possibly a heavy outline



Inner envelope probably (8)

1861 July 12



General aspect
of Const.

Orion 1861 II.

1861 July 12.
Chr. 236

Comet S.P.

J.H. obs. App. rec. (Copy)
Scale

u.

| | | | | | | | | | |
|----|------|------|----|------|------|------|---|------|--------|
| 19 | 19 | 10.9 | 19 | 22 | 20.7 | 28.2 | 3 | 29 | 3 20 |
| * | 20 | 27.9 | 23 | 27.9 | 45.3 | | 6 | 38 | 6 28.5 |
| 23 | 16.7 | | 25 | 2.8 | | | 3 | 18 | 3 16 |
| * | 25 | 2.8 | | | | | 6 | 37 | 6 38 |
| 26 | 1.5 | | | | | | 5 | 12 | 5 10.5 |
| * | 27 | 16.2 | | | | | 8 | 37.5 | 8 39 |
| 28 | 11.6 | | | | | | 5 | 6 | 5 6 |
| * | 29 | 25.6 | | | | | 8 | 37 | 8 37 |
| 30 | 23.7 | | | | | | 6 | 12.5 | 6 13 |
| * | 31 | 38.6 | | | | | 9 | 53 | 9 53 |

Chr. 236

 Δu wt.
AR Δv Reduced. App. rec. H.S. Mot
-21.5

| | | | | | | | | | |
|----|------|------|----|-------|---|----|------|-------|----------------|
| 19 | 19 | 10.9 | -1 | 17.10 | 2 | -3 | 8.3 | -13.2 | Reduced 3 22.0 |
| 23 | 16.7 | | | 16.10 | 1 | 3 | 20.5 | -1.7 | 22.2 |
| 26 | 1.5 | | | 14.70 | 1 | 3 | 27.0 | +3.9 | 23.1 |
| 28 | 11.6 | | | 14.00 | 1 | 3 | 31.0 | 9.3 | 21.7 |
| 30 | 23.7 | | | 12.90 | 1 | 3 | 39.8 | 14.9 | 3 21.9 |
| | | | | | | | | | 3 21.5 |

Chr. Time

Verified

Reduced to 19 24 27.3 -1 15.32 r -3 22.8

Ref. and temp. very small.

1861 July 12. Orion transit (Chr. 236) at 5 50 10.78
Error of inst. assumed = 0.

Rate (2.5)

fast

121. put

2 29.3

5 46.7

(21.236 3 17.4. above)
(about right)

Comet 1861 IV.

1861 July 12.

Star - Altamir 1403³₀₄

| | | | | | |
|----------|----|--------------|-------|----------|---------------|
| 18612.00 | 14 | 8 35.94 | + 57° | 3' 30.0" | 2° 14' 8.54.7 |
| | | + 37.47 s.c. | - 5 | 22.3 | 57° 0' 48.8 |

| | | | | | | |
|--------------------------|----|----------------|----|----|----------------|------------------|
| 1861.00 | 14 | 9 13.41 + 0.04 | 56 | 58 | 7.7 + 0.1 to 8 | 0.18771 |
| Red. to app. | | + 2.46 | | | + 2.2 | 9.71696 |
| Comet - Star | - | 1 15.32 | - | 3 | 22.8 | 1.40487 1.31954 |
| Comet ^o L. d. | 14 | 8 0.59 | 56 | 54 | 17.2 | 2.58097 - 20.871 |
| | | | | | | 9.9734 |

| | |
|---|--------|
| G | 354 15 |
| H | 212 18 |
| J | 161 3 |

| | | |
|-------------|-------|------------|
| top | 0.187 | 8 |
| sin (Cord) | 9.650 | f + 10.47 |
| g | 1.248 | 9" - 12.17 |
| sin (Cord) | 9.952 | 10" + 8.55 |
| sin d | 0.263 | g - 15.85 |
| sin (Cord) | 9.363 | N + 16.50 |
| h | 1.306 | i' + 1.56 |
| sin (H + u) | 9.988 | |
| sin d | 9.923 | |

| | |
|------------|------------|
| Apr. 236. | 19 24 278 |
| Jan. | 2 293 |
| | 19 21.58.5 |
| | 7 22 13.8 |
| | 11 59 44.7 |
| | - 1 57.9 |
| Comb. m.t. | 11 57 47 |

| | | |
|-------|--------|---------|
| C. | 212 10 | + 56 49 |
| | 212 0 | 56 55 |
| C - 0 | + 10' | - 6' |

Comet II. 1861

1861 July 13th16^h 55' to 17^h 08^m SidTo apex $n 9' = 1' 00''$

nucleus 2"

169°

247°

outlines scarcely
discernible above

310°

very hazy
outlines
probably (8) Envelope

Zero 353° 31'

In field

$$\tan. \phi = \frac{11}{26}$$



Tail 25' broad at 50' from n.

Further

another axial ray not very bright
ray eccentric

50' from n

ray in center

Comet II, 1861

July 13, 1861

Z.H.S. 66

Decl of Pos 2nd at $353^{\circ} 31'$
Comet N. f. *

| | | | | Scale | | | |
|---------------|----------|----|----------------------------|-------|------------------|----|-------------------------|
| * | 236 = 14 | 14 | 2.8 - 9.9 | 4' | 14 | 4' | 16 |
| ~~14~~ | | 14 | 46.6 53.5 ^{43.60} | 5 | 39 | 5 | 39 1 24.0 |
| | | | | | | | |
| * | | 15 | 39.6 46.7 ^{43.80} | 4 | 11 | 4 | 18 |
| ~~16~~ | | 16 | 23.0 30.6 | 5 | 36 | 5 | 37 $\frac{1}{2}$ 1 20.2 |
| | | | | | | | |
| * | | 17 | 26.1 33.4 | 4 | 15 | 4 | 17 |
| ~~18~~ | | 18 | 10.6 17.6 ^{44.31} | 5 | 32 $\frac{1}{2}$ | 5 | 34 $\frac{1}{2}$ 1 17.5 |
| | | | | | | | |
| * | | 19 | 6.9 13.9 | 4 | 14 | 4 | 16 $\frac{1}{2}$ |
| ~~20~~ | | 20 | 51.5 58.6 ^{44.61} | 5 | 29 | 5 | 29 1 13.8 |
| | | | | | | | |
| * | | 20 | 47.0 54.2 | 2 | 26 | 2 | 27 |
| ~~17~~ | | 21 | 31.5 39.3 ^{49.00} | 3 | 36 | 3 | 37 $\frac{1}{2}$ 1 10.2 |

Comet II, 1861.

July 13, 1861.

El. (see previous page)

Hel. + 45° 15' - 129° 5' ^{± 0.15} 2.16

17 17 18.7 25.8
18 2.4 9.3 43.60

Reduct.
+ 0.42 44.42 14 - 7.3 1 16.7

17 18 55.7 62.7
19 39.5 46.5 43.80

0.44 24 4 - 3.4 1 16.4

17 20 42.2 49.3
21 26.5 33.5 44.25

- 0.41 24 4 + 0.1 1 17.6

17 22 22.8 29.9
23 7.5 14.5 44.65

- 0.43 23 3 + 3.7 1 17.5

17 24 2.9 10.1
24 47.9 55.3 + 45.10

- 0.46 44.34 4 + 7.3 1 17.5
± 0.53 ± 0.39

El. 17 18 6
19 43
21 30
23 11
24 52

revised

Comet - Star
 Δx Δy

17 21 28.4

+ 44° 28' ± 0.24 + 1' 17" ± 0.16

Comet 1861. II.

1861phae.proj..1968

July 13. 1861

Star is probably δ C. 14455.

$8'' = R. XII. 56.$

P. R. J. Rob.

| | | | | | |
|------------------|----|----|-------|------|----------|
| 1562.00 | 14 | 12 | 35.23 | + 56 | 9' 23.1 |
| 19 x Per. 1851.5 | | | 37.62 | - 5 | 18.7 |
| 1860.00 | 14 | 12 | 30.88 | | 9 59.92 |
| 71 x Per. 1850.5 | | | 41.58 | - 5 | 52.34 |
| 1836.00 | 14 | 12 | 22.72 | | 11 7.80 |
| 25 x Per. 1848.5 | | | 49.50 | - 6 | 59.55 |
| 1835.00 | | 12 | 20.74 | | 11 20.15 |
| 26 x Per. 1848.0 | | | 51.49 | - 8 | 16.36 |
| 1801.00 | | 11 | 11.50 | 56 | 21 11.6 |
| | | 2 | 0.51 | - 17 | 5.5 |

S. C.

| | | | | | | |
|--------------------|----|----|--------------|------|---|-----------|
| Star P. | 14 | 13 | 12.22 + 0.37 | + 56 | 4 | 6.1 + 0.6 |
| J. | | | 12.22 - 0.04 | | 4 | 3.8 + 0.5 |
| R. (1839) | | | 12.22 + 0.02 | | 4 | 2.2 - 0.6 |
| Rob. (1853) (1845) | | | 12.46 + 0.01 | | 4 | 6.6 + 0.5 |
| Arg. Obs. (1842) | | | 12.85 + 0.04 | | 4 | 4.4 + 0.1 |

Proper Motion

| | | | |
|--------------|------------|---------|--------|
| Robinson has | Rob - R. | + 0.56 | + 0.48 |
| | S. C. R. | + 0.045 | 0.0 |
| | - S. C. P. | - 0.30? | - 0.8 |

M. somewhat uncertain.
(By least squares - 0.55)

Assumed = 0.

Adopted mean (I. not yet reduced)

| | | | | | | |
|-------------|----|----|--------|------|---|-------|
| Ans to app. | 14 | 13 | 12.22 | + 56 | 4 | 5.9 |
| | | | + 2.43 | | | + 2.2 |

The γ , α , β , δ etc. are from
Runkler, corrected by a near
star in Argland's catalogue
to 1861.
But the minute sec. etc. of α and
were applied wrongly.

1850.0 1800.0

| | | |
|----------|------------|------------|
| α | 14 12 50.8 | 14 11 11.5 |
| δ | + 58 7.14 | 51 21.19 |
| γ | 0.17296 | 0.17660 |
| β | 9.73357 | 9.73374 |
| | 0.126.2 | 0.126.3 |
| | 1.2022 | 1.2022 |
| | 9.73357 | 9.73374 |
| | 0.03765 | 0.03777 |
| | 1.0906 | 1.0886 |
| 1850.0 | + 1.9800 | 1.9812 |
| | - 16.779 | |
| Robinson | | |
| 1800.0 | + 1.981 | |
| | - 16.779 | |
| Perseus | | |
| | 1.9812 | 16.812 |
| | + 1.9800 | - 16.783 |
| | 48.5 | 762 |
| | 50.5 | 778 |
| | 51.5 | 19798 |
| | 50.5 | 1.9805 |
| | | 16.811 |

| | | |
|----------|---------|---------|
| α | - 0.690 | + 4.77 |
| β | + 1.244 | + 13.25 |
| γ | + 1.746 | - 14.80 |
| δ | + 0.148 | - 0.97 |

| | | |
|----------|--------|--------|
| from | Mr. R. | - 0.01 |
| 1836 | | |
| β | - 0.09 | + 0.06 |
| γ | - 0.06 | - 0.04 |

Adopted 1601.0

$$14 \quad 13 \quad 12.33 \quad + \quad 56 \quad 4 \quad 6.4$$

$$+ 2.43 \quad + 2.2$$

Comet - Nov.

$$+ 44.28 \quad + \quad 1 \quad 17.1$$

Comet's A.R. Dec.

$$14 \quad 13 \quad 59.24 \quad + \quad 56 \quad 5 \quad 25.7$$

$$+ 2.03 \quad + 2.2$$

$$21 \quad 17 \quad 21 \quad 28.4$$

$$5 \quad 46.8$$

$$17 \quad 15 \quad 41.6 \quad \text{Sid. Time}$$

$$17 \quad 26 \quad 10.3$$

$$9 \quad 49 \quad 31.3$$

$$1 \quad 26.6$$

$$9 \quad 47 \quad 55 \quad \text{Cmb. m. A.}$$

$$C. \quad 213 \quad 40 \quad 55 \quad 59$$

$$C-0 \quad + 16. \quad - 6'$$

Comet II 1861

Comet Observed by measuring
clouds with gipsies between . 7
10^m or 15^m for 20° or 30°

North edge paper faintly
2nd part of 2.5 of Hensley
or is directed towards
that point too cloudy for
observing

North edge of tail

1861 July 13

17th 10^m Sec. G.P.B.

Between Clouds

Reduction from 1862.00 to 1861.00

$$58^{\circ} 34' 2'' + (1.40487) \sin \alpha^{\circ} \text{ by } d''$$

$$(2.58097) \cos \alpha^{\circ}$$

Reduce

| 1861.a | | | | | | | |
|--------|--------------------------------|----------------------------|--|-------------------|------|----------|--------------------|
| Date | Object | Star | A.R. of * | Dec. of * | Mag. | Observer | Authority for star |
| July 2 | Comet 1861.II | Arg. Alt. 9.57 | 8 ^h 35 ^m 13 ^s | +62° 46.8' | | B | R. Fev. |
| " 3 | " | " 10374 | 9 48 42 | 66 4.0 50m | | B. | R. |
| " 3 | " | " 10476 | 9 55 53 | 66 15.0 | | S. | |
| { | " 4 | " 11505 | 11 2 43 | 66 46.3 | | S | Z. (Riv.) Fev. |
| | " " | " 11507 | 11 2 48 | 66 47.0 | | S | St. (Riv.) Fev. |
| " 4 | " | ~~Anonymous~~
71 | 10 45 45 | 66 58.8 | | S | |
| " " | Star Anon. & A. D. 113702 | 71 | 10 55 42 | 67 3.4 | | S | |
| " 5 | Star Anon. & 1861.II Anonymous | 71 | 11 52 30 | 66 8. | | | |
| " 5 | " " | Alt 12283 | 11 56 39 | 65 58.7 | | | L. |
| " 6 | " " | " 12813 | 12 31 4 | 64 50.4 50m. | | | |
| " 8 | " " | " 13931 | 13 16 6 | 61 48.7 | | | |
| " 9 | " " | " 13938 | 13 ~~40 15~~
29 36 | 60 23.3 | | | G. |
| " 10 | " " | " 14117 | 13 51 46 | 59 10.8 | | | |
| " 12 | " " | " 14403
04 | 14 9 13 | 58 58.1 | | | |
| " 13 | " " | " 14455 | 14 13 12 | 56 4.1 50m Journ. | | | R. P. Rob. |

Ephemeris of Maia (continued)

Wash Mean Midnight

| | α | | δ | $\log A$ |
|--------|-----------|---|----------|----------|
| July 2 | 181° 42.4 | - | 1° 31.1 | 0.4785 |
| 3 | 181 54.4 | | 1 36.6 | |
| 4 | 182 6.5 | | 1 42.3 | 0.4826 |
| 5 | 182 18.8 | | 1 48.0 | |
| 6 | 182 31.4 | | 1 53.9 | 0.4866 |
| 7 | 182 44.0 | | 1 59.7 | |
| 8 | 182 56.8 | - | 2 6.6 | 0.4906 |

Ephemeris of (63)

| | Washington | | | Δ | $\lg \Delta$ | $\lg \epsilon$ |
|---------|--------------|--------------|--------------|--------------|--------------|----------------|
| | ^a | ^m | ^s | ^h | | |
| June 25 | 11 | 10 | 49 | + 1 45.5 | 0.3704 | 0.3562 |
| 26 | | 12 | 7 | 36.4 | | |
| 27 | | 13 | 26 | 24.0 | | |
| 28 | | 14 | 44 | 19.1 | | |
| 29 | | 16 | 5 | 10.2 | 0.3777 | 0.3521 |
| 30 | | 17 | 26 | 1 4.1 | | |
| July 1 | | 14 | 47 | 0 52.1 | | |
| 2 | | 20 | 9 | 42.9 | | |
| 3 | | 21 | 31 | 33.7 | 0.3844 | 0.3564 |
| 4 | | 22 | 54 | 24.4 | | |
| 5 | | 24 | 18 | 19.0 | | |
| 6 | | 25 | 42 | + 0 5.5 | | |
| 7 | | 27 | 7 | - 0 4.0 | 0.3916 | 0.3550 |
| 8 | | 28 | 32 | 13.6 | | |
| 9 | | 29 | 54 | 23.3 | | |
| 10 | | 31 | 25 | 33.0 | | |
| 11 | | 32 | 52 | 42.8 | 0.3981 | 0.3540 |
| 12 | | 34 | 19 | 0 52.6 | | |
| 13 | | 35 | 47 | 1 2.5 | | |
| 14 | | 37 | 16 | 1 12.5 | | |
| 15 | 11 | 38 | 46 | - 1 22.5 | 0.4044 | 0.3530 |

Correction June 22. -14.5 +1.4

9.6 11 13 21 1 19 17
 10.5 14 46 12 26—
 9.6 15 1 14 19
 9.1 16 26 13 4

Planet. 11 14 38 + 1 19.5
 11 16 0 1 10.7

Ephemeris of Maia (continued)

Wash Mean Midnight.

| | α | δ | $\log A$ |
|--------|-----------|-----------|----------|
| July 2 | 181° 42.4 | - 1° 31.1 | 0.4785 |
| 3 | 181 54.4 | 1 36.6 | |
| 4 | 182 6.5 | 1 42.3 | 0.4826 |
| 5 | 182 18.8 | 1 48.0 | |
| 6 | 182 31.4 | 1 53.9 | 0.4866 |
| 7 | 182 44.0 | 1 59.7 | |
| 8 | 182 56.8 | -2 5.6 | 0.4906 |

Guth's Run for Mars

| | | | |
|------------|------|------|------|
| June 28 29 | 23) | 6.99 | 9.50 |
| July 2 3 | | 2.97 | 4.27 |
| " 5 6 | 0.79 | 7.15 | 7.35 |
| " 9 10 ! | | 2.85 | |

Comet Robt. II at Washington

| | | | | |
|--------|-----------|----|-------------|-------------|
| July 2 | 9 55 19.3 | 10 | 8 13 6.97 | +63 12 14.6 |
| 3 | 8 46 46.4 | 2 | 9 51 41.15 | 66 9 52.5 |
| 3 | 9 10 7.3 | 5 | 9 52 52.55 | 66 11 6.0 |
| 4 | 8 51 20.5 | 12 | 10 52 36.25 | +65 54 20.6 |

Hubbard's elements

| | |
|----------|--------------------|
| I | 1861 June 11.30627 |
| π | 248 56 54.2 |
| Ω | 278 59 9.4 |
| i | 85 38 21.6 |
| log. | 9.913 731 |

App. 9. July 3.

