

KG
11365
194

H. 40

Equatorial -
April 9th 1861
to
May 2nd 1861

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

KG 11365.194



KG-11365,194



New Planet

1861 April 9/10

Discovered by H. P. T. at 1^h 50^m A.M.

Planet is n.p. * 8^{h} or 7^{h} R signals
 with B. between. Over two wires

The star is Wolfe XI. 1041. — also in the Lines. (See following pages)

15 34 51.6 56.7
 05 12.7 17.5

15 35 36.4 41.0
 35 57.4 62.1

15 36 15.9 20.6
 36 36.9 41.7

For Dec. time signal is preceded
 by B. D.

13.03

13 04

13 07

op. side of zero

24.63

24 61

24.96

Obs. in R repeated

13.22

New Planet

In Dec after last series in R

13.22

1

Obs in Dec again repeated

13 14

13 7

The magnitude of the new planet
I estimate as 13th - 14th

Planet α $11^h 59^m 20^s$
Dec $+0 \quad 14$

21.0

22.7

1.7

hly-

New Planet.

1867 Apr. 9.

Star

W. 1011 (Stand. Catalogue)
Santini

12	0	4.14	+ 0	8 338
		4.61		8 36.0

W. 1011 1852.5

6.7

Mean

11	59	36.75	- 0	11 36.8
		36.85		35.2

11	59	36.82	0	11 35.1
		27.63	- 3	0.4

12	0	4.45	+ 0	8 34.7
		2.95		- 19.3

Star. (1861.0)
Rev. to app.

Age

Zone 4 1 6.7

10 29 10 11 14. B. 1

11 14 13 - 17 B. 1

" 22 13 15 0 B 1/4 S. 2 1/4

" 47 10 " 11 13 1

12. a 5 3/4 3/4 " 32 B. 1

B. 5 3/4 5 3/4 " 34 B. 1

S. 2 1/4 2 1/4

Cor. Reful. - 0.15 + 0.39

Santini + 0.60 + 1.6

+ 0.06 + 1.1 L. Zone 4 6 7

d + 0° 9'

G 343 50

s 180 1

H. 248 15

lg d 7.418

m(G+a) 9.446

g 1.082

G. (G+a) 9.983

Red 0.000

m(H+a) 9.968

h 1.278

a(H+a) 9.569

m d 7.418

f + 26.70

g" + 0.01

1° + 17.6

g' - 11.63

N + 0.01

i' - 7.63

New Planet (66)

1861 Apr. 9.

Companions in R.

Planet	15	34	51.6	58.7		- 20.95
Star		35	12.7	17.5		

Planet	15	35	36.4	41.0		21.05
Star		35	57.4	62.1		

Planet.	15	36	15.9	20.6		21.05	21.07
Star		36	36.9	41.7			

Planet.	15	36	56.2	60.9		21.20
Star		37	17.3	22.2		

Planet.	15	37	35.8	40.6		21.10
Star.		37	57.0	61.6		

Declinations

Planet	15	39	25.0		13.03
Star		44	54.0		13.04
Planet.		46	59.0		13.07
Star					13.01
	15	53	8.2		24.63
Planet.		55	4.0		24.61
Star		56	31.3		24.96

Planet.	15	59	18.9	28.1		21.60
Star			40.6	46.6		

Planet	16	0	4.1	10.2		21.75
Star			25.7	32.1		

Planet.	16	0	44.0	50.1		21.80	21.87
Star.		1	5.8	11.9			

Planet	16	27	18.6	22.3		22.65
Star		27	41.1	45.1		

Planet	16	27	55.6	59.4		- 22.55
Star		28	18.1	22.0		

Planet (66)

1661 Apr. 9/10

Redure to El. 15 53 41

* app.	- 21.57	+ 57.3
Pl. R. Dec.	12 0 7.40	+ 0 8 15.4
	11 59 45.43	+ 0 9 12.7

Hor. Mot.	+ 1.8
Daily	+ 43.

Apr. 9	h m s	Pl. R.	Dec.
At 14 39 m.t.	11 59 45	+ 0 9.2	
	~~12 0 7~~		

Star Mot.	+ 1.8
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Daily	43.5	0.8
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El. 15 53 41.

3 17

15 50 24

1 11 37

14 38 47

2 76

14 36 23

Sid. Time

Cambridge m.t.

Planet (66)

Dif. R. and Dec.

15 36 17
49 25
16 11 5

-21.07 5 56
+5.843 5 "
22.07 5 "

Assumed Daily Mot. in Dec. $0^{\circ} 0''$

New Planet (66)

Apr. 10, 1861

J.H.S. obs

236

p 10⁴ 15⁴ 51.2
 * 16 47.3

E.C.p

*(00)

16.63

63.5 (doubtful)

D.B

Planet

36.0 }
 36.24 }
 12.53

Take the mean

10 34 33 }
 34 46 }
 35 53

Not the Planet

26.01

- 9.84

BB ~~after~~ *Long dots & B
Not the Planet

34.11

1.71

D.D before *, see break for Star

Not the P

36.54

4.14

End of Break

B.D

Not the Planet

35.98

3.44

End of Break

This p is not the Planet

New Planet (68)

Apr. 10, 1861

M.S. obs

Any of $\text{P} 262^{\circ} 41'$

~~EL~~ ~~7.31~~

p 10 59 37
* 11 0 39

29.09
4.76

236 = (10 57 32)
58 28

planet n. p. *

p 11 6 2
* 7 8
B.D

31.31
7.35

(11 3 50)
4 54

p 11 8 56
* 9 53

31.68
7.59

AR on Apr. ^{D.B} ~~hor~~

p 236 11 24 35.6
* 25 32.2

11 26 43.9 47.1 - 56.85
27 40.7 44.0

p 26 5.6
* 27 2.2
B.

11 28 14.0 17.2 - 56.75
29 10.8 13.9

p 28 5.8
* 29 2.8
B.B

11 30 11.2 17.5 - 56.80
31 7.9 14.4

p double lig 32 19.2 - 28.7
* 33 16.2 - 25.6
p 34 low - 45.5
35 42.7

11 34 30.9 40.1 - 57.00
35 27.9 37.1
11 36 48.1 57.1 - 57.10
37 45.2 54.2

p 36 24.1 - 33.2
* 11 37 21.2 30.2

11 38 35.8 45.0 - 57.10
39 33.0 42.0

New Planet

Apr. 10. 1861,

p	32.79	(11 46 30 = 236)	11 48 38
*	8.16		49 48

p	36.59	50 14	11 52 26
*	11.88		53 40

p	236 = 11	54	52.0	-	62.2
*		55	49.8	-	59.9

Planet (66)

1861 Apr. 10.

[illegible]

El.	11 26 45	- 56.85 ⁵	+ 0.05 ⁵	- 56.80
	28 16			
	28 16	56.75	0.10	56.65
	30 14	56.80	0.16	56.64
	34 36	57.00	0.29	56.71
	36 53	57.10	0.36	56.74
	38 41	57.10	+ 0.41	56.69
				- 56.70 mean

$\Delta \alpha$ — 56.70 $\Delta \delta$ +3'. 58.9 $\Sigma \epsilon''$ 0.0379
 Refr. 0.00 + 0.1 $n-1$ 5.
 — 56.70 3 59.0 at 11 25 0 $\epsilon\epsilon$.

Planet (66)

1861 Apr. 10.

Same star as on Apr. 9th

$\begin{array}{r} 12 \quad 0 \quad 4.45 \quad + \quad 0 \quad 8 \quad 34.7 \\ \quad \quad + 2.95 \quad \quad \quad - \quad 19.2 \\ P_{-} * \quad - \quad 58.70 \quad \quad + \quad 3 \quad 59.0 \\ @ a.s. \quad 11 \quad 59 \quad 10.70 \quad + \quad 0 \quad 12 \quad 14.5 \end{array}$

$\begin{array}{r} 11 \quad 25 \quad 0 \\ - \quad 3 \quad 17 \end{array}$

$\begin{array}{r} 11 \quad 21 \quad 43 \\ 1 \quad 15 \quad 34 \end{array}$

$\begin{array}{r} 10 \quad 6 \quad 9 \quad \# \\ 1 \quad 39 \end{array}$

10 4 30 Camb. m. st.

$\begin{array}{r} G \quad 343 \quad 59 \\ \times \quad 180 \quad 1 \\ H. \quad 247 \quad 12 \end{array}$

$\begin{array}{r} h_5 \quad 7.418 \\ \quad \quad 9.460 \\ g \quad 1.084 \\ \quad \quad 9.983 \end{array}$

$\begin{array}{r} h_{10} \quad 0.000 \\ \quad \quad 9.985 \\ h \quad 1.278 \\ \quad \quad 9.988 \\ m \quad 7.418 \end{array}$

$\begin{array}{r} f \quad + 26.80 \\ g \quad + 0.01 \\ i \quad + 17.50 \end{array}$

$\begin{array}{r} g' \quad - 11.66 \\ h' \quad + 0.02 \\ i' \quad - 7.59 \end{array}$

Comet-

Apr. 10. 1841

J.H.S. obs

Discovered April 4 by Albert E. Thatcher N.Y.

G.P.B.

$$236 = 12^h \quad 10^m \quad 2^s$$

$$\text{Dec } 120^\circ \quad 29'$$

$$+ \quad 59 \quad 31$$

$$H \quad 7 \quad 4 \quad 40$$

$$17 \quad 4$$

$$59^\circ 43'$$

$$12 \quad 34 \quad 39$$

$$7 \quad 24 \quad 40$$

$$17^h \quad 9^m$$

Star 236.

Scale.

Star 26 $12^h \quad 42^m \quad 6.3^s \quad 14.6^s \quad 6' 00''$ Comet is moving in the
 Comet. $44 \quad 37.8 \quad 45.7 \quad 2 \quad 45$ North preceding direction
 Signal mark for declination

Star X. $12^h \quad 45^m \quad 57.0^s \quad 65.3^s \quad 6 \quad 1$
 Comet. $48 (28.6 \quad 35.1 ?) \quad 2 \quad 53$ Dec. at 16 48 15.

Star X. $12^h \quad 50^m \quad 37.7^s \quad 45.7^s \quad 6 \quad 4$
 Comet. $53 \quad 8.5 \quad 15.7 \quad 3 \quad 7$

$$\text{Stars} \quad 56 \quad 23$$

$$21.6$$

$$57 \quad 29.8$$

$$8 \quad 43$$

$$0 \quad 7$$

(a)

Cont. 18h1. I.?

18h1 Apr. 10

Extreme Diameter of Nebulosity 6' or 7'

No tail - nor structure

Readings from the Sheet $\Delta\alpha$ $\Delta\delta$

12 44 17.8 26.3 + 2 31.35 - 3 15

46 49.4 57.4 -

12 48 8.7 17.2 + 2 31.15 - 3 8

50 40.4 47.8

12 52 49.2 57.4 + 2 30.30 - 2 57

53 20.0 27.2

for Comet. 1861 I.

1861 Apr. 10

Star α compared with star α = Argel. Zone 117 No. 31.

α	12 ^h	59 ^m	39.8 ^s	48.0 ^s	6' 2"
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α	13	2	2.9	11.0	2 1
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					no. May. 2
+ 2	22.78	- 6	1.0		

α	13	3	4.7	12.5	5 49
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α	5	27.2	38.0	3 48
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Comet compared with α again

α	13	7	7.8	15.6	5 35
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Comet	9	34.3	41.9	3 3
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Oct 1867. I

13 1 51.7 59.8

2 22.85

7

4 14.6 22.6

13 5 16.6 24.1

2 22.65

7 39.0 46.8

13 9 19.6 27.3

2 26.25

2 32.

11 46.0 53.4

Chra. slow of El. 2 11.68

(Prob. end of comp.) ± 0.065
by hearing

Stars for Comet.

1861 Apr. 10.

Arg. 117.31.

1861 June 10

17	7	31.68	+59° 38' 44."6
-	5	0.21	+ 22.3
-		0.08	+ 1.1

2 ⁰	17	2	39.9
2 ⁰	+59	38.35	

1861 (19. XXIV)

16824

17	2	31.39	+59 39 0.0
		+ 0.27	

2 ⁰	0.23227
2 ⁰	9.93594

2 ⁰	9.98627 _n
	1.30292

2 ⁰	9.39370 _n
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a) 1861.4

 $\Delta + \Delta$
 $\Delta - \Delta$
Refr. (15°)
Temp. (15°)

17	2	47.98	59 37 33.7
		+ 2.17	- 23.1
2	22.75	- 4	1.0
	0.00		- 0.1
			+ 0.5

1.52076_n

- 33.171

12.889

1.11022

0.10266

x app. place

17	2	12.84	+59° 33' 10.0
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0.67592_n1.97467_n

Red. for x

+2.18

- 22.91

Red. to app.

(a.) Red. to app.

x - a + 2 22.75 - 6 0.4

Red. to m + 0.01 - 0.2

+ 2 22.76 - 6 0.6

256 143

G 343 159

255 42

247 12

0.2302 + 26.30

9.9388_n - 17.90

1.0839 + 22.56

9.6953 + 31.46

2⁰ 0.232 + 26.802⁰ 9.936_n - 17.842⁰ 1.083_n + 22.652⁰ 9.703_n 31.60

0.2947 - 6.01

9.7805 - 13.05

1.2762 - 3.85

9.9018_n

9.9355

2⁰ 0.296_n g' - 6.112⁰ 9.780_n n' - 13.152⁰ 1.279_n i' - 3.802⁰ 9.902_n2⁰ 9.936

Comet 1861 I.

1861 Apr. 10

$HA. Apr. 10. 12.5 - 11.4 + 1.1$
 $10. 22.5 - 16.4 + 1.7$

El.	Δx	Δy (12 ^s before)	Apparent HA - 13.9 + 1.8
12 46 53	2 31.35	- 3 15	-2.04 29.35 + 15.8 59.2
50 44	2 31.15	3 8	-1.09 31.06 + 0.9 59.1
53 24	2 30.30	2 57	-0.48 29.82 + 4.1 52.9
13 11 50	2 26.25	2 32	+ 3.79 31.04 - 29.1 6.1
12 55 28	+2 ^m 29.76	- 2' 58.0	+2 29.82 - 2' 58.1
Ref.	0.00	0.0	0.0
Temp.		+ 0.4	+ 0.4
Motion		+ 0.4	

$\delta - * (x) + 2 29.76$
 $True + 2 29.82$
 $- 2 57.2$
 $- 2 57.7$

12 55 28 (x or 2.04)
 El. 3 18

12 52 10 Sid Time
 1 15 34

11 36 36
 1 54

11 34 42 Am. m. t. δx 17 7 42.60 δ + 59° 30' 12.8
 Par. $\times \Delta$ - 0.749 + 0.52

Stars for Comets

1861 Apr. 11.

1861.00	(9.10)	17	4	34.6	60	6	40.0
19.				15.4	-	1	31.
	9	17	5	18.34	60	15	7.1
				13.2	-	1	30.

α.

δ.

1861.00	[9.10]	17	4	50.0	60"	5'	9"	} star of comp Apr 11
	[9.]		5	33.5	60	13	37	

Dracoma Aug.

17 456 +58 27

9 5018 48 18

4 46 17

17 41

60 1

9 46 22 236

4 44 44

17 1 38

55

17 2 33

60 10

Stars for (86)

1861 Apr. 11.

Planet $11^{\text{h}} 58^{\text{m}} 28^{\text{s}} + 0^{\circ} 16'$ ~~1852~~

1852.0 June 4 $11^{\text{h}} 56^{\text{m}} 23.43^{\text{s}} + 0^{\circ} 14' (31.6)^{\text{s}}$ Mag. 9.5
 6 23.46^{s} 22.9
 7 23.48^{s} 22.8

~~1852~~

Mean 1852.0 $11^{\text{h}} 56^{\text{m}} 23.46^{\text{s}} + 0^{\circ} 14' 22.8$ } examine cl.
 Janit. $11^{\text{h}} 59^{\text{m}} 10.91^{\text{s}}$ $18^{\circ} 55.4'$ } β .
 " $59^{\text{m}} 36.92^{\text{s}}$ $11^{\circ} 35.1'$
 Procession $+ 27.6$ $- 3.0$

The star β can be compared with a Struve's Double major australis 8.0

which precedes it north
 β - Str. D.

$\Delta x + 5^{\text{h}} 18^{\text{s}} \Delta \delta + 8' 0''$

$11^{\text{h}} 59^{\text{m}} 39^{\text{s}}$ $0^{\circ} 15.8'$

Comet-I

Apr. 11. 1861

J. H. S. obs.

236

$\begin{array}{l} \text{☾} \\ * \end{array} \begin{array}{l} 10 \\ [9.10] \end{array} \begin{array}{l} 10 \\ 12 \end{array} \begin{array}{l} 16.0 \\ 21.3 \end{array}$

$\begin{array}{l} 7' \\ 4 \end{array} \begin{array}{l} 22'' \\ 23 \end{array}$

AR

236 Run wire

$\begin{array}{l} \text{☾} \\ * \\ \text{☾} \\ * \\ \text{☾} \\ * \\ \text{☾} \\ * \\ \text{☾} \\ * \end{array} \begin{array}{l} 10 \\ \\ 26 \\ 28 \\ 29 \\ 31 \\ 32 \\ 34 \\ 36 \\ 38 \end{array} \begin{array}{l} 23 \\ 25 \\ 26 \\ 28 \\ 29 \\ 31 \\ 32 \\ 34 \\ 36 \\ 38 \end{array} \begin{array}{l} 23.8 \\ 43.6 \\ 18.0 \\ 37.7 \\ 16.6 \\ 36.6 \\ 21.5 \\ 43.1 \\ 23.8 \\ 26.6 \end{array} \begin{array}{l} \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \end{array} \begin{array}{l} 19.8 \\ 19.7 \\ 20.0 \\ 21.6 \\ 22.8 \end{array}$

B. D. B.

SC

$\begin{array}{l} 10 \\ 25 \\ 27 \\ 28 \\ 30 \\ 31 \\ 33 \\ 34 \\ 36 \\ 38 \\ 40 \end{array} \begin{array}{l} 25 \\ 27 \\ 28 \\ 30 \\ 31 \\ 33 \\ 34 \\ 36 \\ 38 \\ 40 \end{array} \begin{array}{l} 27.6 \\ 46.5 \\ 21.7 \\ 41.0 \\ 19.4 \\ 39.8 \\ 25.0 \\ 46.3 \\ 6.4 \\ 29.0 \end{array} \begin{array}{l} 35.8 \\ 55.6 \\ 30.1 \\ 49.7 \\ 28.7 \\ 48.7 \\ 33.6 \\ 55.2 \\ 15.9 \\ 37.5 \end{array} \begin{array}{l} -2 \\ 2 \\ 2 \\ 2 \\ 2 \end{array} \begin{array}{l} 19.35 \\ 19.45 \\ 20.20 \\ 21.45 \\ 22.10 \end{array}$

Red. to 10 31 36

$\begin{array}{l} 20.92 \\ 20.24 \\ 20.25 \\ 20.73 \\ 20.46 \end{array}$

$\begin{array}{l} 20.45 \\ 20.20 \\ 20.20 \\ 20.68 \\ 20.23 \\ 20.43 \end{array}$

$\begin{array}{l} 236 = \\ * \\ \text{☾} \\ * \\ \text{☾} \\ * \\ \text{☾} \\ * \\ \text{☾} \\ * \end{array} \begin{array}{l} 10 \\ \\ 44 \\ 49 \\ 53 \\ 57 \end{array} \begin{array}{l} 41 \\ 44 \\ 49 \\ 53 \\ 57 \end{array} \begin{array}{l} 29 \\ 54 \\ 22 \\ 49 \\ 34 \end{array}$

$\begin{array}{l} \text{Dec} \\ \text{Comet} \\ \text{Star} \\ \text{Comet} \\ \\ \\ \\ \\ \\ \end{array} \begin{array}{l} 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 11 \end{array} \begin{array}{l} 41 \\ 43 \\ 45 \\ 47 \\ 51 \\ 53 \\ 56 \\ 59 \end{array} \begin{array}{l} 29 \\ 40.8 \\ 53 \\ 6 \\ 34 \\ 58 \\ 1 \\ 46 \end{array}$

$\begin{array}{l} 40.53 \\ 16.17 \\ 41.22 \\ 16.17 \\ 41.88 \\ 15.98 \\ 31.77 \\ 4.94 \\ 32.50 \\ 4.90 \\ \text{Mean} \\ 0.02 \\ \text{Temp. 40} \end{array} \begin{array}{l} 24.36 \\ 25.05 \\ 25.90 \\ 26.83 \\ 27.60 \end{array} \begin{array}{l} 35.7 \\ 4.55 + 0.2 \\ 4.128 \\ 4.22.9 - 0.2 \\ 4.30.5 - 15.0 \\ 4.14.2 \\ -0.1 \\ +4.14.1 \end{array}$

Comet I (continued)

April 11

AR

Apr 10.9 -14.4 +1.77
 12.9 -18.6 +1.97
 14.4 -15.6 +1.02

236

	11	2	45.0	
*		5	14.0	2 29.0
		5	59.8	
*		8	29.7	2 29.9
		9	16.0	
*		11	46.6	2 30.6
		12	38.2	2 31.6
*		15	4.8	
		16	8.1	2 32.9
*		18	41.0	

11	4	40.7	57.0	-2	28.80
	7	9.4	25.9		
	7	55.7	71.8	2	29.60
	10	25.1	41.6		
	11	11.7	28.2	2	30.25
	13	41.8	58.6		
	14	33.6	50.1	2	31.30
	17	4.8	21.5		
	18	3.8	20.3	2	32.50
	20	36.4	52.7		

Observed Differences

El. Comet - Star

10	31	36	-2"	20.51	
10	51	38			+ 4' 14".2
11	11	25	-2	30.49	
Motion (-8°)					- 0.2

0 Red.	
-2 28.86	
Red. to 11 11 25	
-2 30.46	2 30.43
30.44	30.42
30.17	30.25
30.48	30.46
30.80	30.78
30.49	2 30.47

El. 10	51	30	-2"	25.50	+ 4'	14.0	final
Refr.				0.01	+	0.1	

17 2 26.7 60 9 0

Rough Comp. with Scale

El. 10	12	20	-2	15.3	+ 2	59.
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Hor. dist. - 15.2 + 1' 55"

5 16 38.8

Hor. dist. since yesterday - 14.4 + 1 46

Oct 1861 I

861 Apr. 11th

Reduction of Observations. - Star's Place and Comet's Place

9.10 Arg. True 117 no. 34.

17 ⁿ	9 ^m	34.69	60°	6' 18.2
-	5	0.21		+ 22.3
-		0.12		+ 1.5
+		0.27		

a°	17	4	42.3
0°	60	5.91	

1842.00	17	4	34.63	60	6	40.0	18868
			+15.45			-1	31.0

log	0.24028
sin	9.96724 n
log	1.60487

* 1801.00	17	4	50.08	60	5	9.0
Prod. to app.			+2.12			-22.9
~~1801.00~~	-	2	25.51			+4 +4.1

log	2.58096
sin	9.97818 n

app. a. s.	17	2	26.69	60°	9' 0.2
Pr. X Δ.			-0.847		+ 3.21

5	58.3412
-	42.893

G	346	8
L	256	13
H	246	9

El. 10 51 30
fast 3 24
10 48 9
L 19 30
9 28 39
1 33

9 27 M. J. Cambridge

log	0.2400
log(G+L)	9.939~
L	1.065
log(G+L)	9.694~
log	0.3021
log(A+L)	9.786
L	1.279
log(A+L)	9.859~
sin	9.9379

f	+26.4%	g	1 - 1.0
g	-18.4	n	-13.1
n	+23.3	i	-3.8

Comet 9' to 10' in diameter
No tail can be discerned

Perhaps visible to naked eye

Nucleus is possibly stellar but very small if so.

No considerable density about the brightest concentration.
Comet rather diffuse -

Plant (66)

Apr. 11

J.H.S. 06

* of 11.12 mag. planet north of star

AR

²³⁶
 p 12 21 20.6
 * 21 58.2 37.6

Planet, 12. ^{mag} 5

p' 12 23 57.0
 * 25 7.0 16.0

(See opposite page)

p' 29 17.2
 * 30 33.2 16.0

p' 31 7.9
 * 32 24.0 16.1

p' 33 46.0
 * 35 2.2 16.2

p' 36 59.4
 * 37 15.2 15.8

See

²³⁶
 p 12 46 8 1.25
 * 47 33
 p' 48 55 1.22
 * 50 17
 p' 52 17
 p' 57 6 0.59
 * 58 5
 p' 13 0 19 1.13
 * 1 32
 p' 4 0 1.15
 * 15 15

⁹
 8.38
 13.07 4.69 7.86
 8.09 4.90 7.00
 12.99
 13.45
 25.79 4.99 4.96
 30.78
 25.50 5.01 4.93
 30.51
 25.32 4.90 4.76
 30.22

4.898
 98

From sheet

El. 12 23 26.4 32.7 Not the planet
24 4.1 10.2

* 12 25 57.1 63.2 - 1 15.90 u 12 26 0
27 12.9 19.2

12 31 23.1 29.4 - 1 16.00 31 26
32 39.1 45.4

12 33 13.9 20.2 - 1 15.90 33 17
34 29.9 36.0

12 35 52.0 58.2 - 1 16.10 35 55
37 8.0 14.4

12 38 5.4 11.4 - 1 16.10 38 8.
39 21.5 27.5

Planet, in Dec.

El. 12 48 20

12 51 7

12 59 18

13 2 31

13 6 12

12 57 30.

Planet 16.

1861 Apr. 11.

Further Compas. in M.

El. 13 13 43.7 57.1 - 1 17.50
 15 1.1 8.7

13 15 33.2 40.7 - 1 17.25
 16 50.3 58.1

Comparison

El. 12 32 58 Planet - Star $\Delta\alpha$ $\Delta\delta$ Comp.
 12 57 30 + 48.110 5. Σ 0.0378 $n=1.4$
 13 14 42 - 1 17.38 2.

Reduce to 12 57 30. N.H. in R.A. - 1.58 assumed.

- 0.574 - 1 16.74 5

+ 0.52 - 1 16.86 2

At 26. 12 57 30 $\Delta\alpha$ $\Delta\delta$
 Refr. - 1 16.77 + 0 48.0
 0.60 0.0

Star for Planet (66)

1861 Apr. 11

H.C. Jones no. 6. 7.

1852.0

$$11^{\text{h}} 59^{\text{m}} 10.91^{\text{s}} + 0^{\circ} 18' 45.4''$$

$$+ 27.64 - 3 0.5$$

$$1861.0 \quad 11 \quad 59 \quad 38.55 + 0 \quad 15 \quad 44.9$$

$$\text{Red. to app.} \quad + 2.95 - 19.2$$

$$\text{Planet - Star} \quad - 1 \quad 16.77 + 0 \quad 48.0$$

$$11 \quad 58 \quad 24.73 + 0 \quad 16 \quad 13.7$$

$$G \quad 344 \quad 8$$

$$\alpha \quad 179 \quad 55$$

$$\text{H.} \quad 1246 \quad 9$$

$$\log \Delta \quad 7.668$$

$$\log(G+\alpha) \quad 9.439$$

$$g \quad 1.068$$

$$\log(G+g) \quad 9.983$$

$$\log \sigma \quad 0.000$$

$$\log(H+\alpha) \quad 9.961$$

$$h \quad 1.279$$

$$\log(H+g) \quad 9.608$$

$$\log \sigma \quad 7.668$$

$$\text{El.} \quad 12 \quad 57 \quad 30$$

$$\text{foot} \quad 3 \quad 21$$

$$12 \quad 54 \quad 9 \quad \text{Sid Time}$$

$$1 \quad 19 \quad 31$$

$$11 \quad 34 \quad 38$$

$$1 \quad 54$$

$$11 \quad 32 \quad 44 \quad \text{Camber mean solar time}$$

$$f + 26.9 \quad g' - 11.3$$

$$g'' + 0.0 \quad h' 0.0$$

$$h'' + 17.4 \quad i' - 7.9$$

Planet (66)

1861 Apr.

Placed Places

		R		Decl
Apr 9	14 36 23	11 57	45.83	+ 0 9 12.7
10	10 4 30	59	10.70	12 14.5
11	11 32 44	58	24.73	16 13.7

Daily Motion

Apr 9/10	-43.4 ⁵	+ 3' 44"
10/11	43.3	3 45

Apr 19.

11 52 39 + 0° 46.1'

Stars for Comet 1861. I.

1861 Apr. 12. and Apr. 13.

 $16^h 56^m 0^s$ $60^\circ 58'$ approximately

1862.0

~~1862.0~~

A7.	125.37	89	9	16 37	47.58	61	2	20.7	16738
	36		9		58	61	4	56.5	16749
R. 5679	38		6	59	19.84	60	52	25.6	16771

Apr. 13 $16^h 50^m$ $61^\circ 45'$ appx. }
 Apr. 14 $16^h 11^m$ $62^\circ 33'$ }
 + 5.6 $16^h 39^m 50^s$ + $64^s 53.$ — 1862.0 — 5679 RA.

~~1862.0~~~~A7. +~~

A

9 29 12	(624)	} Comet
7 11 41		
$62^\circ 11'$		

9 31 40	} $61^\circ 43'$ Bright Star	7 Draconis
6 50 45		

Comet $16^h 40^m 35^s$ $62^\circ 18'$ Stars $16^h 52^m 53^s$ $62^\circ 24.7'$

Comet I

Apr. 14. 1861

Z.H.S. obs

Comet S. p. (= 17. 12. 11)
 AR (El) * Oct. 16489 - Cir. Reads (82° 40')
 10 22 38.0 82 39
 50.2

* } on one wire only

* }

* }

* }

* }

23 16.3 23.0 - 12.00

27.8 35.5

24 4.7 11.6 - 12.60

17.2 24.3

276
10 22 44.8

* 22 57.1

10 23 24.6

* 37.2

* }

* }

* }

* }

10 24 47.8 54.6 - 12.60

25 0.2 7.4

25 27.3 34.4 - 12.85

25 40.2 47.2

26 8.1 15.3 - 13.05

26 21.3 28.2

26 49.6 56.4 - 13.20

27 2.5 9.9

Dec

-El.

10 31 17

32 46

34 55

36 11

37 25

236 = 10 34 31

10 33 27.

34 56.

37 5

38 22

39 35

on other side of zero

10 40 55

10 43 5

Zero

12.53 20.72 - 12.6 + 8.7

12.71 20.77 11.8 5.6

13.34 20.72 11.2.6 + 1.2

13.63 20.82 11.9.8 - 1.5

14.02 20.74 11.6.0 4.0

13.25 20.75 - 11.2

27.95 not very good. - 11.6 - 11.2

1 11.9

13.2

11.4

11.3

10.0

21.8

1 12.5

at 1/2

Comet (Continued)

Apr. 14.

144 - 22.5 + 2.06

			AR			236 = 10 5-3 40		
276	10	47	50.6	10	49	53.1	60.6	South of * 32"
*			12.8		50	15.6	23.6	- 22.75
		49	49.8		51	51.7	59.8	
*			12.0		52	14.0	21.9	- 22.20
		50	42.9		52	44.2	53.0	
*			5.4		53	7.0	15.6	- 22.65
		51	37.3		53	39.2	47.4	
*			59.9		54	2.0	9.8	- 22.60
		52	24.7		54	27.9	34.7	
*			48.2		54	50.0	58.2	- 22.80

DD

Comet - Star

El.	10	25	9	- 12.717	6
	10	36	51	- 12.5	
	10	52	40	- 22.600	5

Reduce to

El.	10	37	39	- 17.5	- 1' 12.5
Ripr.				0.00	0.0

Comet (Continued)

Apr 14

Comparison of Stars

Ocellum

* (16481) = a	6' 59"	10 57 34.3 43.2	-54.20	
* (16485) = b	4 20	58 29.2 37.9	+54.80	- 2' 39".0
a	7 7	10 59 12.7 21.2		
b	4 30	11 0 7.4 16.1	+54.80	- 2 37.0
a	7 46	11 0 48.6 57.2		
b	5 7½	1 12.4 52.0	+54.80	- 2 38.5

In the Great Refractor the light around the nucleus, can

be discerned over an area of at least

17' in diameter

The nucleus

a sharp point = star 13 or 14 mag.

In comet seeker it looks

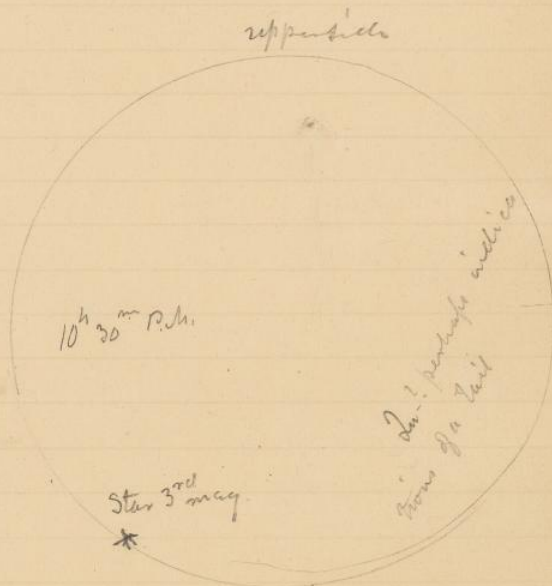
about as bright as the cluster

in Hercules.

Carefully scrutinized but

no certain indication of a tail.

Viewed in Comet seeker pointing NNE.



Stars in Comet.

1861 Apr 14.
 A.L. 125.9 Star α 16 39 21.77 + 12.35 54.80 + 62 36 30.4 - 2 11.2 - 2 38.2
 2-a 0.65
 5.49
 6.83

A.L. 125.11 Star β 16 40 16.76 + 12.37 31 40.5 + 62 33 50.2 - 2 9.7
 0.64
 6.78

β 16 40 29.13 62 31 41.0
 2 p. a 28.92 31 40.5
 Mean 16 40 29.02 62 31 40.7
 + 2.54 - 22.1
 An - 17.21 - 1 11.5
 Cond's 16 40 14.35 62 30 7.1
 - 0.916 + 2.80

10 37 39 - 3 23
 1 31 20
 9 4 19
 2 58
 1 29

9 1 27 Comb. m. A.

2.76 - 62.0 + 5.69
 - 22.5 + 2.06

39 28.0 10 23.0
 α 16 40 14.0 - 16 41 9.0
 β + 62 35.42 + 62 32.76
 $\log \alpha$ 9.28620 0.28638
 $\log \beta$ 9.97262 9.97255
 1.40487 1.40587
 45.29 45.97
 - 1.405 - 1.405
 + 58.34 + 58.34
 0.933
 0.336
 9.862
 1.138
 9.962

α 9.53682 9.53206
 2.58096 2.58096

α 344 36 + 27.22
 α 250 7 97 - 19.28
 β 243 4 10 + 30.1

$\log \alpha$ 0.285 9' - 7.11
 $\log \beta$ 9.972 11 - 11.6
 9 1.089 1' - 3.4
 $\log \gamma$ 9.762

$\log \alpha$ 0.336
 $\log (\alpha + \beta)$ 9.863
 α 1.280
 $\log (\alpha + \beta)$ 9.835
 $\log \gamma$ 9.948

Stars for Comet.

Apr. 18.

15752
 15770 = Really 29192? Error 1^m in one of these authorities 0.61
 0.56

1861.0

A. 9^m 15 50 44.5 +05° 21.84
 B. 7^m 52^m 8.3 65° 41.85

7. Dacini 16 22 7.4 61 49.78

5-foot { El 236 14 41 46 15° 45' Comet
 { H. 10 50 0

236 14 45 2 65 36.5 Star
 15 55 32 10 51 30

14 47 52 61 43. η Draconis
 10 24 48

16 23 8

M 1250^{h m s} R. 15 50 34 Dec 15 51
 M.J.

1861 April Comet 1861 I. 1 1861

1861 Apr. 18-

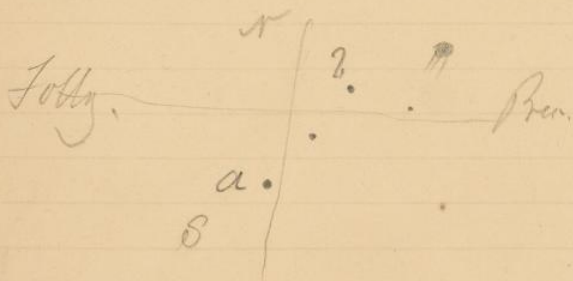
J.H.S. obs.

H.P.J. rec.

D.
 " Comet N p star
 15° 32' 42" comet } comet 5' 43" n.
 33 12
 33 25 star 3 a 9th mag

15 34 32

Stars a and b are north ^{preceding} ~~following~~ star Alder 15770.
 about 1^m and + 5' + 10'



comet 1 1861

1861 April 18

comparum with * b

star b n p * a } star b 10 mag
 comet n p * b }

6 15" 37 28 }
 " " 37 40 }

x b 15 38 6 no sig for star

D. B.

15 39 15

39 27.5 }
 39 39.8 }

B.

15

Comet 1861. I.

1861 Apr 18.

15 41 38.5 ✓

15 42 6 * 1

15 42 54.8 ✓

15 43 23.2 * 1

15 44 12 ✓

15 44 41.8 * 1

x

15	46	12	}
15	46	32.8	

* b p. a. 21^s

Cont 1861. I.

15 57 24.5 ✓

" 58 23.2 x a

15 59 28.5 ✓

16 0 28.2 x a

D. D.

15 1^m 18.8 ✓

15 2 19.5 x a

Obs. for Deel. now follow
Zero has been set $26^{\circ} 40'$

16 7 40 ✓ reads 43^{near} .51

16 9 7 x a " 2 .14

16 11 31 ✓ " 45 .77

16 12 50 x a " 3 .31

16 18 2 ✓ " 44 .92

16 19 30 (?) x a " 6 .97 reject

Orbit 1861. I.

1861 Apr. 18. Second Series.

Obs for R

Compare with $\times a$.

16^h 31 7 .1 }
16 31 17 .0 }

16 33 29 .0 }
16 33 29 .8 } *a

16 34 6 .5 }
16 34 18 .0 }

16^h 35 31.0 }
16 35 42.0 } *a

16 37 11.8 }
16 37 22.5 } The observer takes the chronometer here.

16 38 36.8 }
16 38 47.4 } *a

16 39 38.8 }
16 39 49.5 }
16 41 5.7 } X

Comet 1861.I.

1861 Apr. 18.

~~16~~~~41~~~~16~~~~5' 5.7~~

16

43

35.4

16

46.0

16

45

5.2

16

45

16.0

previously

Dontin circle has been set at $17^{\circ} 41'$

Set now to scale-reading, but so that figures are right-side up.

A

$$\begin{array}{ccccccc} 16 & 50 & 50 & .6 & - & 2' & 9'' \text{ scale reads} \end{array}$$

B

$$16 \quad 52 \quad 35.4 \quad - \quad 6 \quad 29 \quad " \quad "$$

a

$$\begin{array}{ccccccc} 16 & 54 & 0.4 & & & & \text{scale reads } -3' 26'' \\ 16 & 54 & 10.2 & & & & \end{array}$$

B

$$\begin{array}{ccccccc} 16 & 55 & 48.0 & & & & -7' 5.0'' \\ & & 57.5 & & & & \end{array}$$

Chronometer given back to H.P.J. here.

Comet 1861 I.

1861 Apr. 18.

$$\left. \begin{array}{rcl} 16 & 5-7 & 43 \\ 16 & 5-7 & 52.5 \end{array} \right\} * a \times B$$

scale reads 5' 25"

wt. 2 for Div

$$\left. \begin{array}{rcl} 16 & 5-9 & 30.2 \\ 16 & 5-9 & 39.5 \end{array} \right\} * a \times B$$

scale reads 7' 54"

" "

The comet is no longer round, but elongated more towards the north preceding side.

* The stars were each estimated twice

B = A. Z. 112.145

15	56	27.88
-	4	30.17
-		.09

$$\begin{array}{r} 65^{\circ} 44' 58.9'' \\ + 3.4 \\ + 1.3 \\ - 0.8 \end{array}$$

α^0 $2m$ 5
 15 52 3.0
 δ^0 55 53.15

1847.00 [same as de.]

15 91 57.62
+ 10.57

65 45 2.8
-3 21.8

By δ^0
And

581
0.34919
9.92848n
1.60487

K661.0 (B)
Rev. to apparent
a-B

$$\begin{array}{r} 15 \quad 52 \quad 8.19 \\ + 3.36 \\ - 1 \quad 47.42 \\ \hline \end{array}$$
$$\begin{array}{r} 65.41 \\ - 19.9 \\ + 4.258 \\ \hline \end{array}$$

rod⁰

$$\begin{array}{r} 2.58096 \\ 9.724062 \\ -47.77 \\ +58.34 \end{array}$$

Apparent place of a

15 50 24.13

65 45 46.9

6

345 15
238 2
238 58

h. d.

64

✓
C. G.

2

4.1

2
1911

No 8

1

1

27

Count 1861.I.

1861 Apr. 16.

Star a compared with B.

Δx	-1 47.8	+4 30	wt. wt	1/1	-1 47.42	+4 25.8
	1 47.45	4 24		2/1	-0.02	0.0
	1 47.10	4 26		2/2	-1 47.44	+4 25.8

Mean -1 47.42 +4 26.5
 Refr. 0.00 0.11
 Temp. (40°) - 0.7

-1 47.42 +4 25.8

Count comp. with A

Temp. 15 34 32 $\# 43.90$ + 5' 43" by scale
 - 1.0

+ 5 42.0

Assumed Hor. Red.
 40' 80" + 1' 55"

Chro. 236. 15 57 24 -58.7 1 wire Red. 16 12 24 -1 89
 15 59 24 59.7 " " 1 8.5
 16 1 19 1 0.7 " " 1 8.3
 16 7 40 + 41' 37" = 6' 45.4 + 2.1 + 6 54.5
 16 11 31 42.46 6 56.1 + 1.8 57.9
 16 18 2 43.95 7 10.7 - 10.8 59.9
 6 57.4 1 8.6
 16 31 12 1 21.3 2 wires
 16 34 12 1 24.25 " 1 9.4

Comet 1861. I.

861 Apr. 18

Comet comp. with * a continued

Chro. 236.	16 37 17	Δ	$-1^m 24.95$	-1	9.1
	39 44		1 26.75	1	8.2
	43 41		1 29.90	1	8.6

Chro. 236.	16 12 24	$-1^m 4.58$	$+6'$	57.4 ~~56.1~~
Imp.			$-$	0.1

$\frac{1}{2}$ - *	By least squares in AR	-1	8.76	$+6'$	57.3 ~~56.0~~
		-1	8.58		

* app.	15 50 24.13	~~65.45~~	46.9
--------	-------------	------------------	------

$\frac{1}{2}$ AR. Der app.	15 49 15.55	~~65.52~~	42.9
Pm. x Δ	$+0.099$	-3.24	
16 12 24 (236)			

8.980
9.869
0.923
0.329
0.171

1 23 fast	
16 11 1	sin time
1 47 6.5	
14 23 54.5	
- 2 21.5	

14 21 33 Cambr. M. S. I.

Comet 1861.1

Comet comp: with + a 10th
 Circle set at 172.40'

Comet north following

Star	11 ^h	30 ^m	44.5 * a 10mg	} 2d wire
Comet	11	31	48.4	

11 ^h	32	43.0 * a	} 2d wire
11	33	45.8	

11	34	26.2 (?) * a	} 2d wire
11	35	28.0	

11	36	10.2 *	} 1st wire
11	37	11.0	

11	37	48.0 *	}
11	38	lost Dir.	

made a great noise.

(11^h 40^m good for nothing)

11.4 - ~~20.5~~ + 2.10

el.

11 32 44.9 54.7

~~+ 4.40~~

32 49.5 58.9

+ 1 4.40

11 32 54 - 3.26 1.14

11 34 43.6 53.2

35 46.7 56.2

+ 1 3.05

11 35 51 - 1.09 1.96

11 36 27.4 36.6

37 29.1 38.3

+ 1 1.70

11 37 34 + 0.17 1.87

11 38 11.0 20.6

39 11.7 21.3

+ 1 0.30

11 39 16 + 1.42 1.72

11 39 48.9 58.4

40 48.2 57.5

+ 0 59.20

11 40 53 + 26.1 1.81

1 1.73

11 37 20

Observations for Declinations

Star 11ⁿ 41 3^m 59^s 3ⁿ .16 comet star 37.19
 Comet 11 40.34 comet

Star 11ⁿ 41⁸ 18 D. B. ~~40.03~~ 3ⁿ .07 } 56.96
 Comet 40.03 }

Star 11 False D B

Star 11 53^m 39^s 3ⁿ .15 } 38.48
 Comet 11 54 52 41.63 }

Star 11 58 10 5ⁿ .67 } 39.16
 Comet 11 58 16 5ⁿ 44 .83 }

D. D.
 Star 12ⁿ 0^m 28.2 5ⁿ .78 } 39.93
 Comet 12 1 48.8 45 .71 }

Set back upon 172° 40'

Obs. for R.					El.				
12 ⁿ	5 ^m	0 ^s	*a	}	12	7	20	10.7	+ 39.10
12	5	40	e			7	40.9	50.0	+ 39.10
12 ⁿ	6	38	*a	}	12	8	39.5	47.9	+ 38.40
12	7	16	e			9	17.9	26.2	- 1.09
12					12	14	49.9	58.7	+ 33.80
12						15	23.9	32.3	+ 3.60

Declinations-			Hor. Dist. in Dec. + (1' 45")			
Star	11	46 10	3.16			
Comet	11	47 52	40.54	+ 6' 4.4	+ 14.2	6' 18.6
Star	11	49 18	3.07			
Comet	11	50 28	40.03	+ 6 2.2	+ 9.6	6 11.8
Star	11	55 49	3.15			
Comet		57 2	41.63	+ 6 17.1	- 2.9	6 15.2
Star	11	59 20	5.67			
Comet	12	0 27	44.93	+ 6 23.8	- 7.9	6 15.9
Star	12	2 39	5.78			
Comet	7	3 59	45.71	+ 6 31.3	- 14.0	6 17.3
Mean	11	55 58		+ 6 15.8		

Star for Comet.

1861 Apr. 19th

Star a comp: with $\delta =$ Piazzi XV. 168.
a north preceding δ .

Scale⁺

E.L.

a	9	1	12	19	25.8	35.6	
b	2	0.5		21	47.2	56.8	2 21.30

a	9	15	12	24	10.5	20.5	
b	2	13		26	31.8	41.6	2 21.20

a - δ

+ 7' 1.2

- 2" 21.25

* Two independent readings each time; one on each side

Camel 1861. I.

1861 Apr. 19th

Camel - star a.

El. 11 37 20 + 1 1.7⁷⁹ 5)

11 55 58 + 6 15.8

12 10 51 + 37.10 3)

$$\begin{array}{r} 14.85 \\ 33.52 \\ \hline 24.59 \end{array}$$

1.1726

1.3907

1.5283

9.6478

1.0380 + 10.92

El. 11 55 58 + 48.03 + 6 15.8
 24.59 - 0.1

The obs. of R. (Piazzi) of star C are found in Storia Celeste V. 96
 " Dec " " " " II. 49
 " " " " " " II. 150

Wien. Ann

8

5.

9.

+ Not yet corrected for a possible variation in the zero of position.
 The angle was set at 172°40'.

Stars for Comet.

1861 Apr. 19.

$$\text{Bailey } 29740 = \text{Pi. XI. 168} = J$$

$$= \text{Rob. 3276.}$$

$$1808.0 \quad 15^{\circ} 36' 28.04'' \quad 66^{\circ} 26' 41.1'' \\ + 36.27 \quad - 11 \quad 55.8$$

$$1861.0 \quad 15^{\circ} 37' 4.31'' \quad + 66 \quad 14 \quad 45.3$$

Robinson 3276

$$1840.0 \quad 66 \quad 18 \quad 42.92 \\ - 4 \quad 6.73$$

$$66 \quad 14 \quad 36.79$$

$$\text{5 dts. } [1842.04]$$

Taylor.

$$\begin{array}{r} 1830.0 \\ 15^{\circ} 36' 46.0'' \\ \Delta'' \quad 23^{\circ} 39.19'' \\ \hline \text{M.A.} \quad 0.35850 \\ \text{M.V.} \quad 9.90901'' \\ \quad 1.94150 \\ \quad 3.08759 \\ \text{M.D.} \quad 9.76721'' \\ \hline 2.17901'' \\ - 2 \quad 31.01 \\ + 3 \quad 7.28 \\ \hline 1850.5 \\ 15^{\circ} 36' 57'' \\ \quad 2.6635 \\ \quad 9.76721'' \\ \quad 2.3317 \\ \hline 2.3317 \end{array}$$

$$\begin{array}{r} 15 \quad 37 \quad 46 \\ \quad \quad + 48 \\ \hline 15 \quad 35 \quad 34 \end{array} \quad \begin{array}{r} 66 \quad 24.3 \\ \quad \quad 6.2 \\ \hline 66 \quad 27.6 \end{array} \quad \text{at } 10^h 0^m$$

$$\begin{array}{r} 15 \quad 36 \\ \quad \quad + 48 \\ \hline 15 \quad 35 \end{array}$$

Comparison Star of Apr 10

J.H.S. obs

236 = 12 8 58.4 - 6.2 8' 1" *
 11 21.2 - 29.0 1 5.7 y

x in center of field

236 = 12 12 32

1 24

12 11 8 Cir read

4 5.2 34 19 7 26

AR 17 3 42 300° 22

+ 59 38

236 = 12 16 21.0
 1 24
 12 14 5.7
 4 46 26 +33° 33'
 AR 17 1 33

x 236 = 12 33 48.0
 36 10.0

Star x is consequently south of a by 6' 4" about.

Students

1861 April 22

1st eng. appointed for Junior class. In four
divisions Mond. Tues Wed & Ths.

Only the 4th Ths. eng. Apr 25th had a favorable eng.

Finished May 8th well.

By allowing them a set day of week without
any other conditions it has taken 18 days for 4 div-
of Seniors & 17 for Juniors and we have
given up to them all our available time. The
weather was a fair average.

Comet

861 April 27

Thin Clouds obscure the sky
but Comet is easily recog-
nized with naked eye

& indications of a tail
1° long are noticed
by naked eye - In

Comet-seeker tail is
quite evident 2° or 3°

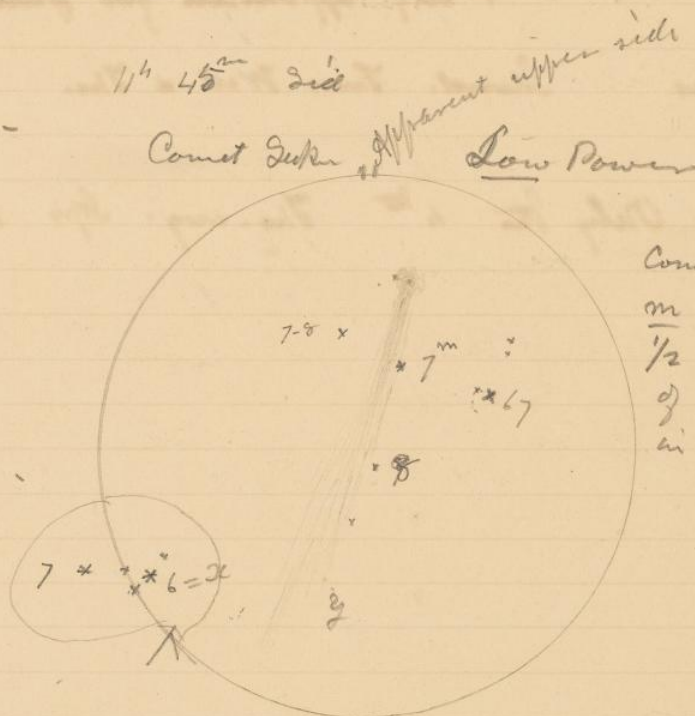
narrower than head

Tail is manifestly narrower than head of Comet

The distance from star $\alpha = 6^{\text{th}}$ to further
edge of tail at z perp to axis is $\frac{2}{10}$ of breadth of
field of high power.

Whole diameter of head at nucleus perp
to axis is $\frac{1}{4}$ breadth of field of
Finder of Gr. Refractor

As seen in Comet-seeker the apparent
left hand is perhaps less definitely bounded - possibly
a curvature as above.



In the Great Ref. light of head more than
fills the field - at centre is a 2 minute nucleus
say $\approx 12^{\text{th}}$ & it is on all sides surrounded
by dim haze - shapeless

If any thing the light close to nucleus is
brightest away from dm - i.e. in direction of
the tail -

Position estimated

At 9^h 30^m P.m.

Comet.

1861 April 29

Quite clear

10^h P.M.

Comet seeker.

very singular appearance

○²○⁵○²head has light not quite equal to
δ Usc. Regi.○⁷○³

40' broad

I fancy that there is a faint tail say 40' or more broad at extremity & curved as above - enveloping the bright narrow ray so conspicuous in the Comet seeker. It is very faint & dumb like - possibly caused by stress - but I am confident that the tail is now 10° long to naked eye though quite faint & easily recognized only for 4'.

Tail in Cyr. Ref. An. in finder is but 4' broad - This includes $> 9/10$ of the light - & it does not sensibly widen for a degree or more though there may be scattered light extending much further. Head is 30' in diameter extreme

light - In Cyr. Ref. - Nebulosity is brightest on sides of nucleus where tail issues.

Comet.

1861 April 29

13^h 20^m Sid

* @ Sunday

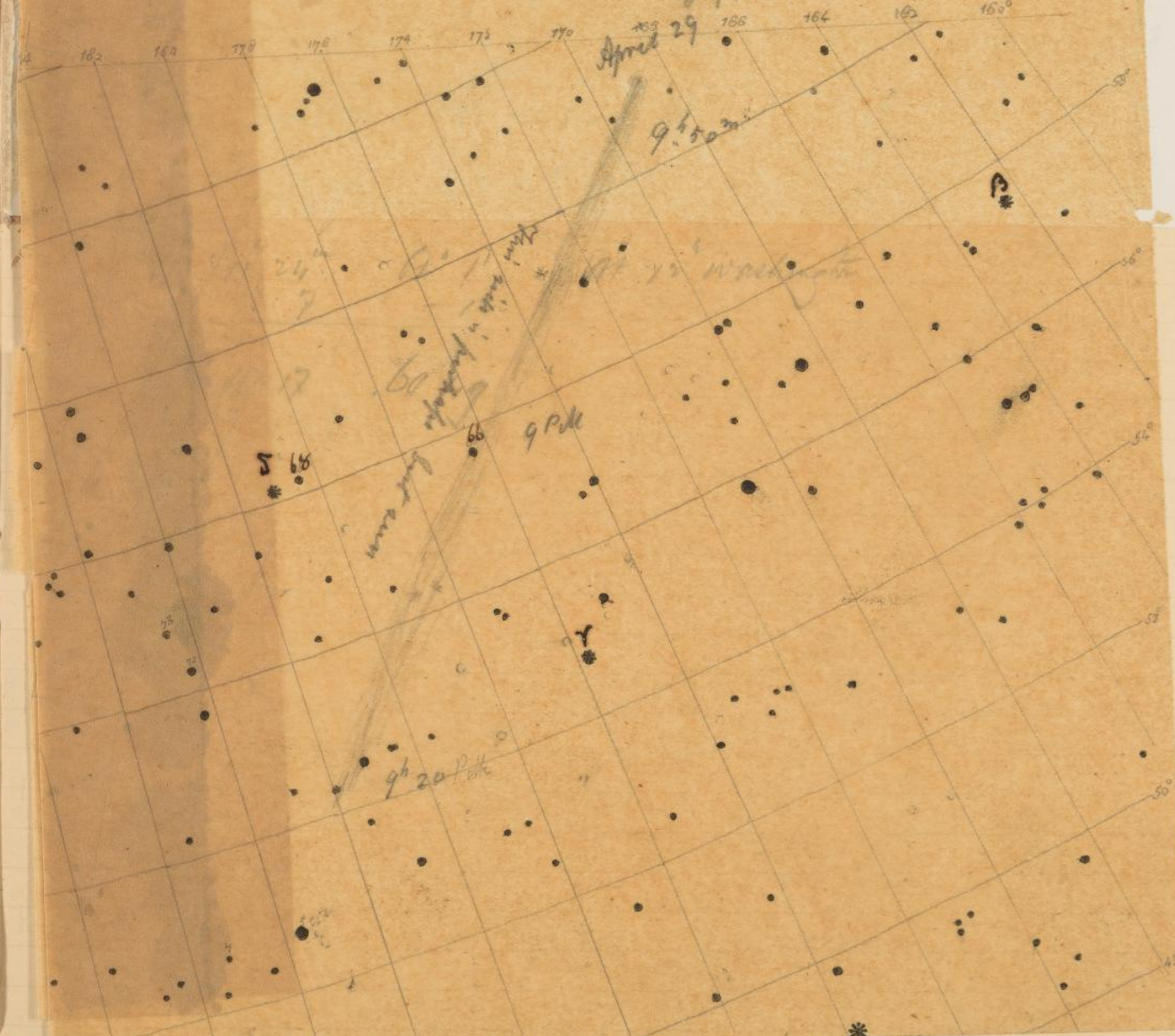


* brightest star

From Hatching Chart.
But a little less than from Comet. under
to a sun day. Sunday morning

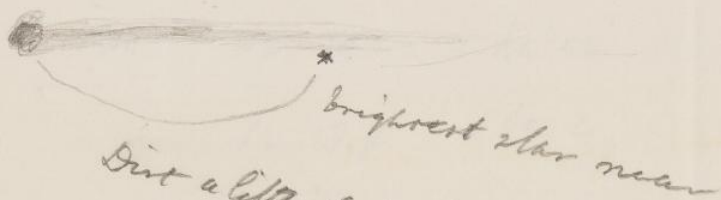
April 29

9^h 50^m



Comet.

1861 April 29

13^h 20^m Sud

* brightest star near
 Dist a little less than from nucleus
 to a sun drag -

11 24^m 64° 17' at 72° Washington
 7 - 12
 11 17 60 49

Comet.

Apr. 27.

Position estimated

At 9 30 P.M. 12 70.5 + 14° 52'

Ephem. 12 17.7 65 4

Corr. - 17" - 12'

The naked eye at 9 10 P.M. the comet is between ϵ and
 Ursae minoris, but nearer ϵ .

Position for Apr. 29.

11 24^m 64° 1' At 12^h Washington
 7 - 12

11 17 60 49

Comet 1861 I.

1861 Apr. 29.

G.P.B. obs.

2 H.S. obs.

Angle of P.D. of Tail $14^{\circ} 9'$ with edge

of scale

30' extreme diameter of light.

Most of light within 10'.

Angle again
of scale.

$224^{\circ} 20'$ with edge

Zero of edge of scale $262^{\circ} 30'$ rough.

Tail goes off south following nucleus
by (say) 40° .

South edge of tail is best defined.

Planet 1861 I.

1861 Apr 29.

J.H. Cook

Comet m.p. star of 8th mag.

Scale at reading 353" 35'

B. D. B

Comet 7 36

14 33 6.8 15.1 - 25.85

Star 1 12

33 32.8 40.8

Comet 8 9

35 37.1 45.2 - 28.65

Star 1 56

36 5.8 13.8

B.

Comet 9 11

37 39.2 46.5 - 30.35

Star 3 17

38 9.2 17.2

Set circle at 352" 40'

5amps in A.R. by El. Comet

14 41 19.1 28.9 - 33.90

Star

41 53.2 62.6

Comet

14 42 43.9 53.7 - 35.60

Star

43 19.6 29.2

Don

Comet 1861. I.

1861 Apr. 29
145 rh.

Comet

Star

14 43 56.8 66.0 - 36.65

44 33.3 42.8

Comet

Star

14 45 15.5 25.1 - 38.00

45 53.4 63.2

Comet

Star

14 46 40.8 50.3 - 39.20

47 19.9 29.6

Compared by chas. 236.

Comet 14 47 45.7 55.3

Star 48 28.2 37.7 42.65

Comet 14 49 51.5 61.2

Star 50 36.0 45.6 44.65

Comet 14 51 53.6 62.8

Star 52 40.1 49.6 46.65

Comet 1861 I

1861 Apr 29

J.H.S. to

Coincidence of different sides of wires

26.13	25.95	Not used
26.13	92	
26.11	94	
26.15	93	
<u>26.09</u>	<u>25.93</u>	

E.L.

Comet	32.08	15 8 54
Star	47.27	9 52

Comet	21.36	15 12 12
Star	34.91	13 19

Comet	26.41	15 14 34
Star	41.92	15 43

Comet	36.35	15 17 8
Star	47.29	18 19

Comet	42.56	15 20 21
Star	51.20	21 17

Comet 1861 I

1861 Apr. 29.

J.W. Schaefer

Hrs of Pos. $82^{\circ}36'$

Set back on 35240

Comet compared with star in R.A. again

D.B.

C.B.

Comet	15	32	29.1	33.8	-1	23.75
-------	----	----	------	------	----	-------

Star	33	52.9	57.5			
------	----	------	------	--	--	--

Changed movable wire.

Comet	15	34	26.0	33.8	-1	26.00
-------	----	----	------	------	----	-------

Star	35	57.9	59.9			
------	----	------	------	--	--	--

Comet	15	36	29.3	37.2	-1	27.95
-------	----	----	------	------	----	-------

Star	37	57.2	65.2			
------	----	------	------	--	--	--

Comet	15	38	38.6	46.5	-1	29.35
-------	----	----	------	------	----	-------

Star	40	8.1	15.7			
------	----	-----	------	--	--	--

Comet	15	41	12.5	20.7	-1	32.95
-------	----	----	------	------	----	-------

Star	42	48.5	53.6			
------	----	------	------	--	--	--

Comet 1861 I.

1861 Apr. 29.

J.H. Sob.

Star in center of field #

By 236 15 41 20

Hor. Ang. 4 21 52

Dec. 60° 25' 18"

The star is probably Altair 11730 - Feb. 1866

After the passage of the Comet in the fourth comp. on last page the lamp went out. The wires were illuminated by a hand lamp during the remainder of the observations. The 4th comp. is to be rejected, because the comet and star were observed by wires differently illuminated.

				Scale	$I_{\text{comp. 45.}}$	App. reduction	Res
14 33 11	-25.85			14 32 49 + 6' 24"	-0.9	-23.58	-49.43 + 3 51.9
35 41	28.65			35 20 6 13	0.8	2.10	.75 3 56.8
37 43	30.35			37 20 8 54	-0.8	19.09	.64 3 50.3
14 41 24	33.90			15 9 23	+2 28.9	15.44	.31 3 46.3
42 49	35.60			12 44	2 12.8	14.04	.64 3 51.2
44 2	36.65			~~12~~ 8	(2 57.6)	12.84	.59 (4 44.9)
45 20	38.00			17 48	1 46.3	11.55	.55 3 56.3
46 46	39.20	= E.C.		20 49	1 24.7	10.13	.33 3 53.6
Chas J.	47 50	42.45	14 49 57			6.98	.43 +3 52.3
"	49 56	44.45	52 3			4.90	.35
"	51 58	46.65	54 5			-2.89	.54
E.C.	15 32 31	83.75				+35.16	48.59
	34 30	86.00				37.12	.89
	36 33	87.95				39.15	.80
	41 16	-92.95				42.93	-49.12

April 1861 I.

1861 Apr. 29.

Star-places.

A. 2. 184.32.

$$\begin{array}{r} 11\ 15\ 53.34 \\ - 17.46 \\ + .17 \end{array}$$

$$\begin{array}{r} 60\ 31\ 1.0 \\ + 48.9 \\ - 0.9 \\ - 2.1 \end{array}$$

Correction

1842.00

$$\begin{array}{r} 11\ 15\ 36.05 \\ + 36.87 \end{array}$$

$$\begin{array}{r} 60\ 31\ 48.9 \\ - 6\ 14.1 \end{array} = \text{Orion},$$

1861.00

$$\begin{array}{r} 11\ 16\ 42.92 \end{array}$$

$$\begin{array}{r} 60\ 25\ 34.8 \end{array}$$

$$\begin{array}{r} 60^{\circ} 28' 20'' \text{tg } 0.24697 \\ 11\ 16\ 9.5'' \text{ } 9.27905 \\ 1.40687 \\ 8.579 \text{ } 0.93089 \\ 58.362 \end{array}$$

Feb. 1866 [1790.0]

$$\begin{array}{r} 11\ 12\ 31.41 \\ 11\ 15 \end{array}$$

$$\begin{array}{r} + 60\ 48\ 57.3 \\ - 23\ 16.2 \end{array}$$

$$\begin{array}{r} 9.99201 \\ 2.58196 \\ 2.57297 \end{array}$$

1861.00

$$\begin{array}{r} 11\ 16\ 42.56 \end{array}$$

$$\begin{array}{r} 60\ 25\ 35.1 \end{array}$$

$$\begin{array}{r} 60^{\circ} 37' 23'' \text{ } 0.24949 \\ 11\ 14\ 37.4'' \text{ } 9.29381 \\ 1.97743 \\ 33.17 \text{ } 1.52073 \\ 3\ 27.08 \\ 9.99143 \\ 3.15353 \\ 3.14496 \end{array}$$

1861.

$$\begin{array}{r} 0.24606 \\ 9.27357 \\ 0.4423 \text{ } 9.64573 \\ 3.5731 \\ 9.99221 \\ - 19.697 \text{ } 1.29440 \end{array}$$

Comet 1861 I.

1861 Apr. 29.

Star - place.

[Angel] Adopted 1861.00

Red to app.

 $\Delta \times$ (Comet - Star)

11 16 42.92

+ 4.12

- 1 5.00

60° 25' 34.8"

- 1.4

+ 2 8.6

Comet app. place.

11 15 42.04

60 27 42.0

G. 34.7" 4"

a. 169 11

H. 227 57

for $\Delta \times$

+ 0.730

- 0.07

E.C. 15 13 2

fast 3 52

Sid. 15 9 10
- 2 30 28.5
- 2 4.3

12 36 37 M. I. Cantz.

has not been published: will be

changed.

Hor. Ang 3 53.5

Reduce to 14.57. a E.C.

3703

 $\frac{2.12.55}{15}$ N.H. in α . - 59.4 - 6.25

Comet - Star

Refr. invisible.

- 49.312 + 3' 52.3

f 28.92
g° 9.15
h° 23.77g' - 11.84
h' + 13.67
i' - 3.08

for	0.246
in (G) 156 15	9.605
g	1.111
a (line)	9.962
for	0.307
in (H) 3 8	9.781
h	1.288
a (H)	9.902
for	9.939

* Not yet corrected for deviation of zero of position

Comet 1861-1

1861 Apr. 29.

Comet - Star 0.5

14 41 24	- 33.90
42 49	35.60
44 11	36.65
45 20	38.00
46 46	39.20

15 8 54
12 12
14 34
17 8
20 21

15.19

13.55

12.54

10.85

8.64

2 28.9 + 24.8

2 12.8 5.0

2 2.6 + 9.2

1 46.3 24.6

1 24.7 43.9

(Probably 5^r out)

15 32 32 - 1 23.75

34 30 26.00

36 33 27.95

38 43 29.35

41 17 32.95

reject. see before

Mean 14 44 4 - 36.67

15 14 38

12.148

+ 1 59.1

15 36 43 - 1 27.66

Reduce to 15 13 2 22

- 1 5.00

+ 2' 8.6

McKerrow's found = 0

11 10" 5

11 10" 5

12.55

As found in Dec. in 1^m - 0" 00

8.

11 17.0 + 60 24

x. 1861.0

11 18.5 60 22

for Planet (66)

1861 May 1.

145 of

α pos. at 10/11 (60. 21.5).

E.C.

14 27 50.5 59.2

✓ 28 32.5 40.9

14 30 23.6 33.7

31 6.2 14.

Star α may tonight by H.R.T. to be (66).

Star α is not the planet.

Star α is in a recognisable position. (P.R.)

for Pinned (66)

1861 May 1.
Tues. day.

Decl.

x	53.77
a	68.92

x	53.47	2nd
-----	-------	-----

x	53.92
a	~~67~~ 69.61

B8B

x	53.20
-----	-------

a	69.46
-----	-------

x	54.67
-----	-------

a	69.64
-----	-------

x	54.75
-----	-------

a	69.94
-----	-------

for Planet (66)

1861 Apr. 22. May 2.

Planet's place for line 4.

$$\alpha = 11^h 59^m.2 - 43.3 (t - \text{Apr. 10}) + \frac{100 d^2 \alpha}{dt^2} \frac{(t - \text{Apr. 10})^2}{200}$$

$$\delta = 0^{\circ} 12' + 3.174 (t - \text{Apr. 10}) + \frac{100 d^2 \delta}{dt^2} \frac{(t - \text{Apr. 10})^2}{200}$$

If we make $100 \frac{d^2 \alpha}{dt^2} = x$ in minutes of time $100 \frac{d^2 \delta}{dt^2} = y$ " " " "

we shall have

	α	δ
May 2	$11^h 43.3^m + 2.42 x$	$1^{\circ} 34' + 2.42 y$
3	$42.6 + 2.64 x$	$1 38 + 2.64 y$
4	$41.9 + 2.88 x$	$1 42 + 2.88 y$

I have now employed the places of other asteroids at about the same season to determine x and y . The result is

x	$+2.1$	-11.2	
	1.4	6.9	
	1.9	13.2	
	2.0	21.6	
	2.2	18.9	
	2.5	8.9	
	1.7	16.5	
	3.0	12.9	
	1.9	11.4	
mean	$+2.1$	-13.5	

J.H.S.

for Planet (66)

1867 May 2. etc.

Most probable
place

May 2	$11^h 48^m.4$	$+1^{\circ} 2'$
3	48.1	1 2
4	47.9	1 3

Deviation from this may be as much as
 $\pm 2^m \pm 24'$

Actually found by H.P.J.

$$11^h 47^m 28^s + 1^{\circ} 8'$$

$$C-O \quad + 0^m 38^s - 6'$$

From this we find $x = +1.84^m$ $y = -11.4'$

Comet 1 1861, between
 14^h & 15^h sidereal Time, Comb. A
 May 2 1861



$$a'a' = 7-8 \text{ mag}$$

$$b' = 8\frac{1}{2} =$$

$$c'c' = 8 =$$

From b' to c'
 is nearly a field
 with low power

H. P. T.

Comet 1861. I.

1861phae.proj...194B

361 May 2.
H.S. on
H.H. rec. (Copy)

Compared with unknown star (= x) by scale.
E.L.

Comet.	4' 24"	15	54	54.0	60.4
Star.	5 28	56	6.3	12.8	

Comet.	3 26	15	57 (44.1)	48.1	53.3
Star.	4 55	59 ()	7.6	(Close breaking)	

Comet.	5 58.	16	9 (2.7)	9.8	Not breaking around
Star.	7 47	16	1 19.5	26.7	

15 54 57	+ 12.35	- 1' 21"	15 54 57 (25.4)
	14.30	- 1 29	15 57 53
	19.5	- 1 49	16 0 7

Set on Comet.

This observation is somewhat doubtful. H.H. -40.5 - 3.5

336.	15 59 57		
H.L.	5 41 14	- 1 14.333	- 1 37.3 15 57 39 E.L.
		- 3.4?	Not in
		- 1 14.33	- 1 30.7

Set. + 57° 18'

May 2.54

Comp: with Acc

Counter out.

9 4 10 15 35 15.52 66 25 44.6 W
10 57 58 34 55.33 28 54.9
13 15 28 33 7.31 33 7.6

52.2
1340. 10.38 362
244 3 52 39.09
21 30 12 30 15 35 36.62

12 3 14
0 0 10.5
10.25 - 10.50

2 4 4
13 14 21 20 30 14.20
19 10 57 2 24 1 48
13 15 20 57 13.13
20 12 3 36.15
138 5 11
11 27

13.5
16.45
148 0
57.13
13.5
35.66
2.9
13.0.19

250.0

151.1

10.30
+1.29
-0.49
+0.30

151.1
+1.29
-0.49
+0.30
151.1
+1.29
-0.49
+0.30
151.1
+1.29
-0.49
+0.30

151.1
+1.29
-0.49
+0.30
151.1
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151.1
+1.29
-0.49
+0.30
151.1
+1.29
-0.49
+0.30
151.1
+1.29
-0.49
+0.30

pe m

pe n

8,39
8 42

Measurement

C-D

$$\begin{array}{r} 100.02 \\ - 0.97 \\ \hline 99.05 \end{array}$$

$$\begin{array}{r} 100.4 \\ - 1.20 \\ \hline 99.20 \end{array}$$

$$\begin{array}{r} 100.4 \\ - 1.44 \\ \hline 98.96 \end{array}$$

$$\begin{array}{r} 100.4 \\ - 1.44 \\ \hline 98.96 \end{array}$$

$$\begin{array}{r} 100.02 \\ - 0.97 \\ \hline 99.05 \end{array}$$

$$\begin{array}{r} 100.02 \\ - 0.97 \\ \hline 99.05 \end{array}$$

Measurement

5 38 5

$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

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$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

$$\begin{array}{r} 100.42 \\ - 19.42 \\ \hline 81.00 \end{array}$$

13.14

May 2.54

Comp: with A

457.2

90.24

10

10. 12 16.6

12 39 20.51

16.35

3 53 15.5

30.2

C

D

94 30 57.2

94 34 9.3

94 34 9.3

94 34 9.3

94 34 9.3

94 34 9.3

94 34 9.3

94 34 9.3

94 34 9.3

94 34 9.3

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94 34 9.3

94 34 9.3

94 34 9.3

94 34 9.3

94 34 9.3

94 34 9.3

^{13.7}
 May 2.54 $154^{\circ} 1' + 51^{\circ} 15' \quad \#$
 $10 \quad 16.4 + 51.15$
 $10 \quad 17.16 + 51.16 + 186.0$

pe n
 18,39
 18.42

Comp: with Acc. $\frac{10769}{70}$ $10 \quad 13.65 + 51^{\circ} 11.4 \quad 802.89 \text{ mg.}$

Observations of Comets and Small Planets.

Date	Obj.	Star.	R. (1861.0) Star; Dec.	Magn. Star.	Method
1901 Apr. 9 ¹⁰	Planet <u>Tuttle</u>	N.L.H. 4.6.7	12 ^h 0 ^m 4 ^s +0° 8'.6	7.6	Micr.
Apr. 10	same.	same.	same.	same.	same.
Apr. 10	Comet. <u>Thatcher</u>	N.L. 117.34	17 24.8	59° 37'.6	G. Scale
Apr. 11	same	N.L. 117.34	4 50	60 5.2	G. Micr.
Apr. 11	Planet <u>Tuttle</u>	N.L. 4.6.7	11 59 39	+0 15.8	1/12. same
Apr. 14	Comet. <u>Thatcher</u>	N.L. 125.11	16 40 29	62 31.7	G. same.
"	N.L. 125.11	N.L. 125.9	16 39 34	62 34.3	F. Scale.
Apr. 14	Comet. <u>Thatcher</u>	<u>Anonymous</u>	15 50 21	65 46.1	(9) Micr. not very good.
"	<u>Anonymous</u> f. 8	N.L. 112.145	15 52 8	65 41.7	F. Scale. not very good.
Apr. 19	Comet. <u>Thatcher</u>	<u>Anonymous</u> 10	15 34 42	66 21.6	(10.) Micr.
"	<u>Anonymous</u> 10	Piazzi 37.168	15 37 4	66 14.6	[7.2] Scale. not very good.
29	Comet. <u>Thatcher</u>	N.L. 184.32			G. Scale and Micr.
May 2.	"	<u>Anonymous</u>			

Reduction to 1875.0

$$1790.0 \quad 3^{\text{m}} 37.977 + (1.97742) \text{ in } 2^{\text{h}} 14^{\text{m}} 0^{\text{s}} \quad (3.15353) \text{ in } 2^{\text{h}} 1825.5$$

$$1800.0 \quad 3^{\text{m}} 7.282 + \left(\begin{smallmatrix} 1.91150 \\ 2.00759 \end{smallmatrix} \right) \text{ in } 2^{\text{h}} 14^{\text{m}} 0^{\text{s}} \quad (3.00759) \text{ in } 2^{\text{h}} 1830.5$$

$$1840.0 \quad 64.483 + (1.44235) \text{ in } 2^{\text{h}} 14^{\text{m}} 0^{\text{s}} \quad (2.62444) \text{ in } 2^{\text{h}} 1850.5$$

$$1862.0 \quad 58.362 + (1.40482) \text{ in } 2^{\text{h}} 14^{\text{m}} 0^{\text{s}} \quad (2.58090) \text{ in } 2^{\text{h}} 1851.5$$

-0.46+0.0091 σ^0 Argel. 1830.
 +1.55 - 0.0150 ~~Argel. 1830.~~
 Argel. 1830.

+1.08 - 0.0059 σ^0 Cassel.
~~+1.04 - 0.0059~~

1861phae,proj...194B