KG
11365
498

φ' for Cambridge = 42° 11'.3

Log tan φ' = 9.9573

KG 11365.496

For Cambridge.

Log $(\pi \rho \cos \varphi')$ = 0.8161

" $(\pi \rho \sin \varphi')$ = 0.7733

Formulae for Par. Cor. (Log $p. \times \Delta$)

$$\alpha - \alpha' = \frac{\pi \rho \cos \varphi' \sin t}{15.\cos \delta}$$

$$\tan \gamma = \frac{\tan \varphi'}{\cos t}$$

$$\delta - \delta' = \frac{\pi \rho \sin \varphi' \sin(\gamma - \delta)}{\sin \gamma}$$

where α' = stars observed R. A.

" α = " geocentric " &c.

KG 11365.498

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March 4.

Comet 1883 I.

f	+1.344 ✓
log. g	+1.0292 ✓
" sin (G+α)	+9.8163 ✓
" tan δ	+9.7964 ✓
" sum	+0.6419 ✓
" 15	+1.1761 ✓
" result.	+9.4658 ✓
2y.	+0.292 ✓
" h	+1.2761 ✓
" sin(H+α)	−9.9643 ✓
" sec δ	+0.0717 ✓
" sum	−1.3121 ✓
" 15	+1.1761 ✓
" result	−0.1360 ✓
2y	−1.368 ✓
α′−α	+0.268 ✓

Log. g.	+1.0292 ✓
" cos. (G+α)	+9.8783 ✓
" sum	+0.9075 ✓
2y.	+8.08 ✓
" h	+1.2761 ✓
" cos(H+α)	+9.5901 ✓
" sin δ	+9.7246 ✓
" sum	+0.5908 ✓
2y.	+3.90 ✓
" i	−0.8941 ✓
" cos δ	+9.9283 ✓
" sum	−0.8224 ✓
2y	−6.64 ✓
δ′−δ	+5.34 ✓

G = 2h 20.2m ✓
α = 0 23.5
(G+α) = 2 43.7 ✓

+32° 2′ = δ

H. = 19 8.1 ✓
α = 0 23.5 ✓
(H+α) = 19 31.6 ✓

March 9.

~~1883 I~~

f	+1.362 ✓		
log. g.	+1.0297 ✓	log. g.	+1.0297 ✓
" sin(G+t)	+9.8938 ✓	" cos(G+t)	+9.7936 ✓
" tan δ	+9.7845 ✓	" sum.	+0.8233 ✓
" sum	+0.7080 ✓	zy.	+6.66 ✓
" 15	+1.1761 ✓	" h	+1.2785 ✓
" result.	+9.5319 ✓	" cos.(H+t)	+9.6876 ✓
zy.	+0.340 ✓	" sin δ	+9.7160 ✓
" h	+1.2785 ✓	" sum	+0.6781 ✓
" sin(H+t)	−9.9412 ✓	zy.	+4.77 ✓
" sec. δ.	+0.0685 ✓	" i	−0.9030 ✓
" sum	−1.2842 ✓	" cos. δ	+9.9315 ✓
" 15	+1.1761 ✓	" sum.	−0.8345 ✓
" result.	−0.1081 ✓	zy	−6.83 ✓
zy.	−1.283 ✓	δ′−δ	+4.60 ✓
t′−t	+0.419 ✓		

$G = 2^h \quad 16.7^m$

$\quad\quad\;\; 1 \quad 10.1$

$(G+t) = 3 \quad 26.2$ ✓

$+31 \quad 20 = \delta$

$H = 18 \quad 46.5$

$\quad\quad\;\; 1 \quad 10.1$ ✓

$(H+t) = 19 \quad 56.6$ ✓

March 14.

f	+1.385 ✓
log. g	+1.0383 ✓
„ sin(G+t)	+9.9469 ✓
„ tan δ	+9.7553 ✓
„ sum	+0.7405 ⌝
„ 15	+1.1761 ⌝
„ result.	+9.5644 ⌝
ly.	+0.367 ⌝
„ h	+1.2735 ✓
„ sin(H+t)	−9.9177 ✓
„ sec. δ.	+0.0609 ✓
„ sum	−1.2521 ⌝
„ 15	+1.1761 ⌝
„ result.	−0.0760 ⌝
ly.	−1.191 ⌝
t′ − t	+0.561 ⌝

log. g	+1.0383 ✓
„ cos.(G+t)	+9.6680 ✓
„ sum	+0.7063 ⌝
ly	+5.08 ⌝
„ h	+1.2735 ✓
„ cos(H+t)	+9.7496 ✓
„ sin δ	+9.6943 ✓
„ sum	+0.7174 ✓
ly.	+5.22 ⌝
„ i	−0.9084 ✓
„ cos δ	+9.9391 ✓
„ sum	−0.8475 ⌝
ly	−7.04 ⌝
δ′ − δ	+3.26 ⌝

G = 2h 17.7m
t = 1 51.9
(G+t) = 4 9.0 ✓

+29 39 = δ

H = 18 24.8
t = 1 51.9 ✓
(H+t) = 20 16.7 ✓

March 19.

f	=	$+1.431$ ✓
log. g		$+1.0470$ ✓
„ sin $(G+\alpha)$		$+9.9736$ ✓
„ tan δ	–	$+9.7121$ ✓
„ sum		$+0.7327$ ✓
„ 15	–	$+1.1761$ ✓
„ result		$+9.5566$ ✓
zy	=	$+0.360$ ✓
„ h		$+1.2731$ ✓
„ sin $(H+\alpha)$		-9.8976
„ sec. δ	–	0.0512 ✓
„ sum		-1.2219 ✓
„ 15	–	$+1.1761$ ✓
„ result	–	-0.0458 ✓
zy	=	-1.111 ✓
$\alpha'-\alpha$	=	$+0.680$ ✓

Log. g		$+1.0470$ ✓
„ cos $(G+\alpha)$	–	$+9.5293$ ✓
„ sum	–	$+0.5763$ ✓
zy	=	$+3.77$ ✓
„ h		$+1.2731$ ✓
„ cos $(H+\alpha)$		$+9.7876$ ✓
„ sin δ	–	$+9.6610$ ✓
„ sum	–	$+0.7217$ ✓
zy	=	$+5.27$ ✓
„ i		-0.9105 ✓
„ cos δ	–	$+9.9488$ ✓
„ sum	–	-0.8593 ✓
zy	=	-7.23 ✓
$(\delta'-\delta)$	=	$+1.81$ ✓

$G = 2^h\ 12.8^m$
$\alpha = 2\ \ 28.1$
$(G+\alpha) = 4\ \ 40.9$

$+27°\ 16' = \delta$

$H = 18^h\ \ 3.2^m$
$\alpha = 2\ \ 28.1$
$(H+\alpha) = 20\ \ 31.3$ ✓

Comp star for March. 5 on Comet
a was D.M. + 31° 89 = fol. star in Leiden Zones.

0 32 48.68 +31 56 31.6

8° 12' 10."20

log. $\frac{u}{15}$ = 0.126064
" sin t = 9.154383
" tan δ = 9.794812
+0.1189 = 9.075259
3.0712
3.1901' = 0.5038043
log. 8. = 0.9030900
25.52 = 1.4068943
0 32 48.68
25.52
0 33 14.20

log. u = 1.302156
" cos. t = 9.995533
19.84 = 1.297689

31 56 31.6
1 19.4
+31 57 51.0

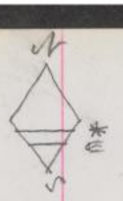
8 18 33

log. $\frac{u}{15}$ = 0.126064
" sin t = 9.159911
" tan δ = 9.795185
+0.1205 = 9.081160
3.0712
3.1917' = 0.5040221
8. = 0.9030900
25.53 = 1.4071121

log. u = 1.302156
" cos. t = 9.995417
19.84 = 1.297573
8
158.72 = 2' 38."7

0 32 48.68 +31 56 31.6
25.53 +2 38.7
Pos. 1883 = 0 33 14.21 +31 59 10.3
+0.30 +5.2
app. pl. * = 0 33 14.51 +31 59 15.5
☾ − * +12.91 −18.1
App. pl. ☾ = 0 33 27.42 +31 58 57.4

8



Comet a 1883. March 5.

Comet	Star.	Diff.	$\frac{\text{Diff.}}{2}$
16 27.2 ✓	16ᵐ 14.2 ✓		
16 46.8 ✓	16 36.8 ✓		
33 14.0 ✓	32 51.0 ✓	0 23.0 ✓	0 11.50 ✓
17 33.2 ✓	17 18.9 ✓		
17 52.2 ✓	17 41.3 ✓		
35 25.4 ✓	35 0.2 ✓	0 25.2 ✓	1 12.60 ✓
18 33.8 ✓	18 19.6 ✓		
18 53.1 ✓	18 42.2 ✓		
37 26.9 ✓	37 1.8 ✓	0 25.1 ✓	1 12.55 ✓
19 31.2 ✓	19 16.6 ✓		
19 51.0 ✓	19 39.2 ✓		
39 22.2 ✓	38 55.8 ✓	0 26.4 ✓	0 13.20 ✓
20 26.3 ✓	20 11.7 ✓		
20 46.8 ✓	20 34.6 ✓		
41 13.1 ✓	40 46.3 ✓	0 26.8 ✓	0 13.40 ✓
21 24.9 ✓	21 9.6 ✓		
21 46.9 ✓	21 33.8 ✓		
43 11.8 ✓	42 43.4 ✓	0 28.4 ✓	0 14.20 ✓
			+ 0 12.91 ✓

6ʰ 19ᵐ 9ˢ.45 ✓ = mean of ⊜ times.
−1 45.3 ✓ = Chr. Cor.

6 17 24.1 ✓
22 52 20.7 ✓

7 25 3.4
−1 12.9

7 23 50.5 C. M. T.
74 44 31

12 8 21

Col. 5 Diff. ☄		Col. 6. Diff. *		Diff. Cols. 5 + 6.
0	19.6 ✓	0	22.6 ✓	3.0 ✓
0	19.0 ✓	0	22.4 ✓	3.4 ✓
0	19.3 ✓	0	22.6 ✓	3.3 ✓
0	19.8 ✓	0	22.6 ✓	2.8 ✓
0	20.5 ✓	0	22.9 ✓	2.4 ✓
0	22.0 ✓	0	24.2 ✓	2.2 ✓
	6)120.2		6)137.3	2.85 ✓
	20.03		22.88	

+31° 59′ 10″.3
−9.1 ✓
+31 59 1.2 ✓

+31° 59′ 10″.3 ✓
+5.2
+31 59 15.5
−18.1
+31 58 57.4
App. pl. ☄

log. 2.85 = 0.4548449 ✓
" 7.5 = 0.8750613 ✓
" cos. dec. = 9.9284858 ✓
2)18″.13 ✓ = 1.2583920 ✓
9.06 ✓

0.4548449 ✓
0.8750613 ✓
9.9284978 ✓
1.2584040 = 18.13

58 yrs. March 16. 1883. Comet a.

Comp. star D.M. + 28° 369. = W_2 2^h 69

1825 =	2^h	2^m	17.45^s ✓✓	+28°	22′	21.7″ ✓✓
		+3	19.85 ✓		+16	37.3 ✓
	2	5	37.30 ✓	+28	38	59.0 ✓
			+0.61 ✓			+2.7
App. pl. * =	2^h	5^m	37.91^s ✓	+28	39	1.7
		1	31.64 ✓		7	23.2
App. pl. ∈ =	2	7	9.55	+28	46	24.9

7	18	34.0	mean of ∈ times.
	−1	36.3	Chr. cor.
7	16	57.7 ✓	
23	35	42.7 ✓	
7	41	15.0 ✓	
	1	15.6 ✓	
7	39	59.4 ✓	= C. m. t. obs.
5	44	31.	
12	24	30.	

Comet a 1883. Mar. 16. 1883.

Comet	Star.	Diff.	$\frac{\text{Diff.}}{2}$
7h 9 37.7	7m 52.1		
9 54.2	8 42.6		
19 31.9	16 34.7	2 57.2	1m 28.60
12 8.0	10 21.0		
12 24.4	11 11.2		
24 32.4	21 32.2	3 0.2	1 30.10
16 14.3	14 26.7		
16 31.4	15 17.2		
32 45.7	29 43.9	3 1.8	1 30.90
18 50.8	17 1.6		
19 7.6	17 52.8		
37 58.4	34 54.4	3 4.0	1 32.00
21 19.2	19 29.5		
21 36.2	20 20.9		
42 55.4	39 50.4	3 5.0	1 32.50
23 52.2	22 2.3		
24 9.5	22 53.3		
48 1.7	44 55.6	3 6.1	1 33.05
26 56.4	25 4.8		
27 13.8	25 56.8		
54 10.2	51 1.6	3 8.6	1 34.30
			+1 31.64

mean of ☄ times 7h 18m 34.0
−1 36.3 = Chr. Cor.
7 16 57.7

Col. 5. Diff. ☄	Col. 6. Diff. ✱	Col. 5 + Col. 6
0 16.5 ✓	0 50.5 ✓	67.0″ ✓
0 16.4 ✓	0 50.2 ✓	66.6 ✓
0 17.1 ✓	0 50.5 ✓	67.6 ✓
0 16.8 ✓	0 51.2 ✓	68.0 ✓
0 17.0 ✓	0 51.4 ✓	68.4 ✓
0 17.3 ✓	0 51.0 ✓	68.3 ✓
0 17.4 ✓	0 52.0 ✓	69.4 ✓
7|118.5 ✓ 16.93 ✓	7|6.8 ✓ 50.97 ✓	67.90

+28° 38′ 59.0″

log. 67.90 ✓ = 1.8318698 ✓
" 7.5 = 0.8750613 ✓
" cos. dec. = 9.9432804 ✓
446.90 ✓ = 2.6502115
889.8
2|442.9
221.4 = +3′ 41.4″ ✓
28 38 59.0 ✓
+28 42 40.4 ✓

log. 67.90 ✓ = 1.8318698 ✓
" 7.5 = 0.8750613 ✓
" cos. dec. = 9.9430253 ✓
446.6 ✓ = 2.6499564 ✓
889.8
443.2 = +7′ 23.2″ ✓
+28 38 59.0 ✓
+28 46 22.2 ✓

~~App. dec. ☄~~

Comet a 1883.
March 25. 1883.

Comet.		Star.		Diff.		$\frac{\text{Diff.}}{2}$	
8 5	52.3 ✓	9	16.4 ✓				
6	8.7 ✓	9	42.0 ✓				
12	1.0 ✓	18	58.4 ✓	6	57.4 ✓	3	28.70 ✓
11	18.2 ✓	14	41.6 ✓				
11	34.8 ✓	15	7.4 ✓				
22	53.0 ✓	29	49.0 ✓	6	56.0 ✓	3	28.00 ✓
16	20.5 ✓	19	42.2 ✓				
16	35.8 ✓	20	7.1 ✓				
32	56.3 ✓	39	49.3 ✓	6	53.0 ✓	3	26.50 ✓
20	38.3 ✓	23	58.5 ✓				
20	53.0 ✓	24	23.1 ✓				
41	31.3 ✓	48	21.6 ✓	6	50.3 ✓	3	25.15 ✓
25	17.5 ✓	28	37.4 ✓				
25	32.0 ✓	29	1.4 ✓				
50	49.5 ✓	57	38.8 ✓	6	49.3 ✓	3	24.65 ✓
						− 3	26.60 ✓

Mean of ☄ times 8 16 1.11 ✓
0 11 11.71 ✓
8 4 49.40 ✓
1 19.43 ✓
8 3 29.97 ✓
+19.5
8 3 49.47
4 44 31.
12 48 20.

Diff. ☾ Diff. *

0^m	$16^s.4$ ✓	0^m	$25^s.6$ ✓	$42''.0$ ✓
0	16.6 ✓	0	25.8 ✓	42.4 ✓
0	15.3 ✓	0	24.9 ✓	40.2 ✓
0	14.7 ✓	0	24.6 ✓	39.3 ✓
0	14.5 ✓	0	24.0 ✓	38.5 ✓
	15.50 ✓		24.98 ✓	40.48 ✓

+24 29 36.0 ✓
− 5 6.8 ✓
+24 24 29.2 ✓

log. 40.48 = 1.607241 ✓
" 7.5 = 0.875061 ✓
" cos. dec. = 9.959046 ✓
= 2.441348 ✓

2)276.3 ✓
889.8 ✓
2)613.5 ✓
306.8 ✓

1.607241 ✓
0.875061 ✓
9.959339 ✓
2.441641 = 276.5 ✓
889.8 ✓
613.3" ✓
−10 13.3 ✓

Comet a 1883.
March 25. 1883.

DM. + 24° 454 Mag. 8.7

(855) 3h 6m 20.6s ✓✓ +24° 23′ 12″ ✓✓
49.0 +3 12
3 7 9.6 ✓ +24 26 24 ✓

46° 47′ 24.″0 ✓

log. $\frac{u}{15}$ = 0.126085
" sin A = 9.862638
" tan D = 9.657497
+0.44288 = 9.646220
3.0710
3.51 38 = 0.545777
log. 28. = 1.447158
98.39 = 1.993935

log. u = 1.302177 ✓
" cos. A = 9.835484
" 28. = 1.447158
384.″43 = 2.584819

3 6 20.6 ✓ +24 23 12. ✓
1 38.39 ✓ 6 24.4 ✓
Mean p. 1883 = 3 7 58.99 ✓ +24 29 36.4 ✓
+0.74 −0.4
Ap. Pl. = 3. 7 59.73 +24 29 36.0
☄ − ✱ −3 26.60 −10 13.3
☄ = = 3 4 33.13 +24 19 22.7

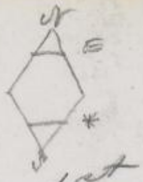
Comet a 1883.

March 25. 1883.

f	+1.432 ✓		
Log. g.	+1.0476 ✓	Log. g	+1.0476 ✓
" sin (G+α)	+9.9937 ✓	" cos (G+α)	+9.2299 ✓
" tan δ	+9.6586 ✓	" sum	+0.2775 ✓
" sum	+0.6999 ✓	2y =	+1.897
" 15	+1.1761 ✓	" h	+1.2734 ✓
" result	+9.5238 ✓	" cos (H+α)	+9.8198 ✓
2y =	+0.334 ✓	" sin δ	+9.6176 ✓
" h	+1.2734 ✓	" sum	+0.7108 ✓
" sin (H+α)	−9.8756 ✓	2y =	+5.14 ✓
" sec. δ	+0.0410	" i	−0.9088 ✓
" sum	−1.1900 ✓	" cos δ	9.9590 ✓
" 15	+1.1761 ✓	" sum	−0.8678 ✓
" result	−0.0139 ✓	2y =	−7.38 ✓
2y =	−1.032 ✓	δ′ − δ =	$-0''.35$ ✓
α′ − α	$+0^{s}.734$ ✓		

G = $2^h\ 12^m.9$ ✓
α = 3 8.0 ✓
(G + α) = 5 20.9 ✓

H = 17 37.3 ✓
α = 3 8.0 ✓
(H + α) = 20 45.3



Comet a 1883.
March 26. 1883.

	Comet	1st star.	2d star.	ε − 1st star	ε − 2d star.	$\frac{\epsilon - 1^{st} *}{2}$
7^h	$32^m\ 8.2$	$33^m\ 47^s.3$	$34^m\ 24^s.7$			
	32 20.0	34 13.2	34 36.4			
	64 28.2	68 0.5	69 1.1	$3^m\ 32^s.3$	4 $32^s.9$	$1^m\ 46^s.15$
	35 4.5	36 42.4	37 20.2			
	35 16.3	37 8.9	37 32.0			
	70 20.8	73 51.3	74 52.2	3 30.5	4 31.4	1 45.25
						$1^m\ 45^s.70$

Mean of comet times = $7^h\ 33^m\ 42^s.2$
Cor. = +20.3
$7^h\ 34^m\ 2^s.5$
0 15 8.3
7 18 54.2
−1 11.9
C. M. T. obs. = 7 17 42.3
4 44 31.
Gr. M. T. = 12 2 13.

Comet a 1883

(7) (8) Mar. 26, 1883

Diff. ☄ = Diff. 1st star. Col. 7 + col. 8.

0^m $11^s.8$ ✓ 0^m $25^s.9$ ✓ $37^s.7$ ✓

0 11.8 ✓ 0 26.5 ✓ 38.3 ✓

38.0 ✓

log. 38.0 = 1.579784 ✓
" 7.5 = 0.875061 ✓
" cos. dec. = 9.961895
261.1 = 2.416740
889.8
2)628.7
314.4 = 5′ 14″.4

1.579784 ✓
0.875061 ✓
9.961604 ✓
2.416449 = 260″.9 ✓
889.8
628.9 ✓

23 39 7.3
23 44 21.7 = Mid. dec.

+10′ 28.9 ✓
23 39 7.3 ✓
23 49 36.2 = Dec. ☄

Comet a 1883. (March 26.)

Comp. star. = D M. + 23° 436. =

Wr. 3h 209 (7.8)

Wr. pos. (1825) =	3h	8m	6″.19 ✓✓	23°	26′	1″.5 ✓✓
		1	41.33 ✓		+6	36.4 ✓
	3	9	47.52 ✓	+23	32	37.9 ✓

47° 26′ 52″.80 ✓

log. $\frac{u}{15}$ = 0.126117 ✓

" sin A = 9.867269 ✓

" tan δ = 9.639210 ✓

+0.4291 ✓ = 9.632596 ✓

+3.0707 ✓

+3.4998 = 0.544043 ✓

log. 58. = 1.763428 ✓

202.99 ✓ = 2.307471 ✓

log. u = 1.302209 ✓

" cos. A = 9.830114 ✓

" 58. = 1.763428 ✓

786″.6 ✓ = 2.895751 ✓

	3	8	6.19 ✓	+23	26	1.5 ✓
		+3	22.99 ✓		13	6.6 ✓
Mean pos. (1883) =	3	11	29.18 ✓	+23	39	8.1 ✓
Ap. pl.			+0.73 ✓			−0.8 ✓
" " star	3	11	29.91	+23	39	7.3 ✓
(☾ − *) =		−1	45.70 ✓		+10	28.9 ✓
Ap. pl. ☾ =	3	9	44.21	+23	49	36.2 ✓

C. M. T. obs. =	7h	17m	42s
	4	44	31
Gr. M. T. =	12	2	13.

March 26. 1883. App. pl.

f	+1.435 ✓
log. g	+1.0494 ✓
„ sin (G+t)	+9.9949 ✓
„ tan δ	+9.6415 ✓
Sum	+0.6858 ✓
„ 15	+1.1761 ✓
„ result.	+9.5097 ✓
2y. =	+0.323 ✓
„ h	+1.2736 ✓
„ sin (H+t)	−9.8771
„ sec. δ	+0.0381 ✓
„ sum	−1.1888 ✓
„ 15	1.1761 ✓
„ result	−0.0127
2y =	−1.030 ✓
t′ − t =	+0.728 ✓

Log. g	+1.0494 ✓
„ cos. (G+t)	+9.1822 ✓
„ sum	+0.2316 ✓
2y =	+1.70 ✓
„ h	+1.2736 ✓
„ cos (H+t)	+9.8178 ✓
„ sin δ	+9.6034 ✓
„ sum	+0.6948
2y =	+4.95 ✓
„ i	−0.9080 ✓
„ cos. δ	9.9619 ✓
„ sum	−0.8699 ✓
2y	−7.41 ✓
δ′ − δ =	−0.767

March 26. time obs.

log. Δ = 0.153

G = 2^h $13^m.5$ ✓

t = 3 11.5 ✓

(G+t) = 5^h $25^m.0$ ✓

H = 17^h $32^m.9$ ✓

t = 3 11.5 ✓

(H+t) = 20^h $44^m.4$ ✓

9.6274

0.0139

9.6413

0.1530

9.4883 = l.f.p. R.A.

0.6243 ✓

0.0139 ✓

0.6382 ✓

0.1530 ✓

0.4852 = l.f.p. Dec.

D M. + 30° 248 (9.8) Suspected

0^h 4^m $25^s.2$ ✓	4^m 37.2 ✓		
4 46.2 ✓	4 57.2 ✓		
9 11.4 ✓	9 34.4 ✓	23.0 ✓	11.50 ✓
5 21.2 ✓	5 33.3 ✓		
5 42.6 ✓	5 53.3 ✓		
11 3.8 ✓	11 26.6 ✓	22.8 ✓	11.40 ✓
6 13.0 ✓	6 25.2 ✓		
6 34.6 ✓	6 45.0 ✓		
12 47.6 ✓	13 10.2 ✓	22.6 ✓	11.30 ✓
6 58.3 ✓	7 10.8 ✓		
7 19.9 ✓	7 30.2 ✓		
14 18.2 ✓	14 41.0 ✓	22.8 ✓	11.40 ✓
7 49.2 ✓	8 1.7 ✓		
8 10.5 ✓	8 21.2 ✓		
15 59.7 ✓	16 22.9 ✓	23.2 ✓	11.60 ✓
8 37.3 ✓	8 50.2 ✓		
8 59.3 ✓	9 9.9 ✓		
17 36.6 ✓	18 0.1 ✓	23.5 ✓	11.75 ✓
9 26.6 ✓	9 39.3 ✓		
9 48.3 ✓	9 58.7 ✓		
19 14.9 ✓	19 38.0 ✓	23.1 ✓	11.55 ✓
10 49.1 ✓	11 2.0 ✓		
11 11.0 ✓	11 20.9 ✓		
22 0.1 ✓	22 22.9 ✓	22.8 ✓	11.40 ✓

of having large Proper Motion.

21.0 ✓	20.0 ✓	41.0 ✓
21.4 ✓	20.0 ✓	41.4 ✓
21.6 ✓	19.8 ✓	41.4 ✓
21.6 ✓	19.4 ✓	41.0 ✓
21.3 ✓	19.5 ✓	40.8 ✓
22.0 ✓	19.7 ✓	41.7 ✓
21.7 ✓	19.4 ✓	41.1 ✓
21.9 ✓	18.9 ✓	40.8 ✓

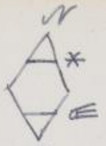
Same as on previous

11	42.7 ✓	11	55.8 ✓		
12	4.8 ✓	12	14.7 ✓		
23	47.5 ✓	24	10.5 ✓	23.0 ✓	11.50 ✓
12	33.2 ✓	12	46.5 ✓		
12	55.6 ✓	13	5.2 ✓		
25	28.8 ✓	25	51.7 ✓	22.9 ✓	11.45 ✓
14	12.0 ✓	14	25.3 ✓		
14	34.3 ✓	14	43.3 ✓		
28	46.3 ✓	29	8.6 ✓	22.3 ✓	11.15 ✓
					11.45
~~15~~	~~1.3 ✓~~	~~15~~	~~14.8 ✓~~		
~~15~~	~~23.7 ✓~~	~~15~~	~~33.6 ✓~~		
~~30~~	~~25.0 ✓~~	~~30~~	~~48.4 ✓~~	24.4 ✓	

page continued.

22.1 ✓	18.9 ✓	41.0 ✓
22.4 ✓	18.7 ✓	41.1 ✓
22.3 ✓	18.0 ✓	40.3 ✓
		41.05 7

log. 41.05 = 1.61331 ✓
" 7.5 = 0.87506 ✓
" cos. dec. = 9.93584
265.6 = 2.42421
889.8
624.2 = 10′ 24.2″



Brooks Comet. Apr. 25. 1883.

Comet.	Star.		
10h 47m 19.3s	10h 45m 37.1s		
47 48.5	46 16.7		
95 7.8	91 53.8	3 14.0	1 37.00
49 48.6	48 8.8		
50 20.3	48 46.7		
100 8.9	96 55.5	3 13.4	1 36.70
52 22.2	50 44.0		
52 54.6	51 19.4		
105 16.8	102 3.4	3 13.4	1 36.70
56 34.5	54 59.7		
57 11.6	55 32.3		
113 46.1	110 32.0	3 14.1	1 37.05
59 6.3	57 34.3		
59 46.0	58 4.3		
118 52.3	115 38.6	3 13.7	1 36.85
			+1m 36.86s
			−35 Ref. cor.
			36.51

10 53 37.8 mean of comet times. +1

. ☄ Brooks (a) 1883 – Apr. 25, 83 3.325 ~~+5.86~~ 5.724
Wendell's Obs

D.M. +11°.702 = W. 1189 (1825) 4 52 5.34 +11 6 38.6
Prec +3 12.8~~5~~ + 5 32.0 ~~39.9~~

1883.0 4 55 18.19 ~~17.96~~ +11 12 ~~12~~ 10.6 ~~18.5~~

Red. to App Place +0.71 −7.9

☄ − ✱ +1 36.56 ~~+~~ 6 21.3

4ʰ 56ᵐ 55.46 ~~54.52~~ +11° 5′ 41″.4 ~~57.2~~

~~Appar Red~~ (~~Aberr Time~~) −1.87 −3.6 ±
~~Red for Time Obs~~ +2.9
Apparent Par +0.22

Obs'd Place 4 56 53.9 ~~5~~ +11° 5′ 40. ~~57~~

Ephem Place 4 56 52.86 +11 6 2.

~~+0.7~~ ~~10~~
~~0.0~~ ~~−3.~~
~~O − C~~
O − C +1.0 −21″

83
5
199.26
192.52
35,1.6.
1.17

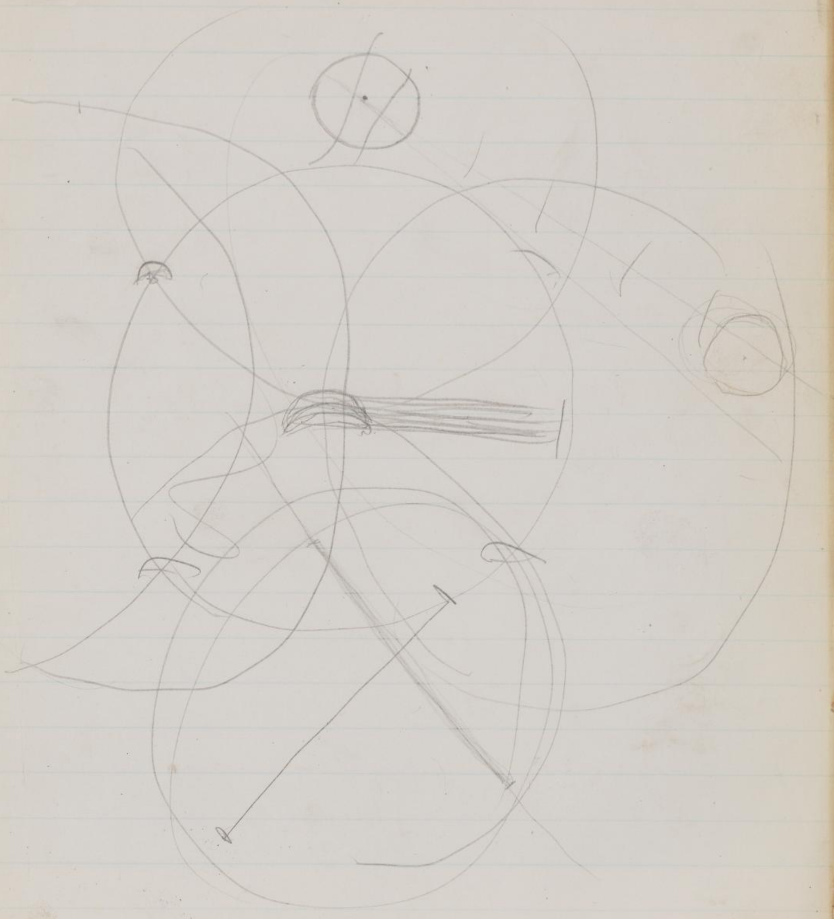
Mean of Fixes
B 238 10 53 37.8
−2 14 17.9
C.M.T. Apr 25 8ʰ 39ᵐ 20.5ˢ
Longitude +4 44 31
Aberr T. −15 51
Greenwich Com Time 13ʰ 8ᵐ 00

Gr. M. T. = 13 23 51
4 44 31.
8 39 20.

☄ Hourly motion
+6ˢ.23 −49″.6

ˢ ″
Corr of our orbit +1.0 −21
" " Oppenheim's orbit +2.5 −26

1.4 7°7
1 30/21



0 29.2 ✓ 0 39.6 ✓ 68.8 ✓

0 31.7 ✓ 0 37.9 ✓ 69.6 ✓

0 32.4 ✓ 0 35.4 ✓ 67.8 ✓

0 37.1 ✓ 0 32.6 ✓ 69.7 ✓

0 39.7 ✓ 0 30.0 ✓ 69.7 ✓

5)170.1 ✓ 5)175.5 ✓ 69.12 ✓

34.02 ✓ 35.10

11 12 18 = dec★
3 10.6
11 9 7

Log. 69.12 = 1.8396037 ✓
" 7.5 = 0.8750613 ✓
" co. dec. = 9.9916416 ✓
5085 ✓ 2,7063066 ✓
889.8
381.3 = ~~6 21.3~~
190.6 = 3 10.6

1.8396037
0.8750613
9.9917211
2,7063861
508.6
889.8
381.3 = 6' 21.3'' ✓
−5.2
26.5
−6

0 29.2 ✓ 0 39.6 ✓ 68.8 ✓

0 31.7 ✓ 0 37.9 ✓ 69.6 ✓

0 32.4 ✓ 0 35.4 ✓ 67.8 ✓

0 37.1 ✓ 0 32.6 ✓ 69.7 ✓

0 39.7 ✓ 0 30.0 ✓ 69.7 ✓

5)170.1 ✓ 5)175.5 ✓

34.02 ✓ 35.10 69.12 ✓

11 12 18=dec*
3 10.6
11 9 7

Log. 69.12 = 1.8396037 ✓
" 7.5 = 0.8750613 ✓
" co. dec. = 9.9916416 ✓
5085 ✓ 2.7063066 ✓
889.8
381.3 = ~~6 21.3~~
190.6 = 3 10.6

1.8396037
0.8750613
9.9917211
2.7063861
5086
889.8
381.3 = -6' 21.3'' ✓
5.2
-6 26.5

Nebula discovered by ~~P~~ Prof. P. May. 8. 1883.

See book 106. p. 60.

Comp. Star = DM. + 48° 2960.

Place from B.B. Vol. VI =

	19^h	46^m	$4^s.30$ ✓	+48°	33′	40″.4 ✓
			+23.94.		2′	4.6
Mid place =	19	46	28.24	+ 48	35	45.0
	296°	37	3.60			

	~~19~~	~~46~~	~~4.30~~ ✓	~~+ 48°~~	~~33′~~	~~40″.4~~ ✓
			~~+47.88~~ ✓		~~+4~~	~~9.2~~
* 1883.0	~~19~~	~~46~~	~~52.18~~	~~+48~~	~~37~~	~~49.6~~
			~~−26.27~~		~~+2~~	~~1.3~~
Pos. Neb. 1883.0 =	~~19~~	~~46~~	~~25.91~~	~~+48~~	~~39~~	~~50.9~~

log $\frac{n}{15}$ = +0.126085

" sin t = n9.951$\overset{34}{47}$ n

" tan δ = +0.0546

−1.3553 n0.13203 n

3.0710

+1.7157 0.23444

28. 1.44716

48.04 = 1.68160

log. n = 1.30217

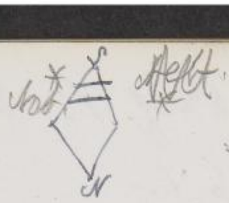
" cos. t = 9.65132

" 28. = 1.44716

~~2.42065~~

251.6 = 2.40065

	19	46	4.30 ✓	+ 48	33	40.4 ✓
			+48.04 ✓		+ 4	11.6 ✓
* 1883.0	19	46	52.34 ✓	+48	37	52.0 ✓
			− 26.27		+2	6.4 ✓
Neb. 1883.0 =	19	46	26.07 ✓	+ 48	39	58.4
			−5.16			−27.0
Neb. 1880.0 =	19	46	20.91 ✓	+48	39	31.4 ✓



Neb.	Star		
14h 18m 38.0s	19m 17.0s		
19 33.0	19 46.5		
38 11.0	39 3.5	52.5	26.25
14 20 8.9	20 47.8		
21 5.2	21 19.0		
41 14.1	42 6.8	52.7	26.35
21 37.3	22 16.4		
22 34.0	22 47.3		
44 11.3	45 3.7	52.4	26.20

.80
26.s27 mean.

55.0	29.5
56.3	31.2
56.7	30.9
168.0	91.6
56.0	30.5
30.5	

~~48 47~~
48 37 52
1 3
~~2~~ 6
~~1 48 39 58 mid app.~~
48 39 mid app.

Log. 25.5 = ~~1.39877~~ = 1.40654 — 1.40654
" 7.5 = 0.87506 — 0.87506
" co-dec. = 9.82015 — 9.81998 ~~9.81982~~
+126.4 = 2.10175 — +126.4=2.10158

Another Neb. discovered by Prof. P. May 8. 1883.

See book 106 p. 61.

14^h 46	20.0	47	20.3	48	57.5	49	58.0
47	30.6	48	31.	50	8.2	51	8.8
+1	10.6	+1	10.7	+1	10.7	+1	10.8

1 10.7
1 10.7
1 10.8
2.8

mean +1 10.7

D.M. +46° 2860 = $\overset{20}{\cancel{19}}{}^h\ 4^m\ 37.5^s$ +46° 2.4'
+24.4 +1.3
Mid. pl. * = $\overset{20}{\cancel{19}}$ 5 1.9 +46 3.7
286° 15' 30"

log. $\frac{u}{15}$ = 0.12609 log. u = 1.30218
" sin t = 9.98228 n " cos t = 9.44711
" tan δ = 0.01617 " 25 = 1.39794
−1.3321 = 0.12454 n 140.4 = 2.14723
3.0710
+1.7389 = 0.24027
log. 25 = 1.39794
43.47 = 1.63821

19 4 37.5 +46° 2.4'
+43.5 +2.3
Pos. * 1880.0 = 19 5 21.0 +46 4.7
+1 10.7 −0.5
" Neb. 1880.0 = $19^h\ 6^m\ 31.7^s$ +46° 4.2'

Aug. 21. 1883.

Peters New. Asteroid.

	~~21~~	~~14~~	~~0.23~~ ✓	~~−15~~	~~33~~	~~17.6~~ ✓	([illegible])
		~~+1~~	~~33.39~~ ✓		~~+8~~	~~11.7~~ ✓	
Pos.* 1883.0	~~21~~	~~15~~	~~33.62~~	~~−15~~	~~25~~	~~5.9~~	
Oe. A. 21338 =	21	14	0.23 ✓	−15	33	17.6 ✓	
			54.61 ✓		+4	5.8 ✓	
1866.5	21	14	54.84 ✓	−15	29	11.8 ✓	
	318°	43	42.60 ✓				

log. $\frac{u}{15}$ 0.1260900 ✓
" sin A. n9.8192990 ✓
" Cot D n9.4425940 ✓
Sum. 9.3879830 ✓
Cor. No. +0.2443 ✓
$\frac{m}{15}$ 3.0709 ✓
3.3152 ✓

log. u = 1.3021820 ✓
" cos. A. = 9.8759823 ✓
1.1781643 ✓
" 33. = 1.5185139 ✓
497.4 ✓ = 2.6966782 ✓

	21h	14m	0.23 ✓	−15	33	17.6 ✓
		+1	49.40 ✓		+8	17.4 ✓
1883.0	21	15	49.63 ✓	−15	25	0.2 ✓
Ap. pl.			+4.07 ✓			+23.8 ✓
Ap. pos. *	21	15	53.70 ✓	−15	24	36.4 ✓
			−2.83 ✓			+27.4 ✓
Ap. pos. Ast.	21	15	50.87 ✓	−15	24	9.0 ✓

f	=	+2.645
Log. g		+1.2717
" sin(G+t)		−9.4992
" tan δ	=	n9.4405
" sum		+0.2114
" 15	=	+1.1761
" result	=	+9.0353
zy	=	+0.108
" h		+1.2838
" sin(H+t)		+9.9962
" sec δ	=	+0.0159
" sum		+1.2959
" 15	=	+1.1761
" result	=	+0.1198
zy	=	+1.318
t′ − t	=	+4.071

	=	
Log. g		+1.2717
" cos.(G+t)	=	+9.9772
" sum	=	+1.2489
zy	=	+17.74
" h		+1.2838
" cos.(H+t)		+9.1185
" sin δ	=	n9.4246
" sum	=	n9.8269
zy	=	−0.67
" i		+0.8424
" cos. δ	=	+9.9841
" sum	=	+0.8265
zy.	=	+6.71
δ′ − δ	=	+23.78

G = 1h 30.6
t = 21 15.8
(G+t) = 22 46.4

H = 8 14.0
t = 21 15.8
(H+t) = 5 29.8

Aug. 24. 1883.

Peters New Asteroid.

	~~21~~	~~13~~	~~28.93~~ ✓	~~−16~~	~~36~~	~~40.0~~ ✓	(8 aug.)
		~~+1~~	~~32.40~~ ✓		~~+8~~	~~11.7~~ ✓	
	~~21~~	~~15~~	~~1.33~~ ✓	~~−16~~	~~28~~	~~28.3~~ ✓	
Oe. A. 21325							
1850.0	21	13	28.93 ✓	−16	36	40.0 ✓	
			54.94 ✓		+4	5.8 ✓	
	21	14	23.87 ✓	−16	32	34.2 ✓	
1866.5	318°	35	58.05 ✓				

log $\frac{w}{15}$	0.1260900 ✓
" sin A	n9.8204110 ✓
" tan D	n9.4727957 ✓
Sum	9.4192967 ✓
Cor. No.	0.2626 ✓
$\frac{w}{15}$	3.0709 ✓
	3.3335 ✓

log. w = 1.3021820 ✓
" cos. A = 9.8751220 ✓
" 33 = 1.5185139 ✓
496.4 = 2.6958179 ✓

	21	13	28.93 ✓	−16	36	40.0 ✓
		+1	50.01 ✓		+8	16.4 ✓
1883.0	21	15	18.94 ✓	−16	28	23.6 ✓
App. pl.			+4.09 ✓			+23.7 ✓
	21	15	23.03 ✓	−16	27	59.9 ✓
			−59.06 ✓		+7	25.4 ✓
Ap. pos. Ast.	21	14	23.97 ✓	−16	20	34.5 ✓

f =	+2.662 ✓		
log. g	+1.2748 ✓	Log. g.	+1.2748 ✓
" sin (G+t)	−9.5004 ✓	" cos. (G+t) =	+9.9771 ✓
" cos δ	n9.4708 ✓	" sum =	+1.2519 ✓
" sum	+0.2460 ✓	No. =	+17.86 ✓
" 15	+1.1761 ✓	" h	+1.2822 ✓
" result	+9.0699 ✓	" cos. (H+t)	+9.2687 ✓
No. =	+0.117 ✓	" sin δ	n9.4526 ✓
" h	+1.2822 ✓	" sum	n0.0035 ✓
" sin (H+t)	+9.9924 ✓	No. =	−1.01 ✓
" sec δ	+0.0182 ✓	" i	+0.8550 ✓
" sum	+1.2928 ✓	" cos. δ	+9.9818 ✓
" 15	+1.1761 ✓	" sum	+0.8368 ✓
" result	+0.1167 ✓	No. =	+6.87 ✓
No. =	+1.309 ✓	δ′−δ =	+23.72 ✓
t′−t	+4.088 ✓		

$G = 1^h\ 30.9^m$ ✓
$t = 21\ \ 15.3$ ✓
$(G+t) = 22\ \ 46.2$ ✓

$H = 8\ \ 1.9$ ✓
$t = 21\ \ 15.3$ ✓
$(H+t) = 5\ \ 17.2$

Aug. 21. 1883.

Peters New Asteroid.

Ast.	*		
23h 4m 56.7	5m 1.2		
5 15.5	5 16.0		
10 12.2	10 17.2	5.0	2.50
5 47.7	5 52.6		
6 7.5	6 8.0		
11 55.2	12 0.6	5.4	2.70
6 41.0	6 46.0		
7 0.1	7 0.6		
13 41.1	13 46.6	5.5	2.75
7 27.2	7 32.1		
7 46.6	7 47.0		
15 13.8	15 19.1	5.3	2.65
8 21.6	8 26.0		
8 40.4	8 41.0		
17 2.0	17 7.0	5.0	2.50
10 9.6	10 14.2		
10 28.6	10 29.5		
20 38.2	20 43.7	5.5	2.75
11 2.6	11 7.5		
11 21.5	11 22.7		
22 24.1	22 30.2	6.1	3.05
12 21.7	12 26.7		
12 40.6	12 41.8		
25 2.3	25 8.5	6.2	3.10
14 5.7	14 10.3		
14 24.4	14 26.0		
28 30.1	28 36.3	6.2	3.10
17 18.0	17 22.5		
17 36.5	17 38.5		
34 54.5	35 1.0	6.5	3.25

Mean = − 2.835

199^{m} 33.5^{s} ✓ ✓

19 57.35 ✓

23^{h} 9^{m} 58.6^{s} ✓ mean of times.

+2 9.6 ✓

23 12 8.2 ✓

9 58 38.4 ✓ ✓

13 13 29.8 ✓

-2 10.0 ✓

13 11 19.8 ✓

C. m. T. obs.

23 35 27.1 ✓ ✓

9 58 38.4 ✓

13 36 48.7 ✓

-2 13.8 ✓

13 34 34.9 ✓

13 36 44.5 ✓ ✓

Cor. = +2 9.6 ✓

Aug. 24. 1883.

Peters New Asteroid.

Ast.	*		
22h 46m 26.2	47m 29.8		
47 1.2	47 55.8		
93 27.4	95 25.6	1m 58.2	59.10
48 22.5	49 26.0		
48 57.4	49 51.9		
97 19.9	99 17.9	1 58.0	59.00
50 13.3	51 17.0		
50 48.7	51 42.7		
101 2.0	102 59.7	1 57.7	58.85
52 5.1	53 8.4		
52 40.2	53 34.7		
104 45.3	106 43.1	1 57.8	58.90
53 59.3	55 3.1		
54 35.0	55 29.6		
108 34.3	110 32.7	1 58.4	59.20
56 22.2	57 25.3		
56 57.3	57 52.0		
113 19.5	115 17.3	1 57.8	58.90
58 28.5	59 31.8		
59 3.8	59 58.4		
117 32.3	119 30.2	1 57.9	58.95
23 0 22.7	1 26.2		
0 58.2	1 53.0		
121 20.9	123 19.2	1 58.3	59.15
2 21.3	3 25.4		
2 57.6	3 52.3		
125 18.9	127 17.7	1 58.8	59.40
4 13.1	5 16.8		
4 48.6	5 43.3		
129 1.7	131 0.1	1 58.4	59.20

Mean — 59.06

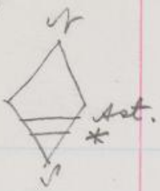
1111^m 42.2^5 ✓ Aug 24 1883
111 10.22 ✓
55 35.11 ✓

22 55 35.11 ✓
10 10 28.08 ✓✓ Sid. Time M. N. (Camb.)

22 55 35.11 ✓
−4.7 ✓ Cor. to Chr.
22 55 30.4 ✓
10 10 28.1 ✓✓
12 45 2.3 ✓✓
−2 5.3 ✓✓
12 42 57.0 ✓✓ C. M. T. obs.

P

Peters New Asteroid
Aug 24, 1883.



Aug. 21. 1883.

Peters New Asteroid.

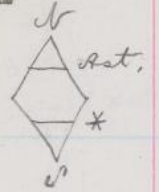
Ast.	*	
18.8 ✓	14.8 ✓	4.0 ✓
19.8 ✓	15.4 ✓	4.4 ✓
19.1 ✓	14.6 ✓	4.5 ✓
19.4 ✓	14.9 ✓	4.5 ✓
18.8 ✓	15.0 ✓	3.8 ✓
19.0 ✓	15.3 ✓	3.7 ✓
18.9 ✓	15.2 ✓	3.7 ✓
18.9 ✓	15.1 ✓	3.8 ✓
18.7 ✓	15.7 ✓	3.0 ✓
18.5 ✓	16.0 ✓	2.5 ✓

log. 3.79 = 0.5786392 ✓
" 7.5 = 0.8750613 ✓
" cos. dec. = 9.9840989 ✓
2/27.4 ✓ = 1.4377994 ✓
13.7 ✓

−15 24 36.4 ✓
+13.7 ✓
−15 24 22.7 ✓

0.5786392 ✓
0.8750613 ✓
✓ 9.9841068 ✓
27.4 = 1.4378073 ✓

−15 24 36.4 ✓
+27.4 ✓
−15 24 9.0 ✓



Aug. 24. 1883.

Peter's New Asteroid.

35.0	26.0	61.0
34.9	25.9	60.8
35.4	25.7	61.1
35.1	26.3	61.4
35.7	26.5	62.2
35.1	26.7	61.8
35.3	26.6	61.9
35.5	26.8	62.3
36.3	26.9	63.2
35.5	26.5	62.0

log. 61.77 = 1.790778
" 7.5 = 0.875061
" cos. dec. = 9.981812
444.3 = 2.647651
889.8
2/445.5
222.8 = 3′ 42″.8

−16 27 59.9
+3 42.8
−16 24 17.1

1.790778
0.875061
9.981951
444.4 = 2.647790
889.8
445.4 = 7′ 25.4

Par. on Peters' New Asteroid.

Aug. 21. 1883.

23 12.1 = T.
21 15.8 = R.A. -15° 24' = δ
+1 56.3

$0.^{s}212$ ✓ ~~6.96~~ $7.''02$ ✓
9.3263 0.8463
0.0139 0.0139
+9.3402 +0.8602

Aug. 24. 1883.

22 55.5 = Θ.
21 14.4 = R.A. -16° 21' = δ
+1 41.1

$0.^{s}188$ ✓ $7.''14$ ✓
9.2742 0.8537
0.0139 0.0139
+9.2881 +0.8676

Brooks. Comet,
Sept. 4. 1883. (1st series)

1st star	2d star	Comet.		
2 19 42.4 ✓	19 57.3 ✓	21 2.8 ✓		
20 12.2 ✓	20 33.8 ✓	22 11.8 ✓		
39 54.6 ✓	40 31.1 ✓	43 14.6 ✓	3 20.0 ✓	1ᵐ 40.00 ✓
			2 43.5 ✓	1 21.75 ✓

2d ✱ = 16 32 47.94 ✓
+1 21.75 ✓
App. α = 16 34 9.69 ✓

16 32 29.47 ✓
1 40.00 ✓
16 34 9.47 ✓
16 34 9.69 ✓
16 34 9.58 ✓

22ʰ 21ᵐ 37.30 ✓
−5.2 ✓
22 21 32.1 ✓
10 53 50.2 ✓
11 27 41.9 ✓
1 52.7 ✓
11 25 49.2 ✓ C. M. T.
4 44 31
16 10 20

Brooks' Comet. Sept. 4. 1883.

f =	+2.727 ✓
Log. g	+1.2820 ✓
„ sin (G+t)	−0.0000
„ tan δ	±0.3244 ✓
„ sum	−1.6064 ✓
„ 15	+1.1761 ✓
„ result	−0.4303 ✓
Zy =	−2.693 ✓
„ h	+1.2769 ✓
„ sin (H+t)	−8.6567 ✓
„ sec δ	+0.3684 ✓
„ sum	−0.3020 ✓
„ 15	+1.1761 ✓
„ result	−9.1259 ✓
Zy =	−0.134 ✓
α′ − α =	−0.100 ✓

Log. g	+1.2820 ✓
„ cos. (G+t)	−7.1169 ✓
„ sum	−8.3989 ✓
Zy =	−0.0251 ✓
„ h	+1.2769 ✓
„ cos (H+t)	+9.9996 ✓
„ sin δ	±9.9560 ✓
„ sum	+1.2325 ✓
Zy =	+17.08 ✓
„ i	+0.8895 ✓
„ cos. δ.	+9.6316 ✓
„ sum	+0.5211 ✓
Zy =	+3.32 ✓
δ′ − δ =	+20.37 ✓

$G = 1^h\ 26.9^m$ ✓
$t = 16\ \ 32.8$ ✓
$G+t = 17\ \ 59.7$ ✓

$H = 7^h\ 16.8^m$ ✓
$t = 16\ \ 32.8$ ✓
$H+t = 23\ \ 49.6$ ✓

69.0
36.5
32.5 ✓

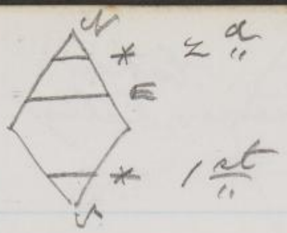
29.8 ✓   36.5 ✓   1 9.5 ✓
69.0
98.8

log. 98.8 = 1.9947569 ✓
" 7.5 = 0.8750613 ✓
" cos. dec. = 9.6345661 ✓
319.4 ✓ = 2.5043843 ✓
889.8 ✓
570.4 ✓
285.2 ✓ = +4' 45.2 ✓
64 27 48.1 ✓
64 32 33.3 ✓

32.5 = 1.5118834 ✓
0.8750613
9.6315877
104.4 = 2.0185324
− 52.2 ✓
64 39 1.1 ✓
64 38 8.9 ✓

1.9947569 ✓
0.8750613 ✓
9.6333070
318.5 ✓ = 2.5031252 ✓
889.8 ✓
571.3 = +9' 31.3 ✓
64 27 48.1 ✓
δ = +64 37 19.4 ✓
δ = +64 37 16.7 ✓
Mean. δ = +64 37 18.0 ✓

1.5118834
0.8750613
9.6318196 ✓
104.4 = 2.0187643
− 1 44.8 ✓
64 39 1.1 ✓
64 37 16.7 ✓



$29^{s}.8$ ✓ $36^{s}.5$ ✓ $1^{m}\ 9^{s}.0$ ✓
69.0
98.8

log. 98.8 = 1.9947569 ✓
" 7.5 = 0.8750613 ✓
" cos. dec. = 9.6345661 ✓
319.4 ✓ = 2.5043843 ✓
889.8 ✓
570.4 ✓
285.2 ✓ = +4' 45.2 ✓
64 27 48.1 ✓
64 32 33.3 ✓

32.5 = 1.511
0.87506
9.6315 87
104.4 = 2.0185324
− 52.2 ✓
64 39 1.1 ✓
64 38 8.9 ✓

1.9947569 ✓
0.8750613 ✓
9.6333070
318.55 ✓ = 2.5031252 ✓
889.8 ✓
571.3 = +9' 31.3 ✓
64 27 48.1 ✓
≡ +64 37 19.4 ✓
≡ +64 37 16.7 ✓
Mean ≡ +64 37 18.0 ✓

1.5118834
0.8750613
9.6318196 ✓
104.4 = 2.0187643
− 1 44.4 ✓
64 39 1.1 ✓
64 37 16.7 ✓

= f

69.0
36.5
32.5

29.8 36.5 1 9.5
69.0
98.8

log. 98.8 = 1.9947569
" 7.5 = 0.8750613
" cos. dec. = 9.6345661
319.4 = 2.5043843
889.8
570.4
285.2 = +4' 45.2
64 27 48.1
64 32 33.3

32.5 = 1.5118834
0.8750613
9.6315877
104.4 = 2.0185324
− 52.2
64 39 1.1
64 38 8.9

1.9947569
0.8750613
9.6333070
318.5 = 2.5031252
889.8
571.3 = +9' 31.3
64 27 48.1
δ = +64 37 19.4
δ = +64 37 16.7
Mean δ = +64 37 18.0

1.5118834
0.8750613
9.6318196
104.4 = 2.0187643
− 1 44.4
64 39 1.1
64 37 16.7

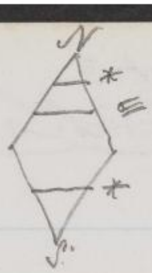
46 (Comet Pons-Brooks 1812) Sept. 4. 1883.

Comet Brooks (Second series, taken later)

S. star.	N. star.	∈			
0h 18m 0.5	18 22.7	19m 16.0			
18 38.0	18 50.5	20 36.2			
36 38.5	37 13.2	39 52.2	3 13.7	2 39.0	1 36.85
21 10.2	21 34.5	22 24.2			
21 49.2	22 2.2	23 44.5			
42 59.4	43 36.7	46 8.7	3 9.3	2 32.0	1 34.65
24 32.0	24 55.2	25 42.6			
25 10.6	25 22.1	27 4.0			
49 42.6	50 17.3	52 46.6	3 4.0	2 29.3	1 32.00
					+1 34.50

16 32 29.47   16 32 47.94
+1 34.50   +1 16.72
16 34 3.97   16 34 4.66
16 34 4.66
16 34 4.32 mean R.A. ∈ App. pl.

mean of ∈ times = 0h 23m 7.92s
+2 20.1
0 25 28.0
10 53 50.2
13 31 37.8
−2 13.0
13 29 24.8 C. m. T. obs.



1	19.50 ✓	37.5 ✓	27.8 ✓	80.2 ✓	117.7 ✓	52.4 ✓
1	16.00 ✓	39.0 ✓	27.7 ✓	80.3 ✓	119.3 ✓	52.6 ✓
1	14.65 ✓	38.6 ✓	26.9 ✓	81.4 ✓	120.0 ✓	54.5 ✓
1.	16.72 ✓				119.00 ✓	53.17 ✓

log. 119.0 = 2.0755470 ✓
" 7.5 = 0.8750613 ✓
" cos. dec. = 9.6345661 ✓
384.7 = 2.5851744 ✓
889.8
2/505.1
252.6 = +4 12.6 ✓
64 27 48.1 ✓
64 32 0.7 ✓

log. 53.17 = 1.7256667 ✓
" 7.5 = 0.8750613 ✓
" cos. dec. = 9.6315877 ✓
2/170.7 ✓ = 2.2323157 ✓
85.4 ✓
− 1 25.4 ✓
64 39 1.1 ✓
64 37 35.7 ✓

2.0755470 ✓
0.8750613 ✓
9.6334511
383.8 = 2.5840594 ✓
889.8
506.0 = +8′ 26.0″ ✓
64 27 48.1 ✓
☄ = 64 36 14.1 ✓
☄ = 64 36 10.2 ✓
Mean ☄ = 64 36 12.2 ✓

1.7256667 ✓
0.8750613 ✓
9.6319670 ✓
170.9 ✓ = 2.2326950 ✓
− 2′ 50.9 ✓
64 39 1.1
☄ = 64 36 10.2

Sept. 5. 1883. Comet Brooks.

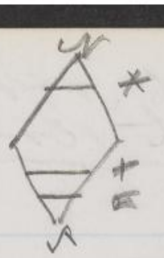
S. *		N. *		☄							
2	7.0	2	40.0	3	6.7						
2	54.3	2	58.7	3	32.0						
5	1.3 ✓	5	38.7 ✓	6	38.7 ✓	1	37.4 ✓	1	0.0 ✓	0	48.70 ✓
4	20.7	4	51.2	5	21.2						
5	6.7	5	12.8	5	43.6						
9	27.4 ✓	10	4.0 ✓	11	4.8 ✓	1	37.4 ✓	1	0.8 ✓	0	48.70 ✓
6	30.8	7	2.2	7	29.0						
7	16.6	7	22.0	7	53.2						
13	47.4 ✓	14	24.2 ✓	15	22.2 ✓	1	34.8 ✓	0	58.0 ✓	0	47.40 ✓
9	39.6	10	9.1	10	38.8						
10	24.3	10	31.5	11	0.2						
20	3.9 ✓	20	40.6 ✓	21	39.0 ✓	1	35.1 ✓	0	58.4 ✓	0	47.55 ✓
11	32.7	12	1.8	12	33.2						
12	16.4	12	24.0	12	53.8						
23	49.1 ✓	24	25.8 ✓	25	27.0 ✓	1	37.9 ✓	1	1.2 ✓	0	48.95 ✓
13	55.9	14	29.3	14	55.8						
14	43.7	14	48.2	15	20.2						
28	39.6 ✓	29	17.5 ✓	30	16.0 ✓	1	36.4 ✓	0	58.5 ✓	0	48.20 ✓
										0	48.25 ✓

16 32 29.42 ✓
0 48.25 ✓
16 33 17.67 ✓

16 32 47.89 ✓
29.74 ✓
16 33 17.63 ✓

☄ 16 33 17.65 ✓ mean R. A.

19 9 12.3 ✓
−2.3 ✓
19 9 10.0 ✓
10 57 46.7 ✓
8 11 23.3 ✓
−1 20.5 ✓
8 10 2.8 ✓ C. M. T.



		S*	N*	☉		
0	30.0 ✓	47.3 ✓	18.7 ✓	25.3 ✓	22.0 ✓	44.0 ✓
0	30.4 ✓	46.0 ✓	21.6 ✓	22.4 ✓	23.6 ✓	44.0 ✓
0	29.0 ✓	45.8 ✓	19.5 ✓	24.2 ✓	21.6 ✓	44.0 ✓
0	29.2 ✓	44.7 ✓	22.4 ✓	21.4 ✓	23.3 ✓	43.8 ✓
0	30.6 ✓	43.7 ✓	22.2 ✓	20.6 ✓	23.1 ✓	42.8 ✓
0	29.25 ✓	47.8 ✓	18.9 ✓	24.4 ✓	23.4 ✓	43.3 ✓
0	29.74				22.83 ✓	43.65 ✓

log. 22.83 = 1.3585059 ✓
" 75 = 0.8750613 ✓
" cos. dec. = 9.6345661 ✓
73.8 ✓ = 1.8681333 ✓
36.9 ✓ =

64 27 48.1
−36.9
64 27 11.2

☉ = 64° 26′ 33″.2 ✓

1.3585059 ✓
0.8750613 ✓
9.6347284 ✓
73.8 ✓ 1.8682959 ✓
64 27 48.1 ✓
−1 13.8 ✓

43.65 ✓ = 1.6399842 ✓
0.8750613 ✓
9.6315877 ✓
140.2 ✓ = 2.1466332 ✓
609.4 ✓
2)749.6 ✓
374.8 −6 14.8 ✓
64 39 1.1 ✓
64 32 46.3 ✓

1.6399842 ✓
0.8750613 ✓
9.6332495
140.7 ✓ = 2.1482950 ✓
608.4
749.1 = −12 29.1 ✓
64 39 1.1 ✓
64 26 32.0 ✓

Sept. 6. 1883.
Comet Brooks.

Comet.	1st star	2d star			
19 13 9.1 ✓	14 21.8 ✓	15 48.6 ✓			
14 46.2 ✓	16 15.7 ✓	17 9.3 ✓			
27 55.3 ✓	30 37.5 ✓	32 57.9 ✓	2 42.2 ✓	5 2.6 ✓	1 21.10 ✓
20 20.8 ✓	21 34.6 ✓	23 1.7 ✓			
21 58.7 ✓	23 27.3 ✓	24 21.0 ✓			
42 19.5 ✓	45 1.9 ✓	47 22.7 ✓	2 42.4 ✓	5 3.2 ✓	1 21.20 ✓
25 13.1 ✓	26 28.2 ✓	27 55.8 ✓			
26 53.8 ✓	28 21.7 ✓	29 15.8 ✓			
52 6.9 ✓	54 49.9 ✓	57 11.6 ✓	2 43.0 ✓	5 4.7 ✓	1 21.50 ✓
29 51.3 ✓	31 5.7 ✓	32 32.6 ✓			
31 32.0 ✓	32 59.0 ✓	33 52.8 ✓			
61 23.3 ✓	64 4.7 ✓	66 25.4 ✓	2 41.4 ✓	5 2.1 ✓	1 20.70 ✓
34 24.3 ✓	35 39.6 ✓	37 6.2 ✓			
36 4.8 ✓	37 32.8 ✓	38 26.7 ✓			
70 29.1 ✓	73 12.4 ✓	75 32.9 ✓	2 43.3 ✓	5 3.8 ✓	1 21.65 ✓
					1 21.23 ✓

Mean of α times = $19^h\ 25^m\ 25.41^s$ ✓

−3.2 Chr. cor.

19 25 22.2 ✓

11 1 43.3 ✓

8 23 38.9 ✓

−1 22.5 ✓

8 22 16.4 ✓ C. M. T. obs.

2	31.30✓	1	37.1✓	1	53.9✓	1	20.7✓	3	31.0✓	2	57.8✓
2	31.60✓	1	37.9✓	1	52.7✓	1	19.3✓	3	30.6✓	2	57.2✓
2	32.35✓	1	40.7✓	1	53.5✓	1	20.0✓	3	34.2✓	3	0.7✓
2	31.05✓	1	40.7✓	1	53.3✓	1	20.2✓	3	34.0✓	3	0.9✓
2	31.90✓	1	40.5✓	1	53.2✓	1	20.5✓	3	33.7✓	3	1.0✓
2	31.64✓							3	32.70✓	2	59.52✓

log. 212.70 = 2.32777✓
" 7.5 = 0.87506✓
" cos. dec. = 9.63906✓
694.8 = 2.84189✓
889.8
195.0
97.5 +1 37.5✓
64 10 43.3✓
64 12 20.8

2.32777
0.87506
9.63864
694.2 = 2.84147
889.8
195.6 +3 15.6✓
64 10 43.3✓
+64 13 58.9✓

log. 179.52 = 2.25411✓
" 7.5 = 0.87506✓
" cos. dec. = 9.63953✓
587.1 = 2.76870✓
889.8
302.7
151.3 = +2 31.3
64 8 53.8
64 11 25.1

2.25411✓
0.87506
9.63888
586.2 = 2.76805✓
889.8
303.6 = +5 3.6
64 8 53.8
64 13 57.4

Brooks Comet, Sept. 6. 1883.

Comp. Star = +64° 1140.

Oe.A. 16400 =	16	33	20.43	+64	15	25.9
			+10.04		−2	31.7
	16	33	30.47	+64	12	54.2
	248	22	37.0			

log. $\frac{w}{15}$ = 0.126099

" sin A = n9.96831

" Cau D = 0.31597

−2.5727 = n0.41038

3.0708

+0.4981 = 9.69732

41. = 1.61278

+20.42 = 1.31010

log. w = 1.302191

" cos A. = n9.56644

" 41 = 1.61278

−303.0 = n2.48141

	16	33	20.43	+64	15	25.9
			+20.42		−5	3.0
* 1883.0 =	16	33	40.85	+64	10	22.9
			−0.19			+20.4
App. *	16	33	40.64	+64	10	43.3
		1	21.23		+3	15.6
	16	32	19.41	+64	13	58.9
	16	32	19.54	+64	13	57.4
App. pl. ☄ =	16	32	19.48	64	13	58.2

Comp. Star = +64° 1152

16 34 30.99 ✓ +64 13 32.4 ✓
+10.04 ✓ −2 31.7
16 34 41.03 ✓ +64 11 0.7 ✓
248 40 15.45 ✓

log. $\frac{w}{15}$ = 0.126099 ✓
" sin A. = n9.96918 ✓
" tan II = 0.31536 ✓
−2.5736 = n0.41054 ✓
3.0708
0.4972 = 9.69653 ✓
41. = 1.61278 ✓
20.38 ✓ = 1.30931 ✓

log. w = 1.30219 ✓
" cos. A = n9.56077 ✓
" 41 = 1.61278 ✓
−299.0 = n2.47574 ✓

16 34 30.99 ✓ +64 13 32.4 ✓
+20.38 ✓ −4 59.0 ✓
★ 1883.0 = 16 34 51.37 ✓ +64 8 33.4 ✓
−0.19 ✓ +20.4 ✓
App. ★ 16 34 51.18 ✓ +64 8 53.8 ✓
2 31.64 +5 3.6 ✓
16 32 19.54 ✓ +64 13 57.4 ✓

Brooks. Comet, 2d series.

Sept. 6. 1883.

Comet.		1st star		2d star.						☄ − 1st ✱	
38	19.0	39	52.2	41	19.2						
39	5.7	40	48.2	41	41.4						
77	24.7	80	40.4	83	0.6	3	15.7	5	35.9	1	37.85
42	21.2	43	53.8	45	20.7						
43	7.8	44	50.4	45	48.0						
85	29.0	88	44.2	91	4.7	3	15.2	5	35.7	1	37.60
46	21.2	47	53.9	49	20.7						
47	8.8	48	51.1	49	45.3						
93	30.0	96	45.0	99	6.0	3	15.0	5	36.0	1	37.50
51	38.7	53	11.2	54	32.4						
52	26.0	54	9.8	55	3.6						
104	4.7	107	21.0	109	42.0	3	16.3	5	37.3	1	38.15
59	46.5	1	17.2	2	44.4						
3 0	31.3	2	15.9	3	10.2						
120	17.8	123	33.1	125	54.6	3	15.3	5	36.8	1	37.65
										−1	37.75

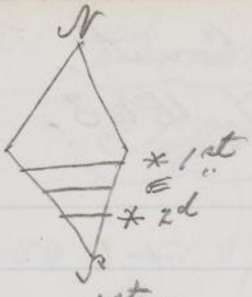
16	33	40.64
	−1	37.75
16	32	2.89
16	32	3.01
16	32	2.95 = App. R. A. ☄

16	34	51.18
	−2	48.17
16	32	3.01

No cor. for Ref. necessary.

Mean of ☄ times = 2h 48m 4.6

2h	48m	4.6
		− 3.5
2	48	1.1
11	1	43.3
15	46	17.8
	2	35.0
15	43	42.8 C. W. S. obs.



		ε	1st ,, *	2d ,, *	ε − 1st ,, *	ε − 2d ,, *
2	47.95 ✓	46.7 ✓	56.0 ✓	22.2 ✓	9.3 ✓	24.5 ✓
2	47.85 ✓	46.6 ✓	56.6 ✓	23.3 ✓	10.0 ✓	23.3 ✓
2	48.00 ✓	47.6 ✓	57.2 ✓	24.6 ✓	9.6 ✓	23.0 ✓
2	48.65 ✓	47.3 ✓	58.6 ✓	25.2 ✓	11.3 ✓	22.1 ✓
2	48.40 ✓	44.8 ✓	58.7 ✓	25.8 ✓	13.9 ✓	19.0 ✓
2	48.17 ✓	33.0 46.60	37.1 57.42	21.1 24.22	10.82 ✓	22.38 ✓

log. 10.82 = 1.03423 ✓
,, 7.5 = 0.87506 ✓
,, cos. dec. = 9.63906 ✓
35.3 ✓ = 1.54835 ✓
17.6 ✓ −17.6
64 10 43.3
64 10 25.7

1.03423 ✓
0.87506 ✓
9.63914 ✓
35.4 = 1.54843 ✓
−35.4 ✓
64 10 43.3 ✓
64 10 7.9 ✓

log. 22.38 = 1.34986 ✓
,, 7.5 = 0.87506 ✓
,, cos. dec. = 9.63953 ✓
73.2 ✓ = 1.86445 ✓
36.6 ✓ +36.6
64 8 53.8
64 9 30.4

1.34986 ✓
0.87506 ✓
9.63937 ✓
73.2 = 1.86429 ✓
+1 13.2
64 8 53.8
64 10 7.0 ✓

64 10 7.9
64 10 7.0
64 10 7.4
ε App. Dec.

Brooks Comet,
Sept. 7. 1883.

✱ 1883.0 =	16	33	40.85 ✓	+64	10	22.9 ✓
			−0.24 ✓			+20.3
App. pl. ✱	16	33	40.61	64	10	43.2
		−2	15.93 ✓		−9	22.9
	16	31	24.68 ✓	+64	1	20.3 ✓
	16	31	24.92 ✓	+64	1	20.7
App. A.R. ☄ =	16	31	24.80 ✓	+64	1	20.5

log. 99.78 = 1.99904 ✓
" 7.5 = 0.87506 ✓
" cos. dec. = 9.63906 ✓
326.0 = 2.51316
889.8
563.8
281.9 = −4 41.9
64 10 43.2
64 6 1.3

1.99904 ✓
0.87506
9.64028
326.9 = 2.51438 ✓
889.8
562.9 = −9 22.9 ✓
64 10 43.2
App. Dec. ☄ = 64 1 20.3

C. M. T. obs. = 8h 12m 27s ✓

Brooks Comet.

Sept. 7. 1883.

* 18830 = 16	34	51.37 ✓	+64	6	33.4 ✓
		−0.24 ✓			+20.3 ✓
Ap. pl. * 16	34	51.13 ✓	+64	8	53.7 ✓
	3	26.21 ✓		−7	33.0
16	31	24.92 ✓	+64	1	20.7

133.26 = 2.12470 ✓
75 = 0.87506 ✓
by. cos. dec. = 9.63953 ✓
435.8 = 2.63929 ✓
889.8
454.0
227.0 = −3 47.0
64 8 53.7
64 5 6.7

2.12470 ✓
0.87506 ✓
9.64051 ✓
436.8 ✓ = 2.64027 ✓
889.8
453.0 = −7 33.0
64 6 53.7
App. dec. = 64 1 20.7
" " " 64 1 20.3
mean App. dec. = 64 1 20.5 = final App. dec. =

58 Sept 21. 1883 Comet Brooks b 1883

A. Searle observer.

north ☄ ○ $\frac{t+t}{2}$	$\frac{t-t}{2}$	North Rumker 5444 $\frac{t+t}{2}$	$\frac{t-t}{2}$	South Radcliffe 3571 $\frac{t+t}{2}$	$\frac{t-t}{2}$	Compt of Stars	
20 22 22.75	29.95	20 23 37.20	51.00	20 24 33.45	48.65		
		− 1 14.95	21.05			−0 56.25	99.65
29 40.75	36.65	30 54.30	54.00	31 51.05	45.45		
		− 1 13.55	17.35			56.75	99.45
34 35.85	35.85	35 49.10	54.10	36 45.60	45.60		
		− 1 13.25	18.25			56.50	99.70
38 49.35	33.75	40 2.40	49.40	40 58.50	50.40	56.10	99.80
		− 1 13.05	15.65				
42 55.85	33.35	44 7.55	49.45	45 4.00	50.30	56.45	99.75
		− 1 11.70	16.10				
20 33 40.81 ✓	33.91	20 34 54.11	51.59	20 35 50.52	48.08	m s −0 56.41	99.67
		− 1 13.30	17.68				

~~☄ − R 5444~~

Δ α

1.24748
15 1.17609
~~2.4~~
δ₀ 60 57 12 cos δ 9.68621
128.76 2.10978

1.99856
1.17609
δ₀ (60 54 51) 9.68674
726.76 2.86139
1889.8
163.0″
−0 56.41 +2 43.0

~~☄ − ✗~~ (~~Rumker~~ 1

☄ − ✗ − 1m 13.30s +2′ 8.8″

20 33 40.81 ✓
+2 51.0 Chr. Cor.
20 36 31.8 ✓
12 0 51.6 ✓
8 35 40.2 ✓
−1 24.5
8 34 15.7 ✓
4 44 31.
13 18 47.

Sept 21. 1883 Comet Brooks b 1883

59

a Secula Obs South ☾		South Rumker 5444		South outside Rad. 3571		North Safford 553 Compare with R. 5444	
$\frac{t+t}{2}$	$\frac{t-t}{2}$	$\frac{t+t}{2}$	$\frac{t-t}{2}$	$\frac{t+t}{2}$	$\frac{t-t}{2}$	$\frac{t+t}{2}$	$\frac{t-t}{2}$
21 20 58.50	23 20	21 22 12.55 − 1 14.05	11.85 11.35	21.— comparison with R 5444		21 26 29.15 − 4 16.60	44.85 56.70
28 52.80	23 80	30 5.80 − 1 13.00	12.50 11.30	31 1.55 − 0 56.75	9.45 21.95	34 22.30 − 4 16.50	43 90 56.40
35 51.90	25.70	37 5.20 − 1 13.30	12.60 13.10	38 1.10 − 0 56.90	9.30 21.90	41 21.70 4 16.50	43.70 56.30
42 59.35	23.85	44 12.60 − 1 13.25	12.90 10.95	45 7.90 − 0 55.30	9.30 22.20	48 28.80 − 4 16.20	43.80 56.70
50 5.05	24.65	51 18.25 − 1 13.20	13.95 10.70	52 13.00 − 0 54.75	8.50 22.45	55 33.90 − 4 15.65	43.60 57.55
21 35 45.52	24.24	21 36 58.88 − 1 13.36	12.76 11.48	− 0 55.92	22.12	21 41 15.17 − 4 16.29	43.97 56.73

21 35 45.52 = mean ☾ times

1.05994
1.17609
9.68621
1.90224
79.844

9 36 10.4 = C. m. T. obs.
4 44 31.
14 20 41 = Gr. m. T. obs.

43.3
4 45.
21 59 58
−11 4
9

1.34478
1.17609
9.68674
161″.3 2.20761
− 0 55.92 + 2′ 41.3

1.75381
1.17609
(61° 0′ 10″) 9.68553
2.61543
~~412.5~~
859.8
~~848.6~~
477.3
~~14′ 8.6~~
− 4 16.29 + 7′ 57.3

☾ − ✶ − 1 13.36 + 1′ 19″.8

Means of sets north and south
B 236
21 4 43.3 ☾ − ✶ − 1m 13s.33 + 1′ 44″.3

Assumed Place of Rumker 5444 (See next page) 1883.0 16 26 29.80 + 60 56 10.0

Red. to app. Place − 0.52 + 18.3

Refraction — —

Proper motion — —

C. M. T. s
Sept 21d 9h 4m 58 16h 25m 15s.95 + 60° 58′ 12″.6

Sept 21, 1883

Place of Rumker 5444
1883.0

Rumker's Cat gives 16 26 29.35 60 56 12.9

5 compns with Rad 3571
by Searle give
Rad 3571 16 27 26.04 +60 53 29.9
−0 56.41 +2 43.0 16 26 29.63 60 56 12.9

other
4 compns with same (smaller uncertain outside square)
by ~~Searle~~ give
16 27 26.04 +60 53 29.9
−0 55.92 +2 41.3 16 26 30.12 60 56 11.2

5~~4~~ compns with Safford 553
by Searle give
16 30 46.41 +61 4 7.4
−4 16.29 +7 57.3 16 26 30.12 60 56 7.1

uncertain in R.A. (short clouds)
2 compns with Rad 3571
by ~~Searle~~ Chandler give
16 27 26.04 60 53 29.9
−0 57.25 +2 34.0 16 26 28.79) 60 56 3.9

Assumed Place of Rumker 5444
for 1883.0
h m s
16 26 29.8 60° 56′ 10.″0

A. Searle obs. — Sept. 22, 1883 — Fr. 1327 — ☄ Brooks b 1883

North ☄	South D.M. 60.1675	South D.M. 60.1676	☄ − ×				
22 30 39.6	22 27 15.0	20 28 42.4					
31 28.0	28 33.9	29 14.7					
31 3.80	27 54.45		+3	9.35	48.4	78.9	127.3
35 31.0	32 6.5	33 34.0					
36 19.8	33 24.7	34 6.0					
35 55.40	32 45.60		3	9.80	488	782	127.0
40 59.5	37 36.0	39 3.5					
41 50.0	38 54.3	39 35.2					
41 24.75	38 15.15		3	9.60	50 5	78.3	128.8
45 59.8	42 37.0	44 49.8					
46 50.6	43 54.7	44 35.8					
46 35.2	43 15.85		3	9.35	50 8	77.7	128.5
51 19.7	47 43.5	49 10.7					
51 57.6	49 14.6	49 55.8					
51 38.65	48 29.05		3	9.60	37.9	91.1 ~~87.2~~	129.0
	means		+3	9.54			128.12

22 41 17.55
5.2
12 4 48.10

10 36 24.25
1 44.2

10 34 40

15/2
2.107617
0.878061
δ(60 40 35) 689967
~~9.597612~~
~~2.581290~~ 2.672645
~~760.89~~
380.44
889.8
509″.4
~~+8′ 29″.4~~
+0′ 59″.2

470.6
889.8
419.2

		m	s			
☄ − ×		+3	9.54			
BD +60 1675 (1883.0)	16	22	9.21	60	36	49.6
			−0.56			+18.2
Refraction						
Proper Motion			±0.03			—
☄ app.	16	25	18.16	+60	44	7.0

C. M. T.
Sept 22 10d 34h 40m s

Sept 22, 1883 am

South	North. Rad. 3571					
☄	Dm 60. 1682					
22 55 46.2	22 58 8.8					
56 42.3	58 33.6					
56 14.25	58 21.20	− 2	7.05	56.1	24.8	80.7
59 22.4	23 1 28.1					
23 0 1.4	2 9.6					
59 41.90	1 48.85	2	6.95	39.0	41.5	80.5
2 43.2	5 1.4					
3 34.2	5 29.9					
3 8.70	5 15.65	2	6.95	51.0	28.5	79.5
5 58.2	7 54.5					
6 27.2	8 44.6					
6 12.70	8 19.55	2	6.85	29.0	50.1	79.1
9 9.7	11 20.9					
9 53.4	11 55.9					
9 31.65	11 38.40	2	6.75	43.7	35.0	78.7

23 2 57.84
−5.2
23 2 52.6
12 4 48.1
10 58 4.5
1 47.8
10 56 16.7

Mean − 2 6.91

79.70

1.901458
0.875061
9.688047
2.464566
598.35

(60 49 8)
291.45
889.80

10 56 16.7 Cm T.		− 2m 6s.91	− 9′ 58″.3.
Rad 3571	1883.0	16 27 26.00	+ 60 53 30.0
Red.		− 0.56	+ 18.2
Refraction			
Proper motion		+ 0.03	−
		16 25 18.56 ±	+ 60 43 49.9 ±

C. M. T.
Sept 22d 10h 56m 17s

Ast.	*		
2^m 2.0 ✓	2 33.6 ✓		
2 42.4 ✓	3 1.3 ✓		
4 44.4 ✓	5 34.9 ✓	50.5	25.25
3 30.8 ✓	4 2.7 ✓		
4 12.0 ✓	4 30.1 ✓		
7 42.8 ✓	8 32.8 ✓	50.0	~~25.00~~
4 59.6 ✓	5 31.3 ✓		
5 39.7 ✓	5 58.7 ✓		
10 39.3 ✓	11 30.0 ✓	50.7	25.35
			25.30 ✓

2^h 3 51.1 ✓
+5
2 8 51.
16 36 50 ✓
9 32 1
1 34 ✓
9 30 27

3 17 52
−25
3 17 27

40.4 27.7 12.7

41.2 27.4 ~~13.6~~

40.1 27.4 12.7

12.7

12.7 = 1.1038037 ✓
7.5 = 0.8750613 ✓
cos. dec. = 9.9832913
91.7 ✓ = 1.9621563

− 1′ 31.7
~~15 47 36~~
~~15 46 4~~

+15 52 37
−1 32 ✓
+15° 51.1 [illegible] 5

Location of Plan. Neb.

8 3
2 5
2)5 8
29

(1854)

2.731
29
24579
5462
79.199

10.12
29
9108
2024
293.48

20	1	10.12 ✓	+16	24	13.2 ✓
	+1	19.20		4	53.5
20	2	29.32 ✓	+16	29	6.7 ✓
300°	37′	19″.80 ✓			

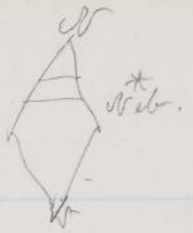
log. $\frac{u}{15}$ = 0.126117
" sin t = n9.934774
" sec δ = 9.471193
−0.34058 = n9.532084
3.0707
+2.7302 = 0.436194 ✓
58. = 1.763428
158.35 = 2.199622

log. u = 1.302209 ✓
" cos. A = +9.707037
" 58. = 1.763428 ✓
592.5 = 2.772674

	20	1	10.12 ✓	+16	24	13.2 ✓
		+2	38.35 ✓		9	52.5 ✓
(m. P. 1883.0)	20	3	48.47 ✓	+16	34	5.7 ✓
			−8.19			−30.6
m. P. 1880.0 =	20	3	40.28 ✓	+16	33	35.1 ✓

Location of Plan. Neb.

See R 108. 178.



Star		Neb.					
4	51.2 ✓	6ᵐ	4.0 ✓				
5	37.3 ✓	6	52.5 ✓				
10	28.5	12	56.5	2	28.0	1	14.0
8	53.3 ✓	10	6.0 ✓				
9	38.6 ✓	10	54.5 ✓				
18	31.9	21	0.5	2	28.6	1	14.3
12	4.0 ✓	13	16.8 ✓				
12	48.8 ✓	14	4.2 ✓				
24	52.8	27	21.0	2	28.2	1	14.1
						1	14.13

20 3 48.47 ✓

+1 14.13 ✓

20 5 2.60 = R. A. Neb. 1883.0

−8.19

20 4 54.41 = R. A. Neb. 1880.0

46.1ᵛ 48.5ᵛ 2.4

45.3ᵛ 48.5ᵛ 3.2

44.8ᵛ 47.4ᵛ 2.6

3/8.2

2.73

log. 2.73 = 0.436163
" cos. δ = 9.981583
" 7.5 = 0.875061
− ~~196.2~~ = 1.292807
~~19.1~~
19.62 16 . 34 5.7
−19.6
16 33 46.1
−30.6
+16 33 15.5 = Pos. Neb. 1880.0 in Dec.

~~0.436163~~
~~0.875061~~
~~9.981645~~
~~2.292869 = 196.3~~
~~16 34 5.7ᵛ~~
~~−3 16.3ᵛ~~
~~16 30 49.4ᵛ = Pos. Neb. 1880.0~~

Location of Nebula discovered by Prof. P.

4162.	4166.	Neb.	4171	4177.
5m 14.2 ✓	5 40.2 ✓	6 28.2 ✓	6 54.7 ✓	7 20.6 ✓
9 16.0 ✓	9 41.9 ✓	10 30.2 ✓	10 56.6 ✓	11 22.1 ✓
12 26.4 ✓	12 52.2 ✓	13 40.5 ✓	14 6.7 ✓	14 32.8 ✓
n.	s	n	n	s
0 46.1 ✓	0 22.9 ✓	0 48.5 ✓	0 37.0	0 47.2
0 45.3 ✓	0 23.4 ✓	0 48.5 ✓	0 37.2 ✓	0 48.2 ✓
0 44.8 ✓	0 23.7 ✓	0 47.4 ✓	0 35.4 ✓	0 48.5 ✓

26.0
25.9
25.8
17.7
25.90

2 6.4
2 6.1
2 6.4
2 6.3

	4162.		4166.		4171.		4177.
1	14.0	0	48.0	0	26.5	0	52.4
1	14.2	0	48.3	0	26.4	0	51.9
1	14.1	0	48.3	0	26.2	0	52.3
1	14.10	0	48.20	0	26.37	0	52.20

2.4	71.4	11.5	95.7
3.2	71.9	11.3	96.7
2.6	71.1	12.0	95.9
2.73	71.47	11.60	96.10

71.47 = 1.854124
cos. dec. = 9.981768
7.5 = 0.875061
514.0 = 2.710953
889.8
375.8 = 6' 15".8

11.60 = 1.064458
= 9.981624
= 0.875061
83.40 = 1.921143
1' 23".4

96.10 = 1.982723
9.981724
0.875061
691.0 = 2.839508
889.8
198.8 = 3' 18".8

Pos. 4166 (1875) =	20	1	35.84 ✓	+16	17	24.2 ✓
		+2	38.35 ✓		+9	52.5 ✓
" 1883.0 =	20	4	14.19 ✓	+16	27	16.7 ✓
			+48.20 ✓		+6	15.8 ✓
" Neb. 1883.0 =	20	5	2.39 ✓	+16	33	32.5 ✓
			8.19			30.6
" Neb. 1880.0 =	20	4	54.20	+16	33	1.9
Pos. 4177 (1875) =	20	3	16.07 ✓	+16	20	23.8 ✓
		+2	38.35 ✓		+9	52.5 ✓
" " (1883.0) =	20	5	54.42 ✓	+16	30	16.3 ✓
		−0	52.20 ✓		+3	18.8 ✓
" Neb. 1883.0 =	20	5	2.22 ✓	+16	33	35.1 ✓
			8.19 ✓			30.6
" Neb. 1880.0 =	20	4	54.03	+16	33	4.5

	20	4	14.19	+16	27	16.7
			−8.19			−30.6
Pos. 4166 at 1880.0 =	20	4	6.00	+16	26	46.1
			−25.90		+6	35.6
	20	3	40.10	+16	33	21.7

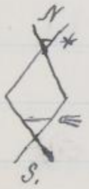
	20	5	54.42	+16	30	16.3
			−8.19			−30.6
Pos. 4177 at 1880.0 =	20	5	46.23	+16	29	45.7
		2	6.30		+3	38.5
	20	3	39.93	+16	33	24.2

Comet Wells. (see p. 88)

June 26, 1882.

Frod. 1327

1 ☄	2 ✱	3 Diff.	4 Diff./2
15h 24m 50.6s	25 17.3		
25 23.6	25 31.0		
50 14.2 √	50 48.3 √	34.1 √	17.05 √
~~27 6.0~~	~~27 21.7~~		
~~27 26.7~~	~~27 33.0~~		
~~54 32.7~~ √	~~54 54.7~~ √	~~22.0~~ √	~~11.00~~ √
27 58.5	28 24.0		
28 33.2	28 38.7		
56 31.7 √	57 2.7 √	31.0 √	15.50 √
29 51.5	30 16.0		
30 22.2	30 27.4		
60 13.7 √	60 43.4 √	29.7 √	14.85 √
30 51.0	31 15.0		
31 26.9	31 29.5		
62 17.9 √	62 44.5 √	26.6 √	13.30 √
			−15.18 √ √



4 | 60.70
15.17

Mean of ☄ times = 15h 28m 39.69s √
6 18 48.84 √
9 9 50.85 √
−1 30.08 √
Mean uncorrected Time 9 8 20.77 √
~~C~~ Cor. to 1327. +1 46.3 √
C. M. T. obs. = 9 10. 7.1 √
4 44 31
13 54 38. √

Diff ~~α~~ 5	Diff. ~~x~~ 6	7 Col 6 − Col. 5.
−33.0	+13.7	−19.3
~~20.7~~	~~14.3~~	~~−9.4~~
−34.7	+14.7	−20.0
−30.7	+11.4	−19.3
−35.9	+14.5	−21.4
14.3	14.3	20.0

mean 33.58 13.58

log. 20.0 = 1.30103

" 7.5 = 0.87506

" cos. dec. = 9.98778

−145.8 = 2.16387

889.8

2)744.0

372.0 = 6′ 12.0

13 31 37.2

−6 12.0

13 25 25.2

1.30103

0.87506

9.98796

−145.9 = 2.16405

889.8

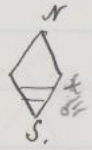
743.9 = −12′ 23.9

Comet Wells.

(see p. 82)

June 28, 1882.

1 ☄	2 ✱	Frod. 1327. 3 Diff.	4 Diff.
15h 42m 8s.6	42 54.8		
42 25.9	43 44.4		
84 34.5 ✓	86 39.2 ✓	2m 4s.7 ✓	1m 2s.35 ✓
			−1m 2.35 ✓



Mean of ☄ times	15h 42m 17s.25 ✓
	6 26 41.95 ✓
	9 15 35.30 ✓
	−1 31.02 ✓
Mean Cam. Time	9 14 4.28 ✓
Cor. to 1327.	+1 46.8 ✓
C. m. T. obs.	9 15 51.1 ✓
	4 44 31
	14 0 22

5 Diff α	6 Diff *	7 Diff Cols 5 & 6.
17.3 ✓	49.6 ✓	32.3 ✓
		32.3 ✓

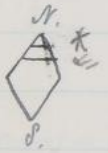
Log. 32.3 = 1.50920 ✓
" 7.5 = 0.87506 ✓
" mid cos. δ = 9.98910 ✓
236.2 ✓ = 2.37336 ✓
~ 3′ 56.2″ ✓

Comet Wells.

July 6. 1882.

Bond. 236.

	1 ☄	2 *	Diff.	4 Diff./2
16	2 54.6	5 7.7		
	3 17.0	5 29.4		
	6 11.6	10 37.1	4m 25s.3	2m 12.75
	6 20.0	8 32.5		
	6 40.4	8 51.7		
	13 0.4	17 24.2	4 23.8	2 11.90
	9 23.3	11 35.2		
	9 41.6	11 52.4		
	19 4.9	23 27.6	4 22.7	2 11.35
	12 25.4	14 36.8		
	12 41.4	14 51.2		
	25 6.8	29 28.0	4 21.2	2 10.60
	15 39.0	17 49.7		
	16 10.7	18 19.4		
	31 49.7	36 9.1	4 19.4	2 9.70
				−2m 11s.26



Mean of ☄ times 16h 9m 31s.34
6 58 14.41
9 11 16.93
−1 30.31
Mean Time 9 9 46.62
Cor. to 236. −52.5
C. M. T. obs. = 9 8 54.1
4 44 31.
13 53 25

5 Diff. ☄	6 Diff. *	7 Diff. Cols. 5 + 6.
22.4 ✓	21.7 ✓	0.7 ✓
20.4 ✓	19.2 ✓	1.2 ✓
18.3 ✓	17.2 ✓	1.1 ✓
16.0 ✓	14.4 ✓	1.6 ✓
31.7 ✓	29.7 ✓	2.0 ✓
108.8	102.2	1.32 ✓
mean 21.76 ✓	20.44 ✓	

Log. 1.32 = 0.12057 ✓

" 7.5 = 0.87506 ✓

" cos. δ_{mid} = 9.99265

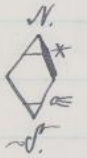
− 9.″7 = 0.98828

Comet Wells.

July 7, 1882.

B. 236.

	1 ☄	2 *	3 Diff.	4 Diff/2
16	4 19.6 ✓	8 44.7 ✓		
	4 53.0 ✓	9(?) 16.0 ✓		
	9 12.6 ✓	18 0.7 ✓	8^m $48^s.1$ ✓	4^m 24.05 ✓
	11 42.4 ✓	16 9.8 ✓		
	12 19.7 ✓	16 36.2 ✓		
	24 2.1 ✓	32 46.0 ✓	8 43.9 ✓	4 21.95 ✓
	17 34.3 ✓	22 5.2 ✓		
	18 16.0 ✓	22 26.2 ✓		
	35 50.3 ✓	44 31.4 ✓	8 41.1 ✓	4 20.55 ✓
	23 3.4 ✓	27 26.7 ✓		
	23 38.4 ✓	27 54.1 ✓		
	46 41.8 ✓	55 20.8 ✓	8 39.0 ✓	4 19.50 ✓
	28 31.3 ✓	33 0.0 ✓		
	29 14.3 ✓	33 20.3 ✓		
	57 45.6 ✓	66 20.3 ✓	8 34.7 ✓	4 17.35 ✓
				-4^m $20^s.65$ ✓



Mean of ☄ times	16^h	17^m	$21^s.24$ ✓
	7	2	10.97 ✓
	9	15	10.27 ✓
		−1	30.95 ✓
Mean Time,	9	13	39.32 ✓
Cor. to 236,			−56.4 ✓
C. M. T. obs. =	9	12	42.9 ✓
	14	44	31.
Gr. M. T. =	13	57	14. ✓

5 Diff. ☾	6 Diff. ✱	7 Sum of Cols. 5 & 6.
33.4 ✓	31.3 ✓	1ᵐ 4.7ˢ ✓
37.3 ✓	26.4 ✓	1 3.7 ✓
41.7 ✓	21.0 ✓	1 2.7 ✓
35.0 ✓	27.4 ✓	1 2.4 ✓
43.0 ✓	20.3 ✓	1 3.3 ✓
190.4	126.4	1ᵐ 3.ˢ36 ✓
Mean 38.08 ✓	25.ˢ28 ✓	

Log. 63.36 = 1.80182 ✓
" 7.5 = 0.87506 ✓
" mid cos. δ = 9.99294 ✓
467.5 ✓ = 2.66982 ✓
889.8 ✓
422.3 = ✓
− 7′ 2.″3 ✓

Log 63.36 1.80182 ✓
" 7.5 0.87506 ✓
" cos. dec. 9.99286 ✓
467.5 ✓ = 2.66974 ✓

889.8 ✓
422.3 ✓
211.2 ✓
− 3 31.2 ✓
10 21 51.0 ✓
10 18 19.8 ✓

57 yrs.

Comet Wells.

June 28. 1882.

Precession Comp.

Comp. star D M. +12° 2014. 8.7

W 9h 221 9h 9m 23s.39 +13° 2′ 55″.3

137° 20′ 50″.85

Log m/15 = 0.126178

" sin α = 9.830944

" tan δ = 9.365045

+0. 2100 = 9.322167

+3. 0701

+3. 2801 = 0.515887

28.5 = 1.454845

+ 93s.48 = 1.970732

Log n = 1.302270

" cos α 9.866568n

" 28.5 1.454845

−420″.42 = 2.623683n

9h 9m 23.39

+ 1 33.48

Middle approx. 9 10 56.87

137° 44′ 13″.05

+13° 2′ 55.3

−7 0.4

+12 55 54.9

Log n/15 = 0.126118

" sin A = 9.827715

" tan D = 9.361004

+0.2065 = 9.314837

+3.0707

+3.2772 = 0.515503

57 = 1.755875

186s.80 = 2.271378

Log n = 1.302210

" cos A = 9.869270n

" 57 = 1.755875

−845″.97 = 2.927355n

9h 9m 23.39

+ 3 6.80

Pos.* 1882.0 9 12 30.19

−1 2.35

9 11 27.84

+1.48

Ap. pl. 9 11 29.32

+13° 2′ 55.3

−14 6.0

+12 48 49.3

−3 56.2

+12 44 53.1

−11.4

+12 44 [illegible]

Comet Wells.
June 28. 1882.
App. Places.

f. -	+2.424 ✓		
log. g	+1.2235 ✓	Log g.	+1.2235 ✓
" sin$(G+\alpha)$	+9.5874 ✓	" cos $G+\alpha$	−9.9648 ✓
" tan δ	+9.3569 ✓	" sum	−1.1883 ✓
" sum	+0.1678 ✓	2y.	−15.43 ✓
" 15	+1.1761 ✓	" h	+1.3101 ✓
" result	+8.9917 ✓	" cos.$(H+\alpha)$	+9.8213 ✓
2y.	+0.098 ✓	" sin δ	+9.3459 ✓
" h	+1.3101 ✓	" sum	+0.4773 ✓
" sin$(H+\alpha)$	−9.8745 ✓	2y.	+3.001 ✓
" sec. δ	+0.0110 ✓	" i	+0.0066 ✓
" sum	−1.1956 ✓	" cos. δ	+9.9890 ✓
" 15	+1.1761 ✓	" sum	+9.9956 ✓
" result	−0.0195 ✓	2y.	+0.99 ✓
2y.	−1.046 ✓	$\delta' - \delta$	−11.44 ✓
$\alpha' - \alpha$	+1.476 ✓		

Cor. for Proper Motion = $+0.''01$ ✓

" " " " = $-0.''8$ ✓

G = 1 16.5 ✓

α = 9 12.5 ✓

$(G+\alpha)$ = 10 29.0 ✓

Cor. for Refraction. = None.

" " " = $-0.''9$

Log. f. P. R.A. = +9.646 ✓

" " " Dec. = +0.778 ✓

H = 11 33.5 ✓

α = 9 12.5 ✓

$(H+\alpha)$ = 20 46.0 ✓

	9^h 11^m $29.^s32$ ✓	$+12^\circ$ $44'$ $41.''7$ ✓
Cor. for Pr. Mot. =	+0.01 ✓	−0.8 ✓
Cor. for Ref. =	9 11 29.33 ✓	+12 44 40.9 ✓
	0.00 ✓	+0.9 ✓
Final pos. =	9 11 29.33 ✓	+12 44 41.8 ✓

1882
1800
82 yrs.

Comet Wells.
July 6. 1882.
Precession Comp.

Comp. star = D.M. +10° 2139. (8.0)

Ll. 20021. 10h 8m 51.18s   10° 55′ 7.0″
+2 10.79   −12 7.8
10 11 1.97   +10 42 59.2
152 45 29.6

log. m/15   0.12614   Log n 1.30226
" sin α   9.66062   " cos α n 9.94894
" tan δ   9.27704   " 82 1.91381
Sum logs.   9.06380   n 3.16499
Cor. no.   +0.1158   1462.2 (24
Log. m   +3.0704   120
+3.1862   262
240
22.2

lg. 3.1862 = 0.50327
" 82. = 1.91381
+261.26s   2.41708

10 8 51.16   10 55 7.0
+4 21.26   −24 22.2
1882.0   10 13 12.44   +10 30 44.8
−2 11.26   −9.7
10 11 1.18   +10 30 35.1
Red. to Ap. pl.   +1.65   −12.2
Ap. pl. ☄ = 10 11 2.83   +10 30 22.9
Cor. for Pr. Mot. =   −0.01   +0.7
10 11 2.82   +10 30 23.6
Cor. for Ref.   0.00   0.0
Final pos. ☄ = 10 11 2.82   +10 30 23.6

Comet Wells.
July 6. 1882.
Ap. Place.

f.	+2.516 √
Log g.	+1.2367 √
" sin(G+α)	+9.1810 √
" tan δ	+9.2685 √
" sum	+9.6862 √
" 15	+1.1761 √
" result	+8.5101 √
2y.	+0.032 √
" h	+1.3083 √
" sin(H+α)	-9.8112 √
" sec δ	+0.0074 √
" sum	-1.1269 √
" 15	+1.1761 √
" result	n9.9508 √
2y	-0.893 √
α′-α	+1.655 √

Log g	+1.2367 √
" cos.(G+α)	-9.9949 √
" sum	-1.2316 √
2y.	-17.05 √
" h	+1.3083 √
" cos.(H+α)	+9.8820 √
" sin δ	+9.2611 √
" sum	+0.4514 √
2y.	+2.83 √
" i	+0.3180 √
" cos. δ	+9.9926 √
" sum	+0.3106 √
2y.	+2.04 √
δ′-δ	-12.18 √

Cor. for Proper Motion = -0.ˢ01 √
" " " " = +0.″7 √

Cor. for Refraction = None.
" " " = "

Log. f. p. R. A. = +9.648 √
" " " Dec. = +0.765 √

G = 1 11.9 √
α = 10 13.2 √
(G+α) = 11 25.1 √

H = 11 5.4 √
α = 10 13.2 √
(H+α) = 21 18.6 √

57 yrs. Comet Wells

July 7. 1882.

Comp. Star. D M. +10° 2152 7.0

W. 10h 344 10h 18m 23.08s ✓ +10° 39′ 6.8″ ✓

+1 30.57 ✓ −8 36.4 ✓

Middle Place. 10 19 53.65 ✓ +10 30 30.4 ✓

154° 58′ 24.″75 ✓

Log $\frac{n}{15}$	0.12612 ✓	Log m	1.30221 ✓
" sin A.	9.62638 ✓	" cos A.	n9.95718 ✓
" tan D	9.26832 ✓	" 57	1.75587 ✓
+0.1049 ✓	= 9.02082 ✓		n3.01526 ✓
+3.0707 ✓			
3.1756 ✓	= 0.50183 ✓		
57.	= 1.75587 ✓		
+181.01 ✓	= 2.25770 ✓		

10 35.8 ✓ (17 ✓
60
435
420
158

	10	18	23.08 ✓	+10	39	6.8 ✓
		+3	1.01 ✓		−17	15.8 ✓
1882.0	10	21	24.09 ✓	+10	21	51.0 ✓
		−4	20.68 ✓		−7	2.3 ✓
	10	17	3.41 ✓	+10	14	48.7 ✓
Red. to Ap. pl.			+1.68 ✓			−12.2 ✓
Ap. pl. ☄ =	10	17	5.09 ✓	+10	14	36.5 ✓
Cor. for Pr. Unb.			+0.01 ✓			−1.1 ✓
	10	17	5.10 ✓	+10	14	35.4 ✓
Cor. for Ref.			−0.44 ✓			−6.5 ✓
Final pos. ☄ =	10	17	4.66 ✓	+10	14	28.9 ✓

Comet Wells.
July 7, 1882,
Ap. Place.

f.	+2.522 ✓		
Log g	+1.2376 ✓	Log g	+1.2376 ✓
" sin(G+α)	+9.0653 ✓	" cos(G+α)	−9.9971 ✓
" tan δ	+9.2622 ✓	" sum	−1.2347 ✓
" sum	+9.5651 ✓	2y	−17.17 ✓
" 15	+1.1761 ✓	" h	+1.3080 ✓
" result	+8.3890 ✓	" cos(H+α)	+9.8894 ✓
2y	+0.024 ✓	" sin δ	+9.2550 ✓
" h	+1.3080 ✓	" sum	+0.4524 ✓
" sin(H+α)	−9.8005 ✓	2y	+2.83 ✓
" sec. δ	+0.0071 ✓	" i	+0.3444 ✓
" sum	−1.1156 ✓	" cos. δ	+9.9929 ✓
" 15	+1.1761 ✓	" sum	+0.3373 ✓
" result.	−9.9395 ✓	2y	+2.17 ✓
2y.	−0.870 ✓	δ' − δ	−12.17 ✓
α' − α	+1.676 ✓		

Cor. for Proper motion = $+0^{s}.01$ ✓
" " " " = $-1''.1$ ✓

G =	1	11.9 ✓
α	10	21.4 ✓
(G+α) =	11	33.3 ✓

Cor. for Ref. (R.A.) = $+0^{s}.44$
" " " (Dec.) = $+6''.5$

Log. f. p. R.A. = +9.648 ✓
" " " Dec. = +0.766 ✓

H =	11	1.9 ✓
α =	10	21.4 ✓
(H+α) =	21	23.3 ✓

57 yrs.

Comet Wells.

June 26. 1882.

W 8h 1324	8h	49m	48.12s ✓	+13°	44′	45.5″ ✓
		+1	34.36 ✓		−6	25.9 ✓
Middle Pl.	8	51	22.48 ✓	+13	38	19.6 ✓
	132°	50′	37.20″ ✓			

Log $\frac{n}{15}$ 0.12612 ✓ Log n 1.30221 ✓

" sin α. 9.86523 ✓ " cos α. 9.83251 ✓ n

" tan δ 9.38497 ✓ " 57 1.75587 ✓

+0.2379 ✓ = 9.37632 ✓ −777.3 ✓ = 2.89059 n

+3.0707 ✓

+3.3086 ✓ = 0.51965 ✓

57 = 1.75587 ✓

+188.59 ✓ = 2.27552 ✓

777.3 (12
60
177
120
57.3

	8	49	48.12 ✓	+13°	44′	45.5 ✓
		+3	8.59 ✓		−12	57.3 ✓
1882.0	8	52	56.71 ✓	+13	31	48.2 ✓
Red. to Ap. pl.			+1.42 ✓			−11.0 ✓
Ap. pl. *	8	52	58.13 ✓	+13	31	37.2 ✓
☄ − *			−15.18 ✓		−12	23.9 ✓
Ap. pl. ☄	8	52	42.95 ✓	+13	19	13.3 ✓
Cor. for Pr. Mot. =			+0.01 ✓			−1.7 ✓
	8	52	42.96 ✓	+13	19	11.6 ✓
Cor. for Ref.			−1.83 ✓ ~~−2.06~~			−25.9 ✓ ~~−28.8~~
Final Pos. ☄ =	8	52	~~40.90~~ ✓ 41.13 ✓	+13	18	~~42.8~~ ✓ 45.7 ✓

Comet Wells.
June 26, 1882.

f.	+2.399 ✓		
Log. g	+1.2186 ✓	Log. g	+1.2186 ✓
" sin(G+t)	+9.6666 ✓	" cos(G+t)	−9.9473 ✓
" tan. δ	+9.3813 ✓	" sum	−1.1659 ✓
" sum.	+0.2665 ✓	2y.	−14.65 ✓
" 15	+1.1761 ✓	" h	+1.3103 ✓
" result	+9.0904 ✓	" cos(H+t)	+9.7932 ✓
2y.	+0.123 ✓	" sin δ	+9.3691 ✓
" h	+1.3103 ✓	" sum	+0.4726 ✓
" sin(H+t)	−9.8941 ✓	2y.	+2.97 ✓
" sec. δ	+0.0122 ✓	" i	+9.8721 ✓
" sum	−1.2166 ✓	" cos. δ	+9.9878 ✓
" 15	+1.1761 ✓	" sum	+9.8599 ✓
" result	−0.0405 ✓	2y.	+0.72 ✓
2y.	−1.098 ✓	δ'' − δ	−10.96 ✓
α' − α	+1.424 ✓		

Cor. for Proper Motion = $+0.^{s}01$ ✓
" " " " = $-1.''7$ ✓

" " Refraction in R.A. = $+2.^{s}06$ ✓
" " " " Dec. = $+28.''8$ ✓

Cor. for Pr. mot. + Ref. = $+2.^{s}0$~~1~~7 ✓
" " " " " $+27.''1$ ✓

Log. f. p. R.A. = +9.646 ✓
" " " Dec. = +0.780 ✓

G. = 1 16.4 ✓
t = 8 53.0 ✓
(G+t) = 10 9.4 ✓

H = 11 40.6 ✓
t = 8 53.0 ✓
(H+t) = 20 33.6 ✓

ζ = 87.4 ✓

Comet Wells.
June 26. 1882.
Refraction Comp. (2 sets)

15 26 41.4 ✓ mean of first 2 sets.
+1 46.3 ✓ Clock cor.
15 28 27.7 ✓ Cor. time.
8 52 41.8 ✓
+6 35 45.9 ✓

log. cos. φ = 9.8684 ✓
" sin t = 9.9947 ✓
Sum logs. = 9.8631 ✓
log. sin ζ. = 9.9996 ✓
q = 46.9 = 9.8635 ✓
2q = 93.8

log. sin q = 9.8634 ✓
" sin² q = 9.7268 ✓
" II = 2.9493 ✓
" r = 8.7528 ✓
Sum logs. = 1.4289 ✓
Cor. no. = +26.″8

log. cos 2q (2×46.5) = n8.8213 ✓
" Δδ″ = 2.8730 ✓
" r = 8.7528 ✓
Sum logs. = n0.4471 ✓
Cor. no. = −2.″8
+26.8
+24.″0 ✓

Ap. pl. ✱ = 8 52 58.13 ✓
☾ − ✱ (2 sets) = −16.28
Ap. R.A. ☾ = 8 52 41.85 ✓

log. sin 2q = 9.9990 ✓
" II = 2.9493 ✓
" r = 8.7528 ✓
" sec δ = 0.0120 ✓
" 1/30 = 8.5229 ✓
+1.72 = 0.2360 ✓

Log. K = 1.3806 ✓
" sin 1″ = 4.6856 ✓
" sec² ζ = 2.6866 ✓
" r = 8.7528 ✓

Comet Wells.
June 26. 1882.
Refraction Comp. (last 2 sets)

$\zeta = 88.2$

15 30 37.9
+1 46.3
15 32 24.2
8 52 44.0
+6 39 40.2

App. pl. * = 8 52 58.13
☄ − * (2 sets) = −14.08
App. R.A. ☄ = 8 52 44.05

log. cos. φ = 9.8684
" sin t = +9.9935
Sum logs. = 9.8619
log sin ζ = 9.9998
q = 46.7 = 9.8621
$2q$ = 93.4

log. sin 2q = 9.9992
" D = 2.9493
" r = 8.8962
" sec δ = 0.0120
" $\frac{1}{30}$ = 8.5229
+2.ˢ40 = 0.3796

log. sin q = 9.8620
" sin² q = 9.7240
" D = 2.9493
" r = 8.8962
Sum logs. = 1.5695
Cor. in. = +37.″1
log cos 2q = n8.7731
(741.4)
" $\Delta\delta_n$ = 2.8700
" r = 8.8962
Sum logs. = n0.5393
Cor. in. = −3.″5

+37.1
+33.″6

log. k = 1.2048
" sin 1″ = 4.6856
" sec² ζ = 3.0058
log. r = 8.8962

+1.72
+2.40
2)+4.12
mean = +2.ˢ06

+24.″0
+33.6
2)+57.6
+28.″8

Final Values.

Comet Wells.
June 28. 1882.
Refraction Comp.

$\zeta = 87^\circ.25$ ✓

log. cos. φ = 9.8684 ✓
" sin t = 9.9958 ✓
9.8642 ✓
" sin ζ = 9.9995 ✓
$q = +47^\circ\ 5'$ = 9.8647 ✓
$2q = 94^\circ\ 10'$
log. cos. $2q$ = n 8.8613 ✓
" $\Delta\delta\,(236.''2)$ = 2.3733 ✓
" r = 8.7279 ✓
$-0.''9$ ✓ = n9.9625 ✓

No. diff. refraction in R. A.

log. k = 1.4043 ✓
" sin 1" = 4.6856 ✓
" sec² ζ = 2.6380 ✓
" r = 8.7279 ✓

Comet Wells.
July 6. 1882.
Refraction Comp.

$\zeta = 82^\circ.4$ ✓ log. $\cos\varphi = 9.8684$ ✓
" $\sin t = 0.0000$ ✓
Sum logs $= 9.8684$ ✓
log. $\sin\zeta = 9.9962$ ✓.
$q = 48^\circ\ 10' = 9.8722$
$2q = 96^\circ\ 20'$
log. $\cos 2q = n\,9.0426$ ✓
" $\Delta\delta(q'')= 0.9868$ ✓
" $r = 8.1102$ ✓
$(\Delta\delta' - \Delta\delta) = -0''.01$ ✓ $= n\,8.1396$ ✓

No. diff. refraction in R. A.

$A'' = 0.990$ ✓
$N'' = 1.158$ ✓
log. $a'' = 6.3630$ ✓
" $B = +0.00602$ ✓
" $T = -0.00146$ ✓
" $\gamma = -0.01253$ ✓

log. $a'' = +6.3630$ ✓
A'' log. $\beta = +0.0045$ ✓
N'' log. $\gamma = -0.0145$ ✓
log. $K = 6.3530$ ✓

log. $\sec\zeta = 0.8786$ ✓
" $\sec^2\zeta = 1.7572$ ✓
" $K = 6.3530$ ✓
" $r = 8.1102$ ✓

log. $B = +0.00602$ ✓
" $T = -0.00146$ ✓
" $\beta = +0.00456$ ✓
log (log. β) $= 7.6590$ ✓
" $A'' = 9.9956$ ✓
" $(A''$ log $\beta) = 7.6546$

" (log γ) $= -8.0979$ ✓
" $N'' = 0.0637$ ✓
8.1616

Comet Wells.
July 7. 1884.
Refraction Cor.

$\zeta = 83.^{\circ}0$ ✓

log. cos φ = 9.8684 ✓
" sin t = 0.0000 ✓
Sum logs. = 9.8684 ✓
log. sin ζ = 9.9968 ✓
q = 48.1 = 9.8716 ✓
2q = 96.2

log. sin 2q = 9.9975 ✓
" D = 2.9493 ✓
" r = 8.1646 ✓
" sec δ = 0.0071 ✓
" $\frac{1}{30}$ = 8.5229 ✓
$+0.^{s}44$ ✓ = 9.6414 ✓

A" = 0.987 ✓
N" = 1.178 ✓
log a" = 6.3508 ✓
" B = +0.00660 ✓
" D = −0.00158 ✓
" γ = −0.01648 ✓

log. β = +0.00502 ✓

log a" = 6.3508 ✓
A" log β = 0.0050 ✓
N" log. γ = −0.0194 ✓
log. K = 6.3364 ✓
" sec² ζ = 1.8282 ✓
" r = 8.1646 ✓

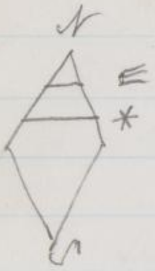
log. sin q = 9.8718 ✓
" sin² q = 9.7436 ✓
" D = 2.9493 ✓
" r = 8.1646 ✓
Sum logs. = 0.8575 ✓
Cor. α. = +7."2 ✓

log. cos. 2q = n 9.0334 ✓
" $\Delta\delta$ = 2.6256 ✓
" r = 8.1646 ✓
Sum logs. = n 9.8236 ✓
Cor. δ. = −0."7 ✓
7.2 ✓
+6."5 ✓

log. A" = 9.9943 ✓
" (log β) = 7.7007 ✓
0.00495 = 7.6950 ✓

log. N" = 0.0712 ✓
" (log γ) = −8.2169 ✓
−0.0194 = −8.2881 ✓

Barnards ☄ Oct. 6. 1886.



☄ *

5 53 47.0 ✓ 51 12.9 ✓
54 19.4 ✓ 52 2.1 ✓
108 6.4 103 15.0 ✓ 4 51.4 ✓ 2 25.70 ✓

58 11.5 ✓ 55 36.4 ✓
58 43.6 ✓ 56 26.1 ✓
116 55.1 ✓ 112 2.5 ✓ 4 52.6 ✓ 2 26.30 ✓

6 2 5.3 ✓ (5) 59 29.9 ✓
2 39.7 ✓ (6) 0 21.0 ✓
124 45.0 ✓ 119 50.9 ✓ 4 54.1 ✓ 2 27.05 ✓

6 6 20.6 ✓ 3 43.4 ✓
6 54.5 ✓ 4 35.0 ✓
133 15.1 ✓ 128 18.4 ✓ 4 56.7 ✓ 2 28.35 ✓
+2 26.85 ✓

Mean of ☄ times = 6h 0m 22s.7 ✓
+12.1 = Chr. Cor.
6 0 34.8 ✓
13 1 3.5 ✓
16 59 31.3 ✓
−2 8.0 ✓
C. M. T. = 16 57 23.3 ✓
4 44 31
21 41 54

Diff. ☾	Diff. *	
32.4 ✓	49.2 ✓	16.8 ✓
32.1 ✓	49.7 ✓	17.6 ✓
34.4 ✓	51.1 ✓	16.7 ✓
33.9 ✓	51.6 ✓	17.7 ✓
4)132.8 ✓	4)201.6 ✓	
33.20 ✓	50.40 ✓	17.20 ✓

log 17.20 = 1.23553

" 7.5 = 0.87506 ✓

" cos δ = 9.99990 ✓

129.″0 = = 2.11049 ✓

+2′ 9.″0 ✓

Barnard's Comet Oct. 6. 1886.

Comp. star = DM. +1° 2473. (8.6) B.

BB VI (DM +1° 2473)

(1855 B)	10	36	0.57 ✓✓	+1	21	3.2 ✓✓	
			+47.74 ✓		−4	50.2 ✓	
	10	36	48.31 ✓	+1	16	13.0 ✓	(mid pl.)
	159	12	4.6 ✓				

log w = 0.12608 ✓
" sin α = 9.55033 ✓
" tan δ = 8.34585 ✓
+0.0105 8.02226 ✓
+3.0710
3.0815 ✓ = 0.48876 ✓
31. = 1.49136 ✓
95.53 ✓ = 1.98012 ✓

log w = 1.30218 ✓
" cos α = n9.97073 ✓
" 31 = 1.49136 ✓
581.1" ✓ = n2.76427

	10	36	0.57 ✓	+1	21	3.2 ✓	
		+1	35.53 ✓		−9	41.1 ✓	
Mean pl. *	10	37	36.10 ✓	+1	11	22.1 ✓	(1886.0)
☄ − * =		+2	26.85 ✓		+2	9.0 ✓	
Mean pl. ☄	10	40	2.95 ✓	+1	13	31.1 ✓	
Red. to ap. pl.			+0.84 ✓			−6.5 ✓	
Ap. pos. ☄ =	10	40	3.79 ✓	+1	13	24.6 ✓	

$f = +1.869$
$G = 2^h\ 12.5$
$H = 4\ 59.7$
log $g = +1.1636$
" $h = +1.2755$
" $i = +0.8977$

2	12.5
10	400.0
12	52.5 = (G + A)

4	59.7
10	400.0
15	39.7 = (H + A)

log $\frac{1}{15}$ = +8.8239
" g = +1.1636
" sin(G+A) = n9.3561
" tan δ = +8.3302
−0.005 −7.6738

log g = +1.1636
" cos(G+A) = n9.9885
−14.20 −1.1521

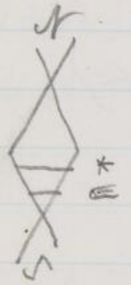
log $\frac{1}{15}$ = +8.8239
" h = +1.2755
" sin(H+A) = n9.9130
" sec δ = +0.0001
−1.029 −0.0125
−0.005
−1.034
+1.869
Cor in R A = +0.835

log h = +1.2755
" cos(H+A) = n9.7594
" sin δ = +8.3301
−0.23 −9.3650

log i = +0.8977
" cos δ = +9.9999
+7.90 +0.8976

−14.20
−0.23
−14.43
+7.90
Cor in δ = −6.53

Barnard's Comet Oct. 8. 1886.



	☄	*		
5	50 44.3	50 18.5		
	51 18.0	51 6.2		
	102 2.3	101 24.7	37.6	18.80
	53 1.5	52 36.9		
	53 34.5	53 23.5		
	106 36.0	106 0.4	35.6	17.80
6	5 34.6	5 8.5		
	6 7.4	5 55.5		
	131 42.0	131 4.0	38.0	19.00
	8 3.0	7 35.9		
	8 35.4	8 22.5		
	136 38.4	135 58.4	40.0	20.00
	9 58.0	9 31.1		
	10 29.1	10 16.6		
	140 27.1	139 47.7	39.4	19.70
				+19.06

mean of ☄ times 6 1 44.6
+12.4 ~~Chr.~~ Cor. for 1327
6 1 57.0
13 8 56.6
16 53 0.4
−2 46.0
~~C. m. T. obs.~~ = 16 50 14.4
−3.1 Cor. B. 236 rel. to 1327.
C. m. T. obs. = 16 50 11.3
4 44 31

Diff. ☄	Diff. *	* − ☄
$33.\overset{5}{7}$ ✓	47.7 ✓	14.0 ✓
33.0 ✓	46.6 ✓	13.6 ✓
32.8 ✓	47.0 ✓	14.2 ✓
32.4 ✓	46.6 ✓	14.2 ✓
31.1 ✓	45.5 ✓	14.4 ✓
√163.0	√233.4 ✓	
32.60 ✓	46.68 ✓	14.08 ✓

log 14.08 = 1.14860 ✓
" 7.5 = 0.87506 ✓
" cos δ = 9.99984 ✓
−105.6 = 2.02350 ✓
−1′ 45″.6 ✓

Barnard's Comet Oct. 8. 1886.

Comp. Star in 5 sets used = Dm. +1°2486 (8.3)

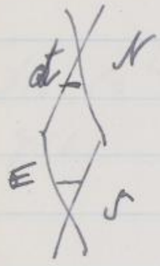
Sr. 10h	10h 40 44.97	+1 52 7.8
756	+1 34.09	−9 35.5
	10 42 19.06	+1 42 32.3
	160 34 45.90	

log $\frac{2}{15}$ = 0.12612	1.30221
" sin α = +9.52179	n9.97856
" tan δ = 8.47473	1.78533
+0.0133 = 8.12264	~~1153.7~~ n3.06210
3.0707	1153.7
3.0840 = 0.48911	
61. = 1.78533	−19 13.7
188.12 = 2.27444	+1 52 7.8
+3 8.12	+1 32 54.1

	10 40 44.97	
Mean pl. * 1886.0	10 43 53.09	+1 32 54.1
Red. to Ap. pl.	+0.84	−6.5
	10 43 53.93	+1 32 47.6
☄ − *	+19.06	−1 45.6
Ap. pl. ☄	10 44 12.99	+1 31 2.0

Comet Friday Oct. 19. 1886.

~~20~~



	E	*		
20	46 44.9 ✓	46 29.0 ✓		
	47 5.9 ✓	46 46.3 ✓		
	93 50.8 ✓	93 15.3 ✓	35.5 ✓	17.75 ✓
	48 21.3 ✓	48 5.4 ✓		
	48 43.2 ✓	48 22.8 ✓		
	97 4.5 ✓	96 28.2 ✓	36.3 ✓	18.15 ✓
	49 19.2 ✓	49 3.7 ✓		
	49 41.1 ✓	49 20.1 ✓		
	99 0.3 ✓	98 23.8 ✓	36.5 ✓	18.25 ✓
	50 15.0 ✓	49 59.7 ✓		
	50 38.0 ✓	50 16.1 ✓		
	100 53.0 ✓	100 15.8 ✓	37.2 ✓	18.60 ✓
	51 14.2 ✓	50 59.1 ✓		
	51 36.8 ✓	51 15.1 ✓		
	102 51.0 ✓	102 14.2 ✓	36.8 ✓	18.40 ✓
	52 9.3 ✓	51 55.0 ✓		
	52 32.1 ✓	52 10.0 ✓		
	104 -41.4 ✓	104 5.0 ✓	36.4 ✓	18.20 ✓
20	45 44.1 ✓	45 28.0 ✓		
	46 4.8 ✓	45 45.7 ✓		
	91 48.9 ✓	91 13.7 ✓	35.2 ✓	17.60 ✓

7 | 56.95
+18.14 ✓
Ref. .17
+17.97

20 49 17.8 ✓
+0 37.7
20 49 55.5
13 52 18.6
6 57 36.9
1 8.4
6 56 28.5

6 56 28.5
4 44 31.0
11 40 59.5

21.0 ✓	17.3 ✓	38.3 ✓
21.9 ✓	17.4 ✓	39.3 ✓
21.9 ✓	16.4 ✓	38.3 ✓
23.0 ✓	16.4 ✓	39.4 ✓
22.6 ✓	16.0 ✓	38.6 ✓
~~22.8~~ 22.8 ✓	15.0 ✓	37.8 ✓
20.7 ✓	17.7 ✓	38.4 ✓
7)13.9	7)46.2	7)60.1 ✓
21.99 ✓	16.60 ✓	38.59 ✓

log. 38.59 = 1.58647 ✓

" 7.5 = 0.87506 ✓

" cos δ = 9.95200 ✓

259.1" = 2.41353 ✓

887.6

628.5 = −10′ 28.5″

+0.8

−10 27.7

Comet Finlay Oct. 19. 1886.

Comp. star "d" is No. 582 from Cordoba Obs.
Vol. 8. p. 257.

(Ep. 1875.0) 18 7 56.10 ✓ −26 26 49.4 ✓ (9½)
271° 59 1.5 ✓

~~log n/R = 0.12606~~
~~sin A =~~
~~cos D =~~

18 7 56.10 ✓ −26 26 49.4 ✓
+20.35 ✓ +3.8 ✓
18 8 16.45 ✓ −26 26 45.6 ✓
272 4 6.8

0.12606 ✓ 1.30215 ✓
n 9.99972 ✓ 8.55746 ✓
n 9.69673 1.04139 ✓
+0.66455 = 9.82251 +8.0 = 0.90100 ✓
3.0712
3.7357 = 0.57237 ✓
11. = 1.04139 ✓
41.09 = 1.61376 ✓

18 7 56.10 ✓ −26 26 49.4 ✓
+41.09 ✓ +8.0 ✓
mean pl. * = 18 8 37.19 ✓ ✓ −26 26 41.4 ✓
+1.71 +7.6 ✓
Ap. pl. * = 18 8 38.90 ✓ −26 26 33.8
+18.14 ✓ −10 28.5 ✓
18 8 57.04 ✓ −26 37 2.3
Cor. for ref. −0.17 ✓ +0.8 ✓
Final place = 18 8 56.87 ✓ −26 37 1.5 ✓

Comp.-star "c" is No. 536 from Vol. 8. Cordoba Obs.

(1875.0) 18 7 52.50 ✓ −26 21 44.4 ✓

~~271 58 7.5~~ ✓

18 7 52.50 −26 21 44.4 ✓

+20.35 +3.8 ✓

18 8 12.85 −26 21 40.6 ✓

272 3 12.8

0.12606 ✓ 1.30215 ✓

~9.99972 ✓ 8.55430 ✓

~9.69510 ✓ 1.04139 ✓

+0.6620 = 9.82088 ✓ +7″.9 = 0.89784 ✓

3.0712

3.7332 = 0.57208 ✓

1.04139 ✓

41.06 ✓ = 1.61347 ✓

18 7 52.50 ✓ −26 21 44.4 ✓

+41.06 ✓ +7.9 ✓

18 8 33.56 ✓ −26 21 36.5 ✓

+18.14 −10 28.5

−0.17 +0.8

+17.97 = −10 27.7 = Corr. ε−x

δ

Comet Finlay Oct. 19. 1886

Red. to Ap. pl.

$f = +1.934$ ✓
$G = 2\ 10.7$ ✓
$H = 4\ 4.9$ ✓
Log $g = +1.1763$ ✓
" $h = +1.2813$ ✓
" $i = +0.8614$ ✓

$\log \frac{1}{15} = = +8.8239$ ✓
" $g = +1.1763$ ✓
" $\sin(G+\alpha) = -9.9143$
" $\tan \delta = -9.6968$ ✓
$+0.409$ ✓ $= +9.6113$

$\log \frac{1}{15} = +8.8239$ ✓
" $h = +1.2813$ ✓
" $\sin(H+\alpha) = +9.9990$ ✓
" $\sec \delta = +0.0480$ ✓
$+1.420$ ✓ $= +0.1522$
$+0.409$ ✓
$+1.934$ ✓
$+3.763$

2	10.7
18	8.6
20	19.3 = $G+\alpha$

4	10.7 ✓
2	4.9 ✓
6	15.6 ✓ = $H+\alpha$

$\log g = +1.1763$ ✓
" $\cos(G+\alpha) = +9.7567$ ✓
$+8.57 = +0.9330$ ✓

$\log h = +1.2813$ ✓
" $\cos(H+\alpha) = -8.8324$ ✓
" $\sin \delta = -9.6488$ ✓
$+0.58 = +9.7625$ ✓

$\log i = +0.8614$ ✓
" $\cos \delta = +9.9520$ ✓
$+6.51 = +0.8134$ ✓
$+8.57$
$+0.58$
$+15.66$

See page 113 for Ap. pl. comps.

9.307°
0.693°

Comet Finlay Oct. 19. 1886.

Diag. of Square = 885".6

~~$\zeta = 11.°7$~~

Altitude = 11.°7

$\zeta = 78.°3$

$\log \sec \zeta = 0.6930$ ✓

$\text{〃} \ \text{〃}^2 \ \zeta = 1.3860$ ✓

$\log K = 6.4080$ ✓

$\text{〃} \sec^2 \zeta = 1.3860$ ✓

$\text{〃} \ r = 7.7940$ ✓

$\log \cos \varphi = 9.86844$ ✓

$\text{〃} \sin t = 9.80807$ ✓

9.67651 ✓

$\text{〃} \sin \zeta = 9.99088$ ✓

$\text{〃} \sin q = 9.68563$ ✓

$q = 29° \ 0'$

$2q = 58° \ 0'$

$\log \frac{1}{30} = +8.5229$ ✓

$\text{〃} \sec \delta = +0.0486$ ✓

$\text{〃} \ r = +7.7940$ ✓

$\text{〃} \ D = +2.9472$ ✓

$\text{〃} \sin 2q = +9.9284$ ✓

$0.17 = +9.2411$ ✓

$\log r = +7.7940$ ✓

$\text{〃} \ D = +2.9472$ ✓

$\text{〃} \sin^2 q = +9.3713$ ✓

$+1.30 \quad +0.1125$ ✓

18.14
−0.17
17.97

$\log r = +7.7940$ ✓

$\text{〃} \ \Delta\delta = -2.7983$ ✓

$\text{〃} \cos 2q = +9.7242$ ✓

$-2.07 = 0.3165$

+1.30

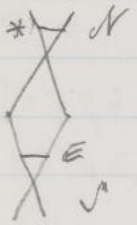
2 40 −0.77 ✓

628.5

627.7

30
10
40

Comet Finlay Oct. 20. 1886.



∈	*		
20 29 33.5	29 39.5		
29 55.0	29 51.0		
59 28.5	59 30.5	2.0	1.00
30 9.2	30 18.9		
30 30.4	30 23.0		
60 39.6	60 41.9	2.3	1.15
30 59.0	31 4.3		
31 19.9	31 16.3		
62 18.9	62 20.6	1.7	0.85
31 50.1	31 55.3		
32 12.1	32 7.7		
64 2.2	64 3.0	0.8	0.40
32 32.2	32 37.5		
32 53.0	32 49.4		
65 25.2	65 26.9	1.7	0.85
33 25.0	33 30.1		
33 46.8	33 42.5		
67 11.8	67 12.6	0.8	0.40
34 15.6	34 20.8		
34 37.6	34 33.3		
68 53.2	68 54.1	0.9	0.45

7)5.10
– 0.73

mean ∈ times = 20 32 0.0
+0 42.2
20 32 42.2
18 56 15.2
6 36 27.0

6 36 27.0
1 4.9
6 35 22.1
4 44 31.0
11 19 53.1

Diff. ∈	Diff. *	(+ * − ∈)
21.5 ✓	11.5 ✓	−10.0 ✓
21.2 ✓	12.1 ✓	−9.1 ✓
20.9 ✓	12.0 ✓	−8.9 ✓
22.0 ✓	12.4 ✓	−9.6 ✓
20.8 ✓	11.9 ✓	−8.9 ✓
21.8 ✓	12.4 ✓	−9.4 ✓
22.0 ✓	12.5 ✓	−9.5 ✓
7|10.2	7|14.8	7|−65.4 ✓
21.46 ✓	12.11 ✓	−9.34 ✓

log. −9.34 = n 0.97035
" 7.5 = 0.87506
" cos. δ = 9.95229
$62.\overset{8}{76}$ = 1.79770
886.0
823.2 = ~~411.6~~
−13 43.2

Finlay's Comet. Oct. 20. 1886.

Comp. Star from Cordoba Obs. Vol. 6.

No. 766.	18h 11m 38.40s	−26 22 13.7
	+20.35	+4.9
	18 11 58.75	−26 22 8.8

272 59 41.5

	0.12606	1.30215
	n 9.99940	+8.71803
	n 9.69525	1.04139
+0.6618	= 9.82071	+1.06157
3.0715		+11.5
3.7330	= 0.57206	
11.	= 1.04139	
41.06	= 1.61345	

	18 11 38.40	−26 22 13.7
	+41.06	+11.5
Mean pl. *	18 12 19.46	−26 22 2.2
Cor. for Ap. pl.	+1.71	+7.6
Ap. pl. *	18 12 21.17	−26 21 54.6
(☄ − *) =	−0.73	−13 43.2
Ap. Pl. α =	18 12 20.44	−26 35 37.8

Finlay's Comet. Oct. 20. 1886.
Ap. Pl. Comp. Star.

$f = +1.943$ ✓
$G = 2^h\ 9.9$ ✓
$H = 4\ \ 0.7$ ✓
Log $g = +1.1773$ ✓
" $h = +1.2818$ ✓
" $i = +0.8575$ ✓

$(G+\alpha) = 20^h\ 22.2$ ✓
$(H+\alpha) = 22\ \ 13.0$ ✓

log $\frac{1}{15}$ = +8.8239 ✓
" g = +1.1773 ✓
" sin $(G+\alpha)$ = −9.9104 ✓
" tan δ = −9.6952 ✓
+0.404 = +9.6068.

log $\frac{1}{15}$ = +8.8239 ✓
" h = +1.2818 ✓
" sin $(H+\alpha)$ = −9.6533 ✓
" sec δ = +0.0477 ✓
−0.641 = −9.8067

+1.943
404
+2.347
−0.641
+1.706 = Cor. for Ap. pl.

log g = +1.1773 ✓
" cos $(G+\alpha)$ = +9.7645 ✓
+8.75 = +0.9418 ✓

log h = +1.2818 ✓
" cos $(H+\alpha)$ = +9.9508 ✓
" sin δ = −9.6475
−7.59 = −0.8801 ✓

log i = +0.8575 ✓
" cos δ = +9.9523 ✓
+6.45 = +0.8098 ✓
+8.75
+15.20
−7.59
+7.61 = Cor. for Ap. pl.

Finlay's Comet. Oct. 20. 1886.
Ref. Comp.

$\zeta = 76.^\circ 1$

See next page for reduction.

Cm

Barnard's ☄ Nov 25. 1886

g = 886".5

δ

B.236

~~Comet N Star~~

Comet North		Star South		☄	★	☄−★		
		m s	m					
10 30 20.2	30 49.5	34 26.2	35 13.3	30 34.85	34 49.75	−4 14.90	+29.7	47.1
36 4.0	35 32.7	40 7.5	40 54.5	36 18.35	40 31.00	12.65	28.7	47.0
41 33.9	42 1.9	45 34.6	46 21.5	41 47.90	45 58.05	10.15	28.0	46.9
				108 41.10			28.80	47.00

B.236 10h 36m 13.7s

α′−α = −4m 12s.57

Corrn chron + 1 32.6

sid. t. 10 37 46.3

☉ 16 21 11.2

C.M.T. Nov 25 18h 16 35.1

16 18 11.1
7 0.1

75.80 ... 1.87967
0.87506
(on 16°20′) 9.98211
... 2.73684

545".6
886.5
δ′−δ = +340.9 = +5′ 40".9
δ′−δ =

Comp Star Dm 16°.2654 (1855) 14 21 39.2 +16 23.6

~~26~~

We. XIV. 461 (1825) 14 20 14.28 +16 32 43.8 +2.842 −16.42

Prec. 61 yrs +2 53.51. −16 40.7

Vienna ~~XXV~~ 1.174 (1860) 14 23 7.82 } 7.80 +16 15 58.7 } 1 } 16 16 2.0

W.B. 1886.0 14 23 7.79 } +16 16 3.1 } 3

Red + .50 − 7.0 estimated

appt ★ 14 23 8.39 (40) +16 15 ~~56.1~~ 55.0

☄−★ −4 12.57 +5 40.9

Refr — —

Motion — +1".4

24.6
0.0
3.0708
9.46881
9.75978
1.30221
9.91277
0.53080
3.395
.2263
+2.8445 = dα
1.21498
−16.4053 .55

1886 Nov 25d 18h 16m 35s sidt app α = 14h 18m 55s.~~82~~ .83 app δ = +16° 21′ ~~38.4~~ 37.3"

ζ = 55

g = 40

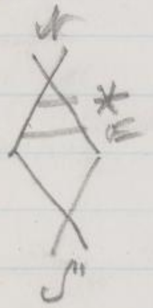
		O−C		O−C	
g = 40	14 19 28.5	−32.7	+16 19.8	+1.8	Comparisons with
	14 19 28.3	−12.5	+16 21.7	−0.1	Lamps "

826
49.6
812
16 85
9843
11
11
2
0
1
13.6
41.0
32.6
+ 56.1
+ 23.7
+0.395
+.0066
+14.4
+.0066
+1.37
1.158
7.820
1.158
0.136

14 10   +19 46   +.58.   −9.7
14 35   +16 54   +.64   −5.2
14 50   +14 54   +.64   −3,4
14 30   +17 20   +.61   −6.5
(}   ″
(14 20   +16 20   +.60   −7.0

1 Vienna XXVI vol p. 174 (1876.0) 14 22 39.37 +16 18 41.5; (2.844 −16.30
2.845 −16 28
+28.45   − 2 42.8
(1886.0) 14 23 7.82 +16 15 58.7

Barnard's New Comet.
May 13. 1887.



	☄	*		
13	50 29.0	49 36.0		
	51 22.9	49 54.3		
	101 51.9	99 30.3	2 21.6	1 10.80
	52 33.3	51 39.5		
	53 26.4	51 58.5		
	105 59.7	103 38.0	2 21.7	1 10.85
	56 21.6	55 27.8		
	57 15.9	55 47.3		
	113 37.5	111 15.1	2 22.4	1 11.20
	58 24.2	57 30.0		
	59 19.2	57 50.8		
	117 43.4	115 20.8	2 22.6	1 11.30
	60 31.1	59 35.6		
	61 25.2	59 57.0		
	121 56.3	119 32.6	2 23.7	1 11.85
				6.00
				+1 11.20

13 56 6.9
+1 17.8
13 57 24.7
3 24 28.9
10 32 55.8
-1 43.7

C. m. T. = 10 31 12.1
4 44 31.

Gr. m. T. 15 15 43.

Δ ∈	Δ *
53.9 ✓	18.3 ✓
53.1 ✓	19.0 ✓
54.3 ✓	19.5 ✓
55.0 ✓	20.8 ✓
54.1 ✓	21.4 ✓
5)270.4 ✓	99.0 ✓
54.08 ✓	19.80 ✓

19.80

34.28 = 1.53504

cos δ = 9.93727

7.5 = 0.87506

222.5 = 2.34737 ✓

− 3′ 42.5

Barnards New Comet.

May 13. 1887.

Comp Star = Gould 15h 714

(1875.0) 15 10 19.30 −30 0 58.2 8½

227 34 49.5

Barnards Comet

Log w/15	0.12606	1.30215
sin α	n 9.88819	n 9.82901
tan δ	n 9.76173	12. = 1.07918
+0.5701	+9.75598	−162.3 = n 2.21034

3.0712

3.6413 = 0.56126

12. = 1.07918

43.70 = 1.64044

	15	10	19.30	−30	0	58.2
			43.70		−2	42.3
1887.0	15	11	3.00	−30	3	40.5
			~~+2.07~~			~~−2.8~~
~~Ap. pl.~~	~~15~~	~~11~~	~~5.07~~	~~−30~~	~~3~~	~~43.3~~
~~☄ − *~~		~~+1~~	~~11.20~~		~~−3~~	~~42.5~~
~~Ap. pl. ☄~~	~~15~~	~~12~~	~~16.27~~	~~−30~~	~~7~~	~~25.8~~
	15	11	3.00	−30	3	40.5
			+2.23			−1.7
	15	11	5.23	−30	3	42.2
		+1	11.20		−3	41.1
Ap. pl. ☄ =	15	12	16.43	−30	7	23.3

Barnard's New Comet.
May 13. 1887. — Ap. pl. Comp.

f = +0.ˢ432
G = 4ʰ 38.5
H = 14 18.3
Log g = +0.9093
" h = +1.2978
" i = −0.6894

4 38.5
15 12.3
19 50.8 = (G + α)

14 18.3
15 12.3
5 30.6 = H + α

Log 1/15 = +8.8239
Log g = +0.9093
" sin(G + α) = −9.9471
" cos δ = −9.76~~35~~ 26
+0.27~~8~~ 7 = +9.44~~38~~ 29

1/15 = +8.8239
h = +1.2978
sin(H + α) = +9.9964
sec δ = +0.06~~30~~ 0.0628
+1.517 = +0.18~~11~~ 09
+0.27~~8~~ 7
+0.432
+2.22~~7~~ 6 = Red. to Ap. pl. in α

+0.9093
+9.6673
+3.77 = +0.5766

+1.2978
+9.1069
−9.~~7006~~ 6998
−1.27 = n0.10~~53~~ 45

−0.6894
+9.9372
−4.23 = n0.626~~8~~ 6
−1.27
−5.50
+3.77
−1.73 = Red. to Ap. pl. in δ

Par. Comp.

13 57 25 = t
15 12 16 = α
−1 14 51 = H.A. ε
−30° 7′ 23″ = δ ε

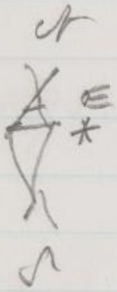
log tan φ′ = +9.9573
" cos t = +9.9764
γ = 43° 44′ = 9.9809
−30 7
γ−δ

log π ρ cos φ′ = +0.8161
" sin t = ~~n~~9.5060
n0.3221
+9.9370
~~ρΔ in RA~~ = n0.3851
Log 15 = 1.1761
Log ρΔ in R.A. = n9.2090

0.7733
9.9825
0.7558
9.8397
0.9161 = log ρΔ in dec.

Barnard's New Comet,

May. 14. 1887.



☄ *

14 1 54.0✓ 0 35.2✓
2 13.4✓ 1 32.1✓
4 7.4✓ 2 7.3✓ 2 0.1✓ 1 0.05✓

4 35.0✓ 3 16.0✓
4 55.2✓ 4 13.9✓
9 30.2✓ 7 29.9✓ 2 0.3✓ 1 0.15✓

6 40.0✓ 5 21.0✓
7 0.0✓ 6 18.9✓
13 40.0✓ 11 39.9✓ 2 0.1✓ 1 0.05✓

8 46.4✓ 7 27.0✓
9 6.5✓ 8 25.0✓
17 52.9✓ 15 52.0✓ 2 0.9✓ 1 0.45✓

10 52.5✓ 9 32.6✓
11 12.0✓ 10 30.1✓
22 4.5✓ 20 2.7✓ 2 1.8✓ 1 0.90✓
1.60
+1 0.32✓

14 6 43.5✓
+1 17.8✓
14 8 1.3✓
3 28 25.4✓
10 39 35.9✓
1 44.8✓
C. m. T = 10 37 51.1✓
4 44 31,
15 22 22

~~★~~

Δ ☾	Δ ★
19.4 ✓	56.9 ✓
20.2 ✓	57.9 ✓
20.0 ✓	57.9 ✓
20.1 ✓	58.0 ✓
19.5 ✓	57.5 ✓
99.2	38.2
19.84 ✓	57.64 ✓

57.64
19.84

37.80 = 1.57749 ✓
7.5 = 0.87506 ✓
cos δ = 9.93902

246.4 2.39157 ✓
+4′ 6.″4

Comet Barnard.
May 14. 1887.
Gould's Cat. (1875)

(5h 821) 15 12 7.61 −29 36 42.3 (8½)

228 1 54.2

log n/15 0.12606 1.30215
" sin α n9.87129 n9.82524
" tan δ n9.75461 12. = 1.07918
+0.5649 +9.75196 −160.9 = n2.20657
3.0712
3.6361 = 0.56063
12. = 1.07918
43.63 = 1.63981

1875.0	15	12	7.61	−29	36	42.3
			+43.63		−2	40.9
1887.0	15	12	51.24	−29	39	23.2
			~~+2.07~~			~~−2.8~~
~~App. pl.~~	~~15~~	~~12~~	~~53.31~~	~~−29~~	~~39~~	~~26.0~~
		~~+1~~	~~0.32~~		~~+4~~	~~6.6~~
~~App. pl. ☄ =~~	~~15~~	~~13~~	~~53.63~~	~~−29~~	~~35~~	~~19.6~~
	15	12	51.24	−29	39	23.2
			+2.23			−1.7
	15	12	53.47	−29	39	24.9
		+1	0.32		+4	7.1
App. pl. ☄ =	15	13	53.79	−29	35	17.8

May 14. 1887.

B 236

14 20 23.5

~~3 28 25.4~~

~~10 51 58.1~~

14 20 23.5

3 43 57.0

10 36 26.5

− 1 44.3

10 34 42.2

36 0.0

1 17.8

∴ B 236 is 1ᵐ 17.8ˢ slow.

B. 394

10 36 0.0

Par. Comp.

~~+~~

14 8 1ʹ = [illegible]

15 13 54ʹ = α

−1 5 53 = H.A. ∈ — Log pΔ in Dec. = +0.9169ʹ

log πρ sin φʹ = +0.7733ʹ

" sin(γ − δ) = +9.9805ʹ

+0.7538ʹ

" sin γ = +9.8369ʹ

log πρ cos φʹ = +0.8161ʹ

" sin t = n9.4527ʹ

Sum logs. = n0.2688ʹ

Log cos δ = +9.9393ʹ

~~Log pΔ in R.A.~~ = n0.3295ʹ

Log 15. = 1.1761ʹ

Log pΔ in R.A. = n9.1534ʹ

---

log tan φʹ = +9.9573ʹ

" cos t = +9.9818ʹ

" tan γ = +9.9755ʹ

43 23ʹ

−29 35ʹ

+72 58ʹ

~~Comet Barnard~~

~~May 14. 1887. — Ap. pl. Comp.~~

~~$f = +0.^s439$~~ ✓
~~$\zeta = 4^h\ 36.^m9$~~ ✓
~~$H = 14\ \ 14.6$~~ ✓
~~$\log g = +0.9088$~~ ✓
~~$\text{"}\ h = +1.2984$~~ ✓
~~$\text{"}\ i = -0.6795$~~ ✓

Comet Barnard. May 13. 1887. Refract. Cor.

$\zeta = 81.9$

$\log K = 6.3710$
$\text{"}\ \sec^2\zeta = \underline{1.7022}$
$\text{"}\ r = 8.0732$

~~$\log r = +8.0732$~~
~~$\text{"}\ \Pi = +2.9472$~~
~~$\text{"}\ \sin^2 q = \underline{+9.3846}$~~
~~$+0.4050$~~

~~$\log r = +8.0732$~~
~~$\text{"}\ \Delta\delta =$~~
~~$\text{"}\ \cos 2q =$~~

$\log \cos \varphi = 9.8684$
$\text{"}\ \sin t = \underline{n9.8191}$
Sum logs $= n9.6875$
$\log \sin \zeta = \underline{9.9956}$
$\text{"}\ \sin q = n9.6919$
$q = -29^\circ\ 28'$
$2q = -59.^\circ0$

$\log r = +8.0732$
$\text{"}\ \Delta\delta = +2.3473$ $(222.''5)$
$\text{"}\ \cos 2q = \underline{+9.7118}$
$+0.1323$

Cor for Ref $+1.''4$

Comet Barnard. May 14. 1887. Refract. Cor.

$\zeta = 73.6$

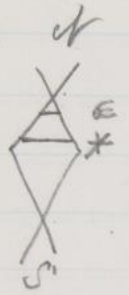
log $K = 6.4256$
" $\sec^2 \zeta = 1.0984$
" $r = 7.5240$

9.8684
9.4469
9.3153
9.9820
log sin $q = 9.3333$
$q = 12^\circ 27'$
$2q = 25^\circ$

7.5240

log $r = +7.5240$
" $\Delta r = +2.3916$ (246.″4)
" cos $2q = +9.9573$
Cor for Ref $= +0.″7$ $+9.8729$

Comet Barnard. May 19. 1887.



	ε	*		
14	57 35.2 ✓	56 21.1 ✓		
	57 45.0 ✓	57 19.2 ✓		
	115 20.2 ✓	113 40.3 ✓	1 39.9 ✓	49.95 ✓
	59 35.2 ✓	58 21.0 ✓		
	59 46.5 ✓	59 21.0 ✓		
	119 21.7 ✓	117 42.0 ✓	1 39.7 ✓	49.85 ✓
	~~63 16.0~~ ✓	~~62 1.1~~ ✓		
	~~63 25.4~~	~~63 1.6~~ ✓		
	~~126 41.4~~ ✓	~~125 2.7~~ ✓	1 38.7 ✓	~~49.35~~ ✓
	65 13.2 ✓	63 58.1 ✓		
	65 23.0 ✓	64 58.5 ✓		
	130 36.2 ✓	128 56.6 ✓	1 39.6 ✓	49.80 ✓
	67 2.2 ✓	65 46.1 ✓		
	67 11.0 ✓	66 47.0 ✓		
	134 13.2 ✓	132 33.1 ✓	1 40.1 ✓	50.05 ✓

4/199.65
+49.91 ✓

mean ε times = 15 2 26.4 ✓
+1 37.1 Chr. Cor.
15 4 3.5 ✓
3 48 8.2 ✓
11 15 55.3 ✓
−1 50.7 ✓
C. m. T. A. = 11 14 4.6 ✓
4 44 31.
15 58 36.

Δ ☾ Δ ✱
9.8 ✓ 58.1 ✓

11.3 ✓ 60.0 ✓

9.8 ✓ 60.4 ✓

8.8 ✓ 60.9 ✓
4)39.7 ✓ 239.4 ✓
9.92 ✓ 59.85 ✓
59.85

Log 49.93 ✓ $= 1.69836$
$7.5 = 0.87506$
$\cos\delta = 9.95116$
$334.''6 = 2.52458$
$+5' 34.6$

Par. Comp.

$15^h\ 4^m\ 4^s = t$ ✓
$15\ 22\ 25 = \alpha$ ✓
$\underbrace{}$
$-18^m\ 21.5^s = $ H.A. ☾

$\log \pi\rho\cos\varphi' = +0.8161$ ✓
$\text{"}\ \sin t = n8.9030$ ✓
Sum logs. $= n9.7191$ ✓
$\log\cos\delta = +9.9513$ ✓
~~$p\,\Delta$ in R.A.~~ $= n9.7678$ ✓
$\log 15 = 1.1761$ ✓
$\log p\,\Delta$ in R.A. $= n8.5917$ ✓

$\log \pi\rho\sin\varphi' = +0.7733$ ✓
$\text{"}\ \sin(\gamma-\delta) = +9.9699$ ✓
$+0.7432$ ✓
$\text{"}\ \sin\gamma = +9.8279$ ✓
$\text{"}\ p\,\Delta$ in Dec. $= +0.9153$ ✓

$\log\tan\varphi' = +9.9573$ ✓
$\text{"}\ \cos t = +9.9986$ ✓
42.17 ✓ $= 9.9587$ ✓
$-26\ 38$ ✓
$68\ 55$ ✓ $= (\gamma-\delta)$

Comp. Star = Cordoba. 15h 1825.
May 19. 1887.

(1875.0)	15	20	49.72	−26	40	53.9 (9½)
			21.52		−1	17.4
	15	21	11.24	−26	42	11.3
	230	17	48.6			

0.12606 ✓ 1.30215
n9.88613 n9.80537
n9.70158 1.07918 = 12
+.5173 +9.71377 −153.7 = n2.18670
3.0712
3.5885 = 0.55491 ✓
1.07918
+43.06 = 1.63409

	15	20	49.72 ✓	−26	40	53.9 ✓
			+43.06 ✓		−2	33.7 ✓
(1887.0)	15	21	32.78 ✓	−26	43	27.6 ✓
			+2.16 ✓			−1.4 ✓
Ap. pl. *	15	21	34.94 ✓	−26	43	29.0 ✓
			+49.91 ✓		+5	34.6 ✓
" " ☄ =	15	22	24.85 ✓	−26	37	54.4 ✓
Cor for Ref.			0.00			+0.7 ✓
~~Cor. for Ref.~~ =	15	22	24.85	−26	37	53.7 ✓

f = +0."455 ✓
G = 4^h 34.7 ✓
H = 13 56.0 ✓
log g = +0.9128 ✓
" h = +1.3012 ✓
" i = −0.6245 ✓

15 21.5
4 34.7
19 56.2 = (G + α)

15 21.5
13 56.0
~~29 17.5~~
5 17.5 = (H + α)

for δ

+0.9128 ✓
+9.6863 ✓
+3."97 +0.5991 ✓

+8.8239 ✓
+0.9128 ✓
−9.9416 ✓
−9.7020 ✓
+9.3803 ✓ +0."240

+1.3012 ✓
+9.2656
−9.6529
−1."66 −0.2197

+8.8239 ✓
+1.3012 ✓
+9.9925 ✓
+0.0491 ✓
+0.1667 ✓ = +1.468
+0.455
Cor. for Ap. pl. = +2."163

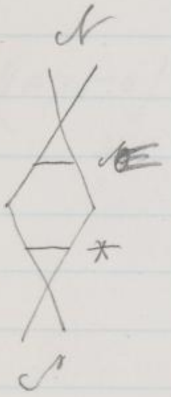
−0.6245 ✓
+9.9509 ✓
−3.76 −0.5754 ✓
−1."45 Cor. for Ap. pl.

ζ = 69°.2

log cos φ = 9.8684
" sin t = n8.9181
Sum logs = n8.7865
log sin ζ = 9.9707
" " q = n8.8158
q = −3° 45′
2q = −7 30

log K = 6.4336
" sec² ζ = 0.8992
" r = 7.3328
" Δδ = 2.5246
" cos 2q = 9.9963
0."7 = = 9.8537

May 25. 1887.
Barnards New Comet.



14 43 33.6 ✓ 42 22.6 ✓
44 14.4 ✓ 42 52.5 ✓
87 48.0 ✓ 85 15.1 ✓ 2 32.9 ✓ 1 16.45 ✓

45 39.5 ✓ 44 27.6 ✓
46 20.0 ✓ 44 57.7 ✓
91 59.5 ✓ 89 25.3 ✓ 2 34.2 ✓ 1 17.10 ✓

47 47.7 ✓ 46 35.4 ✓
48 27.6 ✓ 47 5.2 ✓
96 15.3 ✓ 93 40.6 ✓ 2 34.7 ✓ 1 17.35 ✓

49 58.3 ✓ 48 45.1 ✓
50 37.0 ✓ 49 15.2 ✓
100 35.3 ✓ 98 0.3 ✓ 2 35.0 ✓ 1 17.50 ✓

52 13.0 ✓ 50 59.7 ✓
52 51.2 ✓ 51 29.9 ✓
105 4.2 ✓ 102 29.6 ✓ 2 34.6 ✓ 1 17.30 ✓

.70
+1 17.14 ✓

mean of times = 14 48 10.2 ✓
+1 48.8 ✓ Chr. Corr.
14 49 59.0 ✓
4 11 47.5 ✓
10 38 11.5 ✓
−1 44.6 ✓
C. M. T. obs. 10 36 26.9 ✓
4 44 31.
15 20 58.

Δ ε   Δ *

#

40.8 ✓   29.9 ✓

40.5 ✓   30.1 ✓

39.9 ✓   29.8 ✓

38.7 ✓   30.1 ✓

38.2 ✓   30.2 ✓

198.1 ✓   150.1 ✓

39.62 ✓   30.02 ✓

~~150.1~~   ~~198.1~~

~~48.0~~   ~~348.2~~

39.62
30.02
69.64

~~48.0 = 1.68124 ✓~~
~~7.5 = 0.87506 ✓~~
~~cos δ = 9.96520 ✓~~
~~332″.3 = 2.52150~~
~~887.6~~
~~555.3 = +9′ 15″.3~~

69.64 = 1.84286 ✓
7.5 = 0.87506 ✓
cos δ = 9.96520 ✓
482″.1 ✓ = 2.68312 ✓
887.6 ✓
405.5 = +6′ 45″.5 ✓

May 25. 1887.
Barnard's. New Comet.

Oe. A. 18722.

(1850.0) 15 29 56.03   −22 33 9.3
+1 5.01   −3 45.9
15 31 1.04   −22 36 55.2
232 45 15.6

0.12608
~9.90094
~9.61969
+0.4433   +9.64671
3.0710
3.5143 = 0.54584
37. = 1.56820
130.03 = 2.11404

1.30218
~9.78193
1.56820
449.1 = ~2.65231

15 29 56.03   −22 33 9.3
+2 10.03   −7 29.1
1887.0 = 15 32 6.06   −22 40 38.4
+2.15   −0.9
Ap. pl. ✱ = 15 32 8.21   −22 40 39.3
☄ − ✱ = +1 17.14   +6 45.5
Ap. pl. ☄ = 15 33 25.35   −22 33 53.8
Cor. for Ref. −0.02   +0.7
Cor. pl. ☄ = 15 33 25.33   −22 33 53.1

f = +0.″525
g = 4h 24.9
H = 13 34.1
log g = +0.9304
" h = +1.3042
" i = −0.5427

15 32.1
4 24.9
19 57.0 = (G + α)

15 32.1
13 34.1
5 6.2 = (H + α)

+8.8239
+0.9304
−9.9408
n9.6210
+0.″207 = +9.3161

+8.8239
+1.3042
+9.9879
+0.0349
+1.416 = +0.1509
+0.525
+2.″148 Cor. for Ap. pl.

+4.″16
−1.81
−3.22

+0.9304
+9.6890
+0.6194

+1.3042
+9.3666
−9.5860
−0.2568

−0.5427
+9.9650
−0.5077
−0.″87 = Cor. for Ap. pl.

ζ = 65°.9
log cos φ = 9.8684
" sin t = n9.2806
Sum logs = n9.1490
log sin ζ = +9.9604
" sin q = n9.1886
q = −8° 53′
2q = −17 46
log K = 6.4371
" sec² ζ = 0.7780
" r = +7.2151
" 1/30 = +8.5229
" sec δ = +0.0348
" Π = +2.9482
" sin 2q = n9.4845
−0.″02 n8.2055

Par. Comp.
14 49 59 = t
15 33 25 = α
−43 26 = H.A.E
Log ρ cos φ′ = 0.8161
n9.2766
n0.0927
1.1415
Log p.Δ in R.A. = n8.9512
+9.9575
+9.9921
+9.9654
φ′ = +42° 03′
δ′ = −22 36

15 = 1.1761
9.9654
1.1415

+0.7733
+9.9582
+0.7315
+9.8313
+0.9002
Log p.Δ in dec.

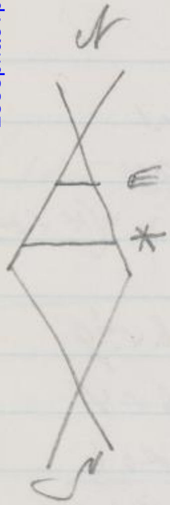
log r = +7.2151
" Π = +2.9482
" sin² q = +8.3774
+0.″03 +8.5407

log r = +7.2151
" Δδ = +2.6080 ~~+2.7445~~
" cos 2q = +9.9788
~~+9.9384~~
+9.8019
+0.63

+0.63
+0.03

∓0.″87
+0.03

Barnard's New Comet,
May 30. 1887.



14 19 2.4 ✓ 17 48.1 ✓
19 25.3 ✓ 18 27.3 ✓
38 27.7 ✓ 36 15.4 ✓ 2 12.3 ✓ 1 6.15 ✓

20 59.2 ✓ 19 44.5 ✓
21 21.4 ✓ 20 24.0 ✓
42 20.6 ✓ 40 8.5 ✓ 2 12.1 ✓ 1 6.05 ✓

22 59.1 ✓ 21 44.0 ✓
23 21.0 ✓ 22 23.2 ✓
46 20.1 ✓ 44 7.2 ✓ 2 12.9 ✓ 1 6.45 ✓

25 6.6 ✓ 23 51.3 ✓
25 28.3 ✓ 24 30.9 ✓
50 34.9 ✓ 48 22.2 ✓ 2 12.7 ✓ 1 6.35 ✓

27 6.4 ✓ 25 50.2 ✓
27 27.2 ✓ 26 30.0 ✓
54 33.6 ✓ 52 20.2 ✓ 2 13.4 ✓ 1 6.70 ✓
+1 6.34 ✓

14 23 13.7 ✓
+1 53.5 ✓
14 25 7.2 ✓
4 31 30.3 ✓
9 53 36.9 ✓
−1 37.2 ✓
G. M. T. obs. = 9 51 59.7 ✓
4 44 31.
14 36 31.

Δ ☄	Δ *
22.9 ✓	39.2 ✓
~~22.9~~ ✓	~~39.2~~ ✓
22.2	39.5
21.9	39.2
21.7	39.6
20.8	39.8
21.90 ✓	39.46 ✓

$$\begin{array}{rl} 39.46 & \\ \underline{21.90} & \\ 17.56 & = 1.24452 \checkmark \\ 7.5 & = 0.87506 \checkmark \\ \cos\delta & = \underline{9.97615} \checkmark \\ 124.7'' & \ 2.09573 \checkmark \\ +2'\ 4.7'' & \end{array}$$

May 30. 1887.
Barnard's New Comet.

Z.A. 14900.	15	40	0.31	−18	44	57.8	(1880.0)
		+2	7.51		−7	2.8	
1887.0	15	42	7.82	−18	52	0.6	
Red. to ap. pl.			+2.10			−0.1	
Ap. pl. ☄	15	42	9.92	−18	52	0.7	
☄ − ✱		+1	6.34		+2	4.7	
Ap. pl. ☄	15	43	16.26	−18	49	56.0	

The above reductions accurate for publication, although the details are not here given.

Log p. × Δ

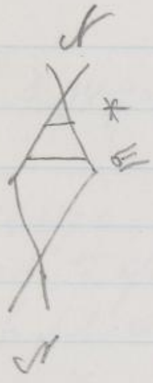
in R.A.	in Dec.
n9.187	+0.881

Pre. for mid. date

in R.A.	in Dec.
+3.″446	−11.″426

Barnard's New Comet.

June 7. 1887.



14 43 27.0	44 57.1				
44 17.5	45 6.8				
87 44.5	90 3.9	2	19.4	1	9.70
45 52.5	47 22.0				
46 42.4	47 31.3				
92 34.9	94 53.3	2	18.4	1	9.20
47 55.6	49 24.2				
48 43.8	49 33.5				
96 39.4	98 57.7	2	18.3	1	9.15
49 54.3	51 23.0				
50 42.6	51 32.2				
100 36.9	102 55.2	2	18.3	1	9.15
51 57.4	53 25.2				
52 45.0	53 34.3				
104 42.4	106 59.5	2	17.1	1	8.55
				— 1	9.15

14 48 13.81
+1 36.5 Chr. Cor.
14 49 50.3
5 3 2.8
9 46 47.5
1 36.1
9 45 11.4 C. M. T.
4 44 31.
14 29 42 Gr. M. T.

Hr. 3451 B. 394.

14 37 29.4 = 9 19 0.0

Δ☾	Δ*
50.5 ✓	9.7 ✓
49.9 ✓	9.3 ✓
48.2 ✓	9.3 ✓
48.3 ✓	9.2 ✓
47.6 ✓	9.1 ✓
44.5	1.6
48.90	9.32

9.32

39.58 = 1.59748

7.5 = 0.87506

cos. δ = 9.98961

289.8 = 2.46215 ✓

Barnard's New Comet,
June 7. 1887.

~~Comp. Star~~.

Comp. Star = ~~4~~ 5ˢ.8 m. −12° ~~4~~ 425 (mag. 5.8)
15 59 33.6 −12° 20.7 L (1855)

Ll. 29331.

+3ˢ.318
+10″.292

15	56	31.08 ✓	~~+02~~ −12	11	47.7 ✓
	+2	24.33 ✓		−7	27.7 ✓
15	58	55.41 ✓	−12	19	15.4 ✓
239	43	51.2 ✓			

0.12614 ✓
n 9.93635 ✓
n 9.33928 ✓
+9.40177 ✓

+0.2522 ✓
+3.0705 ✓
+3.3227 ✓ = 0.52149 ✓
1.93952 ✓
2.46101

289.07

1.30223 ✓
n 9.70248 ✓
1.93952 ✓
n 2.94423 = −879″.5 = −14′ 39″.5

~~−12 11 47.7~~ ✓
~~−14 39.5~~ ✓
~~−12 26 27.2~~

	15	56	31.08 ✓	−12	11	47.7 ✓
		+4	49.07 ✓		−14	39.5 ✓
(1887.0)	16	1	20.15 ✓	−12	26	27.2 ✓
Red. to ap. pl.			+2.09 ✓			+4.3 ✓
Ap. pl. *	16	1	22.24 ✓	−12	26	22.9 ✓
		−1	9.15 ✓		−4	49.8 ✓
Ap. pl. ∈	16	0	13.09 ✓	−12	31	12.7 ✓

June 7. 1887.
Barnard's Comet.

f = +0.654
G = 4 6.1
H = 12 47.6
Log g = +0.9528
" h = +1.3089
" i = −0.2608

G = 4 6.1
α = 16 1.3
G+α = 20 7.4

H = 12 47.6
16 1.3
H+α = 4 48.9

1/15 = +8.8239
Log g = +0.9528
−9.9291
−9.3433
+0.112 = +9.0491

+0.9528
+9.7224
+0.6752 = +4.73

+8.8239
+1.3089
+9.9783
+0.0103
+1.322 = +0.1214
+0.112
+0.654
+2.088 Red. in α

+1.3089
+9.4847
+9.3329
+0.1265
+1.34
+4.73
+6.07
−1.78
+4.29 = Red. in δ

−0.2608
+9.9897
−0.2505
−1.78

0.8161
n9.4805
n0.2966
1.1657
n9.1309 = Log. p. Δ in R.A.

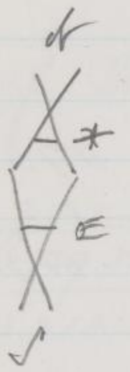
1.1761
9.9896
1.1657

0.7733
9.9189
0.6922
9.8382
+0.8540 = Log p Δ in Dec.

R.A. = 16 0 13
Time 14 49 50
H.A. = −1 10 23 = t

9.9573
9.9792
9.9781 = 43 33
−12 31
(γ − δ) = γ = 56 4

Barnard's Comet.
June 8. 1887.



14 33 23.5	32 27.2			
33 47.4	33 2.0			
67 10.9	65 29.2	1	41.7	50.85
35 4.5	34 8.7			
35 29.1	34 43.2			
70 33.6	68 51.9	1	41.7	50.85
36 47.5	35 52.2			
37 13.4	36 27.0			
74 0.9	72 19.2	1	41.7	50.85
38 51.2	37 55.8			
39 17.5	38 31.0			
78 8.7	76 26.8	1	41.9	50.95
40 33.1	39 37.3			
40 59.6	40 12.5			
81 32.7	79 49.8	1	42.9	51.45
				+50.99

14 37 8.68
+1 35.0 Chr. Cor.
14 38 43.7
5 6 59.3
9 31 44.4
1 33.7
9 30 10.7 C. M. T.
14 44 31
14 14 42

Hr. 3551. = Ballons.

13 41 17.6 = 8 19 0.0

23.9 ✓ 34.8 ✓ 58.7 ✓

24.6 ✓ 34.5 ✓ 59.1 ✓

25.9 ✓ 34.8 ✓ 60.7 ✓

26.3 ✓ 35.2 ✓ 61.5 ✓

26.5 ✓ 35.2 ✓ 61.7 ✓

301.7

mean = 60.34

60.34 = 1.78061

7.5 = 0.87506

cos δ = 9.99093

443.2 ✓ = 2.64660 ✓

887.6

444.4 = 7' 24.4"

Barnard's Comet, June 8. 1887.

Comp. Star = S.D. −11° 4074

(1855) 15 59 43.5 −11 31.6 (K 8.0)

W. 15h 1138) 15 58 5.38 −11 26 30.5 (1875)

+1 42.30 −5 15.3

(3.30 15 59 47.68 −11 31 45.8

10.17) 239 56 55.5

0.12611 1.30221

n9.93730 n9.69965

n9.30960 1.79239

+0.2361 +9.37301 n2.79425 = 622.7 = 10′ 22.7

+3.0707

+3.3068 = 0.51940

62. = 1.79239

205.02 2.31179

15 58 5.38 −11 26 30.5

3 25.02 −10 22.7

1887.0 16 1 30.40 −11 36 53.2

+50.99 −7 24.4

16 2 21.39 −11 44 17.6

Red. to ap. pl. +2.08 +4.1

Ap. pl. ☾ 16 2 23.47 −11 44 13.5

14 38 44
16 2 23
-1 23 39 = R.A.

9.9573
9.9705
9.9868

44 8
-11 44
y - δ = 55 52

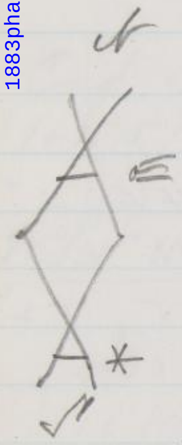
0.8161
~9.5524
~0.3685
1.1669
~9.2016 = Log pΔ in R.A.

1.1761
9.9908
1.1669

0.7733
9.9179
0.6912
9.8428
+0.8484 = Log. pΔ in dec.

Barnard's Comet.

June 13. 1887.



17 12 42.8 11 9.9
13 27.7 11 25.0
26 10.5 22 34.9 3 35.6 1 47.80

15 47.1 14 13.3
16 31.0 14 28.6
32 18.1 28 41.9 3 36.2 1 48.10

20 42.5 19 8.0
21 24.0 19 22.7
42 6.5 38 30.7 3 35.8 1 47.90

26 26.6 24 51.4
27 7.8 25 5.5
53 34.4 49 56.9 3 37.5 1 48.75

29 56.5 28 21.3
30 37.0 28 35.1
60 33.5 56 56.4 3 37.1 1 48.55
+1 48.22

17 21 28.30
+4 38.7
17 26 7.0
5 26 42.1
11 59 24.9
1 57.9
11 57 27.0 C. M. T.
4 44 31.
16 41 58. Gr. M. T.

Hr. 3451. = Hr. 1327.

16 29 18.5 = 16 33 0.0

Δε	Δ*	(−ε+*)
44.9 ✓	15.1 ✓	−29.8 ✓
43.9 ✓	15.3 ✓	−28.6 ✓
41.5 ✓	14.7 ✓	−26.8 ✓
41.2 ✓	14.1 ✓	−27.1 ✓
40.5 ✓	13.8 ✓	−26.7 ✓

39.0

27.80

−27.80 = 1.44404

7.5 = 0.87506

cos δ = 9.99584

−206.5 ✓ = 2.31494 ✓

887.6

681.1 = 11′ 21.1″ ✓

Barnard's Comet.
June 13. 1887.

Comp. Star = S.D. −7° 4255 (A.G.)

(1855) 16 10 7.8 −7 55.1 (A.G.K.)

Tr. 16^h 184 16 8 31.05 −7 50 39.5 (1825)

1 40.13 −4 50.8

16 10 11.18 −7 55 30.3

3.233
9.38

245 32 47.7

0.12611 1. 30221

n9.94811 n9.66373

n9.14366 1.79239 (62)

+0.1651 +9.21788 n2.75833 = 573.2 = 9′ 33.″2

+3.0707

+3.2358 = 0.50998

1.79239

200.62 2.30237

	16	8	31.05	−7	50	39.5
		+3	20.62		−9	33.2
1887.0	16	11	51.67	−8	0	12.7
Red. to App. pl.			+2.0~~7~~6			+2.8
App. pl. *	16	11	53.7~~4~~3	−8	0	9.9
		+1	48.22		+11	21.1
App. pl. ☄ =	16	13	41.9~~6~~5	−7	48	48.8

June 13. 1887.
Barnard's Comet.

f = +0.706 ✓
g = 3 56.5 ✓
H = 12 26.4 ✓
Log g = +0.9538 ✓
" h = +1.3101 ✓
" i = −0.0086 ✓

3 56.5
16 11.9
20 8.4

12 26.4
16 11.9
4 38.3

+0.9538 ✓
+9.7254 ✓
+0.6792 ✓ = +4.78 ✓

+8.8239
+0.9538
−9.9279
−9.1479
+8.8535   +0.071

+1.3101 ✓
+9.5428 ✓
−9.1439 ✓
−9.9968   −0.99 ✓

+8.8239
+1.3101
+9.9718
+0.0042
+0.1100

−0.0086 ✓
+9.9958 ✓
−0.0044 ✓   −1.018 ✓

+1.2~~59~~88
+0.706
~~+2.036~~ ✓
+2.065 ✓ Red. in R.A.

−2.00 ✓
+4.78 ✓
+2.78 ✓ Red. in Dec.

17 26 7
16 13 42
+1 12 25 = H.A.

0.8161
9.4923
0.3084
1.1721
+9.1363 = Log p Δ in R.A.

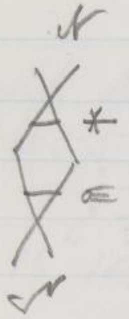
1.1761
9.9960
1.1721

0.7733
9.8932
0.6665
9.8389
(+0.8276 = Log p Δ in δ)

9.9573
9.9780
9.9793

43 38
−7 49
51 27

Barnard's Comet.
June 18. 1887.



15 20 40.3 21 51.2
20 51.0 22 4.7
41 31.3 43 55.9 2 24.6 1 12.30

23 32.5 24 43.5
23 44.0 24 56.7
47 16.5 49 40.2 2 23.7 1 11.85

25 10.1 26 20.7
25 21.9 26 34.0
50 32.0 52 54.7 2 22.7 1 11.35

26 47.5 27 58.2
26 59.6 28 11.3
53 47.1 56 9.5 2 22.4 1 11.20

28 27.2 29 39.2
28 40.2 29 52.0
57 7.4 59 31.2 2 23.8 1 11.90
1 11.72

15 25 1.43
+4 37.8
15 29 39.2
5 30 38.7
9 59 0.5
1 38.1
9 57 22.4 C. M. T.
4 44 31.
14 41 53. Gr. M. T.

Fr. 34851, Fr. 1327

15 35 19.7 = 15 39 0.0

10.7✓ 13.5✓ 24.2✓

11.5✓ 13.2✓ 24.7✓

11.8✓ 13.3✓ 25.1✓

12.1✓ 13.1✓ 25.2✓

13.0✓ 12.8✓ 25.8✓

25.0✓

~~24.80~~

25.00✓ =
~~24.80~~ = 1.39794
7.5 = 0.87506
cos δ = 9.99670
186.1 = 2.26970✓
887.6
701.5 = 11 41.5✓

Barnard's Comet.
June 14. 1887.

Comp. Star. = BD −6° 4419.

(1855)	16 15 12.3	−6° 51.8 (∠ 7.3)
Ll. 29798	16 12 15.37	−6 43 36.2
3".210	+2 19.64	−6 35.2
9".086	16 14 35.01	−6 50 11.4
	243 38 45.2	

	0.12614	+1.30223
	n9.95234	n9.64730
	n9.07877	+1.93952 (87)
+0.1436	+9.15725	n2.88905 = 774.5 = 12′ 54″.5
+3.0705		
+3.2141	= 0.50706	
	1.93952	
279.63	2.44658	

	16 12 15.37	−6 43 36.2
	+4 39.63	−12 54.5
1887.0	16 16 55.00	−6 56 30.7
	−1 11.72	−11 41.5
	16 15 43.28	−7 8 12.2
	+2.04	+3.0
App. pl. =	16 15 45.32	−7 8 9.2

15 29 39
16 15 45
−46 6 = H. A.

+0.8161
n9.3007
n0.1168

1.1761
9.9966
1.1727

1.1727
n8.9441 = Log p Δ in R. A.

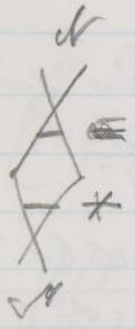
6.7733
9.8836
0.6569
9.8319
+0.8250 = Log p Δ in Dec.

9.9573
9.9912
9.9661

42 46
−7 8
49 54

7

Barnard's Comet, June 15. 1887.



15 7 9.3 ✓ 5 44.0 ✓
7 31.2 ✓ 5 54.2 ✓
14 40.5 ✓ 11 38.2 ✓ 3 2.3 ✓ 1 31.15 ✓

9 25.3 ✓ 7 59.5 ✓
9 46.7 ✓ 8 10.2 ✓
19 12.0 ✓ 16 9.7 ✓ 3 2.3 ✓ 1 31.15 ✓

16 17.2 ✓ 14 49.0 ✓
16 37.0 ✓ 14 59.9 ✓
32 54.2 ✓ 29 48.9 ✓ 3 5.3 ✓ 1 32.65 ✓

18 28.7 ✓ 17 0.5 ✓
18 46.7 ✓ 17 11.0 ✓
37 15.4 ✓ 34 11.5 ✓ 3 3.9 ✓ 1 31.95 ✓

20 46.7 ✓ 19 17.2 ✓
21 4.0 ✓ 19 28.0 ✓
41 50.7 ✓ 38 45.2 ✓ 3 5.5 ✓ 1 32.75 ✓
9.65 ✓
+1 31.930

15 14 35.28 ✓
+4 36.0 ✓ Chr. Cor.
15 19 11.3 ✓
5 34 35.2 ✓
9 44 36.1 ✓
-1 35.8 ✓
9 43 0.3 ✓ C. M. T.
4 44 31. ✓
14 27 31. ✓ Gr. M. T.

June 15. 1887.

345th Ballou

15 28 55.5 = 9 41 0.0

21.9 ✓ 10.2 ✓ 32.1 ✓

21.4 ✓ 10.7 ✓ 32.1 ✓

19.8 ✓ 10.9 ✓ 30.7 ✓

18.0 ✓ 10.5 ✓ 28.5 ✓

17.3 ✓ 10.8 ✓ 28.1 ✓

151.5 ✓

30.30 ✓

30.30 ✓ = 1.48144

7.5 = 0.87506

cos δ = 9.99720

225.8 2.35370 ✓

887.6

661.8 = 11′ 1.8″

Barnard's Comet,
June 15. 1887.

Comp. Star = BD −6° 4416 (mag. 8.9 Sj.)
(1855) 16 14 42.5 −6° 30.8 (8.9 Sj.)

Sr. 16^h 27m. 16 13 6.66 −6 26 36.0 (1825)
+1 39.20 −4 39.6
16 14 45.86 −6 31 15.6
243 41 27.9

3.205
9.02

0.12611
n9.95251
n9.05808
+9.13670

1.30221
9.64661
1.79239 (62)
2.74121
551.1 = 9′ 11.″1

+0.1370
+3.0707
+3.2077 = 0.50619
62. = 1.79239
198.88 2.29858

16 13 6.66 −6 26 36.0
3 18.88 −9 11.1
(1887.0) 16 16 25.54 −6 35 47.1
Red. to ap. pl. +2.05 +3.3
Ap. pl. * 16 16 27.59 −6 35 43.8
+1 31.93 +11 1.8
Ap. pl. ☄ 16 17 59.52 −6 24 42.0

Barnard's Comet.
June 15. 1887.

f = +0.714
g = 3 55.8
H = 12 19.4
Log g = +0.9564
" h = +1.3103
" i = −9.8754

3 55.8
16 16.4
20 12.2

12 19.4
16 16.4
4 35.8

+8.8239
+0.9564
−9.9234
−9.0631
+0.058 +8.7668

+8.8239
+1.3103
+9.9700
+0.0029
+1.280 +0.1071
+0.714
+2.052 Cor in α

+0.9564
+9.7367
+0.6931 +4.93

+1.3103
+9.5553
−9.0602
−9.9258 −0.84

−9.8754
+9.9971
−9.8725 −0.75
−1.59
+4.93
+3.34 Cor in δ

15 19 11
16 16 28
− 57 17 = H. A.

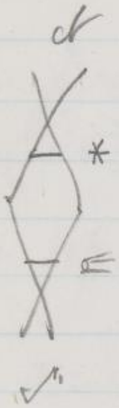
9.9573
9.9862
9.9711 = 43 6
− 6 36
$(\gamma - \delta)$ = +49 42

0.8161
n9.3934
0.2095
1.1732
n9.0363 = Log p Δ in R.A.

1.1761
9.9971
1.1732

0.7733
9.8823
0.6556
9.8346
+0.8210 = Log p Δ in dec.

Barnard's Comet.
June 25. 1887.



16 46 29.9 43 30.1
47 1.0 44 12.3
93 30.9 87 42.4 5 48.5 2 54.25

50 24.8 47 26.2
50 57.5 48 8.3
101 22.3 95 34.5 5 47.8 2 53.90

54 26.7 51 27.2
54 59.6 52 9.4
109 26.3 103 36.6 5 49.7 2 54.85

63 1.7 60 3.0
63 37.2 60 45.0
126 38.9 120 48.0 5 50.9 2 55.45

67 19.1 64 20.1
67 55.1 65 2.0
135 14.2 129 22.1 5 52.1 2 56.05
+2 54.90

mean of times = 16 56 37.3
+3 10.1 Chr. cor.
16 59 47.4
6 14 0.8
10 45 46.6
−1 45.8
10 44 0.8 O. M. T. obs.
4 44 31.
15 28 32. Gr. M. T.

Δ ☾	Δ *	
31.1	42.2	73.3
32.7	42.1	74.8
32.9	42.2	75.1
35.5	42.0	77.5
36.0	41.9	77.9
		28.6
		75.72

75.72 = 1.87921
cos. δ = 0.00000
7.5 = 0.87506
567.9 = 2.75427
887.6
319.7 = 5' 19.7

Barnard's Comet,
June 25. 1887.

Dm +0° 3571 = Comp. Star. (9.4 B.)

(1855.0) 16 36 4.47 +0 12 27.7
+49.12 −1 55.2
16 36 53.59 +0 10 32.5
249° 13′ 23.″8

0.12608
~9.97080
+7.48629
~7.58317

1.30217
~9.54989
1.50515 32.
~2.35721 = 227.6
−3′ 47.″6

−0.0038
+3.0710
+3.0672 = 0.48674
1.50515
98.15 = 1.99189

16 36 4.47 +0 12 27.7
+1 38.15 −3 47.6
1887.0 16 37 42.62 +0 8 40.1
Red. to ap. pl. +2.07 +5.9
Ap. pl. * 16 37 44.69 +0 8 46.0
+2 54.90 −5 19.7
Ap. pl. ☄ = 16 40 39.59 +0 3 26.3

June 25. 1887.

B. 236. Ballou.

17 18 85 ✓ 10 50 0.0

6 29 32.3 ✓

10 48 36.2 ✓

-1 46.3 ✓

10 46 49.9 ✓

10 50 0.0

∴ 3 10.1 is the amt. that B. 236 is slow.

3 38.9 ✓ 11 44.4 ✓

16 37.7 ✓ 16 37.7 ✓

20 16.6 ✓ 4 22.1 ✓

$f = +0.^s833$ ✓

g = 3 38.9 ✓

H = 11 44.4 ✓

Log g = +0.9740 ✓

" h = +1.3104 ✓

" i = +9.7802 ✓

+0.9740 ✓

+9.7493 ✓

+0.7233 ✓ +5.29 ✓

+1.3104 ✓

+9.6173

+7.4016 ✓

+8.3293 ✓ +0.02 ✓

+8.8239 ✓

+0.9740 ✓

-9.9176 ✓

+7.4016 ✓

-0.001 ✓ -7.1171 ✓

+9.7802 ✓

+0.0000 ✓

+9.7802 ✓ +0.60 ✓

+5.91 ✓ Red. in δ

+8.8239 ✓

+1.3104 ✓

+9.9591 ✓

+0.0000 ✓

+1.240 ✓ +0.0934 ✓

+0.833 ✓

+2.072 ✓ Red. in R. A.

16 59 47 ✓

16 37 45 ✓

+22 2 ✓ = H. A.

0.7733 ✓

9.8269 ✓

0.6002

9.8282 ✓

+0.7720 ✓ = Log p Δ in dec.

9.9573 ✓

9.9980 ✓

9.9593 ✓

42 19 ✓

+0 9 ✓

γ-δ = +42 10 ✓

0.8161 ✓ 1.1761 ✓

8.9816 ✓ 0.0000 ✓

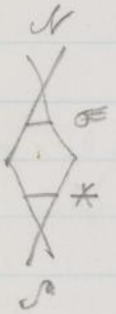
+9.7977 ✓ 1.1761 ✓

1.1761 ✓

+8.6216 ✓ = Log p Δ in R. A.

Barnards Comet

July 17. 1887.



19 15 39.8 14 16.0
16 14.9 14 29.7
31 54.7 28 45.7 3 9.0 1 34.50

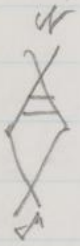
21 33.6 20 9.0
22 7.7 20 22.5
43 41.3 40 31.5 3 9.8 1 34.90

25 11.0 23 45.7
25 44.5 23 59.8
50 55.5 47 45.5 3 10.0 1 35.00

Mean = 19 21 5.2 +1 34.80
+1 8.2
19 22 13.4
7 21 ~~2.3~~
12 1 11.1
1 58.1
C. M. T. = 11 59 13.0

11 59 5
4 44 31
16 43 36

29 35.5 28 11.3
30 4.8 28 49.8
59 40.3 57 1.1 2 39.2 1 19.60



33 14.6 31 49.9
33 43.5 32 28.6
66 58.1 64 18.5 2 39.6 1 19.80

36 7.8 34 42.6
36 37.1 35 21.5
72 44.9 70 4.1 2 40.8 1 20.40

Mean = 19 33 13.9 +1 19.93
+1 8.2
19 34 22.1
7 21 ~~2.3~~
12 13 19.8
−2 0.1
C. M. T. = 12 11 19.7
4 48 3.1

35.1 ✓ 13.7 ✓ 48.8 ✓

34.1 ✓ 13.5 ✓ 47.6 ✓

33.5 ✓ 14.1 ✓ 47.6 ✓
24.0
48.00 = mean.

1.68124
75 = 0.87506
cos = 9.99711
357.6 = 2.55341
887.6
530.0 = 8′ 50.0″

29.3 ✓ 38.5 ✓ 9.2

28.9 ✓ 38.7 ✓ 9.8

29.3 ✓ 38.9 ✓ 9.6
1.6
mean = 9.53

0.97909
0.87506
9.99693
71.0 = 1.85108

Barnard's Comet.

July 18. 1887.

First Comp. Star = Glasgow 4278 and Lamont 2450.

Glasgow (1870)	17	15	42.92	+6	39	33.15	
		+0	49.63		−1	4.89	
	17	16	32.55	+6	38	28.3	wt. 2
Lam. 2450 (1850)	17	14	44.63	+6	40	51.8	
		+1	48.01		−2	22.8	
(1887.0)	17	16	32.64	+6	38	29.0	wt. 1.
Mean "	17	16	32.58	+6	38	28.5	
			+2.11			+10.1	
App. pl. *	17	16	34.69	+6	38	38.6	
		+1	34.80		+8	50.0	
" " ☄	17	18	9.49	+6	47	28.6	
B.B. VI. 3403.	17	15	15.13	+6	48	17.3	
		+1	33.31		−2	2.5	
(1887.0)	17	16	48.44	+6	46	14.8	
			+2.11			+10.1	
App. pl. *	17	16	50.55	+6	46	24.9	
☄ − *		+1	19.93		+1	11.0	
" " ☄	17	18	10.48	+6	47	35.9	

Log. p Δ (1st obs.)
9.354 0.719

Log. p Δ (2nd obs.)
9.391 0.721

Olbers' Comet.

Oct. 19. 1887.

B.B. VI, +22° 2536. 12 54 28.16 ✓✓ +22 32 35.8 ✓✓

+47.04 ✓ −5 12.0 ✓

12 55 15.20 ✓ +22 27 23.8 ✓

193 48 48.0 ✓

0.12608 ✓ 1.30217 ✓

n9.37796 ✓ n9.98726 ✓

9.61629 ✓ 1.50515 ✓ =(32.)

−0.1319 n9.12033 ✓ −623.1 = n2.79458 ✓

3.0710

+2.9391 = 0.46822 ✓

32. = 1.50515

94.05 = 1.97337 ✓

12 54 28.16 ✓ +22 32 35.8 ✓

+1 34.05 ✓ −10 23.1 ✓

* 1887.0 = 12 56 2.21 ✓ +22 22 12.7 ✓

+0.06 ✓ −3.9 ✓

App. pl. * = 12 56 2.27 ✓ +22 22 8.8 ✓

−29.47 ✓ +3.2 ✓

App. pl. ☄ = 12 55 32.80 ✓ +22 22 12.0 ✓

$f = +1^s.628$ ✓
$G = 2^h\ 2^m.1$ ✓
$H = 4\ 5.9$ ✓
Log. g = +1.0913 ✓
" h = +1.2811 ✓
" i = +0.8624 ✓

$$\begin{array}{rr} 2 & 2.1 \\ 12 & 56.0 \\ \hline (G+\alpha) = 14 & 58.1 \end{array} \qquad \begin{array}{rr} 4 & 5.9 \\ 12 & 56.0 \\ \hline 17 & 1.9 = (H+\alpha) \end{array}$$

log $\frac{1}{15}$ = +8.8239 ✓
" g = +1.0913 ✓
" sin(G+α) = −9.8459 ✓
" tan δ = +9.6144 ✓
−0.237 −9.3755 ✓

log $\frac{1}{15}$ = +8.8239 ✓
" h = +1.2811 ✓
" sin(H+α) = −9.9859 ✓
" sec δ = +0.0340 ✓
−1.333 ✓ −0.1249 ✓
−0.237 ✓
−1.570 ✓
+1.628
Cor in α = +0.058 ✓

log g = +1.0913 ✓
" cos(G+α) = −9.8530 ✓
−8.80 −0.9443

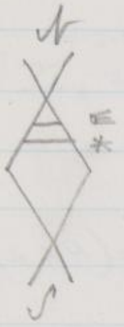
log h = +1.2811 ✓
" cos(H+α) = −9.3993 ✓
" sin δ = +9.5804 ✓
−1.82 = −0.2608

log i = +0.8624 ✓
" cos δ = +9.9660 ✓
+6.74 = +0.8284 ✓
−10.62 ✓
−3.88 ✓ Cor. in δ

$$\begin{array}{r} -0^m\ 29.47 \\ +\ 0.06 \\ \hline -0^m\ 29.41 \end{array} \qquad \begin{array}{r} +3.20 \\ -3.88 \\ \hline -0.32 \end{array}$$

Olbers' Comet.

Oct. 19. 1887.



6 59 23.7 ✓ 59 53.4 ✓
7 0 15.1 ✓ 0 46.0 ✓
119 38.8 ✓ 120 39.4 ✓ 1 0.6 ✓ 30.30 ✓

1 30.3 ✓ 1 59.7 ✓
2 22.6 ✓ 2 52.9 ✓
123 52.9 ✓ 124 52.6 ✓ 0 59.7 ✓ 29.85 ✓

3 50.2 ✓ 4 20.0 ✓
4 43.4 ✓ 5 13.0 ✓
128 33.6 ✓ 129 33.0 ✓ 0 59.4 ✓ 29.70 ✓

6 9.9 ✓ 6 38.7 ✓
7 3.1 ✓ 7 32.5 ✓
133 13.0 ✓ 134 11.2 ✓ 0 58.2 ✓ 29.10 ✓

8 17.7 ✓ 8 46.2 ✓
9 12.2 ✓ 9 40.5 ✓
137 29.9 ✓ 138 26.7 ✓ 0 56.8 ✓ 28.40 ✓

−29.47 ✓

Mean of times = 7 4 16.8 ✓
+59.7 Chr. Cor.
7 5 16.5 ✓
13 51 21.0 ✓
17 13 55.5
−2 49.4
17 11 6.1 ✓ C. m. T. obs.
4 44 31
21 55 37

$\Delta\,\epsilon$	$\Delta\,*$	$* - \epsilon$
51.4	52.6	+1.2
52.3	53.2	+0.9
53.2	53.0	−0.2
53.2	53.8	+0.6
54.5	54.3	−0.2
5)264.6	5)266.9	+2.3
52.92	53.38	−+0.46

$0.''46 = 9.66276$

$7.5 = 0.87506$

$\cos\delta = \underbrace{9.96603}$

$3.''19 = 0.50385$

Olbers' Comet.

Oct. 21. 1887.

21/2 13^h 77	13	4	40.28 ✓✓	+21	56	0.6 ✓✓
		+1	30.58 ✓		−9	57.1 ✓
	13	6	10.86	+21	46	3.5
	196	32	42.9			

Olbers Comet.

	0.12611 ✓		n9.98164 ✓
	n9.45450 ✓		1.30221 ✓
	9.60132 ✓	62.=	1.79239 ✓
−0.1520	n9.18193 ✓	−1191.9	n3.07624 ✓
3.0707			−19′ 51.″9
+2.9187 ✓	= 0.46519 ✓		
	1.79239		
180.96	2.25758		

	13	4	40.28 ✓	+21	56	0.6 ✓
		3	0.96		−19	51.9 ✓
* 1887.0	13	7	41.24	+21	36	8.7 ✓
			+0.08 ✓			−3.5 ✓
Ap. pl. *	13	7	41.32 ✓	+21	36	5.2 ✓
		−3	26.58 ✓		+3	47.3 ✓
Ap. pl. ☾ =	13	4	14.74 ✓	+21	39	52.5 ✓

$f = +1.651$ ✓
$g = 2\ \ 1.5$ ✓
$H = 3\ \ 57.5$ ✓

13 7.7
2 1.5
$(G+\alpha) = 15\ \ 9.2$

13 7.7
3 57.5
$(H+\alpha) = 17\ \ 5.2$

Log $g = +1.0968$ ✓
" $h = +1.2822$ ✓
" $i = +0.8545$ ✓

Log $\frac{1}{15} = +8.8239$ ✓
" $g = +1.0968$ ✓
" $\sin(G+\alpha) = -9.8662$ ✓
" $\tan\delta = +9.5976$ ✓
$-0.242 = -9.3845$ ✓

Log $\frac{1}{15} = +8.8239$ ✓
" $h = +1.2822$ ✓
" $\sin(H+\alpha) = -9.9875$ ✓
" $\sec\delta = +0.0316$ ✓
-1.334 ✓ $= -0.1252$ ✓
-0.242 ✓
-1.576 ✓
$+1.651$ ✓
$+0.075$ ✓ Cor. in α

Log $g = +1.0968$ ✓
" $\cos(G+\alpha) = -9.8313$ ✓
$-8.47 = -0.9281$ ✓

Log $h = +1.2822$ ✓
" $\cos(H+\alpha) = -9.3744$ ✓
" $\sin\delta = +9.5660$ ✓
$-1.67 = -0.2226$ ✓

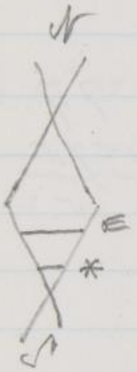
Log $i = +0.8545$ ✓
" $\cos\delta = +9.9684$ ✓
$+6.65$ ✓ $= +0.8229$ ✓
-10.14 ✓
-3.49 ✓ Cor. in δ

$-3\ \ 26.58$
$+0.08$
$-3^{m}\ \ 26.50$

$+3\ \ 47.30$
$-0\ \ 3.49$
$+3^\circ\ 43.81'$

Olbers' Comet,

Oct. 21, 1887.



6^h	51^m	42.5^s	55	27.7				
	52	34.6	55	46.0				
	104	17.1	111	13.7	6	56.6	3	28.30
6	56	37.7	0	21.8				
	57	28.0	0	39.0				
	114	5.7	121	0.8	6	55.1	3	27.55
	1	40.0	5	22.5				
	2	27.8	5	38.0				
	124	7.8	131	0.5	6	52.7	3	26.35
	6	34.6	10	16.5				
	7	20.8	10	30.8				
	133	55.4	140	46.9	6	51.5	3	25.75
	11	12.5	14	53.2				
	11	57.0	15	6.2				
	143	9.5	149	59.4	6	49.9	3	24.95
							3	26.58

Mean of times = 7 1 57.6
+1 6.4 Chr. Cor.
7 3 4.0
13 59 14.2
17 3 49.8
-2 47.7
17 1 2.1 C. m. T. obs.
4 44 31
21 45 33

Δ ☾	Δ *	
52.1 ✓	18.3 ✓	33.8 ✓
50.3 ✓	17.2 ✓	33.1 ✓
47.8 ✓	15.5 ✓	32.3 ✓
46.2 ✓	13.9 ✓	32.3 ✓
44.5 ✓	13.0 ✓	31.5 ✓
5)240.9	5)77.9 ✓	13.0
48.18 ✓	15.58 ✓	32.6 ✓

32.6 = 1.51322 ✓
75 = 0.87506 ✓
cos δ = 9.96828 ✓
227.3 = 2.35656 ✓
+3 47.3

Oct. 30. 1887.

Olbers ☄

½ 13ʰ 897   13 40 56.65   +18 34 0.2
+1 29.25   −9 22.6
13 42 25.90   +18 24 37.6
205 36 285

0.12611
n9.63569
9.52227
−0.1923   n9.28407
3.0707
2.8784 = 0.45915
62 = 1.79239
178.46   2.25154

1.30221
n9.95510
1.79239
−1121.2   n3.04970
−18′ 41.2″

13 40 56.65   +18 34 0.2
+2 58.46   −18 41.2
* 1887.0   13 43 55.11   +18 15 19.0
+0.14   −2.5
Ap. pl. * =   13 43 55.25   +18 15 16.5
−2 25.97   +4 22.8
Ap. pl. ☄ =   13 41 29.28   +18 19 39.3

$f = +1.695$
$G = 1^h\ 58.5$
$H = 3\ \ 20.4$
log $g = +1.1048$
" $h = +1.2878$
" $i = +0.8101$

1	58.5
13	43.9
15	42.4

3	20.4
13	43.9
17	4.3

log $\frac{1}{15}$ = +8.8239
" g = +1.1048
" sin$(G+A)$ = −9.9165
" tan δ = +9.5182
−0.231 = −9.3634

log $\frac{1}{15}$ = +8.8239
" h = +1.2878
" sin$(H+A)$ = −9.9870
" sec δ = +0.0224
−1.322 = −0.1211

−0.231
−1.553
+1.695
+0.142 Cor in α

log g = +1.1048
" cos$(G+A)$ = −9.7520
−7.19 = −0.8568

log h = +1.2878
" cos$(H+A)$ = −9.3816
" sin δ = +9.4958
−1.46 = −0.1650

log i = +0.8101
" cos δ = +9.9776
+6.13 = +0.7877

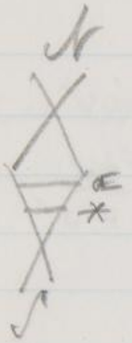
−7.19
−1.46
−8.65
+6.13
−2.52 Cor. in δ.

−2 25.97
+ 0.14
2 25.83

+4 22.8
− 2.5
+4 20.3

Oct. 30, 1887.

Olbers Comet.



7 53 6.1 55 52.5
53 54.5 56 2.5
107 0.6 111 55.0 4 54.4 2 27.20

56 50.7 59 36.0
57 37.7 59 45.5
114 28.4 119 21.5 4 53.1 2 26.55

60 33.0 3 17.5
1 18.4 3 26.0
121 51.4 126 43.5 4 52.1 2 26.05

4 18.1 7 2.0
5 7.0 7 14.6
129 25.1 134 16.6 4 51.5 2 25.75

11 28.7 14 10.7
12 15.1 14 21.7
143 43.8 148 32.4 4 48.6 2 24.30
−2 25.97

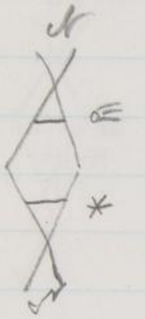
mean of times = 8 1 38.9
+1 41.6 Chr. cor.
8 3 20.5
14 34 43.1
17 28 37.4
−2 51.8
17 25 45.6 C. m. T. obs.
4 44 31
22 10 17

$\Delta\epsilon$	$\Delta *$	
48.4 ✓	10.0 ✓	34.8 ✓
47.0 ✓	9.5 ✓	37.5 ✓
45.4 ✓	8.5 ✓	36.9 ✓
48.9 ✓	12.6 ✓	36.3 ✓
46.4 ✓	11.0 ✓	35.4 ✓
5) 236.1 ✓	5) 51.6 ✓	36.90 ✓
47.22 ✓	10.32 ✓	

36.90 = 1.56703
7.5 = 0.87506
cos δ = 9.97746
262.8 = 2.41955
+4 22″.8

(Comet Pons-Brooks 1812)

Sept. 3. 1883



☾	*		
22 8 52.9	6 31.6		
9 39.4	7 4.3		
18 32.3	13 35.9	4 56.4	2 28.20
12 41.3	10 18.8		
13 26.2	10 53.0		
26 7.5	21 11.8	4 55.7	2 27.85
16 28.8	14 8.2		
17 16.7	14 42.0		
33 45.5	28 50.2	4 55.3	2 27.65
20 21.0	18 1.2		
21 8.8	18 34.4		
41 29.8	36 35.6	4 54.2	2 27.10
24 14.6	21 53.2		
25 1.2	22 27.8		
49 15.8	44 21.0	4 54.8	2 27.40
30 50.3	28 31.0		
31 38.8	29 5.7		
62 29.1	57 36.7	4 52.4	2 26.20
			+ 2m 27.40s

mean ☾ times = 22h 19m 18.3s

−5.2 Clock Cor.

22 19 13.1

10 49 53.6

11 29 19.5

−1 52.9

11 27 26.6 = C. m. T. obs.

$\Delta \epsilon$	$\Delta *$	
46.5 ✓	32.7 ✓	79.2 ✓
44.9 ✓	34.2 ✓	79.1 ✓
47.9 ✓	33.8 ✓	81.7 ✓
47.8 ✓	33.2 ✓	81.0 ✓
46.6 ✓	34.6 ✓	81.2 ✓
48.5 ✓	34.7 ✓	83.2 ✓
		80.90 ✓

80.90 = 1.90795 ✓
7.5 = 0.87506 ✓
$\cos\delta$ = 9.63026 ✓
259.0 = = 2.41327 ✓
887.6
628.6 = 10′ 28.″6 ✓

Sept. 3. 1883.

(Comet Pons-Brooks 1812.)

Dm. +64° 1139

Oe. A. 16376 = 16h 32m 29s.66 ✓ +64° 43′ 46″.5 ✓✓ (8.9)

+9.22 ✓ −2 32.3 ✓

16 32 38.88 ✓ +64 41 14.2 ✓

248° 9′ 43″.2

$\frac{w}{v}$ = 0.12610 ✓ 1.30219 ✓

sin α = n9.96766 ✓ n9.57053 ✓

tan δ = 0.32517 ✓ 1.61278 ✓

−2.6238 = n0.41893 −305″.8 = n2.48550 ✓

3.0708

+0.4470 = 9.65031 ✓

41. = 1.61278 ✓

+18s.33 = 1.26309

16 32 29.66 ✓ +64 43 46.5 ✓

+18.33 ✓ −5 5.8 ✓

1883.0 = 16 32 47.99 ✓ +64 38 40.7 ✓

App. pl. red. = −0.04 ✓ +20.4 ✓

" " * = 16 32 47.95 ✓ +64 39 1.1 ✓

+2 27.40 ✓ +10 28.6 ✓

" " ☌ = 16 35 15.35 ✓ +64 49 29.7 ✓

$f = +2\overset{s}{.}727$ ✓
$G = 1^h\ 26.7$ ✓
$H = 7\ \ 21.0$ ✓
$\log g = +1.2819$ ✓
$\ \ "\ \ h = +1.2773$ ✓
$\ \ "\ \ i = +0.8870$ ✓

$$\begin{array}{rl} 16 & 32.8 ✓ \\ 1 & 26.7 ✓ \\ \hline 17 & 59.5 ✓ = G+\alpha \end{array}$$

$$\begin{array}{rl} 16 & 32.8 ✓ \\ 7 & 21.0 ✓ \\ \hline 23 & 53.8 = H+\alpha \end{array}$$

$\log g = +1.2819$ ✓
$\ \ "\ \ \sin(G+\alpha) = -0.0000$ ✓
$\ \ "\ \ \tan\delta = +0.3244$ ✓
-1.6063 ✓
$15. = 1.1761$ ✓
$-2.692 = -0.4302$ ✓

$\log g = +1.2819$ ✓
$\ \ "\ \ \cos(G+\alpha) = n\,7.3388$ ✓
$-0.04 = -8.6207$

$\log h = +1.2773$ ✓
$\ \ "\ \ \sin(H+\alpha) = n\,8.4322$ ✓
$\ \ "\ \ \sec\delta = +0.3684$ ✓
-0.0779 ✓
1.1761 ✓
-0.080 ✓ $= -8.9018$ ✓
-2.692 ✓
-2.772 ✓
$+2.727$ ✓
$\alpha' - \alpha = -0.045$ ✓

$\log h = +1.2773$ ✓
$\ \ "\ \ \cos(H+\alpha) = +9.9999$ ✓
$\ \ "\ \ \sin\delta = +9.9560$ ✓
$+17\overset{''}{.}10 = +1.2332$

$\log i = +0.8870$ ✓
$\ \ "\ \ \cos\delta = +9.6316$ ✓
$+3.30 = +0.5186$ ✓
$+17.10$
$+20.40$
-0.04
$+20.36 = \delta' - \delta$

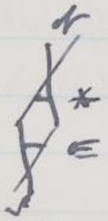
Sept. 26. 1883.

☄ Pons-Brooks. (1812).

Oe. A. 16269-70) 16 25 41.64 ✓ +60 7 44.1 ✓ (9)

+19.47 −2 44.0

16 26 1.11 +60 5 0.1



246 30 16.6

n/15 = 0.12609 ✓ 1.30219 ✓

sin α = n9.96241 ✓ n9.60062 ✓

tan δ = 0.24002 ~~0.35312~~ ✓ 1.61278

~~2.9645~~ = ~~n0.44162~~ ✓ 327.8 = n2.51559

2.1307 ✓ n0.32852 −5′ 27.″8

3.0709 ✓

~~+0.3064~~

+0.9402 = 9.97322 ✓

41. = 1.61278 ✓

+38.55 = 1.58600

Wrong.

~~16 25 41.64 ✓ +60 7 44.1 ✓~~

~~+38.55 ✓ −5 27.8 ✓~~

~~* 1883.0 = 16 26 20.19 ✓ +60 2 16.3 ✓~~

~~Red. to Ap. Pl. −0.60 ✓ +17.6 ✓~~

~~Ap. pl. * = 16 26 19.59 ✓ +60 2 33.9 ✓~~

~~☄ − * = +1 23.07 ✓ −11 10.7 ✓~~

~~Ap. pl. ☄ = 16 27 42.66 ✓ +59 51 23.2 ✓~~

See Red. Book II, p. 34.

Wrong the star No. assumed in above red. See Obs. Book. Star used was Dm. +60° 1677.

Mean ☄ times = 2 4 55.1 ✓

+2 58.9 Chr. Cor.

2 7 54.0 ✓

12 20 34.3 ✓

13 47 19.7 ✓

−2 15.5 ✓

13 45 4.2 ✓ = C. M. T. No.

Sept. 26. 1883.

c Pons-Brooks. App. pl. red.

$f = +2.^s862$ 7
$g = 1\ 24.0$ 7
$H = 5\ 43.7$ 7
Log $g = +1.3010$ 7
" $h = +1.2733$ 7
" $i = +0.9096$ 7

$1\ 24.0$ ✓
$16\ 26.3$ ✓
$17\ 50.3$ ✓

$5\ 43.7$ ✓
$16\ 26.3$ ✓
$22\ 10.0$ ✓

Log $\frac{1}{15} = +8.8239$
" $g = +1.3010$ ✓
" $\sin(G+\alpha) = -9.9996$ ✓
" $\tan\delta = +0.2391$ ✓
-2.310 -0.3636

Log $\frac{1}{15} = +8.8239$ ✓
" $h = +1.2733$ ✓
" $\sin(H+\alpha) = -9.6644$ ✓
" $\sec\delta = +0.3015$ ✓
-1.156 -0.0631 ✓
-2.310
-3.466
$+2.862$
-0.604 Red. in α

Log $g = +1.3010$ ✓
" $\cos(G+\alpha) = -8.6260$ ✓
-0.0845 -9.9270 ✓

" $h = +1.2733$ ✓
" $\cos(H+\alpha) = +9.9479$ ✓
" $\sin\delta = +9.9377$ ✓
$+14.42$ $+1.1589$ ✓

" $i = +0.9096$ ✓
" $\cos\delta = +9.6985$ ✓
$+4.06$ $+0.6081$ ✓
$+14.42$
18.48
$-.84$
$+17.64$ = Red. in δ

Dec. red.

$57.74 = 1.76148$
$7.5 = 0.87506$
$\cos\delta = 9.69963$
$216.9 = 2.33617$
887.6
$670.7 = 11'\ 10.''7$

Comet Pons.-Brooks. (1812.)
Sept. 4. 1883.

Oe.A. 16376. 16 32 29.66 +64 43 46.5

+9.22 −2 33.1

16 32 38.88 +64 41 13.4

248° 9 43.2

w/15 = 0.12609

sin K = n9.96766

tan δ = 0.32516

−2.6237 = n0.41891

3.0709

+0.4472 = 9.65050

41. = 1.61278

+18.34 = 1.26328

i = 1.30219

cos K = n9.57053

41. = 1.61278

−305.8 = n2.48550

−5′ 5.8″

16 32 29.66 +64 43 46.5

+18.34 −5 5.8

1883.0 = 16 32 48.00 +64 38 40.7

Comet. Pons-Brooks (1812.)

Obs. of Sept. 6. 1883.

Oe.A. 16400. 16h 33m 20s.43 ✓ ✓ +64° 15′ 25″.9 ✓ ✓

+10.25 ✓ −2 31.3 ✓

16 33 30.68 ✓ +64 12 54.6 ✓

248° 22′ 40″.2

$\frac{n}{15}$ = 0.12609 ✓ n = 1.30219 ✓

sin α = n9.96832 ✓ = n9.56642 ✓

tan δ = 0.31597 ✓ 41. = 1.61278 ✓

−2.5726 = n0.41038 −303″.0 = n2.48139

3.0709 −5′ 3″.0

+0.4983 = 9.69749 ✓

1.61278 ✓

+20s.43 = 1.31027

16 33 20.43 ✓ +64 15 25.9 ✓

+20.43 ✓ −5 3.0 ✓

16 33 40.86 ✓ +64 10 22.9 ✓

Sept. 21. 1883.

☾ Pons-Brooks. (1812)

Star reductions.

DM. +61° 1598. ✓ = Oe.A. 16341. ✓✓

Oe.A. 16341. =	16 30 12.15 ✓	+61 9 21.5 ✓
	+18.45 ✓	−2 44.0
	16 30 30.60 ✓	+61 6 37.5 ✓
	247° 37′ 39.0 ✓	

$\frac{w}{15}$ =	0.12609 ✓	1.30219 ✓
sin α =	n9.96601 ✓	n9.58050 ✓
tan δ =	0.25823 ✓	41. = 1.61278 ✓
−2.2404 ✓ =	n0.35033 ✓	−312.9 = n2.49547
3.0709 ✓		−5′ 12.9″
+0.8305 =	9.91935 ✓	
41. =	1.61278 ✓	
+34.05 =	1.53212 ✓	

	16 30 12.15 ✓	+61 9 21.5 ✓
	+34.05 ✓	−5 12.9 ✓
* 1883.0 =	16 30 46.20 ✓	+61 4 8.6 ✓

Sept. 21. 1883.

☉= Pons.-Brooks. (1812)

Star reductions.

DM +60° 1682 = Rad. 3571.

Rad. 3571. =	16	26	53.30 ✓	+60	58	30.2 ✓
			+16.34 ✓		−2	30.5 ✓
	16	27	9.64 ✓	+60	55	59.7 ✓
	246	47	24.6 ✓			

$\frac{w}{15}$ = 0.12609 ✓

sin α = n9.96335 ✓

tan δ = 0.25506 ✓

−2.2106 = n0.34450

3.0709 ✓

+0.8603 = 9.93465 ✓

38. = 1.57978 ✓

+32.69 = 1.51443

w = 1.30219 ✓

cos α = n9.59561 ✓

38. = 1.57978 ✓

−300.3 ✓ = n2.47758

−5′ 0.3″

	16	26	53.30 ✓	+60	58	30.2 ✓
			+32.69 ✓		−5	0.3 ✓
* 1883.0	16	27	25.99 ✓	+60	53	29.9 ✓
		−0	55.92 ✓		+2	41.3
	16	26	30.07	+60	56	11.2

Sept. 26. 1883.

Comet Pons-Brooks (1812)

(with second star. — see Book 33. p. 89)

B.B.VI 1727.	16	25	3.64 ✓	+58	47	36.6 ✓
			+13.58		−1	52.0
	16	25	17.22	+58	45	44.6

246° 19' 18.3"

$\frac{n}{15}$ = 0.12608 ✓ n = 1.30218 ✓

sin α = n9.96181 ✓ cos α = n9.60379 ✓

tan δ = 0.23442 ✓ 28. = 1.44716 ✓

−2.1004 ✓ = n0.32231 −225.5" = n2.35313

3.0710 ✓ −3' 45.5"

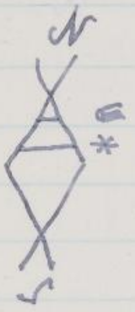
+0.9706 = 9.98704 ✓

28. = 1.44716 ✓

+27.18 1.43420

	16	25	3.64 ✓	+58	47	36.6 ✓
			27.18 ✓		−3	45.5 ✓
✱ 1883.0 =	16	25	30.82 ✓	+58	43	51.1 ✓
			−0.60 ✓			+17.6 ✓
Ap. pl. ✱	16	25	30.22 ✓	+58	44	8.7 ✓
		+0	19.88 ✓		+4	55.1 ✓
Ap. pl. ☄ =	16	25	50.10 ✓	+58	49	3.8 ✓

Sept. 26. 1883.
Comet Pons-Brooks. (1812.)
(2nd series — see previous page.)



78.16 = 1.89298 ✓
7.5 = 0.87506 ✓
cos. δ. = 9.70191 ✓
295.1 = 2.46995 ✓
+4' 55.1"

2 20 6.~~44~~8 ✓ = mean of times
+2 58.9 ✓

2 23 5.7 ✓
12 20 34.3 ✓

14 2 31.4 ✓
−2 18.0 ✓

C. m. T. 14 0 13.4 ✓
5 44 31.

Gr. m. T. = 19 44 44.

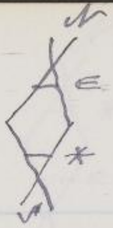
Sept. 22. 1883.

Comet Pons-Brooks (1812)

c

☄		*1675		~~*1676. Not a lettered *~~					
22^h 30^m	39^s.6	27^m	15^s.0	~~28^m~~	~~42^s.4~~				
31	28.0	28	33.9	~~29~~	~~14.7~~				
62	7.6	55	48.9			6^m	18^s.7	3^m	9^s.35
35	31.0	32	6.5						
36	19.8	33	24.7						
71	50.8	65	31.2			6	19.6	3	9.80
40	59.5	37	36.0						
41	50.0	38	54.3						
82	49.5	76	30.3			6	19.2	3	9.60
45	59.8	42	37.0						
46	50.6	43	54.7						
92	50.4	86	31.7			6	18.7	3	9.35
51	19.7	47	43.5						
51	57.6	49	14.6						
103	17.3	96	58.1			6	19.2	3	9.60
								+3	9.54 E

22 41 17.6 mean.
12 4 18.1 7
10 36 59.5 7
1 44.4 7
10 35 15.1 7.
−0 35.1 = Chr. cor.
10 34 40.0 = C. M. T.



$\Delta \varepsilon$	$\Delta *$	
48.4 ✓	78.9 ✓	127.3 ✓
48.8 ✓	78.2 ✓	127.0 ✓
50.5 ✓	78.3 ✓	128.8 ✓
50.8 ✓	77.7 ✓	128.5 ✓
37.9 ✓	91.1 ✓	129.0 ✓
		40.6

mean = 128.12 ✓

Log 128.12 = 2.10762 ✓
7.5 = 0.87506 ✓
cos δ = 9.69010 ✓
470.7 = 2.67278
887.6
416.9 = +6′ 56.9″

+60° 1675.

Star with first series.

Sept. 22. 1883.

BD. VI. +60°1675)	16	21	43.68	+60	40	42.6	(9.4) (1855)
			+13.58		−1	56.2	
	16	21	57.26	+60	38	46.4	

245° 29' 18.9"

w/15 = 0.12608 1.30218

sin α = n9.95899 n9.61791

tan δ = 0.24995 ~~0.34424~~ 28. = 1.44716

~~2.60772~~ ~~n0.44931~~ 232.9" = n2.36725

−2.1628 = n0.33502 −3' 52.9"

3.0710

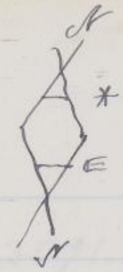
+0.9082

~~0.3838~~ = 9.95818

28. = 1.44716

+25.43 = 1.40534

	16	21	43.68	+60	40	42.6
			+25.43		−3	52.9
* 1883.0	16	22	9.11	+60	36	49.7
ε − *		+3	9.54		+6	56.9
	16	25	18.65	+60	43	46.6
			−0.57			+18.0
Ap. Pl. ε	16	25	18.08	+60	44	4.6
Pr. mot.			+0.03			0.0
Ap. pl. ε	16	25	18.11	+60	44	4.6



Comet Pons-Brooks.

Second series.

Sept. 22. 1883.

E	*		
22 55 46.2	58 8.8		
56 42.3	58 33.6		
112 28.5	116 42.4	4 13.9	2 6.95
22 59 22.4	1 28.1		
23 0 1.4	2 9.6		
119 23.8	123 37.7	4 13.9	2 6.95
2 43.2	5 1.4		
3 34.2	5 29.9		
126 17.4	130 31.3	4 13.9	2 6.95
5 58.2	7 54.5		
6 27.2	8 44.6		
132 25.4	136 39.1	4 13.7	2 6.85
9 9.7	11 20.9		
9 53.4	11 55.9		
139 3.1	143 16.8	4 13.7	2 6.85
		E − * =	−2 6.91

mean E times = $23^h\ 2^m\ 57.^s8$

(Kr. 1327 used with chronograph)

Comet Pons-Brooks.

Second series.

Sept. 22. 1883.

Δ ☄	Δ *	Σ Δ Δ
56.1 ✓	24.8 ✓	80.9 ✓
39.0 ✓	41.5 ✓	80.5 ✓
51.0 ✓	28.5 ✓	79.5 ✓
29.0 ✓	50.1 ✓	79.1 ✓
43.7 ✓	35.0 ✓	78.7 ✓
		79.74 ✓

79.74 = 1.90168 ✓
7.5 = 0.87506 ✓
cos. δ = 9.68807 ✓
291.6 ✓ = 2.46481 ✓
887.6 ✓
596.0 = 9′ 56.″0 ✓

Comet Pons-Brooks. (sec. series)

Comp. Star. = +60° 1682 = Radcliffe (Johnson) 3571.

J. 3571.	16	26	53.30 ✓	+60	58	30.2 ✓
			+16.34 ✓		−2	30.5 ✓
	16	27	9.64 ✓	+60	55	59.7 ✓

246° 47 24.6 ✓

$\frac{w}{\omega}$ = 0.12609 — 1.30219 ✓

sin α = n 9.96334 ✓ — n 9.59561 ✓

tan δ = 0.25506 ✓ — 1.57978 ✓

−2.2105 = n 0.34449 — −300.″3 = n 2.47758

3.0709 — −5′ 0.″3

+0.8604 = 9.93470 ✓

38. = 1.57978 ✓

+32.ˢ70 = 1.51448 ✓

	16	26	53.30 ✓	+60	58	30.2 ✓
			+32.70 ✓		−5	0.3 ✓
* 1883.0	16	27	26.00 ✓	+60	53	29.9 ✓
			−0.57 ✓			+18.0 ✓
App. pl. *	16	27	25.43 ✓	+60	53	47.9 ✓
ϵ − *		−2	6.91 ✓		−9	56.0 ✓
App. pl. ϵ	16	25	18.52 ✓	+60	43	51.9 ✓
	Pr. corr.		+0.03	Pr. corr.		0.0
	16	25	18.55	+60	43	51.9

Comet Pons-Brooks.

Oct. 1. 1883. (1st series)

Comet. Pons-Brooks.

Oct. 1. 1883. (1st series)

Comet Pons Brooks. (1812)

Oct. 1. 1883.

~~Comp. * = +58° 1649 with second series, was~~
~~(also used with first series not being a better star)~~

Comp. * = +58° 1641 (with 1st series)

Oe A. 16267.	16	25	39.10	+58°	35′	16.6″	(7.8)
			+22.14		−2	44.0	
	16	26	1.24	+58	32	32.6	
	246	30	18.6				

$\frac{\alpha}{15}$ = 0.12610   1.30219

sin α = n9.96291   n9.60061

tan δ = 0.21340   1.61278

−2.0040 = n0.30191   −327.8″ = n2.51558

3.0708   −5′ 27.8″

+1.0668 = 0.02808

41. = 1.61278

+43.74 = 1.64086

	16	25	39.10	+58	35	16.6
			+43.74		−5	27.8
*1883.0 =	16	26	22.84	+58	29	48.8

Comet Pons-Brooks. (1812)
Oct. 1. 1883.

Comp.* +58° 1649 (with second series)

B.B.VI. +58° 1649.	16 32 27.94 ✓	+58 39 14.8 ✓ (A.G.)
	+15.12	−1 52.
	16 32 43.06	+58 37 23.
	248 10 45.9	
m/15 =	0.12608 ✓	1.30218 ✓
sin α =	n9.96770 ✓	n9.57020 ✓
tan δ =	0.21478 ✓	1.44716 ✓
−2.0350 =	n0.30856	−208.7 = n2.31954
3.0710		−3′ 28.7″
+1.0360 =	0.01536 ✓	
n. =	1.44716 ✓	
+29.01 =	1.46252 ✓	

	16 32 27.94 ✓	+58 39 14.8 ✓
	+29.01 ✓	−3 28.7 ✓
* 1883.0 =	16 32 56.95 ✓	+58 35 46.1 ✓

Comet Pons-Brooks. (1812)
Oct. 3, 1883. (1st series)

(For * see p. 209) Comet Pons-Brooks (1812)

Oct. 3. 1883. (1st series)

Reductions of Obs. of Winnecke's Comet, made in 1875. (Red. already partly made in old Record Books)

Oe. 18459-90	$18^h\ 20^m\ 57^s.11$	$-16°\ 11'\ 8''.8$	(1850.0)
	$+43.74$	$+22.9$	
	18 21 40.35	−16 10 45.9	(mid. pl.)
~~Log~~ Ap. place end date	275 25 5.2		

Log $\frac{m}{15}$ = 0.12610
" sin h = 9.99806n
" tan δ = 9.46260n
+9.58676

log n 1.30219
log cos α 8.97508
" 25 1.39794
+47''.3 1.67521

+0.3862
+3.0708
+3.4570
25.0
~~12.5~~
+ 86.43
~~43.21~~

0.53870
1.39794
~~1.09691~~
1.93664
~~1.63561~~

	18 20 57.11	−16 11 8.8	
	+1 26.43	+47.3	
Mean pl. *	18 22 23.54	−16 10 21.5	(1875.0)

Oa. 18304-5	$18^h\ 21^m\ 28.58^s$ ✓	$-16^\circ\ 17'\ 4.0''$ ✓	(1850.0)
	+ 43.26	+23.5	
	18 22 11.84	−16 16 40.5	(mid. pl.)
	275 32 57.6		

log $\frac{n}{15}$	0.12610	log n	1.30219
" sin α	9.99796 n	log cos δ	8.98545
" tan δ	9.46559 n	" 25	1.39794
$+0.388\overset{7}{\cancel{5}}$	~~9.58944~~	$+48.4''$	1.68558
+3.0708	9.58965		
+3.4595	0.53901		
	~~0.53899~~		
25.0	1.39794		
+ 86.49	1.93695		

18 21 23.58	−16 17 4.0	
	48.4	
+ 1 26.49	~~+ 24.1~~	
18 22 50.06	− 16 16 $\overset{15.6}{\cancel{39.9}}$	(1875.0)

	h m s	° ′ ″	
Oa. 18426-7	18 26 42.01 ✓	−16 14 59.4 ✓	(1850.0)
	+ 43.24	+ 29.1	
	18 27 25.25	−16 14 30.3	(mid.-pl.)
	276 51 18.75		

log $\frac{n}{15}$	0.12610	log n	1.30219
" sin α	9.99688 n	log cos α	9.07686
" tan δ	9.46436 n	" 25	1.39794
+ 0.3867	9.58734	+ 59.″8	1.77699
+ 3.0708			
+ 3.4575	0.53876		
25.0	1.39794		
+ 86.44	1.93670		

18 26 42.01	−16 14 59.4	
+ 1 26.44	59.8	
18 28 8.45	−16 13 59.6	(1875.0)

Oa. 19233-4	19h 3m 31.85s ✓	−16° 40′ 20.8″ ✓	(1850.0)
	+43.21	+1 8.6	
	19 4 15.06	−16 39 12.2	(mid. pl.)
	286 3 45.90		

log $\frac{n}{15}$	0.12610	log n	1.30219
" sin α	9.98270 n	" cos α	9.44199
" tan δ	9.47586 n	" 25	1.39794
+0.3843	9.58466	+138.7″	2.14212
+3.0708			
+3.4551	0.53846		
25.0	1.39794		
+86.38	1.93640		

19 3 31.85	−16 40 20.8	
+1 26.38	+2 18.7	
19 4 58.23	−16 38 2.1	(1875.0)

	h m s	° ′ ″	
LL. 36162	19 5 10.62	−16 37 0.1	(1800.0)
	+ 2 9.49	+ 3 30.8	
	19 7 20.11	−16 33 29.3	(mid. pl.)
	286 50 1.6		

log $\frac{n}{15}$	0.12615	log n	1.30224
" sin α	9.98098 n	" cos δ	9.46179
" tan δ	9.47322 n	" 75	1.87506
+0.3805	9.58035	+435.6″	2.63909
+3.0704			
+3.4509	0.53793		
75.0	1.87506		
+ 258.82	2.41299		

19 5 10.62	−16 37 0.1	
+ 4 18.82	+ 7 15.6	
19 9 29.44	−16 29 44.5	(1875.0)

Comet. Pons-Brooks (1812)

Oct. 3. 1883.

Comp. Star = +58° 1644. (with 1st series)

BB.VI +58° 1644.	16	28	31.64	+58	13	5.5 (9.0)
			+15.40		−1	47.8
	16	28	47.04	+58	11	17.7
	244	11	45.6			

$\frac{n}{n}$ = 0.12608   1.30218

sin α = n 9.96465   n 9.58836

tan δ = 0.20739   1.44716

n1.9866 = n 0.29812   −217.6″ = n 2.33770

3.0710   −3′ 37.6

+1.0844 = 0.03519

28. = 1.44716

+30.36 = 1.48235

	16	28	31.64	+58	13	5.5
			+30.36		−3	37.6
* 1883.0 =	16	29	2.00	+58	9	27.9

Oct. 3. 1883.
Comet Pons-Brooks (1812)
(with second series.)

Oe A. 16 26 7 | +58° 16 41 (7.8)

16 26 0.70 ✓ +58 32 36.6 ✓
16 25 39.10 ✓ +58 35 16.6 ✓ (7.8)
246 30 10.5
~~246 24 46.5~~

w/15 = 0.12610 ✓ 0.12610 ✓ 1.30219 ✓ 1.30219 ✓
sin α = n9.96211 ✓ n9.96241 ✓ n9.60222 ✓ n9.60065 ✓
tan δ = 0.21418 ✓ 0.21342 41. = 1.61278 ✓ 1.61278 ✓
−2.0063 ✓ = n0.30239 * ~~329.0~~ = n2.51719 n2.51562
3.0708 ✓ n0.30193 −5′ 29.0″ −327.8″
+1.0645 ✓ = 0.02714 ✓ −2.0041 −5′ 27.8″
41. = 1.61278 ✓ 3.0708
+43.64 = 1.63992 +1.0667 = 0.02804 ✓
41. = 1.61278 ✓
43.73 = 1.64082

16 25 39.10 ✓ +58 35 16.6 ✓
+43.73 ✓ −5 27.8 ✓
*1883.0 = 16 26 22.83 ✓ +58 29 48.8 ✓

Feb. 3, 1883.
Comet Pons-Brooks (1812)
(with second [illegible].)

[illegible] +5° [illegible] 1661 (7.8)

16 25 39.10 +5 58 05 16.6 (9.8)

[illegible]

16 25 39.10 +5 58 05 16.5
+8.173 -2 3.26
16 26 [illegible] +5 56 [illegible]