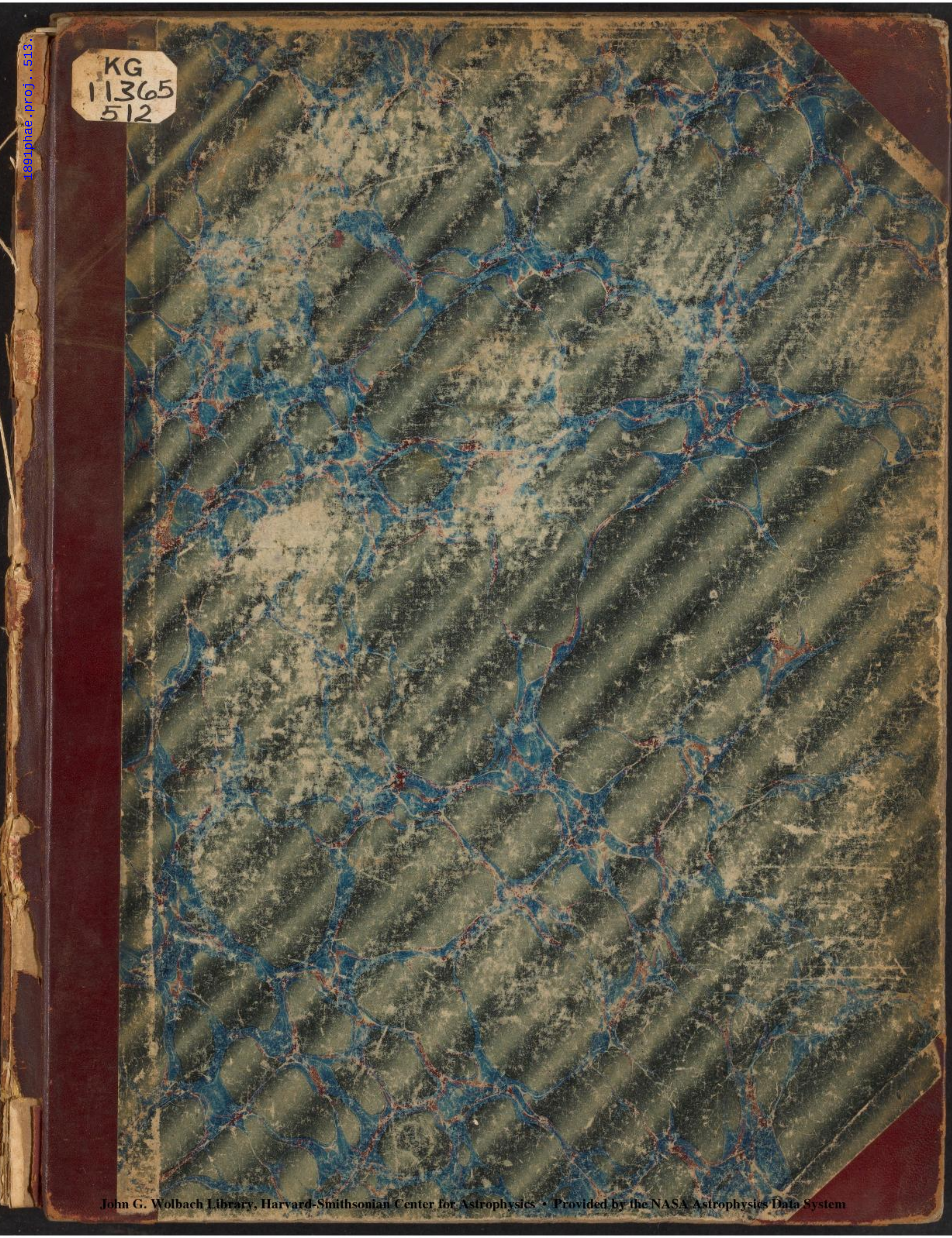
KG
11365
512



320=7.00 KG11365.512

To convert Log. p. Δ from basis $8.''57$ to $8.''85$,
add the constant log 0.0139 ✓

~~Log$(\rho\,\pi\cos\varphi') = +0.81610$ ✓ $(\pi = 8.''85)$~~

Log$(\rho\,\pi\sin\varphi') = +0.7735$ ✓ $(\pi = 8.''85)$

Log $\dfrac{\rho\,\pi\cos\varphi'}{15.} = +9.6400$ ✓ $(\pi = 8.''85)$

Log tan $\varphi' = +9.9575$ ✓

Comet Barnard (Mar. 29. 1891)

Obs. of ☿ Apr. 1. 1891.

Comp. Star = Dur +41° 234 (9.1)
Let. Star = Dur +41° 231 (9.0 K)

(Let.* 1855) = 1^h 7^m 5^s +41° 24.8

Arg₂ 1^h 118 = 1 5 22.24 +41 13 42.1 (1825)
+1 52.17 +10 35.2
1 7 14.41 +41 24 17.3 Mid. Pl.
16° 48′ 36.″

Log $\frac{n}{15}$ = +0.12611
" sin α = +9.46120
" tan δ = 9.94535
+0.3409 = +9.53266
3.0708
+3.4117 = +0.53297
66. = +1.81954
+225.17 = 2.35251

Log n = +1.30220
" cos α = 9.98104
" 66. = +1.81954
1267.0 = 3.10278

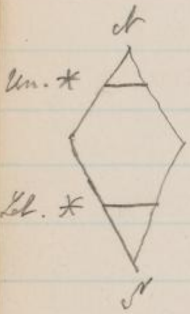
(*1825) 1 5 22.24 +41 13 42.1
3 45.17 +21 7.0
* 1891.0 = 1 9 7.41 +41 34 49.1
+2.14 −5.3
Ap. pl. Let.* = 1 9 9.55 +41 34 43.8
Un.−L. Star = +1 12.~~60~~ .83 +5 ~~38.5~~ 48.5
Ap. pl. Un.* = 1 10 22.~~75~~ .38 +41 40 ~~22.3~~ 32.3
☄ − Un.* = −1 30.~~46~~ .28 +8 ~~[illegible]~~ 10.1
Ap. pl. ☄ = 1 8 ~~51.69~~ 52.10 +41 48 ~~[illegible]~~ 42.4
−4.28
1 8 47.82

The above obs. fully cor. for ref.

	1	5	22.24 ✓	+41	13	42.1 ✓		
		+3	45.17 ✓		+21	7.0 ✓		
Lat. ★ 1891.0	1	9	7.41 ✓	+41	34	49.1 ✓		
Com − L. ★ =		+1	12.83 ✓		+5	48.5 ✓		Cor. for Ref.
Com. ★ 1891.0 ·	1	10	20.24 ✓	+41	40	37.6 ✓		
App. pl. cor.			−2.14 ✓			−5.3 ✓		
	1	10	18.10 ✓	+41	40	32.3 ✓		
α − Com. ★ =		−1	30.15 ✓		+8	9.9 ✓		Cor. for Ref.
App. pl. α =	1	8	47.95 ✓	+41	48	42.2 ✓		

Comet Barnard (Mar. 29. 1891)

Obs. of Apr. 1. 1891.



Un. Star.		Lt. Star.					
9 19	32.1	18	32.5				
20	33.5	19	8.5				
40	5.6	37	41.0	+2	24.6	+1	12.30
22	15.2	21	13.6				
23	15.0	21	51.5				
45	30.2	43	5.1	+2	25.1	+1	12.55
25	15.0	24	10.2				
26	11.5	24	49.9				
51	26.5	49	0.1	+2	26.4	+1	13.20
27	53.0	26	46.8				
28	47.8	27	29.3				
56	40.8	54	16.1	2	24.7	+1	12.35
							4/2.40
8/193	43.1					+1	12.60

mean = 9h 24m 12.9s

Δ Lon. ★	Δ Lat. ★	
61.4°	36.0°	97.4°
59.8°	37.9°	97.7°
56.5°	39.7°	96.2°
54.8°	42.5°	97.3°

4/388.6°

Mean 97.15°

97.15 = 1.98744 ✓
7.5 = 0.87506 ✓
(41° 17') cos δ = 9.87590 ✓
547.5^{7} = 2.73840
886.0
2/339.5 ✓
169.8^{7} = +2′ 49.8″ ✓
41 13 42.
+41 16 32. ✓

1.98744 ✓
0.87506 ✓
9.87590
2.73840 ✓ = 547.5^{7}
886.0
+338.5^{7}
+5′ 38.5″ ✓

Ap. pl. Bar. Comet (Marc. 29. 1891)

Obs. of Apr. 8. 1891.

f = −0.221 ✓
g = 16h 39.7 ✓
H = 17 7.0 ✓
Log g = +0.6178 ✓
" h = +1.2750 ✓
" i = −0.9006 ✓

ǂ
16 39.7
1 9.1
17 48.8
$(G+\alpha)$

17 7.0
1 9.1
18 16.1
$(H+\alpha)$

Log $\frac{1}{15}$ = +8.8239 ✓
" g = +0.6178 ✓
" sin$(G+\alpha)$ = −9.9995 ✓
" tan δ = +9.9481 ✓
−0.245 = −9.3893 ✓

" $\frac{1}{15}$ = +8.8239
" h = +1.2750 ✓
" sin$(H+\alpha)$ = −9.9989 ✓
" sec δ = +0.1261 ✓
−1.674 = −0.2239 ✓
−0.245
−0.221
−2.″140 ✓ = Red. in α

Log g = +0.6178 ✓
" cos$(G+\alpha)$ = −8.6886
−0.20 = −9.3064

" h = +1.2750 ✓
" cos$(H+\alpha)$ = +8.8462 ✓
" sin δ = +9.8220
+0.88 = +9.9432

" i = −0.9006 ✓
" cos δ = +9.8739 ✓
−5.95 = −0.7745
−0.20
−6.15
+0.88
−5.″27 Red. in δ

Parallax Computation (Bar. ε of Leor. 29)

Obs. of Apr. 1, 1891.

$9^h\ 8^m.7$

$1\ \ \ 8.9$

$7^h\ 59^m.8$ ✓

+41° 49′

$0^r.492$ ✓ $6^r.40$ ✓

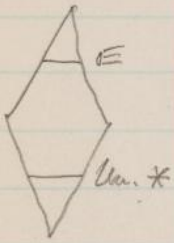
9.6920 ✓ 0.8062 ✓

0.0139 ✓ 0.0139 ✓

+9.7059 ✓ +0.8201 ✓

Ap. pl. Barnard's Comet (Mar. 29. 1891)

Obs. of Apr. 1. 1891.



☄	*		
8^h 59^m 39.1^s ✓ 9 0 13.5 ✓	9^h 1^m 10.5^s ✓ 1 45.0 ✓		
119 52.6 ✓	122 55.5 ✓	3 2.9 ✓	1 31.45 ✓
2 25.0 ✓ 2 59.5 ✓	3 55.0 ✓ 4 30.5 ✓		
125 24.5 ✓	128 25.5 ✓	3 1.0 ✓	1 30.50 ✓
5 14.5 ✓ 5 49.0 ✓	6 43.8 ✓ 7 21.5 ✓		
131 3.5 ✓	134 5.3 ✓	3 1.8 ✓	1 30.90 ✓
8 1.5 ✓ 8 35.5 ✓	9 29.0 ✓ 10 7.1 ✓		
136 37.0 ✓	139 36.1 ✓	2 59.1 ✓	1 29.55 ✓
10 49.2 ✓ 11 22.5 ✓	12 15.5 ✓ 12 56.0 ✓		
142 11.7 ✓	145 11.5 ✓	2 59.8 ✓	1 29.90 ✓
			−1 30.46 ✓
			+0.31 ✓
			−1 30.15 ✓

65 30.93 ✓

9 5 30.93 ✓

Chr. cor. = +3 12.0

9 8 42.93 ✓

0 39 0.66 ✓

8 29 42.33 ✓

−1 23.50 ✓

8 28 18.83 ✓ C. m. T.

4 44 31.0 ✓

13 12 49.83 ✓ Gr. m. T.

Δ ∈	Δ *	∈ + *
$0^m.\ 34.4^s$ ✓	$0^m\ 34.5^s$ ✓	68.9^s ✓
34.5 ✓	35.5 ✓	70.0 ✓
34.5 ✓	37.7 ✓	72.2 ✓
34.0 ✓	38.1 ✓	72.1 ✓
33.3 ✓	40.5 ✓	73.8 ✓
20.7	186.3	71.40 ✓
34.14	37.26	

Lg 71.40 = 1.85370 ✓
" 7.5 = 0.87506 ✓
" cos δ = 9.87288 ✓
399.6 ✓ = 2.60164 ✓
886.0 ✓
√486.4 ✓
243.2 ✓

1.85370 ✓
0.87506 ✓
9.87288 ✓
2.60164 ✓ = 399.6 ✓
886.0 ✓
+8′ 6.4″ ✓ = 486.4 ✓
+3.5
+8 9.9

Comp. of Ref. Cor. on Barnard's ☄ of Mar. 29. 1891

Obs. of Apr. 1. 1891.

Diff. Ref. Computation between Cat. and Unkn. stars.

$9^h\ 24^m.2$ mean of times
$1\ \ 10.8^?$ R.A.

$+8\ \ 13.8$ = H. A.

+41° 40'

ζ = 8°.5 = Alt.
ζ = 81°.5

Log cos φ = +9.8684 ✓
" sin t = +9.9214 ✓
Sum = +9.7898 ✓
Log sin ζ = +9.9952 ✓
" sin g = +9.7946 ✓
g = 38°.5
2g = 77°.0

Log. K = +6.3774 ✓
" $\frac{1}{30}$ = +8.5229 ✓
(41° 38') " cos δ_0 = +9.8732 ✓
(886".0) " + g = +2.9474 ✓
" tan² ζ = +1.6510 ✓
" sin 2g = +9.9887 ✓
+0".23 ✓ = +9.3612 ✓

Log K = +6.3774 ✓
" + g = +2.9474 ✓
" tan² ζ = +1.6510 ✓
" sin² g = +9.9887 ✓
+9".21 = +0.9645 ✓

" K = +6.3774 ✓
(338".5) " (d' − d) = +2.5295 ✓
" tan² ζ = +1.6510 ✓
" cos 2g = +9.3521 ✓
+0".81 = +9.9100 ✓
+9.21
+10".02 = Cor. in δ

Comp. of Ref. Cor. on Barnard's ☄ of Mar. 29. 1891.

Obs: of Apr. 1. 1891.

Diff. Ref. Comp. between Compt. star and comet.

9 8.7 ✓ = mean ☄ transits,
1 8.9 ✓ = R.A.
+7 59.8 ✓

~~+41°~~
+41° 48' ✓

h = 9.°9 Alt.
ζ = 80.°1

Log K = +6.3957 ✓
" $\frac{1}{30}$ = +8.5229 ✓
" cos δ_0 = +9.8731 ✓
" +g = +2.9474 ✓
" tan$^2 \zeta$ = +1.5162 ✓
" sin 2g = +9.9946 ✓
+0.″18 +9.2499 ✓

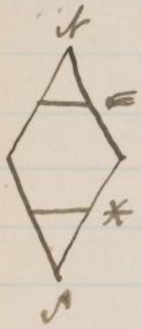
Log K = +6.3957 ✓
" +g = +2.9474 ✓
" tan$^2 \zeta$ = +1.5162 ✓
" sin$^2 g$ = +9.6250 ✓
+3.″05 = +0.4843 ✓

" K = +6.3957 ✓
(486.″4) " (δ'−δ) = +2.6870 ✓
" tan$^2 \zeta$ = +1.5162 ✓
" cos 2g = +9.1943 ✓
+0.″62 = +9.7932 ✓
+3.05
+3.″67 Cor. in δ

Log cos φ = +9.8684 ✓
" sin t = +9.9375 ✓
Sum = +9.8059 ✓
" sin ζ = +9.9935 ✓
" sin g = +9.8124 ✓
g = 40.°5 ✓
2g = 81.°0 ✓

Comet a 1891 (Barnard Mar. 29.)

Obs. of Apr. 8. 1891.



☄		*					
8h 47	4.7	47	25.9				
47	19.4	48	7.7				
94	24.1	95	33.6	1	9.5	0	34.75
48	37.4	48	57.2				
48	50.9	49	40.9				
97	28.3	98	38.1	1	9.8	0	34.90
50	10.1	50	29.2				
50	23.5	51	18.2				
100	33.6	101	47.4	1	9.8	0	34.90
51	40.8	52	2.4				
51	57.3	52	47.2				
103	38.1	104	49.6	1	11.5	0	35.75
53	24.5	53	42.1				
53	36.8	54	29.0				
107	1.3	108	11.1	1	9.8	0	34.90
55	3.1	55	20.1				
55	15.7	56	8.8				
110	18.8	111	28.9	1	10.1	0	35.05
611	144.2						−35.042

Ref. cor. = +0.45

−34.59

Chron cor	8h 51	7.02s	
	+ 3	37.74	
	8h 54	44.76s	
	1 6	36.5s	
	7 48	8.3s	
	1	16.7s	
	7 46	51.6s	C.M.T.
	4 44	31.0	
	12 31	22.6	G.M.T.

0 14.7$^{\wedge\,7}$	0 41.8$^{\wedge\,7}$	0 56.5$^{\wedge\,7}$
0 13.5$^{\wedge\,7}$	0 43.7$^{\wedge\,7}$	0 57.2$^{\wedge\,7}$
0 13.4$^{\wedge\,7}$	0 45.0$^{\wedge\,7}$	0 58.4$^{\wedge\,7}$
0 16.5$^{\wedge\,7}$	0 44.8$^{\wedge\,7}$	0 61.3$^{\wedge\,7}$
0 12.3$^{\wedge\,7}$	0 46.9$^{\wedge\,7}$	0 59.2$^{\wedge\,7}$
0 12.6$^{\wedge\,7}$	0 48.7$^{\wedge\,7}$	0 61.3.$^{\wedge\,7}$
6) 83.0	6) 270.9	58.98$^{\wedge\,7}$
13.83	45.15	

Log 58.98 = 1.77070.

" 7.5 = 0.87506.

" cos δ = 9.91651

365.0^{7} = 2.56227

886.0

521.0 = 8 41.0^{7}

1825
1891
2/66
33
1825
1858

Comet a 1891 (Barnard Mar. 29)

Obs. of Apr. 8. 1891.

Comp. Star = Arg. +34° 266 (9.0 M)

(1855) = (1 23 57.7) (+34° 8.7)

W₂ 1ʰ 518. = 1 22 15.01 +34° 0' 11''.4 (1825)

(1 24 6.8) (+34 10 31.1) (mid. pl.)

21° 1' 37''

+34 10 31.1

Log m/15 +0.12611

" sin α +9.55486

" tan δ +9.83185

Sum. +9.51282

Cor. Log. +0.32570~~00~~

Con. +3.0708

Sum. +3.3965

Log sum. +0.53104

" 66. +1.81954

Sum logs. +2.35058

Cor. Log +224.170 = +3ᵐ 44ˢ.187

Log n = +1.30220

" cos α = +9.97007

" 66. = +1.81954

+1235.40 +3.09181

+20' 35''.4

* 1825.0	1	22	15.01	+34°	0'	11''.4
Prec.		+3	44.16		+20'	35''.4
* 1891.0	1	25	59.17	+34	20	46.8
			−1.90 ~~−1.72~~			−5.8
* App.	1	25	57.45 ~~−34.66~~ ~~−35.08~~	+34	20	41.0 ~~45.9~~ ~~+8 41.0~~
~~☄~~	~~1~~	~~25~~	~~22.81~~	~~+34~~	~~29~~	~~22.0~~
~~☄ (cor. for ref.) =~~	~~1~~	~~25~~	~~22.79~~	~~+34~~	~~29~~	26.9
App. pl. * =	1	25	~~57.45~~ 57.27	+34	20	41.0
☄ − * =			−34.~~59~~ .67		+8	~~47.0~~ 45.7
App. pl. ☄ =	1	25	~~22.86~~ 22.60	+34	29	~~28.0~~ 26.7

Comet a 1891 (Barnard Mar. 29)

Obs. of Apr. 8. 1891.

f = −0.ˢ185
G = 16ʰ 54.1
H = 16 37.4
Log g = +0.6226
" h = +1.2774
" i = −0.8862

G = 16ʰ 54.1 H = 16 37.4
δ 1 26.0 δ 1 26.0
G+δ = 18 20.1 H+δ = 18 3.4

Log 1/15 = +8.8239
" g = +0.6226
" sin(G+δ) = −9.9983
" tan δ = +9.8346
−0.19~~8~~0 −~~2~~9.2794

~~Log g = +0.6226~~
~~" cos(H+δ) = +8.1269~~
+0.056 ~~+8.7495~~

Log 1/15 = +8.8239
" h = +1.2774
" sin(H+δ) = −10.0000
" sec. δ = +0.0832
−1.5~~29~~ 30 −0.1845
−0.19~~3~~0
−0.185
~~−1.722~~, Cor. in R.A.
−1.~~90~~5

~~Log h = +1.2774~~
~~" cos(G+δ) = +8.9424~~
~~" sin δ = 9.7514~~
+0.936 ~~+9.9712~~

~~Log i = −0.8862~~
~~" cos. δ = 9.9168~~
~~−0.8030~~

~~−6.353~~
~~+0.936~~
~~−5.417~~
~~+0.056~~
~~−5.361 Cor. in Dec.~~

Log g = +0.6226
" cos(G+δ) = +8.9424
0.3673 = +9.5650

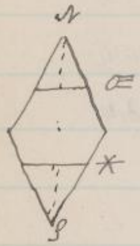
Log i = −0.8862
" cos δ = +9.9168
0−6.354 = −0.8030
+.5104
−5.8440 Cor. in Dec

Log h = +1.2774
" cos(H+δ) = 8.1669
" sin δ = 9.7514
~~1431~~ = +9.1957
0.157

.3673
.1431
.5104

Comet a 1891 (Barnard Mar. 29)

Obs of April 9, 1891.



	☌			*					
8	53	22.5	8	52	39.9				
	53	47.3		53	16.6				
	107	9.8		105	56.5	1	13.3	0	36.65
	55	53.3		55	8.4				
	56	16.3		55	48.0				
	112	9.6		110	56.4	1	13.2	0	36.60
	57	52.2		57	5.8				
	58	14.5		57	47.1				
	116	6.7		114	52.9	1	13.8	0	36.90
	1	7.7		0	18.2				
	1	27.0		1	2.8				
	122	34.7		1	21.0	1	13.7	0	36.85
	3	26.2		2	35.1				
	3	44.~~7~~6		3	22.5				
	127	10.8		5	57.6	1	13.2	0	36.60
	5	57.1		5	20.4				
	6	30.9		5	53.6				
	132	28.0		11	13.9	1	14.1	0	37.05
Rej. this obs. 1st " Cap. thought to be wrong at time of obs.	~~7~~	~~48.2?~~		~~7~~	~~7.4~~				
	~~8~~	~~19.0~~		~~7~~	~~44.1~~				
	~~16~~	~~07.2~~		~~14~~	~~51.5~~	~~1~~	~~15.7~~	~~0~~	~~37.85~~
	11	36.2		10	45.5				
	11	56.5		11	34.3				
	1~~4~~43	32.7		22	19.8	1	12.9	0	36.45
	859	132.3							

Mean Comet T. ~~9 11 30.88~~

Chron. Cor ~~+ 3 42.0~~

~~9 15 12.9~~

~~1 10 33.0~~

~~8 11 39.9~~

~~1 19.4~~

~~8 2 20.5~~ ~~C.M.T.~~

~~4 44 31.0~~

~~12 47 51.5~~ ~~G.M.T.~~

9 1 30.9

+3 42.0 Chr. cor.

9 5 12.9

1 10 33.0

7 54 39.9

−1 17.8

7 53 22.1 C.m.T.

4 44 31.0

12 37 53.1 Gr. m. T.

+ 36.7~~29~~3

Ref. Cor. = ~~+0.61~~

~~+37.34~~

Ref. Cor +0.56

+37.29

0	24.8	0	36.7	61.5
0	23.0	0	39.6	62.6
0	22.3	0	41.3	63.6
0	19.3	0	44.6	63.9
0	18.4	0	47.4	65.8
0	33.8	0	33.1	66.9
	6) 141.6		242.7	
	23.60		40.45	
0	20.3	0	48.8	69.1
				64.77

+33 17 ~~3~~2 8.0
+4 0.0
+33 21 ~~3~~2 8.0
mid. dec.

Log 64.77 = +1.81137
" 7.5 = +0.87506
" cos δ = +~~9.92214~~ 9.92215
406.0" = 2.6085~~7~~8
886.0"
2) 480.0
240.0 = +4' 0.0"

+1.81137
+0.87506
+9.92182
2.6082~~4~~5 = 405.7"
886.0
480.3 = +8' 0.3"
Ref. Cor. = +8.1
+8 8.4

+8 0.3
Ref. Cor. +1.3
+8' 1.6" [illegible]

Comet a 1891 (Barnard Mar. 29.)

Obs. of Apr. 9. 1891.

Comp. Star = Arg. + 33° 252 (7.8 K)

St_2 1h 539. = 1h 23m 1.68s ✓ +32° 56′ 56.4″ ✓ (1825)

1 24 53.12 ✓ +33 7 15.5 ✓ (mid pl.)

21° 13′ 17.″ ✓

Log $\frac{n}{15}$ +0.12611 ✓	Log n = +1.30220 ✓
" sin α +9.55867 ✓	" cos α = +9.96951 ✓
" tan δ +9.81452 ✓	" 66 = +1.81954 ✓
Sum +9.49930 ✓	+1233.8″ = +3.09125 ✓
Cor. 2y. +0.3157 ✓	+20′ 33.8″ ✓
Constant +3.0708 ✓	
Sum. +3.3865 ✓	
Log do. +0.52976 ✓	
Log 66 +1.81954 ✓	
Sum logs. +2.34930 ✓	

Cor. 2y. = +223.51 ✓ = +3m 43.51s ✓

* 1825.0	1 23 1.68 ✓	+32 56 56.4 ✓
	+3m 43.51s ✓	+20′ 33.8″ ✓
* 1891.0	1 26 45.19 ✓	+33 17 30.2 ✓
Red. to Ap. pl.	−1.87 ~~−1.69~~ ✓	−6.0 ✓
Ap. pl. *	1 26 43.32 ~~43.50~~ ~~37.82~~ ✓	+33 17 24.2 ✓
~~☄ − *~~	+0 ~~36.73~~ ✓	+8′ ~~8.4~~ ~~8.3~~ ✓
~~Ap. pl. ☄~~	~~1 27 20.23~~ ✓	~~+33 25 [illegible]~~ ✓
~~☄ (cor for ref.)~~	~~1 27 20.82~~ ✓	~~+33 25 32.6~~ ✓
Ap. pl. * =	1 26 43.32 ~~43.30~~ ✓	+33 17 24.2 ✓
	+37.29 ~~37.34~~ ✓	+8′ 1.6 ~~8.4~~ ✓
Ap. pl. ☄ =	~~1 27 20.46~~ ~~20.79~~ ✓	+33 25 25.8 ~~32.6~~ ✓
=	1 27 20.61 ✓	

Comet a 1891 (Barnard Mar. 29)
Obs. of Apr. 9. 1891.

f = −0.181
G = 16h ~~57.9~~ 54.9
H = 16 33.2
log g = +0.6182
" h = +1.2778
" i = −0.8836

G = 16h ~~57.9~~ 54.9m   H = 16h 33.20
δ   1 26.8   1 26.8
G+δ   18h ~~18.7~~ 21.7   H+δ ~~18~~ 17h 59.9m

log 1/15 = +8.8239
" g = +0.6182
" sin(G+δ) = −9.9981
" tan δ = 9.8173
−0.1809   −29.2575

~~log g = +0.6182~~
~~" cos(H+δ) = +0.0000~~
~~+4.1515   +0.6182~~

~~log h = +1.2778~~
~~" cos(G+δ) = +9.9773~~ 8.9615
~~" sin δ = +9.7395~~ 9.9788
+0.9524 ~~+9.8754~~   ~~+0.9946~~

log 1/15 = +8.8239
" h = +1.2778
" sin(H+δ) = −10.0000
" sec δ = +0.0778
−1.5118   −0.1795
−0.1809
−0.181
−~~1.6927~~ Cor. in R. A.
1.8731

~~log i = −0.8836~~
~~" cos δ = +9.9222~~
~~−6.3944~~   ~~−0.8058~~
~~+0.9524~~
~~+9.8754~~
~~−5.4420~~
~~+3.4810~~
~~4.1515~~
~~−1.2905~~
+~~7.6325~~ ~~Cor in Dec.~~

log g = +0.6182
" cos(G+δ) = +8.9615
0.3799 +9.5797

log i = −0.8836
" cos δ = +9.9222
−6.3944 = −0.8058
+ .3799
~~+10.7899~~
~~+4.3955~~ Cor. in Dec.
−6.0145

~~10.41~~

log h = +1.2778
" cos(H+δ) = ~~+0.0000~~ −7.8199
sin δ = +9.7395
~~10.41~~ ~~+1.0173~~

6.8372

Comet a 1891 (Barnard Mar. 29.)

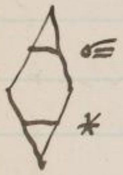
Obs. of Apr. 8.

Refract. Comp.

Alt. = $8.^{\circ}5$ ✓

$\zeta = 81.^{\circ}5$ ✓

Log K = +6.3774 ✓



$t = +7^h\ 29.^m1$

$\delta_0 = +34^{\circ}\ 25'$

Log cos φ = +9.8684

" sin t = +9.9663

+9.8347

" sin ζ = +9.9952

$q = +43.^{\circ}7$ = log sin q = +9.8395

$2q = +87.4$

Log K = = +6.3774

" $\frac{1}{30}$ = +8.5229

" sec δ_0 = +0.0835

" +886.0 = +2.9474

" tan² ζ = +1.6510

" sin $2q$ = +9.9996 ✓

$+0.^s38$ = +9.5818 ✓

Chan. Val. $+0.^s45$

Log K = +6.3774

" +886.0 = +2.9474

" tan² ζ = +1.6510

" sin² q = +9.6788

$+4.''51$ = +0.6546 ✓

" K = +6.3774

" +886.0 = +2.9474

" tan² ζ = +1.6510

" cos $2q$ = +8.6567

$+0.''43$ ✓ = +9.6325 ✓

+4.51 ✓

$+4.''94$ ✓

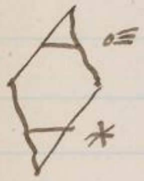
Chan. Val. $+6.''0$

Comet a 1891 (Barnard Mar. 29.

Obs. of Apr. 9.

Refract. Comp.

Alt. = 6.°5 ✓
ζ = 83.°5 ✓



Log cos φ = +9.8684
" sin t = +9.9584
+9.8268
" sin ζ = +9.9972
q = +42.°5 " " q = +9.8296

$2q$ = +85.°0

Log K = +6.3382
" $\frac{1}{30}$ = +8.5229
" sec δ_0 = +0.0774
" +886.0 = +2.9474
" tan² ζ = +1.8866 ~~+9.92[illegible]~~
" sin 2q = +9.9983
~~+0.″01~~ = ~~+7.8086~~ ✓
+0.″59 = +9.7708 ✓

Chan. Val. +0.″59

Log K = +6.3382 ✓
t = +7ʰ 38.ᵐ8
δ_0 = +33° 13′

Log K = +6.3382
" +886.0 = +2.9474
" tan² ζ = +1.8866 ~~+9.92[illegible]~~
" sin² q = +9.6594
~~=+8.8692~~
+6.″79 = +0.8316 ✓

Log K = +6.3382
" +886.0 = +2.9474
" tan² ζ = +1.8866 ~~+9.92[illegible]~~
" cos 2q = +8.9403
~~=+8.1501~~ ✓
+1.″30 = +0.1125 ✓
+6.79
+8.″09 Ref. in δ.

Chan. Val. +8.1

Comet a 1891 (Barnard Mar. 29)

Parallax Comp.

Obs. of Apr. 8. 1891.

~~t~~ H. A. = $+7^h\ 29^m.1$ ✓

$0^s.475$

9.6767
0.0139

+9.6906.

Dec. = $+34^\circ\ 25'$

$6''.11$

0.7860
0.0139

+0.7999.

Obs. of Apr. 9. 1891.

H. A. = $+7^h\ 38^m.8$ ✓

$0^s.459$

9.6618
0.0139

+9.6757.

Dec. = $+33^\circ\ 13'$

$6''.25$

0.7959.
0.0139

+0.8098

Comet 1884 I = Pons-Brooks (1812)

Parallax Computations.

Sept. 21, 1883. (2d series)

9 36 10.
12 1 55.

21 38 5.
16 25 16.

+5 12 49. = H.A.

(+61.°0)

+9.6400 ✓
+9.9908 ✓

+9.6308 ✓
+9.6856 ✓

+9.9452

+0.7734 ✓
+9.4482

+0.2216
+9.9892

+0.2324

+9.9575
+9.3089

+0.6486

77.3 = γ
61.0 = δ

+16.3 = γ − δ

Sept. 22. 1883 (1st series)

10 34 40.
12 5 52.

22 40 32.
16 25 18.

+6 15 14. = H.A.

(+60°.7)

+9.9575 ✓
n8.8156 ✓

n1.1419 ✓

−85.9 = γ
60.7 = δ

−146.6 = γ − δ

+9.6400 ✓
+9.9991 ✓

+9.6391 ✓
+9.6896

+9.9495

+0.7734 ✓
n9.7407 ✓

n0.5141 ✓
n9.9989 ✓

+0.5152 ✓

Comet 1884 I = 1883 b (Pons-Brooks)

Obs. of Oct. 5. 1883.

Comp. Star = Dur. + 58° 1646. = Oe. A. 16314.

16	28	41.44 ✓	+58°	6′	7.6″ ✓	(1882)
		+21.80 ✓		−2	34.0 ✓	
16	29	3.24	+58	3	33.6 ✓	
(247°	15′	49″)				

Log $\frac{n}{15}$ = +0.12610 ✓

" sin α = n9.96487 ✓

" tan δ = +0.20521 ✓

= n0.29618

−1.9778

2.0708

+1.0930 = +0.03862 ✓

41. = +1.61278 ✓

+44.81 ✓ = +1.65140

Log n +1.30219 ✓

" cos α = n9.58715 ✓

" 41. = +1.61278 ✓

−317.8″ = n2.50212 ✓

−5′ 17.8″ ✓

	16	28	41.44 ✓	+58°	6′	7.6″ ✓
			+44.81 ✓		−5	17.8 ✓
* 1883.0	= 16	29	26.25 ✓	+58	0	49.8 ✓
App. pl.	=		−0.66 ✓			+16.6 ✓
App. pl. *	= 16	29	25.59 ✓	+58	1	6.4 ✓
☄ − *	=		+27.~~64~~ 57 ✓		−7	42.~~3~~ 9 ✓
" " ☄	= 16	29	53.~~23~~ .16 ✓ ✓	+57	53	~~24.1~~ 23.5 ✓ ✓

Comet 1884 I = Pons-Brooks. (1812).

Parallax Computations.

Sept. 25. 1883. (2nd series.).

10 56 17.
12 5 52.
23 2 9.
16 25 19.
+6 36 50. = H.A.

+9.6400
+9.9943
+9.6343
+9.6896
+9.9447

(+60.7)

+9.9575
n9.2061
n0.7514

−79.9 = γ
+60.7 = δ
−140.6 = (γ−δ)

+0.7734
n9.8026
n0.5760
n9.9932
+0.5828

Sept. 26. 1883. (1st series)

13 45 4.
12 21 38.
26 6 42.
16 25 49.
+9 40 53. = H.A.

+59.8

+9.6400
+9.7559
+9.3959
+9.7016
(+9.6943)

+9.9575
n9.9147
n0.0428

−47.8 = γ
+59.8 = δ
−107.6 = γ−δ

+0.7734
n9.9792
n0.7526
n9.8697
+0.8829

Comet 1884 I = 1883 b = Pons-Brooks.

Obs. of Oct. 15, 1883.

Comp. Star = DM. +55° 1865 (A.9)

~~Accurate place from Helsingfors - Gotha Zones. (Zones 151 and 152 mean.)~~

Star = Helsingfors - Gotha Cat. No. 8933.

	16h	38m	22.16s	+55°	53′	43.2″	(1875)
			~~+7.80~~ +4.88			−28.0	
mid. pl. =	16	38	~~29.96~~ 27.04	+55	53	15.2	
	~~289°~~ 289	~~37′~~ 36	~~23.~~ 46.				

Log n/15 = +0.12606

" sin α = n9.9719~~4~~1

" tan δ = +0.16918

−1.8500 = n0.2671~~2~~5

+3.0712

+1.2212 = +0.08679

t. = +0.90309

+9.77 = +0.98988

Log n = +1.30216

" cos α = n9.54~~[illegible]~~203

" t. = +0.90309

= ~~n1.74707~~

−55.9″ = n1.74728

* 1875.0 =	16 38	22.1~~6~~5	+55	53	43.2
		+9.77			−55.9
* 1883.0 =	16 38	31.9~~3~~2	+55	52	47.3
		−0.66			+15.7
App. pl. * =	16 38	31.2~~7~~6	+55	53	3.0
☉ − * =	+0	29.50		−4	58.~~3~~7
App. pl. ☉ =	16 39	0.7~~7~~6	+55	48	~~4.7~~ 4.3

Comet 1884 I = 1883 b = Pons – Brooks

Obs. of Oct. 18. 1883.

Comp. Star = Dur. + 55° 1873 (8.3)
" " = Helsingfors – Gotha Cat. No. 8953.

	16	41	40.49 ✓	+55	9	22.3 ✓
			+5.04 ✓			−26.8 ✓
Mid. pl.	16	41	45.53 ✓	+55	8	55.5 ✓
	250°	26′	23.″			

Log $\frac{n}{15}$ = +0.12606 ✓
" sin α = n9.97419 ✓
" tan δ = +0.15718 ✓
−1.8090 ✓ = n0.25743 ✓
+3.0712 ✓
+1.2622 ✓ = +0.10113
A = +0.90309 ✓
+10.10 ✓ = +1.00422 ✓

Log n = +1.30216 ✓
" cos α = n9.52478 ✓
" A. = +0.90309 ✓
−53.″7 = n1.73003

* 1875.0 =	16	41	40.49 ✓	+55	9	22.3 ✓
Prs. =			+10.10 ✓			−53.7 ✓
* 1883.0 =	16	41	50.59 ✓	+55	8	28.6 ✓
Ap. pl. =			−0.6~~4~~6 ✓			~~+16.1~~ +15.6 ✓
Ap. pl. * =	16	41	49.9~~5~~3 ✓	+55	8	~~44.7~~ 44.2 ✓
☄ − * =		+0	34.50 ✓		+5	25.7 ✓
Ap. pl. ☄ =	~~16~~	~~41~~	~~15.45~~	+55	14	~~10.6~~ ✓
	16	42	24.4~~5~~3 ✓			9.9 ✓

Comet 1884 I. (Pons-Brooks.)

5148

Obs. of Oct. 30, 1883.

Harvard College Cat. No. 5148.
Comp. Star = Dm. +53° 1916.

*1875.0 =	17h	1m	35.78s ✓	+52°	59′	21.9″ ✓
			+5.44 ✓			−20.4 ✓
	17	1	41.22 ✓	+52	59	1.5 ✓
	255°	25′	18.″			

Log $\frac{n}{15}$ +0.12606 ✓
" sin α n9.98579 ✓
" tan δ +0.12263 ✓
−1.7158 = n0.23448 ✓
+3.0712 ✓
+1.3554 ✓ = +0.13207 ✓
A. = +0.90309 ✓
+10.84s = +1.03516

Log n = +1.30216 ✓
" cos α = n9.40089 ✓
" A. = +0.90309 ✓
−40.4 ✓ = n1.60614 ✓

* 1875.0 =	17	1	35.78 ✓	+52	59	21.9 ✓
			+10.84 ✓			−40.4 ✓
* 1883.0 =	17	1	46.62 ✓	+52	58	41.5 ✓
Ap. pl. cor. =			−0.58 ✓			+15.~~4~~3 ✓
Ap. pl. * =	17	1	46.04 ✓	+52	58	56.~~9~~8 ✓
		−0	33.59 ✓		−3	10.1 ✓
☾ Ap. pl. =	17	1	12.45 ✓	+52	55	46.~~8~~7 ✓

Comet 1884 I. (Pons-Brooks)

Obs. of Oct. 30. 1883.

$f = +3.026$ ✓
$G = 1^h\ 25^m.3$ ✓
$H = 3\ \ 20^m.5$ ✓
$\text{Log}\ g = +1.3262$ ✓
$"\ \ h = +1.2877$ ✓
$"\ \ i = +0.8103$ ✓

$G = 1^h\ 25^m.3$ ✓ | $H = 3^h\ 20^m.5$ ✓
$\alpha = 17\ \ 1.8$ ✓ | $\alpha = 17\ \ 1.8$ ✓
$G+\alpha = 18\ \ 27.1$ ✓ | $H+\alpha = 20\ \ 22.3$ ✓

$\text{Log}\ \frac{1}{15} = +8.8239$ ✓
$"\ \ g = +1.3262$ ✓
$"\ \sin(G+\alpha) = -9.9970$ ✓
$"\ \tan\delta = +0.1225$ ✓
-1.860 ✓ $= -0.2696$ ✓

$"\ \ \frac{1}{15} = +8.8239$ ✓
$"\ \ h = +1.2877$ ✓
$"\ \sin(H+\alpha) = -9.9103$ ✓
$"\ \sec\delta = +0.2203$ ✓
-1.747 ✓ $= -0.2422$ ✓
-1.860 ✓
-3.607 ✓
$+3.026$ ✓
-0.581 ✓

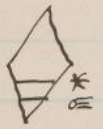
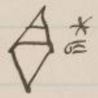
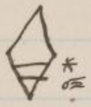
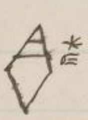
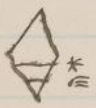
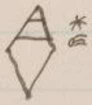
$\text{Log}\ g = +1.3262$ ✓
$"\ \cos(G+\alpha) = +9.0718$ ✓
$+2''.50 = +0.3980$ ✓

$"\ \ h = +1.2877$ ✓
$"\ \cos(H+\alpha) = +9.7648$ ✓
$"\ \sin\delta = +9.9022$ ✓
$+9''.01 = +0.9547$ ✓

$"\ \ i = +0.8103$ ✓
$"\ \cos\delta = +9.7797$ ✓
$+3''.89$ ✓ $= +0.5900$ ✓
$+2.50$ ✓
$+9.01$ ✓
$+15''.40$ ✓

(2d series.) Comet I 1884 (Pons-Brooks)

Obs. of Oct. 4. 1883.

		☄		★					
	21	16	39.3	16	14.7				
		16	46.1	16	20.9				
		17	14.8	17	20.5				
		17	23.2	17	26.8				
		68	3.4	67	22.9	+0	40.5	+0	10.12
		18	8.1	18	13.8				
		18	17.1	18	20.6				
		19	17.3	18	51.2				
		19	23.8	18	58.0				
		75	6.3	74	23.6	+0	42.7	+0	10.68
		20	20.2	19	54.8				
		20	28.0	20	0.9				
		21	0.8	21	6.0				
		21	8.5	21	12.1				
		82	57.5	82	13.8	+0	43.7	+0	10.92
		21	58.5	22	4.7				
		22	7.8	22	11.1				
		22	52.2	22	25.8				
		22	58.5	22	32.1				
		89	57.0	89	13.7	+0	43.3	+0	10.82
		24	4.9	23	38.7				
		24	11.7	23	45.0				
		24	32.0	24	37.9				
		24	39.2	24	44.2				
		97	27.8	96	45.8	+0	42.0	+0	10.50
		25	15.7	25	21.0				
		25	22.2	25	27.2				
		26	14.0	25	48.0				
		26	20.2	25	54.2				
		103	12.1	102	30.4	+0	41.7	+0	10.42
								+0	10.58

21 21 31.8 = mean

−1 34.4

21 19 57.4

12 52 6.7

8 27 50.7 ⊙

−1 23.4

8 26 27.3 C. m. T.

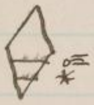
		58 9 27.9 ✓
		+16.7
		+58 9 44.6 ✓
		−2 1.9 ✓
		+58 7 42.7 ✓

Δ☾	Δ*	
36.30 ✓	65.85 ✓	29.55 ✓
67.95 ✓	37.40 ✓	30.55 ✓
40.55 ✓	71.20 ✓	30.65 ✓
52.20 ✓	21.05 ✓	31.15 ✓
27.30 ✓	59.20 ✓	31.90 ✓
58.15 ✓	27.00 ✓	31.15 ✓
		30.82 ✓

30.82 ✓ = +1.48883 ✓
7.5 = +0.87506 ✓
cos δ = +9.72215
−121.9 ✓ = +2.08604 ✓
−2′ 1.9″ ✓

(1st series) Comet. I, 1884. (Pons-Brooks.)

Obs. of Oct. 4, 1883.

	☄		*					
	20 56	50.9	57	10.0				
	56	58.2	57	15.7				
	57	52.2	57	34.0				
	57	58.7	57	40.0				
	229	40.0 ✓	229	39.7 ✓	+0	0.3	+0	0.07 ✓
	~~59~~	~~34.0~~	~~59~~	~~16.6~~				
	~~59~~	~~41.3~~	~~59~~	~~22.6~~				
	~~21 0~~	~~27.7~~	~~0~~	~~40.3~~				
	~~0~~	~~28.8~~	~~0~~	~~46.7~~				
	~~240~~	~~11.8~~ ✓	~~240~~	~~6.4~~ ✓	~~+0~~	~~5.4~~	~~+0~~	~~1.35~~ ✓
	1	19.2	1	37.3				
	1	26.1	1	43.4				
	2	25.1	2	9.3				
	2	33.9	2	15.2				
	247	44.3 ✓	247	45.2 ✓	−0	0.9	−0	0.22 ✓
	3	22.4	3	5.0				
	3	29.8	3	10.9				
	4	3.7	4	21.2				
	4	11.3	4	27.8				
	255	7.2 ✓	255	4.9 ✓	+0	2.3	+0	0.58 ✓
	5	3.7	5	21.1				
	5	11.5	5	27.7				
	6	17.0	5	58.8				
	6	23.7	6	5.1				
	262	55.9 ✓	262	52.7 ✓	+0	3.2	+0	0.80 ✓
	7	8.3	6	52.3				
	7	18.2	6	58.0				
	7	27.8	7	45.3				
	7	35.0	7	51.5				
	269	29.3 ✓	269	27.1 ✓	+0	2.2	+0	0.55 ✓
							+0	0.36 ✓

21 3 14.8 ✓ = mean.
−1 34.4 ✓
21 1 40.4 ✓
12 52 6.7 ✓
8 9 33.7 ✓
−1 20.2 ✓
8 8 13.5 ✓ C. M. T.

~~+58° 5' 15".5~~
~~+16.7~~
~~+58 5 32.2~~

~~58 5 32.2~~
~~1 10.2~~
~~58 6 42.4~~

~~+58 5 32.2~~
~~+2 20.4~~
~~+58 7 52.6~~

Δ☾	Δ*	
60.90	24.15	36.75
66.85	~~31.40~~ 31.90	~~35.45~~ 34.95
41.40	76.55	35.15
72.75	37.55	35.20
14.65	53.25	38.60
		~~35.43~~
		35.33

See Red. B, 8, p. 168.

35.~~43~~ .33 = ~~+1.54937~~ +1.54814
7.5 = +0.87506
cos δ = +9.72279

2/~~140.4~~ 140.0 = ~~2.14722~~ 2.14599
~~70.2~~
70.0

+2 20.0

Comet 1884 I (Pons-Brooks)

Obs. of Sept. 26. 1883. (1st series)

Comp. Star = Dm. +60° 1677 (9.5)

Position for 1883.0 taken from Pulkowa Obs. in A. N. Vol. 109. p. 381.

1883.0 (*)	16	24	26.21 ✓	+60°	0′	5.5″ ✓
Ap. pl.			−0.6~~1~~0 ✓			+17.~~0~~6 ✓
Ap. pl. *	16	24	25.6~~0~~1 ✓	+60	0	~~22.9~~ 23.1 ✓
σ − *		+1	23.0~~7~~2 ✓		−11	~~10.7~~ 12.0 ✓
Ap. pl. σ =	16	25	48.6~~7~~3 ✓	+59	49	~~12.2~~ ~~12.4~~ ✓ 11.1

The above replaces previous computation.

See Red. Book. 3. p. 184.

Comet 1884 I (Pons-Brooks)

Parallax Computations.

Sept. 26. 1883 (2d series)

14 0 13.
12 21 38.
26 21 51.
16 25 50.
+9 56 1. (H.A.)

(+59°.8)

+9.9575 ✓
n9.9331 ✓
n0.0244 ✓

−46.6 = γ
+59.8 = δ
−106.4 = γ − δ

+9.6400 ✓
+9.9869 ✓
+9.6269 ✓
+9.7016 ✓
+9.9253 ✓

+0.7734 ✓
n9.9820 ✓
n0.7554 ✓
n9.8613 ✓
+0.8941 ✓

Oct. 1. (2d series)

9 54 42
12 41 21.
22 36 3.
16 27 35.
+6 8 28. = H.A.

+58.8

+9.9575
n8.5428
n1.4147

−87.8 = γ
+58.8 = δ
−146.6 = γ − δ

0.776
0.845
.069
9
15)621(41
60
21

0.776
41
0.817
9.9122
0139
+9.9261 ✓

+0.7734
n9.7407
n0.5141
n9.9997
+0.5144 ✓

Comet 1884 I. (Pons.-Brooks)

Par. Comp.

Oct. 3. 1883.

7 30 57
12 49 14
20 20 11.
16 28 35.
+3 51 36.

0.658
.717
.059
7
15)413(28
30
113
120

658
28
0.686

9.8363
139
9.8502

+58.4

+0.7734
+8.3558
+9.1292
+9.9362
+9.1930

+9.9575
+9.7242
+0.2333

+59.7 = γ
58.4
+1.3 = γ − δ

Oct. 3. (2d series)

7 44 9
12 49 14
20 37 23.
16 28 35.
+4 8 48. = H. A.

+58.4

+9.9575
+9.6680
+0.2895

+62.8 = γ
+58.4 = δ
+4.4 = γ − δ

+9.6400
+9.9469
+9.5869
+9.7193
+9.8676

+0.7734
+8.8849
+9.6583
+9.9495
+9.7088

Comet 1884 I (Pons-Brooks)

Par. Comps.

Oct. 4. 1883 (1st series)

~~M.T.~~ = 8 8 14   +58.1
~~S.T.~~ = 12 53 11.
S.T. = 21 1 25.
R.A. = 16 29 11.
+4 32 14. (H.A.)

+9.6400 ✓
+9.9672 ✓
+9.6072
+9.7230
+9.8842

+9.9575
+9.5736
+0.3839

+67.5 = γ
+58.1 = δ
+9.4 = γ − δ

+0.7734 ✓
+9.2131 ✓
+9.9865 ✓
+9.9656
+0.0209

Oct. 4. (2d series)

8 26 27.
12 53 11.
21 19 38.
16 29 12.
+4 50 26. (H.A.)

(+58.1)

+9.9575
+9.4721
+0.4854

+71.9 = γ
+58.1 = δ
+13.8 = γ − δ

+9.6400 ✓
+9.9794 ✓
+9.6194 ✓
+9.7230 ✓
+9.8964

+0.7734 ✓
+9.3775 ✓
+0.1509 ✓
+9.9780 ✓
+0.1729 ✓

Comet 1884 I. (Pons - Brooks.)

Par. Comp.

Oct. 5. 1883.

(+57.9)

11 11 57.
12 57 7.
24 9 4.
16 29 53.
+7 39 11.

+9.6400
+9.9582
+9.5982
+9.7254
+9.8728

+0.7734
n9.9231
n0.6965
n9.9580
+0.7385

+9.9575
n9.6219
n0.3356

−65.2 = y
+57.9 = δ
−123.1 = y − δ

Oct. 14. 1883.

9 15 31.
13 32 36.
22 48 7.
16 37 45
+6 10 22. = H.A.

+56.0

+9.6400
+9.9996
+9.6396
+9.7476
+9.8920

+0.7734
n9.7774
n0.5508
n9.9995
+0.5513

+9.9575
n8.6397
n1.3178

−87.2 = y
+56.0 = δ
−143.2 = y − δ

Oct. 15. 1883.

(+55.8)

11 57 0.
13 36 33.
25 33 33.
16 39 1.
+8. 54 32 (H.A.)

+9.6400
+9.8588
(+9.4988)

+0.7734
n9.9770
n0.7504
n9.9006
+0.8498

+9.9575
n9.8398
n0.1177

−52.7 = y
+55.8 = δ
−108.5 = y − δ

Comet 1884 I. (Pons-Brooks).

Par. Comp.

Oct. 16. 1883.

(+55.6)

7 6 2.
13 40 29.
20 46 31.
16 39 56.
+4 6 35.

+9.6400 ✓
+9.9449 ✓
+9.5849 ✓
+9.7520 ✓
+9.8329

+0.7734 ✓
+9.0734 ✓
+9.8468 ✓
+9.9475 ✓
+9.8993 ✓

+9.9575 ✓
+9.6752 ✓
+0.2823 ✓
+62.4 = γ ✓
+55.6 = δ
+6.8 = $\gamma - \delta$

Oct. 17. 1883.

8 9 29. ✓
14 44 26. ✓
22 53 55.
16 41 10.
+6 12 45. = H.A.

+55.4

0.718
.775
57
7
15) 399 (27
30
90 .718
90 .745
.9

0.745
9.8722 ✓
139
9.8861

3.68
3.44
.24
7
15) 168 (11 ✓
15 3.68 ✓
18
3.57 ✓
0.5527
139
0.5666

Comet 1884 I (Pons-Brooks)

Par. Comp.

(Oct. 18. 1883)

7 55 31 +55.2
13 48 22
21 43 53.
16 42 24.
+5 1 29. = H.A.

0.696
.751
55
6
15)330
22

.696
22
0.718
9.8561
139
(+9.8700)

+9.9575
+9.4059
+0.5516

+74.3 = γ
+55.2 = δ
+19.1 = $\gamma - \delta$

+0.7734
+9.5148
+0.2882
+9.9835
+0.3047

Oct. 30. 1883

8 29 34. +52.9
14 35 41.
23 5 15.
17 1 12
+6 4 3. = H.A.

.672
.720
.048
19
432
48
30)912(30.
90
12

.672
30
.702
9.8463
139
9.8602

+9.9575
n8.2419
n1.7156

−88.9 = γ
+52.9 = δ
−141.8 = $\gamma - \delta$

+0.7734
n9.7913
n0.5647
n9.9999
+0.5648

Comet 1884 I (Pons-Brooks)

Par. Comp.

Nov. 8. 1883.

(+51.4)

9 9 14
15 11 10.
24 20 24.
17 20 39.
+6 59 45. = H.A.

.649
.695
46
2
15) 9 2
6

.655
9.8162
139
(+9.8301)

+9.9575 ✓
−9.4130
n0.5445

−74.1 = φ
+51.4 = δ
−125.5 = φ − δ

+0.7734 ✓
n9.9107 ✓
n0.6841 ✓
n9.9831 ✓
(+0.70105)

See B. f. p. 43

Mar 8, 1883

Comet a, 1883. App. Pl. Reduction.

f. +1.362 G. 2 16.3 H 18 50.8
g. 2^h 16.3^m α. 1 1.5 α. 1 1.5
H. 18^h 50.8^m G+α = 3 17.8 H+α = 19 52.3
Log g. +1.0297
" h. +1.2748 δ = +31° 32′ 41″
" i. −0.9015

Log 1/15 = 8.8239
" g. 1.0297
" sin(G+α) 9.8808
" tan δ 9.7882
9.5226 = +0.333

Log g. 1.0297
" cos(G+α) 9.8130
0.8427 = +6.962

Log h. 1.2748
" cos(H+α) 9.6728
" sin δ 9.7187
0.6663 = +4.638

log 1/15 8.8239
" h. 1.2748
" sin(H+α) 9.9456 n
" sec δ 0.0695
0.1138 n = −1.300
f = +1.362
+0.395

Log i. 0.9015 n
" cos δ 9.9305
0.8320 n = −6.792
+4.808

This is correct and supplants that in B. f. p. 43.

See B8. p. 39.

Mar 1, 1883

Comet a, 1883 - App. Pl. reduc.

f. +1.312	G. 2 23.7	H 19 21.0
G. 2 23.7	α 23 52.9	α 23 52.9
H. 19 21.0	G+α = 2 16.6	H+α = 19 13.9
log g. +1.0234		
" h. +1.2773	δ = +31° 13′ 49″	
" i. −0.8871		

log $\frac{1}{15}$	+8.8239	log g.	+1.0234
" g	+1.0234	" cos(G+α)	+9.9179
" sin (G+α)	+9.7493		+0.9413 = +8.736
" tan δ	+9.7913	log h.	+1.2773
	+9.3879 = +0.244	" cos(H+α)	+9.5009
log 1/15	+8.8239	" sin δ	+9.7210
" h.	+1.2773		+0.4992 = +3.156
" sin (H+α)	−9.9771	log i.	−0.8871n
" sec δ	+0.0703	" cos δ	+9.9297
	−0.1486 = −1.408		−0.8168 = −6.558
	f = +1.312		
	+0.148		+5.334

This supplants reduction in B8. p. 39.

See Book 8, p 109.

Nov. 6. 1884.

Comet Wolff - app. Pl. reduction.

f. +2.763 ✓
g. 1 48.1 ✓
H. 2 49.2 ✓
log. g. +1.3062 ✓
" h. +1.2928 ✓
" i. +0.7582 ✓

g. 1 48.1
α 22 21.9
$g+\alpha$ = 0ʰ 10ᵐ.0

H. 2 49.2
α 22 21.9
$H+\alpha$ = 1ʰ 11ᵐ.1

δ = +1° 12' 52"

log $\frac{1}{15}$ +8.8239
" g +1.3062
" sin $(g+\alpha)$ +8.6397
" tan δ +8.3271 ~~8.3270~~
+7.0969 = +0.001

log $\frac{1}{15}$ +8.8239
" h. +1.2928
" sin $(H+\alpha)$ +9.4847
" sec δ +0.0001
+9.6015 = +0.400
f = +2.763
+3.164

log g. +1.3062
" cos $(g+\alpha)$ +9.9996
" 1.3058 = +20.22

log h. +1.2928
" cos $(H+\alpha)$ +9.9788
" sin δ +8.3270
+9.5986 = +0.397

log i. +0.7582
" cos δ +9.9999
+0.7581 = +5.729
+26.346

This supplants reduction in B 8. p109.

Computation of Parallaxes on "Peters New Asteroid" (287).

1889. Sept. 19. (1st series)

21^h 22.4^m = S. T. −17° 28′ = δ

21 57.4^m = R.A.

−0 35.0 = H.A.

7.41
7.18
−.23

$0.^s068$ $7.''37$

8.8325 0.8675

0.0139 0.0139

n8.8464 +0.8814

Sept. 19. (2d ser.)

22^h 53.4^m = S. T. −17° 28′ = δ

21 57.3^m = R.A.

+0 56.1 = H.A.

7.38
7.15
−.23

$0.^s099$ $7.''34$

8.9956 0.8657

0.0139 0.0139

+9.0095 +0.8796

Sept. 23.

−17° 46′

21 34.7^m = S. T.

21 56.2^m = R.A.

≠

−0 21.5 = H.A.

$0.^s043$ $7.''41$

8.6335 0.8698

0.0139 0.0139

n8.6474 +0.8837

Computation of Parallaxes. on Petrea. New Asteroid.

Sept. 24. (1st ser.)

20 58.6 = S.T. —— −17° 51′ −

21 55.8 = R.A.

−0 57.2 ✓ = H.A.

$7''.36$ ✓

$0^{s}.109$ ✓

9.0374 —— 0.8669

0.0139 —— 0.0139

n9.0513 ✓ —— +0.8808 ✓

Sept. 24. (2d ser.)

23^{h} $30^{m}.9$ ✓ = S.T. —— −17° 51′ +

21 55.8 ✓ = R.A.

+1 35.1 ✓ = H.A.

$0^{s}.179$ —— $7''.25$

9.2529 ✓ —— 0.8603 ✓

0.0139 ✓ —— 0.0139 ✓

+9.2668 ✓ —— +0.8742 ✓

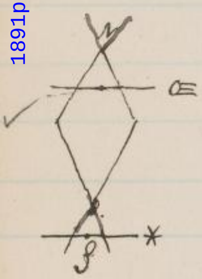
Comp. of Ref.

$26^h\ 7.9^m$ = S.T. +59° 49′
$16\ \ 25.8$ = R.A.
$+9\ \ 42.1$ = H.A.

$26\ \ 23.1$ = S.T.
$16\ \ 25.8$ = R.A.
$+9\ \ 57.3$ = H.A. +59° 49′

Comet Wolf, ~~Sept. 9~~

Obs. of Sept. 9. 1891.



	Comet.	Star.		
22	30 58.9 ✓	29 38.6 ✓		
	31 32.5 ✓	29 51.1 ✓		
	62 31.4 ^	59 29.7 ^	3 1.7 ^	1 30.85 ^
	33 19.6 ✓	31 59.0 ✓		
	33 53.1 ✓	32 11.6 ✓		
	67 12.7 ^	64 10.6 ^	3 2.1 ^	1 31.05 ^
	35 37.0 ✓	34 16.5 ✓		
	36 11.5 ✓	34 29.5 ✓		
	71 48.5 ^	68 46.0 ^	3 2.5 ^	1 31.25 ^
	37 56.2 ✓	36 35.3 ✓		
	38 30.6 ✓	36 48.3 ✓		
	76 26.8 ^	73 23.6 ^	3 3.2 ^	1 31.60 ^
	40 15.5 ✓	38 58.6 ✓		
	40 50.8 ✓	39 4.0 ✓		
	81 6.3 ^	78 2.6 ^	3 3.7 ^	1 31.85 ^
				+ 1 31.32 ✓

357 125.7

22h 35m 54.57 ✓

Chron. cor. +36.3

22 36 30.87 ✓

11 13 46.17 ✓

11 22 44.70 ✓

−1 51.85 ✓

11 20 52.85 C.M.T.

Δ∈	Δ*	−∈+*
0 33.6	0 12.5^{s}	−0 21.1^{s}
0 33.5^{s}	0 12.6^{s}	−0 20.9^{s}
0 34.5^{s}	0 13.0^{s}	−0 21.5^{s}
0 34.4^{s}	0 13.0^{s}	−0 21.4^{s}
0 35.3^{s}	0 13.4^{s}	−0 21.9^{s}
21.3	14.5	−0 21.36^{s} ✓
34.26	12.90	

− 21.36 = 1.32960 ✓

7.5 = 0.87506 ✓

cos δ = 9.96572 ✓

−148.0 ✓ = 2.17038

886.0 ✓

738.0 = +12′ 18.″0 ✓

Comet Wolf.
Obs. of Sept. 9. 1891.

Comp. Star = BD. +22° 602 (A.O.R.)

Comp. Star = Rumker. 3h 1033.

3^h	46^m	46.05^s ✓	$+22°$	$12'$	$1.5''$ ✓	(1836)
	+1	36.40 ✓		+5	2.5 ✓	
3	48	22.45 ✓	+22	17	4.0 ✓	
57°	5′	42.8″				

Log $\frac{m}{15}$	+0.12609 ✓	Log n	= +1.30218 ✓
" sin α	+9.92406 ✓	" cos α	= 9.73500 ✓
" tan δ	+9.61258 ✓	" 55	= 1.74036 ✓
+0.45993	= +9.66273 ✓	+599.16 ✓	= +2.77754 ✓
+3.0709 ✓	+ ~~0.54787~~		
+3.5308 ✓			
Log Aug. term.	= ~~0.21060~~ 0.54787 ✓	+9′ 59.16″ ✓	
Log. 55.	= 1.74036 ✓		
	= + ~~1.95096~~	194.191 + 3m 14.19	
194.19	= +2.28823 ✓ ~~459.7392~~		

	3^h	46^m	46.05^s ✓	+22°	12′	1.5″ ✓	(1836)
		+ 3	14.19 ✓		+ 9	59.2 ✓	
* 1891.0	= 3	50	0.24 ✓	+22	22	0.7 ✓	(1891)
			+1.78			+9.2 ✓	
App. pl. *	= 3	50	2.02 ✓	+22	22	9.9 ✓	
		+1	31.~~32~~ 28 ✓		+12	18.~~0~~ .6 ✓	
	= 3	51	33.3~~4~~ 0 ✓	+22	34	~~27.9~~ 28.5 ✓	

Cor. for Ref. −0.04″ +0.6″

Comet Wolf.

obs. of Sept. 9, 1891.

$\mathcal{G} = 21^{h}\ 50^{m}.9$ ✓ $\mathcal{H}\ \ 6^{h}\ 55^{s}.7$ ✓
$\alpha = \underline{3\ \ \ 50.0}$ ✓ $\alpha\ \underline{3\ \ \ 50.0}$ ✓
$(\mathcal{G}+\alpha) = 1.\ \ 40.9$ ✓ $(\mathcal{H}+\alpha)\ 10^{h}\ \ 45.7$ ✓

$f = +1^{s}.236$ ✓
$\mathcal{G} = +21^{h}\ 50^{m}.9$ ✓
$\mathcal{H} = +\ 6^{h}\ 55^{m}.7$ ✓
$\log g = +0.9804$ ✓
$\text{"}\ h = +1.2752$ ✓
$\text{"}\ i = +0.8996$ ✓

$\log 1/15 = +8.8239$ ✓
$\text{"}\ g = +0.9804$ ✓
$\log \sin.(\mathcal{G}+\alpha) = +9.6296$ ✓
$\text{"}\ \tan\delta = \underline{+9.6144}$ ✓
$+0.112$ ✓ $+9.0483$ ✓

$\log 1/15 = +8.8239$ ✓
$\text{"}\ h = +1.2752$ ✓
$\text{"}\ \sin(\mathcal{H}+\alpha) = +9.5032$ ✓
$\text{"}\ \sec.\delta = \underline{+0.0340}$ ✓
$+0.433$ ✓ $= +9.6363$ ✓
$+0.112$ ✓
$\underline{+1.236}$ ✓
$+1.781$ ✓ Cor. in α

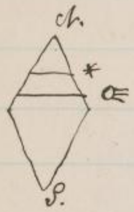
$\log g = +0.9804$ ✓
$\text{"}\ \cos(\mathcal{G}+\alpha) = \underline{+9.9565}$ ✓
$+8''.65$ ✓ $= +0.9369$ ✓

$\log h = +1.2752$ ✓
$\text{"}\ \cos(\mathcal{H}+\alpha) = -9.9768$ ✓
$\text{"}\ \sin\delta = \underline{+9.5804}$ ✓
-6.80 ✓ $= -0.8324$ ✓

$\log i = +0.8996$ ✓
$\text{"}\ \cos.\delta = \underline{+9.9660}$ ✓
$+7''.34$ ✓ $= +0.8656$ ✓
$\underline{+8.65}$ ✓
$+15.99$ ✓
$\underline{-6.80}$ ✓
$+9.19$ ✓ Cor. in α

Comet Swift.

Sept. 10. 1891.



✓

Comet.		Star.					
22 55	35.6 ✓	57	16.7 ✓				
56	24.5 ✓	57	51.5 ✓				
112	0.1 ✓	115	8.2 ✓	3	8.1	1	34.05
58	57.0 ✓	0	38.0 ✓				
59	46.3 ✓	1	13.0 ✓				
118	43.3 ✓	121	51.0 ✓	3	7.7	1	33.85
2	30.0 ✓	4	11.0 ✓				
3	20.4 ✓	4	46.7 ✓				
125	50.4 ✓	128	57.7 ✓	3	7.3	1	33.65
6	5.1 ✓	7	45.9 ✓				
6	56.1 ✓	8	21.8 ✓				
133	1.2 ✓	136	7.7 ✓	3	6.5	1	33.25
9	38.5 ✓	11	19.0 ✓				
10	30.5 ✓	11	55.5 ✓				
140	9.0 ✓	143	14.5 ✓	3	5.5	1	32.75
628	104.0					− 1	33.51 ✓

23h 2m 58.40 ✓

Chron. cor. +40.29 ✓

23 3 38.61 ✓

11 17 42.72 ✓

11 45 55.89

− 1 55.55 ✓

11 44 0.34 C.M.T.

Δ☾	Δ *	☾ - *
0 48.9^	0 34.8^	0 14.1^
0 49.3^	0 35.0^	0 14.3^
0 50.4^	0 35.7^	0 14.7^
0 51.0^	0 35.9^	0 15.1^
0 52.0^	0 36.5^	0 15.5^
251.6	177.9	
50.32	35.58	- 0 14.74^ ✓

Log 14.74 = +1.16850

" cos δ = +9.966~~3~~6

" 7.5 = +0.87506

$-102''.3$ = +2.00992 ✓

$-1' 42''.3$ ✓

Comet Wolf.

Sept. 10. 1891.

Comp. Star = Dm. + 22° 618 (A.G. R.) ✓
" " = Rümker 3^{te} 1062.

3^h 51^m $54^s.70$ ✓ +22° 6′ 48″.0 ✓ (1836)
+1 37.13 +4 52.05
3 53 31.83 ✓ + 22 11 40.05 ✓ (1863½)
58 22 57.45 ✓

~~Log n/15 = +0.12609~~ ✓
~~" sin α = 9.72448~~
~~" tan δ = 9.60888~~
~~0.2880 = 9.45945~~
~~+3.0709~~ ✓
~~3.3589 = +0.52620~~
~~log 55 = +1.74036~~
~~2.26656 = 184.74~~

~~log n = +1.30219~~ ✓
~~" cos δ = +9.96682~~
~~" 55 = +1.74036~~
~~1021.8 = +3.00937~~

log n/15 = +0.12609 ✓
" sin α = +9.93022 ✓
" tan δ = +9.61064 ✓
+0.46446 ✓ = +9.66695 ✓
+3.0709 ✓
+3.5354 ✓ = +0.54844 ✓
log 55 = +1.74036 ✓
+2.28880 ✓ = 194.446 3^m $14^s.45$ ✓

log n = +1.30219 ✓
" cos δ = +9.71957 ✓
" 55 = +1.74036 ✓
+9′ 38″.2 ✓ = 578.2 ✓ = 2.76208 ✓

	3^h	51^m	$54^s.70$ ✓	+22°	6′	48″.0 ✓	(1836)
		+3	14.45 ✓		+9	38.2 ✓	
* 1891.0 =	3	55	9.15 ✓	+22°	16′	26″.2 ✓	(1891.)
Red. to Ap. pl. =			+1.79 ✓			+9.2 ✓	
Ap. pl. * =	3	55	10.94 ✓	+22	16	35.4 ✓	
		−1	33.51 ✓		−1	42.3 ✓	
	3	53	37.43 ✓	+22	14	53.1 ✓	

No appreciable cor. for ref.

Comet Wolfe

Sept. 10, 1891.

G 21 51.9 H 6 51.5
δ 3 55.2 δ 3 55.2
$(G+\delta)$ 25 47.1 $(H+\delta)$ 10 46.7

$f = +1.\overset{s}{2}47$
$G. = 21^h\ 51.\overset{m}{9}$
$H. = 6\ 51.5$
$\log g = +0.9832$
$\text{" } h = +1.2749$
$\text{" } i = +0.9012$

$\log 1/15 = +8.8239$
$\text{" } g = +0.9832$
$\text{" } \sin(G+\delta) = +9.6537$
$\text{" } \tan\delta = \underline{+9.6124}$
$+0.118 = +9.0732$

$\log g = +0.9832$
$\text{" } \cos(G+\delta) = \underline{+9.9507}$
$+8.598 = +0.9339$

$\log 1/15 = +8.8239$
$\text{" } h = +1.2749$
$\text{" } \sin(H+\delta) = +9.4975$
$\text{" } \sec.\delta = \underline{+0.0337}$
$+0.427 = +9.6300$
$+1.247$
$\underline{+0.118}$
$+1.792$ Corr. in α

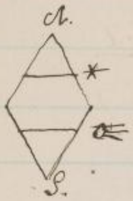
$\log h = +1.2749$
$\text{" } \cos(H+\delta) = -9.9774$
$\text{" } \sin\delta = \underline{+9.5787}$
$-6.78 = -0.8310$

$\log i = +0.9012$
$\text{" } \cos\delta = \underline{+9.9663}$
$\underline{+7.370} = +0.8675$
~~+9.182~~

$+8.59$
$\underline{+7.37}$
$+15.96$
$\underline{-6.78}$
$+9.18$ Corr. in δ.

Comet Wolf.

Sept. 12. 1891.



✓

	Comet.	Star.		
22	38 27.5 ✓	39 46.3 ✓		
	38 55.0 ✓	40 23.0 ✓		
	77 22.5 ✓	80 9.3 ✓	2 46.8 ✓	1 23.40 ✓
	40 58.4 ✓	42 16.7 ✓		
	41 25.5 ✓	42 53.8 ✓		
	82 23.9 ✓	85 10.5 ✓	2 46.6 ✓	1 23.30 ✓
	43 29.3 ✓	44 46.6 ✓		
	43 55.5 ✓	45 24.0 ✓		
	87 24.8 ✓	90 10.6 ✓	2 ~~5~~4 45.8 ✓	1 ~~27.90~~ 22.90 ✓
	46 3.0 ✓	47 20.0 ✓		
	46 28.9 ✓	47 57.4 ✓		
	92 31.9 ✓	95 17.4 ✓	2 45.5 ✓	1 22.75 ✓
	48 32.9 ✓	49 49.2 ✓		
	48 58.2 ✓	50 26.8 ✓		
	97 31.1 ✓	100 16.0 ✓	2 44.9 ✓	1 22.45 ✓
	435 134.2			~~1 23.96~~
				— 1 22.96

22^{h} 43^{m} $43^{s}.42$ ✓ <

Chron. corr. + 0 45.20 ✓

22 44 2~~7~~8.62 < ✓

11 25 35.83^{4} < ✓

11 18 52.79^{8} < ✓

− 1 51.21 < ✓

11 17 1.58^{7} ✓ < C.M.T.

Δ☾	Δ*	☾+*
0 27.5^	0 36.7^	1 4.2^
0 27.1^	0 37.1^	1 4.2^
0 26.2^	0 37.4^	1 3.6^
0 25.9^	0 37.4^	1 3.3^
0 25.3^	0 37.6^	1 2.9^
32.0	36.2	
26.40	37.24	1 3.64^ ✓

6364 = 1.80373 ✓
7.5 = 0.87506 ✓
cos δ = 9.96803 ✓
443.4 = 2.64682
886.0
442.6 = 7′ 22″.6

1.80373
0.59.87506
9.96821
2.64700 = 443.6 ✓
886.0
442.4
− 7′ 22″.4 ✓

Comet Wolf.
Sept. 12. 1891.

Comp. Star = Dm. + 21° 587 (6.5 K) ✓
" " = Weisse 3^h 1215.

3^h 54^m $59.^s74$ ✓ $+21°$ $31'$ $38.''4$ ✓ (1825)
+ 1 56.26 ✓ + 5 43.2 ✓
3 56 56.00 ✓ + 21 37 21.6 ✓
59° 14′ 0″ ✓

log $\frac{n}{15}$ = +0.12610 ✓ log n = +1.30220 ✓
" sin δ = +9.93412 ✓ " cos δ = +9.70888 ✓
" tan δ = +9.59812 ✓ " 66 . = +1.81954 ✓
+0.4553 ✓ +9.65834 ✓ 677.05 ✓ = +2.83062 ✓
+3.0708 ✓ +11′ 17.″0 ✓
+3.5261 ✓ = +0.54729 ✓
log 66 = +1.81954 ✓
+2.36683 ✓ = + 232.72 ✓ 3^m $52.^s72$ ✓

~~3 54 59.74 +21 31 38.4~~
~~+1 56.26 +5 43.2~~
~~3 56 56.00 +21 37 21.6~~

3 54 59.74 ✓ +21 31 38.4 ✓ (1825)
+3 52.72 ✓ +11 17.0 ✓
* 1891.0 = 3 58 52.46 ✓ +21 42 55.4 ✓ (1891)
Ap. pl. cor. = +1.84 ✓ +9.5 ✓
Ap. pl. * = 3 58 54.30 ✓ +21 43 4.9 ✓
−1 22.9~~6~~2 ✓ −7 ~~22.4~~ 23.1 ✓
3 57 31.3~~4~~8 ✓ +21 35 ~~42.5~~ 41.8 ✓

Cor. for ref. +0.^{s}04 −0.″4

$\mathcal{G}$ 21^h^ 53.0^m^ $\mathcal{H}$ 6 43.1

δ 3 58.9 δ 3 58.9

$(\mathcal{G}+\delta)$ 1^h 51.9 $(\mathcal{H}+\delta)$ 10^h 42^m0

$f = +1^a.271$

$\mathcal{G} = 21^h 53.0$

$\mathcal{H} = 6^h 43.1$

$\log g = +0.9902$

" $h = +1.2743$

" $i = +0.9041$

$\log 1/15 = +8.8239$

" $g = +0.9902$

" $\sin(\mathcal{G}+\delta) = +9.6712$

" $\tan\delta = \underline{+9.6002}$

$+0.122 = +9.0855$

+8.634

$\log g_{\mathcal{G}} = +0.9902$

" $\cos(\mathcal{H}+\delta) = \underline{+9.9460}$

$= +0.9362$

$\log h_{\mathcal{H}} = +1.2743$

" $\cos(\mathcal{G}+\delta) = -9.9743$

" $\sin\delta = \underline{+9.5682}$

$= -0.8168$

$\log 1/15 = +8.8239$

" $h = +1.2743$

" $\sin(\mathcal{H}+\delta) = +9.5235$

" $\sec.\delta = \underline{+0.0320}$

$+0.450 = +9.6537$

-6.568

$\log i = +0.9041$

" $\cos\delta = \underline{+9.9680}$

$= +0.8721$

+1.271

$\underline{+0.122}$

+1.393 Cor. in α

$\underline{+7.457}$

~~+9.525~~

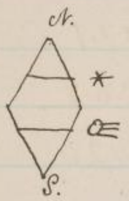
+16.08

-6.56

+9.52 Cor. in δ.

Comet Wolf.

Sept. 14. 1891.



✓

	Comet.		Star.					
22	37	38.9 ✓	37	3.2 ✓				
	38	21.5 ✓	37	51.2 ✓				
	76	0.4 ✓	74	54.4 ✓	1	6.0 ✓	0	33.00 ✓
	39	33.4 ✓	38	56.7 ✓				
	40	15.3 ✓	39	44.8 ✓				
	79	48.7 ✓	78	41.5 ✓	1	7.2 ✓	0	33.60 ✓
	42	57.3 ✓	42	20.2 ✓				
	43	39.0 ✓	43	8.9 ✓				
	86	36.3 ✓	85	29.1 ✓	1	7.2 ✓	0	33.60 ✓
	44	52.9 ✓	44	15.2 ✓				
	45	33.7 ✓	45	4.2 ✓				
	90	26.6 ✓	89	19.4 ✓	1	7.2 ✓	0	33.60 ✓
	46	57.9 ✓	46	19.9 ✓				
	47	38.9 ✓	47	8.9 ✓				
	94	36.8 ✓	93	28.8 ✓	1	8.0 ✓	0	34.00 ✓
							+ 0	33.56~~6~~ ✓

	425	148.8 ✓	
22^h	42^m	44.88 ✓	
Chron corr.	+ 0	54.07 ✓	
22	43	38.95 ✓	
11	33	28.94 ✓	
11	10	10.01 ~~9.99~~ ✓	
	− 1	49.79 ✓	
11	8	20.22 ✓	C.M.T.

Δ ☾	Δ *	☾ + *
0 42.6°	0 48.0°	1 30.6°
0 41.9°	0 48.1°	1 30.0°
0 41.7°	0 48.7°	1 30.4°
0 40.8°	0 49.0°	1 29.8°
0 41.0°	0 49.0°	1 30.0°
8.0	42.8	
41.60	48.56	1 30.16° ✓

90.16 = 1.95501 ✓
7.5 = 0.87506 ✓
cos. δ = 9.97024 ✓
631.4 = 2.80031 ✓
886.0
254.6 = −4′ 14.6″ ✓

1.95501 ✓
0.87506 ✓
9.97034 ✓
2.80041 ✓ = 631.6
886.0
254.4 ✓
−4′ 14.4″ ✓

Comet Wolf.
Sept. 14. 1891.

Comps. Star = D M. + 20° 701 (8.7 K) ✓
" " = Weisse 3h 1266.

$3^h\ 56^m\ 52^s.17$ ✓ $+20°\ 47'\ 1''.3$ ✓ (1825)

+1		55.76 ✓		5′	38.25
3	58	47.93 ✓	20°	52′	39.55.
59	41	58.95 ✓^			

Log u/15 = +0.12610 ✓^
" sin α = +9.93621. ✓^
" tan δ = +9.58140. ✓^
+0.4403 ✓^ = +9.64371 ✓^
+3.0708 ✓^
+3.5111 ✓ =^ +0.54544 ✓^
~~log 66~~ = +1.81954 ✓
+2.36498 ✓ = 231.73 ✓ = $3^m\ 51^s.73$ ✓

Log u = +1.30220 ✓
" cos α = +9.70288 ✓
" 66. = +1.81954 ✓
667.76 ✓ = +2.82462 ✓
$+11'\ 7''.76$ ✓

	3	56	52.17 ✓	+20	47	1.3 ✓
		+3	51.73 ✓		+11	7.76 ✓
* 1891.0 =	4	0	43.90 ✓	+20	58	9.06 ✓
Ap. pl.			+1.89 ✓			+10.0 ✓
Ap. pl. * =	4	0	45.79 ✓	+20	58	19.1 ✓
		+0	33.~~56~~ 61 ✓		−4	~~14.4~~ 15.2 ✓
	4	1	19.~~35~~ 40 ✓	+20	54	~~4.7~~ 3.9 ✓

Cor. for ref. +0.05″ −0.″8

$\mathcal{G}$ 21 52.5 < $\mathcal{H}$ 6 34.6 <
δ 4 0.7 < δ 4 0.7 <
$(\mathcal{G}+\delta)$ 1 53.2 < $(\mathcal{H}+\delta)$ 10 35.3 <

$f = +1.\overset{2}{2}89$ <
$\mathcal{G} = 21^h\ 52.5^m$ <
$\mathcal{H} = 6\ 34.6$ <
log g = +0.9969 <
" h = +1.2739 <
" i = +0.9064 <

log 1/15 = +8.8239 <
" g = +0.9969 <
" sin$(\mathcal{G}+\delta)$ = +9.6759 <
" tan δ = +9.5835 <
+0.120 ~~28~~ = +9.0802 <

log 1/15 = +8.8239 <
" h = +1.2739 <
" sin$(\mathcal{H}+\delta)$ = +9.5577 <
" sec. δ = +0.0298 <
+0.485 ~~54~~ = +9.6853 <
+1.289 <
+0.120 <
+1.894 < Cor. in α

log $g_{\mathcal{G}}$ = +0.9969 <
" cos$(\mathcal{H}+\delta)$ = +9.9447 < ~~9.9677~~
+8.742 < = +0.9416 <

log $h_{\mathcal{H}}$ = +1.2739 <
" cos$(\mathcal{G}+\delta)$ = +9.9697 ~~+9.9447~~
" sin δ = +9.5537 <
∓6.270 < = ∓0.7973^2 <

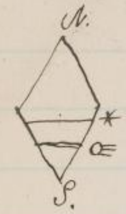
log i = +0.9064 <
" cos δ = +9.9702 <
= 0.8766 <

+7.527 <
~~+9.999~~
+8.74 <
+7.53 <
+16.27 <
−6.27 <
+10.00 < Cor. in δ

Comet Wolf.

Sept. 16. 1891.

✓



Comet.	Star.		
22 54 46.0 ✓	55 14.9 ✓		
55 6.1 ✓	55 55.9 ✓		
109 52.1 ✓	111 10.8 ✓	1 18.7 ✓	0 39.35 ✓
56 58.0 ✓	57 26.8 ✓		
57 17.0 ✓	58 7.7 ✓		
114 15.0 ✓	115 34.5 ✓	1 19.5 ✓	0 39.75 ✓
59 26.0 ✓	59 54.2 ✓		
59 45.0 ✓	60 35.4 ✓		
119 11.0 ✓	120 29.6 ✓	1 18.6 ✓	0 39.30 ✓
23 1 36.5 ✓	2 4.1 ✓		
1 54.4 ✓	2 44.5 ✓		
123 30.9 ✓	4 48.6 ✓	1 17.7 ✓	0 38.85 ✓
4 14.8 ✓	4 42.2 ✓		
4 31.9 ✓	5 22.7 ✓		
128 46.7 ✓	10 4.9 ✓	1 18.2 ✓	0 39.10 ✓
			−0 39.27 ✓

593 155.7
22^h 59^m 33.57 ✓ ✓
Chron. corr. + 1 1.61
23 0 35.18 ✓ ✓
11 41 22.05
11 19 13.13 ✓
− 1 51.27 ✓
11 17 21.86 ✓ G.M.T.

Δ☾	Δ*	* - ☾
0 20.1^s	0 41.0^s	0 20.9^s
0 19.0^s	0 40.9^s	0 21.9^s
0 19.0^s	0 41.2^s	0 22.2^s
0 17.9^s	0 40.4^s	0 22.5^s
0 17.1^s	0 40.5^s	0 23.4^s
93.1	4.0	110.9
18.62	40.80	

mean = 0^m $22^s.18$ ✓

+20 12 48
−1 18
+20 11 30

$22.18 = 1.34596$ ✓
$7.5 = 0.87506$ ✓
$\cos\delta =$ ~~9.97192~~ 9.97239 ✓
$155.9'' =$ ~~2.19294~~ 2.19341 ✓
~~−2 35.9~~ ✓
156.1
78.0

1.34596 ✓
0.87506 ✓
~~9.97194~~ 9.97246 ✓
~~2.19296~~ ✓ ~~= 155.9''~~ ✓
2.19348
~~− 2' 35.9''~~ ✓
156.1 = −2' 36.1'' ✓

Comet Wolf.

Sept. 16. 1891.

Comp. Star = Dm. + 20° 713 (9.5) ✓
To be joined with + 20° 708 (9.1 B)

Lat. ✱ = $4^h\ 0^m\ 11.27$ ✓ $+20°\ 17'\ 32''.0$ ✓ (1855)

+ 1 3.027 + 3 0.54

4 1 14.29 + 20 20 32.54

$60°\ 18'\ 34''.35$ ✓

Log $\frac{n}{w}$ = +0.12607 ✓ Log n = +1.30216 ✓

" sin α = +9.93888 ✓ " cos α = +9.69488 ✓

" tan δ = +9.56907 ✓ " 36. = +1.55630 ✓

0.4306 ✓ = +9.63402 ✓ $5'\ 57''.55$ 357.550 ✓ = +2.55334 ✓

+3.0711 ✓ ✱

+3.5017 ✓ = +0.54428 ✓

log 36 = +1.55630 ✓

2.10058 ✓ = 126.060 ✓ $2^m\ 6.06^{sec.}$ ✓

$4^h\ 0^m\ 11^s.27$ ✓ $+20°\ 17'\ 32''.0$ ✓

+ 2 6.06 ✓ $+5'\ 57.55$ ✓

Lat. ✱ 1891. 4 2 17.33 ✓ + 20 23 29.55 ✓

Ap. pl. = +1.94 ✓ +10.4 ✓

~~Ap. pl. ✱ = 4 2 19.27~~ ✓ ~~+20 23 40.0~~ ✓

~~−0 39.27~~ ✓ ~~−2 35.9~~ ✓

~~4 1 40.00~~ ✓ ~~+20 21 4.1~~ ✓

(See p. p. 206-9)

No appreciable cor. for ref.

Dm. place of + 20° 713 is as fol.

$4^h\ 3^m\ 32^s.4$ + 20° 6'.7 (1855)

Comet Wolfe

Sept. 16, 1891.

$G = 21\ 51.5$ ✓ $H = 6\ 26.1$ ✓

$\alpha = 4\ 2.3$ ✓ $\delta = 4\ 2.3$ ✓

~~25~~ 1 53.8 ✓ 10 28.4 ✓

$f = +1.299$ ✓

$g = 21^h\ 51.5^m$ ✓

$H = 6\ 26.1$ ✓

log g = +1.0014 ✓

" h = +1.2735 ✓

" i = +0.9082 ✓

log 1/15 = +8.8239 ✓

" g = ~~+0.9969~~ +1.0014 ✓

" sin(G+δ) = +9.6780 ✓

" tan δ = +9.5702 ✓

~~+0.11722 = +9.0690~~

+0.118 = +9.0735

log 1/15 = +8.8239 ✓

" h = +1.2735 ✓

" sin(H+δ) = ~~+9.9643~~ +9.5908 ✓

" sec. δ = +0.0281

~~+0.5296 = +9.7168~~

+0.520 ✓ = +9.7156 ✓

+1.299 ✓

+0.118 ✓

+1.937 ✓ Cor in α

log g = ~~+0.9969~~ +1.0014 ✓

" cos(G+δ) = ~~9.9643~~ +9.9441 ✓

~~-0.9612 = -9.145~~

~~+8.82~~ ✓ = +0.9455

log h = +1.2735 ✓

" cos(H+δ) = ~~+9.9441~~ -9.9643 ✓

" sin δ = +9.5421 ✓

~~+0.7601 = +5.756~~

-6.02 ✓ = -0.7799 ✓

log i = ~~+0.9064~~ +0.9082 ✓

" cos δ = +9.9719 ✓

~~+0.8783 = +7.556~~

+7.59 ✓ = +0.8801 ✓ ~~+4.167~~

~~+0.88~~ ~~+0.946~~

~~+8.47~~

~~-6.02~~

~~+2.45 = Cor. in δ~~

+8.82 ✓

+7.59 ✓

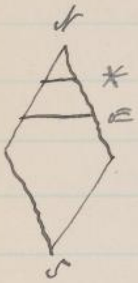
+16.41 ✓

-6.02 ✓

+10.39 ✓ = Cor. in δ

Comet Wolff.

Sept. 26. 1891.



	☄		*					
23	48	39.9	49	56.2				
	49	17.5	50	19.4				
	97	57.4	100	15.6	2	18.2	1	9.10
0	2	0.6	3	17.2				
	2	41.1	3	41.0				
12	4	41.7	6	58.2	2	16.5	1	8.25
	5	11.0	6	28.2				
	5	52.1	6	51.7				
	11	3.1	13	19.9	2	16.8	1	8.40
13								
	7	55.0	9	11.5				
	8	36.0	9	35.4				
	16	31.0	18	46.9	2	15.9	1	7.95
13								
	10	16.3	11	33.0				
	10	58.2	11	57.0				
	21	14.5	23	30.0	2	15.5	1	7.75
14							−1	8.29

629 147.7

$0^h\ 3^m\ 8.77^s$

Chron. corr. +1 37.86

0 4 46.63

12 20 47.58

11 43 59.05

−1 55.33

11 42 3.72 C.M.T.

Δ Œ	Δ *	Œ − *
37.6 ✓	23.2 ✓	14.4°
40.5°	23.8°	16.7°
41.1°	23.5°	17.6°
41.0°	23.9°	17.1°
41.9°	24.0°	17.9°
202.1	118.4	
40.42	23.68	0 16.74° ✓

16.74 = 1.22376 ✓
7.5 = 0.87506 ✓
cos δ = 9.98271 ✓
120.6″ = 2.08153 ✓
−2′ 0.6″ ✓

1.22376 ✓
0.87506 ✓
9.98274 ✓
2.08156 ✓ = 120.7″
−2′ 0.7″ ✓

Comet Wolff.

Sept. 26. 1891.

Comp. Star = Dur. +15° 630 (8.7 P.)
" " = Piazzi 4h No. 86.

4h 16m 55.52s ✓ +15° 50′ 33.0″ ✓ (1800)
+2 36.16 ✓ +6 36.8 ✓
4h 19m 30.68s ✓ 15° 57′ 9.8″ ✓
64° 52′ 40.20″ ✓

Log m/15 = +0.12614 ✓
" sin α = +9.95684 ✓
" tan δ = 9.45614 ✓
+0.3460 = +9.53912 ✓
+3.0705 ✓
+3.4165 = +0.53358 ✓
log 91 = +1.95904 ✓
+2.49262 = +310.90 sec. = +5m 10.90 sec.

Log n = +1.30223 ✓
" cos α = +~~9.98294~~ 9.62793 ✓
" 91 = +1.95904 ✓
= +2.88920 ✓

774.8″ ✓
+12′ 54.8″ ✓

4h 16m 55.52 sec. ✓ +15° 50′ 33.0″ ✓ (1800)
+5m 10.90 ✓ +12′ 54.8″ ✓
∗ 1891.0 = 4h 22m 6.42 sec. ✓ +16° 3′ 27.8″ ✓ (1891)
Ap. pl. cor. = +2.10 ✓ +11.8 ✓
Ap. pl. ∗ = 4 22 8.52 ✓ +16 3 39.6 ✓
−1 8.29 ✓ −2 0.7 ✓
4 21 0.23 ✓ +16 1 38.9 ✓

No appreciable cor. for ref.

Comet Wolf.

Sept. 26, 1891.

$G \quad 21^{l} \quad 57.8 \qquad H \quad 5 \quad 43.4$

$\delta \quad \underline{4 \quad 22.1} \qquad \delta \quad \underline{4 \quad 22.1}$

$\overset{2}{\cancel{26}} \quad 19.9 \qquad 10 \quad 5.5$

$f = +1.\overset{2}{3}68$

$G = 21 \quad 57.8$

$H = 5 \quad 43.4$

$\log g = +1.0165$

$\text{"} \; h = +1.2733$

$\text{"} \; i = +0.9096$

$\log 1/15 = +8.8239$

$\text{"} \; g = +1.0165$

$\text{"} \; \sin(G+\delta) = +9.7583$

$\text{"} \; \tan\delta = \underline{+9.4591}$

$+0.114 = +9.0578$

$\log 1/15 = +8.8239$

$\text{"} \; h = +1.2733$

$\text{"} \; \sin(H+\delta) = +9.6804$

$\text{"} \; \sec\delta = \underline{+0.0173}$

$+0.62\overset{4}{3} = +9.7949$

$+1.368$

$\underline{+0.114}$

$+2.105$ Cor. in α

$\log g_{G} = +1.0165$

$\text{"} \; \cos(G+\delta) = \underline{+9.9135}$

$= +0.9300$

$+8.515$

$\log h_{H} = +1.2733$

$\text{"} \; \cos(G+\delta) = -9.9434$

$\text{"} \; \sin\delta = \underline{+9.441\overset{9}{8}}$

$= -0.658\overset{6}{5}$

$-4.55\overset{6}{5}$

$\log i = +0.9096$

$\text{"} \; \cos\delta = \underline{+9.9827}$

$= +0.8923$

$\underline{+7.80\cancel{4}}$

~~+11.760~~

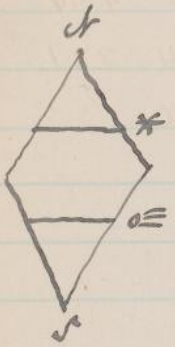
$+16.31$

$\underline{-4.55\overset{6}{5}}$

$+11.7\overset{5}{6}$ Cor. in δ

Barnard's New Comet. (disc. Sept. 27. 1891)

Sept. 30. 1891.



	☄	*		
23	2 42.1 ✓	3m 59.0 ✓		
	3 20.1 ✓	4 17.5 ✓		
	6 2.2 ✓	8 16.5 ✓	2m 14.3s ✓	1m 7.15s ✓
	4 54.8 ✓	6 11.8 ✓		
	5 32.5 ✓	6 29.5 ✓		
	10 27.3 ✓	12 41.3 ✓	2 14.0 ✓	1 7.00 ✓
	7 26.2 ✓	8 42.0 ✓		
	8 3.9 ✓	9 0.0 ✓		
	15 30.1 ✓	17 42.0 ✓	2 11.9 ✓	1 5.95 ✓
	10 13.1 ✓	11 31.8 ✓		
	10 52.8 ✓	11 49.2 ✓		
	21 5.9 ✓	23 21.0 ✓	2 15.1 ✓	1 7.55 ✓
	12 53.7 ✓	14 11.5 ✓		
	13 33.3 ✓	14 29.6 ✓		
	26 27.0 ✓	28 41.1 ✓	2 14.1 ✓	1 7.05 ✓
	15 34.9 ✓	16 50.4 ✓		
	16 12.1 ✓	17 7.7 ✓		
	31 47.0 ✓	33 58.1 ✓	2 11.1 ✓	1 5.55 ✓
				−1 6.71 ✓

	~~23~~	~~9~~	~~16.6~~ ✓
Chr. cor.		~~+1~~	~~54.2~~ ✓
	~~23~~	~~11~~	~~10.8~~ ✓
	~~12~~	~~36~~	~~33.8~~ ✓
	~~10~~	~~34~~	~~37.0~~ ✓
		~~−1~~	~~44.0~~ ✓
	~~10~~	~~32~~	~~53.0~~ ✓ ~~= C. m. T.~~

23h	9m	16.6s ✓	
	+1	15.4 ✓	Ch. cor.
23	10	32.0s ✓	
12	36	33.8s ✓	
10	33	58.2s ✓	
	−1	43.9s	
10	32	14.3s ✓	= C. m. T. obs.

Δ∈	Δ*	
0^m $38^s.0$ ✓	0^m $18^s.5$ ✓	0^m $56^s.5$ ✓
0 37.7 ✓	0 17.7 ✓	0 55.4 ✓
0 37.7 ✓	0 18.0 ✓	0 55.7 ✓
0 39.7 ✓	0 17.4 ✓	0 57.1 ✓
0 39.6 ✓	0 18.1 ✓	0 57.7 ✓
0 37.2 ✓	0 17.3 ✓	0 54.5 ✓
		0 56.15 ✓

56.15 = 1.74935 ✓
7.5 = 0.87506 ✓
cos δ = 9.99984 ✓
421.1 = 2.62435
886.0
464.9 = −7′ 44.″9 ✓

{ No refraction.
{ No proper motion.

Barnards New Comet. (disc. Sept. ~~26.~~ 27. 1891)

Sept. 30. 1891.

Comp. Star = DM. −1° 4090 (9.5 B.)
This star turns out to be unlettered.

See p. 76.

~~$f = +1.^{s}387$~~
~~$G = 21^{h}\,56.^{m}3$~~
~~$H = 5\;26.3$~~
~~$\log g = +1.0243$~~
~~" $h = +1.2739$~~
~~" $i = +0.9068$~~

~~$\log 1/15 = +8.8239$~~
~~" $g = +1.0243$~~
~~" $\sin(G+\delta) =$~~
~~" $\tan\delta =$~~

~~$\log 1/15 = +8.8239$~~
~~" $h = +1.2739$~~
~~" $\sin(H+\delta) =$~~
~~" $\sec.\delta =$~~

~~$\log g = +1.0243$~~
~~" $\cos(H+\delta) =$~~

~~$\log h = +1.2739$~~
~~" $\cos(G+\delta) =$~~
~~" $\sin.\delta =$~~

~~$\log i = +0.9068$~~
~~" $\cos\delta =$~~

Barnard's New Comet.

Sept. 30. 1891.

Pos. of star to which −1° 4090 is to be joined.

Dm. −0° 4136 (9.0 K)

Star = St. XX. 1315

20	49	57.83 ✓	−1°	5′	43.1″ (1825)
	+1	41.94 ✓		+7	27.2 ✓
20	51	39.77 ✓	−0	58	15.9 ✓
312°	54′	56.6″ ✓			

Log $\frac{m}{15}$ = +0.12611 ✓

" sin α = n9.86472 ✓

" tan δ = n8.22919 ✓

+0.0166 ✓ = +8.22002 ✓

+3.07008 ✓

+3.08674 ✓ = +0.48960 ✓

66. = +1.81954 ✓

203.77 ✓ = +2.30914 ✓

Log n = +1.30220 ✓

" cos α = +9.83309 ✓

" 66. = +1.81954 ✓

+901.2″ = +2.95483 ✓

		20^h	49^m	$57.^s83$ ✓	−1°	5′	43.1″ ✓
			+3	23.77 ✓		+15	1.2 ✓
* 1891.0	=	20	53	21.60 ✓	−0	50	41.9 ✓
Un. * − St. *	=		+0	49.96 ✓		−5	20.7 ✓
Un. St. * 1891.0	=	20	54	11.56 ✓	−0	56	2.6 ✓
Red. to Ap. pl.	=			+2.12 ✓			+10.1 ✓
Ap. pl. Un. *	=	20	54	13.68 ✓	−0	55	52.5 ✓
☄ − Un. *	=		−1	6.71 ✓		−7	44.9 ✓
Ap. pl. ☄	=	20	53	6.97 ✓	−1	3	37.4 ✓

Barnards New Comet.

Sept. 30. 1891.

Assume App. Pos. Comp. Star = 20h 54.2m and −0° 55.2′

f = +1.s387

G = 21h 56.m3

H. = 5 26.3 (G+α = 18 50.5

21 56.3
20 54.2

5 26.3
20 54.2
2 20.5 = H+α

Log g = +1.0243

" h = +1.2739

" i = +0.9068

Log $\frac{1}{15}$ = +8.8239
" g = +1.0243
" sin(G+α) = −9.9894
" tan δ = n8.2057
+0.011 = +8.0433

" $\frac{1}{15}$ = +8.8239
" h = +1.2739
" sin(H+α) = +9.7600
" sec δ = +0.0001
+0.721 = +9.8579

+1.387
+0.011
+0.721
+2.119 = Cor. in α

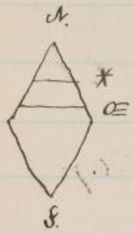
Log g = +1.0243
" cos(G+α) = +9.339$\overset{6}{5}$
+2.″31 +0.363$\overset{9}{8}$

" h = +1.2739
" cos(H+α) = +9.9127
" sin δ = n8.2056
−0.25 = n9.3922

" i = +0.9068
" cos δ = +9.9999
+8.07 = +0.9067
+2.31
+10.38
−0.25
+10.13 = Cor. in δ.

Barnard's New Comet. (Sept. 27)

Oct. 1. 1891.



☄	*			
22h 8 40.4 ✓	22 9 23.6 ✓			
9 16.3 ✓	9 31.3 ✓			
17 56.7 ✓	18 54.9 ✓	0 58.2 ✓	0	29.10 ✓
10 38.2 ✓	11 23.1 ✓			
11 15.1 ✓	11 30.8 ✓			
21 53.3 ✓	22 53.9 ✓	1 0.6 ✓	0	30.30 ✓
14 19.3 ✓	15 3.3 ✓			
14 53.2 ✓	15 11.0 ✓			
29 ~~15~~ 12.5 ✓	30 14.3 ✓	1 1.8 ✓	0	30.90 ✓
17 52.7 ✓	18 36.7 ✓			
18 31.7 ✓	18 48.4 ✓			
36 24.4 ✓	37 25.1 ✓	1 0.7 ✓	0	30.35 ✓
20 1.8 ✓	20 44.8 ✓			
20 39.0 ✓	20 55.7 ✓			
40 40.8 ✓	41 40.5 ✓	0 59.7 ✓	0	29.85 ✓
22 52.0 ✓	23 35.6 ✓			
23 30.1 ✓	23 46.8 ✓			
46 22.1 ✓	47 22.4 ✓	1 0.3 ✓	0	30.15 ✓
25 23.1 ✓	26 7.0 ✓			
26 0.7 ✓	26 18.2 ✓			
51 23.8 ✓	52 25.2 ✓	1 1.4 ✓	0	30.70 ✓

22	27	36.8 ✓	22	28	20.5 ✓			
	28	14.0 ✓		28	31.7 ✓			
	55	50.8 ✓		56	52.2 ✓	1	1.4 ✓	0 30.70 ✓
	30	58.8 ✓		31	41.8 ✓			
	31	36.1 ✓		31	53.2 ✓			
	62	34.9 ✓		63	35.0 ✓	1	0.1 ✓	0 30.05 ✓
	35	46.2 ✓		36	29.5 ✓			
	36	22.3 ✓		36	39.2 ✓			
	72	8.5 ✓		73	8.7 ✓	1	0.2 ✓	0 30.10 ✓
	38	21.0 ✓		39	3.9 ✓			
	38	55.9 ✓		39	13.8 ✓			
	77	16.9 ✓		78	17.7 ✓	1	0.8 ✓	0 30.40 ✓
								— 0 30.24 ✓

22^h 23^m $15^s.6$ ✓ = mean of times.

+1 15.6 ✓ = Cor. to 1327.

22 24 31.2 ✓

12 40 30.3 ✓

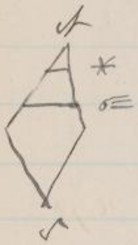
9 44 0.9 ✓

−1 35.7 ✓

9 42 25.2 ✓ C. m. T. obs.

{ No refraction,
{ No. proper motion.

Barnard's New Comet.
Oct. 1. 1891.



Δ☄	Δ*	
35.9 ✓	7.7 ✓	28.2 ✓
36.9 ✓	7.7 ✓	29.2 ✓
33.9 ✓	7.7 ✓	26.2 ✓
39.0 ✓	11.7 ✓	27.3 ✓
37.2 ✓	10.9 ✓	26.3 ✓
38.1 ✓	11.2 ✓	26.9 ✓
37.6 ✓	11.2 ✓	26.4 ✓
37.2 ✓	11.2 ✓	26.0 ✓
37.3 ✓	11.4 ✓	25.9 ✓
36.1 ✓	9.7 ✓	26.4 ✓
34.9 ✓	9.9 ✓	25.0 ✓
		26.71 ✓

26.71 = +1.42667 ✓
7.5 = +0.87506 ✓
cos δ = +9.99995 ✓
−200.″3 ✓ = +2.30168

Barnard's New Comet.

Oct. 1. 1891.

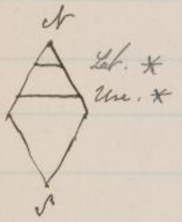
~~20^h 54^m 13.68^s −0° 55′ 52.5″ (Lamp. 76)~~

−0° 4136 for 1891.0 =	20	53	21.60 ✓	−0	50	41.9 ✓
			+2.10 ✓			+10.1 ✓
Ap. pl. ★ =	20	53	23.70 ✓	−0	50	31.8 ✓
☌ − ★ =		−0	30.24 ✓		−3	20.3 ✓
Ap. pl. ☌ =	20	52	53.46 ✓	−0	53	52.1 ✓

Barnard's New Comet.

Transits to join unlettered Comp. Star of Sept. 30 to Lettered Comp. Star of Oct. 1.

Lettered Star = −0° 4136 and unlet * = −1° 4090.



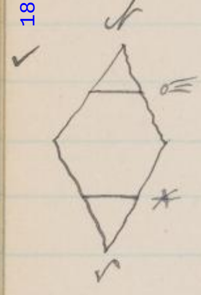
Unl. * −1° 4090	Lett * −0° 4136		
22 46 15.7 ✓	22 45 47.0 ✓		
47 6.9 ✓	45 55.3 ✓		
93 22.6 ✓	91 42.3 ✓	1 40.3 ✓	0 50.15 ✓
47 54.8 ✓	47 26.0 ✓		
48 45.7 ✓	47 34.5 ✓		
96 40.5 ✓	95 0.5 ✓	1 40.0 ✓	0 50.00 ✓
49 44.0 ✓	49 15.2 ✓		
50 35.0 ✓	49 23.3 ✓		
100 19.0 ✓	98 38.5 ✓	1 40.5 ✓	0 50.25 ✓
51 49.2 ✓	51 20.3 ✓		
52 39.9 ✓	51 28.4 ✓		
104 29.1 ✓	102 48.7 ✓	1 40.4 ✓	0 50.20 ✓
54 12.6 ✓	53 44.4 ✓		
55 3.2 ✓	53 52.5 ✓		
109 15.8 ✓	107 36.9 ✓	1 38.9 ✓	0 49.45 ✓
56 18.2 ✓	55 49.7 ✓		
57 9.2 ✓	55 57.6 ✓		
113 27.4 ✓	111 47.3 ✓	1 40.1 ✓	0 50.05 ✓
59 2.3 ✓	58 34.2 ✓		
59 53.3 ✓	58 42.2 ✓		
118 55.6 ✓	117 164 ✓	1 39.2 ✓	0 49.60 ✓
			0 49.96 ✓

Δ Unk.*	Δ Lett.*	
0 51.2 ✓	0 08.3 ✓	42.9″ ✓
0 50.9 ✓	0 8.5 ✓	42.4 ✓
0 51.0 ✓	0 8.1 ✓	42.9 ✓
0 50.7 ✓	0 8.1 ✓	42.6 ✓
0 50.6 ✓	0 8.1 ✓	42.5 ✓
0 51.0 ✓	0 7.9 ✓	43.1 ✓
0 51.0 ✓	0 8.0 ✓	43.0 ✓
		42.77 ✓

42.77 = 1.63114 ✓
7.5 = 0.87506 ✓
cos δ = 9.99995 ✓
— 320.7″ ✓ = 2.50615 ✓

Barnards New Comet. (Sept. 27)

Oct. 2. 1891.



	☄	*		
21h	18m 16.1s	18m 59.8s		
	18 55.0	19 27.1		
	37 11.1	38 26.9	1m 15.8s	0m 37.90s
	19 53.2	20 36.9		
	20 31.0	21 4.2		
	40 24.2	41 41.1	1 16.9	0 38.45
	21 40.8	22 24.4		
	22 19.8	22 51.9		
	44 0.6	45 16.3	1 15.7	0 37.85
	24 53.0	25 36.0		
	25 30.4	26 3.2		
	50 23.4	51 39.2	1 15.8	0 37.90
	27 59.4	28 42.0		
	28 36.4	29 11.0		
	56 35.8	57 53.0	1 17.2	0 38.60
22	10 29.8	11 2.8		
	10 55.0	11 40.7		
	21 24.8 14	22 43.5	1 18.7	0 39.35
	13 19.9	13 52.4		
	13 44.2	14 30.7		
	27 4.1 14	28 23.1	1 19.0	0 39.50
	15 21.2	15 53.6		
	15 45.6	16 31.8		
	31 6.8 15	32 25.4	1 18.6	0 39.30
				− 0 38.61

Mean of times = 21h 41m 45.7
Cl. cor. = +1 15.8

21 43 1.5
12 44 26.9

8 58 34.6
−1 28.2

8 57 6.4 C. M. T. obs.

Δ☾	Δ*	
38.9" ✓	27.3" ✓	66.2 ✓
37.8 ✓	27.3 ✓	65.1 ✓
39.0 ✓	27.5 ✓	66.5 ✓
37.4 ✓	27.2 ✓	64.6 ✓
37.0 ✓	29.0 ✓	66.0 ✓
25.2 ✓	37.9 ✓	63.1 ✓
24.3 ✓	38.3 ✓	62.6 ✓
24.4 ✓	38.2 ✓	62.6 ✓
		64.59 ✓

64.59 = 1.81017 ✓

7.5 = 0.87506 ✓

cos δ = 9.99996 ✓

484.4 ✓ = 2.68519 ✓

886.0

401.6 = +6' 41.6" ✓

Barnard's New Comet. (Sept. 27)

Oct. 2. 1891.

Comp. Star same as on Oct. 1. = Dm. -0° 4136.
" " = W. XX. 1315.

* 1891.0 =	20h	53m	21.60s ✓	-0°	50′	41.9″ ✓
Ap. Pl. Cor. =			+2.08 ✓			+10.1 ✓
Ap. pl. * =	20	53	23.68	-0	50	31.8 ✓
☌ - * =		-0	38.61 ✓		+6	41.6 ✓
Ap. pl. ☌ =	20	52	45.07	-0	43	50.2 ✓

Barnard's New Comet (Sept. 27.)

Oct. 2. 1891.

$f = +1.387$
$G = 21^h\ 56.2^m$
$H = 5\ \ 17.8$
$\log g = +1.0242$
$\log h = +1.2743$
$\log i = +0.9044$

$$\begin{array}{rr} 21 & 56.2 \\ 20 & 53.4 \\ \hline 18 & 49.6 \\ (G+A) & \end{array} \qquad \begin{array}{rr} 5 & 17.8 \\ 20 & 53.4 \\ \hline 2 & 11.2 \\ (H+A) & \end{array}$$

$\log \frac{1}{\omega} = +8.8239$
$\log g = +1.0242$
$\log \sin(G+A) = -9.9898$
$\log \tan \delta = 8.168\overset{7}{5}$
$+0.010 = +8.0064$

$\log \frac{1}{\omega} = +8.8239$
$\log h = +1.2743$
$\log \sin(H+A) = +9.7338$
$\log \sec \delta = +0.0001$
$+0.679 = +9.8321$
$+1.387$
$+0.010$
$+2.076$ Cor. in α

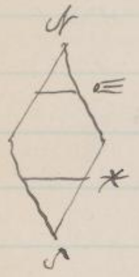
$\log g = +1.0242$
$\log \cos(G+A) = +9.3319$
$+2.27'' = +0.3561$

$\log h = +1.2743$
$\log \cos(H+A) = +9.9246$
$\log \sin \delta = -8.1684$
$-0.23 = -9.3673$

$\log i = +0.9044$
$\log \cos \delta = +9.9999$
$+8.02 = +0.9043$
$+2.27$
$+10.29$
-0.23
$+10.06$ Cor. in δ.

Barnard's New Comet (1891 d) = Sept. 27.

Obs. of Oct. 3. 1891.



	☌	*		
22h	1m 55.0	2m 33.7		
	2 26.1	3 15.2		
	4 21.1	5 48.9	1m 27.8	0m 43.90
	3 49.0	4 26.1		
	4 19.7	5 9.6		
	8 8.7	9 35.7	1 27.0	0 43.50
	9 4.3	9 42.9		
	9 34.2	10 24.2		
	18 38.5	20 7.1	1 28.6	0 44.30
	11 35.0	12 13.4		
	12 5.0	12 54.8		
	23 40.0	25 8.2	1 28.2	0 44.10
	14 4.0	14 41.7		
	14 32.7	15 23.8		
	28 36.7	30 5.5	1 28.8	0 44.40
	17 35.6	18 13.7		
	18 4.7	18 55.7		
	35 40.3	37 9.4	1 29.1	0 44.55
	20 47.4	21 25.0		
	21 16.2	22 7.2		
	42 3.6	43 32.2	1 28.6	0 44.30
	23 10.8	23 48.2		
	23 39.7	24 30.8		
	46 50.5	48 19.0	1 28.5	0 44.25
	25 20.6	25 58.0		
	25 48.5	26 40.1		
	51 9.1	52 38.1	1 29.0	0 44.50
				− 0 44.20

Mean of times,

22h	14m	23.8s
	+1	16.0
22	15	39.8
12	48	23.4
9	27	16.4
	−1	32.9
9	25	43.5

C. M. T.

Δ σ≡	Δ ✱	
31.″1 ✓	41.″5 ✓	72.″6 ✓
30.7 ✓	43.5 ✓	74.2 ✓
29.9 ✓	41.3 ✓	71.2 ✓
30.0 ✓	41.4 ✓	71.4 ✓
28.7 ✓	42.1 ✓	70.8 ✓
29.1 ✓	42.0 ✓	71.1 ✓
28.8 ✓	42.2 ✓	71.0 ✓
28.9 ✓	42.6 ✓	71.5 ✓
27.9 ✓	42.1 ✓	70.0 ✓
		71.53 ✓

71.53 = 1.85449 ✓
7.5 = 0.87506 ✓
cos δ = 9.99998 ✓
536.4 ✓ = 2.72953 ✓
886.0 ✓
349.6 = +5′ 49.″6 ✓

Barnard's Comet 1891 ~~b~~ d = 1891. Sept. 27.
Obs. of Oct. 3. 1891.

Comp. Star = Dm. −0° 4135 (9.2 K)
" " = Weisse XX 1317.

	20 49 58.78 ✓	−0° 53′ 58.″3 ✓	1825
	+1 41.80 ✓	+7 27.2 ✓	
mid. pl. =	20 51 40.58 ✓	−0 46 31.1	
	α 312° 55′ 8.″7 ✓		

Log $\frac{n}{15}$ = +0.12610 ✓
" sin α = n9.86870 ✓
" tan δ = n8.13136 ✓
+0.0132 = +8.12216 ✓
+3.0708 ✓
+3.08440 ✓ = 0.48911 ✓
66. = 1.81954 ✓
203.54 ✓ = 2.30865 ✓

Log n = +1.30219 ✓
" cos α = +9.83312 ✓
" 66. = +1.81954 ✓
+901.″3 ✓ = +2.95485

★1825.0 =	20 49 58.78 ✓	−0 53 58.3 ✓
	+3 23.54 ✓	+15 1.3 ✓
★1891.0 =	20 53 22.32 ✓	−0 38 57.0 ✓
	+2.06 ✓	+10.1 ✓
Ap. pl. ★ =	20 53 24.38 ✓	−0 38 46.9 ✓
☄ − ★ =	−0 44.20 ✓	+5 49.6 ✓
Ap. pl. ☄ =	20 52 40.18 ✓	−0 32 57.3 ✓

(No. ref.
" Prop. mot.)

Barnard's Comet. = 1891 ~~b~~ d = 1891 Sept. 27,

Obs. of Oct. 3. 1891.

f = +1.388 ✓
G = 21 56.8 ✓
H = 5 13.5 ✓
Log g = +1.0240 ✓
" h = +1.2745 ✓
" i = +0.9030 ✓

21 56.8
20 53.4
18 50.2
(G+α)

5 13.5
20 53.4
2 6.9
(H+α)

Log 1/15 = +8.8239 ✓
" g = +1.0240 ✓
" sin(G+α) = −9.9895 ✓
" tan δ = n8.0543 ✓
+0.008 ✓ = +7.8917 ✓

" 1/15 = +8.8239 ✓
" h = +1.2745 ✓
" sin(H+α) = +9.7209 ✓
" sec δ = +0.0000 ✓
+0.660 ✓ = +9.8193 ✓
+0.008 ✓
+1.388 ✓
+2.056 ✓ Cor. in α

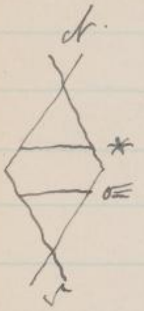
Log g = +1.0240 ✓
" cos(G+α) = +9.3370 ✓
+2.30 ✓ +0.3610 ✓

" h = +1.2745 ✓
" cos(H+α) = +9.9297 ✓
" sin δ = n8.0542 ✓
−0.18 ✓ = n9.2584 ✓

" i = +0.9030 ✓
" cos δ = +0.0000 ✓
+8.00 = +0.9030 ✓
+2.30
+10.30 ✓
− 0.18 ✓
+10.12 ✓ = Cor. in δ.

Comet d 1891 = Barnard Sept. 27.

Obs. of Oct. 8. 1891.



Comet.	Star.		
22h 3 44.2 ✓	4m 19.9s ✓		
4 30.7 ✓	5 11.2 ✓		
8 14.9 ✓	9 31.1 ✓	1m 16.2s ✓	0m 38.10s ✓
5 53.5 ✓	6 29.3 ✓		
6 40.0 ✓	7 21.2 ✓		
12 33.5 ✓	13 50.5 ✓	1 17.0 ✓	0 38.50 ✓
9 58.0 ✓	10 33.3 ✓		
10 45.2 ✓	11 25.0 ✓		
20 43.2 ✓	21 58.3 ✓	1 15.1 ✓	0 37.55 ✓
12 10.4 ✓	12 46.8 ✓		
12 58.8 ✓	13 38.5 ✓		
25 9.2 ✓	26 25.3 ✓	1 16.1 ✓	0 38.05 ✓
16 25.8 ✓	17 2.4 ✓		
17 13.2 ✓	17 53.5 ✓		
33 39.0 ✓	34 55.9 ✓	1 16.9 ✓	0 38.45 ✓
21 48.4 ✓	22 25.0 ✓		
22 36.6 ✓	23 16.8 ✓		
44 25.0 ✓	45 41.8 ✓	1 16.8 ✓	0 38.40 ✓
23 37.7 ✓	24 14.9 ✓		
24 26.0 ✓	25 5.4 ✓		
48 3.7 ✓	49 20.3 ✓	1 16.6 ✓	0 38.30 ✓
			−0 38.19 ✓

Mean ~~of~~ times = 22h 13m 46.3s ✓
Cor. to 1327 = +1 16.3 ✓
22 15 2.6 ✓
13 8 6.2 ✓
9 6 56.4 ✓
−1 29.6 ✓
C. m. T. obs. = 9 5 26.8 ✓

Δ∈	Δ*	
46.5 ✓	51.3 ✓	97.8 ✓
46.5 ✓	51.9 ✓	98.4 ✓
47.2 ✓	51.7 ✓	98.9 ✓
48.4 ✓	51.7 ✓	100.1 ✓
47.4 ✓	51.1 ✓	98.5 ✓
48.2 ✓	51.8 ✓	100.0 ✓
48.3 ✓	50.5 ✓	98.8 ✓
		98.93 ✓

98.93 = 1.99533 ✓

7.5 = 0.87506 ✓

cos δ = 9.99999 ✓

742.″0 = 2.87038

886.0

144.0 = −2′ 24.″0 ✓

Comet d 1891 = Barnard Sept. 27.
Obs. of Oct. 8. 1891.

Comp. Star = D.M. +0° 4634 (8.5K)
" " = Weisse 20h 1380

	h	m	s	°	′	″
	20	50	37.06	+0	11	9.9
		+1	41.31		+7	28.8
Mid. pl. =	20	52	18.37	+0	18	38.7 dec
	α 313°	4′	35.6″			

(1825.)

Log $\frac{n}{5}$ = +0.12610
" sin α = n9.86359
" tan δ = +7.73479
−0.0053 = n7.72448
+3.0708 = m
+3.0655 = +0.48650
66. = +1.81954
+202.32 = +2.30604

Log m = +1.30219
" cos α = +9.83440
" 66. = +1.81954
903.9″ = +2.95613

	h	m	s	°	′	″
	20	50	37.06	+0	11	9.9
		+3	22.32		+15	3.9
* 1891.0 =	20	53	59.38	+0	26	13.8
Red. to Ap. pl. =			+1.99			+10.6
Ap. pl. * =	20	54	1.37	+0	26	24.4
☄ − * =		−0	38.19		−2	24.0
Ap. pl. ☄ =	20	53	23.18	+0	24	0.4

No. ref.
No Prop. mot.

f = +1.429
G = 22 2.5
H = 4 52.2
Log g = +1.0304
" h = +1.2761
" i = +0.8941

22 2.5	4 52.2
20 54.0	20 54.0
18 56.5	1 46.2
(G+α)	(H+α)

Log $\frac{1}{15}$ = +8.8239
" g = +1.0304
" sin(G+α) = $-9.98\overset{62}{67}$
" tan δ = +7.8826
−0.005 = $-7.723\overset{5}{6}$

Log $\frac{1}{15}$ = +8.8239
" h = +1.2761
" sin(H+α) = +9.6503
" sec δ = +0.0000
+0.563 = +9.7503
+1.429
+1.992
−0.005
+1.987 = Cor. in α.

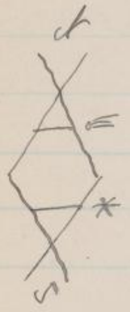
Log g = +1.0304
" cos(G+α) = $+9.387\overset{4}{5}$
+2.62 = +0.4179

" h = +1.2761
" cos(H+α) = +9.9516
" sin δ = +7.8826
$+0.1\overset{3}{2}$ = +9.1103

" i = +0.8941
" cos δ = +0.0000
+7.84 = +0.8941
+2.62
+0.12
+10.58 = Cor. in δ

Comet d 1891. = Barnard Sept. 27.

Oct. 9. 1891.



	☄		*					
21h	26m	4.8 ✓	26m	28.3 ✓				
	26	33.3 ✓	26	41.8 ✓				
	52	38.1 ✓	53	10.1 ✓	0m	32.0 ✓	0m	16.00 ✓
	27	14.7 ✓	27	38.0				
	27	44.0 ✓	27	51.3 ✓				
	54	58.7 ✓	55	29.3 ✓	0	30.6 ✓	0	15.30 ✓
	28	36.7 ✓	29	0.7 ✓				
	29	6.0 ✓	29	13.8 ✓				
	57	42.7 ✓	58	14.5 ✓	0	31.8 ✓	0	15.90 ✓
	30	49.3 ✓	31	13.5 ✓				
	31	18.9 ✓	31	26.9				
	62	8.2 ✓	62	40.4 ✓	0	32.2 ✓	0	16.10 ✓
	32	39.7 ✓	33	3.9 ✓				
	33	9.7 ✓	33	17.2 ✓				
	65	49.4 ✓	66	21.1 ✓	0	31.7 ✓	0	15.85 ✓
	35	15.1 ✓	35	38.6 ✓				
	35	43.0 ✓	35	51.7 ✓				
	70	58.1 ✓	71	30.3 ✓	0	32.2 ✓	0	16.10 ✓
	39	43.0 ✓	40	6.9 ✓				
	40	11.3 ✓	40	19.8 ✓				
	79	54.3 ✓	80	26.7 ✓	0	32.4 ✓	0	16.20 ✓
	42	12.2 ✓	42	34.8 ✓				
	42	39.7 ✓	42	48.1 ✓				
	84	51.9 ✓	85	22.9 ✓	0	31.0 ✓	0	15.50 ✓
							−0	15.87 ✓

Cor. to 1327. = 21 33 3.8 ✓ = mean ☄ times.
+1 16.4 ✓
21 34 20.2 ✓
13 12 2.8 ✓
8 22 17.4 ✓
−1 22.3 ✓
8 20 55.1 ✓ C. m. T.
4 44 31.
13 5 26.

Δε	Δ*	
$28.^s5$ ✓	$13.^s5$ ✓	$42.^s0$ ✓
29.3 ✓	13.3 ✓	42.6 ✓
29.3 ✓	13.1 ✓	42.4 ✓
29.6 ✓	13.4 ✓	43.0 ✓
30.0 ✓	13.3 ✓	43.3 ✓
27.9 ✓	13.1 ✓	41.0 ✓
28.3 ✓	12.9 ✓	41.2 ✓
27.5 ✓	13.3 ✓	40.8 ✓
		42.04 ✓

42.04 = 1.62366 ✓
7.5 = 0.87506 ✓
cos. δ = 0.00000 ✓
315.3 = 2.49872 ✓
886.0
570.7 = +9′ 30.7 ✓

Comet 1891 d = Barnard Sept. 27.

Obs. of Oct. 9. 1891.

Comp. Star same as on Oct. 8. = DM. +0° 4634 = W. XX 1340.

* 1891.0 =	20h	53m	59s.38	+0°	26′	13″.8
Ap. pl. cor. =			+1.98			+10.6
Ap. pl. * =	20	54	1.36	+0	26	24.4
☄ − * =		−0	15.87		+9	30.7
Ap. pl. ☄ =	20	53	45.49	+0	35	55.1

No ref.
No prop. mot.

Comet 1891 d = Barnard Sept. 27.

Obs. of Oct. 9. 1891.

22 3.2
20 54.0
18 57.2
(G+α)

4 47.9
20 54.0
1 41.9
(H+α)

f = +1.441
G = 22 3.2
H = 4 47.9
Log g = +1.0333
" h = +1.2765
" i = +0.8919

Log 1/15 = +8.8239
" g = +1.0333
" sin(G+α) = −9.9863
" tan δ = +7.8826
−0.005 = −7.7261

Log 1/15 = +8.8239
" h = +1.2765
" sin(H+α) = +9.6336
" sec δ = +0.0000
+0.542 = +9.7340
+1.441
+1.983
−0.005
+1.978 Cor. in α

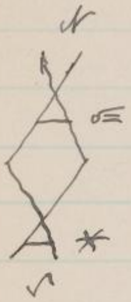
Log g = +1.0333
" cos(G+α) = +9.3927
+2.67 = +0.4260

" h = +1.2765
" cos(H+α) = +9.9556
" sin δ = +7.8826
+0.13 = +9.1147

" i = +0.8919
" cos δ = +0.0000
+7.80 = +0.8919
+2.67
+0.13
+10.60

Comet d 1891 = Barnard Sept. 27.

Obs. of Oct. 24. 1891.



	☄	*		
23	5 53.5	8m 26.5		
	6 18.7	8 38.5		
	12 12.2	17 5.0	4 52.8	2 26.40
	9 13.4	11 46.2		
	9 38.4	11 58.5		
	18 51.8	23 44.7	4 52.9	2 26.45
	12 33.5	15 6.5		
	12 58.2	15 18.5		
	25 31.7	30 25.0	4 53.3	2 26.65
	15 54.0	18 26.5		
	16 19.1	18 38.5		
	32 13.1	37 5.0	4 51.9	2 25.95
	19 23.1	21 55.1		
	19 46.7	22 7.0		
	39 9.8	44 2.1	4 52.3	2 26.15
	23 26.0	25 58.0		
	23 49.6	26 9.5		
	47 15.6	52 7.5	4 51.9	2 25.95
	27 30.2	30 1.0		
	27 53.0	30 12.6		
	55 23.2	60 13.6	4 50.4	2 25.20
				−2 26.11

23 16 28.4

Chr. cor. + 3 19.8

23 19 48.2

14 11 11.1

9 8 37.1

−1 29.9

9 7 7.2 C. m. T.

4 44 31.

13 51 38.

Δ☾	Δ*	
−25.2 ✓	+12.0 ✓	−13.2 ✓
25.0 ✓	12.3 ✓	−12.7 ✓
24.7 ✓	12.0 ✓	−12.7 ✓
25.1 ✓	12.0 ✓	−13.1 ✓
23.6 ✓	11.9 ✓	−11.7 ✓
23.6 ✓	11.5 ✓	−12.1 ✓
22.8 ✓	11.6 ✓	−11.2
		16.7
		−12.39 ✓

+4 10 41.2
+6 36.6
+4 17 17.8

−12.39 = n1.09307 ✓
75 = +0.87506 ✓
cos δ = +9.99879 ✓
−92.7 = n1.96692 ✓
886.0
793.3 = +13 13.3

n1.09307
+0.87506
+9.99879

Comet d 1891 = Barnard Sept. 27.

Obs. of Oct. 24. 1891.

Comp. Star = Dm. + 4° 4642 (8.4 L)
" " = Ll. 41336.

	21h	7m	12.14s	+3°	48′	6.0″	(1800)
		+2	16.91		+11	5.2	
mid. pl.	21	9	29.05	+3	59	11.2	
	317°	22′	15.8″				

Log n/15 = +0.12614
" sin α = n9.83075
" tan δ = +8.84315
−0.0631 = n8.80004
+3.0705
+3.0074 = +0.47819
91. = +1.95904
273.67 = +2.43723

Log n = +1.30223
" cos α = +9.86673
" 91. = +1.95904
+1342.8″ = +3.12800

	21	7	12.14	+3°	48′	6.0″
		4	33.67		+22	22.8
* 1891.0 =	21	11	45.81	+4	10	28.8
Red. to Ap. pl. =			+1.82			+12.4
Ap. pl. * =	21	11	47.63	+4	10	41.2
☄ − *		−2	26.11		+13	13.3
Ap. pl. ☄ =	21	9	21.52	+4	23	54.5

No. ref.
No. prop. mot.

Comet d. 1891.

Obs. of Oct. 24, 1891.

f = +1.562 ✓
g = 22 12.1 ✓
H = 3 44.9 ✓
Log g = +1.0593 ✓
" h = +1.2840 ✓
" i = +0.8413 ✓

22 12.1 ✓
21 11.8 ✓
19 23.9 ✓
(G+α)

3 44.9 ✓
21 11.8 ✓
0 56.7
(H+α)

Log $\frac{1}{15}$ = +8.8239 ✓
" g = +1.0593
" sin(G+α) = −9.9703
" tan δ = $+8.863\overset{2}{\cancel{3}}$ ✓
−0.052 ✓ = $-8.716\overset{7}{\cancel{8}}$ ✓

" $\frac{1}{15}$ = +8.8239 ✓
" h = +1.2840 ✓
" sin(H+α) = +9.3889 ✓
" sec δ = +0.0012 ✓
+0.315 = +9.4980

+1.562 ✓
+1.877 ✓
−0.052 ✓
+1.825 ✓ = Cor. in α

Log g = +1.0593
" cos(G+α) = +9.5538
+4.10 = +0.6131

" h = +1.2840
" cos(H+α) = +9.9865 ✓
" sin δ = +8.8621
+1.36 = +0.1326

" i = +0.8413
" cos δ = +9.9988
+6.92 = +0.8401 ✓

+4.10
+1.36
+12.38 ✓ = Cor. in δ

Comp. Star for Comet 1883 I. (Brooks-Swift.)

Obs. of. Mar. 25. 1883.

Comp. Star = D.M. +24° 454. (8.7 R)
" " = Rümker (Neue Folge) 16244.

3h 6m 1.31s +24° 21' 55.7" (1850)
+57.91 +3 47.7
3 6 59.22 +24 25 43.4
46° 44' 48.3"

Log n/15 +0.12609
" sin α +9.86233
" tan δ +9.65727
+0.4423 = +9.64569
3.0709
+3.5132 = +0.54570
33. = +1.51851
+115.94 = +2.06421

Log n = +1.30218
" cos α = +9.83584
" 33. = +1.51851
+453.4" = +2.65653

	3h	6m	1.31s	+24°	21'	55.7"
		1	55.94		+7	33.4
*1883.0 =	3	7	57.25	+24	29	29.1
Ap. pl. cor. =			+0.73			−0.4
" " * =	3	7	57.98	+24	29	28.7
☄ − *		−3	26.64		−10	13.8
Ap. pl. ☄ =	3	4	31.34	+24	19	14.9

Comp. Star for Sappho. ~~joined to −11° 3492.~~
Obs. of Apr. 16 and 17, 1888.

S.D. −11° 3492. (Lettered)
Gr. 13^h 202.

	13	10	47.69 ✓	−11	52	50.2 ✓
		+1	38.60 ✓		−10	1.6 ✓
mid. pl. =	13	12	26.29	−12	2	51.8
	198°	6′	34.″4			

Log $\frac{u}{15}$ = +0.12611
" sin α = n9.49253
" tan δ = n9.32925
+0.0887 = +8.94789
+3.0707
+3.1594 = +0.49961 ✓
63. = +1.79934 ✓
194.51 = 2.29895

Log u = +1.30220
" cos α = n9.97794
" 63. = +1.79934
−1200.″8 = n3.07948

	13	10	47.69 ✓	−11	52	50.2 ✓
		+3	14.51 ✓		−20	0.8 ✓
* 1888 =	13	14	2.20 ✓	−12	12	51.0 ✓

Comp. Star for Sappho.

Obs. of May 7. 1888.

S.D. -8° 3495 (7.0 Sj.)

Sjellerup 4740.

$13^h\ 2^m\ 11.48^s$ $-8^\circ\ 49'\ 2.4''$ ✓ (1865)

+0 36.00 −3 42.0 ✓

mid. pl. = 13 2 47.48 −8 52 44.4 ✓

$195^\circ\ 41'\ 52.2''$

Log $\frac{n}{15}$ + 0.12607

" sin α n9.43227

" tan δ n9.19373

+0.0565 = +8.75207 ✓

+3.0711

+3.1276 = +0.49521 ✓

23. = +1.36173 ✓

+71.94 = +1.85694 ✓

Log n = +1.30216

" cos α = n9.98349

" 23. = +1.36173

$-444.0''$ = n2.64738

13 2 11.48 ✓ −8 49 2.4 ✓

+1 11.94 ✓ −7 24.0 ✓

* 1888.0 = 13 3 23.42 ✓ −8 56 26.4 ✓

+1.27 −6.5

Ap. pl. * = 13 3 24.69 −8 56 32.9

Comp. Star for Sappho.

Obs. of May 7, 1888.

$f = +0.123^c$

$g = 5\ 23.9^c$

$H = 14\ 38.2^c$

$\log g = +0.7190^c$

$\text{"}\ h = +1.2946^c$

$\text{"}\ i = -0.7360^c$

$$\begin{array}{rr} 5 & 23.9^c \\ 13 & 3.4^c \\ \hline (g+\alpha_0) = 18^h & 27.3^{m\,c} \end{array}$$

$$\begin{array}{rr} 14 & 38.2^c \\ 13 & 3.4^c \\ \hline (H+\alpha_0) = 3^h & 41.6^{m\,c} \end{array}$$

$\log \frac{1}{15} = +8.8239^c$

$\text{"}\ g = +0.7190^c$

$\text{"}\ \sin(g+\alpha_0) = -9.99\overset{69}{70}$

$\text{"}\ \tan \delta = -9.1968^c$

$+0.0545 = +8.7367$

$\log \frac{1}{15} = +8.8239^c$

$\text{"}\ h = +1.2946^c$

$\text{"}\ \sin(H+\alpha_0) = +9.9155^c$

$\text{"}\ \sec \delta = +0.0053^c$

$+1.094 = +0.0393$

$+0.054$

$+0.123$

$+1.271$ = Cn. in α.

$\log g = +0.7190^c$

$\text{"}\ \cos(g+\alpha) = +9.0749^c$

$+0.622 = +9.7939$

$\log h = +1.2946^c$

$\text{"}\ \cos(H+\alpha) = +9.75\overset{42}{\cancel{26}}$

$\text{"}\ \sin \delta = -9.1914\overset{5}{\cancel{8}}$

$-1.734 = -0.2402$

$\log i = -0.7360^c$

$\text{"}\ \cos \delta = +9.9947^c$

$-5.379 = -0.7307$

-1.734

-7.113

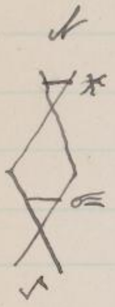
$+0.622$

~~-6.489~~

-6.491^w

Comet 1891 d = Barnard Sept. 27.

Obs. of Oct. 28. 1891.



	☄	*				
22	51 32.0 ✓	50 21.0 ✓				
	52 17.7 ✓	50 29.7 ✓				
	103 49.7 ✓	100 50.7 ✓	2	59.0 ✓	1	29.50 ✓
	57 20.5 ✓	56 8.7 ✓				
	58 7.4 ✓	56 17.5 ✓				
	115 27.9 ✓	112 26.2 ✓	3	1.7 ✓	1	30.85 ✓
	59 44.5 ✓	58 33.2 ✓				
23	0 31.5 ✓	58 42.0 ✓				
	120 16.0 ✓	117 15.2 ✓	3	0.8 ✓	1	30.40 ✓
	2 16.0 ✓	1 4.0 ✓				
	3 2.3 ✓	1 12.9 ✓				
	125 18.3 ✓	122 16.9 ✓	3	1.4 ✓	1	30.70 ✓
	4 55.0 ✓	3 44.0 ✓				
	5 42.5 ✓	3 52.7 ✓				
	130 37.5 ✓	127 36.7 ✓	3	0.8 ✓	1	30.40 ✓
						1.85
	595 29.4				+1	30.370 ✓

	22	59	32.9 ✓
Chr. cor. =		+3	36.9 ✓
	23	3	9.8 ✓
	14	26	57.3 ✓
	8	36	12.5 ✓
		−1	24.6 ✓
C. m. T. =	8	34	47.9 ✓

☄	✱		
22h 51m 32.0s	50m 21.0s		
52 17.7	50 29.7		
103 49.7	100 50.7	2m 59.0s	1m 29.50s
57 20.5	56 8.7		
58 7.4	56 17.5		
115 27.9	112 26.2	3 1.7	1 30.85
22 59 44.5	58 33.2		
23 0 31.5	58 42.0		
120 16.0	117 15.2	3 0.8	1 30.40
2 16.0	1 4.0		
3 2.3	1 12.9		
125 18.3	122 16.9	3 1.4	1 30.70
4 55.0	3 44.0		
5 42.5	3 52.7		
130 37.5	127 36.7	3 0.8	1 30.40

22 59 32.9 mean.
+3 36.9 Chr. cor.
23 3 9.8
14 26 57.3
8 36 12.5
−1 24.6
8 34 47.9 C. m. T. As.

Δ ·≡	Δ *	
−45.7″	+8.7″	−37.0″
−46.9	+8.8	−38.1
−47.0	+8.8	−38.2
−46.3	+8.9	−37.4
−47.5	+8.7	−38.8

Log −37.90 = n1.57864
" 7.5 = +0.87506
" cos mid δ = +9.99781
−282.8″ = n2.45151
−886.0
603.2 = −10′ 3.2″

Comp. Star = DM. +5° 4761 (9.5 B)

$21^h\ 13^m\ 35^s.72$ $+5^\circ\ 41'\ 4''.5$ (1855)

$+53.64$ $+4\ 12.0$

$21\ 14\ 29.36$ $+5\ 45\ 16.5$

$318^\circ\ 37'\ 20''.4$

Log $\frac{t}{15}$ = +0.12607

" sin α = n9.82021

" tan δ = +9.00335

−0.0890 = n8.94963

+3.0711

+2.9821 = +0.47452

36. = +1.55630

+107.36 = +2.03082

Log t = +1.30217

" cos α = +9.87528

" 36. = +1.55630

+541.7″ = +2.73375

+9′ 1.7″

	21^h	13^m	$35^s.72$	$+5^\circ$	$41'$	$4''.5$
		+1	47.36		+9	1.7
* 1891.0 =	21	15	23.08	+5	50	6.2
App. Pl. =			+1.76			+12.8
App. Pl. * =	21	15	24.84	+5	50	19.0
⊜ − * =		+1	30.37		−10	3.2
App. Pl. ⊜ =	21	16	55.21	+5	40	15.8

$f = +1.^{s}582$
$G = 22^{h}\ 11.^{m}7$
$H = 3\ \ 28.4$
Log $g = +1.0650$
" $h = +1.2864$
" $i = +0.8212$

$22^{h}\ 11.^{m}7$
$21\ \ 15.4$
$19\ \ 27.1$
$G + \lambda$

$3^{h}\ 28.^{m}4$
$21\ \ 15.4$
$0\ \ 43.8$
$H + \lambda$

Log $\frac{1}{15} = +8.8239$
" $g = +1.0650$
" $\sin(G+\lambda) = -9.9678$
" $\tan \delta = +9.0093$
$-0.073 = -8.8660$

Log $g = +1.0650$
" $\cos(G+\lambda) = +9.5694$
$+4.31 = +0.6344$

Log $\frac{1}{15} = +8.8239$
" $h = +1.2864$
" $\sin(H+\lambda) = +9.2786$
" $\sec \delta = +0.0022$
$+0.246 = +9.3911$
$+1.582$
$+1.828$
-0.073
$+1.755$

" $h = +1.2864$
" $\cos(H+\lambda) = +9.9920$
" $\sin \delta = +9.0070$
$+1.93 = +0.2854$

" $i = +0.8212$
" $\cos \delta = +9.9978$
$+6.59 = +0.8190$

Δ☄	Δ*	
$-45^{s}.7$ ✓	$+8^{s}.7$ ✓	$-37^{s}.0$ ✓
46.9 ✓	8.8 ✓	38.1 ✓
47.0 ✓	8.8 ✓	38.2 ✓
46.3 ✓	8.9 ✓	37.4 ✓
47.5 ✓	8.7 ✓	38.8 ✓
		39.5
		−37.90 ✓

−37.90 = n1.57864

7.5 = +0.87506

cos δ = +9.99781

$-282.''8$ = n2.45151

$$\frac{886.0}{603.2} = -10'\ 3.''2 \checkmark$$

Comet d 1891 = Barnard Sept. 27.
Obs. of Oct. 28. 1891.

Comp. Star = Dur. + 5° 4761 (9.5 B)

21h	13m	35s.72	+5°	41'	45".5	(1855)
	+5	3.64		+4	12.0	
21	14	29.36	+5	45	16.5	
318°	37'	20".4				

Log n/15 = +0.12607
" sin α = n9.82021
" tan δ = +9.00335
−0.0890 = n8.94963
+3.0711 =
+2.9821 = +0.47452
36. = +1.55630
107.36 = +2.03082

Log n = +1.30217
" cos α = +9.87528
" 36. = +1.55630
+541".7 = +2.73375

	21	13	35.72	+5	41	45.5
		+1	47.36		+9	1.7
* 1891.0 =	21	15	23.08	+5	50	6.2
Ap. pl.			+1.76			+12.8
Ap. pl. *	21	15	24.84	+5	50	19.0
☄ − *		+1	30.37		−10	3.2
Ap. pl. ☄	21	16	55.21	+5	40	15.8

Comet d 1891 = Barnard Sept. 27.
Obs. of Oct. 28. 1891.

f = +1.582 ✓
G = 22 11.7 ✓
H = 3 28.4 ✓
Log g = +1.0650 ✓
" h = +1.2864 ✓
" i = +0.8212 ✓

22 11.7
21 15.4
19 27.1
G+α

3 28.4
21 15.4
0 43.8
H+α

Log $\frac{1}{15}$ = +8.8239
" g = +1.0650
" sin(G+α) = −9.9678
" tan δ = $+9.009\overset{4}{3}$
−0.073 $-8.866\overset{1}{0}$ ✓

Log g = +1.0650
" cos(G+α) = +9.5694 ✓
+4.31 +0.6344 ✓

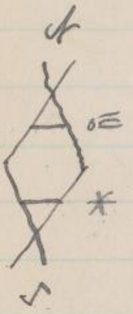
" h = +1.2864
" cos(H+α) = +9.9920
" sin δ = $+9.007\overset{2}{0}$
+1.93 $+0.285\overset{6}{4}$ ✓

Log $\frac{1}{15}$ = +8.8239
" h = +1.2864
" sin(H+α) = +9.2786
" sec δ = +0.0022
+0.246 +9.3911 ✓
+1.582
+1.828
−0.073
+1.755 Cor. in α

" i = +0.8212
" cos δ = +9.9978
+6.59 +0.8190 ✓
+4.31
+1.93
+12.83 Cor. in δ

Comet d 1891. = Barnard Sept. 27.

Obs. of Nov. 2. 1891.



	☄	*				
0	43 54.5^s	46^m 3.3^s				
	44 31.0^s	46 46.5^s				
	88 25.5^{s+}	92 49.8^{s+}	4^m	24^s.3$^+$	2^m	12^s.15$^+$
	47 36.0^s	49 45.5^s				
	48 13.5^s	50 28.8^s				
	95 49.5^{s+}	100 14.3^{s+}	4	24.8^{s+}	2	12.40^{s+}
	51 14.2^s	53 26.0^s				
	51 58.0^s	54 9.4^s				
	103 12.2^{s+}	107 35.4^{s+}	4	23.2^{s+}	2	11.60^{s+}
	55 1.0^s	57 8.5^s				
	55 36.5^s	57 51.9^s				
	110 37.5^{s+}	115 0.4^{s+}	4	22.9^{s+}	2	11.45^{s+}
	58 51.0^s	60 57.1^s				
	59 25.5^s	61 41.0^s				
	118 16.5^{s+}	122 38.1^{s+}	4	21.6^{s+}	2	10.80^{s+}
						58.40^s
					+2	11.68^{s+}

0 51 ~~38.1~~ 38.1^s_t

+2 56.0^s Chr. cor.

$\frac{24}{\cancel{0}}$ 54 34.1$^{s+}_t$

14 46 40.1$^{s+}_t$ = Sid. T. C. mean noon.

10 7 54.0$^{s+}_t$

-1 39.6$^{s+}_t$

10 6 14.4$^{s+}_t$ = C. m. T. obs.

Δ ☾		Δ *		
0	$36^{s}.5$ ·+	0	$43^{s}.2$ ·+	$79^{s}.7$ ·+
0	37.5 ·+	0	43.3 ·+	80.8 ·+
0	35.8 ·+	0	43.4 ·+	79.2 ·+
0	35.5 ·+	0	43.4 ·+	78.9 ·+
0	34.5 ·+	0	43.9 ·+	78.4 ·+
				79.40 ·+

$$\begin{array}{rrr} 7 & 24 & 12. \\ & +2 & 28 \\ \hline +7 & 26 & 40. \end{array}$$

Log. 79.40 = +1.89982 ✓
" 7.5 = +0.87506 ✓
" cos δ = +9.99637 ✓
590.5 ✓ = +2.77125 ✓
886.0 ✓
2)295.5 ✓
147.8 ✓

+1.89982 ✓
+0.87506 ✓
+9.99632 ✓
+2.77120

590.5
886.0
+295.5

Comet d 1891. (Barnard Sept. 27.)

Obs. of Nov. 2. 1891.

Comp. Star = DM. +7° 4721 (A.2 K) ✓
" " = Weisse 21h 692.

	× 21h	27m	46.81	+7°	6′	30.4″	(1855)
		+1	38.01		+8	41.4	
(1858)	21	29	24.82	+7	15	11.8	mid. pl.
	322°	21′	12″				

Log $\frac{m}{15}$ = +0.12611 ✓
" sin α = n9.78589 ✓
" tan δ = +9.10474
−0.1039 = n9.01674
+3.0708 ✓ = $\frac{m}{15}$
+2.9669 = +0.47231
66. = +1.81954
+195.82 = +2.29185

Log n = +1.30220 ✓
" cos α = +9.89861 ✓
" 66. = +1.81954
+1048.0″ = +3.02035

	21h	27m	46.81 ✓	+7°	6′	30.4″ ✓
		+3	15.82 ✓		+17	28.0 ✓
* 1891.0 =	21	31	2.63 ✓	+7	23	58.4 ✓
			+1.74			+13.97
ap. pl. * =	21h.	31 m.	4.37s.	+7°	24′	12.37″
		−2	11.68 ✓		+4	55.5 ✓
Ap. pl. ☄ =	21	28	52.69 ✓	+7	29	7.8 ✓

Comet d 1891. (Barnard Sept. 27.)

Obs. of Nov. 2. 1891.

$f = +1.607$
$G = 22\ 16.6$
$H = 3\ 8.1$
Log. $g = +1.0672$
" $h = +1.2898$
" $i = +0.7915$

$$\begin{array}{lrr} & 22 & 16.6 \\ & 21 & 31.0 \\ \hline (g+\alpha_0) = & 19^h & 47.6^m \end{array} \qquad \begin{array}{lrr} & 3 & 8.1 \\ & 21 & 31.0 \\ \hline (H+\alpha_0) = & 0^h & 39.1^m \end{array}$$

Log. $\frac{1}{15}$ = $= +8.8239$
" g = $= +1.0672$
" $\sin(G+\alpha) = -9.9502$
" $\tan\delta = +9.1135$
$-0.0901 = -8.9548$

Log. $\frac{1}{15}$ $= +8.8239$
" h $= +1.2898$
" $\sin(H+\alpha) = +9.2299$
" $\sec\delta$ $= +0.0036$
$+0.2224 = +9.3472$

$$\begin{array}{r} +1.607 \\ +0.222 \\ \hline +1.829 \\ -0.090 \\ \hline +1.739^s \end{array}$$

Log. g $= +1.0672$
" $\cos(G+\alpha) = +9.6556$
$+5.282 = +0.7228$

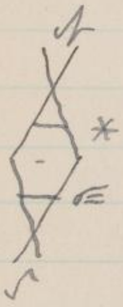
Log. h $= +1.2898$
" $\cos(H+\alpha) = +9.9937$
" $\sin\delta$ $= +9.1099$
$+2.474$ $+0.3934$

" i $= +0.7915$
" $\cos.\delta = +9.9964$
$+6.136$ $+0.7879$

$$\begin{array}{r} +6.136 \\ +2.474 \\ +5.282 \\ \hline +13.892'' \end{array}$$

Comet d 1891 = Barnard Sept. 27.

Obs. of Nov. 3. 1891.



	☄		*					
22^h	52^m	24.0^s	53^m	29.4^s				
	52	58.0	54	7.1				
	105	22.0	107	36.5	2	14.5^s	1	7.25^s
	54	55.3	56	0.9				
	55	30.8	56	38.5				
	110	26.1	112	39.4	2	13.3	1	6.65
	57	43.0	58	49.0				
	58	18.8	59	26.5				
	116	1.8	118	15.5	2	13.7	1	6.85
23	8	38.0	9	43.5				
	9	14.5	10	20.5				
	17	52.5	20	4.0	2	11.5	1	5.75
	137							
22	54.5		23	59.0				
23	33.1		24	35.2				
46	27.6		48	34.2	2	6.6	1	3.30
166								29.80
636	10.0						−1	5.96

23^h 3^m 37.0^s

+3 2.1 Chr. cor.

23 6 39.1

14 50 36.6

8 16 2.5

−1 21.3

8 14 41.2 = C.M.T. obs.

Δ☾	Δ✱	
$34^s.0$	$37^s.7$	$71^s.7$
35.5	37.6	73.1
35.8	37.5	73.3
36.5	37.0	73.5
38.6	36.2	74.8
		73.28

7 56 13.
−2 51.
7 53 22.

73.28 = 1.86499
7.5 = 0.87506
cos δ = 9.99582
544.3 = 2.73587
886.0
2/341.7
170.8

1.86499
0.87506
9.99587
2.73592 = 544.4
886.0
341.6
−5′ 41.6″

Comet d 1891. (Barnard Sept. 27)

Obs. of Nov. 3. 1891.

Comp. Star = DM. +7° 4725 (8.5 K)
Comp. Star = Weisse 21h 723

21h	29m	10.89s	+7°	38′	26.4″	(1825)
	+ 1	37.68		+ 8	43.7	
21	30	48.57	+7	47	10.1	
322°	42′	8.55″				

Log. $\frac{n}{15}$ = 0,12611
" sin L = −9.78244
" tan δ = +9.13588
−0.1108 = −9.04443 Sum logs.
+3.0708 $\frac{n}{15}$
+2.9600 = +0.47129 Sum
66 = +1.81954
+195.36 = +2.29083 Log

Log. n = +1.30220
" cos L = +9.90064
" 66 = +1.81954
~~+2005.5~~ +1052.9″ = +3.02238

* 1891	21h	29m	10.89s	+7°	38′	26.4″
		+ 3	15.36		17	32.9
	21h	32m	26.25s	+7°	55′	59.3″
			1.73			14.0
ap. pl. * =	21h	32m	27.98s	+7°	56′	13.3″
		−1	5.96		−5	41.6
" " ☌ =	21	31	22.02	+7	50	31.7

Comet d 1891. (Barnard Sept. 27)

Obs. of Nov. 3. 1891.

$f = +1.619$
$G = 22\ 18.0$
$H = 3^h\ 41$
Log $g = +1.0692$
" $h = +1.2904$
" $i = +0.7848$

$$\begin{array}{rrr} & 21 & 32.4 \\ & 22 & 18.0 \\ \hline (g+\alpha) = & 19^h & 50.4^m \end{array}$$

$$\begin{array}{rr} 21 & 32.4 \\ 3 & 4.1 \\ \hline 0^h & 36.5^m \end{array}$$

Log. 1/15 = +8.8239
" g = +1.0692
" sin(G+γ) = $-9.947\overset{5}{6}$
" tan δ = +9.1441
−0.0965 = $-8.98\cancel{4}8^{7}$

Log. g = +1.0692
" cos.(G+γ) = +9.6658
$+5.30\cancel{9}$ (432) = $+0.7\overset{3}{2}50$

Log. L = $+1.2904\cancel{8}$
" cos.(H+γ) = $+9.994\overset{4}{3}$
" sin δ = +9.1399
+2.660 = $+0.424\overset{7}{8}$

Log. 1/15 = +8.8239
" L = +1.2904
" sin(H+γ) = +9.2002
" sec. δ = +0.0042
+0.2083 + 9.3187

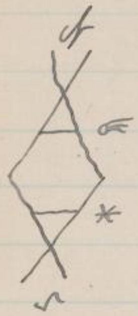
$$\begin{array}{r} +1.619 \\ +0.208 \\ \hline +1.82\overset{7}{7} \\ -0.096 \\ \hline +1.731 \end{array}$$

Log. i = +0.7848
" cos. δ = +9.9958
+6.034 = +0.7806

$$\begin{array}{r} +2.660 \\ +5.30\overset{432}{\cancel{9}} \\ \hline +14.\overset{126}{\cancel{003}} \end{array}$$

Comet d 1891 = Barnard Sept. 27.

Obs. of Nov. 4, 1891.



	☄		*					
23^{h}	14^{m}	30.0^{s}	13^{m}	29.0^{s}				
	15	1.5	13	50.3				
	29	31.5	27	19.3	2	12.2^{s}	1	6.10^{s}
	16	44.5	15	41.0				
	17	13.6	16	3.0				
	33	58.1	31	44.0	2	14.1	1	7.05
	21	26.5	20	22.5				
	21	55.5	20	44.2				
	43	22.0	41	6.7	2	15.3	1	7.65
	23	53.6	22	49.0				
	24	21.8	23	10.7				
	48	15.4	45	59.7	2	15.7	1	7.85
	29	28.0	28	22.8				
	29	56.0	28	44.8				
	59	24.0	57	7.6	2	16.4	1	8.20
	34	59.5	33	52.5				
	35	26.2	34	15.0				
	70	25.7	68	7.5	2	18.2	1	9.10
	282	176.7						45.95
23	23	44.7					+1	7.66
	+3	8.8 Chr. cor.						

$-3^{s}.89$

23 26 53.5 ✓+
14 54 33.2 ✓+
8 32 20.3 ✓+
− 1 23.9 ✓+
8 30 56.4 ✓+ C. W. T. obs.

Δ☾	Δ✳	
$31^{s}.5$ ·	$21^{s}.3$ ·	52.8 ·
29.1 ·	22.0 ·	51.1 ·
29.0 ·	21.7 ·	50.7 ·
2.8.2 ·	21.7 ·	49.9 ·
28.0 ·	22.0 ·	50.0 ·
26.7 ·	22.5 ·	49.2 ·
		50.61 ·

8	5	53.4
	4	15.1
8	10	8.5

50.61 = 1.70424
7.5 = 0.87506
cos. δ = 9.99565
2.57495

375.8
886.0
2|510.2
255.1 = 4' 15"

1.70424
0.87506
9.99557
2.57487

375.7
886.0
510.3

8' 30.3"

Comet d 1891. = Barnard Sept. 27.

Ph. of Nov. 4. 1891.

Comp. Star = Bm. +7° 4727 (8.2 K) ✓
" " = W. XXI 748.

21h 29m 47.78s ✓ +7° 48' 4.2 (1855)
+ 1 36.88 + 8 45.03
21h 31m 24.66s. +7° 56' 49.23".
322° 51' 9.9".

Log. $\frac{n}{15}$ = 0.12611.^
" sin α = −9.78095.^
" tan δ = +9.14487.^
−0.11270. = −9.05193.^
+3.0708.
2.95817 = +0.47101.^
66 = +1.81954.^
+195.23s = +2.29055.^

Log. n = $+1.\overset{3}{\cancel{2}}0220$.^
Log. cos. α = +9.90150.^
" 66 = +1.81954.^
1055.0" = +3.02324.^

21h 29m 47.78s ^ +7° 48' 4.2" ^
3 15.23 17 35.0
* 1891.0 21h. 33m 3.01s ^ +8° 5' 39.2" ^
1.72 14.21
*ap. pl. = 21h 33m 4.73s ^ +8° 5' 53.4" ^
+ 1 7.66 + 8 30.3
21 34 12.39 +8° 14' 23".7

Comet d 1891. = Barnard Sept. 27.

Obs. of Nov. 4. 1891.

$f = +1.633$
$G = 22\ 19.2$
$H = 3^h\ 0.1^m$
Log. $g = +1.0719$
" $h = +1.2911$
" $i = +0.7779$

$$\begin{array}{rrr} & 22 & 19.2 \\ & 21 & 33.1 \\ \hline (G+\alpha_0) = & 19^h & 52.3^m \end{array} \qquad \begin{array}{rrr} & 3^h & 0.1 \\ & 21 & 33.1 \\ \hline (H+\alpha) = & 0^h & 33.2^m \end{array}$$

Log. $1/5 = +8.8239$
" $g = +1.0719$
" $\sin(G+\delta) = -9.9456$
" $\tan\delta = +9.15\overset{30}{\cancel{28}}$
$-0.098\overset{7}{6} = -8.994\overset{4}{2}$

Log $1/5 = +8.8239$
" $h = +1.2911$
" $\sin(H+\delta) = +9.1594$
" $\sec.\delta = +0.0044$
$+0.1900 = +9.2788$
$+1.633$
$+1.823$
$-0.09\overset{9}{8}$
$+1.72\overset{4}{\cancel{3}}\ ^{5}$

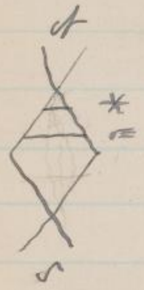
Log. $g = +1.0719$
" $\cos.(G+\delta) = +9.6728$
$+5.555 = +0.744\overset{6}{7}$

Log. $h = +1.2911$
" $\cos(H+\delta) = +9.9954$
" $\sin\delta = +9.1486$
$+2.723 = +0.4^{3}51$

Log. $i = +0.7779$
" $\cos.\delta = +9.9956$
$+5.936 = +0.7735$
$+2.723$
$+5.555$
$+14.214''$

Comet Wolff. (1884 III.)

Nov. 24. 1891.



☄ *

3^h 0^m 18.0^s 2^m 5.5^s

1 3.5 2 30.2

1 21.5 4 35.7 3 14.2 1 37.10

3 6.5 4 54.2

3 52.5 5 18.5

6 59.0 10 12.7 3 13.7 1 36.85

5 51.5 7 39.5

6 37.1 8 3.8

12 28.6 15 43.3 3 14.7 1 37.35

8 45.0 10 33.2

9 31.0 10 57.4

18 16.0 21 30.6 3 14.6 1 37.30

11 46.0 13 34.1

12 32.2 13 58.5

24 18.2 27 32.6 3 14.4 1 37.20

61 143.3 185.80

3 6 20.3 −1 37.16

+1 39.5 Chr. cor.

3 7 59.8

16 13 24.3

10 54 35.5

−1 47.2

10 52 48.3 C. m. T. ob.

Δ ☄	Δ *	☄ − *
$45^{s}.5$ •+	$24^{s}.7$ •+	20.8 •+
46.0 •+	24.3 •+	21.7 •+
45.6 •+	24.3 •+	21.3 •+
46.0 •+	24.2 •+	21.8 •+
46.2 •+	24.4 •+	21.8 •+
		21.48 •+

−11° 47′ 40.0
− 2 37.7
−11 50 17.7

21.48 = 1.33203
7.5 = 0.87506
cos δ = 9.99073
157.7 2.19782
−2′ 37.7″

1.33203
0.87506
9.99066
157.7 = 2.19775
−2′ 37.7″

Comet Wolf. (1884 III)
Nov. 28. 1891.

Comp. Star = BD −11° 907 (8.9 Sg.)
" " = Schj. No. 1471.

4h 29m 6.91s −11° 51′ 13.0″ (1865)
0 ~~36~~ 36.57 + 1 40.23″
mid place = 4h. 29m 43.48s. −11° ~~52′~~ ~~53.23″~~
67° 25′ 52.2″ −11° 49′ 32.77

Log n/15 = + 0.12606~~7~~
" sin α = − 9.96217
" tan δ = $-9.32\overset{091}{\cancel{304}}$
+0.025~~28~~ 165 = $+9.409\,\underset{14}{\cancel{27}}$
+3.0711
+3.09~~69~~ 66 = +0.49093
Log 26 = +1.41497
+80.52 = +1.90590

Log. n = +1.30216
Log. cos. α = +9.58410
Log. 26 = +1.41497
+ 200.1 = +2.30123

4 h 29m. $\overset{6.91}{\cancel{43.48}}$s −11° 51′ 13.0″
1 20.52 + 3 20.1
*1891.0 4h. 30m 27.43s. −11° 47′ 52.9″
+ 3.11. + 13.1
ap. pl. * = 4h. 30m 30.54s. −11° 47′ 39.8″.
− 1 37.16 − 2 37.7
" " ☉ = 4 28 53.38 ~~11 45 2.1~~
−11 50 17.5

Comet Wolf (1884 III)

Nov. 24. 1891.

$f = +1.839$
$G = 22^h\ 30.1$
$H = 1\ \ 41.3$
Log. $g = +1.1142$
" $h = +1.3032$
" $i = +0.5723$

$22^h\ \ 30.1^m$
$4\ \ \ 30.5$
$(G+\alpha_0) = 3^h.\ \ 0.6^m$

$1\ \ 41.3$
$4\ \ 30.5$
$(H+\alpha_0) = 6^h.\ \ 11.8^m$

Log. $\frac{1}{r} = +8.8239$
" $g = +1.1142$
" $\sin(G+\gamma) = +9.8506$
" $\tan\delta = -9.3199$
$n0.1284 = -9.1086$

Log. $\frac{1}{r} = +8.8239$
" $h = +1.3032$
" $\sin(H+\gamma) = +9.9994$
" $\sec.\delta = +0.0093$
$+1,3\overset{6}{\cancel{9}}\overset{7}{\cancel{9}} = +0.1358$
$+1.839$
$+3.238$
-0.128
$+3.110^s$

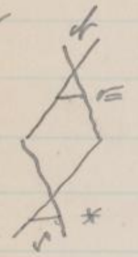
Log. $g = +1.1142$
" $\cos.(G+\delta) = +9.8\overset{484}{506}$
$+9.221 = +0.9648$

Log. $h = +1.3032$
" $\cos.(H+\gamma) = -8.7112$
" $\sin\delta = -9.3106$
$+\overset{0}{\cancel{0}}.2114 = +9.3250$

Log. $i = +0.5723$
" $\cos.\delta = +9.9907$
$+3.656 = +0.5630$
$+9.221$
$+0.211$
$+13.088''$

Comet d 1891. (Barnard Sept. 27)

Obs. of Nov. 6, 1891.



☾	*		
23h 41m 24.4s	42m 20.2s		
41 55.9s	42 39.0s		
83 20.3s+	84 59.2s+	1m 38.9s+	0m 49.45s+
43 21.0s	44 16.0s		
43 53.0s	44 34.6s		
87 14.0s+	88 50.6s+	1 36.6s+	0 48.30s+
46 33.2s	47 28.5s		
47 5.2s	47 46.6s		
93 38.4s+	95 15.1s+	1 36.7s+	0 48.35s+
49 15.8s	50 10.5s		
49 47.5s	50 28.6s		
99 3.3s+	100 39.1s+	1 35.8s+	0 47.90s+
54 41.4s	55 34.0s		
55 12.0s	55 51.8s		
109 53.4s+	111 25.8s+	1 32.4s+	0 46.20s+
			240.20s+
471 129.4s+			−0 48.04s+

23h 47 18.9s ☾+
+ 3 21.7s Chr. cor.
23 50 40.6 ☾+
15 2 26.3s ☾+
8 48 14.3s ☾+
− 1 26.5s ☾+
8 46 47.8s ☾+ C. M. T. obs.

$\Delta\alpha$	$\Delta\delta$	
$-31.5^{\cdot +}$	$+18.8^{\cdot +}$	$-12.7^{\cdot +}$
$32.0^{\cdot +}$	$18.6^{\cdot +}$	$-13.4^{\cdot +}$
$32.0^{\cdot +}$	$18.1^{\cdot +}$	$-13.9^{\cdot +}$
$31.7^{\cdot +}$	$18.1^{\cdot +}$	$-13.6^{\cdot +}$
$30.6^{\cdot +}$	$17.8^{\cdot +}$	$-12.8^{\cdot +}$
		-13.28^{+}

8 50 38
+6 34
8 57 12

−13.28 = 1.12320
+ 7.5 = 0.87506
+ cos δ = 9.99481
−98.4 = 1.99309
886.0
−2) 787.6
393.8 = +6 33.8

n1.12320
+0.87506
+9.99468
−98.4 = n1.99294
886.0
787.6 = +13′ 7.6″

Comet d 1891. (Barnard Sept. 27.)

Obs. of Nov. 6. 1891.

Comp. Star = Dm. +8° 4734 (A.G. K.) ✓
" " = W. Bessel. XXI 946.

21h 37m 43.08s ✓   + 8 32 21.6 ✓   (1850)
1 37.52 ^   + 8 57.9
21h. 39m. 20.60s. ^   +8° 41′ 19.5″ ^
324° 50′ 9″ ^

Log $\frac{n}{15}$ = + 0.12611 ^
" sin α = − 9.76036 ^
" tan. δ = + 9.18418 ^
−0.11767 ^ = − 9.07065 ^
+3.0708
+2.95327 ^ = + 0.47029 ^
66 = + 1.81954
+194.90 = + 2.28983 ^

Log. n = + 1.30220 ^
" Cos. α = + 9.91249 ^
" 66 = + 1.81954 ^
108.20 = + ~~2~~ 3 .03423

21h. 37m 43.08s
3 14.90
* 1891.0 = 21h. 40 57.98 ^
1.74
Ap. pl. * = 21h. 40m. 59.7~~2~~5 ^
− 0 48.04 ✓
Ap. pl. ☄ = 21 40 11.68

~~8° 32′ 21.6″~~
~~1 48.2~~
~~8° 34′ 9.8″~~
~~14.68~~
~~8° 34′ 24.5~~

+ 8° 32′ 21.6″
18 2.0
+ 8° 50′ 23.6″
14.6~~8~~7 ^
+ 8° 50′ 38.3~~87~~ ^
+13 7.6 ✓
+9 3 45.9 ✓

Comet d 1891 (Barnard Sept. 27.)

Obs. of Nov. 6. 1891.

f = +1.662
G. = 22^h 20.7^m
H = 2 52.0
Log. g = +1.0782
" h = +1.2924
" i = +0.7635

g = 22. 20.7
α_0 = 21 $\overset{41.0}{\cancel{40.9}}$
~~44~~ 24 ~~61.6~~7
(g+α) = 20 1.67

H = 2 52.0
α_0 = 21 $\overset{41.0}{\cancel{40.9}}$
(H+α) = 0^h $\overset{3\ 0}{\cancel{32.9}}$

Log. 1/15 = +8.8239 ^
" g, = +1.0782 ^
" sin(G+γ) = −9.9358 ^
" tan δ = +9.1917 ^
−0.1070 = n9.0296 ^

Log. g = +1.0782 ^
" cos.(G+γ) = +9.7042 ^
+6.059 = +0.7824 ^

Log. h = +1.2924 ^
" cos.(H+γ) = +9.9955 ^
" sin. δ = +9.17$\overset{17}{\cancel{32}}$ ^
+2.881 ^ = +0.4596 ^

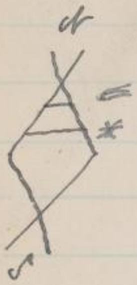
Log. 1/15 = +8.8239
" h = +1.2924
" sin(H+γ) = +9.1555 ^
" sec. δ = +0.0049 ^
+0.1891 = +9.2767 ^

Log. i = +0.7635
" cos. δ = +9.99$\overset{48}{\cancel{51}}$ ^
+5.732 = +0.758$\underset{3}{\cancel{6}}$ ^
+6.059
+2.881
+14.672" ^

+1.662 ^
+0.189 ^
+1.851 ^
−0.107 ^
+1.74~~4~~ s ^

Comet d 1891. (Barnard Sept. 27.)

Obs. of Nov. 27. 1891.



	☄		*					
0^h	39^m	54.8^s	41^m	54.0^s				
	40	28.0^s	42	49.4^s				
	80 0	22.8 ·+	84	43.4 ·+	4	20.6^s ·+	2	10.30^s ·+
	44	8.7^s	46	6.5^s				
	44	42.4^s	47	1.8^s				
	88	51.1 ·+	93	8.3 ·+	4	17.2 ·+	2	8.60 ·+
	48	58.5^s	50	55.0^s				
	49	30.5^s	51	50.0^s				
	98	29.0 ·+	102	45.0 ·+	4	16.0 ·+	2	8.00 ·+
	53	38.4^s	55	33.5^s				
	54	10.2^s	56	28.5^s				
	107	48.6 ·+	112	2.0 ·+	4	13.4 ·+	2	6.70 ·+
	57	47.5^s	59	40.5^s				
	58	17.5^s	60	35.0^s				
	116	5.0 ·+	120	15.5 ·+	4	10.5 ·+	2	5.75 ·+
								38.85 ·+
	489	156.5 ·+						
0	49	9.6 ·+					−2	7.77 ·+
	+2	1.1^s Chr. cor.						
0	51	10.7 ·+						
16	25	14.0 ·+						
8	25	56.7 ·+						
	− 1	22.9 ·+						
8	24	33.8 ·+ C. m. T. obs.						

Δ☄	Δ*	
$33^s.2$ ·+	$55^s.4$ ·+	$22^s.2$ ·+
33.7 ·+	55.3 ·+	21.6 ·+
32.0 ·+	55.0 ·+	23.0 ·+
31.8 ·+	55.0 ·+	23.2 ·+
30.0 ·+	54.5 ·+	24.5 ·+
		22.90 ·+

19° 29′ 47.″
21.0
+ 1 ~~8~~
19 ~~29~~ ~~55.0~~
31 8.0

22.90 = 1.35984 ✓
7.5 = 0.87506 ✓
cos δ = 9.97436 ✓
= 2.20926 ✓
~~2~~)161.9
~~8.0~~
+80.95 = +1′ 21.0″ ✓

1.35984 ✓
0.87506 ✓
9.97430 ✓
2.20920 ✓
+161.9 ✓ =
+2′ 41.9″

Comet d 1891. (Barnard Sept. 27.)

Obs. of Nov. 27. 1891.

Comp. Star = Dm. + 19° 5097 (8.3 R.) ✓
" " = Rümker ~~XXIII~~ 11109.

23 15 40.47 ✓ +19 11 22.8 ✓ (1836)
+1 21.92 2 48.02
23^h 17^m 2.39^s ^ +19° 14′ 10.82″ ^
349° 15′ 36″ ^

Log. $\frac{n}{15}$ = +0.12610 ^
" sin α = −9.27033 ^
" tan δ = +9.54276 ^
−0.0871 = −8.93919 ^
+3.0708
+2.9837 = +0.47476 ^
55 = +1.74036 ^
+164.10 = +2.21512 ^

Log. n = +1.30219 ^
" cos. α = +9.99232 ^
" 55 = +1.74036 ^
+1083.6 = +3.03487 ^

23 15 40.47 +19 11 22.8
2 44.10 18 3.6
★1891 = 23^h 18^m 24.57^s ^ +19° 29′ 26.4″ ^
+1.99 20.76
Ap. pl. ★ = 23^h 18^m 26.56^s ^ +19° 29′ 47.2″ ^
−2 7.77 ✓ +2 41.9 ✓
" " E = 23 16 18.79 ✓ +19 32 29.1 ✓

Comet d 1891. (Barnard Sept. 27).

Obs. of Nov. 27. 1891.

$f = +1.853$ ^
$G = 22\ 31.9$ ^
$H = 1\ 29.9$ ^
Log. $g = +1.1163$ ^
" $h = +1.3047$ ^
" $i = +0.5245$ ^

$H = 1^h\ 29.9^m$
$\alpha_0 = 23\ 18.4$
$(H+\alpha_0) = 24^h\ 48.3^m$

Log. $\frac{1}{15} = +8.8239$ ^
" $g = +1.1163$ ^
" $\sin(G+\gamma) = -9.7293$ ^
" $\tan\delta = +9.5487$ ^
$-0.^s1652 = n\,9.2182$

Log. $g = +1.1163$ ^
" $\cos(G+\gamma) = +9.9263$ ^
$+11.03 = +1.0426$ ^

Log. $\frac{1}{15} = +8.8239$ ^
" $h = +1.3047$ ^
" $\sin(H+\gamma) = +9.3205$ ^
" $\sec\delta = +0.0256$ ^
$+0.2983 = +9.4747$

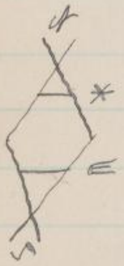
Log. $h = +1.3047$ ^
" $\cos(H+\gamma) = +9.9903$ ^
" $\sin\delta = +9.5231$ ^
$+6.58 = +0.8181$ ^

Log. $i = +0.5245$ ^
" $\cos\delta = +9.9744$ ^
$+3.154 = +0.4989$ ^
$+11.03$
6.58
$+20.76''$ ^

$+1.853$ ^
$+0.298$ ^
$+2.151$ ^
-0.165 ^
$+1.986$ ^

Comet Wolf. (1884 III)

Dec. 8. 1891.



☄		*					
3^h 38^m	25.5^s	37^m	13.0^s				
39	0.5	37	49.5				
77	26.0·+	75	2.5·+	2	23.5·+	1	11.75·+
41	2.5	39	49.3				
41	37.0	40	26.0				
82	39.5·+	80	15.3·+	2	24.2·+	1	12.10·+
45	8.2	43	51.0				
45	34.6	44	28.0				
90	42.8·+	88	19.0·+	2	23.8·+	1	11.90·+
47	56.8	46	43.6				
48	31.2	47	20.5				
96	28.0·+	94	4.1·+	2	23.9·+	1	11.95·+
50	21.6	49	9.2				
50	56.5	49	46.0				
101	18.1·+	98	55.2·+	2	22.9·+	1	11.45·+
							59.15·+
						+1	11.83·+

446 154.4

~~3^h 44^m 51.4^s~~ ✓
+3 19.9 ✓
~~+2 19.9~~ chr. cor.
~~3 47 11.3~~ ✓
3 48 11.3 ✓
~~17 8 36.1~~ ✓
~~10 38 35.2~~
~~−1 44.6~~
~~10 36 50.6~~

3 44 51.4 ✓·+
+3 19.9 ✓
3 48 11.3 ✓·+
17 8 36.1 ✓+
10 39 35.2 ✓·+
1 44.8 ✓·+
10 37 50.4 ✓+ C. m. T. obs.

ΔE	Δ*	
35.0 ·+	36.5 ·+	71.5 ·+
34.5 ·+	36.7 ·+	71.2 ·+
34.4 ·+	37.0 ·+	71.4 ·+
34.4 ·+	36.9 ·+	71.3 ·+
34.9 ·+	36.8 ·+	71.7 ·+
		71.42 ·+

−1.4 15 58.9
−.3 3.4
−14 19 2.3

71.42 = 1.85382
7.5 = 0.87506
Cos. δ = 9.98640
519.1 = 2.71528
886.0
2 | 366.9
183.4
= 3′ 3″.4

71.42 = 1.85382
7.5 = 0.87506
Cos. δ = 9.98630
519.0 = 2.71518
886.0
367.0
6′ 7″.0

Comet Wolf. (1884 III).

Dec. 8. 1891.

Comp. Star = S.D. −14° 893 (8.24)
" " = W. IV 346.

4^h 15^m 41.52^s	−14° 25′ 43.5″ ✓ (1825)
1 31.10	+ 4 50.07
4^h 17^m 12.62^s ^	−14° 20 53.43 ^
64° 18′ 9″ ^	

	Log n/15 = +0.12611 ^		Log n = +1.30220 ^
	" sin α = +9.95477 ^		" cos. α = +9.63716 ^
	" tan δ = −9.40789 ^		" 66 = +1.81954 ^
−0.30816	= −9.48877 ^	+574.0	= +2.75890 ^
+3.0708			
+2.7626	= +0.43130 ^		
66	= +1.81954 ^		
+178.17	= +2.25084 ^		

	4 h 15 m 41.52	−14° 25′ 43.5″
	+ 2 58.17	+ 9 34.0
✱ 1891.0 =	4^h 18^m 39.69^s ^	−14° 16′ 9.5″ ^
	+ 3.19 ✓	+ 10.6 ✓
App. pl. ✱ =	4 18 42.88 ✓	−14 15 58.9 ✓
	+ 1 11.83 ✓	− 6 7.0 ✓
" " ☄ =	4 19 54.71 ✓	−14 22 5.9 ✓

Comet Wolf (1884 III)
Dec. 8. 1891.

$f = +1\overset{s}{.}991$

$G = 22^h\ 37\overset{m}{.}6$

$H = 0^h\ 48.1$

$\text{Log}\ g = +1.1432$

" $h = +1.3088$

" $i = +0.2660$

$G = 22^h\ 37\overset{m}{.}6$ | $H = 0^h\ 48\overset{m}{.}1$
$\alpha_0 = \underline{4\ \ 18.7}$ | $\alpha_0 = \underline{4\ \ 18.7}$
$G+\alpha_0 = 2^h\ 56\overset{m}{.}3$ | $(H+\alpha_0) = 5\ \ 6.8$

$\text{Log}\ \frac{1}{15} = +8.8239$

" $g = +1.1432$

" $\sin(G+\alpha_0) = +9.8424$

" $\tan\delta_0 = \underline{n9.405\overset{4}{3}}$

$-0\overset{s}{.}164 = n9.2148$

" $\frac{1}{15} = +8.8239$

" $h = +1.3088$

" $\sin(H+\alpha_0) = +9.9885$

" $\sec\delta_0 = \underline{+0.0136}$

$+1\overset{s}{.}363 = +0.1345$

$+1\overset{s}{.}991$
$\underline{+1.363}$
$+3.354$
$\underline{-0.164}$
$+3\overset{s}{.}190$ = App. pl. cor. in R.A.

$\text{Log}\ g = +1.1432$

" $\cos(G+\alpha_0) = \underline{+9.8564}$

$+9.\overset{8}{9}9 \quad +0.9996$

" $h = +1.3088$

" $\cos(H+\alpha_0) = +9.3618$

" $\sin\delta_0 = \underline{n9.391\overset{8}{7}}$

$-1.15 = n0.0623$

" $i = +0.2660$

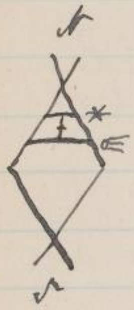
" $\cos\delta_0 = \underline{+9.9864}$

$+1.79 = +0.2524$

$\underline{+9.99}$
$+11.78$
$\underline{-1.15}$
$+10\overset{''}{.}63$ = App. pl. cor. in Dec.

Comet Wolf. (1884 III)

Dec. 28. 1891.



	☄		*					
4^{h}	3^{m}	44.0^{s}	5^{m}	12.8^{s}				
	4	20.7	5	40.5				
	8	4.7	10	53.3	2	48.6 ~~24.3~~	1	24.30
	6	30.6	8	0.0				
	7	7.6	8	28.0				
	13	38.2	16	28.0	2	49.8	1	24.90
	9	50.2	11	19.0				
	10	26.5	11	46.6				
	20	16.7	23	5.6	2	48.9	1	24.5
	12	27.0	13	56.0				
	13	3.0	14	23.5				
	25	30.0	28	19.5	2	49.5	1	24.8
	15	28.7	16	57.2				
	16	4.6	17	25.0				
	31	33.3	34	22.2	2	48.9	1	24.5
								123.0
	97	122.9					−1	24.6
4	9	54.3						
	−0	23.0 Chr. cor.						
4	9	31.3						
18	27	27.3						
9	42	4.0						
	−1	35.4						
9	40	28.6 G.M.T.						

Col. 1 Δ ☾	Col. 3 Δ ★	Col. 1 − Col. 2.
36.7	27.7	9.0
37.0	28.0	9.0
36.3	27.6	8.7
36.0	27.5	8.5
35.9	27.8	8.1
		~~8.7~~
		8.66

Log. 8.66 = 0.93752
" 7.5 = 0.87506
" cos. δ = n9.98598
= n1.79856

2 | −62.88
−31.44

Log 8.66 = 0.93752
" 7.5 = 0.87506
" cos. δ = −9.98596
−62.88 = −1.79854

Comet Wolf. (1884 III)

Dec. 28. 1891.

Comp. Star = AG −14° 875 (85K)

" " = W. Bessel IV 282.

4 12 40.57ˢ −14 38 45.6" (1825)

+ 1 31.11 +4 58.0

4ʰ 14ᵐ 11.68ˢ −14 33 47.6

63° 32′ 55.2″

Log $\frac{n}{15}$ = +0.12611^

" sin α = +9.95198^

" tan. δ. = −9.41463^

−0.31097^ = −9.49272^

+3.0708

+2.75981^ = +0.44088^

66 = +1.81954^

+182.13ˢ = +2.26042^

Log n = +1.30220^

" cos. α = +9.64925^

" 66 = +1.81954^

590.2 = +2.77099^

4h. 12m. 40.57s. − 14° 38′ 45.6″

+ 3 2.15 + 9 50.2

* 1891.0 = 4ʰ 15ᵐ 42.72ˢ^ −14° 28 55.40″^

3.22 + 6.94

ap. pl. * = 4h. 15ᵐ 45.94ˢ −14° 28′ 48.46″^

−1 24.60 − 1 2.88

ap. pl. ☄ = 4ʰ 14ᵐ 21.34ˢ^ − 14° 29′ 51.34″

Comet Wolf (1884 III)

Dec. 28, 1891.

$f = 2.219$

$G = 22\ 46.4$

$H = 23\ 33.3$

Log. $g = +1.1840$

" $h = +1.3100$

" $i = -0.0112$

$$\begin{array}{rrr} & 22 & 46.4 \\ & 4 & 15.7 \\ \hline (G+\alpha_0) = & 3^h. & 2.1^m. \end{array}$$

$$\begin{array}{rrr} & 23 & 33.3 \\ & 4 & 15.7 \\ \hline (H+\alpha_0) = & 3^h. & 49.0^m \end{array}$$

Log. $\frac{1}{15} = +8.8239$

" $g = +1.1840$

" $\sin(G+\alpha_0) = +9.8534$

" $\tan.\ \delta = n\,9.4121$

$-0.187 = n\,9.2734$

Log. $\frac{1}{15} = +8.8239$

" $h = +1.3100$

" $\sin.(H+\alpha_0) = +9.9248$

$\sec.\ \delta = +0.0141$

$+1.183 = +0.0728$

$$\begin{array}{r} +2.219 \\ +1.183 \\ \hline +3.402 \\ -0.187 \\ \hline +3.215 \end{array}$$

Log. $g = +1.1840$

" $\cos.(G+\alpha_0) = +9.8455$

$+10.70 = +1.0295$

Log. $h = +1.3100$

" $\cos.(H+\alpha_0) = +9.7332$

" $\sin\ \delta = n\,9.3980$

$-2.762 = n\,0.4412$

Log. $i = -0.0112$

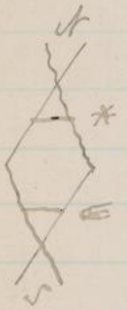
" $\cos.\ \delta = +9.9859$

$-0.993 = n\,9.9971$

$$\begin{array}{r} -0.993 \\ -2.762 \\ \hline -3.755 \\ +10.700 \\ \hline +6.945 \end{array}$$

Comet Wolf. (1884 III)

Jan. 20. 1892.



	☄	*				
6	41 8.5	41 55.5				
	41 34.5	42 31.0				
	82 4~~2~~3.0	84 26.5	1	~~44.5~~ 43.5	0	~~52.25~~ 51.75
	42 58.0	43 45.2				
	43 24.5	44 20.9				
	86 22.5	88 6.1	1	43.6	0	51.80
	44 45.3	45 32.5				
	45 12.0	46 7.5				
	89 57.3	91 40.0	1	42.7	0	51.35
	46 34.2	47 21.0				
	47 0.5	47 57.1				
	93 34.7	95 18.1	1	43.4	0	51.70
	48 24.5	49 11.6				
	48 51.3	49 46.6				
	97 15.8	98 58.2	1	42.4	0	51.20
						~~258.30~~ 257.80
	447 17~~2~~3.3	~~148.9~~			− 0	51.~~66~~56

6h. 44 59.3
+ 4 28.7
6 49 28.0
19 58 8.1
10 51 19.9
1 46.7
10 49 33.2

Col. 1 Δ ⋲	Col. 2 Δ *	Col. 1 + Col. 2
26.0°	35.5°	61.5°
26.5°	35.7°	62.2°
26.7°	35.0°	61.7°
26.3°	36.1°	62.4°
26.8°	35.0°	61.8°
32.3	27.3	61.92°
26.46	35.46	

-11° 33′ 54″.3
-3 35.6
-11 37 29.9

Log. 61.92 = 1.79183
" 7.5 = 0.87506
" cos δ = 9.99109
-454.9 = 2.65798
886″.0
2)431″.1 = ~~7′ 11″.1~~
215″.6 = 3′ 35″.6

61.92 = 1.79183
7.5 = 0.87506
cos. δ = 9.99100
454.87 = 2.65789
886.00
431.13″ = 7′ 11″.1

Comet Wolf (1884 III)

Jan. 20. 1892.

Comp. Star = S.D. −11° 877 (A.G.K)
" " = Fr. 4h 426.

4h. 18m 47.05s −11° 43′ 16.2″ (1825)
1 34.54 +4 46.7
4h. 20m. 21.59s. −11° 38′ 29.5″

65° 5′ 30″

Log $\frac{n}{15}$ = +0.12611
" sin α = +9.95760
" tan δ = n9.31393
−0.2498 = n9.39764
+3.0708
+2.8210 = +0.45040
67 = +1.82607
189.0 = 2.27647

Log. n = +1.30220
" cos. α = +9.62445
" 67 = +1.82607
+565.88 +2.75272

	4h. 18m. 47.05s.			−11° 43′ 16.20″
	3	9.0		+9 25.88
*1892 =	4h. 21m.	56.05s.		−11° 33′ 50.32″
		0.30		−3.97
* ap. pl. =	4h. 21m.	56.35s		−11° 33′ 54.29″
☄ −* =		−51.~~66~~ 56		−7 11.1
Ap. pl. ☄ =	4h 21m	4.~~69~~ 79		−11 41 5.4

Comet Wolf (1884 III)

Jan. 20, 1892.

$f = -0.595$ ^

$G = 15 \quad 37.3$ ^

$H = 22 \quad 5.8$ ^

Log. $g = +0.8220$ ^

" $h = +1.3015$ ^

" $i = -0.6186$ ^

$$\begin{array}{rr} 15 & 37.3 \\ 4 & 21.9 \\ \hline (G+\alpha_0) = 19h. & 59.2m. \end{array}$$

$$\begin{array}{rr} 22 & 5.8 \\ 4 & 21.9 \\ \hline (H+\alpha_0) = 2h. & 27.7m. \end{array}$$

$$\begin{array}{lr} \text{Log.} \frac{1}{15} = & +8.8239 \\ \text{" } g. = & +0.8220 \\ \text{" } \sin(G+\alpha_0) = & -9.9380 \\ \text{" } \tan \delta = & n9.3109 \\ \hline +0.0783 \quad = & +8.8948 \end{array}$$

$$\begin{array}{lr} \text{Log} \frac{1}{15} = & +8.8239 \\ \text{" } h = & +1.3015 \\ \text{" } \sin(H+\alpha_0) = & +9.7787 \\ \sec \delta. = & +0.0089 \\ \hline +0.8185 \quad = & +9.9130 \end{array}$$

$$\begin{array}{r} +0.8185 \\ +0.0783 \\ \hline +0.896\cancel{8} \\ -0.595 \\ \hline +0.301 \end{array}$$

$$\begin{array}{lr} \text{Log.} g = & +0.8220 \\ \text{" } \cos.(G+\alpha_0) = & +9.6973 \\ \hline +3.306 \quad = & 0.5193 \end{array}$$

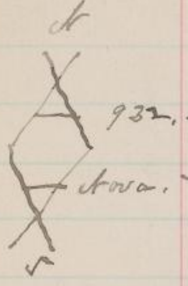
$$\begin{array}{lr} \text{Log.} h = & +1.3015 \\ \text{" } \cos(H+\alpha_0) = & +9.9028 \\ \text{" } \sin \delta = & n9.3020 \\ \hline -3.209 \quad = & -0.5063 \end{array}$$

$$\begin{array}{lr} \text{Log.} i. = & -0.6185 \\ \text{" } \cos. \delta. = & +9.9911 \\ \hline -4.070 \quad = & -0.6096 \end{array}$$

$$\begin{array}{r} -4.070 \\ -3.209 \\ \hline -7.279 \\ +3.306 \\ \hline -3.973 \end{array}$$

Copeland's New Star. (Announced Feb. 2. 1892.)

Feb. 4. 1892.



Nova.	+30° 932		
6^h 58^m $35^s.6$	7^h 0^m $12^s.6$		
59 40.0	1 3.0		
117 39.6	121 15.6	3^m	$36^s.0$	1 48.00
3 32	4 40.5		
3 31.5	5 30.8		
126 34.7	130 11.3	3 36.6	1 48.30
5 59.0	7 26.0		
6 26.9	8 26.2		
132 25.9	136 2.2	3 36.3	1 48.15
8 55.1	10 32.8		
9 23.4	11 22.5		
138 18.5	141 55.3	3 36.8	1 48.40
11 48.5	13 26.0		
12 16.5	14 15.5		
144 5.0	147 41.5	3 36.5	1 48.25
19 42.5	21 20.3		
20 11.0	22 9.5		
159 53.5	163 29.8	3 36.3	1 48.15
22 36.0	24 13.8		
23 4.5	25 3.0		
165 40.5	169 16.8	3 36.3	1 48.15
			−1 48.20

Δ Nova	Δ Comp. ✱.	
28.4 ✓	50.4 ✓	78.8 ✓
28.3 ✓	50.3 ✓	78.6 ✓
27.9 ✓	50.2 ✓	78.1 ✓
28.3 ✓	49.7 ✓	78.0 ✓
28.0 ✓	49.5 ✓	77.5 ✓
28.5 ✓	49.2 ✓	77.7 ✓
28.5 ✓	49.2 ✓	77.7 ✓
		78.06 ✓

30 28 34
−3 11
30 25 23

78.06 = +1.89243 ✓
7.5 = +0.87506 ✓
Lg cos δ = +9.93542 ✓
504.6 = +2.70291
886.0
2/381.4
190.7 = 3′ 10.″7

+1.89243
+0.87506
+9.93566
+2.70315 = 504.8
886.0
−6′ 21.″2 = 381.2

Lettered Star for Copeland's ~~Neb.~~ Nova. is
DM. + 30° 932. (9.1 K)

Comp. Star = Weisse 5^h 709.

	5^h	22^m	$33^s.04$	$+30°$	$24'$	$45''.3$	(1825)
		+2	24.15		+2	2.2	
mid. Pl. =	5	24	57.19	+30	26	47.5	

81° 14' 18"

Log $\frac{x}{5}$ = +0.12609
" sin α = +9.99491
" tan δ = +9.76925
+0.7766 = +9.89022
+3.0709
+3.8475 = +0.58518
75. = +1.87506
288.56 = +2.46024

Log x = +1.30218
" cos α = +9.18277
" 75. = +1.87506
+229.1" = +2.36001

	5^h	22^m	$33^s.04$	$+30°$	$24'$	$45''.3$
		+4	48.56		+3	49.1
* 1900.0 =	5	27	21.60	+30	28	34.4
		−1	48.20		−6	21.2
Nova 1900.0 =	5	25	33.40	+30	22	13.2
		−2	53.14		−2	17.5
" 1855.	5	22	40.26	+30	19	55.7

5	22	40.26 ✓	+30	19	55.7 ✓	(Nova (1885)
	−0	3.50 ✓		+7	34.5 ✓	
5	22	36.76 ✓	+30	27	30.2 ✓	(r 1885)

5	22	40.26 ✓	+30	19	55.7 ✓	
	+0	5.02 ✓		+6	18.4 ✓	
5	22	45.28 ✓	+30	26	14.1 ✓	(t 1885)

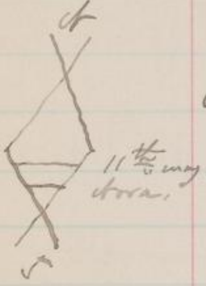
5	22	40.26 ✓	+30	19	55.7 ✓	
	+0	14.45 ✓		−1	37.1 ✓	
5	22	54.71 ✓	+30	18	18.6 ✓	(u 1885)

5	22	40.26 ✓	+30	19	55.7 ✓	
	+0	3.35 ✓		+9	26.5 ✓	
5	22	43.61 ✓	+30	29	22.2 ✓	w 1885.

5.	22	40.26 ✓	+30	19	55.7 ✓	
	+0	3.39 ✓		+1	13.6 ✓	
5	22	43.65 ✓	+30	21	9.3 ✓	(s 1885)

Location of 11th mag. star near Nova (Copeland) with respect to Nova. (This 11th mag. is the star used ~~with~~ to compare the light of Nova with.

Feb. 6. 1892



Nova.	11th mag.				
6h 0m 15.6s	0m 13.4s				
0 48.4	0 57.3				
1 4.0 ✓	1 10.7 ✓	0m	6.7 ✓	0m	3.35 ✓
2 10.8	2 8.3				
2 43.5	2 52.2				
4 54.3 ✓	5 0.5 ✓	0	6.2 ✓	0	3.10 ✓
3 12.8	3 10.5				
3 45.9	3 54.9				
6 58.7 ✓	7 5.4 ✓	0	6.7 ✓	0	3.35 ✓
4 17.4	4 15.2				
4 50.5	4 59.5				
9 7.9 ✓	9 14.7 ✓	0	6.8 ✓	0	3.40 ✓
5 17.5	5 15.0				
5 50.9	5 59.9				
11 8.4 ✓	11 14.9 ✓	0	6.5 ✓	0	3.25 ✓
				+0	3.29 ✓

Δ Nova.	Δ 11th mag.	Diff. ^{s}
0^m 32.8^s	0^m 43.9^s	11.1^s
0 32.7^s	0 43.9^s	11.2^s
0 33.1^s	0 44.4^s	11.3^s
0 33.1^s	0 44.3^s	11.2^s
0 33.4^s	0 44.9^s	11.5^s
		11.26^s

30 19 55.7
+36.4

~~30 19 +9.3~~

+30 20 32.1

~~11.26 = 1.05538~~
~~7.5 = 0.87506~~
~~cos. δ = 9.93549~~
~~= 1.86633~~

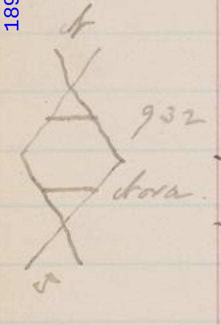
2–72.9
36.4

11.26. = 1.05154
0.87506
9.93606
= 1.86266

1.05154
0.87506
9.93602
1.86262
+72".9
+1 12.9

Location of Nova with reference to Dm. +30° 932 (9.14) 2d obs. See p. 150-4 for 1st obs.

Feb. 6. 1892.



Nova.	932		
6^h 12^m 53.0^s	14^m 34.0^s		
13 24.5	15 20.3		
26 17.5	29 54.3	3^m 36.8	1^m 48.40
16 3.8	17 41.8		
16 32.5	18 31.8		
32 36.3	36 13.6	3 37.3	1 48.65
20 8.5	21 46.7		
20 37.8	22 35.9		
40 46.3	44 22.6	3 36.3	1 48.15
23 5.4	24 43.4		
23 34.1	25 32.5		
46 39.5	50 15.9	3 36.4	1 48.20
26 10.0	27 48.4		
26 39.0	28 37.3		
52 49.0	56 25.7	3 36.7	1 48.35
29 6.7	30 44.7		
29 35.8	31 34.2		
58 42.5	62 18.9	3 36.4	1 48.20
32 7.2	33 45.2		
32 36.4	34 34.5		
64 43.6	68 19.7	3 36.1	1 48.05
			−1 48.29

Δ Nova.	Δ 932.	Sum.
31.5 ✓	46.3 ✓	77.8 ✓
28.7 ✓	50.0 ✓	78.7 ✓
29.3 ✓	49.2 ✓	78.5 ✓
28.7 ✓	49.1 ✓	77.8 ✓
29.0 ✓	48.9 ✓	77.9 ✓
29.1 ✓	49.5 ✓	78.6 ✓
29.2 ✓	49.3 ✓	78.5 ✓
		78.26 ✓

+30 28 34.4
−3 10.0
+30 25 24.4

78.26 = 1.89354 ✓
7.5 = 0.87506 ✓
cos δ = 9.93542 ✓
505.9 = 2.70402 ✓
886.0
2)380.1
190.0

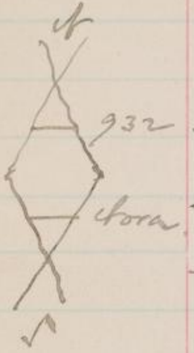
1.89354
0.87506
9.93566
2.70426 = 506.1 ✓
886.0 ✓
−6 19.9 ✓ = 379.9 ✓

Location of Copeland's Nova. with reference to DM. + 30° 932 (9.1K)
Feb. 6. 1892.

* 1900.0	5	27	21.60 ✓	+30	28	34.4 ✓
		−1	48.29 ✓		−6	19.9 ✓
Nova 1900.0 =	5	25	33.31 ✓	+30	22	14.5 ✓

Location of Copeland's Nova with reference to Dm. +30° 932. (9.1 K)

Feb. 9. 1892.



	Nova		932					
5h	43m	34.7s	45m	30.3s				
	44	21.0	46	2.2				
	87	55.7	91	32.5	3m	36.8s	1	48.40
	51	19.2	53	15.1				
	52	5.6	53	46.6				
	103	24.8	107	1.7	3	36.9	1	48.40
	54	13.0	56	8.6				
	54	59.6	56	40.2				
	109	12.6	112	48.8	3	36.2	1	48.10
	57	24.8	59	14.9				
	58	5.5	59	52.0				
	115	30.3	119	6.9	3	36.6	1	48.30
6	4	9.9	6	0.2				
	4	50.8	6	37.6				
	9	0.7	12	37.8	3	37.1	1	48.55
	7	49.7	9	40.1				
	8	31.0	10	17.2				
	16	20.7	19	57.3	3	36.6	1	48.30
	13	13.0	15	3.5				
	13	54.5	15	40.5				
	27	7.5	30	44.0	3	36.5	1	48.25
							−1	48.33

Δ Nova.	Δ 932.	
46.3	31.9	78.2
46.4	31.5	77.9
46.6	31.6	78.2
40.7	37.1	77.8
40.9	37.4	78.3
41.3	37.1	78.4
41.5	37.0	78.5
		78.19

+30° 28′ 34.4″
− 3 10.3
+30 25 24.1

78.19 = 1.89315
7.5 = 0.87506
cos δ = 9.93542
505.4 = 2.70363
886.0
2/380.6
190.3 = 3′ 10.3″

1.89315
0.87506
9.93566
2.70387 = 505.7
886.0
380.3 = 6′ 20.3″

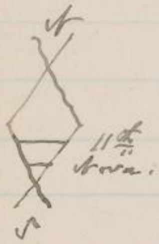
Final Position of Copeland's Nova from observations on Feb. 4, 6 and 9. 1892.

* 1900.0 =	5^{h}	27^{m}	$21^{s}.60$ ✓	+30°	28′	34″.4 ✓		
		−1	48.33		−6	20.3 ✓		
Nova 1900.0 =	5	25	33.27 ✓	+30	22	14.1 ✓	(Feb. 9.)	
" "	5	25	33.40 ✓	+30	22	13.2 ✓	(Feb. 4)	
" "	5	25	33.31 ✓	+30	22	14.5 ✓	(Feb. 6)	
" "	5	25	33.33 ✓	+30	22	13.9 ✓	(mean.)	

Av. Dev. $0^{s}.05$ Av. Dev. 0″.5

Location of 11th mag. star near Copeland's Nova with respect to Nova.

Feb. 9. 1892.



	11 magn.	Nova.				
6	48 51.2	48 53.5				
	49 24.3	49 15.2				
	98 15.5	98 8.7	0	6.8	0	3.40
	49 34.1	49 36.4				
	50 7.1	49 58.0				
	99 41.2	99 34.4	0	6.8	0	3.40
	50 17.9	50 20.1				
	50 50.8	50 41.5				
	101 8.7	101 1.6	0	7.1	0	3.55
	51 11.1	51 13.3				
	51 44.4	51 35.0				
	102 55.5	102 48.3	0	7.2	0	3.60
	51 58.1	52 0.4				
	52 31.2	52 21.9				
	104 29.3	104 22.3	0	7.0	0	3.50
					+0	3.49

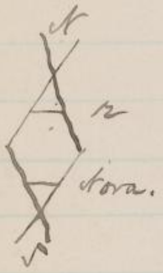
Δ 11th mag.	Δ Nova.	
33.1′	21.7′	11.4′
33.0′	21.6′	11.4′
32.9′	21.4′	11.5′
33.3′	21.7′	11.6′
33.1′	21.5′	11.6′
		11.50 ✓

+30 22 13.9
+ 37.2
~~+30 21 36.7~~
+30 22 51.1

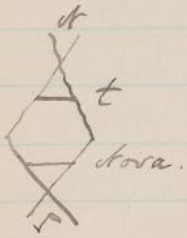
11.50 = 1.06070 ✓
7.5 = 0.87506 ✓
cos δ = 9.93549 ✓
2)74.4″ = 1.87165 ✓
37.2

1.06070 ✓
0.87506 ✓
9.935~~[illegible]~~ ✓
1.871~~61~~ ✓ = 74.4″ ✓ = +1′ 14.4″

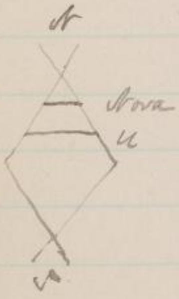
Location of Faint Comparison Stars for Copeland's Nova, Feb. 13. 1892



r	Nova				
7^h 42^m 32.5^s	42^m 52.4^s				
43 22.1	43 9.6				
85 54.6	86 2.0	0	7.4	0	3.70
43 54.2	44 13.5				
44 43.5	44 30.8				
88 37.7	88 44.3	0	6.6	0	3.30
				− 0	3.50



t	Nova				
7 50 29.1	50 39.0				
51 23.1	51 3.5				
101 52.2	101 42.5	0	9.7	0	4.85
51 52.5	52 2.6				
52 47.0	52 26.5				
104 39.5	104 29.1	0	10.4	0	5.20
				+0	5.02



u	Nova				
7 55 22.1	55 15.0				
56 7.3	55 45.5				
111 29.4	111 0.5	0	28.9	0	14.45
58 11.8	58 5.0				
58 57.4	58 35.3				
117 9.2	116 40.3	0	28.9	0	14.45
				+0	14.45

δ Nova = ~~+30° 22′ 13.9″~~
~~+3 47.2~~
~~+30 26 1.1~~

+30 19 55.7
+3 47.2
+30 23 42.9

Δ Δ

66.70 = 1.82413 ✓
7.5 0.87506 ✓
cos δ = 9.93549
431.6 = 2.63508
886.0
454.4 227.2 = 3′ 47.2″

49.6 ✓ 17.2 ✓ 66.8 ✓

1.82413 ✓
0.87506 ✓
9.93579 ✓
431.5 ✓ = 2.63498 ✓
886.0
454.5 = +7′ 34.5″ ✓ = 2δ

49.3 ✓ 17.3 ✓ 66.6 ✓
66.70 ✓

+30 19 55.7
+3 9.2
+30 23 4.9

~~30 22 13.9~~
~~+3 9.2~~
~~+30 25 23.1~~

78.45 = 1.89459
7.5 = 0.87506
cos δ = 9.93589
507.6 = 2.70554
886.0
2/378.4
189.2

54.0 ✓ 24.5 ✓ 78.5 ✓

1.89459
0.87506
9.93583
507.6 = 2.70548
886.0
378.4 = +6′ 18.4″ ✓

54.5 ✓ 23.9 ✓ 78.4 ✓
78.45 ✓

+30 19 55.7 ✓
−48.6
+30 19 7.1

~~+30 22 13.9~~
~~−48.6~~
~~+30 21 25.3~~

15.00 = 1.17609
7.5 = 0.87506
cos δ = 9.93589
2/97.1 = 1.98704
48.6

45.2 ✓ 30.5 ✓ 14.7 ✓

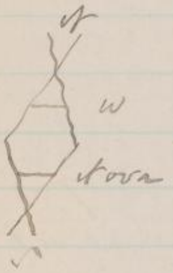
1.17609
0.87506
9.93613
97.1 1.98728

45.6 ✓ 30.3 ✓ 15.3 ✓
15.00 ✓

−1′ 37.1″ ✓

Location of Faint Comparison Stars for Copeland's Nova.

Feb. 13. 1892.



w	Nova		
8 8 12.5 ✓	7 57.5 ✓		
8 25.5 ✓	8 33.6 ✓		
16 38.0 ✓	16 31.1 ✓	0 6.9 ✓	0 3.45 ✓
9 15.9 ✓	9 1.4 ✓		
9 29.5 ✓	9 37.5 ✓		
18 45.4 ✓	18 38.9 ✓	0 6.5	0 3.25
			+0 3.35 ✓

+30 19 55.7 ✓
+4 43.2 ✓
+30 24 38.9 ✓

~~30 22 13.9~~
~~+4 43.2~~
~~30 26 57.1~~

Δ Δ

13.0 ✓ 36.1 ✓ 49.1 ✓

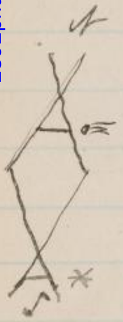
13.6 ✓ 36.1 ✓ 49.7 ✓
49.40 ✓

49.40 = 1.69373 ✓
7.5 = 0.87506 ✓
cos δ = 9.93589 ✓
319.7 = 2.50468 ✓
886.0
2/566.3
283.2 = +4 43.2

1.69373 ✓
0.87506 ✓
9.93572 ✓
319.5 = 2.50451 ✓
886.0
566.5 = +9 26.5 ✓

Swifts' New Comet.

Mar. 9. 1892.



	☄	*		
16^h	7^m 49.0^s ✓	11^m 27.0 ✓		
	8 13.5 ✓	11 50.5 ✓		
	16 2.5 ✓	23 17.5 ✓	7^m 15.0^s ✓	3^m 37.50^s ✓
	13 14.0 ✓	16 49.5 ✓		
	13 31.0 ✓	17 9.0 ✓		
	26 45.0 ✓	33 58.5 ✓	7 13.5 ✓	3 36.75 ✓
	19 21.8 ✓	22 56.1 ✓		
	19 40.9 ✓	23 18.9 ✓		
	39 2.7 ✓	46 15.0 ✓	7 12.3 ✓	3 36.15 ✓
	24 33.5 ✓	28 5.5 ✓		
	24 49.5 ✓	28 27.5 ✓		
	49 23.0 ✓	56 33.0 ✓	7 10.0 ✓	3 35.00 ✓
				145.40
			− 3	36.35 ✓

130 73.2

16^h 16^m 24.1^2

+ 0 40.1 ✓ Chr. cor.

16 17 4.2^3

23 11 19.3

17 5 $44^5.9$

2 48.0

17 2 $56^5.9$ C. M. T.

−ε	+✱	
−24.5 ✓	+23.5 ✓	−1.0 ✓
17.0 ✓	19.5 ✓	+2.5 ✓
19.1 ✓	22.8 ✓	+3.7 ✓
16.0 ✓	22.0 ✓	+6.0 ✓
		+2.80 ✓

$$\begin{array}{rrr} -29 & 16 & 13. \\ & +7 & 32. \\ \hline -29 & 8 & 41. \end{array}$$ ✓

Log 2.80 = +0.44716 ✓
" 7.5 = +0.87506 ✓
" cos δ = +9.94067 ✓
18.3 ✓ = +1.26289 ✓
886.0
2)904.3 ✓
452.2 ✓ = +7′ 32.″2 ✓

+0.44716 ✓
+0.87506 ✓
+9.94121 ✓
+1.26343 ✓
+18.3 ✓
886.0 ✓
904.3 ✓ =
+15′ 4.″3 ✓

+3.ˢ783
+6.″45

Swifts' New Comet.

Mar. 9. 1892.

Comp. Star = Gould's Cat. Gen. (Vol. 14) 26524.

19ʰ 15ᵐ 4.ˢ40 ✓ −29° 17′ 58.1″ ✓ (1875)
+32.13 ✓ +54.4 ✓
19 15 36.53 ✓ −29 17 3.7 ✓
288° 54′ 8.0″ ✓

Log m/15 = +0.12605 ✓
" sin α = −9.97593 ✓
" tan δ = n9.74882
9.85080
+0.7093 = n
+3.0713 ✓
+3.7806 = +0.57756
Log. 17 = +1.23045
+64.27 ✓ = +1.80801

Log n = +1.30214 ✓
" cos α = +9.51048 ✓
" 17 = +1.23045 ✓
+110.4 ✓ = +2.04307 ✓
+1 50.4

19 15 4.40 ✓ −29 17 58.1 ✓
+1 4.27 ✓ +1 50.4 ✓
* 1892.0 = 19 16 8.67 ✓ −29 16 7.7 ✓
−0.84 ✓ −5.4 ✓
Ap. pl. * = 19 16 7.83 ✓ −29 16 13.1 ✓
− 3 36.~~35~~ 64 ✓ +15 ~~4.3~~ 7.3 ✓
~~19 12 31.48~~ ✓ ~~−29 1 8.8~~ ✓
Cor. for Ref.
Ap. pl. ☄ 19 12 31.19 ✓ −29 1 5.8 ✓

Cor. for Ref. −0.ˢ29 ✓ +3.″0 ✓

Swift's New Comet.
Mar. 9. 1892.

f = −0.165 ✓
G = 17 22.5 ✓
H = 18 43.0 ✓
Log g = +0.8130 ✓
" h = +1.2743 ✓
" i = −0.9042 ✓

	17	22.5		18	43.0
	19	16.1		19	16.1
(G+D)	12^h	38.6^m	(H+D)	13^h	59.1

Log. 1/r = +8.8239
" g = +0.8130
" sin(G+D) = −9.2183
" tan δ = n9.7486 ✓
+0.0401 = +8.6038

Log. 1/r = +8.8239
" h = +1.2743
" sin (H+D) = −9.6960
" sec. δ = +0.0593 ✓
~~− 0.7137~~ = −9.8535

−0.7137
+ 0.0401
−0.6736
−0.165
−0.839

~~+ 0.0401~~
~~− 0.753$\frac{7}{5}$~~
~~− 0.165~~
~~0.918~~ = Ap. pl. cor in R.A.

Log. g = +0.8130
" cos(G+D) = −9.9938
−6.409 = −0.8068

Log h = +1.2743
" cos(H+D) = −9.9385
" sin δ = n9.6892 ✓
+7.980 = +0.9020

Log. i = −0.9042
" cos. δ = +9.9407 ✓
−6.997 = −0.8449
−6.409
−13.406
+7.980
−5.426 = Ap. pl. cor. in Dec.

Swift's New Comet.

Mar. ~~9~~ 11, 1892.

✓

☄	*		
15 51 39.5	52 53.9		
52 17.4	53 30.5		
103 56.9	106 24.4	2 27.5	1 13.75
54 14.7	55 25.5		
54 49.8	56 5.4		
109 4.5	111 30.9	2 26.4	1 13.20
57 9.0	58 16.0		
57 41.8	58 58.1		
114 50.8	117 14.1	2 23.3	1 11.65
59 49.1	0 54.0		
16 0 19.8	1 38.4		
120 8.9	122 32.4	2 23.5	1 11.75
2 35.5	3 37.0		
3 4.1	4 24.1		
125 39.6	128 1.1	2 21.5	1 10.75
5 6.5	6 7.2		
5 35.0	6 56.0		
130 41.5	133 3.2	2 21.7	1 10.85
7 51.6	8 50.2		
8 18.9	9 40.5		
136 10.5	138 30.7	2 20.2	1 10.10
			82.05
			−1 11.72

16 0 2.3
+50.9
16 0 53.2
23 19 12.4
16 41 40.8
−2 44.1
16 38 56.7 C. m. T.

37.9	36.6	74.5
35.1	39.9	75.0
32.8	42.1	74.9
30.7	44.4	75.1
28.6	47.1	75.7
28.5	48.8	77.3
27.3	50.3	77.6
		75.73

−27 12 27
— 3 10
−27 15 37

75.73 = +1.87927 +1.87927
7.5 = +0.87506 +0.87506
cos δ = +9.94908 +9.94888
505.1 = +2.70341 +2.70321

886.0
2)380.9
190.4

504.9
886.0
381.1 = −6 21.1

$+3.^{s}72$
$+6.''0$

Swifts' New Comet.

Mar. 11. 1892.

Comp. Star = Cordoba Obs. (Cat. Gen. Vol. (4.)) 26682.
mean of 3 obs.

26682. 19 22 8.12 −27° 14' 21.3 (1875)
+31.62 +51.0
19 22 39.74 −27 13 30.3
290° 39' 56.1"

Log $\frac{n}{\nu}$ +0.12605
„ sin α −9.97111
„ tan δ −9.71137
+0.64355 = +9.80853
+3.0713
+3.71488 = +0.56994
Log 17 = +1.23045
+63.15 = +1.80039

Log n = +1.30214
„ cos α = +9.54767
„ 17. = +1.23045
+120.3 = +2.08026
+2 0.3

	19	22	8.12	−27	14	21.3
		+1	3.15		+2	0.3
*1892.0	19	23	11.27	−27	12	21.0
Ap. pl. cor.			−0.80			−6.1
„ „ * =	19	23	10.47	−27	12	27.1
		−1	11.~~72~~ 26		−6	~~21.1~~ 28.9
	~~19~~	~~21~~	~~58.75~~	~~−27~~	~~18~~	~~48.2~~
Cor. for Ref. Ap. pl. of ☄	19	21	59.21	−27	18	56.0

Cor. for Ref. = $+0.^{s}46$ $-7.''8$

Swift's New Comet.

Mar. 11. 1892.

$f = -0.^{s}155$ ✓
$G = 17^{h}\ 25.^{m}2$ ✓
$H = 18^{h}\ 34.^{m}3$ ✓
Log g = +0.8189 ✓
" h = +1.2739 ✓
" i = −0.9065 ✓

36
19 23.2
17 25.2
12 48.4 ✓
($G+\alpha$)

37.
19 23.2 ✓
18 34.3 ✓
13 57.5 ✓
($H+\alpha$)

Log $\frac{1}{15}$ = +8.8239 ✓
" g = +0.8189 ✓
" $\sin(G+\alpha)$ = −9.3214 ✓
" $\tan\delta$ = −9.7109 ✓
+0.047 ✓ = +8.6751 ✓

Log $\frac{1}{15}$ = +8.8239 ✓
" h = +1.2739 ✓
" $\sin(H+\alpha)$ = −9.6906 ✓
" $\sec\delta$ = +0.0509 ✓
−0.691 ✓ = −9.8393 ✓
−0.155 ✓
−0.846 ✓
+0.047 ✓
−0.799 ✓ Cor. in α

Log. g = +0.8189 ✓
" $\cos(G+\alpha)$ = −9.9903
−6.44 ✓ = −0.8092

Log. h = +1.2739 ✓
" $\cos(H+\alpha)$ = −9.9403
" $\sin\delta$ = −9.6600
+7.48 ✓ = +0.8742
Log i = −0.9065 ✓
" $\cos\delta$ = +9.9491
−7.17 ✓ = −0.8556
−6.44 ✓
−13.61 ✓
+7.48 ✓
−6.13 ✓ Cor. in δ

$\zeta = 82.3$ ✓ Refraction Comps. for Swifts' Com. a.
Obs. of Mar. 9. 1892.

log $\cos\varphi$ = $+9.8683$ ✓
„ $\sin t$ = $n9.8437$ ✓✓
Sum = $n9.7120$ ✓
log $\sin\zeta$ = $+9.99\overset{61}{\cancel{57}}$ ✓
$g = -31.3$ ✓ „ $\sin g$ = $n9.7159$ ✓✓

$t = -2^h\ 57^m$ ✓
$\delta_0 = -29.1$ ✓

„ K = $+6.3669$ ✓
„ $\frac{1}{30}$ = $+8.5229$ ✓
„ $\cos\delta_0$ = $+9.9414$ ✓
„ $+g$ = $+2.9474$ ✓
„ $\tan^2\zeta$ = $+1.7380$ ✓
„ $\sin 2g$ = -9.9483 ✓
-0.292 ✓ = -9.4649 ✓

log K = $+6.3669$ ✓
„ $+g$ = $+2.9474$ ✓
„ $\tan^2\zeta$ = $+1.7380$ ✓
„ $\sin^2 g$ = $+9.4312$ ✓
Sum = $+0.4835$ ✓
Z_y = $+3.''04$ ✓

„ K = $+6.3669$ ✓
„ $(d'-d)$ = $+9.9564$ ✓
„ $\tan^2\zeta$ = $+1.7380$ ✓
„ $\cos 2g$ = $+9.6629$ ✓
Sum = $+7.7242$ ✓
Z_y = $+0.''005$ ✓
$+3.04$ ✓
Total Cor. = $+3.''045$ ✓

Refraction Comp. for Swift's Neb. [illegible]
Obs. of Mar. 11. 1892.

$\zeta = 83.\overset{\circ}{9}$ ✓

$t = -3^h\ 22^m$ ✓
$\delta_0 = -27.3$ ✓

log cos φ = +9.8683
" sin t = n9.8874 ✓✓
Sum = n9.7557 ✓
log sin ζ = +9.9975 ✓✓
" sin q = n9.7582 ✓✓

$q = -35.0$

" K = +6.3263 ✓
" $\frac{t}{30}$ = +8.5229 ✓
" cos δ_0 = +9.9487 ✓
" ~~+~~ q = n2.9474 ✓
" tan² ζ = +1.9422 ✓
" sin 2q = −9.9730 ✓
+0.″458 ✓ = +9.6605

log K = +6.3263 ✓
" −q = n2.9474 ✓
" tan² ζ = +1.9422 ✓
" sin² q = +9.5172 ✓
Sum = n0.7331 ✓
Δy = −5.″41 ✓

" K = +6.3263 ✓
" (d′−d) = −2.5810 ✓
" tan² ζ = +1.9422 ✓
" cos 2q = +9.5341 ✓
= −0.3836 ✓

Δy = −2.″42 ✓
−5.41 ✓
Total Cor. = −7.″83 ✓

~~Ref~~ Parallax Comp. Comet ~~b~~ a 1892 (Swift)

Mar. 9.

$t = -2^h\,55^m$
$\delta = -29^\circ.0$

$0''.334$ ✓	$7''.25$
9.5237 ✓	0.8603 ✓
0.0139 ✓	0.0139 ✓
$n9.5376$ ✓	$+0.8742$ ✓

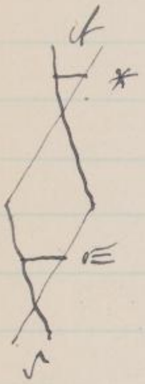
Mar. 11. Comet a 1892.

$t = -3^h\,21^m$
$\delta = -27^\circ.3$

$0''.365$	$6''.97$
9.5623 ✓	0.8432 ✓
0.0139 ✓	0.0139 ✓
$n9.5762$ ✓	$+0.8571$ ✓

Mar. 19. 1892.

Comet c 1892 (Denning)



☄ *

8 55 33.0 ✓ 57 0.5 ✓

56 46.0 ✓ 57 27.5 ✓

112 19.0 114 28.0 2 9.0 -1 4.50

58 31.9 ✓ 59 56.9 ✓

59 42.0 ✓ 0 24.5 ✓

118 13.9 120 21.4 2 7.5 1 3.75

2 2.9 ✓ 3 27.5 ✓

3 14.0 ✓ 3 54.8 ✓

125 16.9 127 22.3 2 5.4 1 2.70

9 6 1.8 ✓ 7 26.2 ✓

7 14.3 ✓ 7 54.0 ✓

133 16.1 135 20.2 2 4.1 1 2.05

10 32.5 ✓ 11 56.3 ✓

11 47.5 ✓ 12 25.0 ✓

142 20.0 144 21.3 2 1.3 1 0.65

-1 2.73 ✓

mean ☄ times = 9 3 $\overset{6}{8.59}$ ✓

+1 42.0 ✓ Chr. cor.

9 4 50.6 ✓

23 50 44.9 ✓

9 14 5.7 ✓

-1 30.8 ✓

9 12 34.9 ✓ C. M. T.

Δ☉	Δ*	
−73.0	+27.0	−46.0
70.1	27.6	−42.5
71.1	27.3	−43.8
72.5	27.8	−44.7
75.0	28.7	−46.3
		−44.66

+59 31 36
−5 58
+59 25 38

Lg −44.66	= n1.64992 ✓		n1.64992 ✓
" 7.5	= +0.87506 ✓		+0.87506 ✓
" cos δ	= +9.70683 ✓		+9.70641 ✓
−170.5" ✓	= n2.23181 ✓		n2.23139 ✓
+886.0 ✓			170.4
			886.0
2/+715.5 =			715.6 = −11 55.6
357.8 ✓ = −5 57.8"			

Mar. 19. 1892.

Comet c 1892 (Denning)

Comp Star = DM. +59° 2595 (6.3 M) ✓
" " Oe A. 24834-6 (mean)

	22	46	46.64 ✓	+59	15	42.4 ✓ (1892)
			+58.75 ✓		+7	55.0 ✓
mid. Pl.	22	47	45.39 ✓	+59	23	37.4 ✓
	341°	56′	20.8″ ✓			

Log $\frac{r}{15}$ +0.12609 ✓
" sin t n9.49180 ✓
" tan δ +0.22891 ✓
−0.7006 = n9.84550 ✓
+3.0709 =
+2.3703 ✓ = +0.37480 ✓
50. = +1.69897 ✓
+118.54 ✓ = +2.07377 ✓

Log r = +1.30218 ✓
" cos t = +9.97805 ✓
" 50. = +1.69897 ✓
+953.2″ = +2.97920 ✓

	22	46	46.64 ✓	+59	15	42.4 ✓
		+1	58.51 ✓		+15	53.2 ✓
* 1892.0 =	22	48	45.15 ✓	+59	31	35.6 ✓
			−2.87 ✓			−11.9 ✓
App. pl. * =	22	48	42.28 ✓	+59	31	23.7 ✓
		−1	2.77 ✓		−11	58.4 ✓
App. pl. ☌ =	22	47	39.51 ✓	+59	19	25.3 ✓

	−1	2.73 ✓	−11	55.6 ✓
Ref. cor. =		−0.04 ✓		−2.8 ✓
	−1	2.77 ✓	−11	58.4 ✓

Mar. 19. 1892.

Comet c 1892 (Denning)

f = −0.″124 ✓
G = 17 31.9 ✓
H = 17 59.7 ✓
log g = +0.8129 ✓
" h = +1.2732 ✓
" i = −0.9106 ✓

17 31.9 ✓
22 47.7 ✓
16 19.6 ✓
(G+α)

17 59.7 ✓
22 47.7 ✓
16 47.4 ✓
(H+α)

Log 1/15 = +8.8239 ✓
" g = +0.8129 ✓
" sin(G+α) = −9.9569 ✓
" tan δ = +0.0270 ✓
−0.418 = −9.6207 ✓

" 1/15 = +8.8239 ✓
" h = +1.2732 ✓
" sin(H+α) = −9.9778 ✓
" sec δ = +0.2924 ✓
− 2.330 ✓ = −0.3673 ✓
− 0.124 ✓
− 0.418 ✓
− 2.872 ✓

Log g = +0.8129 ✓
" cos(G+α) = −9.6275 ✓
−2.76 = −0.4404 ✓

" h = +1.2732 ✓
" cos(H+α) = −9.4935 ✓
" sin δ = +9.9346 ✓
−5.03 = −0.7013 ✓

" i = −0.9106 ✓
" cos δ = +9.7076 ✓
− 4.15 ✓ = −0.6182 ✓
− 2.76 ✓
− 5.03 ✓
− 11.94 ✓

Alt $48.^\circ0$
$Z = 76.0$

Mar. 19. 1892.

Comet c 1892 (Denning)

$t = +10^h\ 16.^m6$ ✓
$\delta_0 = +59.^\circ4$ ✓

$\log \cos \varphi = +9.8683$ ✓
$\text{"} \sin t = \underline{+9.6395}$ ✓
$\text{Sum} = +9.5078$ ✓
$\text{"} \sin \zeta = \underline{+9.9869}$ ✓
$2q = 38.^\circ8$ $\quad$ $\text{"} \sin q = +9.5209$ ✓
$q = +19.^\circ4$ ✓

$\text{"}\ K = +6.4188$ ✓
$\text{"}\ \frac{1}{30} = +8.5229$ ✓
$\text{"} \cos \delta_0 = +9.7068$ ✓
$\text{"} -g = -2.9474$ ✓
$\text{"} \tan^2 \zeta = +1.2064$ ✓
$\text{"} \sin 2q = \underline{+9.7970}$ ✓
-0.040 ✓ $= -8.5993$ ✓

$\log K = +6.4188$ ✓
$\text{"} -g = -2.9474$ ✓
$\text{"} \tan^2 \zeta = +1.2064$ ✓
$\text{"} \sin^2 q = \underline{+9.0426}$ ✓
$\text{Sum} = -9.6152$ ✓
$2y = -0.''41$

$\text{"}\ K = +6.4188$ ✓
$(715.6)\ \text{"}\ (\delta' - \delta) = -2.8547$ ✓
$\text{"} \tan^2 \zeta = +1.2064$ ✓
$\text{"} \cos 2q = \underline{+9.8917}$ ✓
$\text{Sum} = \underline{-0.3716}$ ✓
$2y = -2.''35$ ✓
$\underline{-0.41}$ ✓
Total cor. $= -2.76$ ✓

Comet ~~b~~ a 1892. (Swift.)

Mar. 20. 1892.

☄	*				
16 43 29.7	44 18.0				
44 10.9	44 33.0				
87 40.6	88 51.0	−1	10.4	−0	35.20
45 6.1	45 54.1				
45 47.1	46 9.3				
90 53.2	92 3.4	1	10.2	−0	35.10
46 53.1	47 40.6				
47 33.8	47 55.0				
94 26.9	95 35.6	1	8.7	−0	34.35
48 56.9	49 48.0				
49 37.4	49 57.7				
98 34.3	99 41.7	1	7.4	−0	33.70
51 29.2	52 16.5				
52 9.0	52 29.0				
103 38.2	104 45.5	1	7.3	−0	33.65
53 42.3	54 29.5				
54 22.4	54 41.5				
108 4.7	109 11.0	1	6.3	−0	33.15
55 23.5	56 9.9				
56 3.0	56 22.5				
111 26.5	112 32.4	1	5.9	−0	32.95
				−0	34.01

16 49 37.5
+1 50.9
16 51 28.4
23 54 41.4
16 56 47.0
−2 46.6
16 54 0.4 G.M.T.

Δ ☄	Δ *	
0′ 41″.2	0′ 15″.0	0 56.2
0 ~~4~~41.0	0 15.2 ✓	0 56.2
0 40.7	0 14.4	0 55.1
0 40.5	0 13.7	0 54.2
0 39.8	0 12.5	0 52.3
0 40.1	0 12.0	0 52.1
0 39.5	0 12.6	0 52.1
0 40.40	0 13.63	0 54.03 ✓

−18 39 48. ✓
−3 12.
−18° 43 0. ✓

54.03 = +1.73263 ✓
75 = +0.87506 ✓
cos δ = +9.97654 ✓
2/383.9 = +2.58423 ✓
192.0 = −3′ 12.0

+1.73263 ✓
+0.87506 ✓
+9.97640 ✓
+2.58409 ✓
383.8 ✓
−6′ 23″.8 ✓

+3ˢ.45
+10″.1

Comet $\overset{a}{8}$ 1892 (Swift)
Mar. 20. 1892.

Comp. Star = BD −18° 5609 (8.0 M) ✓

" " = Pz A. (−15° to −31°) 20274−5.

20ʰ	1ᵐ	3ˢ.42 ✓	−18°	46′	47″.4 ✓	(1850)
	+1	12.45 ✓		+3	32.1 ✓	
20	2	15.87	−18	43	15.3	
300°	33′	58″.0				

Log n/15 = +0.12608 ✓
" sin t = −9.93502
" tan δ = −9.53005
+0.3901 = +9.59115
+3.0710
+3.4611 = +0.53921
Log. 42 = +1.62325
+145.37 = +2.16246

Log n = +1.30217 ✓
" cos t = +9.70632
" 42 = +1.62325
+428.3 = +2.63174
+7 8.3

	20	1	3.42 ✓	−18	46	47.4
		+2	25.37 ✓		+7	8.3 ✓
*1892.0	20	3	28.79 ✓	−18	39	39.1 ✓
Red. to App. Pl.			−0.71 ✓			−8.4 ✓
App. pl. * =	20	3	28.08 ✓	−18	39	47.5 ✓
☄ − * =		−0	34.01 ✓		−6	24.3 ~~23.8~~ ✓
App. pl. ☄ =	20	2	54.07 ✓	−18	46	11.8 ✓

Comet b 1892 (Swift)
Mar. 20. 1892.

$f = -0.113$
$G = 17\ 34.5$
$H = 17\ 55.4$
Log $g = +0.8123$
" $h = +1.2732$
" $i = -0.9105$

$$\begin{array}{rr} 17 & 34.5 \\ 20 & 3.5 \\ \hline 13^h & 38.^m0 \end{array}$$
$(G+\alpha)$

$$\begin{array}{rr} 17 & 55.4 \\ 20 & 3.5 \\ \hline 13^h & 58.^m9 \end{array}$$
$(H+\alpha) = 13^h\ 58.^m9$

Log $\frac{1}{15} = +8.8239$
" $g = +0.8123$
" $\sin(G+\alpha) = -9.6177$
" $\tan\delta = -9.5287$
$+0.^s061 = +8.7826$

" $\frac{1}{15} = +8.8239$
" $h = +1.2732$
" $\sin(H+\alpha) = -9.6954$
" $\sec\delta = +0.0235$
$-0.655 = -9.8160$

$$\begin{array}{r} -0.113 \\ \hline -0.768 \\ +0.061 \\ \hline -0.707 \end{array}$$
Cor. in α

Log $g = +0.8123$
" $\cos(G+\alpha) = -9.9590$
$-5.91 = -0.7713$

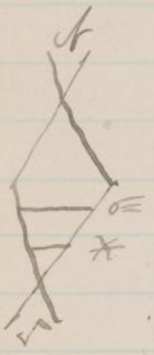
" $h = +1.2732$
" $\cos(H+\alpha) = -9.9387$
" $\sin\delta = -9.5052$
$+5.21 = +0.7171$

" $i = -0.9105$
" $\cos\delta = +9.9765$
$-7.71 = -0.8870$

$$\begin{array}{r} -5.91 \\ \hline -13.62 \\ +5.21 \\ \hline -8.''41 \end{array}$$
$= $ Cor. in δ

Comet c 1892. (Denning)

Mar. 21. 1892.



	☌≡		*					
9h	21m	2.4s	18m	45.4s				
	22	22.0	19	6.5				
	43	24.4	37	51.9	+5m	32.5	+2m	46.25
	25	15.3	22	57.5				
	26	35.3	23	18.9				
	51	50.6	46	16.4	5	34.2	+2	47.10
	29	30.5	27	11.2				
	30	51.5	27	35.1				
	60	22.0	54	46.3	5	35.7	+2	47.85
	37	0.0	34	39.5				
	38	23.5	35	4.0				
	75	23.5	69	43.5	5	40.0	+2	50.00
	41	23.3	39	3.0				
	42	49.0	39	27.9				
	84	12.3	78	30.9	5	41.4	+2	50.70
							+2	48.38

9 31 31.28
+1 55.2
9 33 26.5
23 58 38.0
9 34 48.5
− 1 34.2
9 33 14.3 C.M.T.

Δ☉≡	Δ*	
1^m 19.6	0^m 21.1	0^m 58.5
1 20.0	0 21.4	0 58.6
1 21.0	0 23.9	0 57.1
1 23.5	0 24.5	0 59.0
1 25.7	0 24.9	0 60.8
1 21.96	0 23.16	58.80

59 36 47 ✓
+1 52 ✓
59 38 39. ✓

58.80 = 1.76938 ✓
7.5 = 0.87506 ✓
cos δ = 9.70396 ✓
2/223.0" = 2.34840
111.5 = +1' 51.5" ✓

1.76938 ✓
0.87506 ✓
9.70360 ✓
2.34804 ✓ = 222.9"
+3' 42.9" ✓

$+2^{s}.431$ Comet c 1892 (Denning)
$+19''.22$ Mar. 21. 1892.

Comp. Star = BM. +59° 2625 (7.3 G.)
" " = Groombridge 3959.

$22^{h}\ 53^{m}\ 53^{s}.64$ +59° 10′ 38″.3 (1810)
+1 39.67 +13 8.0
mid Pl. 22 55 33.31 +59 23 46.3
343° 53′ 19″.6

Log n/15 = +0.12612
" sin t = n9.48326
" tan δ = +0.22805
−0.6272 = n9.79743
+ 3.0706 =
+2.4434 = +0.38799
82. = +1.91381
200.3 = +2.30180

Log n = +1.30221
" cos t = +9.98260
" 82. = +1.91381
1579.9 = +3.19862

22 53 53.64 +59° 10′ 38″.3
+3 20.35 +26 19.9
* 1892.0 = 22 57 13.99 +59 36 58.2
Red. to Ap. Pl. −3.14 −11.5
Ap. pl. * = 22 57 10.85 +59 36 46.7
(☄ − *) +2 48.38 +3 43.8 ~~47.9~~
Ap. pl. ☄ = 22 59 59.23 +59 40 30.5

Comet c 1892 (Denning)
Mar. 21. 1892.

f = −0.101 ✓
G = 17 37.2 ✓
H = 17 51.1 ✓
Log g = +0.8130 ✓
" h = +1.2732 ✓
" i = −0.9103 ✓

17 37.2 ✓
22 57.2
16 34.4
(G+α)

17 51.1 ✓
22 57.2
16 48.3
(H+α)

Log $\frac{1}{15}$ = +8.8239 ✓
" g = +0.8130 ✓
" sin(G+α) = −9.9690 ✓
" tan δ = +0.2319 ✓
−0.688 ✓ = −9.8378 ✓

" $\frac{1}{15}$ = +8.8239 ✓
" h = +1.2732 ✓
" sin(H+α) = −9.9784 ✓
" sec δ = +0.2960 ✓
−2.352 ✓ = −0.3715 ✓
−0.688 ✓
−0.101 ✓
−3.141 Cor in α

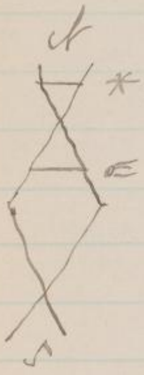
Log g = +0.8130 ✓
" cos(G+α) = −9.5631 ✓
−2″.38 = −0.3761 ✓

" h = +1.2732 ✓
" cos(H+α) = −9.4882 ✓
" sin δ = +9.9358 ✓
−4.98 = −0.6972 ✓

" i = −0.9103 ✓
" cos δ = +9.7080 ✓
−4.11 ✓ = −0.6143 ✓
−2.38 ✓
−4.98 ✓
−11.47 Cor. in δ.

Comet b 1892 (Swift).

$\zeta = 75.3^\circ$ Mar. 20. 1892.



$16^h\ 51.5^m$ = S.T.
$20\ \ \ 3.2$ = R.A.
$-3\ \ 11.7$ = H.A.

$-18.7^\circ = \delta_0$

Log cos φ = +9.8683
" sin t = n9.8706
Sum. = n9.7389
" sin ζ = +9.9855
" sin q = n9.7534
q = −34.5°

No ref. in R.A.

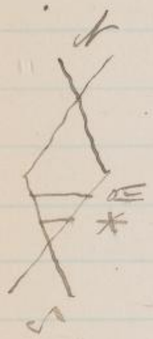
2q = −69.0°

Log K = +6.4211
(−383.8") " (d′−d) = n2.5841
" tan² ζ = +1.1622
" cos 2q = +9.5543
= n9.7217

Cor. in Dec. = −0.53"

$\zeta = 76.7°$ ✓

Comet c 1892 (Denning)
Mar. 21. 1892.



$$\begin{array}{rl} 9^h & 33.5 = \text{S.T.} \\ 22 & 58.6 = \text{R.A.} \\ \hline +10 & 34.9 = \text{H.A.} \end{array}$$

$+59.6° = \text{Dec.}$ ✓

$\text{Log} \cos \varphi = +9.8683$

$\text{"} \sin t = +9.5597$ ✓

$\text{Sum} = +9.4280$ ✓

$\text{"} \sin \zeta = +9.9882$ ✓

$\text{"} \sin q = +9.4398$ ✓

No ref. in R.A.

$q = +16.0°$

$\text{Log } K = +6.4159$ ✓

$2q = +32.0° \; (+222.''9) \log (d'-d) = +2.3481$ ✓

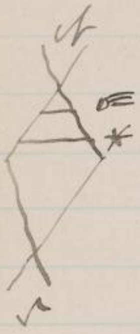
$\text{"} \tan^2 \zeta = +1.2528$ ✓

$\text{"} \cos 2q = +9.9284$ ✓

$\text{Cor. in Dec} = +0.''88 \qquad = +9.9452$ ✓

Comet ~~b~~ a 1892 (Swift)

Mar. 29. 1892.



	☌≡	*		
17	14 3.0	11 56.8		
	14 26.0	12 41.0		
	28 29.0	24 37.8	+3 51.2	+1 55.60
	17 32.5	15 25.3		
	17 54.6	16 9.8		
	35 27.1	31 35.1	3 52.0	1 56.00
	20 45.5	18 37.5		
	21 7.3	19 22.1		
	41 52.8	37 59.6	3 53.2	1 56.60
	23 58.5	21 49.3		
	24 19.1	22 34.2		
	48 17.6	44 23.5	3 54.1	1 57.05
	27 15.8	25 5.4		
	27 35.4	25 50.7		
	54 51.2	50 56.1	3 55.1	1 57.55
				+1 56.56

Mean ☌≡ times = 17 20 53.8

+2 45.1 Chr. cor.

17 23 38.9

0 30 10.4

16 53 28.5

−2 46.0

C. M. T. 16 50 42.5

Δ☾	Δ✱	
$23^{s}.0$	$44^{s}.2$	21.2
22.1	44.5	22.4
21.8	44.6	22.8
20.6	44.9	24.3
19.6	45.3	25.7
		23.28 ✓

−9 26 25. ✓
+1 26. ✓
−9 24 59. ✓

23.28 = +1.36698 ✓
7.5 = +0.87506 ✓
cos δ = +9.99408 ✓
2)172″.2 = +2.23612
86.1

+1.36698 ✓
+0.87506 ✓
+9.99411 ✓
+2.23615 ✓
172″.2 ✓
+2 52″.2 ✓

+3.246
+12".69

Comet ~~b~~ a 1892. (Swift)

Mar. 29. 1892.

Comp. Star = B.D. −9° 5560 (7.8 M.)

20 36 25.7 −9° 34.1 (1855)

Schj. 8246. = 20 36 58.15 −9 31 58.2 (1865)
43.82 +2 51.3
Mid. Pl. = 20 37 41.97 −9 29 6.9
309° 25' 29".6

Log $\frac{n}{15}$ = +0.12606
″ sin d = n9.88788
″ tan δ = n9.22292
+0.1725 = +9.23686
+3.0712
+3.2437 = +0.51104
27. = +1.43136
+87.58 = +1.94240

Log n = +1.30216
″ cos δ = +9.80282
″ 27. = +1.43136
+343".8 = +2.53634
+5' 43".8

20ʰ 36ᵐ 58ˢ.15 −9° 31' 58".2
+1 27.58 +5 43.8
20 38 25.73 −9 26 14.4
−0.63 −10.6
App. pl. ✱ = 20 38 25.10 −9 26 25.0
+1 56.56 +2 52.3
App. pl. ∈ = 20 40 21.66 −9 23 32.7

No ref. cor in R.A.
+0".1 ″ ″ Dec.

f = −0.062 ✓
G = 17 46.5 ✓
H = 17 16.7 ✓
Log g = +0.8205
" h = +1.2743
" i = −0.9040

17 46.5
20 38.4
14 24.9 ✓
(G+L)

17 16.7
20 38.4
13 55.1
(H+L)

Log $\frac{1}{15}$ = +8.8239 ✓
" g = +0.8205 ✓
" sin(G+L) = −9.7715 ✓
" tan δ = n9.2207 ✓
+0.043 ✓ = +8.6366 ✓

" $\frac{1}{15}$ = +8.8239 ✓
" h = +1.2743 ✓
" sin(H+L) = −9.6824 ✓
" sec δ = +0.0059 ✓
−0.612 ✓ = −9.7865 ✓
−0.062 ✓
−0.674 ✓
+0.043 ✓
−0.631 ✓

Log g = +0.8205 ✓
" cos(G+L) = −9.9067 ✓
−5.34″ ✓ = −0.7272 ✓

" h = +1.2743 ✓
" cos(H+L) = −9.9428 ✓
" sin δ = n9.2148 ✓
+2.70″ ✓ = +0.4319 ✓

" i = −0.9040 ✓
" cos δ = +9.9941 ✓
−7.91″ ✓ = −0.8981 ✓
−5.34 ✓
−13.25 ✓
+2.70 ✓
−10.55 ✓

$\zeta = 68°.5$ ✓ Comet ~~b~~ a 1892 (Swift)

Mar. 29. 1892.

17 23.6 = S.T.
20 39.4 ✓ = R.A.
−3 15.8 = H.A.

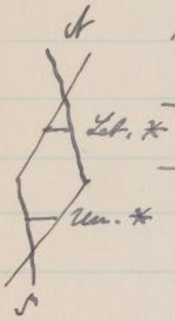
$-9° 25' = \delta_0$

Log cos φ = +9.8683 ✓
" sin t = n9.8775 ✓
Sum. = n9.7458 ✓
log sin ζ = +9.9687 ✓
" sin q = n9.7771 ✓
q = −36.8 ✓
2q = −73.6 ✓

No ref. in R.A.

Log K = +6.4345 ✓
(+172".2) " (d′−d) = +2.2360 ✓
" tan² ζ = +0.8092 ✓
" cos 2q = +9.4508 ✓
+0".09 ✓ = +8.9305 ✓

Obs. of Apr. 20. 1892, to ~~form~~ join Lettered and Unlet. Stars (Arm. +20° 704 and 713. See this book, p. 66)



Unlet. *	Let. *				
$10^h\ 1^m\ 15^s.5$ ✓	$9^h\ 58^m\ 2^s.0$ ✓				
1 39.0 ✓	58 11.9 ✓				
12 2 54.5 ✓	116 13.9	6	40.6	3	20.3
8 9.2 ✓	10 4 57.8 ✓				
8 34.9 ✓	5 6.0 ✓				
16 44.1 ✓	10 3.8	6	40.3	3	20.1
12 20.0 ✓	9 4.9 ✓				
12 42.3 ✓	9 16.5 ✓				
25 2.3 ✓	18 21.4	6	40.9	3	20.4
16 52.6 ✓	13 40.6 ✓				
17 18.0 ✓	13 49.0 ✓				
34 10.6 ✓	27 29.6	6	41.0	3	20.5
21 16.6 ✓	17 58.0 ✓				
21 35.5 ✓	18 13.5 ✓				
42 52.1 ✓	36 11.5	6	40.6 ~~50.6~~	3	20.3 ~~25.3~~
25 59.9 ✓	22 43.6 ✓				
26 21.0 ✓	22 56.2 ✓				
52 20.9 ✓	45 39.8	6	41.1	3	20.5
31 5.6 ✓	27 53.0 ✓				
31 30.5 ✓	28 1.4 ✓				
62 36.1 ✓	55 54.4	6	41.7	3	20.3
				+3	20.34 ✓

$10^h\ 16^m\ 54^s.3$ ✓

Chr. corr. +4 50.± ✓

10 21 44. ✓

23.5	9.9	33.4
25.7	8.2	33.9
22.3	11.6	33.9
~~25.4~~		
25.4	8.4	33.8
18.9	15.5	34.4
21.1	12.6	33.7
24.9	8.4	33.3
		33.77 ✓

+20 23 30.
−5 24.
+20 18 6.

33.77 = 1.52853 ✓
75 = 0.87506 ✓
cos δ = 9.97190 ✓
237.4″ = 2.37549 ✓
886.0
2)648.6 = ~~10′~~
324.3 = −5′ 24.3″ ✓

1.52853 ✓
0.87506 ✓
9.97215 ✓
2.37574 ✓
237.5″ ✓
886.0
648.5 = −10′ 48.5″

Obs. to join let. * and unlet *. (See p. 206-7 and also p. 66. of this book.)

Let. * 1891.0	=	4	2	17.33 ✓	+20	23	29.6 ✓
			+3	20.~~34~~ .14 ✓		−10	~~48.5~~ 51.6 ✓
Un. * 1891.0	=	4	5	37.~~67~~ 47 ✓	+20	12	~~41.1~~ 38.0 ✓
Ap. pl.	=			+1.94 ✓			+10.4 ✓
Ap. pl. Un. *	=	4	5	39.~~61~~ 41 ✓	+20	12	~~51.5~~ 48.4 ✓
σ − Un. *	=		−0	39.27 ✓		−2	36.1 ✓
Ap. pl. σ	=	4	5	0.14 ✓	+20	10	12.3 ✓

Cor. for Ref.

$-0^s.20$ $-3''.1$

Computation of Refraction in obs. to join lettered and unlettered star on Apr. 20. 1892.
(See p.p. 206.–8)

$T = 10^h\ 21.7^m$ ✓ $\delta_0 = +20^\circ\ 18'$ ✓
R.A. = $4\ \ 4.0$ ✓
H.A. = $+6\ \ 17.7$ ✓

$\log \sin \varphi = +9.8287$ ✓
$\text{"}\ \text{"}\ \delta_0 = +9.5402$ ✓
$+0.2338$ ✓ $= +9.3689$ ✓
$\text{"}\ \cos \varphi = +9.8684$ ✓
$\text{"}\ \text{"}\ \delta = +9.9722$ ✓
$\text{"}\ \text{"}\ t = -8.8872$ ✓
$-0.0534 = -8.7278$ ✓
$+0.1804$
$\log \cos \zeta = +9.25624$
$\zeta = 79^\circ\ 36'$

$\log K = +6.3982$ ✓
$\text{"}\ \frac{1}{30} = +8.5229$ ✓
$\text{"}\ \cos \delta_0 = +9.9722$ ✓
$\text{"}\ (-g) = -2.9474$ ✓
$\text{"}\ \tan^2 \zeta = +1.4726$ ✓
$\text{"}\ \sin 2q = +9.9968$ ✓
$-0^s.204 = -9.3101$ ✓

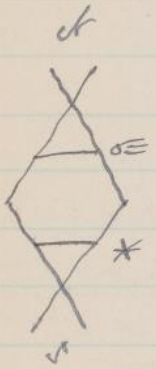
$\log \cos \varphi = +9.8684$ ✓
$\text{"}\ \sin t = +9.9987$
$+9.8671$ ✓
$\text{"}\ \sin \zeta = +9.9928$ ✓
$\text{"}\ \sin q = +9.8743$ ✓
$q = +48^\circ\ 29'$
$2q = +96^\circ\ 58'$

$\log K = +6.3982$ ✓
$\text{"}\ (-g) = -2.9474$ ✓
$\text{"}\ \tan^2 \zeta = +1.4726$ ✓
$\text{"}\ \sin^2 q = +9.7487$ ✓
$-3.''69 = -0.5669$ ✓

$\text{"}\ K = +6.3982$ ✓
$\text{"}\ (d'-d) = n\,2.8119$ ✓
$\text{"}\ \tan^2 \zeta = +1.4726$ ✓
$\text{"}\ \cos 2q = n\,9.0838$ ✓
$+0.''58$ ✓ $= +9.7665$ ✓
-3.69 ✓
$-3.''11$ ✓

Comet a 1892 (Swift)

May. 18. 1892.



	ε	*				
17	43 55.9	42 26.0				
	44 39.5	43 18.0				
	88 35.4	85 40.0	2	55.4	+1	27.70
	46 48.7	45 18.4				
	47 31.7	46 6.2				
	94 20.4	91 24.6	2	55.8	+1	27.90
	49 47.7	48 17.1				
	50 30.6	49 4.2				
	100 18.3	97 21.3	2	57.0	+1	28.50
	53 1.8	51 36.0				
	53 48.5	52 18.1				
	106 46.3	103 49.1	2	57.2	+1	28.60
	56 6.0	54 34.5				
	56 48.3	55 21.5				
	112 54.3	109 56.0	2	58.3	+1	29.15
					+1	28.37 ✓
				Cor. for Ref.		−0.04 ✓
					+1	28.33 ✓

Mean ☌ times = 17 50 17.5 ✓

−1 32.0 Chr. Cor.

17 48 45.5 ✓

3 47 18.2 ✓

14 1 27.3 ✓

−2 17.8 ✓

C.M.T. 13 59 9.5 ✓

Δ☾	Δ*	
43.6°	48.0°	91.6°
43.0°	47.8°	90.8°
42.9°	47.1°	90.0°
42.7°	47.1°	89.8°
42.3°	47.0°	89.3°
42.90	47.40	90.3 ✓

+31 25 53.
$\underline{\ \ +2\ \ 34.}$
+31 28 27. ✓

90.3 ✓ = 1.95569 ✓
7.5 = 0.87506 ✓
cos δ = 9.93109 ✓
577.9 = 2.76184 ✓
886.0
308.1
2/308.1
154.0

1.95569 ✓
0.87506 ✓
9.93088 ✓
2.76163 ✓

577.6 ✓
886.0
308.4 = +5′ 8.4″ ✓
+0.6 ✓
+5 9.0 ✓

(67 yrs.)

Comet a 1892 (Swift).

May 18, 1892.

Comp. Star = B M. + 31° 4906 (9.0 M)

(1825.0)	23	17	16.84	+31	4	3.3	(Y.B. 3880.)
		+1	37.82		11	0.0	
Mid. Pl. =	23	18	58.66	+31	15	3.3	
	349°	43	40.				

Log $\frac{u}{15}$	+0.12610	+1.30220
" sin α	n9.25121	+9.99298
" tan δ	+9.78307	+1.82607
−0.1447 =	n9.16038	+1322.1 +3.12125

+3.0708

+2.9261 = 0.46629

67 = 1.82607

+196.05 = 2.29236

	23	17	16.84	+31	4	3.3
		+3	16.05		+22	2.1
✱ 1892.0 =	23	20	32.89	+31	26	5.4
Red. to Ap. Pl. =			−0.42			−12.1
Ap. pl. ✱ =	23	20	32.47	+31	25	53.3
☄ − ✱		+1	28.33		+5	9.0
Ap. pl. ☄	23	22	0.80	+31	31	2.3

$f = +0^s.363$ ✓
$G = 19\ 24.9$ ✓
$H = 13\ 56.8$ ✓
Log $g = +0.8192$ ✓
" $h = +1.3011$ ✓
" $i = -0.6268$ ✓

$19\ 24.9$ ✓
$23\ 20.5$ ✓
$18\ 45.4$ ✓
$(G+A)$

$13\ 56.8$ ✓
$23\ 20.5$
$13\ 17.3$ ✓
$(H+A)$

Log $\frac{1}{15} = +8.8239$ ✓
" $g = +0.8192$ ✓
" $\sin(G+A) = -9.9914$ ✓
" $\tan\delta = +9.7831$ ✓
$-0.262 = -9.4176$ ✓

" $\frac{1}{15} = +8.8239$ ✓
" $h = +1.3011$ ✓
" $\sin(H+A) = -9.5197$ ✓
" $\sec\delta = +0.0681$ ✓
$-0.516 = -9.7128$ ✓
-0.262
-0.778
$+0.363$ ✓
-0.415 Corr. in α

Log $g = +0.8192$ ✓
" $\cos(G+A) = +9.2940$ ✓
$+1.30$ $+0.1132$

" $h = +1.3011$ ✓
" $\cos(H+A) = -9.9748$ ✓
" $\sin\delta = +9.7150$ ✓
$-9.79 = -0.9909$ ✓

" $i = -0.6268$ ✓
" $\cos\delta = +9.9319$ ✓
$-3.62 = -0.5587$ ✓
-9.79 ✓
-13.41 ✓
$+1.30$ ✓
-12.11 Corr in δ

$\zeta = 64.7$

Comet a 1892 (Swift)

May 18. 1892.

Refraction Computation.

$t = -5^h\,32^m.$

$\delta_0 = +31°\,28'$

Log cos φ = +9.8683

" sin t = n9.9968

Sum = n9.8651 ✓

" sin δ = +9.9562 ✓

" sin q = n9.9089 ✓

q = −54.2

2q = −108.4

Log K = +6.4380 ✓

" $\frac{1}{30}$ = +8.5229 ✓

Colog. cos δ_0 = +0.0691 ✓

Log tg = +2.9474 ✓

" $\tan^2\zeta$ = +0.6508 ✓

" sin 2q = n9.9772 ✓

−0.04" = n8.6054 ✓

Log K = +6.4380 ✓

" tg = +2.9474 ✓

" $\tan^2\zeta$ = +0.6508 ✓

" $\sin^2 q$ = +9.8182 ✓

+0.72 = +9.8544 ✓

" K = +6.4380 ✓

" (d′−d) = +2.4891 ✓

" $\tan^2\zeta$ = +0.6508 ✓

" cos 2q = n9.4992 ✓

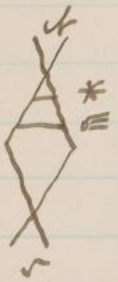
−0.12 = n9.0771 ✓

+0.72

+0.60"

Comet a 1892 (Swift Mar. 6.)

Obs. of Sept. 2. 1892.



	☄	*			
21	15 29.1	16 49.6			
	16 1.6	17 17.1			
	31 30.7	34 6.7	2 36.0	1	18.00
	18 3.2	19 23.9			
	18 35.5	19 51.0			
	36 38.7	39 14.9	2 36.2	1	18.10
	20 37.0	21 57.5			
	21 9.8	22 25.0			
	41 46.8	44 22.5	2. 35.7	1	17.85
	23 7.5	24 28.0			
	23 39.5	24 55.0			
	46 47.0	49 23.0	2 36.0	1	18.00
	26 15.0	27 36.2			
	26 47.8	28 3.5			
	53 2.8	55 39.7	2 37.3	1	18.65
	209 45.6			−1	18.12

	21	20	58.6
		+1	41.5
	21	22	40.1
	10	49	9.8
	10	33	30.3
		−1	43.8
C. m. T. =	10	31	46.5

Δ☾	Δ*	
0 32.5 ✓	0 27.5 ✓	5.0 ✓
0 32.3 ✓	0 27.1 ✓	5.2 ✓
0 32.8 ✓	0 27.5 ✓	5.3 ✓
0 32.0 ✓	0 27.0 ✓	5.0 ✓
0 32.4 ✓	0 27.3 ✓	5.1 ✓
		5.12

5.12 = 0.70927 ✓
7.5 = 0.87506 ✓
cos δ = 9.78~~396~~ 401 ✓
~~23.35~~ ~~= 1.36829~~ ✓ ✓
23.4 ✓ = 1.36834

Comet a 1892.

Obs. of Sept. 2. 1892.

Comp. Star = DM. +52° 164 (8.7 M)
(Oelt. 734)

(1882)	0	38	23.23 ✓	+52	16	19.3 ✓
		+1	24.25 ✓		+8	15.0 ✓
	0	39	47.48 ✓	+52	24	34.3 ✓
	9°	56′	52.″2			

Log $\frac{n}{15}$ = +0.12609 ✓
" sin α = +9.23782 ✓
" tan δ = +0.11360 ✓
+0.3000 = +9.47711 ✓
+3.0707
+3.3707 = 0.52772 ✓
1.69897 ✓
168.53 = 2.22669 ✓

Log n = +1.30218
" cos α = +9.99342
" 50. = +1.69897
+987.6″ = +2.99457

	0	38	23.23 ✓	+52	16	19.3 ✓
		2	48.53 ✓		+16	27.6 ✓
*(1892.0)	0	41	11.76 ✓	+52	32	46.9 ✓
			+2.74 ✓			+7.6 ✓
Ap. pl. * =	0	41	14.50 ✓	+52	32	54.5 ✓
		−1	18.12 ✓			−23.4 ✓
Ap. pl. ☄ =	0	39	56.38 ✓	+52	32	31.1 ✓

f = +1.440
G = 21 27.9
H = 7 21.7
Log g = +1.0774
" h = +1.2774
" i = +0.8866

G = 21 27.9
t = 0 41.2
22 9.1

H = 7 21.7
t = 0 41.2
8 2.9

Log $\frac{1}{15}$ = +8.8239
" g = +1.0774
" sin (G+t) = n9.6676
" tan δ = +0.1157
n9.6846
−0.484

" $\frac{1}{15}$ = +8.8239
" h = +1.2774
" sin (H+t) = +9.9343
" sec δ = +0.2160
+0.2516
+1.785
+1.440
+3.225
− 0.484
+2.741

Log g = +1.0774
" cos (G+t) = +9.9670
+1.0244
+10.53

" h = +1.2774
" cos (H+t) = −9.7058
" sin δ = +9.8997
= −0.8829
− 7.64

" i = +0.8866
" cos δ = +9.7840
+0.6706
+4.68
+10.53
+15.21
−7.64
+7.57